Future Energy Llanwern

EIA Scoping Report

Scoping Report [PINS Ref: EN010171]

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Appendix 5A LVIA Methodology

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1.0 Introduction

1.1 Background

1.1.1 Future Energy Llanwern Limited (the Applicant) has commissioned WSP UK Limited (WSP) to produce an Environmental Impact Assessment (EIA) Scoping Report for the Future Energy Llanwern Solar Farm (the Proposed Development). The Applicant is seeking consent for the Proposed Development which would comprise the construction and operation of a solar photovoltaic (PV) scheme within the Gwent Levels ("the Site"). The Proposed Development would have a generating capacity of greater than 350 megawatts (MW). A full list of acronyms and technical words with definitions is provided in **Appendix 1A: Glossary.**

1.1.2 The Proposed Development comprises the following key physical elements (**paragraph 2.5.2**):

- solar photovoltaic (PV) modules;
- PV module mounting structures;
- inverter units;
- transformers;
- high voltage (HV) switchgear and control equipment;
- onsite cabling;
- substation and transformer housing;
- grid connection infrastructure;
- fencing and security measures;
- new access tracks and bridges;
- upgrades to existing access tracks;
- temporary construction compound; and
- environmental enhancements.

1.1.3 The Site is located approximately 13.0 kilometres (km) east of Newport on

agricultural land between the villages of Redwick and Undy. The total area of the Scoping Red Line Boundary is 548.3 hectares (ha). The Site is located within the Local Authority administrative areas of Monmouthshire County Council and Newport City Council.

1.1.4 The location of the Site, denoted by the Scoping Red Line Boundary, is shown on **Figure 1-1**. The Site is described in **Chapter 2: Description of the Nature and the Purpose of the Project**.

1.1.5 Under the Planning Act 2008[1] , the Proposed Development meets the threshold to qualify as a Nationally Significant Infrastructure Project (NSIP) requiring a Development Consent Order (DCO). The DCO threshold for generating stations in Wales comprises energy generating projects over 350MW. Therefore, with a minimum proposed capacity greater than 350MW, the Proposed Development exceeds this threshold.

1.1.6 This submission of the EIA Scoping Report will provide the basis for a formal request for an EIA Scoping Opinion from the Planning Inspectorate, on behalf of the Secretary of State for Energy Security and Net Zero, under Regulation 10(1) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017[2] (as amended) (EIA Regulations).

1.2 Definition of an EIA

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

1 The Planning Act (2008), [Online], available at: https://www.legislation.gov.uk/ukpga/2008/29/contents [Accessed December 2024].

2 The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017) (as amended), [Online], available at: https://www.legislation.gov.uk/uksi/2017/572#:~:text=10.,provided%20in%20the%20environmental%20statement [Accessed December 2024].

consent (the 'determining authority') before it makes its decision.

1.3 Requirement for EIA

1.3.1 The Proposed Development is defined as a Nationally Significant Infrastructure Project (NSIP) under Sections 14(1)(a) and 15(3A) of the Planning Act 2008[1] as an onshore generating station in Wales exceeding 350MW capacity. At this stage the grid connection infrastructure is proposed to comprise underground cables, a new substation and upgrades to the existing connection point to the transmission network and forms part of the assessment of the EIA and application.

1.3.2 The Proposed Development is subject to the EIA Regulations (2017)[2]. These regulations dictate whether developments fall within 'Schedule 1' or 'Schedule 2'. Those falling under 'Schedule 1' must be subjected to EIA, however those under 'Schedule 2' are subject to an EIA if they are considered to have 'likely significant effects' on the environment owing to the scheme's nature, size or location.

1.3.3 The Proposed Development falls under 'Schedule 2' of the EIA Regulations[2], specifically:

- Paragraph 3(a) of Schedule 2 of the EIA Regulations[2] as it constitutes 'Industrial installations for the production of electricity…'.

1.3.4 Policy and legislation relevant to the Proposed Development is described in **Chapter 3: Legislation and Planning Policy Overview.**

1.3.5 Owing to the nature, size and location of the Proposed Development there is the potential for the Proposed Development to have significant effects on the environment and as such it requires a supporting Environmental Statement (ES). In line with Regulation 8(1)(b) of the EIA Regulations[2] the Applicant provides notice that an ES will be prepared to support the DCO application.

1.3.6 Following the completion of the surveys, assessments, and consultation processes outlined in this EIA Scoping Report, an application for a DCO will be made to the to the Secretary of State (SoS) for Energy Security and Net Zero for determination in accordance with the Planning Act 2008[1]. The DCO application will be accompanied by an ES, in accordance with Regulation 5(2)(a) of the Infrastructure Planning

(Applications: Prescribed Forms and Procedure) Regulations 2009 (APFP Regulations)[3]. The ES will set out the methods and findings of a comprehensive EIA undertaken in line with the EIA Regulations[2].

1.3.7 Following Scoping, the outputs of the subsequent EIA will be two-fold:

- A Preliminary Environmental Information Report (PEIR), produced in connection with the formal statutory consultation on the Proposed Development. The PEIR will present the current understanding of the potential likely significant effects of the Proposed Development at the time of the consultation and its purpose will be to provide information that enables interested parties, including members of the public, local authorities and statutory bodies, to understand the likely significant environmental effects so that they can provide meaningful feedback; and
- The PEIR will be followed by the ES, which will be produced in support of the Application. The ES will report the detailed assessment of the likely significant effects resulting from the Proposed Development and identify the proposed mitigation measures.

1.4 Purpose of the EIA Scoping Report

1.4.1 The purpose of this report is to ensure that the subsequent EIA is focused on the key impacts likely to give rise to significant effects, and to obtain agreement on the EIA approach and scope. As well as identifying elements to be considered in the EIA, this report identifies those elements that are not considered necessary to assess further. This approach is in line with the general aim to undertake proportionate EIA, as advocated by industry best practice and as set out in paragraph 5.10 of the Planning Inspectorate Advice Note Seven[4] (Environmental

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3 The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations (2009), [Online], available at: https://www.legislation.gov.uk/uksi/2009/2264/contents/made [Accessed December 2024].

4 Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (2020), [Online], available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-

Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements).

1.4.2 Additionally, the EIA Scoping Report will inform the Planning Inspectorate and statutory consultees on relevant aspects of the Proposed Development prior to the formulation of a formal Scoping Opinion. There is no obligation to request a Scoping Opinion, but the Applicant has opted to conduct such an exercise in order to ensure that the public are aware of and engaged on the Proposed Development, and to provide for the accuracy of the EIA in assessing those effects that have the potential to be significant.

1.4.3 Whilst this EIA Scoping Report presents the overall framework for the EIA in relation to the environmental factors and associated effects, the exact scope of the EIA will be influenced by the Scoping Opinion received, the on-going design evolution of the Proposed Development, and through on-going baseline data collection (e.g., field surveys etc.) and consultation with stakeholders. Where further evidence justifies a change to the scope of the EIA, this will be explained in the ES along with confirmation of whether the change has been agreed with relevant consultees.

1.4.4 **Table 1-1** sets out the information which a request for a Scoping Opinion must include with reference to Regulation 10(3) of the EIA Regulations[2] and where this information can be found in this report.

Table 1-1 Information Required to Accompany a Request for a Scoping Opinion

Information Required	Location within this Report
A plan sufficient to identify the land	Figure 1-1
A description of the nature and purpose of the development, including its location and technical capacity	Chapter 2 (Description of the Nature and the Purpose of the Project)
An explanation of the likely significant effects of the development on the environment	Chapter 5 to 17 (Topic Assessment Chapters)

environmental-information-and-environmental-statements/ [Accessed December 2024].

Information Required	Location within this Report
Such other information or representations as the person making the request may wish to provide or make	Chapter 5 to 17 (Topic Assessment Chapters)
Other Information	Chapter 5 to 17 (Topic Assessment Chapters)

1.4.5 In addition to the above, Regulation 10(3) of the EIA Regulations[2] also requires 'such other information or representations as the person making the request may wish to provide or make'. This additional information is set out in **Table 1-2**.

1.4.6 As such, the purpose of this EIA Scoping Report can be summarised in the following points:

- Provide a summary of the Proposed Development;
- Set out the proposed scope of work and methods to be applied whilst carrying out the EIA; and
- Detail the proposed structure and content of the ES that is to be submitted with the DCO application.

Table 1-2 Other Information Provided within this EIA Scoping Report

Information Required	Location within this Report
An overview of the conditions present on site and in the surrounding area, together with a brief overview of the relevant planning policy context.	Chapter 5 to Chapter 17 (Topic Assessment Chapters)
Outline of the scope and assessment methodology (including the significance criteria to be adopted) for assessing the likely significant environmental effects to be employed for each aspect to be reported in the ES.	Chapter 4 (The Environmental Impact Assessment Methodology)
The approach to dealing with alternatives.	Chapter 4 (The Environmental Impact Assessment Methodology)
The approach to undertaking the cumulative assessment.	Chapter 17

Information Required	Location within this Report
The proposed approach to the EIA and an appraisal of the key environmental aspects and matters to be covered in the EIA (i.e. "scoped in") and the aspects and matters not requiring further consideration (i.e. "scoped out").	Chapters 5 to Chapter 17 (Topic Assessment Chapters)
The proposed structure and format of the ES which will comprise four main parts: • **Volume I: Non-Technical Summary;** • **Volume II: Main Text;** • **Volume III: Supporting Technical Appendices; and Volume IV: Supporting Figures and Plans.**	Chapter 4 (The Environmental Impact Assessment Methodology)

1.4.7 This EIA Scoping Report has been prepared in accordance with the guidance provided by the Planning Inspectorate Advice Note Seven. **Table 1-3** lists the requirements identified in the Planning Inspectorate Advice Note Seven and details where this information can be found in this report.

Table 1-3 Information Required to align with the Planning Inspectorate Advice Note Seven

EIA Scoping Reports Contents	Location within this Report
Transboundary Screening Matrix.	**Chapter 4** (The Environmental Impact Assessment Methodology)
The Proposed Development	
an explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g., design parameters.	**Chapter 2** (Description of the Nature and the Purpose of the Project)
referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development.	**Figure 1-1** (Location of Proposed Scoping Red Line Boundary) **Figure 2-1** (Environmental Constraints)
Approach to EIA And Topic Areas	
an outline of the reasonable alternatives considered and the reasons for selecting the preferred option.	**Chapter 4** (The Environmental Impact Assessment Methodology)
a summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues.	**Chapter 4** (The Environmental Impact Assessment Methodology)

EIA Scoping Reports Contents	Location within this Report
detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided.	**Chapters 5** to **17** (Topic Assessment Chapters)
results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters.	**Chapters 5** to **17** (Topic Assessment Chapters)
aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect e.g., criteria for determining sensitivity and magnitude.	**Chapters 5** to **17** (Topic Assessment Chapters)
any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects.	**Chapters 5** to **17** (Topic Assessment Chapters)
Sources of Information	
references to any guidance and best practice to be relied upon.	**Chapters 5** to **17** (Topic Assessment Chapters)
evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities); and	**Chapters 5** to **17** (Topic Assessment Chapters)
an outline of the structure of the proposed ES.	**Chapter 4** (The Environmental Impact Assessment Methodology)

Structure of this EIA Scoping Report

1.4.8 The remainder of this EIA Scoping Report is structured as follows:

- **Chapter 2: Description of the Nature and the Purpose of the Project** – provides a description of the development Site and the Proposed Development as it has been considered within this EIA Scoping Report.
- **Chapter 3: Legislation and Planning Policy Overview** – provides an overview of the legislative and planning policy framework in relation to the development Site and Proposed Development.
- **Chapter 4: The Environmental Impact Assessment Methodology** – explains the approach that has been taken to identify the scope of the EIA, outline of the reasonable alternatives considered and how the EIA will proceed.

- **Chapter 5 to 16: Topic Assessments** – sets out the proposed scope and methodology for each technical topic where a significant environmental effect is likely to arise as a result of the Proposed Development.
- **Chapter 5:** Landscape and Visual Impact Assessment;
- **Chapter 6:** Glint and Glare Assessment;
- **Chapter 7:** Cultural Heritage and Archaeology;
- **Chapter 8:** Ecology;
- **Chapter 9:** Ornithology;
- **Chapter 10**: Water Environment and FRA;
- **Chapter 11:** Ground Conditions;
- **Chapter 12:** Traffic and Transport;
- **Chapter 13:** Noise and Vibration;
- **Chapter 14:** Climate Change Resilience;
- **Chapter 15:** Greenhouse Gase Assessment; and
- **Chapter 16:** Socio-Economics, Tourism & Recreation.
- **Chapter 17: Other Environmental Topics** – provides a summary of other environmental topics which have been considered during the preparation of this EIA Scoping Report. It is proposed that these topics can be addressed relatively briefly and qualitatively, without requiring modelling, detailed assessment, or standalone chapters.
- **Chapter 18: Cumulative Effects** – sets out Stage 1 of the Cumulative Effects Assessment and presents the Long List of other developments.
- **Chapter 19: Summary of Scope** – identifies those effects that are scoped out of the EIA along with the topic- specific elements which have been scoped out of further assessment and sets out the proposed content of the Environmental Statement.

1.4.9 This EIA Scoping Report also contains a number of supporting Appendices which are referenced throughout the document.

1.4.10 Each chapter will include a list of figures relevant to the specific chapter.

2.0 Description of The Nature and The Purpose of the Project

2.1 Need for the Proposed Development

2.1.1 There has been an increasing need for the UK to further invest and strengthen their renewable energy supply with the UK Government declaring an Environmental and Climate Change Emergency on 1 May 2019[5]. Following the research presented by the Intergovernmental Panel on Climate Change (IPCC) which concluded that global emissions would need to fall by approximately 45 percent from 2010 levels by 2030, with the aim of achieving net zero by approximately 2050. The UK Government declaration highlights the importance and the recognised need to promote low carbon energy supply technologies.

2.1.2 There are various legislative, regulatory and policy requirements which highlight the need to reduce carbon emission and increase the capacity of renewable energy supply across Wales and the UK. Specifically, Overarching National Policy Statement for Energy (EN-1)[6] has made clear that there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure, which the Proposed Development constitutes. EN-1[6] directs the Secretary of State to give substantial weight to the need and benefits of Nationally Significant Infrastructure Projects (NSIP). It states "subject to any legal requirements, the urgent need for CNP infrastructure to achieving our energy objectives, together with national security, economic, commercial and net zero benefits, will general outweigh any other residual impacts not capable of being addressed by application of the mitigation hierarchy. Government strongly supports the delivery of CNP infrastructure, and it should be progressed as quickly as possible." Please refer to **Section 3.3** for further information relating to EN-1.

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5 UK Environmental and Climate Change Emergency (2019), [Online], available at: https://www.parliament.uk/business/news/2019/may/mps-debate-the-environment-and-climate-change/ [Accessed December 2024].

6 Department for Energy Security and Net Zero (2024) Overarching national policy statement for energy (EN-1), GOV.UK. Available at: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1 [Accessed: December 2024].

2.1.3 Notwithstanding the above, Paragraph 3.3.9 of National Policy Statement for Renewable Energy Infrastructure (NPS-EN3)[7] clarifies that there is 'no limit' on the need for renewable energy. Consequently, the NPS does not advocate for a sequential approach to site selection as a matter of principle, stating that:

'As most renewable energy resources can only be developed where the resource exists and where economically feasible, and because there are no limits on the need established in Part 3 of EN-1, the Secretary of State should not use a sequential approach in the consideration of renewable energy projects (for example, by giving priority to the re-use of previously developed land for renewable technology developments).'

2.1.4 The Draft Climate Change Act 2008[8] (2050 Target Amendment) Order which was published in 2019 furthered the UK's commitment and required a change in the reduction of greenhouse gas emissions outlined in the Climate Change Act 2008 from 80% to 100% when compared to 1990 levels.

Additionally, Net Zero Wales[9] was published in 2021 which set the requirement for Wales to meet the required average reduction of 37% in greenhouse gas emissions (GHG) against the baseline for Carbon Budget Two (CB2) in order to reach Net Zero GHG emissions by 2050. The Welsh Energy Targets[10] which were published in 2017, detail the renewable energy targets which form part of Welsh Governments' commitment for a more sustainable future. These included a target of producing 70% of the electricity consumed in Wales from renewable sources by 2030. In January 2023 the Welsh Government announced an updated target to meet 100% of its electricity needs from renewable sources by 2035 and to achieve 1.5GW of

7 National Policy Statement for Renewable Energy Infrastructure (2024), [Online], available at: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3 [Accessed December 2024].

8 Draft Climate Change Act 2008 (2050 Target Amendment) Order (2019), [Online], available at: https://commonslibrary.parliament.uk/research-briefings/cbp-8590/ [Accessed December 2024].

9 Net Zero Wales (2021), [Online], available at: https://www.gov.wales/sites/default/files/publications/2021-10/net-zero-wales-summary-document.pdf [Accessed December 2024].

10 Welsh Energy Targets (2017), [Online], available at: https://www.gov.wales/sites/default/files/publications/2019-06/energy-generation-2017-report.pdf [Accessed December 2024].

renewable energy capacity within local ownership by 2035, these targets have now been formally adopted.

2.1.5 Additionally, Planning Policy Wales (Edition 12)[11], published in 2024, acknowledges Wales has been set a 95% net zero target for 2050 by the 2019 Climate Change Committee and that in October 2021 the Welsh Government published its Net Zero Wales CB2 Plan and Carbon Budget 3 (CB3) Plan which are establishing the pathway to net-zero.

2.1.6 It should be noted the Welsh Government declared a climate change emergency on 29 April 2019[12] signalling their commitment to address climate change. This was further cemented with the publication of Prosperity for All: A Low Carbon Wales[13] which was published March 2019 and detailed 100 policies and proposals with the aim of achieving the 2020 interim emissions targets.

2.1.7 **Chapter 3: Policy and Legislative Context** addresses the legislative, regulatory and policy requirements relevant to the Proposed Development further.

2.1.8 The suite of applicable policy reinforces the importance of delivering energy generation from renewable sources to meet the energy needs of Wales and the UK. The Proposed Development will contribute towards reducing carbon emissions and increase the capacity of renewable energy generation within Wales and the UK.

2.2 Objectives of the Proposed Development

2.2.1 The Proposed Development comprises the construction and operation of a solar energy generation scheme with an output greater than 350MW which aims to produce low carbon energy generation to provide to the National Grid which will further strengthen Wales's energy mix and contribute towards decarbonisation and

11 Welsh Government (2024). Planning Policy Wales 12th Ed. (c. 3), pp. 31. [Online], available at: https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf [Accessed December 2024].

12 Welsh Environmental and Climate Change Emergency (2019), [Online], available at: https://www.gov.wales/welsh-government-makes-climate-emergency-declaration [Accessed December 2024].

13 Prosperity for All: A Low Carbon Wales (2019), [Online], available at: https://www.gov.wales/sites/default/files/publications/2019-06/low-carbon-delivery-plan_1.pdf [Accessed December 2024].

renewable energy generation targets for both Wales and the wider UK.

2.2.2 Additionally, the following objectives of the Proposed Development have been identified: ensuring the Proposed Development helps to:

- restore historic landscapes and reduce adverse environmental effects on designated sites; and
- provides community benefits in the form of increased economic outputs and use of the local supply chain.

2.3 Introduction to the Proposed Development

2.3.1 The remainder of this chapter provides a description of the Proposed Development and its setting for the purposes of identifying and reporting the potential impacts and likely significant environmental effects.

2.3.2 As the design and implementation of Proposed Development is currently evolving consideration has been given to the Planning Inspectorate Advice Note Nine: Using the 'Rochdale Envelope'[14]. As such, a 'design envelope' approach will be utilised, identifying key parameters for the environmental assessments to be carried out whilst retaining sufficient flexibility to accommodate further refinements during the detailed design phase. This methodology is further discussed in **Chapter 4: The Environmental Impact Assessment Methodology**.

2.3.3 This EIA Scoping Report has been informed by the Scoping Red Line Boundary depicted in **Figure 1-1**, which refers to the maximum extent of land that is to be included within the DCO application including limits of land within which the Proposed Development will be constructed, operated and maintained. It should be noted that the Scoping Red Line Boundary includes land required for permanent and temporary purposes and demonstrates the envisaged maximum extent of temporary and permanent land take.

14 Planning Inspectorate's Advice Note Nine (2018), [Online], available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope [Accessed December 2024].

2.4 Location and Setting of the Proposed Development

2.4.1 The Proposed Development falls within the administrative jurisdiction boundaries of Newport City Council and Monmouthshire Council. The Proposed Development is located 2.5km south of Llanwern Steelworks. The Site comprises agricultural fields which are predominantly used for grazing pasture and arable use. It should be noted that none of the fields proposed to support the Proposed Development fall within Best and Most Versatile Agricultural Land as per The Predictive ALC Map for Wales[15], which uses the Ministry of Agriculture Fisheries and Food (MAFF) 1988[16] classification. The Predictive Map tool shows the majority of the Site falling within Grade 3b, with pockets of Grade 4. ALC is reviewed further in **Chapter 11: Ground Conditions.**

2.4.2 The fields extend along the northern banks of the Severn Estuary and when combined are approximately 548.3 hectares (ha) in size. Individual fields themselves range in size across the Site and are irregularly shaped.

2.4.3 The key existing environmental constraints relevant to the Site are shown on **Figure 2-1**.

2.4.4 The extent of developable land associated with the Proposed Development is shown on **Figure 2-2,** whilst **Figure 2-3** shows the anticipated capacity of the Proposed Development on the basis of the developable land.

2.4.5 Owing to its proximity to the Severn Estuary, there are a combination of coastal flood defences including sea walls and coastal dykes which protect the area from rising sea levels and subsequent salt water intrusion.

2.4.6 The River Usk lies 3.7km west of the Proposed Development. The Goldcliff Pill, a man-made drainage ditch, lies 1.2km to the south-west of the Proposed Development.

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15 The Predictive ALC Map for Wales, [Online], available at: https://www.gov.wales/agricultural-land-classification-predictive-map [Accessed December 2024].

16 MAFF (ADAS) 1995. Agricultural Land Classification for North Wiltshire Local Plan. file:///C:/Users/Admin/Downloads/ALC%20survey%20%20report%20ALCB05195%20(5).pdf [Accessed December 2024].

2.4.7 The Proposed Development lies within the Gwent Levels, which consists of a series of six Sites of Special Scientific Interest (SSSIs) and is registered as a Landscape of Outstanding Historic Interest in Wales (LOHI). The Site is located within the following three Gwent Levels SSSIs:

- Gwent Levels – Whitson SSSI[17];
- Gwent Levels - Redwick and Llandevenny SSSI[18]; and
- Gwent Levels – Magor and Undy[19].

2.4.8 Additionally, the Proposed Development lies on the boundary of Gwent Levels – Nash and Goldcliff SSSI[20]. The Newport Wetlands SSSI and Severn Estuary SSSI are located 1.2km and 20m west of the Proposed Development, respectively.

2.4.9 The Gwent Levels represents an extensive network of drainage ditches known as reens. A large proportion of the reens, which previously supported a range of rich plant species and invertebrates are now in unfavourable condition and are less intensively managed leading to a number of reens becoming overgrown[17].

2.4.10 The special features which are specifically referenced in the citation for the SSSI designations of this area, within which the Proposed Development is sited, include the following:

- Reen and ditch habitat, which support a range of aquatic plants which in turn, support other wildlife.
- A diverse community of aquatic and terrestrial insects, invertebrates, otters and water voles, which inhabit the reens, ditches and their banks.

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17 Gwent Levels – Whitson SSSI, [Online], available at: https://naturalresources.wales/media/636520/SSSI_0148_SMS_EN0013223.pdf [Accessed December 2024].

18 Gwent Levels - Redwick and Llandevenny SSSI, [Online], available at: https://naturalresources.wales/media/646109/SSSI_0563_SMS_EN0012ca0.pdf [Accessed December 2024].

19 Gwent Levels – Magor and Undy SSSI. [Online], available at: https://naturalresources.wales/media/676549/sssi_0307_sms_en001.pdf [Accessed December 2024].

20 Gwent Levels – Nash and Goldcliff SSSI, [Online], available at: https://naturalresources.wales/media/648463/SSSI_0649_SMS_EN001efd9.pdf [Accessed December 2024].

2.4.11 The Gwent Levels: Whitson SSSI is of particular importance for its large number of nationally rare and notable invertebrate species. A total of 65 species of these rare invertebrates have been recorded in this area including *Anthomyza bifasciata*, *Coptophlebia volucris* and *Hydrophilus piceus*. This area is also important for its flora as it contains the nationally rare hairlike pondweed *Potamogeton trichoides* and is the only location in Gwent for the tussock sedge *Carex elata*[16].

2.4.12 The Gwent Levels: Magor and Undy SSSI is the most easterly of the Gwent Levels sites supporting a total of 43 nationally rare and notable invertebrate species such as the soldier fly *Stratiomys furcata*, the snail killing fly *Pherbellia brunnipes* and the water beetle *Haliplus mucronatus*. This area also supports a number of rare and notable aquatic plant species including the pondweed *Potamogeton trichoides* and *P. berchtoldii* and the narrow-leaved water plantain *Alisma lanceolatum*. The boundary of this site has been drawn to include the sea wall back ditch which contains brackish water species such as the water beetle *Agabus conspersus* and the nationally rare brackish water crowfoot *Ranunculus baudotii*[18].

2.4.13 Finally, the Gwent Levels: Redwick and Llandevenny SSSI supports invertebrate species including *Chalcis sispes* a parasite of the Stratiomys fly larvae, the beetle *Scirtes orbicularis* and the drone fly *Pharhelophilus consimilis*. The area also contains a number of nationally rare plant species including the rare *Myriophyllum verticillatum* located in peaty ditches in the northern part of the site and the brackish water crowfoot associated with the ditches bordering the sea wall[17].

2.4.14 In addition to the features listed above, there are specific features associated with the individual SSSIs and their components. These are addressed further in **Chapter 8: Ecology**.

2.4.15 Overall, the Gwent Levels extends from the east of Cardiff to Caldicot, covering a total area of 5700ha. The low-lying topography of the Gwent Levels landscape has been shaped by recurrent events of inundation and reclamation from the sea. The extensive drainage system was introduced, consisting of shallow trenches leading into an extensive system of interconnected ditches. Owing to the proximity to the Severn Estuary, the Gwent Levels area is characterised as an area of low-lying estuarine alluvial wetlands and intertidal mudflats.

2.4.16 The water levels in the reens are adjusted by pumps, sluices and penstocks. In the summer, water levels are kept high to provide drinking water for livestock and in winter the boards are removed to allow floodwater to drain into the Severn Estuary[21].

2.4.17 There is an extensive network of reens lying within or adjacent to the Scoping Red Line Boundary, these are depicted in **Figure 2-1**. Additionally, there is an extensive network of hedgerows across the Site which are associated with the reen network, predominantly bordering the reens.

2.4.18 The Severn Estuary SSSI, Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar borders the southern boundary of the Site. These sites are designated for their internationally important numbers of overwintering birds and supporting habitats. Additionally, the Newport Wetlands located 578.0m to the south-west and Penhow Woodlands located 4.24km north of the Site's easterly boundary are both designated National Nature Reserves (NNR). The River Usk / Afon Wysg located 3.7km north-west of the Site is a designated SAC. There are several Scheduled Monuments within the surrounding area, the closest, at approximately 180m south of the Site, is the Moated Site E of Grangefield Farm (MM205). Two further Scheduled Monuments, Undy Churchyard Cross (MM126) and Relict Seawall alongside Collister Pill Reen (MM226) are situated within 1.0km of the Site, approximately 900m to the northeast of its eastern extent. The remaining 24 scheduled monuments are located in excess of 1.0km from the Site, with the majority situated north of the A4810 and a group of three to the west, in proximity to the village of Goldcliff.

2.4.19 The Site is located near to a number of small villages including, Goldcliff which lies approximately 1.7km to the west, Whitson 200.0m to the north-west and Redwick 51m to the north. The M4 is located 1.9km to the north-east and can be accessed via the Causeway, which is a single-track lane which lies along the north-east border of the Site and the B4245.

21 Gwent Levels: Redwick and Llandevenny SSSI, [Online], available at: https://naturalresources.wales/media/646109/SSSI_0563_SMS_EN0012ca0.pdf [Accessed December 2024].

2.4.20 There is an extensive public right of way (PRoW) network running within and around the Site, these are shown in **Figure 2-1**. Please refer to **Chapter 16: Socio-Economics** which details the PRoWs within proximity to the Proposed Development.

2.5 Operational Design

2.5.1 The Proposed Development would have a generating capacity of greater than 350MW of electrical power for a period of 40 years, which is equivalent to the power used by 117,600 homes.

2.5.2 The principal operational infrastructure will be as follows:

- solar photovoltaic (PV) modules;
- PV module mounting structures;
- inverter units;
- transformers;
- high voltage (HV) switchgear and control equipment;
- onsite cabling;
- substation and transformer housing;
- grid connection infrastructure;
- fencing and security measures;
- new access tracks and bridges;
- upgrades to existing access tracks;
- temporary construction compound; and
- environmental enhancements including Site reinstatement and habitat creation.

Solar PV Modules

2.5.3 The proposed solar PV modules have not been selected at the time of writing this EIA. Due to the rapid development of PV technologies, an element of flexibility is required prior to final design selection with respect to the dimensions, appearance

and arrangement of the modules. Therefore, to inform this EIA Scoping Report a reasonable enveloping assumption has been applied which includes a dimensional panel parameter of up to 3.5 metres (m) at its highest point. It should be noted this has taken into account the mounting structures together with the panels and therefore represents an anticipated maximum height of 3.5m. **Figure 2-4** provides an indicative plan of the proposed solar PV modules.

2.5.4 The modules will be fixed on a mounting structure, with the panels oriented towards the south at a slope of 15 to 25 degrees from horizontal as shown on **Figure 2-5**.

Module Mounting Structures

2.5.5 Each row of panel modules will be mounted on a steel frame which will be driven 1.0m to 1.5m into the ground depending on the ground conditions present. There will be a separation distance of approximately 3m between the rows of modules to prevent the accumulation of surface water runoff and to ensure maintenance can be carried out and to minimise the effect of inter-row shading. Additionally, there will be a gap of 1-2cm between the panels to allow permeability of water and prevent accumulation of surface water runoff.

2.5.6 For the purposes of this EIA Scoping Report, it is assumed the panel modules will be mounted on structures with a clearance level above ground level (agl) up to 1.0m, and a maximum upper height of up to 3.5m agl. It should be noted the parameters defined above are currently indicative as the final structures' elevation will be influenced by the topography, flood risk and other constraints across the Site.

Inverters, Transformers and Switchgear Stations

2.5.7 The supporting infrastructure includes the inverters, transformers and switchgear, which are described in further detail below. The Proposed Development will house the supporting infrastructure in containers which will be approximately 3.5m high, 2.5m wide and 6.5m in length, as depicted on **Figure 2-6**. Overall, there will be 8 transformer units located across the Site,

2.5.8 It is expected that the inverters, transformer sand switchgear stations will be mounted up to 1.0m agl. They will be located at regular intervals across the Site, however as the design of the Proposed Development evolves, the layout of the site

will be determined to take into account the relevant environmental conditions and technical requirements.

Onsite Cabling

2.5.9 The onsite cabling will comprise low voltage electrical cabling which will be used to connect the PV modules to the inverter stations . These cables will all be underground and installed via trenching. There may be a requirement for horizontal directional drilling (HDD) within the Site to cross beneath existing buried utilities, underneath roads and hedges and drains.

2.5.10 Higher voltage cables will be required between the inverter stations and between the onsite electrical infrastructure. These cables are likely to run centrally through the Site towards the transformer units.

2.5.11 As the design of the Proposed Development evolves, the alignment and location of such cables will be determined taking into account the relevant environmental conditions and technical requirements present on Site. A reasonable worst-case scenario will be assessed for EIA purposes.

2.5.12 Electricity generated will be sent to the Proposed Development's substation before transferring to the National Grid Substation. The connection routes are not yet [fully] defined but lie within the western extent of the Scoping Red Line Boundary, running north before entering the Proposed Development's substation, and the National Grid's Whitson Substation.

Fencing and Security Measures

2.5.13 A security fence with gated access will enclose the operational areas of the Proposed Development. The gated access and fencing will consist of weld mesh and will be coated with green RAL 6005, or similar, as shown in **Figure 2-9**. The proposed access gate(s) will be located at each access location and will be up to 3.0m in height and 3.0m wide with fence posts measuring up to 3.0m high and 0.5m wide, spaced equidistantly up to 4.5m with concrete foundations driven up to 1.0m into the ground. The access gate(s) will also have concrete foundations which will be up to 0.5m wide and installed up to 1.0m below existing ground level.

2.5.14 CCTV infrastructure will consist of pole mounted cameras, positioned appropriately around the perimeter of the operational areas of the Proposed Development.

2.6 Proposed Development Substation

2.6.1 Substations play a key role for the delivery of electricity transmission throughout the National Grid transmission network. One of their key functions includes the conversion of electricity into different voltages, depending on the required output. Substations use transformers to transform or 'switch' the voltage, meaning that it has been either increased or decreased.

2.6.2 The proposed substation design is being developed and refined through the iterative design process. As part of the Rochdale Envelope approach, which is applicable to this EIA Scoping Report, a reasonable worst-case scenario for the substation within the Site will be assumed to ensure that a robust assessment of the Proposed Development is undertaken. The Proposed Development's substation will likely consist of electrical infrastructure such as transformers, switchgear and safety equipment. The dimensions of the proposed substation are highly dependent on the findings of further work and will be refined through the iterative design process. Maximum parameters for the substation will be defined throughout the DCO application, and a reasonable worst-case scenario will be assessed and presented in the ES.

2.6.3 A generic substation drawing has been included for reference in **Figure 2-8**; however, it should be noted that exact design, layout and location of the substation will be confirmed through the design process and set out within the ES.

Grid Connection

2.6.4 There is a requirement for the Proposed Development to connect to a grid distribution system, however, such systems are subject to a different consenting regime. The proposed substation described above would connect the Proposed Development into the national distribution system.

2.6.5 The electricity generated by the Proposed Development would be exported to National Grid as the Distribution Network Operator (DNO). The Applicant has received an offer of grid connection from National Grid. The Proposed Development

will connect to the existing electricity distribution site, Whitson National Grid Substation (275kV), which is located 500m north west of the anticipated Proposed Development's substation.

2.6.6 The offer from National Grid accounts for the export of 380 MW from the Proposed Development, ensuring that the minimum expected output of 350 MW can be accommodated as part of this application.

Access and Access Tracks

2.6.7 The Proposed Development would be primarily accessed via the M4 and the A4810 down Broad Street Common (ST 38552 85031) through to North Row (ST 41236 84602), which lies 403 m north-east of the Scoping Red Line Boundary.

2.6.8 Secondary points of access to the solar arrays will be required across the Proposed Development, the details of which will be confirmed once the general arrangement and layout of the Project is further developed. The following secondary access points are currently under consideration:

- Access off Pill Street (ST 42611 85064);
- Access off the unnamed road at the junction at Pill Street and Whitewall (ST 43337 85358);
- at Half Acre Corner;
- the substation area would be accessed from Broad Street Common which runs through the Scoping Red Line Boundary between the Site and the Whitson National Grid Substation (ST 38552 85031);
- Access off Sea Street Lane (ST 41300 84044):and
- Potential access along Mead Lane is being reviewed.

2.6.9 Refer to **Figure 1-1** which depicts the proposed access points described above.

2.6.10 It should be noted that a proportion or all of the proposed access points above may be required to support the Proposed Development.

2.6.11 Within the Site, existing internal tracks, points of access and field gates would be utilised where practical, however, in cases where these tracks need to be upgraded

or new tracks would be constructed to provide access as shown on **Figure 2-7**. The internal tracks would be up to 5m wide and comprised of compacted stone with excavation kept to a minimum.

2.6.12 As detailed in **Figure 2-7**, three different scenarios for access tracks are being considered owing to the variation in topography across the Site. The scenarios which are being assessed include a base of varying thickness, underlain by a sub-base and/or a Terram 1000 Geotextile (or similar material) providing a layer of separation between the road and the existing soil across the Site.

2.6.13 It is anticipated that the internal tracks would be routed outside of the designated buffer zones for watercourses and reens, except for instances where they are crossing from one field to another. Where there will be a requirement to cross a watercourse or reen, different temporary methods may be required dependent on the ground conditions and environmental constraints present on the Site. It is proposed that a set of standard crossing types will be considered where practical, however, their precise locations and details of construction type and methodology will be assessed in the ES as this level detail is currently not known.

2.6.14 All scenarios would include a drainage trench up to 0.7m deep running along the length of the road. No ground levelling would be required across the Site apart from the substation compound area.

2.7 Construction Design

2.7.1 The construction works would include the following principal activities:

- Site preparation;
- Import of construction materials, plant and equipment to Site;
- the establishment of a construction compound(s);
- upgrading of existing Site tracks / access roads and construction of new tracks;
- marking out the location of the infrastructure.

- Construction of solar infrastructure:
- Import of components to Site;
- erection of module mounting structures;
- mounting of PV modules;
- installation of electric cabling;
- installation of transformer cabins;
- construction of substation compound;
- cable installation;
- the establishment of mobilisation areas and running tracks;
- temporary construction compounds (to be located on or near cable routes;
- stripping and storage of topsoil in sections;
- trenching in sections;
- appropriate storage and capping of excavated soil;
- appropriate construction drainage with pumping where necessary;
- sectionalised approach of duct installation;
- excavation and installation of jointing pits;
- link box installation;
- cable pulling;
- implementation of crossing methodologies for reens, watercourses, infrastructure (including roads and rail), and sensitive habitats (e.g., HDD, cable bridging, etc.);
- testing and commissioning;
- Site reinstatement, habitat creation;
- mitigation; and
- protection of environmental features.

2.7.2 Many of these operations would be carried out concurrently, although predominantly

in the order identified above to minimise the overall length of the construction programme. In addition, the Proposed Development would be phased to ensure that the civil works would be continuing whilst other aspects of the Site are progressed. Site restoration would be programmed towards the end of the construction period.

Construction Programme

2.7.3 The construction of the Proposed Development is anticipated to take 18 months; however, the final programme will be dependent on the detailed layout design and consideration of potential environmental constraints on the timing of construction activities. These issues will be addressed in the ES.

Site Preparation

2.7.4 The removal of stock clearance and removing double hedgerows have been identified as Site preparation activities.

Construction Management

2.7.5 An outline Construction Environmental Management Plan (oCEMP) which will detail mitigation measures identified throughout the EIA process to be employed during the construction phase will be provided to support the DCO Application.

2.7.6 An outline Construction Traffic Management Plan (oCTMP) will be provided to support the DCO Application. It will include details on construction logistics and construction worker travel along with information to guide the delivery of materials, plant, equipment, and staff during the construction phase.

Temporary Construction Compounds

2.7.7 Temporary Construction Compounds will be utilised throughout the construction phase, however, the exact locations have yet to be confirmed, these compounds would be located nearby to proposed points of access and will be sited outside of constrained areas.

2.7.8 The construction compounds constitute temporary works and will remain for the duration of the construction period. The compounds will include provisions for storage of materials, office and welfare spaces, car parking, etc.

2.7.9 The compound areas will be positioned and built in a way that ensures minimal disruption to its surroundings in terms of noise to surroundings and any impact to nearby watercourses, reens, ditches.

Operation and Maintenance

2.7.10 The Operational Phase of the Proposed Development is proposed to be 40 years. From an operational perspective, it is likely that the proposed solar farm will require ongoing maintenance which is likely to generate additional vehicular movements. However, these numbers will be considerably lower than that of the construction phase and will not occur on a regular basis (i.e. only when maintenance is scheduled / required). Activities would include vegetation management, routine maintenance and the replacement of any equipment along with overall monitoring of the Solar Farm.

2.7.11 Throughout the Operational Phase, there will be the need to replace parts of the equipment to ensure that any damaged, faulty or degraded equipment does not impede functionality and output. The effects of these activities are anticipated to be less than those occurring during the construction phase and would be controlled and managed through appropriate management plans and by the requirements of the DCO.

2.7.12 It is anticipated that there may be a degree of HGV activity required when equipment is replaced onsite. The ES will include further details of the maintenance and replacement activities and appropriate controls will be developed as part of the DCO process.

2.7.13 The overall management of the ecological and landscape features will be undertaken in accordance with a detailed Landscape and Ecological Management Plan (LEMP) which will be secured via a requirement of the DCO.

2.7.14 At this stage of the design, the number of visits and permanent staff are not known it is anticipated however that a small number of additional staff would be required on an infrequent basis for the replacement of solar infrastructure as necessary.

2.8 Decommissioning

2.8.1 With regards to the Decommissioning Phase, the Applicant has three options; to decommission the Proposed Development and dismantle and remove the panels and associated infrastructure; to apply for an extension to the operating period using existing equipment; or apply to install new equipment on the Site. For the purpose of this EIA Scoping Report, it has been assumed that the Proposed Development would be decommissioned and dismantled at the end of the operational lifetime.

2.8.2 If the first option is chosen, all solar infrastructure including PV modules, mounting poles, inverters substation and transformers would be dismantled and removed from the Site in the reverse sequence to which they would be installed. The infrastructure would be removed from the Site and recycled or disposed of in accordance with good practice following the waste hierarchy, with materials being reused or recycled whenever possible. All waste will be disposed of in accordance with the relevant legislation at the time of decommissioning.

2.8.3 All cables would be cut below ground level (bgl) and left in the ground, thus reducing the overall impact of decommissioning on sensitive features. The overall landform and landscape condition would be restored to its current condition. This approach is considered to be less environmentally damaging than seeking to remove cables entirely.

2.8.4 The infrastructure listed above would be removed from the Site and recycled or disposed of in accordance with relevant good practice following the waste hierarchy, with materials being reused or recycled whenever possible. All waste will be disposed of in accordance with the relevant legislation at the time of decommissioning. Any requirement to leave the Access Tracks in-situ would be discussed and agreed with the landowners at the time of decommissioning and consented separately.

2.9 Site Reinstatement and Habitat Creation

2.9.1 Upon the cessation of operational activities, the Site would be restored with the exception of new areas of wildlife habitat and wildlife features which would be retained. It is also proposed that any new crossing points would remain in-situ to

avoid damage or disturbance to reens.

2.9.2 Habitats created/maintained during the 40-year operational period have the potential to be ecologically valuable and support protected species and as such the restoration impacts should be assessed in advance of the decommissioning works commencing. This process would be informed by on-going monitoring of ecological features and pre-decommissioning surveys to establish the value of the Site at the relevant time. A detailed oLEMP will be produced as a requirement attached to the DCO and prior to the start of construction activities.

2.10 Embedded Environmental Design Measures

2.10.1 Throughout the EIA process, embedded environmental design measures form an inherent consideration. As such, potential measures would be identified in order to avoid, reduce and where possible, offset significant adverse environmental effects identified throughout the EIA process and assessments. Where possible, such measures would be incorporated into the design of the Proposed Development to prevent adverse environmental effects.

2.10.2 The ES would assess the effects of the Proposed Development within the context of the embedded environmental design measures proposed. Please refer to **Chapter 4: The Environmental Impact Assessment Methodology Section 4.9** which details the approach to embedded environmental design measures and additional mitigation measures.

2.10.3 A summary of the embedded environmental design measures incorporated into the Proposed Development are presented in **Table 2-1**. Additionally, a preliminary commitments register is included as part of this Scoping Report (**Appendix 2A**).

Table 2-1 Embedded Environmental Design Measures

Environmental Factor to which the Embedded Environmental Design Measure Relates	Embedded Environmental Design Measure and Associated Benefit
Biodiversity	*Buffer distances to reems will be maintained at 7m and 12.5m from top of bank across the Site area. These would be managed to suit invertebrates to the benefit of the reen habitats.*

Environmental Factor to which the Embedded Environmental Design Measure Relates	Embedded Environmental Design Measure and Associated Benefit
Landscape and Visual Impacts	*Panels maintain a low profile in a flat landscape, limiting their visibility and the potential for landscape and visual impacts.*
Landscape and Visual Impacts	*Panels will be offset from all PROWS in order to minimise impacts upon users of these.*
Glint and Glare	*Exploring design options that minimize the visual impact of the solar farm on the surrounding landscape will be explored.*
Drainage	*Gaps maintained between each panel on the arrays to prevent an accumulation of rainwater runoff and to replicate greenfield response.*
Flood Risk and Biodiversity	*Where reens have double Hedgerows, the hedges on the southern side would be reduced / removed so as to open up the reens to increased sunlight and to prevent any accumulation of debris within them.*
Noise	*The panels are inert and silent. Noise from the transformers and substation would be limited and these components would be positioned away from any noise sensitive receptors.*
Statutory Designations	*Site selection has avoided AONB, National Park or Green Belt land.*

3.0 Legislation and Planning Policy Overview

3.1 Introduction

3.1.1 This Chapter sets out the Planning Policy context that will be considered in respect of the Proposed Development.

3.1.2 The development proposal relates to the construction, operation, maintenance and decommissioning of the Proposed Development a ground mounted solar farm with a generating capacity of over 350 MW for a temporary period of 40 years.

3.2 Planning Policy Context

3.2.1 The Planning Act 2008[22] (he PA 2008) provides the primary legislative basis and defines the application process under which consent for Nationally Significant Infrastructure Projects (NSIP) are sought. The PA 2008 sets out that projects meeting certain defined criteria are classified as NSIPs and in this instance the Scheme is defined as an NSIP under Section 14(1)(a) of the and 15(2) of the Planning Act 2008 (as amended) as it comprises the construction of an onshore generating station of more than 350MW in Wales (Section 14(1)(a) of the PA 2008).

3.2.2 In accordance with Section 104(2) of the PA 2008, National Policy Statements (NPS) set out the policy basis for qualifying NSIP developments and provide the primary basis for making decisions on Development Consent Order (DCO) applications for 'NSIPs' (NSIPs). There are currently six National Policy Statements covering the Energy sector. The most relevant statements to the Proposed Development are:

- Overarching NPS for energy (EN-1);
- NPS for renewable energy infrastructure (EN-3); and
- NPS for electricity networks infrastructure (EN-5).

22 UK Government (2008) Planning act 2008, Legislation.gov.uk. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents [Accessed: December 2024].

3.3 Overarching National Policy Statement for Energy (EN-1)

3.3.1 The Overarching National Policy Statement for Energy (EN-1)[23] sets the national policy for major energy infrastructure in the UK, which includes renewable energy projects. It is a key document used by the Secretary of State to assess applications for energy developments that are 'nationally significant' under the PA2008. This NPS combined with technology specific energy NPSs, provides the primary policy for decision by the Secretary of State.

3.3.2 EN-1 highlights the urgent need for low-carbon infrastructure, which includes solar, to achieve a secure, reliable and affordable energy system by 2050. It emphasises that renewable energy sources are cost-effective, fuel free and critical for the UK's decarbonisation goals of reaching Net Zero by 2050.

3.3.3 EN-1 has made clear that there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure, which the Proposed Development constitutes. EN-1 directs the Secretary of State to give substantial weight to the need and benefits of NSIPs. It states "subject to any legal requirements, the urgent need for CNP infrastructure to achieving our energy objectives, together with national security, economic, commercial and net zero benefits, will general outweigh any other residual impacts not capable of being addressed by application of the mitigation hierarchy. Government strongly supports the delivery of CNP infrastructure and it should be progressed as quickly as possible."

3.3.4 In summary, EN-1 strongly supports the development of nationally significant low-carbon energy infrastructure due to its critical role in national security, economic growth and environmental sustainability, with a presumption in favour of approving such projects.

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23 Department for Energy Security and Net Zero (2024) Overarching national policy statement for energy (EN-1), GOV.UK. Available at: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1 [Accessed: December 2024].

3.4 National Policy Statement for renewable energy infrastructure (EN-3)

3.4.1 NPS EN-3 (National Policy Statement for renewable energy infrastructure)[24] along with the overarching NPS for Energy (EN-1), provides the primary policy framework for decision making by the Secretary of State for nationally significant renewable energy infrastructure projects.

3.4.2 The NPS highlights the urgent need for increased electricity generation to meet the UK's energy and decarbonisation goals and the transition to net zero by 2050. It states that "Government analysis suggests demand for electricity could more than double by 2050, suggesting a requirement for a fourfold increase in low carbon electricity generation, with most from renewables".

3.4.3 The NPS outlines that solar plays a "key part of the government's strategy for low-cost decarbonisation of the energy sector" with plans to expand solar capacity fivefold by 2035. The NPS recognises that solar farms will inevitably affect rural areas due to their large land requirements.

3.4.4 Overall, the NPS emphasises the critical and urgent need for renewable energy, including solar, to meet the UK's decarbonisation targets.

3.5 National Policy Statement for Electricity Networks Infrastructure (EN-5)

3.5.1 NPS EN-5 (National Policy Statement for Electricity Networks Infrastructure)[25] focuses on infrastructure related to electricity networks, such as transmission systems (both overhead and underground) and associated infrastructure such as substations and converter stations.

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24 Department for Energy Security and Net Zero (2024a) National policy statement for Renewable Energy Infrastructure (EN-3), GOV.UK. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3 [Accessed: December 2024].

25 Department for Energy Security and Net Zero (2024a) National policy statement for Electricity Networks Infrastructure (EN-5), GOV.UK. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5 [Accessed: December 2024].

3.5.2 Alongside EN-1, it serves as a key policy document for decisions on infrastructure projects related to electricity networks.

3.5.3 Since the Proposed Development includes underground cables and on-site substation, this NPS is relevant.

3.6 Relationship of NPS's with Welsh policies

3.6.1 NPS EN-1 clarifies the status of the NPSs in relation to other Development Plan documents and associated Guidance. Of relevance to this Proposed Development, the NPS has taken account of Planning Policy Wales and Technical Advice Notes for Wales.

3.6.2 NPS EN-1 notes the potential for conflict between these documents and the overarching NPSs and subsequently explains "in the event of a conflict between these documents and an NPS, the NPS prevails for the purpose of Secretary of State decision making given the national significance of the infrastructure."

3.6.3 NPS EN-3 also provides useful guidance as to how planning policy and advice issued by Welsh Government ought to be considered in the context of an NSIP scale project in Wales:

- Policy set out in existing planning guidance in England and, for any proposed project located in Wales, in relevant planning policy and advice issued by the Welsh Government, will provide important information to applicants of nationally significant renewable energy projects.
- Applicants should take these policies and guidance (including any relevant targets) into account and explain how their proposals fit with guidance or, alternatively, why they depart from them.
- The Secretary of State should also have regard to these policies and guidance (including any relevant targets) in its decision making.
- Whether an application conforms to the guidance, or the targets will not necessarily be a reason for approving or rejecting the application.

3.7 Welsh Planning Policy

3.7.1 As the Site is located in Wales the relevant sections of Future Wales – The National Plan 2040[26] , the Environment Wales Act (2016)[27] , Planning Policy Wales (Edition 12)[28] and the associated Technical Advice Notes are also material considerations. These are set out below.

3.8 Future Wales: The National Plan 2040

3.8.1 Future Wales – The National Plan 2040 is Wales's National Development Framework (NDF), aiming to address key national priorities through the planning system. The plan focuses on solutions to issues and challenges at a national scale. Future Wales is supported by policies set out in Planning Policy Wales (PPW), and the guidance in supplementary Technical Advice Notes.

3.8.2 Policy 17 (Renewable and Low Carbon Energy and Associated Infrastructure) is of most relevance to the Proposed Development, as it supports the principle of developing renewable and low carbon energy from all technologies and at all scales to meet future energy needs.

3.8.3 Policy 9 (Resilient Ecological Networks and Green Infrastructure) is of relevance as the Site is located within a Site of Special Scientific Interest (SSSI). The policy aims to enhance biodiversity, protect ecosystems and maximise green infrastructure as part of placemaking, requiring the use of nature-based solutions for sustainable growth, ecological connectivity, social equality and well-being.

3.9 Planning Policy Wales (Edition 12, February 2024)

3.9.1 Planning Policy Wales (PPW) sets out the land-use planning policies of the Welsh Government and is supplemented by Technical Advice Notes (TANs). It emphasises the importance of low carbon electricity as the main source of energy for Wales and

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26 Llywodraeth Cymru Welsh Government (2021) Future wales: The national plan 2040, GOV.WALES. Available at: https://www.gov.wales/future-wales-national-plan-2040 [Accessed December 2024].

27 Environment (wales) Act 2016 (2016) Legislation.gov.uk. Available at: https://www.legislation.gov.uk/anaw/2016/3/contents [Accessed December 2024].

28 Llywodraeth Cymru Welsh Government (2024) Planning Policy Wales, GOV.WALES. Available at: https://www.gov.wales/planning-policy-wales [Accessed December 2024].

the need for significant investment in energy generation, transmission and distribution infrastructure.

3.9.2 PPW sets ambitious targets for renewable energy, aiming for Wales to generate 70% of its electricity from renewable sources by 2030, with local ownership of at least 1GW of renewable capacity. The Welsh Government supports renewable energy projects that benefit local communities.

3.9.3 PPW promotes green infrastructure in developments, requiring planning applications to include green infrastructure statements.

3.9.4 In terms of biodiversity and ecology, PPW states that planning authorities must follow a step-wise approach to maintain and enhance biodiversity, build ecological networks and deliver net benefits. The step-wise approach is to avoid, minimise, mitigate and compensate for environmental impacts.

3.9.5 PPW puts protections in place for SSSIs. Development within or affecting SSSIs is generally discouraged, except when necessary for the management of the site.

3.10 Technical Advice Notes

3.10.1 As has been set out above, PPW is supported by a series of Technical Advice Notes (TANs). TANs provide detailed planning advice on specific topics. Of relevance to the Proposed Development are:

- TAN 5: Nature Conservation and Planning (Sept 2009);
- TAN 11: Noise (Oct 1997); and
- TAN 15: Development and Flood Risk (2004).

3.11 Local Policy

Newport Local Development Plan 2011-26 (January 2015)

3.11.1 The Local Development Plan (LDP) is the development plan for Newport and is the basis for land use planning within the Council's administrative area.

3.11.2 Policy CE10 (Renewable Energy) has most relevance to the Proposed Development. It states:

"Renewable Energy schemes will be considered favourably, subject to there being no over-riding environmental and amenity considerations. Small scale micro-generation will be encouraged within the settlement boundary. Large scale proposals may be more appropriately located outside of the defined settlement boundary if no appropriate brownfield sites exist. Cumulative impacts of renewable energy schemes will be an important consideration".

3.11.3 Newport City Council are in the process of preparing a replacement Local Development Plan. They advise that they are working towards a public consultation on a Deposit Plan (a full draft Local Development Plan) between October and December 2024.

Monmouthshire County Council Adopted Local Development Plan (February 2014)

3.11.4 The LDP constitutes the development plan for the area and forms the basis for decisions in the determination of planning applications and appeals.

3.11.5 Policy SD1 (Renewable Energy) has most relevance to the Proposed Development it states:

"Renewable energy schemes will be permitted where:

(1) There are no unacceptable adverse impacts upon the landscape, townscape and historic features and there is compliance with Policy LC5, with regard to protection and enhancement of landscape character;

(2) There are no unacceptable adverse impacts on biodiversity;

(3) There are no unacceptable adverse impacts on the amenities of nearby residents by way of noise, dust, odour or increase in traffic;

(4) The wider environmental, economic, social and community benefits directly related to the scheme outweigh any potentially adverse impacts; and

(5) The distinct identify of Monmouthshire will not be compromised.

For all types of renewable energy, cumulative impacts will be an important consideration where there are other renewable energy schemes currently operating in the area.

When technology is no longer operational there is a requirement to decommission, remove the facility and complete a restoration of the site to its original condition."

3.11.6 Monmouthshire County Council are currently working towards the Deposit Plan stage of the Replacement Local Development Plan process, which will set out the detailed policy framework and land use allocations for Monmouthshire up to 2033. The Deposit Plan is currently under consultation with the public until the 16 December 2024[29].

3.11.7 The Deposit Plan is due to be adopted May 2026[30].

[29] Replacement Local Development Plan Overview and Timescale (2024) Online, Available at: https://www.monmouthshire.gov.uk/planning-policy/rldp-overview-and-timescale/ [Accessed December 2024].

[30] Monmouthshire Replacement Local Development Plan Delivery Agreement (2024) Online, Available at: https://www.monmouthshire.gov.uk/app/uploads/2024/10/Monmouthshire-RLDP-Delivery-Agreement-Revised-October-2024.pdf [Accessed December 2024].

4.0 The Environmental Impact Assessment Methodology

4.1 Introduction

4.1.1 Environmental Impact Assessment (EIA) is a systematic process that must be followed for certain categories of development before they can receive development consent. EIA aims to identify a project's likely significant effects through the scoping process, and then assess those effects which will be reported in an Environmental Statement (ES). This helps to ensure that the predicted effects, and the scope for mitigation measures to reduce them where necessary, are properly understood by the public and the Planning Inspector before it makes its decision.

4.1.2 The EIA process should be systematic, analytical, impartial, consultative, and iterative allowing opportunities for environmental concerns to be addressed in the design of a project. Typically, a number of design iterations take place in response to environmental constraints identified during the EIA process prior to the final design being reached.

4.1.3 The EIA process will identify the different methodologies used for the assessment and these should be based on recognised good practice and guidelines specific to each technical area as set out in **Chapters 5** to **17**. Consultees are also encouraged to provide confirmation of agreement to the proposed scope in terms of what is included and excluded, the methodology and the receptors identified.

4.1.4 As part of an on-going design process, the detail provided in this chapter will be further refined for the PEIR. Following Statutory Consultation, a further update to the description of the Proposed Development will be included the ES which will confirm the details for which consent will be sought. This will include the final design parameter and any limits of deviation.

4.1.5 The final built form and layout of the Proposed Development, as well as the installation / construction methods to be utilised, will, eventually, be determined by the chosen contractor(s). However, all works will be required to be undertaken within the parameters assessed for the Proposed Development. With this in mind, the EIA will represent a reasonable 'worst-case', ensuring a robust assessment of the likely

significant effects.

4.1.6 This chapter describes the principles of EIA and approach being taken to identify and evaluate potential effects associated with Future Energy Llanwern. The approach to scoping is outlined along with the broad principles relating to establishment of baseline conditions, embedded environmental measures, methodology and assessment of effects that will be adopted for the EIA. This chapter also sets out the proposed temporal, spatial and technical scope of the environmental assessments, along with an overview of the proposed methodologies for cumulative effects assessment.

4.2 EIA Terminology

Impacts and Effects

4.2.1 EIA is concerned with the identification and evaluation of likely significant effects on the environment. However, the terms impact and effect are often used synonymously, and this can lead to confusion. For clarity, the convention used in this assessment is to use 'impacts' within the context of the term EIA, which describes the process from Scoping through to Environmental Statement preparation to subsequent monitoring and other work. Otherwise, this document uses the word 'effects' when describing the environmental consequences of the Proposed Development. For example, such effects may come about as a result of the following:

4.2.2 Physical activities that will take place if the development were to proceed (e.g. vehicle movements during construction operations); and

4.2.3 Environmental changes that are predicted to occur as a result of these activities (e.g., loss of vegetation prior to the start of construction work or an increase in noise levels). In some cases, one change causes another change, which in turn results in an environmental effect.

4.2.4 The predicted environmental effects are the consequences of the environmental changes for specific environmental receptors. For example, with respect to bats, the loss of roosting sites or foraging areas could affect the bats' population size; with regard to people, an increase in noise levels could affect amenity.

4.2.5 This assessment is concerned with assessing the significance of the environmental effects of the Proposed Development, rather than the activities or changes that cause them. However, this requires these activities to be understood and the resultant changes identified; often based on predictive assessment work.

Types and Effects

4.2.6 Paragraph 5 of Schedule 4 of the EIA Regulations[2] requires the "description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development." The ES will consider all of the types of effects listed, as appropriate, in the environmental topic chapters in terms of how they arise, their nature (i.e., whether they are beneficial or adverse) and duration. Each effect will have a source originating from the Proposed Development, a pathway and a receptor. Effects may fall into one of the following categories:

- **Direct effects** are readily identified because of the physical connection between an aspect of the Proposed Development and an affected receptor;
- **indirect effects** require some additional pathway for the effect to arise. For example, a listed building may not be directly affected by any elements of a development, but its setting may be if the Proposed Development is visible in views from it or when looking towards it; in which case there will be an indirect effect;
- **secondary effects** will typically require further pathway connections, for example, an effect on a receptor population A could have a secondary effect on receptor population B, if B was itself dependent on A in some way, as, for example, a food source; and
- **cumulative effects** arise when the receptors affected by one development, are also affected by other developments resulting in the aggregation of environmental effects or the interaction of impacts.

4.2.7 Transboundary effects are those effects that will affect the environment in another state within the European Economic Area (EEA). The EIA Regulations[2] require an ES to consider the transboundary effects of a development (paragraph 5 of Schedule 4). Given the nature of the Proposed Development and its proposed location, significant transboundary effects are unlikely. However, the transboundary screening matrix and scoping exercise will be completed as detailed in the Planning Inspectorate's 'Advice Note Twelve'[31] and included within the ES.

4.2.8 The majority of the predicted effects will either be beneficial or adverse and will be described as such in the ES.

Temporal and Spatial Scope

4.2.9 Temporal effects are typically defined as being permanent or temporary as follows:

- **Permanent** - these are effects that will remain even when the Proposed Development is complete, although these effects may be caused by environmental changes that are permanent or temporary; and
- **Temporary** - these are effects that are related to environmental changes associated with a particular activity and that will cease when that activity finishes. The expressions 'short-term' and 'long-term' may also be used to provide a further indication of how long the effect will be experienced.

4.2.10 Spatial scope refers to the area over which changes to the environment are predicted to occur as a consequence of the Proposed Development. In practice, an EIA should focus on those areas where these effects are likely to be significant.

4.2.11 The spatial scope will vary between environmental topics and has been described with relation to each topic based on the information currently available. For example, the spatial effects of a development on landscape and visual amenity will likely cover a much greater area to that affected by noise. The spatial scope of each assessment may be refined for the ES in response to comments from consultees or further

31 Planning Inspectorate's Advice Note Twelve (2015), [Online], available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-twelve-transboundary-impacts-and-process/nationally-significant-infrastructure-projects-advice-note-twelve-transboundary-impacts-and-process [Accessed December 2024].

assessment work.

4.2.12 Effects are generally considered in relation to the following key stages of a proposed development:

- **Construction** – the effects may arise from the construction activities themselves, or from the temporary occupation of land. Effects are often of limited duration although there is potential for permanent effects. Where construction activities create permanent change, the effects will continue into the operational period;
- **Operation** – effects may be permanent, or they may be temporary, intermittent, or limited to the life of a proposed development until decommissioning (as in the case of solar developments which gain planning permission for a defined and finite number of years); and
- **Decommissioning** – effects may arise from the decommissioning activities themselves, or from the temporary occupation of land. The effects will generally be temporary and of limited duration. Additional permanent change will normally be unlikely unless associated with restoration.

4.3 Consultation and Engagement

4.3.1 Consultation is an intrinsic element of the EIA and DCO application processes and will be reported within the ES and application supporting documentation including a Consultation Report.

4.3.2 The Applicant is committed to promoting dialogue with statutory and non-statutory consultees and the local community, seeking to engage with all those with an interest in the Proposed Development to provide transparency during the process.

4.3.3 As part of the EIA process, consultation will be undertaken with a range of statutory and non-statutory consultees aligning with Section 42 of the PA 2008[1]. In line with the PA 2008[1], the Applicant will carry out a pre-application consultation with a range of prescribed consultees. Please refer to Section 42 and 47 of the PA 2008[1] for a full list of the prescribed consultees, however the key stakeholders to be consulted s part of the pre-application process include (but are not limited to) the following:

- Local authorities;
- prescribed statutory bodies;
- landowners/land interests;
- local communities; and
- other key interest groups.

4.3.4 In addition to the prescribed statutory consultation described above, the consenting regime encourages engagement in non-statutory consultation with all potentially affected parties:

"a sufficiently early stage to allow consultees a real opportunity to influence the proposals. At the same time, consultees will need sufficient information on a project to be able to recognise and understand the impacts". [32]

4.3.5 Such engagement allows for stakeholders and communities to gain a better insight and understanding of the Proposed Development as well as any potential effects identified. Additionally, this engagement enables the opportunity for non-statutory consultees to influence the design as it evolves and help identify appropriate mitigation. Local knowledge and understanding is important, and the Applicant will seek to engage with consultees through both formal and informal consultation prior to submission of the DCO application.

4.3.6 Statutory and non-statutory consultation will help to inform the preparation of key materials as part of the EIA in support of the pre-application DCO process. This includes this EIA Scoping Report, the PEIR supporting statutory consultation and the ES submitted alongside the DCO application.

4.3.7 A Consultation Report will form part of the DCO application and will summarise how pre-application consultation was undertaken and set out how feedback received was considered by the Applicant.

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32 Department for Communities and Local Government (2015). Planning Act 2008: Guidance on the pre-application process. [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/418009/150326_Pre-Application_Guidance.pdf [Accessed December 2024].

4.4 General Assumptions and Limitations

4.4.1 The design and details of the Proposed Development are still under development. The EIA will clearly define the maximum design parameters, where some uncertainty exists in certain design elements, and establish the evolution of those design parameters and how they have been informed by the EIA process.

4.5 Defining the Study Area

4.5.1 Each of the topic assessment chapters (**Chapters 5** to **17**) describes the study area to be considered, providing a clear explanation as to why the study area has been adopted for that specific topic.

4.5.2 Advice Note Nine: Rochdale Envelope acknowledges the degree of variability with regards to a developments design and notes the requirements for the EIA to assess the likely worst-case scenario to encapsulate and assess all potential significant environmental effects that will arise as a result of the Proposed Development. The use of a parameter-based design envelope will lead to the assessment considering the maximum design scenario.

4.5.3 A parameter-based approach will provide sufficient detail to allow for an extensive and comprehensive assessment whilst ensuring there is sufficient flexibility to refine the Proposed Development as it evolves through its design, provision of the Preliminary Environmental Impact Report (PEIR) and the ES. This approach is key owing to the rapidly evolving nature of solar PV technology.

4.5.4 As such, this approach has been adopted when developing the Scoping Red Line Boundary which accompanies this EIA Scoping Report. This will also enable the subsequent EIA to be refined from the study area defined in **Figure 1-1** and underpin the process with a description of the location, design and size of the Proposed Development, that is suitable to allow a comprehensive assessment of its likely significant environmental effects.

4.5.5 Please note that factor specific study areas will be applied and defined/justified in the relevant environmental factor chapters of the ES.

4.6 EIA Scoping

4.6.1 The results of the EIA process are reported in an ES and Schedule 4(4) of the EIA Regulations[2] specifies that the ES should describe those:

"…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."

4.6.2 Regulation 5(2)€ of the EIA Regulations[2] requires the interaction between these factors to be considered. In addition, Regulation 5(4) requires ESs to consider:

"…the expected significant effects arising from the vulnerability of the Proposed Development to major accidents or disasters that are relevant to that development."

4.6.3 Establishing which aspects of the environment are likely to be significantly affected by a particular project is captured in the EIA scoping process which aims to identify those aspects of the environment and associated issues that need to be considered when assessing the potential effects resulting from a proposed development. This recognises that there may be some environmental elements for which the project is unlikely to have a significant effect and hence where there is no need for further investigation to be undertaken as part of the EIA.

4.6.4 Scoping involves identifying the following:

- The people and environmental resources (collectively known as 'receptors') that could be significantly affected by the Proposed Development; and
- the work required to take forward the assessment of these potentially significant effects.

4.6.5 This involves scoping being started at the outset of the EIA, with the initial conclusions about the likely significant effects of the Proposed Development being set out in this EIA Scoping Report.

4.6.6 The proposed scope of the EIA for the Proposed Development is detailed in **Chapters 5** to **17** of this EIA Scoping Report. It should be noted the scope and assessment methodologies proposed in this EIA Scoping Report are based on the recognised good practice and guidelines specific to each of the topic areas presented.

Establishing Baseline Conditions

4.6.7 Establishing a baseline against which to assess the effects of the Proposed Development is an important part of the EIA process. Determining the environmental conditions that currently reside within the assessment boundary of the Proposed Development will allow potential environmental effects of the Proposed Development to be predicted.

4.6.8 The baseline conditions are determined though desk-based studies, assessments and survey work undertaken with respect to the Proposed Development. The environmental topic chapters identify where significant effects are anticipated as a result of the Proposed Development and consider the following information:

- baseline data from surveys undertaken from 2019 to 2024;
- the description of the Proposed Development in **Chapter 2**;
- relevant guidance on assessment methodologies; and
- any cumulative effects, which may arise.

Establishing Future Baseline Conditions

4.6.9 With regards to the establishment of future baseline conditions, if other developments are anticipated to be completed before the Proposed Development begins construction, effects arising from those developments will be taken into consideration and reported in the topic chapters and considered as part of the potential 'future baseline'. The ES will clearly distinguish between developments forming part of the baseline and those in the Cumulative Effects Assessment.

4.6.10 This EIA Scoping Report will take account of readily available information, such as the Local Development Plan and climate change scenario data, to provide a description of the natural changes in the local environment over an appropriate

timescale that the datasets support. Additionally, a description of the future baseline conditions will be presented in the Project Description chapter of the ES.

4.7 EIA Methodology

4.7.1 The ES will identify the assessment methodologies based on recognised good practice and guidelines specific to each of the relevant environmental topic areas where the Proposed Development could result in significant effects. In general terms, the technical studies undertaken for each topic area and chapter included in the ES to accompany the application will include:

- Collection and collation of existing baseline information about the receiving environment and surveys to fill any gaps in knowledge or to update any historic information, together with identification of any relevant trends in, or evolution of, the baseline;
- consultation with experts and relevant consultees as necessary;
- consideration of the potential effects of the Proposed Development on the baseline, followed by identification of any additional mitigation measures to seek to avoid or reduce any predicted adverse effects;
- assessment and evaluation of any residual significant effects after mitigation measures have been implemented; and
- compilation of the ES chapter.

4.7.2 The preparation of this EIA Scoping Report has been informed by the legislative and policy context relevant to the Proposed Development. It has also been informed by the simple rule that, to be significant, an effect must be of sufficient importance that it could influence the process of decision-making about whether or not consent should be granted for the Proposed Development or an element of it (the 'significance test') which is further discussed in **Section 4.8**.

4.7.3 The conclusion that is made using the significance test is based upon professional judgement, with reference to the project description, and available information about the Proposed Development.

4.7.4 The magnitude and other characteristics of the potential changes that are expected to be caused by the Proposed Development include;

- The sensitivity of receptors to these changes;
- the effects of these changes on relevant receptors; and (where relevant); and
- the value of receptors.

4.7.5 If the information that is available at this stage does not enable a robust conclusion to be reached that a potential effect is not likely to be significant, the effect is then taken forward for further assessment.

4.7.6 Subsequent to the issue of this EIA Scoping Report, the scope of the assessment may be progressively refined in response to comments from the determining authority and from consultees, together with environmental information resulting from survey or assessment work carried out in relation to the EIA, and the evolution of the project proposals.

4.8 Overview of Significance Evaluation Methodology

4.8.1 The receptors that could be significantly affected, and therefore be taken forward for consideration in further detailed assessment in the ES, are identified within each topic chapter. The approach that has been adopted to determine whether the effects on these receptors are significant is to apply a combination of professional judgement and a topic-specific significance evaluation methodology.

4.8.2 In applying this approach to significance evaluation, it is necessary to ensure that there is consistency between each environmental topic in the level at which effects are considered to be significant. Thus, it is inappropriate for the assessment of one topic to conclude that minor effects are significant, when, for another topic, only comparatively major effects are significant.

4.8.3 To achieve the desired level of consistency, the specialists responsible for writing each of the technical chapters in this EIA Scoping Report have considered the ‘significance test’ to inform their decision on whether effects are likely to be significant or not and therefore require further consideration in the ES, as well as the

relevant topic-specific significance evaluation methodology. This approach will also be adopted for the technical assessments to be included in the ES.

4.8.4 For some of the topics to be assessed in the ES, there is published guidance available about significance evaluation. Where such guidance exists, even if in draft, it will be used to inform the development of the significance evaluation methodologies to be used in the ES. For other topics, it will be necessary to develop methodologies without the benefit of guidance. This will involve technical specialists drawing on their previous experience of significance evaluation in EIA.

Evaluation Matrices

4.8.5 Significance evaluation involves combining information about the sensitivity or value of a receptor, and the magnitude and other characteristics of the changes that affect the receptor. The approach to using this information for significance evaluation is outlined in **Table 4-1** below.

Receptor Sensitivity of Value

4.8.6 The sensitivity or value of a receptor is largely a product of the importance of an asset, as informed by legislation and policy, and as qualified by professional judgement. For example, receptors for landscape, biodiversity or the historic environment may be defined as being of international or national importance; lower value resources may be designated as being sensitive or important at a county or district level.

4.8.7 The use of a receptor will also play a part in its classification. For example, when considering effects on the amenity of a human population, a receptor used for recreational purposes may be valued more than a place of work as the environmental quality of the recreational receptor is more likely to be an important part of that receptor's use.

Magnitude of Change

4.8.8 The magnitude of change affecting a receptor that will result from the Proposed Development will be identified on a scale from minor alterations of change, up to major changes or the total or substantial loss of the receptor. For certain topics, the magnitude of change will be related to guidance on levels of acceptability (e.g., for

air quality or noise), and be based on numerical parameters, whilst for others it will be a matter of professional judgement to determine the magnitude of change, using descriptive terminology.

Determination of Significance

4.8.9 The determination of significance is derived with reference to information about the nature of the development, the receptors that could be significantly affected and their sensitivity or value, together with the magnitudes of change that are likely to occur. For many environmental aspects, significance can be determined by using a matrix (see **Table 4-1**).

4.8.10 In addition, professional judgement is applied because, for certain environmental topics, the lines between the sensitivities or magnitudes of change may not be clearly defined and the resulting assessment conclusions will be justified.

4.8.11 Variations to this approach, which may be applicable to specific environmental topics (e.g., ecology and ornithology), will be detailed in the relevant 'Assessment methodology' sub-section contained in each environmental topic chapter.

4.8.12 The overall significance matrix that will be used for the EIA is shown in **Table 4-1**. Reference is made to:

- Major effects, which will always be determined as being significant in EIA terms;
- moderate effects that may be significant, although there may also be circumstances where such effects are considered 'not significant' based on specific scenarios and professional judgement; and
- minor or negligible effects, which will always be determined as 'not significant'.

4.8.13 Effects can be beneficial or adverse.

Table 4-1 Significance Evaluation Matrix

Sensitivity/importance/value	Magnitude of change: Very high	High	Medium	Low	Very low
Very high	Major (Significant)	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)
High	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)
Medium	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)
Low	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
Very Low	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

Note: Significant effects are those identified as 'Major'. 'Moderate' effects have the potential to be significant, however there may be some exceptions, depending on the environmental topic and the application of professional judgment.

4.9 Approach to Mitigation

4.9.1 As detailed in **Section 4.10** embedded design measures will be identified and embedded within the design of the Proposed Development to reduce or offset the potential consequences of the Proposed Development whilst additional mitigation measures may require adherence to particular constraints on construction methodology or mode of operation. The final assessment of significance will take into account these aforementioned embedded design measures as well as the mitigation measures and constraints that have been incorporated into the Proposed Development (i.e., it will be the assessment of residual effects).

4.10 Environmental Measures

4.10.1 The ES will include a description of the "measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment", in accordance with Regulation 14(2)(c) of the EIA Regulations[2]. With regard to each environmental aspect, the EIA process will systematically identify impacts and effects whilst taking in to consideration the environmental measures that the Proposed Development will adopt. These environmental measures take into account avoidance, best practice and design commitments across the Proposed Developments lifecycle. Ultimately this leads to the classification of such measures into primary or tertiary measures in accordance with the IEMA 'Guide to Shaping Quality Development'[33] as follows:

4.10.2 Throughout the evolution of the Proposed Development design and the EIA process, opportunities for embedded design measures will be identified, where potential significant adverse environmental effects are identified, these will be fed into the design process to confirm whether they can be avoided or otherwise mitigated in accordance with the hierarchy described above. In addition to this, good practice measures will be identified with regards to legislative requirements and measures of standard practice to manage commonly occurring effects.

4.10.3 With regard to the embedded environmental design measures relevant to the construction phase of the Proposed Development, these would be set out within the 'Embedded environmental Design Measures' section of each supporting technical chapter. Additionally, those relevant to the operational phase would be predominantly demonstrated through the design of the Proposed Development. Overall demonstrating that embedded environmental design measures have been incorporated into the Proposed Development's preliminary design are taken into account.

33 Institute of Environmental Management and Assessment (2016). Environmental Impact Assessment Guide to: Delivering Quality Development. [Online] Available at: https://www.iema.net/document-download/7014 [Accessed December 2024].

4.10.4 Following the application of embedded measures, where the potential for a significant environmental effect remains, ‘additional measures’ will be considered to avoid, reduce or compensate this effect. The ES will report on the anticipated effects of the Proposed Development following the implementation of all mitigation to determine the ‘residual effects’. A clear statement will be made as to whether the residual effects are significant or not significant. Residual effects may be beneficial as well as adverse.

4.10.5 In accordance with EIA Regulations[2], there will be a need to monitor the effectiveness and implementation of any of the measures proposed, where appropriate. The means for securing how measures will be implemented and monitored will be set out in the ES.

4.10.6 A separate Register of Environmental Actions and Commitments document will also be provided as part of the DCO application which will summarise the environmental measures committed to within the ES and associated appendices.

4.10.7 It should be noted that the final assessment of significance will take into account the mitigation measures and constraints that have been incorporated into the Proposed Development (i.e. it will be the assessment of residual effects).

4.10.8 It is likely that the following management plans will be submitted as part of the EIA or as a post-consent condition:

- Outline Construction Environmental Management Plan (oCEMP);
- Outline Landscape and Ecological Management Plan (oLEMP); and
- Outline Construction Traffic Management Plan (oCTMP).

4.11 Opportunities for Enhancing the Environment

4.11.1 Enhancement measures are those measures implemented as part of the Proposed Development that are ‘over and above’ mitigation and are not considered when determining the significance of environmental effects.

4.11.2 Opportunities for environmental enhancement measures (i.e., off-site planting, Biodiversity Net Benefit (BNB) etc.) will be considered throughout the design evolution of the Proposed Development and reported in the individual environmental topic chapters where relevant. The opportunities for enhancing the environment are set out within the individual technical chapters where relevant. Specifically, **Chapter 8: Ecology** and **Chapter 9: Ornithology**.

4.12 Alternatives Considered

4.12.1 The EIA Regulations[2] require that the ES contains a description of 'reasonable alternatives' considered relevant to the project (for example in terms of development design, technology, location, size and scale). This may include alternative designs which are relevant to the objectives of the Proposed Development and its specific characteristics. The ES must report the main reasons for selecting the chosen option, including a comparison of the environmental effects. The ES will include content to:

- Identify, describe, and evaluate the likely significant effects on the environment of implementing the Proposed Development, and reasonable alternatives considering the objectives and the geographical scope of the Proposed Development.
- Summarise the reasons for choosing the Proposed Development, in the light of the other reasonable alternatives dealt with.
- Outline the reasons for selecting the alternatives dealt with, including a description of how the assessment was undertaken including any difficulties encountered in compiling the required information.
- The alternative assessment will focus on ana analysis of layouts, sizing, technologies, and design parameters considered within the EIA Scoping Red Line Boundary.
- The decision-making processes that have taken place during the design process will be detailed within the ES to outline how environmental constraints and opportunities have defined the Proposed Development.

4.12.2 A 'No development' alternative will not deliver additional energy generation capacity therefore it will not be considered further.

4.13 Site Selection Process

4.13.1 The process for site selection and a review of potential other alternative sites was initially guided by a review of parameters which are key to ensuring the viability of a Solar Farm Development, including:

- Proximity to the transmission network with available capacity;
- Satisfactory irradiance levels;
- Land use (urban and wooded locations excluded) and neighbouring land use;
- Topography and accessibility;
- Availability of the land for the lifetime of the Proposed Development;
- Compatible uses and neighbouring uses
- Previously developed land;
- Landscape and visual considerations;
- Site specific allocation;
- Agricultural Land Classification;
- Site orientation and size (capability of accommodating the required quantum of solar panels); and
- Deliverability and accessibility of the Site.

4.13.2 The filtering process subsequently analysed the planning and environmental constraints of areas which met the above parameters, subsequently excluding those sites which would be incompatible with solar development from a policy or environmental perspective.

4.13.3 It is recognised that the Site is located within a SSSI and as per PPW12 Chapter 6 these sites “must be avoided except in wholly exceptional circumstances”. Part of the exceptional circumstances relate to the proximity of the grid connection, available capacity and compatibility of the SSSI, including its features, with the type of development proposed. The Proposed Development represents a viable means of ensuring effective long-term management of the SSSI to ensure it can fulfil its role

at the heart of a resilient ecological network. Additionally, there is an urgent need for renewable energy development as per NPS EN1 and EN3.

4.13.4 The full site selection and alternatives assessment will be presented in the ES. With further refinement being undertaken as the schemes design continues to progress.

4.14 Cumulative Effects

4.14.1 A cumulative effects assessment (CEA) is being carried out in accordance with the EIA Regulations[2] and the new NSIP: Advice on Cumulative Effects Assessment Guidance[34]. The CEA will consider the cumulative effects of a scheme, in this instance a cumulative effects assessment is being undertaken with respect to the Proposed Development.

4.14.2 The Planning Inspectorates guidance suggests that other developments that are deemed likely to go ahead, or are going ahead and are considered reasonably foreseeable, and for which sufficient information is available and therefore will be taken forward for consideration.

4.14.3 The National Policy Statement (NPS) for Energy EN-1 states the following:

"when considering cumulative effects, the ES should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence."

4.14.4 For the purpose of the cumulative effects assessment, the 'other development' include the following:

- projects that have planning permission;
- projects which are on the Planning Inspectorates Programme of Projects whether a scoping report has been submitted or not;

34 Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. (Online). [Accessed: December 2024]. Available at: Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment - GOV.UK.

- projects that are identified in development plans and in other plans; and
- programmes as may be relevant.

4.14.5 The Cumulative Effects Assessment focuses on other developments within the proximity of the Proposed Development which may have effects on the same resources and receptors. The cumulative effects assessment includes other developments that may begin construction, operation or be decommissioned within the same period as the construction and operation of the Proposed Development. With regards to the decommissioning, it is considered to be too far into the future for any meaningful consideration of cumulative effects with other developments, it is therefore not addressed within this Chapter.

4.14.6 As such the EIA will consider the cumulative effects of the Proposed Development in combination with the environmental effects of other existing and/or approved developments on the sensitive receptors which have been identified through the EIA process.

4.14.7 Two types of effects will be considered:

- Inter-project effects: typically, consideration will be given to whether there is potential for the effects of the Project and effects of other 'major' developments to combine and result in a significant environmental effect; and
- Intra-project effects: typically, these effects occur when different activities associated with a project act upon the same environmental receptor. In determining such effects, consideration will be given to the sensitivity of the receptor and the magnitude of the environmental change. Consideration is given to both the interaction of significant effects and the interaction of different impacts from project activities even if individually they are not significant.

4.14.8 Inter-project cumulative effects are to be assessed within each technical chapter e.g., Landscape and Visual Impact Assessment (LVIA) (where applicable).

4.14.9 With regards to Intra-project cumulative effects, Schedule 4 Paragraph 5(e) of the EIA Regulations[1] states the requirement of an Environmental Statement to include a description of the likely significant effects of the Proposed Development on the environment resulting from:

"the cumulation of effects with other existing and, or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources"

4.14.10 The cumulative effects assessment will include the identification of a long list of developments within the appropriate Zone of Influence (ZoI) for each respective discipline, which will form the basis of the search area for the cumulative effects assessment.

4.14.11 In line with the guidance Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment[34] which was publish 20 September 2024, a four-stage approach has been adopted as detailed in **Table 4-2** below.

Table 4-2 Stages associated with Cumulative Effects Assessment[32]

Stage 1	• Establishing the long list of other existing and, or approved development. • define and document the ZOI for each environmental aspect considered within the Environmental Statement. • When identifying other existing and, or approved developments, applicants should not restrict their search to development of the same type as the proposed NSIP. • Where relevant, applicants should consult consenting bodies in EU states to assist with the identification of cumulative effects with developments outside of the UK. • Indicate a level of certainty which can be assigned to each other existing and, or approved development as described in Table 4.2 below.
Stage 2	• Establishing the short list
Stage 3	• Information gathering
Stage 4	• Assessment

4.14.12 In order to effectively identify other existing, and or approved development types that should form part of the Cumulative Effect Assessment, major developments as defined in the Town and Country Planning Regulations (i.e. development of 10 or more dwellings, over 1ha in area, buildings of more than 1,000m^2, waste development, or development involving the winning and working of minerals or the use of land for mineral-working deposits).

4.15 Stage 1: Establishing the Long List

4.15.1 The first stage of the Cumulative Effect Assessment produces a long list of other relevant projects, plans and activities ('other developments') occurring within a large study area within the vicinity of the Proposed Development. The long list considers the scale of other developments, and the potential for these to produce cumulative effects with the Proposed Development.

4.15.2 The search area defined in **Table 4-3** and shown on **Figure 4-1** has been applied when developing the long list of other developments. It should be noted that these initial screening ranges are based on the consideration of the maximum extents of potential impacts from those activities and are therefore considered to be highly precautionary. The use of impact-setting screening ranges for individual topics may use reduced ranges depending on topic-specific criteria.

4.15.3 All other developments located within the search area as defined in **Table 4-3** have been identified through a desktop study using the following data sources:

Table 4-3 Cumulative effects assessment search area extents

Topic	Search area extent
Landscape and Visual Impact Assessment (LVIA)	Based on the maximum extent of the Zone of Theoretical Visibility (ZTV) - 5km
Glint and Glare	Based on Civil Aviation Authority's guidance[35] - 10km
Cultural Heritage and	Based on the extent of the EIA Scoping Boundary plus

35 Renewable energy developments: solar photovoltaic developments CAST Aerodrome Safeguarding Guidance Note (2023) (Online). Available at: https://www.caa.co.uk/media/hlsmmmoi/cast-renewable-energy-developments-solar-july-2023.pdf [Accessed: December 2024].

Topic	Search area extent
Archaeology	a 5 kilometre (km) radius to capture relevant designated sites.
Ecology	Based on the extent of the EIA Scoping Boundary, with a 30m buffer for badger setts, a 500m buffer for ponds in relation to Great Crested Newts and a 10km buffer for desk based search of International and European Designated sites.
Ornithology	Based on the extent of the EIA Scoping Boundary, with a 10km buffer for desk based search of Internal and European Designated sites.
Water Environment and FRA	Based on the extent of the EIA Scoping Boundary plus a 1.5km radius.
Ground Conditions	Based on the maximum extent of the Zone of Influence of 250 metres (m) for soil resources. Based on the maximum extent of the Zone of Influence of 500 m for land contamination.
Traffic and Trasport	Based on access and/or as a delivery route, including any roads which are utilised as the haul route for deliveries up to the principal road network, i.e. principal A-roads and/or the Motorway.
Noise and Vibration	**Construction noise and vibration** Based on the extent of the EIA Scoping Boundary plus a 300 m radius. **Construction traffic noise** Based on relevant guidance on assessing noise from road traffic contained in Design Manual for Roads and Bridges (DMRB) LA111: Noise and vibration – 50 m distance from road transport routes that may be used during the construction phase.

Topic	Search area extent
	Operational Noise Based on the extent of the EIA Scoping Boundary plus a 500 m radius. Operational noise from new plant required for the grid connection Based on the extent of the EIA Scoping Boundary plus a 1000 m radius.
Climate Change Resilience	Based on the extent of the EIA Scoping Boundary
Greenhouse Gas Assessment	GHG emissions is not restricted by geographical area, instead focussing on any increase or decrease in emissions as a result of the Proposed Development
Socio-Economics	Based on the maximum extent of the Zone of Theoretical Visibility (ZTV) - 5km

4.15.4 All other developments located within the search area as defined in **Table 4-3** have been identified through a desktop study using the following data sources:

- PINS website including applications and the scoping stage (https://infrastructure.planninginspectorate.gov.uk/projects/);
- Local Authority planning portals, where relevant;
- Local Authority Development Plans, where relevant; and
- Developers and project proponents' websites where available.

4.15.5 Any additional sources specific to an individual aspect is outlined in the Topic Assessment Chapters (**Chapters 5** to **16**)

Tiered Approach

4.15.6 In accordance with the new Advice note[32], projects are to be considered within the identification of the long list which will include the categories presented in **Table 4-3**.. The criteria are used to indicate a level of certainty that can be applied to each other existing and/or approved developments, ranging from Tier 1 (most certain) to Tier 3 (least certain).

Table 4-4 Identifying and assigning certainty to cumulative[32]

Tier 1	• Under construction; • Permitted application(s), whether under the PA2008 or other regimes, but not yet implemented; and • Submitted application(s) whether under the PA2008 or other regimes but not yet determined. • Refusals subject to appeal procedures not yet determined
Tier 2	• Projects on the Planning Inspectorate's Programme of Projects where a scoping report has been submitted
Tier 3	• Projects on the Planning Inspectorate's Programme of Projects where a scoping report has not been submitted. • Identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight being given as they move closer to adoption) recognising that there will be limited information available on the relevant proposals. • Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

4.15.7 In accordance with the updated Advice on Cumulative Assessment Guidance Advice note[32], the tiering structure detailed in **Table 4-4** has been used for screening and assessment of other developments. In assessing the potential for cumulative effects from the Proposed Development, it is important to consider that other developments, predominantly those 'proposed', may or may not be taken forward for development. Therefore, there is a need to build in a consideration of certainty (or uncertainty) with respect to the potential impacts which might arise from such proposals, in line with the approach set out by the new Advice note[32]. For example, other developments which are already under construction have a higher degree of certainty that these will contribute to cumulative effects than those development applications that are at an early stage.

4.15.8 For these reasons, all of the relevant other developments included within the long list are allocated into 'Tiers', reflecting their current status within the planning and development process. This allows the Cumulative Effect Assessment to present several scenarios, reflecting the varying levels of certainty of an activity proceeding and therefore the potential for impacts to arise that might act cumulatively with the impacts arising from the Proposed Development.

4.15.9 As per the updated Advice on Cumulative Assessment Guidance[32], the list of cumulative projects established as the long list are presented in **Chapter 18: Cumulative Effects** to enable the Local Authorities to provide comment on the long list.

4.15.10 It should be noted that the subsequent stages of the Cumulative Effects Assessment will be presented within the Preliminary Environmental Impact Report supporting the Proposed Development.

4.16 Proposed Topics to be Included in the ES

4.16.1 **Chapters 5** to **18** present the likely or potential significant environmental effects associated with the Proposed Development presenting in this EIA Scoping Report. The methodology and assessment criteria defined for the topic assessments in order to identify the effects of the Proposed Development are also detailed.

4.16.2 The following topics will be included within the ES:

- LVIA (Chapter 5);
- Glint and Glare (Chapter 6);
- Cultural Heritage and Archaeology (Chapter 7);
- Ecology (Chapter 8);
- Ornithology (Chapter 9);
- Water Environment and Flood Risk Assessment (FRA) (Chapter 10);
- Ground Conditions (Chapter 11);
- Traffic and Transport (Chapter 12);
- Noise and Vibration (Chapter 13);

- Climate Change Resilience (Chapter 14);
- Greenhouse Gases (Chapter 15); and
- Socio-Economics (Chapter 16).

4.16.3 As part of the EIA process and based on the information available to date, there are a number of environmental factors, as listed within Article 3(1) of EU Directive 2014/52/EU24, for which it is considered an assessment as part of the EIA is not justified, and therefore will not be considered within the ES.

4.16.4 As such, **Chapter 17: Other Environmental Topics**, presents a summary of the environmental topics that have been considered during the production of this EIA Scoping Report, and for which standalone chapters are not anticipated to be required in the ES. Technical appendices will be provided for these topics with a short summary provided in a single chapter within the ES for the following topics:

- Population and Human Health;
- Arboriculture;
- Marine Ecology;
- Climate Change Resilience;
- Waste;
- Major Accidents and Disasters;
- Heat and Radiation; and
- Air Quality.

5.0 Landscape and Visual

5.1 Introduction

5.1.1 The landscape and visual impact assessment (LVIA) will consider the potential likely significant effects on the landscape resource and visual amenity that may arise from the construction, operation and decommissioning of the Proposed Development. This Chapter of the EIA Scoping Report describes the methodology to be used within the LVIA (see **Appendix 5.A**: LVIA Methodology for the full description), an overview of the baseline conditions, the datasets to be used to inform the LVIA, the potential likely significant effects to be considered, and how these will be assessed.

5.1.2 The LVIA will interface with other environmental aspects for which outputs are provided as follows; **Chapter 6: Glint and Glare, Chapter 7: Cultural Heritage, Chapter 8: Ecology, Chapter 9: Ornithology, Chapter 11: Ground Conditions, Chapter 13: Noise and Vibration, Chapter 13: Climate Change Resilience** and **Chapter 16: Socio-economics and Amenity.**

5.1.3 This chapter is supported by **Figure 5-1: Zone of Theoretical Visibility with Viewpoint Locations and Designated Landscapes** and should be read in conjunction with **Chapter 2: Description of the Nature and the Purpose of the Project.**

5.2 Consultation

5.2.1 At this time no consultation has been undertaken with key stakeholders regarding the assessment of likely significant effects on the landscape resource and visual amenity arising from the construction and operation of the Proposed Development. It is therefore intended that this EIA Scoping Report will form the basis for consultation response from key stakeholders.

5.3 Study Area

5.3.1 Institute of Environmental Management and Assessment (IEMA) Guidance[36,37] recommends a proportionate EIA focused on the potential likely significant effects of a proposed development. The LVIA Study Area must therefore be large enough to capture all likely significant effects. However, an overly large LVIA Study Area may be considered disproportionate if it makes understanding the key impacts arising from the Proposed Development more difficult by including extraneous baseline information, and thus the unnecessary inclusion of receptors which are unlikely to be significantly affected by the Proposed Development.

5.3.2 This is supported by the Landscape Institute (GLVIA3) (Landscape Institute, 2013)[38] (paragraph 3.16) which recommends that '*The level of detail provided should be that which is reasonably required to assess the likely significant effects'.* Paragraph 5.2 also states that *'The Study Area should include the site itself and the full extent of the wider landscape around it which the Project may influence in a significant manner*'.

5.3.3 The Study Area for the Proposed Development is therefore based on professional judgement which aims to include those areas which are potentially and likely to be significantly affected by the Proposed Development. This judgement is based on an understanding of the local landscape character and the scale of the construction and development activities proposed within the Scoping Red Line Boundary as well as a review of Study Areas used for similar solar projects.

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36 Institute of Environmental Management and Assessment Environmental Impact Assessment Guide to Shaping Quality Development (2015), [Online], available at: https://www.iaia.org/pdf/wab/IEMA%20Guidance%20Documents%20EIA%20Guide%20to%20Shaping%20Quality%20Development%20V6.pdf [Accessed December 2024]

37 Institute of Environmental Management and Assessment Delivering Proportionate EIA (2017), [Online], available at: delivering-proportionate-eia-july-2017.pdf[Accessed December 2024].

38 Guidelines for Landscape and Visual Impact Assessment (Third Edition) (2013) [Online], available at: https://www.shropshire.gov.uk/media/27454/cd-83-glvia-3.pdf [Accessed December 2024].

5.3.4 The Study Area for the Proposed Development would extend to a distance of 5 kilometres (km) from the Scoping Red Line Boundary as illustrated in **Figure 5-1.** The Study Area may be reviewed and amended to address evolution and refinement of the components of the Proposed Development, the identification of any additional effects pathways, and consultation responses.

5.4 Baseline Conditions

Data Sources

5.4.1 A range of desk-based and site-based data will be sourced to undertake the LVIA, covering landscape and visual receptors and other relevant cumulative development. The desk-based data will be drawn from Ordnance Survey and a range of open-access document sources, in addition to the relevant planning policy documents outlined in **Chapter 3: Legislative and Policy Context**. The principal desk-based data sources used to inform this Section are set out in **Table 5-1**.

Table 5-1 Key Sources of LVIA Data

Organisation	Data Source	Data Provided
Ordnance Survey (OS)	Scale 1:50,000 and 1:25,000 mapping as appropriate	Baseline information on the landscape context including topography, drainage, settlement pattern, land use, tree cover, promoted recreational routes, transport network and infrastructure.
Google Earth Pro	Aerial photography and Street View.	Baseline information and Street View images on the landscape context including drainage, settlement pattern, land use, tree cover, transport network and infrastructure.
National Resources Wales	National Landscape Character Areas[39]	High-level baseline information on landscape character which sets the context for local LANDMAP data.
	LANDMAP Visual and Sensory (VSAA)[40]	Baseline information on landscape character in Wales, recorded and evaluated in a nationally consistent data set.

39 Natural Resources Wales. (2013). National Landscape Character Areas (NLCA) map and descriptions. (online). Available at: https://naturalresources.wales/evidence-and-data/maps/nlca/?lang=en. [Accessed December 2024].

40 Natural Resources Wales. (2021). Using LANDMAP in Landscape and Visual Impact Assessments GN46. (online). Available at

Organisation	Data Source	Data Provided
	National Seascape Assessment for Wales[41]	Baseline information on seascape character areas in Wales.
Newport City Council	Newport Local Development Plan 2011-26[42]. Special Landscape Areas REVISED DEPOSIT PLAN June 2013 Background Paper.	Baseline information on Special Qualities of SLAs – Caldicot Levels within Study Area.
	Landscapes of Historic Interest	Baseline information on the Gwent Levels Landscape of Historic Interest.
	Public Rights of Way	Baseline Information on Public Rights of Way.
	Open Access Map	Baseline Information on Open Access Land.
Monmouthshire County Council	Monmouthshire County Council Adopted Local Development Plan 2011-2021 - Adopted February 2014[43] Gwent Levels Landscape Character Assessment, 2017[44]	County Landscape Character Areas and Types within Monmouthshire in Study Area.

https://naturalresourceswales.gov.uk/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/using-landmap-in-landscape-and-visual-impact-assessments-gn46/?lang=en.[Accessed December 2024].

41 Natural Resources Wales (2015) National Seascape Assessment for Wales (online). Available at https://cdn.cyfoethnaturiol.cymru/media/682028/mca-00-technical-report-summary-method-appendix.pdf [Accessed December 2024].

42 Newport Local Development Plan 2011-26 (2013) Special Landscape Areas Background Paper (online). Available at https://www.newport.gov.uk/documents/Planning-Documents/LDP-2011-2026/Special-Landscape-Area-June-2013.pdf [Accessed December 2024].

43 Monmouthshire County Council (2014) Local Development Plan (online) Available at https://www.monmouthshire.gov.uk/app/uploads/2017/05/Adopted-Local-Development-Plan-with-PDF-tags.pdf [Accessed December 2024].

44 Gwent Levels Landscape Character Assessment (2017) (online) Available at https://static1.squarespace.com/static/5a1d5fb38a02c70db7c34f81/t/5b23d07e03ce64eefd2cb1d0/1529073847987/Appendix+1+Landscape+Character+Assessment.pdf [Accessed December 2024].

Organisation	Data Source	Data Provided
	Public Rights of Way	Baseline Information on Public Rights of Way.
	Open Access Map	Baseline Information on Open Access Land.
	Historic Landscapes	Baseline Information on Historic Landscapes – Gwent Levels.
CADW	CADW GIS Dataset[45]	Designated Heritage Assets including Registered Parks and Gardens and Registered Historic Landscapes.
Sustrans	National Cycle Network Map[46]	Sustrans and National Cycling Network (NCN) 4: Celtic Trail within the Study Area.
Wales Coast Path	Wales Coast Path[47]	Baseline Information about the Wales Coast Path within the Study Area.

Baseline Environment

5.4.2 The Proposed Development site is located adjacent to the Severn Estuary between Whitson in the west and south of Undy in the east within the administrative jurisdiction boundaries of Newport City Council and Monmouthshire County Council. The nearest settlement is Redwick village located 51 metres (m) to the north of the Scoping Red Line Boundary.

5.4.3 The landscape within the site predominantly comprises a cluster of rectilinear agricultural fields used for pasture and arable use, bordered by a combination of hedgerows, hedgerow trees, linear tree belts and drainage reens. These vegetative boundaries often line reens which can be overgrown. Bridges cross the ditches and provide connectivity to some of the network of fields. Lines of electricity transmission pylons also cross the Proposed Development site, mainly in the north-west and east, forming prominent vertical elements in the landscape. A number of existing solar farms are also evident in the landscape located between Whitson and Redwick, and west of Whitson.

5.4.4 Several public rights of way (PRoW) cross the Site and the wider regular farmland,

[45] CADW. GIS Dataset (online) Available at https://cadwpublic-ui.azurewebsites.net/ [Accessed December 2024.

[46] Sustrans (online) Available at http://www.sustrans.org.uk/ncn/map [Accessed December 2024].

[47] Wales Coast Path (online) Available at https://www.walescoastpath.gov.uk/?lang=en [Accessed December 2024].

broadly running from north to south, and a small number running east to west.

5.4.5 The wider Study Area landscape comprises a mixture of agricultural fields, with a number of settlements including Newport, Caldicot and Magor, as well as a network of transport infrastructure including the M4/M48, the A4810, the A48 and the South Wales Main Railway Line. The Wales Coast Path runs along the Severn Estuary adjacent to the southern boundary of the Site. Numerous large-scale industrial buildings associated with the steel works (Tata Steel and Llanwern Works), Magor Brewery and Tesco distribution centre, including operational wind turbines and substations (such as Whitson), are also visible broadly to the north, set against a backdrop of wooded rising landform.

Landscape Character

National Landscape Character

5.4.6 Natural Resources Wales (NRW) has divided Wales into 48 National Landscape Character Areas (NLCA). The NRW Landscape Character Map for Wales[48] is referred to for a strategic understanding of landscape character within the Study Area. This outlines the wider setting for the Proposed Development and provides a context for the description of local landscape character.

5.4.7 The Proposed Development is located within **NLCA34 - Gwent Levels** (Natural Resources Wales, 2014) which covers the majority of the Study Area.

5.4.8 **NLCA 34** is described as a:

"distinctive, flat, lowland landscape with a geometric patchwork of watercourses that run between fertile fields, there has been a rapid growth of once small settlements into dormitory villages, and urban expansion from both Cardiff and Newport."

5.4.9 Key Characteristics of the **NLCA 34** area are listed below:

- *"Alluvium – former marsh and inter-tidal areas from the Severn Estuary. Triassic mudstones are beneath*

48 National Landscape Character Areas for Wales (online) Available at www.naturalresources.wales [Accessed December 2024].

- *Reclaimed landscape – drained, improved, enclosed, historical, agricultural landscape*
- *Divided by the Usk estuary – into two distinct parts: the Wentlooge levels to the west and the Caldicot Level to the east. Collectively they occupy all the coastal levels between Cardiff and the England border by the Severn crossings. The Wye also flows out across the eastern end of this area.*
- *Reens and willows or hedgerows - a network of straight drainage ditches known as reens, acting also as field boundaries; still very extensive patterns but there are only remnant lines of willows on their banks. Hedgerows with less regular field shapes are on the slightly higher ground, reflecting different phases of reclamation and enclosure.*
- *Fertile soils and agriculture - supporting a variety of crops including cereal, sheep grazing, dairying, lowland beef production and equestrian husbandry.*
- *Wet pasture - one of the largest areas of reclaimed wet pasture in Britain. The reens support rare aquatic plants are home to a diverse range of invertebrates.*
- *Archeologically important - one of the finest examples of a 'hand crafted' landscape, it is on the Register of Landscape of Outstanding Historic Interest. Some of the drainage and reclamation works still present in today's landscape date from the Roman period, while buried under the alluvium are archaeological deposits of immense potential and spanning the prehistoric to Medieval periods.*
- *Comparatively little settlement - away from the urban fringes, the Levels have comparatively little settlement, with small nucleated and ribbon settlements linked by narrow roads.*
- *Open views between hills in Wales and England – an exposed landscape in places with long views to surrounding areas and (from only areas with slight elevation) to the Severn Estuary and Bristol Channel.*
- *Major developments on fringes – Llanwern Steelworks, a power station and pylons stand out in the flat landscape, while disproportionately large modern*

factory units outside Newport are also visible for long distances, and main motorways and rail lines are heard. Suburban development has enlarged settlements and urban development has spread from the adjacent Cardiff and Newport areas."

5.4.10 Three further NLCAs are located within the fringes of the Study Area in the north-west and north including:

- NLCA31 - Central Monmouthshire;
- NLCA32 – Wye Valley and Wentwood; and
- NLCA35 – Cardiff, Barry and Newport.

Regional Landscape Character

5.4.11 The Living Levels Partnership is a collective of stakeholders including RSPB Cymru, Gwent Wildlife Trust (GWT), Natural Resources Wales (NRW), Newport City Council (NCC), Monmouthshire County Council (MCC), City of Cardiff Council (CCC), Gwent Archives (GA), Cardiff Story Museum, Sustrans, National Trust, Bumblebee Conservation Trust and BugLife Cymru. They have produced the *Gwent Levels Landscape Character Assessment*[49], which provides a regional level characterisation of the landscape within the Gwent Levels. Those that are located within the Study Area (5 km radius) include:

- A2 – Caldicot Level (Site located within);
- B1 – Severn Estuary;
- C2 – Lower River Usk; and
- D2– Caldicot Level and Hinterland.

5.4.12 The **Caldicot Level** Character Area (A2) is described as "*an extensive character area, which extends between the River Usk in Newport and the bedrock promontory*

49 Living Levels Landscape Partnership Landscape Conservation Action Plan [Online], available at: https://static1.squarespace.com/static/5a1d5fb38a02c70db7c34f81/t/5b239f600e2e72064cb5018b/1529061237545/LL_Part_1_Introduction+and+Executive+Summary_Web.pdf [Accessed December 2024].

at Sudbrook in Monmouthshire." Its key characteristics include:

- *"A flat, open and exposed historic landscape of reclaimed pasture;*
- *Variety of field patterns and drainage channels/reens;*
- *Field enclosures generally regular and neat;*
- *More piecemeal field patterns south of Undy and Magor Pill;*
- *Extensive mature overgrown trees/hedgerows;*
- *The historic reens, hedgerows and tree lines including pollarded willows are mostly intact*
- *Part of the M4 corridor, lines of pylons/powerlines and views of the Second Severn Crossing are visually dominant;*
- *Settlement pattern largely confined to linear residential development along the reenside roads and scattered farmsteads; and*
- *Predominantly detached/cottage housing - rendered/painted rubblestone with tiled/slate roofs."*

Local Landscape Character – LANDMAP Aspect Areas

5.4.13 The NRW LANDMAP[3] landscape character information has been referred to for an understanding of landscape character within the Study Area. This outlines the setting for the Proposed Development within the Study Area.

5.4.14 LANDMAP[3] provides an all-Wales resource of landscape characteristics, qualities, and influences, arranged within five aspect layers: Geological Landscape, Landscape Habitats, Visual and Sensory, Historic Landscape and Cultural Landscape.

5.4.15 **Table 5-2** details the LANDMAP[3] Aspect Areas that overlap with or lie immediately adjacent to the Proposed Development.

Table 5-2 LANDMAP Aspect Areas

Aspect Area	Overall Evaluation	Summary
Geological Landscape		
Caldicot Level – Goldcliff (NWPRTGL031)	High	Forms a key part of the Gwent Levels coastal flats.
Caldicot Moor (MNMTHGL086)	Moderate	Reclaimed saltmarsh but not sterilised by industrial development so deposits may retain some scientific value
Newport - (Barnardstown-Green Moor) (NWPRTGL004)	Low	Area intensively developed and few or no natural features remain.
Magor Pil – Caldicot Pil (MNMTHGL092)	Moderate	No notable sites/landforms recorded and geomorphology typical of feature/process and not known to be exceptional or is widespread.
Welsh Grounds (NWPRTGL033)	Moderate	No notable sites/landforms recorded and forms only small part of much larger feature.
Bedwin Sands-Charston Sands (MNMTHGL093)	Moderate	Few notable sites/landforms recorded and geomorphology typical of feature/process and not known to be exceptional and is part of much larger system.
Landscape Habitats		
Farmland N. of Magor and Rogiet (NWPRTLH054)	Outstanding	The reens in this section of the level are particularly rich in plant and invertebrate species. 65 nationally rare and notable invertebrates have also been recorded form the area. The land use here is mainly grass lays for pasture and silage / hay. This Aspect Area forms part of one of the most extensive areas of reclaimed wet pasture in the UK.
NWPRTLH033	Outstanding	The Gwent Levels are one of the most extensive areas of reclaimed wet pasture in the UK. They are rich in plant species and communities due to the variety of reen types and their management. A number of nationally rare plant species and invertebrates are recorded from this section of the Levels.
Magor, Undy & Caldicot Levels (MNMTHLH088)	Outstanding	Could possibly only be evaluated as high because many of the fields present are stock grazed or arable and have varying

Aspect Area	Overall Evaluation	Summary
		levels of ecological value and only approximately 50% of the area is designated as SSSI. Evaluated as outstanding however because they are a unique habitat, the most important of its kind in Wales and have unique features that set it apart from other "similar" habitats on a wider scale.
East Usk and Llanwern Industrial (NWPRTHL022)	High	In spite of the fact that the dominant character of this landscape is undeniably industrial, represented by the modern Llanwern Steelworks and the Gwent Euro Park, this area is, nevertheless, of high value because of its demonstrable and significant potential for the survival of intact archaeological remains dating back to the prehistoric era.
Visual and Sensory		
Caldicot Level (NWPRTVS037)	High	A rare, distinctive landscape of rectangular and sinuous fieldscapes with reens, hedges and field boundary trees and attractive settlements and farmhouses with a strong sense of place. It will be of outstanding value if they were not some degrading of the landscape and detractors in places.
Western Coastal Grasslands (MNMTHVS053)	High	The area has long views framed by attractive pollarded willows lining the reens with a coastal edge character. The reens, hedgerows and tree lines including pollarded willows are mostly intact although the area is spoilt to an extent by the powerlines. A unique landscape defined by its flat levels, historical character and fragile grasslands/reen system. The area is part of the Gwent levels which is the largest levels systems in the UK and a rare landscape.
Western Saltmarsh and Mudbanks (MNMTHVS057)	Outstanding	Stretching from Sudbrook in the east to Cold Harbour Pill in the west, this open linear strip of saltmarsh allows long views across the Severn Estuary. Dissected by the Second Severn Crossing there are dramatic views of the bridge as it rises out of the estuary.

Aspect Area	Overall Evaluation	Summary
Estuary Mudflats (NWPRTVS007)	Outstanding	An extensive area of intertidal mud bordering the Severn estuary accommodating the second highest tidal range in the world. The area is very exposed, covered with water at high tide and forms part of the raw seascape.
Severn Estuary (NWPRTVS008)	Outstanding	The Severn estuary is a large dynamic tidal waterbody, which is at a vast scale. It forms a wild seascape which influences the character of much of Newport. Superb views are possible towards the Welsh coast and across to the English coast.
Bedwin Sands (MNMTHVS095)	Outstanding	It is an open and windy seascape, with long views to the English coastline interrupted by the Severn Bridge and Second Severn Crossing. The strong tidal action results in a visually diverse landscape from exposed mudflats to sandbanks and ragged rock formations.
Llanwern (NWPRTVS044)	Low	Decline of the steelworks has reduced the area's sense of place and the presence of many detractors mean that the area has a low value overall.
Historic Landscape		
Whitson (NWPRTHL019)	Outstanding	The central and western parts (represented by Whitson and Porton) have been characterised as a unique and fascinating example of a planned landscape and linear settlement dating to the 12th-14th centuries, while the eastern part of the area, represented by the extensive enclosed 'open fields' of Broadmead, constitutes a very rare single-period landscape and the most extensive area of 19th century survey planned Parliamentary enclosure on the Gwent Levels.
East Usk and Llanwern Industrial (NWPRTHL022)	High	In spite of the fact that the dominant character of this landscape is undeniably industrial, represented by the modern Llanwern Steelworks and the Gwent Euro Park, this area is, nevertheless, of high value because of its demonstrable and significant potential for the survival of intact

Aspect Area	Overall Evaluation	Summary
		archaeological remains dating back to the prehistoric era.
Redwick (NWPRTHL018)	Outstanding	A remarkably coherent, irregular landscape, the product of extensive wetland reclamation during the medieval period, focused on the well-preserved nucleated medieval settlement of Redwick. Recent archaeological work in this area has demonstrated exceptionally high potential for the survival of archaeological remains of all periods within the intertidal zone, including Mesolithic human footprints, Bronze Age roundhouses, palstave axes, cattle footprints and fish-traps, Roman field systems and metalworking areas and medieval ecclesiastical field systems
Caldicot Level (MNMTHHL001)	Outstanding	Caldicot Level is a major component of the Gwent Levels coastal plain located on the N side of the Severn Estuary. This area of reclaimed estuarine alluvium is regarded as a cultural resource of exceptional importance.
Cultural Landscape		
Caldicot Level (NWPRTCLS051)	No overall evaluation provided in the LANDMAP[3] tables	No summary provided in the LANDMAP[3] tables.
Llanwern (NWPRTCLS061)	As above	As above.
Western coastal grasslands (MNMTHCLS082)	As above	As above.
Western Saltmarsh and Mudbanks (MNMTHCLS087)	As above	As above.
Estuary Mudflats (NWPRTCLS013)	As above	As above.
Bedwin Sands (MNMTHCLS134)	As above	As above.

Landscape Planning Designations

National Designated Landscapes

5.4.16 There are no nationally designated landscapes (National Parks and National Landscapes (former Areas of Outstanding Natural Beauty)) within the Study Area.

Local Designated Landscapes

5.4.17 Except for the eastern part of the Site, the Proposed Development will be located within the locally designated Caldicot Levels Special Landscape Area (SLA) as illustrated in **Figure 5-1**. SLAs are non-statutory designations which are created by local planning authorities to identify landscapes that are distinctive or unique in the local authority context.

5.4.18 The Caldicot Levels SLA is described by Newport County Council as a unique area of landscape consisting of reclaimed marsh and wetlands which extends from Cardiff to Chepstow. The area is characterised by its network of drainage ditches (reens) which vary in form and character. The main lines of vegetation follow the drainage ditches and these vary from no vegetation through to reeds and scrub to strong lines of trees of primarily willow and oak. The main visual detractors to the SLA are the interface with the Llanwern Steelworks on its northern boundary and the cluster of overhead lines that cross the SLA. The Caldicot Levels SLA is influenced by lines of pylons, a solar scheme and scattered wind energy schemes.

5.4.19 Key qualities of the SLA include:

- *"Extensive area of reclaimed marsh and wetlands that extends from Cardiff to Chepstow.*
- *Characterised by its network of drainage ditches (reens) which vary in form and character. The eastern edge of the SLA is characterised by a regular, rectilinear pattern, whereas around Whiston and Caldicot the pattern is more sinuous.*
- *The vegetation pattern reflects the differing period of enclosure. The main lines of vegetation follow the drainage ditches and these vary from no vegetation through the reeds and scrub to strong lines of trees, primarily willows and oak.*

- *The main visual detractors to the SLA are the interface with the Llanwern Steelworks site on its northern boundary and the cluster of overhead power lines that focus upon Uskmouth power station.*
- *The SLA also covers the intertidal zone on the seaward side of the sea wall. This includes the Welsh Grounds an extensive area of mudflats exposed at low tide. The interrelationship of the intertidal zone to the inland area is focused upon the protective sea wall."*

5.4.20 Monmouthshire County LDP does not define any SLA's, however Policy LC5 Protection and Landscape Character[8] states particular emphasis will be given to those landscapes identified through the LANDMAP Landscape Character Assessment as being of high and outstanding quality because of a certain landscape quality or combination of qualities.

5.4.21 Ancient Woodlands are scattered throughout the Study Area, largely focused within the undulating ridges and hills broadly to the north of the Study Area. There are minimal woodland areas within the Levels landscape.

5.4.22 Registered Parks and Gardens, and Landscapes of Historic Interest are considered under visual receptors as a visitor or tourist attraction and are also addressed in **Chapter 7: Cultural Heritage.**

5.4.23 A summary of the LVIA Methodology is included in **Section 5.6** below, including the consideration of the value and susceptibility of receptors when establishing their sensitivity.

Visual Amenity

5.4.24 As illustrated in **Figure 5-1**, the Proposed Development is generally likely to have a limited presence and visibility within the Study Area due to a combination of factors, including the generally low-lying nature of Proposed Development physical elements and the presence of mature vegetation dividing fields and on the boundaries of the Site, which limits visibility considerably from all directions.

5.4.25 Views into the Site from locations accessible to the public will generally be close range and often filtered through gaps in boundary hedgerows. More distant views into the Site will be increasingly filtered by layers of vegetation as the distance from

the Proposed Development increases.

5.4.26 **Figure 5-1** illustrates the theoretical visibility of the Proposed Development on low lying land broadly between Goldcliff (to the west) extending to the M4 to the east and into the Severn Estuary to the south. Visibility beyond the A4810 and railway line to the south of Magor is restricted to higher ground including Wilcrick Hill, Bishton and Salisbury Hill Barn.

Visual Receptors

5.4.27 A combination of ZTV analysis and desk-based research together with an initial site appraisal has been used to establish a visual baseline. This process has determined that there will be a limited number of visual receptors with potential views of the Proposed Development within the Study Area. Initial site work has established that in reality views of the site from publicly accessible locations where there is potential for receptors to experience a change to their visual amenity are restricted to within 2km of the red line boundary, and predominantly within 1km. Visual receptors to be considered are as follows:

- Settlements and Residential Properties:
    - Residents in Redwick, Whitson, Magor and Undy, Broadstreet Common and Goldcliff (no visibility from Newport, Llanfinangel, Caldicot, Llandevaud, Llanmartin, Underwood, Langstone, Llanwern and Nash); and
    - A number of scattered individual residential properties (outwith settlement boundaries) within 1 km of the Site.
- People using Recreational Routes:
    - Wales Coast Path;
    - Sustrans Cycle Route 4;
    - Network of PRoW (footpaths, bridleways and byways) within the Study Area including those within 1 km of the Site likely to have the greatest visibility of the Proposed Development (no visibility from PRoW beyond this distance including from elevated locations where panoramic views are potentially available such as from Wilcrick Hill

and Bishton as these routes are not accessible, and Usk Valley Walk south of Chepstow Hill being beyond 5 km to the north); and

- Open Access Land.

- Drivers, passengers, and cyclists (where permitted) using the:
  - A4810;
  - Network of minor B roads and unclassified roads within the Study Area including those within 1 km of the Site likely to have greater visibility of the Proposed Development; and
  - Wales Railway Line, south of Magor and Undy.
- Recreational and tourist destinations:
  - Magor Marsh Nature Reserve.

Viewpoint Selection

5.4.28 17 viewpoints have been proposed in **Table 5-3** to cover a range of receptor locations, considering the following assessment assumptions:

- viewpoints from where there are likely to be significant and not significant effects;
- viewpoints representative of views within the LVIA Study Area;
- viewpoints representing a range of distances and directions; and
- an integrated approach representing several aspects from the same location.

5.4.29 The proposed viewpoints have been selected from the ZTV within 2km of the red line boundary inside of the Study Area. These locations, once agreed through the scoping process, will be ‘ground truthed’. For the avoidance of doubt, if an area on the map is shown to be outside the ZTV then there will be no view of the Proposed Development from that location.

5.4.30 In selecting the viewpoint locations, the following may be noted:

- The NatureScot (former Scottish Natural Heritage) guidance[50] recognises "the need to limit the list of viewpoints to a reasonable number";
- Over-provision of viewpoints "can be as unhelpful as under-provision" and "may distract attention from where impacts may be significant";
- An appropriate balance must be struck through the LVIA consultation process to agree on a proportionate number of viewpoints;
- Not all receptors require a viewpoint – receptors are still assessed and may refer to representative viewpoints;
- Not all viewpoints require a photomontage – construction works and/or distant viewpoints with no significant effects may be better illustrated by an annotated photograph only.

5.4.31 Early feedback from The Planning Inspectorate expressed a preference for one / two viewpoints from the English side of the River Severn near Portishead / Avonmouth. The 5 km Study Area does not extend to the English side of the River Severn which is located over 8 km to the south. Given this intervening distance, wide views across the River Severn and the low-lying nature of the Proposed Development, significant effects from the English side is unlikely and therefore excluded from the viewpoint list.

Table 5-3 Proposed Viewpoints

Viewpoint Reference	Viewpoint Name	Distance and direction	Receptor
1	Wales Coast Path, Porton House	NE	Recreational receptors
2	Wales Coast Path - Portland Grounds	N	Recreational receptors
3	Wales Coast Path, west of Magor Sewage Works	NW	Recreational receptors
4	PRoW, south of Pill Farm	SW/SE	Recreational receptors

50 Visual Representation of Wind Farms (2017), [Online], available at: https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf [Accessed December 2024].

Viewpoint Reference	Viewpoint Name	Distance and direction	Receptor
5	Minor road near Summerleaze Farm	S	Road users
6	Sustrans Cycle Route 4, east of Redwick	S	Road users, recreational receptors
7	PRoW, Redwick	S	Residents, recreational receptors
8	PRoW, Great Porton	E/SE	Recreational receptors
9	PRoW, Half Acre	SE	Recreational receptors
10	Minor road (N Row) west of Tonew Kennels	SW	Road users
11	Caldicot Level	S/SW	Recreational receptors
12	A4810	SW	Road users
13	Whitson	E	Residents, road users
14	PRoW off Chapel Road	E	Recreational receptors
15	Magor Marsh Nature Reserve	S	Visitors
16	Minor road south of Undy Common	SW	Road users
17	Undy	S	Residents

Future Baseline

5.4.32 Landscape change is an ongoing process and will continue across the Study Area irrespective of whether the Proposed Development proceeds. Change can arise through natural processes (for example, the maturity of woodlands) and natural systems (for example, river erosion, rising sea water levels) or because of human activity including land use and land management.

5.4.33 Both the Newport City Council and Monmouthshire County Council Development Plans indicate strategic and economic growth within their boundaries which is likely to affect settlements within the Study Area. Other land management, and consequently landscape character, is dependent on economic and environmental factors including the future effects of climate change and human adaptation which are difficult to predict at a local level and not a matter for this assessment. It is

however likely that mitigation and adaptation in response to changing climate and biodiversity pressures will continue to have an influence within the Study Area in the form of increased renewable energy and other environmental changes such as increased urbanisation and changes to the current levels of woodland / tree cover.

5.4.34 Further information on the future baseline of relevance to the LVIA is provided in **Chapter 16: Socio-economics and Amenity**.

5.5 Mitigation

5.5.1 As part of the project design process, several designed in measures will reduce the potential for impacts on landscape and visual receptors as listed further below. As there is a commitment to implement these measures, they are considered inherent to the design of the Proposed Development. The determination of magnitude and significance will assume the implementation of such measures. Some of these measures are considered standard industry practice for this type of development.

5.5.2 The requirement for any additional (secondary) mitigation measures will be dependent on the significance of the effects on landscape and visual receptors. The requirement for and feasibility of any mitigation measures will be consulted upon with statutory consultees throughout the EIA process.

5.5.3 Although the measures cannot be fully identified at this stage, the principles proposed to mitigate and reduce potential landscape and visual effects undertaken as part of the optioneering are outlined below. The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

5.5.4 Design and mitigation measures will also be informed through reference to the strategy and guidelines of the landscape as defined by the LANDMAP[3] assessment.

Approach to Design and Environmental Measures

5.5.5 High level landscape and visual assessment work is being undertaken to assist the consideration of the location, appearance and orientation of the solar panels and associated infrastructure for the Proposed Development, within the Scoping Red Line Boundary. This is a key component of the design and environmental measures

process and will include use of baseline landscape and visual data, consideration of the location of similar infrastructure and specific site/field surveys. The design measures will consider the potential to reduce overall landscape and visual effects as well as the use of other landscape design techniques.

5.5.6 Designed in environmental measures in respect of the provisional and then the final Study Area will involve the design of the Proposed Development as part of the ongoing site selection work. The ongoing work will consider constraints and potential effects relating to physical landscape elements (such as linear woodlands, trees and hedgerows), and landscape character, landscape designations and visual amenity, together with other environmental and technical constraints. The sensitivity of the surrounding landscape and of residents, road/rail users, and recreational users of the landscape will be a key consideration in the siting and design of the Proposed Development within the 'final' Study Area.

5.5.7 An outline landscape strategy (the Landscape and Environmental Management Plan or 'LEMP') will be prepared to mitigate the landscape and visual effects and help to 'fit' or better assimilate the Proposed Development into its landscape setting. The outline LEMP may include the following:

- advance survey of landscape elements and other environmental receptors;
- retention plans to ensure the protection of particular landscape elements;
- advance landscape works to 'grow' proposed planting as early as possible, where practicable;
- restoration of temporary construction works, (post construction);
- implementation of landscape works which are likely to include earthworks and drainage, fencing/boundary, colour coordination, hard works, soft works/planting and maintenance;
- enhancement works;
- a maintenance period of five years will be implemented to ensure the establishment of proposed landscape planting works; and
- a management plan will be implemented to care for the landscape and environmental measures as part of the on-going operational period.

5.5.8 The outline LEMP will be prepared to ensure benefits to the SSSI features along with monitoring and contingency measures to ensure their maintenance.

5.5.9 The LVIA proposes to assess the potential landscape and visual effects of the Proposed Development during the construction period and at Year five post implementation of any landscape planting works.

5.5.10 Relevant LVIA Designed In Measures include:

- Vegetation will be retained where possible and mapped (Vegetation Retention Plan or similar). Otherwise, vegetation removal will be undertaken in line with British Standard (BS) 5837-2012 (Trees in relation to design, demolition and construction) and scheduled to avoid bird breeding seasons. The hedgerow vegetation to be retained will be conserved, enhanced and sympathetically managed to encourage species diversity and enhanced wildlife habitats. The protection and retention of the existing landscape boundary features will provide immediate screening, retain the landscape character and pattern and help reduce the effects of the Proposed Development;
- A Construction Environmental Management Plan (CEMP) is to be implemented by the contractor. The contractor will ensure that the relevant environmental measures within the CEMP and health and safety procedures are implemented. A CEMP will identify the project management structure roles and responsibilities with regard to managing and reporting on the environmental impact of the construction phase. Other measures that feed into the CEMP relevant to this technical assessment include the protection of visual receptors. The CEMP will be the securing mechanism for many measures;
- All temporary construction access and contractor's compounds/laydown areas will be sensitively sited to avoid and/or reduce and mitigate adverse landscape and visual effects. Following construction, these areas will be returned to previous conditions where reasonably possible;

- An outline CEMP will be adopted to minimise temporary disturbance to residential properties and tourists/visitor attractions. This may include plans for temporary or permanent screening;
- A crossing schedule/PRoW Management Plan will be prepared which includes crossing methodology for each crossing of a recreational route. Signage and/or temporary recreational route diversions will be provided during construction and opportunities taken where possible to provide a diversion of similar or enhanced amenity;
- The final form of the Proposed Development will be finished to a high standard of design, using quality materials and integrated into the surrounding environment through the adoption of a robust, sustainable landscape planting strategy, taking account of the landscape character and related environmental receptors. The outline LEMP will be developed to mitigate landscape and visual effects and where possible, protect landscape character, key characteristics and elements, and enhance landscape quality through use of sustainable landscape design techniques. Areas of temporary vegetation loss will be reinstated at the first available planting/seeding season following completion. Reinstatement of vegetation will seek to provide landscape enhancement. Opportunities for enhancement will be identified following further evolution of the Proposed Development design and with stakeholder engagement. All new planting will be subject to a five-year establishment period with appropriate maintenance and on-going management; and
- A decommissioning plan will be prepared for the Proposed Development in line with the latest relevant available guidance.

5.6 Proposed Assessment Methodology

5.6.1 The project-wide approach to the assessment methodology is set out in **Chapter 4: The Environmental Impact Assessment Methodology**. However, it is also necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the LVIA.

5.6.2 The assessment will be undertaken following the GLVIA3[1], and other best practice

guidance. A full description of the LVIA methodology is provided in **Appendix 5.A: LVIA Methodology** of the EIA Scoping Report.

Summary of the LVIA Methodology

5.6.3 The landscape and visual effects (and whether they are significant) are determined by an assessment of the nature or 'sensitivity' of each receptor or group of receptors and the nature of the effect or 'magnitude of change' that will result from the Proposed Development. The evaluation of sensitivity takes account of the value and susceptibility of the receptor to the Proposed Development. This is combined with an assessment of the magnitude of change which takes account of the size and scale of the proposed change, the geographical extent, and the duration of that change. By combining assessments of sensitivity and magnitude of change, a level of landscape or visual effect can be evaluated and determined.

5.6.4 The resulting level of effect is described in terms of whether it is significant or not significant and the type of effect is described as either direct or indirect; temporary or permanent (reversible); cumulative; and beneficial, neutral or adverse.

5.6.5 The period for the assessment covers the construction period of the Proposed Development, and the subsequent operation and decommissioning phases. The assessment will also include the implementation and establishment of embedded landscape measures which are likely to overlap with the construction and / or operation periods. Additionally, residual effects will be assessed following the implementation of appropriate mitigation.

5.6.6 The landscape and visual assessment will require a combination of quantitative and qualitative assessment and wherever possible a consensus of professional opinion will be sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

Determining the Significance of Effects

5.6.7 A matrix presented in **Table 5-4** is used as a guide to illustrate the LVIA process. In accordance with the emphasis placed in GLVIA3[1] upon the application of professional judgement, an overly mechanistic reliance upon a matrix is avoided through the provision of clear and accessible narrative explanations of the rationale

underlying the assessment made for each landscape and visual receptor. Such narrative assessments provide a level of detail over and above the outline assessment provided by use of the matrix alone. Wherever possible, cross references will be made to baseline figures and/or to photomontage visualisations to support the rationale. The matrix, as presented in **Table 5-4** should therefore be considered as a guide and any deviation from this guide will be clearly explained in the assessment rationale.

Table 5-4 Evaluation of Landscape and Visual Effects

Magnitude of Change	Landscape and Visual Sensitivity			
Very high	**High**	**Medium**	**Low**	**Very low**
High	Substantial	Major	Moderate	Not Used
High-Medium	Substantial	Major to Moderate	Moderate to Minor	
Medium	Major	Moderate	Minor	
Medium-Low	Major to Moderate	Moderate to Minor	Minor	
Low	Moderate	Minor	Negligible	
Low-Very Low	Moderate to Minor	Negligible	Negligible	
Very Low	Minor	Negligible	Negligible	
Zero	None/ No View			

5.6.8 Significant landscape and visual effects are highlighted in bold and shaded in dark blue in **Table 5-4** and relate to all those effects that result in a '**Substantial**', **'Major**' or a '**Major to Moderate**' level of effect. In some circumstances, '**Moderate**' levels of effect (in light blue) also have the potential, subject to the assessor's professional opinion, to be considered as significant and these exceptions are also highlighted in bold and will be explained as part of the assessment, where they occur. White or un-shaded boxes in **Table 5-4** indicate a non-significant effect.

Potential Cumulative Effects

5.6.9 Cumulative landscape and visual effects resulting from the Proposed Development in addition to and in combination with other solar farm developments will be assessed in accordance with the technical guidance and outline methodologies set out in **Chapter 4: The Environmental Impact Assessment Methodology** (including specific LVIA methodology in **Appendix 5.A: LVIA Methodology**).

5.6.10 The cumulative assessment will assess the effects of other similar developments that have been screened in as part of the cumulative effects assessment (CEA) screening exercise.

5.6.11 The following Proposed Development effects have the potential to result in cumulative effects:

- cumulative landscape and visual effects during construction, operation and decommissioning of the Proposed Development;
- effects on landscape character, elements and characteristics as a result of the Proposed Development in addition, and in combination with other similar development;
- effects on landscape designations (special landscape qualities and integrity) as a result of the Proposed Development in addition, and in combination with other similar development; and
- effects on visual receptors as a result of the Proposed Development in addition, and in combination with other similar development.

5.6.12 The cumulative assessment methodology for the LVIA will be described in the EIA report once the scope of any cumulative assessment is confirmed and agreed with stakeholders and consultees.

5.6.13 The cumulative effect assessment will follow the approach outlined in **Chapter 4: The Environmental Impact Assessment Methodology**, of this EIA Scoping Report.

5.7 Description of Likely Significant Effects

5.7.1 In accordance with the EIA Regulations 2017[51], the EIA for the Proposed Development will consider those impacts where there is a risk of a likely significant effect only. The following section draws on industry experience and expertise to identify those effect-receptor pathways that may potentially lead to a significant impact. Where experience and available evidence indicate an effect-receptor pathway will not lead to a likely significant effect with regards to the EIA Regulations 2017 the pathway is scoped out from the assessment.

5.7.2 Viewpoint analysis and site survey, which includes an assessment of sensitivity and magnitude, will be used as part of the assessment to identify those receptors that are most likely to be significantly affected.

5.7.3 It is important to note that whilst some effects can be identified as likely to be significant at this pre-assessment stage, there is the potential for other receptors to be significantly affected and vice-versa, subject to evolution in design and further details of the LVIA.

Table 5-5 Potential effects on landscape and visual receptors

Receptor	Activity or Impact	Potential Effect
Construction Phase		
Landscape elements within the Study Area.	Land preparation (site clearance, earthworks)	Removal of landscape elements present under the baseline conditions. Direct and temporary localised effects on landscape elements may be significant.
Host Regional and Local LCAs (LANDMAP), and Caldicot Levels SLA that are within the Study Area and that are at least partly within the ZTV.	Construction activity of the Proposed Development including the presence of machinery, vehicle movements, associated noise, construction	Direct and temporary significant effects on the host landscape character. Indirect and temporary effects (significant and not significant) related to the visibility of the construction

51 The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017), [Online], available at: https://www.legislation.gov.uk/uksi/2017/572#:~:text=10.,provided%20in%20the%20environmental%20statement [Accessed December 2024].

Receptor	Activity or Impact	Potential Effect
	lighting, contractors facilities and site access.	activities and their effect on landscape character, special landscape qualities and setting of the Caldicot Levels SLA.
Visual Receptors within the Study Area: nearby settlements (residents); transport routes (primarily minor roads); recreational routes (including PRoW, Wales Coast Path, Sustrans Cycle Route 4); and recreational and tourist destinations.	Construction activity of the Proposed Development including the presence of cranes, other machinery, vehicle movements, associated noise, construction lighting, contractors facilities and site access.	Temporary significant effects on views and visual amenity resulting from visibility of the temporary construction activities within the Study Area.
Operation Phase		
Landscape elements within the Study Area.	Implementation of the landscape design plan.	A new framework of landscape elements such as recontoured land and newly planted hedgerows and trees will be introduced surrounding the Proposed Development, where applicable.
Host Regional and Local LCAs (LANDMAP[3]), and Caldicot Levels SLA that are within the Study Area and that are at least partly within the ZTV.	Operation of the Proposed Development.	Direct and significant effects on the host landscape character. Indirect effects (significant and not significant) related to the visibility of the Proposed Development and their effect on landscape character, special landscape qualities and setting of the Caldicot Levels SLA.
Visual Receptors within the Study Area: nearby settlements (residents); transport routes (primarily minor roads); recreational routes (including PRoW, Wales Coast Path, Sustrans Cycle Route 4); and	Operation of the Proposed Development.	Significant effects on views and visual amenity resulting from visibility of the Proposed Development within the Study Area.

Receptor	Activity or Impact	Potential Effect
recreational and tourist destinations.		
Decommissioning Phase		
Host Regional and Local LCAs (LANDMAP[3]), and Caldicot Levels SLA that are within the Study Area and that are at least partly within the ZTV.	Decommissioning activity of the Proposed Development including the presence of cranes, other machinery, vehicle movements, associated noise, construction lighting, contractors facilities and site access.	Direct and temporary significant effects on the host landscape character. Indirect and temporary effects (significant and not significant) related to the visibility of the decommissioning activities and their effect on landscape character, special landscape qualities and setting of the Caldicot Levels SLA.
Visual Receptors within the Study Area: nearby settlements (residents); transport routes (primarily minor roads); recreational routes (including PRoW, Wales Coast Path, Sustrans Cycle Route 4); and recreational and tourist destinations.	Decommissioning activity of the Proposed Development including the presence of cranes, other machinery, vehicle movements, associated noise, construction lighting, contractors facilities and site access.	Temporary significant effects on views and visual amenity resulting from visibility of the temporary decommissioning activities within the Study Area.

Activities or Impacts Scoped Out of Assessment

5.7.4 A number of potential activities and related impacts have been proposed to be scoped out from further assessment in **Table 5-6** due to no likely significant effect. These judgements with respect to no likely significant effect at this EIA scoping stage have been made based on the knowledge of the baseline environment, the nature of planned works and the wealth of evidence on the potential for impact from such projects more widely. The conclusions follow (in a site-based context) existing best practice. The elements which are proposed to be scoped out of requiring further assessment are presented in **Table 5-6.**

Table 5-6 Activities or Impacts Scoped Out of Assessment

Activity or Impact	Justification
Receptors outwith the ZTV	All receptors within the Study Area that are outwith the ZTV will have *no view* of the Proposed Development and are scoped out.
Indirect effects upon National Landscape Character Areas (NLCAs)	NLCAs within the Study Area cover extensive areas and consequently it is considered unlikely that the construction, operation and decommissioning of the Proposed Development will have the potential to result in significant indirect landscape effects on these receptors. This conclusion is supported by GLVIA3[1] (Paragraph 5.14) (Landscape Institute and IEMA, 2013), which advises that "*Broad scale assessments at national and regional level can be helpful in setting the landscape context but are unlikely to be helpful on their own as the basis for LVIA – they may be too generalised to be appropriate for the particular purpose".*
Indirect effects upon landscape and visual receptors beyond 5km	The location, nature and scale of the Proposed Development, and its visual influence beyond 5km does not result in significant effects and therefore does not justify wider assessment. This includes the two viewpoint locations on the English side of the River Severn that were requested by The Planning Inspectorate.
Cumulative effects beyond 5km	The location, nature and scale of the Proposed Development, and its visual influence beyond 5km does not result in significant effects and is therefore unlikely to result in any significant cumulative effects.
Individual Residential Properties beyond 1 km	Individual residential properties outwith settlement boundaries beyond 1km are scoped out of the assessment given limited visual effects which are unlikely to result in any visual compromise to a property.
Indirect effects on Seascape Character	Construction, operation and decommissioning effects on seascape character in relation to the Proposed Development are scoped out as significant effects on the key characteristics of the seascape character areas are unlikely.

5.8 Opportunities for Enhancing the Environment

5.8.1 Landscape enhancement measures within the Site will be considered beyond any required mitigation where the opportunity arises. Due to the Levels being recognised as an ‘open landscape’, excessive mitigation planting would not align with the character of the landscape. An inherent mitigation strategy would therefore be implemented which would position the Proposed Development away from key visual receptors. Screening from the Wales Coast Path would be largely ineffective given the route runs on a ridge along the sea wall which overlooks onto the site in the north and the Channel to the south.

5.9 Limitations And Assumptions

5.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified for the LVIA:

- Landscape and visual elements are dynamic and subject to change, both seasonally and over time. Consequently, the landscape and visual baseline used for assessment may be subject to change over the timescale of the Proposed Development. Assumptions on the nature and scale of change will have to be made which are potentially subject to a degree of error; and Viewpoints are selected from publicly accessible locations.

6.0 Solar Glint & Glare Assessment

6.1 Introduction

6.1.1 This Chapter assesses the potential impact of the Future Energy Llanwern Solar Farm on glint and glare and the extent to which this may affect the relevant sensitive receptors, such as roads, railways, and aerodromes, during the operational phase. Given the scale of the Proposed Development, with an output exceeding 350 MW, it is proposed that the potential solar glint and glare impacts on the adjacent surroundings are quantified and assessed within the EIA and reported in the ES. The Proposed Development will be constructed on approximately 548.3 ha of agricultural land between the villages of Redwick and Undy within the local authority jurisdiction areas of Monmouthshire County Council and Newport City Council.

6.1.2 Glare or dazzle in the built environment can occur when sunlight is reflected from the façade surfaces onto buildings, pedestrians, vehicles, trains, and aircraft. The problem can occur when the proposed facades have significant areas of reflective material and when the bright area caused by the incident sunlight is within the observer's field of view.

6.1.3 Glint is typically defined as a momentary flash of bright light, often caused by a reflection off a moving source. A typical example of glint is a momentary solar reflection from a moving car. Glare is defined as a continuous source of bright light. Glare is generally associated with stationary objects, which, due to the relative slow movement of the sun, reflect sunlight for a longer duration. Owing to the nature of the Proposed Development, this Chapter will focus on the assessment on the potential solar glare impacts on the adjacent surroundings.

6.1.4 The Glint and Glare chapter for the ES will:

- Define glint and glare and explain the potential mechanisms for their creation from solar farms;
- Identify potential receptors within the vicinity of the Future Energy Llanwern Solar Farm, comprising adjacent main roads, train tracks, and aerodromes;

- Describe the methodology used to assess the potential for glint and glare, including the use of modelling tools;
- Present the results of the assessment, identifying any receptors potentially affected by glint and glare and quantifying the potential impacts; and
- Consider the potential for mitigating measures to reduce the impact of glint and glare.

6.2 Legislation and Guidance

6.2.1 No specific legislation in relation to glint and glare affecting vehicle and train drivers exists in the UK, however, there is guidance available which is widely applied for these assessments in the UK. The following documents listed in **Table 6-1** below, have been used to inform the glint and glare assessment.

Table 6-1 Policy and Guidance

Policy	Reference to the G&G assessment
National Policy Statement for Renewable Energy Infrastructure (EN-3)[52]	Paragraphs 2.10.102- 2.10.106 set out the requirements of the applicants assessment and includes reference to glint and glare assessment. Setting out that "*applicants should map receptors qualitatively to identify potential glint and glare issues and determine if a glint and glare assessment is necessary as part of the application."* Whilst further stating that "*When a quantitative glint and glare assessment is necessary, applicants are expected to consider the geometric possibility of glint and glare affecting nearby receptors and provide an assessment of potential impact and impairment based on the angle and duration of incidence and the intensity of the reflection*".
The National Planning Policy Framework Guidance for 'Renewable and	In paragraph 013: *"The deployment of large-scale solar farms can have a negative impact on the rural environment, particularly in undulating landscapes. However, the visual impact of a well-planned and well-screened solar farm can be properly addressed within the landscape if planned sensitively. Particular factors a local planning authority will need to consider include:*

52 Department for Energy Security and Net Zero (2024). National Policy Statement for Renewable Energy Infrastructure (EN-3). [Online] Available at: National Policy Statement for renewable energy infrastructure (EN-3) (publishing.service.gov.uk) [Accessed December 202]).

Policy	Reference to the G&G assessment
Low Carbon Energy (2015)[53]	• *the proposal's visual impact, the effect on landscape of glint and glare (see guidance on landscape assessment) and on neighbouring uses and aircraft safety.* • *the extent to which there may be additional impacts if solar arrays follow the daily movement of the sun.* • *the potential to mitigate landscape and visual impacts through, for example, screening with native hedges. The approach to assessing cumulative landscape and visual impact of large scale solar farms is likely to be the same as assessing the impact of wind turbines. However, in the case of ground mounted solar panels it should be noted that with effective screening and appropriate land topography the area of a zone of visual influence could be zero."*
Guidance	
The British Research Establishment's (BRE) publication "Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice," by J Littlefair et al. (2022)[54].	Section 5.8 Solar dazzle: "*5.8.2 The problem can occur either when there are large areas of reflective glass or cladding on the façade, or when there are areas of glass or cladding that slope back so that high altitude sunlight can be reflected along the ground (Figures 42 and 43). Thus, solar dazzle is only a long-term problem for some heavily glazed (or mirror clad) buildings. Photovoltaic panels generally tend to cause less dazzle because they are designed to absorb light.* *5.8.3 If it is likely that a building may cause solar dazzle the exact scale of the problem should be evaluated. This is done by identifying key locations such as road junctions and railway signals and working out the number of hours of the year that sunlight can be reflected to these points. BRE Information Paper IP 3/87[21] gives details.* *5.8.4 Where solar reflection can happen, the next step is to calculate the angle between the driver's line of view and the reflected sun. For vertically mounted clear double glazing facing a driver on a level road, solar dazzle could be a significant issue if this angle is less than 10°. With a sloping façade or high reflectance glazing or cladding, solar dazzle might be a problem at higher angles of view as well. Sunlight that reflects off the façade at a glancing angle might also be bright enough to cause problems at higher angles of view.*

53 Ministry of Housing, Communities & Local Government, 2015, Renewable and low carbon energy, Available online at: https://www.gov.uk/guidance/renewable-and-low-carbon-energy [Accessed December 2024].

54 Littlefair, P.J. (2022) Site Layout and Planning for Daylight and Sunlight: a guide to good practice. BRE Construction Research Communications, Garston, UK. 2022 edition. [Accessed December 2024].

Policy	Reference to the G&G assessment
	5.8.5 If the reflected sun would be visible close to the driver's line of sight, even if this only happens for a small numbers of hours per year, then either a more detailed calculation of solar glare is required, or measures should be taken to reduce the glare."
This links to the BRE information Paper IP 3/87 which provides further guidance. (1987)[55].	The BRE Information Paper IP 3/87 provides guidance on calculating solar glare reflected from sloping glazed facades. It offers a method to assess whether a proposed building's facade will cause glare for pedestrians, motorists, or occupants of nearby buildings
US Federal Aviation Agency Guidance: Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports (2013)[56]	The FAA acknowledges the fact that solar energy systems have the potential to cause glint and glare that could result in ocular impact to pilots or air traffic controllers, compromising the safety of the air transportation system.
Technical Guidance for Evaluating Selected Solar Technologies on Airports (2018)[57]	This document updated the previous version of the guidance issued in 2010. In this version and in relation to glint and glare analyses, the FAA updated Section 3.1.2 '*Reflectivity'* to incorporate the latest information about evaluating solar glint and glare and corresponding references to glare throughout the document.
Pager Power, 'Solar Photovoltaic and Building Development – Glint and Glare Guidance (2022)[58]	Pager Power has developed a document with the aim to provide guidance for assessing the impact of glint and glare from solar photovoltaic (PV) panels and building developments with large reflective façades upon surrounding receptors to dwellings, roads, rail, and aviation receptors. The Guidance 'Solar Photovoltaic and Building Development – Glint and Glare Guidance' was updated in 2022.

55 Littlefair, P.J.(1987) Solar dazzle reflected from sloping glazed facades BRE IP 3/87,Bracknell, IHS BRE Press. Accessed December 2024].

56 Department of Transportation, Federal Aviation Administration (FAA), 2013, Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports, Available at: https://www.govinfo.gov/content/pkg/FR-2013-10-23/pdf/2013-24729.pdf Accessed [December 2024].

57 Federal Aviation Administration (FAA), 2018, Technical Guidance for Evaluating Selected Solar Technologies on Airports, Available at: https://www.faa.gov/sites/faa.gov/files/airports/environmental/FAA-Airport-Solar-Guide-2018.pdf Accessed December 2024].

58 Scrivener, D. et al. (2022). Solar Photovoltaic and Building Development – Glint and Glare Guidance, Fourth Edition. Pager Power Urban and Renewable. Available at: https://www.pagerpower.com/wp-content/uploads/2022/09/Solar-Photovoltaic-Glint-and-Glare-Guidance-Fourth-Edition.pdf [Accessed December 2024].

Policy	Reference to the G&G assessment
Detailed guidance on quantification of glare and criteria is provided in Hassall, D. N. H. (1991)[59]. Reflectivity: Dealing with Rogue Solar Reflections. University of South Wales.	Hassall's research provides a crucial foundation for assessing glare impact on drivers. By defining a specific threshold for uncomfortable or disabling glare, it allows for quantitative analysis of how solar reflections might affect driving conditions. This helps determine when and where glare could be a significant issue for road safety.
Aerodrome Safeguarding Advice Note (Feb 2024)[60]	Solar farms near airports pose a glare risk to aircraft. The UK Civil Aviation Authority advises a glare assessment for solar developments within a certain distance of airports. "It is essential to conduct an aviation perspective glint and glare assessment when a reflective surface is to be located on or immediately adjacent to an aerodrome. In most cases, an assessment should be undertaken for a solar energy development which is being proposed within a specific distance from an aerodrome as determined by the aerodrome authority. For many aerodromes, 5km is the distance of choice but it could be considered out to 10km. In exceptional circumstances assessments may be required beyond 10km."

6.3 Study Area

6.3.1 The Study Area for the glint and glare assessment encompasses the Proposed Site of approximately 270.87 ha, as shown in **Figure 6-1**. In accordance with the Civil Aviation Authority's guidance[61], the extent of the study area for aviation should cover a radius of 10km from the centre of the Site (**Figure 6-2**). This is to ensure that potential glare impacts on aircraft are adequately assessed. Additionally, the study area includes all roads and dwellings within 1km from the Scoping Red Line Boundary, and all railway tracks within 500m from the Scoping Red Line Boundary

59 Hassall, D. N. H. (1991). Reflectivity: Dealing with Rogue Solar Reflections. University of South Wales. [Accessed December 2024].

60 Civil Aviation Authority (CAA). (2024, April). CAST Advice Note 5: Renewable Energy Developments - Renewable Energy. https://www.caa.co.uk/combined-aerodrome-safeguarding-team-cast/cast-publications/cast-advice-notes/ [Accessed December 2024].

61 Renewable energy developments: solar photovoltaic developments CAST Aerodrome Safeguarding Guidance Note (2023) (Online). Available at: https://www.caa.co.uk/media/hlsmmmoi/cast-renewable-energy-developments-solar-july-2023.pdf [Accessed: December 2024].

as well. This is in accordance with the Pager Power Guide. Therefore, the study area covers up to 10km from the Proposed Site. A list of the study area is summarised below:

6.4 Baseline Conditions

6.4.1 The baseline conditions will establish the existing environmental conditions in relation to glint and glare within the Scoping Red Line Boundary, located approximately 13km east of Newport, as described in **Section 6.1,** encompassing an area of approximately 548.3 ha.

6.4.2 This baseline data will form the foundation for a glare model that will be used to predict the potential impacts of the Proposed Development on identified sensitive receptors. By comparing the baseline conditions to the modelled conditions with the solar farm in place, the increase in glint and glare caused by the Proposed Development can be determined.

6.4.3 Information to establish the baseline model will be collected from available sources including existing topographical surveys, mapping data, aerial photographic data, and other relevant data of the existing conditions.

6.4.4 In addition to local farms, the Proposed Development is also in a close proximity of several villages, including Goldcliff and Whitson to the west, Redwick to the north, Undy and Magor to the north-east.

Sensitive Receptors

6.4.5 Sensitive receptors are individuals or groups who may be particularly affected by the impact of glare from the Proposed Development. In this Study Area, sensitive receptors include:

- Train drivers on tracks within 500m of the Scoping Red Line Boundary;
- Vehicle users on roads within 1km of the Scoping Red Line Boundary;
- Dwellings located within 1km of the Scoping Red Line Boundary; and
- Aircraft pilots and air traffic control personnel operating within a 10km radius of the Proposed Site.

6.4.6 While pedestrians and walkers long the Wales Coastal Path may experience discomfort from glare, the potential for severe accidents is significantly lower compared to other identified sensitive receptors. Therefore, pedestrians will not be included in the detailed glare assessment.

6.4.7 No sensitive receptors have been identified who may be particularly effected by the impact of glint from the Proposed Development.

Train Tracks

6.4.8 As discussed in the above sections, solar farms have the potential to cause glare on train drivers using train tracks within 500m based on the Pager Power Guidelines[7].

6.4.9 An initial assessment showed that the nearest train track from the boundary of the Proposed Development is the track leading to Severn Tunnel Junction station.

6.4.10 The assessment identified that the nearest point of the track is located approximately 1km from the nearest point of the Scoping Red Line Boundary which will include solar development, as shown in **Figure 6-3**.

6.4.11 Therefore, this study shows that no impact is anticipated on train drivers, hence, this will be excluded from the detailed assessment in the next stage.

Roads

6.4.12 There is a potential impact from the Proposed Development on vehicle drivers using the roads within 1km from the Scoping Red Line Boundary. The (BRE 2022) Guide[3] recommends glare assessments for sensitive locations such as junctions as areas around traffic signals, where glare may pose high risk to drivers and impair their vision.

6.4.13 The main major road which could be impacted by the Proposed Development is A4810 (Queen's Way). The Proposed Development, however, is surrounded by local roads which are not usually assessed for glare. As a conservative approach some of these roads will be assessed especially where junctions are located.

6.4.14 The sensitive locations for vehicle drivers will be the roundabouts and main junctions within the previously discussed areas.

6.4.15 **Table 6-2** and **Figure 6-4** below show the names and locations which will be assessed for potential glare on road users.

Table 6-2 Road Sensitive Locations

Location	Description	Sensitivity
1	Junction of The Ramp, The Causeway, W End, and Church Rd	High
2	Junction of The Whitewall and Mill Reen	High
3	Junction of Green St and S Row	High
4	Junction of N Row and Green St	High
5	Junction of Bryn Rd and Church Row	High
6	Junction of Church Row and S Row	High
7	Junction of Bryn Rd, Mead Ln, and S Row	High
8	Junction of Broadway St Cmn, N Row, and Rush Wall	High
9	Roundabout connecting Queen`s way (A4810) and Llanwern Rd	High
10	Roundabout connecting Queen`s Way with the side road leading to Tata Steel Llanwern House	High
11	Junction of Whitson Common Rd and Porton Rd	High
12	Junction of Whitson Common Rd and Goldcliff Rd	High

Dwellings

6.4.16 The study area is not considered dense with residential areas. Few residential houses or farms are scattered around the Scoping Red Line Boundary within 1km. Those identified receptors are listed in **Table 6-3** and shown in **Figure 6-5.**

Table 6-3 Sensitive Receptors - Dwellings

Location	Description	Sensitivity
1	Houses within Undy town along W End and Church Rd	Medium
2	Few Houses along The Causeway	Medium
3	Houses along Whitewall	Medium
4	Houses along Summerleaze	Medium
5	Houses in Redwick town	Medium
6	Houses along N Row	Medium
7	Houses in Whitson town along Whitson Rd and Porton Rd	Medium

Aerodrome

6.4.17 Based on the guidance referenced previously, a 10km radius has been utilised to identify any airports which could be within the Zone of Influence of the Scoping Red Line Boundary. The review identified that the nearest airport is Bristol Airport which is located approximately 20km to the south east of the Proposed Site. Therefore, as the airport is outside of the radius of assessment, it is not considered a sensitive distance. The assessment of glare on aerodromes are therefore scoped out as the risks of impact are very low.

6.4.18 The second closest airport is Cardiff Airport, which is located approximately 37km south west of the Proposed Site. Therefore, there are no identified aerodromes to be included in the Glint and Glare assessment.

6.4.19 **Figure 6-6** shows the location of the identified airports from the Proposed Site.

6.5 Proposed Assessment Methodology

6.5.1 The assessment methodology and significance criteria will be based on the Federal Aviation Agency (FAA) guidance[6]. While this guidance was developed specifically for aviation, which is highly sensitive to glare, it will be conservatively applied to other identified receptors in this study, such as road users and residents of dwellings.

Assessment Methodology – Method 1

6.5.2 The methodology of the assessment comprises the following key steps and tasks:

- Identify locations of the relevant receptors;
- Undertake the analysis to determine whether a solar reflection is geometrically possible between the proposed solar PV panels and the receptors;
- Consider Field of View (FOV) of 30° for vehicle users, and 200° from the windows of the dwellings;
- Identify the potential glare at the receptors and the time and duration of occurrence, if applicable;
- Determine whether any identified solar reflection is significant;

- Consider if glare still be possible with existing screening (e.g., vegetation, existing buildings);
- Consider mitigation, if required; and
- Identify residual effects after mitigation.

6.5.3 The above methodology is in line with the Solar Photovoltaic Glint and Glare Guidance (2022)[7]. The BRE guidelines on Glare and Dazzle (2022)[3] which provide methods for quantifying potential glare, have also been used as a reference and further guidance.

Annual Computational Analysis and Criteria

6.5.4 The Solar Glare Hazard Analysis Tool technology (SGHAT) is a validated tool developed by Sandia National Laboratories specifically designed to measure glare for aviation according to the Solar Glare Hazard Analysis Plot. The SGHAT tool public use is now restricted and replaced by Forge Solar, which will be used for this assessment[62].

6.5.5 The ocular impact of solar glare is quantified into three categories:

- Green - low potential to cause after-image (flash blindness);
- Yellow - potential to cause temporary after-image; and
- Red - potential to cause retinal burn (permanent eye damage).

6.5.6 The above categories of ocular impacts of solar glare can be visualized with the Glare Hazard Plot. The accompanying chart (**Figure 6-7**), which represents a universal Hazard Plot, displays the ocular impact as a function of glare-subtended source angle and retinal irradiance. Each minute of glare is displayed on the chart as a small circle in its respective hazard zone. A reference point is provided that illustrates the hazard from viewing the sun without filtering, i.e., staring at the sun.

62 ForgeSolar tool, Available online at: https://www.forgesolar.com/ [Accessed December 2024].

6.5.7 The Forge Solar tool uses an interactive google map interface, where the locations of the Proposed Site and the receptors modelled are all recorded (latitude, longitude, and elevation) allowing the calculation of the sun and sun vector positions specific to them.

6.5.8 Photovoltaic systems are represented by a continuous planar polygon footprint and a set of customizable parameters. Each PV installation is modelled with its own PV array footprint in the editor and positioned at the Proposed Site location.

6.5.9 The solar reflectance of the PV module is related to the PV module material. The tool provides different surface material options to choose from according to the reflectivity the PV possesses.

6.5.10 During the annual computational analysis with the Forge Solar tool, sunlight reflections are computed at each PV array on a minute-by-minute basis according to the specified module tilt and orientation. The analysis then checks whether the resulting solar reflections intersect (impact) the receptors, and if so, it computes its duration and intensity.

6.5.11 The tool does not consider obstructions such as vegetation and buildings. Therefore, it considers a line of view between the reflector surfaces and the receptors. This approach considers the worst-case scenario, however, obstructions such as the ones created by topography itself should, in most cases, be taken into account. This is judged on a case-to-case basis, in which the results for both scenarios would be reported.

Additional Assessment Methodology – Method 2

6.5.12 The FAA methodology (Method 1) will be the primary methodology for the glare assessment. However, the following assessment methodology (Method 2) may be used in specific situations:

- If the glare impact results from Method 1 are inconclusive or show unacceptable significance;
- To account for the presence of existing obstructions (vegetation, buildings) not considered by Method 1; and

- To provide a more detailed assessment of discomfort glare for specific receptors (e.g., residents).

6.5.13 The second methodology to identify impact on vehicle drivers using roads, and for dwellings is similar to that used is mainly defined by the Veiling Luminance as the glare metric, in line with Hassall (1991)[8]. The assessment process comprises two stages:

Stage 1: Raytracing Analysis

- Identification of Relevant Receptors: Roads used by vehicles and external windows of dwellings will be identified for assessment;
- Observation Point Selection: Points on the windows and along any identified routes where the proposed development is visible and could potentially cause glare will be identified; and
- Raytracing Simulation: A raytracing tool will be used to determine if a solar reflection is possible between the solar farm and the identified observation points.

Stage 2: Veiling Luminance Assessment

- For locations identified as potential glare sources in Stage 1, a veiling luminance analysis will be conducted to assess the intensity of glare; and
- The subsequent steps involved in both stages, including the calculation of veiling luminance, comparison to threshold values, and significance evaluation, will be detailed in subsequent sections.

6.5.14 A discussion of the Raytracing and Veiling Luminance (VL) metrics is provided below.

Stage 1 - Raytracing Analysis

6.5.15 As part of the assessment a geometry-based raytracing analysis is undertaken to visualize the specular reflections by the Proposed Development and assess the potential reflections between the PVs and the adjacent receptors. The raytracing analysis is carried out for the entire year to identify the points where reflected light intersects the routes and identifies the times and locations where glare is geometrically possible.

6.5.16 The specialist tool Radiance has been used for the raytracing calculations. Radiance was developed by the Building Technologies Department of the Environmental Energy Technologies Division at the Lawrence Berkeley National Laboratory, University of California. The software is widely used in the lighting and daylighting industry for several applications in the built environment.

6.5.17 Where a solar reflection is geometrically possible it does not necessarily mean that glint or glare will be experienced by the receptor. Even when the glint or glare source is within the line of view of the receptors, the intensity of light reflection decreases with distance. However, whenever the glint or glare source is within the line of view of the receptors, the duration and intensity of light reflection will need to be assessed to determine whether this would affect the receptors.

Stage 2 - Veiling Luminance (VL) Assessment

6.5.18 Following a geometrically based raytracing analysis, veiling luminance will be calculated to determine the intensity of glare at each point. Veiling luminance can be described as a veil or haze of brightness that emanates from a glare source. This veil is caused by a scattering of light from a bright glare source across the retina. Its magnitude will depend on the illuminance of the glare source at the observer's eye and the position of the glare source relative to the observer's line of sight.

6.5.19 Veiling luminance is measured in Candela per square metre and can be estimated using the following equation:

$$L_v = \frac{10E}{\theta^2}$$

6.5.20 Where, E is the illumination on the observer's eye produced by the glare source and θ is the angle between the centre of the glare source and the line of sight.

6.5.21 Hassall proposes that the critical value for veiling glare is 500 Candela / m², above which the veiling luminance in the scene is likely to create disability glare. The most critical area for the human eye where vision is more sensitive to movement and colours lies within a 10° cone. Outside this area, the eye can adjust better to higher reflected luminance; nevertheless, veiling glare may still occur.

6.5.22 Calculations will consider the position of the sun relative to a receptor's position, the geometry and size of the glare source (the proposed structure), and material properties, i.e., reflectivity, specularity, and roughness.

Factors Included for the Calculation of the Veiling Luminance

6.5.23 A 3D model will be used to calculate the veiling luminance at key points of the proposed development. For vehicle drivers, a 30° field of view will be assumed, based on Hassall (1991)[8]. For observers within buildings, a horizontal field of view of approximately 110° and a vertical field of view of 120° will be assumed for occupants standing at an average height of 1.8m from a window.

6.5.24 The Veiling luminance will be calculated for locations and times based on the results of the Stage 1 raytracing assessment.

6.5.25 Where the veiling luminance exceeds the recommended upper limit of 500Cd/m², this will be recorded in terms of time and hour of the year. Where an occurrence exceeds the criteria and falls within the 30° angle of view for vehicle drivers or the 110° horizontal field of view for building occupants, the impact will be recorded as high. Occurrences exceeding 500Cd/m² but falling outside the critical angles will not be reported.

6.6 Description of Likely Significant Effects

Construction and Decommissioning

6.6.1 There are no significant effects that will arise as a result of the construction or decommissioning phases due to the nature of the Proposed Development, effects will not occur until the panels are fully installed and following the end of the operational phase effects will diminish to none as panels are removed from the Site.

Operation

Receptor Sensitivity

6.6.2 Disability glare, caused by excessive brightness in the field of vision, can significantly impair visual performance and increase the risk of accidents. This impact is particularly critical for transportation modes such as aviation, road, and rail, where rapid decision-making and visual acuity are paramount for safety. Even low levels of

glare can compromise visibility and reaction times, potentially leading to serious consequences.

6.6.3 Receptors susceptible to potential glare impacts from the Proposed Development have been identified as road users and residents within a 1km radius of the Proposed Scoping Red Line Boundary. Since the desk-based study scoped out aerodromes and railway lines due to their distance from the Proposed Site, their sensitivity will not be discussed in this study.

6.6.4 Road users at junctions and roundabouts are considered to be highly sensitive to glare due to their critical role in traffic flow and the potential for severe accidents caused by impaired vision. However, road paths[63], especially local roads are considered to be low sensitivity to glare.

6.6.5 Residents are considered to have a medium sensitivity to glare, as while discomfort may occur, the potential for severe accidents is significantly lower compared to road users at junctions and roundabouts.

6.6.6 Based on professional opinion, receptors sensitivity is listed in **Table 6-4** below:

Table 6-4 Receptors Sensitivity

Receptor	Sensitivity
Road's junctions, round abouts, and traffic light locations	High
Local Road paths (outside junctions, round abouts, and traffic light)	Low
Dwellings	Medium

Significance Criteria – Method 1

6.6.7 The assessment of glare impacts in Method 1 will employ Forge Solar, a validated tool originally designed for aviation glare assessment. To evaluate the potential glare significance for road users and residents, the tool will be conservatively applied. This analysis will categorize the potential ocular impact of solar glare into three levels:

63 Road paths refer to the road where there is no stopping point such as a traffic light, or a roundabout, therefore the driver is expected to be driving uninterruptedly.

- Green: Low potential to cause after-image (flash blindness);
- Yellow: Potential to cause temporary after-image; and
- Red: Potential to cause retinal burn (permanent eye damage).

6.6.8 Roundabouts and junctions on main roads will be considered as high-sensitivity receptors due to the potential for glare to impact driver safety. Junctions on local roads will be considered as medium-sensitivity receptors. Consequently, any glare impact identified as Yellow or Red for these receptors will be considered significant and require mitigation measures.

6.6.9 The assessment will identify areas where glare levels exceed acceptable thresholds and propose appropriate mitigation measures to reduce the potential impact on the receptors.

6.6.10 **Table 6-5** sets out the significance criteria based on FAA methodology.

Table 6-5 Significance Criteria – Method 1

Glare Category	Impact Level	Mitigation Required
No impact	Negligible	No
Green	Negligible	No
Yellow	Moderate Adverse	Yes
Red	Major Adverse	Yes

Significance Criteria – Method 2

6.6.11 Based on the combined results of the raytracing and veiling luminance assessments (Stage 1 and Stage 2), glare impacts will be categorized as follows:

- Negligible: Glare impacts are considered insignificant and do not require further assessment;
- Minor: Low levels of glare may cause minimal discomfort but are unlikely to significantly impair vision or safety;

- Moderate: Glare levels may cause discomfort and potentially reduce visibility. However, based on the preliminary assessment, mitigation measures are not required at this stage; and
- Major: High levels of glare are likely to cause significant visual impairment and increased safety risks, necessitating mandatory mitigation measures.

6.6.12 The significance criteria based on the Veiling Luminance method is summarised in **Table 6-6** below.

Table 6-6 Significance Criteria – Method 2

Glare Impact Category	Description	Mitigation Required
Negligible	No ray intersection or reflection outside 30° field of view	No
Minor Adverse	VL below 400 cd/m² or, VL above 500 cd/m² with sun in field of view	No
Moderate Adverse	VL between 400 and 500 cd/m²	No
Major Adverse	VL above 500 cd/m² with sun outside field of view	Yes

6.6.13 This categorization system will be used to evaluate the potential impacts of glare on the receptors based on the results of the raytracing and veiling luminance assessments.

Table 6-7 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
The assessment of glare on roads	Operation	✔		The main major road which could be impacted by the Proposed Development is A4810 (Queen's Way). The Proposed Development, however, is surrounded by local roads which are not usually assessed for glare. As a conservative approach some of these roads will be assessed especially where junctions are located.

Element	Phase	Scoped In	Scoped Out	Justification
The assessment of glare on dwellings	Operation	✔		The potential impact of climate change on the receptors identified in **Table 6-3**.
The assessment of glare on railway lines	Operation		✔	
The assessment of glare on aerodromes and railway lines	Operation		✔	The review identified that the nearest airport is Bristol Airport which is located approximately 20km to the south east of the Proposed Site. Therefore, as the airport is outside of the radius of assessment, it is not considered a sensitive distance.

6.7 Opportunities for Enhancing the Environment

6.7.1 Given the specific focus of this assessment on potential glare impacts on dwellings, main and local roads, opportunities for enhancing the environment are limited. .

6.7.2 However, there may be some potential to integrate environmental considerations into the design and operation of the solar farm, such as:

- Visual amenity: Exploring design options that minimize the visual impact of the solar farm on the surrounding landscape.

6.7.3 These opportunities will be considered further as the project progresses and more detailed design information becomes available.

6.8 Mitigation

6.8.1 Mitigation measures will be considered if glare assessments identify significant effects on, roads, or dwellings. Potential mitigation options include:

- Solar panel optimisation: Adjusting the orientation, tilt, or spacing of solar panels to minimize glare reflection.

- Screening: Implementing physical barriers or vegetation to obstruct the line of sight between the solar farm and sensitive receptors.

6.8.2 The specific mitigation measures required will be determined based on the nature and severity of the identified glare impacts and will be subject to further refinement as the project progresses.

6.8.3 The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

6.9 Limitations and Assumptions

6.9.1 To ensure transparency within the EIA process, the following limitations have been identified:

- Data limitations: The accuracy of the assessment will be dependent on the quality and availability of data, including topographical data, solar panel specifications, and receptor information. Where data limitations exist, reasonable assumptions have been made based on available information and industry best practices.
- Model limitations: The raytracing and veiling luminance models to be used in the assessment have inherent limitations. These limitations include assumptions about solar panel reflectivity, atmospheric conditions, and receptor characteristics.
- Glare duration: While the assessment will identify potential glare occurrences, determining the exact duration of glare events for each receptor may be challenging due to limitations in the modelling software.

6.9.2 It is important to note that the findings of this assessment are based on the information available at this stage of the project and may be subject to refinement as the project progresses.

7.0 Cultural Heritage and Archaeology

7.1 Introduction

7.1.1 This Chapter considers the impacts of the Proposed Development on Cultural Heritage and Archaeology during construction, operation and decommissioning and identifies potential significant effects. It sets out the proposed methodology that will be applied for the Cultural Heritage and Archaeology assessment and identifies impacts that can be scoped out of the assessment. Where necessary, further assessment will be presented in the Environmental Statement (ES).

7.1.2 Statutory provision for the safeguarding of historic assets has been made at a national and local level. Historic assets comprise below and above ground archaeological remains, buildings, structures, monuments or heritage landscapes.

7.2 Consultation

7.2.1 Consultation was sought in June 2024 with Cadw, the national historic environment service for Wales, and Heneb: the Trust for Welsh Archaeology, to inform Environmental Impact Assessment (EIA) Scoping with respect to Cultural Heritage and Archaeology issues.

7.2.2 Cadw responded on 10th June 2024[64] and agreed that a Historic Environment Desk Based Assessment (HEDBA); an ASIDOHL2 Assessment and an accompanying ES Chapter will be required to support an application for the Proposed Development. The proposed HEDBA should include analysis of LiDAR information, in conjunction with other data, to identify non-designated archaeological sites. Cadw advised that archaeological evaluations, if required, should be conducted in line with section 6.1.26 of Planning Policy Wales (2024). Cadw also advised that the The Historic Environment (Wales) Act 2023 will be enacted prior to the commencement of the EIA and will be of material consideration[65].

64 Cadw, *Future Energy Llanwern - Request for Pre-application Advice email correspondence* 10/06/2024.

65 This came into force on 4 December 2024).

7.2.3 Heneb provided a response on 6th August 2024[66] noting that a desk-based assessment will need to be reviewed before it could comment on the suitability of an appropriate mitigation approach. Nonetheless, Heneb stated that a desk-based assessment should be prepared in accordance with professional standards set out in CIfA Standard and Guidance for historic environment desk-based assessment, section 3.2.1. Furthermore, Heneb provided comment on the suitability of various investigation techniques within the Gwent Levels stating, '*In regard to the effectiveness of geophysical survey and trial trenching within the levels, there have been instances in more recent investigative work within the surrounding area, where geophysical surveying has produced beneficial results, along with trial trenching in which features were encountered. Therefore, we cannot definitely say that those methods are ineffective. Auger surveys within the region have also proven to be effective in determining the depths and sequences of land surfaces, alluvium and peat deposits, in order to further inform proposed developments in the area.*' Heneb also recommended that any archaeological works be undertaken by a CIfA registered organisation or by an accredited MCIfA level CIfA member.

7.2.4 For the preparation of the Cultural Heritage and Archaeology assessment within the ES, further consultation will be undertaken with the relevant LPA archaeological advisor and the conservation officers at Newport Council and Monmouthshire County Council, who provide advice on built heritage matters to the LPAs. Cadw will be consulted in respect of any significant adverse effects arising on impacts to the setting of statutorily designated assets. Discussions will focus on consensus with respect to study areas, methodology, key constraints, and the consideration of other relevant information which may not be available through the Historic Environment Record (HER).

66 Heneb/GGAT, *Future Energy Llanwern - Request for Pre-application Advice GGAT email correspondence* 06/08/2024 File Reference: NEW1673

7.3 Study Area

7.3.1 In order to inform an understanding of the historic environment context of the Site, a 5-kilometre (km) radius Study Area around the Scoping Red Line Boundary shown in **Figure 7-1** has been utilised to capture relevant data on designated assets. A 1km Study Area, from the Scoping Red Line Boundary, has been used for the identification of non-designated assets. The sizes of the proposed study areas are judged sufficient to understand the archaeological potential and historic character of the Site, and broad enough to capture potential impacts to heritage assets. A broad range of open-source data has been accessed. The data has enabled an initial assessment of the likely nature, extent, preservation and significance of any known or possible buried historic assets that may be present within, or adjacent to, the Site. The 5km radius Study Area around the Scoping Red Line Boundary will also be applied when considering impacts to historic asset significance through changes to setting, alongside the utilisation of a Zone of Theoretical Visibility (ZTV), which is a computer-generated tool used to determine the extent of the likely visibility of a proposed development. Where appropriate, reference will be made to key historic assets beyond the Study Area where potential impact may be considered. Further details regarding how study area collected data will be used to inform the assessment methodology are provided under **Section 7.5**.

7.3.2 The distances given for historic assets, within the 5km, and 1km Study Areas from the Scoping Red Line Boundary, are approximate to within 10 metres (m) unless otherwise stated.

7.4 Baseline Conditions

7.4.1 A high-level appraisal of historic assets has been undertaken to inform this scoping assessment using publicly available (open-source) information. Designated historic assets within the Scoping Red Line Boundary and within the 5km Study Area have been identified through information collated from Cadw, and non-designated assets within the Study Area have been identified through a search of the Glamorgan-Gwent Archaeological Trust HER, maintained by Heneb: The Trust for Welsh Archaeology.

Designated Historic Assets

7.4.2 The Site is situated within a designated historic asset, The Gwent Levels Historic Landscape of Outstanding Historic Interest in Wales, (HLW(GT)2), a Registered Historic Landscape (RHL). The Gwent Levels is defined by a diverse area of environmental and archaeological potential that encompasses the majority of the Site, excluding the area centred on Whitson Substation, within the Site's northwestern extent (**Figure 7-1**). The Gwent Levels covers an extensive area of low-lying estuarine alluvium within the Severn Estuary. The Gwent Levels area has been influenced by a vast tidal range and land within the Gwent Levels has been reclaimed by man over an extended period and so this area retains the remains of patterns of settlement, enclosure and drainage from successive periods.

7.4.3 Within the 5km Study Area, there are 28 scheduled monuments, three registered historic parks and gardens, 85 listed buildings and five conservation areas (**Figure 7-2**). There are no World Heritage Sites or protected wrecks within the 5km Study Area.

7.4.4 Of the 28 scheduled monuments within the 5km Study Area, the closest, at approximately 180m south of a cable route corridor towards the northeastern extent of the Site, is the Moated Site E of Grangefield Farm (MM205). Two further Scheduled Monuments, Undy Churchyard Cross (MM126) and Relict Seawall alongside Collister Pill reen (MM226) are situated within 1km of the Site, approximately 900m to the northeast of its eastern extent. The remaining 24 scheduled monuments are located in excess of 1km from the Site, with the majority situated north of the A4810 and a group of three scheduled monuments are present to the west, in proximity to the village of Goldcliff.

7.4.5 The three registered historic parks and gardens within the Study Area are the Grade I Listed Dewstow House (PGW(Gt)44(MON)), the Grade II Listed Pencoed Castle (PGW(Gt)3(NPT)) and the Grade II Listed Beechwood Park (PGW(GT)18(NPT)). Pencoed Castle is the closest to the Site at a distance of approximately 3.3km to the north, Dewstow House is situated to the northwest of Caldicot, approximately 4km northeast of the Site, and Beechwood Park is the furthest from the Site, at 4.4km to the northwest.

7.4.6 The 85 listed buildings within the 5km Study Area include:

- Three Grade I listed buildings including, the Church of St Thomas (2940), located within Redwick Conservation Area, 210m north of the centre of the Site, the Church of St Mary (2928), situated approximately 1.5km north of the Site in Magor, and the Church of St Mary (2936) situated approximately 3km to the west of the Site.
- Eleven Grade II* listed buildings are located within the 5km Study Area, the closest of which is Whitson Church (2943), situated 80m to the north of the western site access. Whitson Court including attached pavilions and garden walls (2944) is situated 360m to the south of the Site's northwestern extent. The remaining nine Grade II* Listed Buildings are located in excess of 1.5km to the north and northeast of the Site.
- Seventy-one Grade II listed buildings are located within the 5km Study Area. Seven are situated within 1km of the Site, of which Little Porton Byre (3066) and Little Porton Cottage (3065) are the closest to the Site, with both fronting onto the Site's western access road and therefore situated within 20m west of the Site. Samson Court (17451) is located 360m south of the western site access, along Whitson Common Road. Both Whitson Lodge (2946) and Whitson Farm (17540) are also situated further north, along Whitson Road, and in excess of 600m west of the Site's western extent. Whitson Brick House (3060) is located 700m east of the Site and approximately 400m northwest of the historic core of Redwick, and finally, the Church of St Mary (2052) is located approximately 970m to the northeast of the northeastern extent of the Site. The remaining 64 Grade II listed buildings are located between 1km and 5km from the Site, with groupings to the west, northwest and northeast.

7.4.7 Five conservation areas are situated within the 5km Study Area, the closest of which is Redwick Conservation Area (242). Redwick Conservation Area (242), which contains the historic core of the village of Redwick, is located 90m to the north of the Site, and approximately 500m to the east and west (see **Figure 7-2**). Magor Conservation Area (257) encompasses the village of Magor and is situated approximately 1.1km to the north of the Site and Rogiet Conservation Area is located

approximately 2km to the northeast of the Site. The remaining two conservation areas are located within the eastern part of Newport and are located over 4km to the northwest of the Site.

7.4.8 Aside from the Gwent Levels RHL (HLW(GT)2), there are no other Registered Historic Landscapes or World Heritage Sites within a 10km radius of the Site.

Non-designated Historic Assets

7.4.9 Within the Site, there are seven Historic Landscape Character Areas (HLCA) (**Figure 7-3**) and 44 non-designated historic assets recorded within the Glamorgan Gwent Archaeological Trust HER (**Figure 7-4**). The Site also lies within The Levels Archaeologically Sensitive Area (ASA).

7.4.10 The non-designated historic assets recorded within the HER are primarily distributed within the southwestern part of the Site, with 32 assets mapped within Porton and Redwick Broadmead HLCAs, a further nine within Redwick HLCA, two within northern Redwick HLCA and one within Whitson Black Fen HLCA, south of Whitson Substation (see **Figure 7-3**). Of the 44 non-designated historic assets within the Site, 27 date to the post-medieval period, eight to the Medieval period, three to the Roman period, while six are undated. The majority of the assets were identified through historic mapping, with 20 of the post-medieval assets comprising footbridges and the remaining seven consisting of historic hedges, drainage ditches, a footpath, a stone and a sluice. The medieval assets primarily relate to excavated drainage enclosures, although a possible water mill is also recorded. The Roman features include a possible north-south Roman road, which runs between Penhow and Magor Pill, in the eastern extent of the Site. The undated features relate to two excavated drainage features, a field, an in-tact reen[67], a road aligned northwest to southeast in the eastern extent of the Site, and an enclosure approximately 500m south of Redwick village.

[67] A ‘reen’, otherwise known as a ryhne or rhine, are a form of drainage ditch, or canal, used to covert wetland areas close to the sea into pasture. See the Collins Dictionary definition: https://www.collinsdictionary.com/dictionary/english/reen [Accessed December 2024].

7.4.11 There are six previous investigations recorded within the Site, excluding desk-based assessments (**Figure 7-5**). Prior to the construction of a solar farm at Llanwern, Newport, field visits (E007241), associated with a large Historic Area Assessment (E007476), were undertaken in 2015 across the western extent of the Site. Towards the eastern extent of the Site, three previous investigations are recorded in proximity to the Magor brewery effluent plant, including a geophysical study (E004496) and two watching briefs (1607 and E006095). Further southwest, a field visit (E001380) to Cold Harbour reen is recorded from 2005. Finally, a borehole survey (E006976) from 1999 associated with the M4 Relief Road is mapped within the northwestern fringe of the Site.

7.4.12 Within the 1km Study Area, there are 276 non-designated historic assets, alongside two historic settlements and two further Historic Landscape Character Areas, recorded within the GGAT HER (**Figure 7-3** and **Figure 7-4**). Additionally, there are 135 previous investigations recorded within the 1km Study Area, with the majority of these relating to watching briefs, geophysical investigations and intrusive surveys, alongside the occasional excavation (**Figure 7-5**).

7.4.13 The Levels ASA incorporates the entirety of the Site and is split across two administrative zones: Monmouth, which includes Magor & Undy, Rogiet and Caldicot which incorporates the eastern part of the Site; and Newport City Council, which includes Goldcliff, Whitson and Redwick and incorporates the western parts of the Site.

7.4.14 Historic Landscape Character Areas were identified as part of a historic landscape characterisation programme following the creation of RHLs. The characterisation program gathered more detailed information about each RHL, identifying distinct areas within them, primarily to provide information for landscape conservation and management. The seven HLCAs[68] within the Site include (**Figure 7-3**):

68 GGAT. Historic Landscape Characterisation: The Gwent Levels. Available online at: https://www.ggat.org.uk/cadw/historic_landscape/Gwent%20Levels/English/GL_Main.htm#06 [Accessed December 2024].

7.4.15 Redwick (HLCA06) covers the eastern half of the Site. The historic landscape is characterised by irregular field patterns of small fields (including some regular areas) and drainage features (reens, surface drainage) that include major medieval reens. A few intrusive modern buildings have appeared but overall, the condition of the historic landscape remains good. The landscape's spatial coherence and integrity are considered high.

- Redwick Broadmead (HLCA007) covers the central western section of the Site, and the historic landscape is characterised by regular field patterns of large rectangular fields, drainage features (reens, ridgeing/surface drainage, bridges, medieval drainage channels) and seawall, single green lane (pollards) without waste. The historic landscape has a very high integrity and coherence relating to its 19th-century origins and it demonstrates how landscapes were transformed through Parliamentary enclosure.
- Northern Redwick (HLAC008) covers the northern central section of the Site, and the historic landscape is characterised by uniformity and a limited range of landscape features, regular field-boundary patterns with few lanes and settlements, and a sea wall. Extensive ploughing and the removal of hedges have damaged the condition of parts of this historic landscape, although the western extent is in better condition.
- Green Moor (HLCA009) incorporates a thin section of the northern central extent of the Site. The historic landscape is characterised by uniformity, a strong "wetland" feel, regular field patterns, straight roads (grid-layout), and drainage features (reens, ridgeing/surface drainage, grips and bridges). Industrial and commercial development has intruded upon the central areas of this historic landscape, although the area comprising the Site still appears to retain its character.
- Porton (HLCA004) covers the southwestern extent of the Site, and the historic landscape is characterised by drainage features (reens, surface drainage, grip system), a seawall, rectangular fields in a planned grid of roads, and a network of green lanes, fishery features (important Putcher

rank). Overall, the historic landscape is extremely coherent with very high integrity and few visual intrusions.

- Whitson (HLCA003) covers narrow elements of the northwestern extent of the Site, excluding Whitson Substation, which is situated within Whitson Back-fen. The historic landscape is characterised by drainage features (reens, banks, and ridging/surface drainage, including the medieval Monksditch), a linear settlement on the former common, fen-banks, green lanes, long narrow fields, and pollarded trees. The historic landscape is very important and coherent and presents a fine example of an English planted settlement that has been reclaimed in the Welsh Marches.
- Whitson Black-fen (HLCA002) incorporates the most north-westerly extent of the Site, Whitson 275KV Substation. The historic landscape is characterised by well-preserved drainage features (reens, banks, and surface drainage), rectilinear field patterns arranged in blocks, very little settlement, and straight roads, lined by pollarded willows, giving a strong "wetland" feel. The integrity and coherence of the historic landscape have been degraded.
- Major Lower Grange (HLCA010) sits immediately north of two site access roads which extend northward from the eastern extent of the Site. The historic landscape is characterised by several large rectilinear fields enclosed by major reens, which date from the mid-13th century after Tintern Abbey was given licence to drain and enclose the land for agricultural usage. The historic landscape is very significant as the patterns of fields and boundary reens are in good condition and retain their original character as elements of a medieval monastic grange.

7.5 Proposed Assessment Methodology

Relevant Legislation and Guidelines

7.5.1 Relevant national legislation, policy and guidance which have informed this scoping chapter and will guide the EIA assessment are listed in **Table 7-1**.

Table 7-1 Policy, Legislation, and Guidance Relevant to the Proposed Development

Legislation / Policy/ Guidance	Description
Legislation	
The Historic Environment (Wales) Act 2023[69]	The Historic Environment (Wales) Act 2023 made provision to consolidate legislation relating to the historic environment in Wales in one place.
The Hedgerows Regulations 1997[70]	Sets out legal requirements that protect important hedgerows by controlling their removal.
Policy	
Planning Policy Wales, Edition 12[71]	National planning policy for Wales is set out in Planning Policy Wales (Edition 12, 2024) (PPW). Chapter 6, 'Distinctive and Natural Places', explains how planning system must take into account the Welsh Government's objectives to protect, conserve, promote and enhance the historic environment.
National Policy Statement[72]	National energy infrastructure planning policy is set out in National Policy Statement (2023) (NPS). EN-1, 'Overarching National Policy Statement for energy' and EN-3. 'National Policy Statement for renewable energy infrastructure' explain how the historic environment may be impacted by the construction, operation and decommissioning of energy infrastructure, how to assess and mitigate harm, and opportunities for enhancement.
Future Wales: The National Plan 2040 (February 2021)[73]	The National Development Framework Future Wales – the National Plan 2040, sets out the Welsh Government's land use priorities and provides a national land use framework.
Newport City Council Local Development Plan (adopted	Local planning policy that highlights key objectives for the local council, which include the following policies

69 National Assembly for Wales. (2023). Historic Environment (Wales) Act. Available at: https://www.legislation.gov.uk/asc/2023/3/contents/enacted [Accessed December 2024].

70 Welsh Government. (1997). The Hedgerows Regulations 1997. Available at: https://www.legislation.gov.uk/uksi/1997/1160/introduction/made [Accessed December 2024].

71 Welsh Government. (2024). Planning Policy Wales, Edition 12. Available at: https://gov.wales/planning-policy-wales [Accessed December 2024].

72 Department for Energy Security and Net Zero. (2023). National Policy Statement for energy infrastructure. Available at: National Policy Statements for energy infrastructure - GOV.UK (www.gov.uk) [Accessed December 2024].

73 Welsh Government. (2021). Future Wales: The National Plan 2040. Available at: https://www.gov.wales/future-wales-national-plan-2040 [Accessed December 2024].

Legislation / Policy/ Guidance	Description
2015)[74]	relating to the Historic Environment: • CE4 Historic Landscapes, Parks, Gardens and Battlefields; • CE5 Locally Listed Buildings and Sites; • CE6 Archaeology; and • CE7 Conservation Areas.
Monmouthshire County Council Adopted local development plan (adopted 2014)[75]	Local planning policy that highlights key objectives for the local council, which include the following policies relating to the Historic Environment:
Guidance	
Technical Advice Note 24: The Historic Environment[76]	TAN 24 was adopted in May 2017 to provide guidance on how the planning system should consider the historic environment during development plan preparation and decision making on planning applications.
Cadw. Heritage Impact Assessment in Wales[77]	Sets out the general principles to consider when planning changes to historic assets and applying for listed building, conservation area and scheduled monument consent.
Cadw. Setting of Historic Assets in Wales[78]	Sets out the principles used to assess the potential impact of development or land management proposals within the settings of World Heritage Sites, ancient monuments (scheduled and unscheduled), listed buildings, registered historic parks and gardens, and conservation areas.

74 Newport City Council. (2015). Newport Local Development Plan 2011-26 Adopted Plan. Available at: https://www.newport.gov.uk/documents/Planning-Documents/LDP-2011-2026/LDP-Adopted-Plan-January-2015.pdf [Accessed December 2024].

75 Monmouthshire County Council. (2014). Monmouthshire County Council Adopted Local Development Plan: 2011-2021. https://www.monmouthshire.gov.uk/app/uploads/2017/05/Adopted-Local-Development-Plan-with-PDF-tags.pdf [Accessed December 2024].

76 Welsh Government (2017). Technical Advice Note 24: The Historic Environment. Available at: https://gov.wales/technical-advice-note-tan-24-historic-environment [Accessed December 2024].

77 Cadw 2017. Heritage Impact Assessment in Wales. Available at: https://cadw.gov.wales/advice-support/placemaking/heritage-impact-assessment/heritage-impact-assessment [Accessed December 2024].

78 Cadw 2017. Setting of Historic Assets in Wales. Available at: https://cadw.gov.wales/advice-support/placemaking/heritage-impact-assessment/setting-historic-assets [Accessed December 2024].

Legislation / Policy/ Guidance	Description
Cadw. Managing Historic Character in Wales[79]	Explains why it is important to recognise historic character and use it as an evidence base for conservation, regeneration and planning work. It shows how policies and programmes to manage change can take inspiration from the past to help create and sustain distinctive places for the future.
Cadw Guide to Good Practice on using The Register of Landscapes of Historic Interest in Wales in The Planning and Development Process Revised (2nd) Edition (2007)[80]	Describes the ASIDOHL assessment methodology
CIfA: Code of conduct: professional ethics in archaeology (2022)[81]	Ensuring professional conduct in archaeology.
CIfA Code of conduct: professional conduct (2021)[82]	Ensuring professional conduct.
CIfA Standard and guidance for historic environment desk-based assessment (2020)[83]	Guidance for producing desk-based assessment.

79 Cadw 2017. Managing Historic Character in Wales. Available at: https://cadw.gov.wales/advice-support/placemaking/historic-character/managing-historic-character [Accessed December 2024].

80 Cadw 2007. Guide to Good Practice on using The Register of Landscapes of Historic Interest in Wales in The Planning and Development Process. Available at: https://cadw.gov.wales/sites/default/files/2019-05/LandscapesRegisterGoodPractice_EN_0.pdf [Accessed December 2024].

81 Chartered Institute for Archaeologists (CIfA). (2022), Code of conduct: professional ethics in archaeology ,Available at: https://www.archaeologists.net/sites/default/files/Code%20of%20conduct%20revOct2022.pdf [Accessed December 2024].

82 Chartered Institute for Archaeologists (CIfA), (2021) Code of conduct: professional conduct. Available at: https://www.archaeologists.net/sites/default/files/Regulations%20for%20professional%20conduct.pdf [Accessed December 2024].

83 Chartered Institute for Archaeologists (CIfA), (2020) Standard and guidance for historic environment desk-based assessment. Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf [Accessed December 2024].

Legislation / Policy/ Guidance	Description
CIfA Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (2020)[84]	Guidance for archaeological and built heritage consultancy work.
Welsh Assembly Government: Conservation Principles for the sustainable management of the historic environment in Wales (2011)[85]	Guidance for interpreting and managing the historic environment in Wales, including assessing heritage values and significance.
Newport City Council Archaeology & Archaeologically Sensitive Areas: Supplementary Planning Guidance[86]	Local planning guidance for development within ASAs, including what works may be required and how procedures for consultation and evaluation will be implemented.

Proposed Surveys / Site Visits

7.5.2 A historic environment desk-based assessment (HEDBA) will be undertaken, to include a description of known historic assets and a discussion of the potential for further, as yet unknown, historic assets. The archaeological desk-based assessment will be presented in a fully illustrated technical appendix to the ES. This will include a detailed baseline compiled through consultation of a standard range of data sources, listed in **Table 7-2**.

84 Chartered Institute for Archaeologists (CIfA). (2020), Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment. Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GCommissioning_2.pdf [Accessed December 2024].

85 Welsh Assembly Government. (2011). Conservation Principles for the sustainable management of the historic environment in Wales. Available at: https://cadw.gov.wales/sites/default/files/2019-05/Conservation_Principles_EN_0.pdf [Accessed December 2024].

86 Newport City Council. (2015). Archaeology & Archaeologically Sensitive Areas: Supplementary Planning Guidance. Available at: Archaeology-SPG---August-Adoption-Version (newport.gov.uk) [Accessed December 2024].

Table 7-2 Data Sources to be Consulted

Source	Data	Comment
Cadw	Information on statutorily designated historic assets	Statutory designations (scheduled monuments; statutorily listed buildings; registered parks and gardens; historic battlefields) can provide a significant constraint to development.
Heneb: The Trust for Welsh Archaeology	HER	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources.
Local Planning Authority	Conservation Area	An area of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance.
Local Planning Authority	ASAs	Areas that indicate where archaeology may become a component in the determination of planning applications. Historic assets located within ASAs do not necessarily have more heritage significance than those without.
The National Monument Record (NMR), Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW)	Information on Wales's monuments	Provides detailed information about Welsh monuments, including aspects of archaeological, architectural, ecclesiastical, industrial, defensive and maritime history.
Historic Maps	National Library of Scotland (NHLS); Old Maps Online; The Genealogist; Glamorgan Archives.	Historic maps, Ordnance Survey maps, tithe maps (and apportionments), estate maps and any other relevant historical maps will be consulted to enable analysis of change at the Site over time.
Aerial Photography	RCAHMW; Britain from Above; and the Central Registry for Aerial Photography Wales (CRAPW).	Provide aerial images of the Site so that provision can be made for analysis of the Site dating from the early 20th century to the present, including the study of cropmarks, soilmarks and earthworks to identify features that otherwise may not be visible at the present time.

Source	Data	Comment
Gwent and Glamorgan Archives	Historic maps; historic landowner information; historic photographs	If appropriate, the Glamorgan Archives will be visited to gather further information pertinent to the Site and cultural heritage.
Data Map Wales (formerly Lle Map)	LiDAR	Data Map Wales is a free online repository for LiDAR imagery in Wales.
Archaeological Data Service (ADS)	Fieldwork reports	The Archaeological Data Service includes an archive of digital fieldwork reports
National Library of Wales	Online and locally stored records	Catalogue records relating to the historic environment of Wales.
British Geological Survey (BGS)	Solid and drift geology digital map; online BGS geological borehole record data.	Subsurface deposition, including buried geology and topography, can provide an indication of potential for early human settlement, and potential depth of archaeological remains.
Groundsure	Ordnance Survey maps from the 1st edition (1860–70s) to present day.	Provides a good indication of past land use and impacts which may have compromised archaeological survival. Provides an indication of the possible date of any buildings on the Site.
Internet	Web-published local history	Many key documentary sources, such as Gwent County History local and specialist studies are now published on the web and can be used to inform the archaeological and historical background.
The Applicant	Topographical survey data	Survey data can provide an indication of the impact of past land use, e.g., ground raising or lowering, which is useful for understanding possible truncation and likely depth of archaeological remains.

7.5.3 A walkover survey will be undertaken within the Site to survey known historic assets and to assess the potential for previously unrecorded remains and historic hedgerows[87]. Setting will be surveyed from publicly accessible locations.

87 Welsh Government. (1997). The Hedgerows Regulations 1997. Available at: https://www.legislation.gov.uk/uksi/1997/1160/introduction/made [Accessed December 2024].

7.5.4 Further fieldwork may be required following completion of the archaeological desk-based assessment. The need for this will be determined on the basis of the results of the desk-based assessment, and in consultation with the LPA archaeological advisor, and will be considered where this is necessary to understand the nature of the archaeological interests and to inform the assessment of effects. The scope of surveys will be proportionate to the potential archaeological interests and extent of disturbance which may result from the construction of the Proposed Development but may initially involve geophysical survey, with a potential for intrusive survey where required. Surveys may also need to consider the geoarchaeological interests within the Site. The approach to mitigation of impacts on identified archaeological remains is outlined in **Section 7.8**.

7.5.5 The assessment will identify the potential direct and indirect effects of the Proposed Development on historic assets. Information within a 1km study area will be used to inform the archaeological potential of the Site.

7.5.6 Effects on the settings of designated historic assets will be considered primarily within 5km of the Scoping Red Line Boundary. For those assets included within the settings assessment, the ES will describe the significance of the historic asset and the contribution of setting to that significance, in accordance with guidance provided by Cadw in The Setting of Historic Assets in Wales (2023) and Conservation Principles (2011). This will be completed with reference to the designation description, a site visit in each case and other information which may be relevant.

EIA Approach

7.5.7 The ES Chapter will set out the planning framework with respect to buried historic assets (archaeological remains), built historic assets and historic landscapes. It will include the methodology for assessing the environmental effects predicted during the construction, and operation (completed development) phases. It will provide a summary overview of the baseline conditions. The Policies, legislation and guidance used during the preparation of the Chapter are set out in **Table 7-1**.

7.5.8 The ES will include a description of the research undertaken and results obtained, as well as an assessment of the nature and potential significance of the effects arising from the Proposed Development. Consideration will be given to any necessary mitigation, following consultation with the Applicant and consultees. All work will be completed in accordance with the Chartered Institute for Archaeologists (CIfA) Code of Conduct and Standard and Guidance for Archaeological Desk-Based Assessments.

Assessments of Effects Methodology

Potential Receptors

7.5.9 While the HEDBA will identify specific receptors potentially affected by the proposed development, a high-level review of available historic environment information outlined in **Section 7.4** indicates that affected receptors may include:

- Designated historic assets within 5km of the Site (Scheduled Monuments, Listed Buildings, RHL, Conservation Areas);
- Non-designated historic landscapes (HLCAs);
- Buried non-designated historic assets within the Site (i.e. discrete archaeological features, residual artefactual remains, human skeletal remains); and
- Non-designated above ground historic assets within 100m of the Site (locally listed buildings, HER-recorded visible structures).

7.5.10 The potential disturbances to these receptors are likely to be variable. The greatest magnitude of change will likely be localised to areas of the Proposed Development that either boast deep construction-related excavations and/or proposed structures with large massing. The Proposed Development could affect cultural heritage and archaeology receptors through:

- Direct disturbance of historic assets;
- Changes to the settings of historic assets, affecting their significance; and
- Changes to the historic landscape.

Direct Disturbance

7.5.11 Any effects arising from direct disturbance to historic assets will be expected to occur during the construction phase and are permanent and irreversible but restricted to the footprint of the Proposed Development.

7.5.12 Direct disturbance will arise only from physical disturbance caused by the construction of the Proposed Development. Therefore, effects on known historic assets will be considered only where these are located within the footprint of the Proposed Development. Direct effects on historic assets outside the footprint of the Proposed Development will not occur and are scoped out.

7.5.13 There is potential for previously unrecorded historic assets to be directly affected by the Proposed Development. Such effects will be considered with reference to a characterisation of the potential presence of such historic assets developed from an understanding of the historic landscape context, and reference to appropriate cartographic and documentary sources.

Effects on Setting

7.5.14 The setting of historic assets is defined in Cadw guidance[88] as:

"The setting of a historic asset includes the surroundings in which it is understood, experienced and appreciated, embracing *present and past relationships to the surrounding landscape".*

7.5.15 Cadw guidance identifies a staged approach to the assessment of effects on settings, with the first stage being the identification of the historic assets which may be affected. In accordance with guidance, this will be done with reference to the ZTV and also considering:

- the location, size and scale of the proposed development; and
- the location of the identified historic assets.

88 Cadw (2017). Setting of historic assets in Wales. Available at: https://cadw.gov.wales/sites/default/files/2019-05/Setting%20of%20Historic%20Assets%20in%20Wales%20EN.pdf [Accessed December 2024].

7.5.16 On this basis, designated assets within 5km of the Scoping Red Line Boundary which fall within the initial ZTV will be included in the assessment. It is not considered likely that setting impacts will be incurred on designated historic assets beyond 5km from the Scoping Red Line Boundary. Nonetheless, where the initial ZTV identifies historic assets beyond 5km, only the most sensitive and significant historic assets, such as World Heritage Sites, have the potential to be significantly affected. Significant effects in these cases are only likely to occur where the solar array will intervene in specific views that make a substantial contribution to the significance of an asset.

Historic Landscape

7.5.17 As the Site is within The Gwent Levels Historic Landscape of Outstanding Historic Interest (HLW(GT)2), an Assessment of the Significance of the Impact of Development on Historic Landscape (ASIDOHL) will be completed in accordance with relevant guidance[89]. This will be presented in a separate technical appendix, with the results incorporated into the ES assessment.

Significance Criteria

Determining the Significance of Effects

7.5.18 The EIA Regulations recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that are “likely to be significantly affected by the development”.

7.5.19 The EIA Regulations do not define significance and it will be necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity or value of a receptor (**Table 7-3**) and the magnitude of the effect (**Table 7-4**), as set out in **Table 7-5**. This approach provides a mechanism

89 Cadw. (2007). Guide to Good Practice on using The Register of Landscapes of Historic Interest in Wales in the Planning and Development Process. Available at: https://cadw.gov.wales/sites/default/files/2019-05/LandscapesRegisterGoodPractice_EN_0.pdf [Accessed December 2024].

for identifying elements of the Proposed Development for which mitigation measures may be required.

Significance of Historic Assets

7.5.20 For the purposes of assessing the significance of effects in EIA terms, heritage significance has been assigned to one of four classes, with reference to the heritage values described in Conservation Principles and relying on professional judgement as informed by policy and guidance. The hierarchy given in **Table 7-3** reflects the TAN24 and EN-1 (NPS) distinction between designated and non-designated heritage assets. The TAN24 further distinguishes between designated assets of the highest heritage significance (i.e., scheduled monuments, protected wreck sites, Registered Battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites) and other designated heritage assets. **Table 7-3** details the basis for assessing receptor value (heritage significance).

7.5.21 Unless the nature and exact extent of buried archaeological remains within any given area have been determined through prior investigation, their significance can be uncertain, and a judgement will be made on the basis of existing knowledge.

7.5.22 In relation to designated historic assets, the EIA will consider the contribution that historic character and setting make to the overall significance of the asset.

Table 7-3 Site Selection Criteria within the Defined Search Area

Heritage Significance	Summary Rationale	Examples
High	Asset has significance for an outstanding level of archaeological, architectural, historic and/or artistic interest.	All designated heritage assets or non-designated assets of demonstrably schedulable quality.
Medium	Asset has significance for a high level of archaeological, architectural, historic and/or artistic interest.	Locally listed buildings and buildings of merit. Regionally significant non-designated historic assets of archaeological interest.
Low	Asset has significance for elements of archaeological architectural, historic or artistic interest.	Locally-significant historic assets of archaeological interest and important hedgerows.

Heritage Significance	Summary Rationale	Examples
Negligible	Due to its nature of form/condition/survival, cannot be considered as an asset in its own right.	Non-extant Historic Environment Record (HER) references.

Magnitude of Change

7.5.23 Determination of magnitude of change upon the significance of known or potential historic assets is based on the severity of likely impact (e.g., physical effects on built historic assets or the permanent presence of new structures etc. that result in changes to the contribution of setting to the heritage significance of a built historic asset). **Table 7-4** describes the criteria used in this assessment to determine the magnitude of change:

Table 7-4 Magnitude of Change

Magnitude of Change	Description of Change
High	Change to asset significance resulting in an appreciable change in our ability to understand and appreciate the asset and its historical context, character and setting. Notable alterations to the setting of an asset that affect our appreciation of it and its significance; or the unrecorded loss of archaeological interest.
Medium	Change to asset significance resulting in an appreciable change in our ability to understand and appreciate the asset and its historical context, character and setting. Notable alterations to the setting of an asset that affect our appreciation of it and its significance; or the unrecorded loss of archaeological interest.
Low	Change to asset significance resulting in a small change in our ability to understand and appreciate the asset and its historical context, character and setting.
Negligible	Negligible change or no material change to asset significance. No real change in our ability to understand and appreciate the asset and its historical context, character and setting.

Assessment of effects

7.5.24 The assessment of likely significant effects will consider all stages of the Proposed Development. The significance level attributed to each effect will be assessed based on the heritage significance of the affected historic asset and the magnitude of change (impact) to the heritage significance of the asset.

7.5.25 Effects may be either adverse or beneficial and are defined initially without mitigation as set out in **Table 7-5**.

Table 7-5 Significance of Effect Matrix

Magnitude of Change (Impact)	Historic Asset (receptor) Heritage Significance			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Major Moderate	Minor	Negligible	Negligible
Negligible	Minor or Negligible	Negligible	Negligible	Negligible

7.5.26 As identified in **Chapter 4: The Environmental Impact Assessment Methodology**, residual effects that are classified as Major are considered to be 'significant' in EIA terms. Residual effects classified as Moderate have the potential to be significant though there may be exceptions, and this will subject to professional judgment. Residual effects classified as minor or below are considered to be 'not significant'.

7.5.27 The impact of change to the setting of historic assets will comply with the methodology set out by the Welsh Government and Cadw[90]. The setting of historic assets is described by Setting of Historic Assets in Wales as 'important to the way in which historic assets are understood, appreciated and experienced and contributes to their significance'[91]. This includes tangible and intangible factors such as function, sensory perceptions or historical, artistic, literary and scenic associations'[92].

90 Welsh Government and Historic Environment Service (Cadw). (2017). Setting of Historic Assets in Wales. Available at: https://cadw.gov.wales/sites/default/files/2019-05/Setting%20of%20Historic%20Assets%20in%20Wales%20EN.pdf, [Accessed December 2024].

91 Ibid.

92 Ibid.

7.5.28 The methodology outlined above, together with professional judgement, will be used to determine whether the impact of change to historic assets and their setting amounts to substantial harm, total loss, or less than substantial harm to their significance, as set out in EN-1 and EN-3 of the NPS.

7.6 Description of Likely Significant Effects

7.6.1 The following potential effects will be considered during the construction, operational and decommissioning phases of the Proposed Development:

Construction Phase

- **Permanent loss, truncation and/or disturbance to known or previously unrecorded buried historic assets (archaeological remains) due to construction activities** (such as site preparation, construction compound, installation of mounting structures, bases for transformer and switchgear modules, access tracks, on-site cabling and grid connection) as well as landscaping and planting (where applicable).
- **Temporary impacts to the setting of designated historic assets within 5km of the Scoping Red Line Boundary during construction** (e.g., from light, noise or traffic movement).

Operational Phase

- **Permanent changes to the setting of significant historic assets within the 5km Study Area.**
- **Change in historic landscape character as a result of change in land use during the operational phase.**

7.6.2 The following effects are not considered to be significant at this EIA Scoping stage and will be scoped out of the assessment:

- **Operational effects on known and previously unrecorded buried historic assets** on the basis that once the Proposed Development has been completed no further ground disturbance will occur;
- **Setting of non-designated above-ground historic assets that lie more than 100m from the Scoping Red Line Boundary**. An assessment of the

effect upon the setting of these assets is scoped out on the basis that such assets are not significant enough to warrant such an assessment, and it is considered unlikely that significant environmental effects will arise where these assets are not within or immediately adjacent to the Site. This is in line with proportionality set out in Planning Policy Wales Edition 12[8].

- **Any effect during the decommissioning phase**. Based on the proposed options for decommissioning outlined in **Chapter 2: Description of the Nature and the Purpose of the Project**, potential impacts on buried and above historic assets from related activities are thought to be negligible. Any impacts to buried historic assets within the footprint of the Proposed Development at construction stage will be permanent and lead to the removal/ degradation of affected assets. Additionally, proposed buried services, including cables, are intended to left in-situ. Likewise, the removal of above ground infrastructure associated with the Proposed Development will revert the setting of above ground historic assets it is existing character. Consequently, the assessment of decommissioning-related effects is scoped out from the Cultural Heritage and Archaeology chapter.

7.6.3 **Table 7-6** provides details on the aspects scoped in or out of the assessment.

Decommissioning Phase

7.6.4 It has been determined, using professional judgement and a high-level examination of available baseline information, that there would be no further/significant effects on archaeology and built heritage arising from Decommissioning. Consequently, it is scoped out from further consideration. The justification is detailed under **paragraph 7.6.2.**

Table 7-6 Site Selection Criteria within the Defined Search Area

Element	Phase	Scoped In	Scoped Out	Justification
Buried non-designated historic assets within the Site	Construction	✓		There is potential for physical impacts to buried non-designated historic assets within the footprint of the solar farm and associated infrastructure. Therefore, these elements are scoped in for further assessment.
Non-designated above ground historic assets within 100m of the Site	Construction Operation	✓		There is potential that impacts could be experienced to the significance of non-designated above ground historic assets, through a change in their setting, within 100m of the Site. Therefore, these elements are scoped in for further assessment.
Designated historic assets within 5km of the Site	Construction Operation	✓		There is potential for impacts to be experienced to the significance of designated historic assets within 5km of the Site, through a change to their setting. Therefore, these elements are scoped in for further assessment.
Gwent Levels Historic Landscape of Outstanding Historic Interest (HLW(GT)2)	Construction Operation	✓		There is potential for effects on the historic landscape due to change in land use during the construction and operational phases and therefore this element is scoped in for further assessment.
Scheduled Monument further than 5km from the Site	Construction Operation		✓	Due to distance and their lack of relationship to the Site, Scheduled Monuments further than 5km from the Site are not anticipated to experience impacts and can therefore be scoped out of the assessment.

Element	Phase	Scoped In	Scoped Out	Justification
Listed Buildings further than 5km from the Site	Construction Operation		✓	Due to the distance away from the Site and lack of visibility towards the Site, Listed Buildings exceeding a distance of 5km from the Site have been scoped out of the assessment.
Non-designated above ground historic assets over 100m from the Site	Construction Operation		✓	Due to their regional importance and distance from the Site, these assets have been scoped out of the assessment. It is unlikely that there will be a direct historic relationship between these assets and the Site.
Non-designated buried historic assets outside of the Site	Construction Operation		✓	These assets will not experience any physical impacts, due to construction and operational works being conducted within the Site. Therefore, such impacts can be scoped out.

7.7 Opportunities for Enhancing the Environment

7.7.1 Any further surveys undertaken as part of the assessment, including the proposed HEDBA, have the potential to enhance our understanding of the archaeological interests of the Site and preserve encountered buried historic assets through record. Consideration will be given to disseminating this to the public in line with best practice[93]. This may be delivered through providing investigation results to the HER.

7.7.2 Additional opportunities for direct enhancement may come through potential mitigation measures, specifically design alterations to preserve historic assets in-situ. This will be dependent on the preservation state and importance of the encountered archaeological remains being considered.

93 Welsh Government (2017). Planning Policy Wales. Technical Advice Note 24: The Historic Environment. Available at: https://www.gov.wales/sites/default/files/publications/2018-09/tan24-historic-environment.pdf [Accessed December 2024].

7.7.3 Enhancement to the historic environment may also through community-engagement initiatives which seek to present the results of project-related archaeological surveys, such as talks given to local groups or the provision of information boards, as appropriate. This approach will need to be undertaken in consultation with the Local Planning Authority Archaeological Advisor, and Cadw where appropriate.

7.8 Mitigation

7.8.1 As historic assets are an irreplaceable resource it is generally considered as standard practice within the planning system to implement mitigation measures. This is to ensure that finite and irreplaceable remains are not removed/lost without record. The level of mitigation proposed is, in each case, proportionate to the significance of the asset being affected. Review and assessment of the significance of residual effects will be undertaken as part of the ES chapter, as detailed in **Section 7.6**.

7.8.2 Where feasible, and warranted, design adjustments will be agreed with the Principal Design team, in consultation where necessary with other environmental discipline teams, with an aim to minimise impacts to known and previously unrecorded historic assets. Such design adjustments will be considered during the EIA and presented in the ES. Where design adjustments are not feasible or warranted, an appropriate mitigation strategy will be proposed to reduce or mitigate any significant adverse effects identified.

7.8.3 Measures to mitigate effects will normally consist of design adjustments, to allow significant resources to be protected and retained (preservation in situ) or, where this is not feasible, investigation and recording before and during development, with dissemination at an appropriate level (preservation by record).

7.8.4 Based on current understanding of the potential impacts to buried historic assets and site conditions a possible mitigation strategy may follow a phased, iterative approach including a programme of non-intrusive surveys, followed by localised evaluation investigations, such as targeted trial trenching, prior to the commencement of construction where necessary. Dependent on investigation results further mitigation measures may be required including targeted monitoring of construction works in the form of archaeological watching briefs.

7.8.5 The HEDBA will provide an in-depth exploration of the baseline, likely development effects and recommended mitigation measures. The agreed mitigation strategy identified for the Proposed Development will be devised following the results of the HEDBA, in consultation with the LPA's Archaeological Advisor and Conservation Officer, and where appropriate, Cadw.

7.8.6 Given the nature of the Site being situated on coastal alluvial flats, certain non-intrusive investigations such as geophysical magnetometry may not be suitable. This, however, does not preclude the use of other non-intrusive and geophysical survey techniques in localised sample areas should the results of the HEDBA identify a specific need for that survey.

7.9 Limitations and Assumptions

7.9.1 The main limitation to assessment is the nature of the archaeological resource - buried and not visible - which means it can be difficult to predict the presence and likely significance of buried historic assets accurately, and consequently the impact upon them, based primarily on desk-based sources. The principal source of information is the HER, which lists all known archaeological sites and finds. The information provides an initial indication of archaeological potential rather than a definitive list of all potential buried historic assets because the full extent of a buried historic resource cannot be known prior to site-specific archaeological field investigation.

7.9.2 Current understanding may be limited, in particular for periods not present or poorly represented in the historical record (prehistoric, Roman and early medieval periods) particularly where no past archaeological investigation of the Site has been carried out.

7.9.3 Notwithstanding these limitations, the methodology presented in this EIA Scoping Chapter is considered to be robust, utilising reasonably available information, and conforms to the requirements of local and national guidance and planning policy. Typically, appropriate standard archaeological prospection and evaluation techniques are used to reduce the uncertainties inherent in any desk-based assessment, as part of an overall EIA mitigation strategy.

8.0 Ecology

8.1 Introduction

8.1.1 This chapter of the Scoping Report sets out the approach to the ecological assessment.

8.1.2 The Ecology Chapter of the ES will assess the likely effects of the Proposed Development upon ecological features within and surrounding the Site during its construction, operation and decommissioning phases. The chapter will set out a detailed baseline and assess the effects likely to arise both alone and cumulatively with other relevant projects, together with any avoidance, mitigation and compensation measures necessary to reduce these in accordance with nature conservation legislation and planning policy. The chapter will also describe enhancements to contribute to local and national conservations priorities.

8.1.3 This section of the Scoping Report sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available. This excludes ornithological receptors which are addressed separately in **Chapter 9** of this Scoping Report.

8.2 Consultation

8.2.1 A request for non-statutory pre-application advice was made to Natural Resources Wales (NRW) on 2 July 2024, with a meeting also being held on 14 August. Following the meeting a further request was made covering distinct issues and directed to the relevant specialists within the organisation.

8.2.2 The request for advice covered the following matters of relevance to the proposals for Ecology:

- Seeking agreement as to how best to establish baseline conditions for the SSSI(s) across the EIA Scoping Red Line Boundary and the preferred management regime for the area;
- Seeking agreement on the scope of proposed ecology survey work to support the application; and

- Requesting confirmation as to whether the creation of new ditch habitat would be welcomed.

8.2.3 NRW provided a formal response on 27 September 2024 (ref: CAS-264330-X0X8), provided in **Appendix 8A**: **NRW Consultation.**

8.3 Study Area

8.3.1 The Study Area incorporates areas where significant effects could have potential to occur throughout the life of the Proposed Development and has been extended for certain components defined below to take into consideration populations of more mobile species, with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) EcIA guidance[94]. The Study Area is as follows:

- Land within the Scoping Red Line Boundary;
- An additional 30m (from the Scoping Red Line Boundary) for badger setts, which may have tunnels extending into the Scoping Red Line Boundary;
- An additional 500m for ponds, in relation to their potential for great crested newts;
- A desk-based search within 10km of the Scoping Red Line Boundary for international / European designated sites;
- A desk-based search within 2km of the Scoping Red Line Boundary for other statutory designated sites and non-designated sites; and
- A desk-based search within 2km of the Scoping Red Line Boundary for records of protected and notable species, extended to 10km for rare bats.

8.3.2 The baseline survey work also encompassed additional land due to changes in the red line boundary during the course of the initial design stage.

94 CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, version 1.3*. Chartered Institute of Ecology and Environmental Management, Winchester.

8.4 Baseline Conditions

Designated Sites

8.4.1 A desk-based study included a data enquiry from South-East Wales Biodiversity Records Centre (SEWBReC) in January 2024 for designated sites within 2km of the Scoping Red Line Boundary.

8.4.2 A search was made of the UK governments on-line tool Multi-Agency Geographic Information for the Countryside (MAGIC[95]) for International/ National Site Network sites up to 10km from the application Site. A summary is provided in **Table 8-1**.

Table 8-1 Designated Sites

Site Name	Proximity to Scoping Red Line Boundary	Description
Severn Estuary Ramsar (International Designation)	*20m south*	*The Ramsar site covers over 24,000 hectares (ha) and meets the following Ramsar criteria:* • Ramsar criterion 1 Due to immense tidal range (second-largest in world), this affects both the physical environment and biological communities. Habitats Directive Annex I features present include: • H1110 Sandbanks which are slightly covered by sea water all the time • H1130 Estuaries • H1140 Mudflats and sandflats not covered by seawater at low tide • H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) • Ramsar criterion 3 Due to unusual estuarine communities, reduced diversity and high productivity. • Ramsar criterion 4 This site is important for the run of migratory fish between sea and river via estuary.

95 www.magic.gov.uk.

Site Name	Proximity to Scoping Red Line Boundary	Description
		It is also of particular importance for migratory birds during spring and autumn. • Ramsar criterion 8 The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon, sea trout, sea lamprey, river lamprey, allis shad, twaite shad and eel use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad and twaite shad which feed on mysid shrimps in the salt wedge. • Ramsar criterion 5 Assemblages of international importance: Species with peak counts in winter: 70919 waterfowl (5 year peak mean 1998/99-2002/2003) • Ramsar criterion 6 Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): **Species with peak counts in winter**: • Tundra swan • Greater white-fronted goose • Common shelduck • Gadwall • Dunlin • Common redshank Species/populations identified subsequent to designation for possible future consideration under criterion 6. **Species regularly supported during the breeding season**: • Lesser black-backed gull **Species with peak counts in spring/autumn:** • Ringed plover **Species with peak counts in winter**: • Eurasian teal • Northern pintail

Site Name	Proximity to Scoping Red Line Boundary	Description
Severn Estuary Special Protection Area (SPA) (International Designation)	*20m south*	*Refer to Chapter 9: Ornithology.*
Severn Estuary Special Area of Conservation (SAC) (International Designation)	*20m south*	*Designated primarily for Annex I habitats:* • Estuaries; • Mudflats and sandflats not covered by seawater at low tide; and • Atlantic salt meadows (Glauco-Puccinellietalia maritimae). *Annex I habitats present as a qualifying feature:* • Sandbanks which are slightly covered by sea water all the time; and • Reefs. *Designated primarily for Annex II species:* • Sea lamprey • River lamprey • Twaite shad
River Usk SAC (International Designation)	*3.7km west*	*Designated primarily for Annex II species:* • Sea lamprey • Brook lamprey • River lamprey • Twaite shad • Atlantic salmon • Bullhead • Otter *Annex I habitats present as a qualifying feature:* • Watercourses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation. *Annex II species present as a qualifying feature:* • Allis shad.
Wye Valley and Forest of Dean Bat	*9.5km north-east*	*Designated primarily for Annex II species:* • Lesser horseshoe bat

Site Name	Proximity to Scoping Red Line Boundary	Description
Sites SAC (International Designation)		• Greater horseshoe bat
Gwent Levels – Magor and Undy SSSI (National Designation)	*Within the Site*	*One of a series of six SSSIs, totalling 5700 hectares (about 14 000 acres) lying alongside the Severn Estuary. The land is below high mean water level and the sea is kept out by extensive sea defences. Traditionally, fields are drained by a system of ridge and furrow or 'grips' (shallow trenches) into the extensive system of interconnected ditches that surrounded each field.* *Gwent Levels: Magor and Undy SSSI is the most easterly and is different from the other Gwent Levels SSSIs in that much lies on peat as opposed to clay. As a result, the remnant fen meadows within the SSSI support a far wider range of plants than other areas across the Gwent Levels. It has three special features:* • Reen and ditch habitat • Insects and other invertebrates • Shrill carder bee
Gwent Levels – Redwick and Llandevenny SSSI (National Designation)	*Within the Site*	*Part of the Gwent levels as described above, with three special features:* • Reen and ditch habitat • Insects and other invertebrates • Shrill carder bee
Gwent Levels – Whitson SSSI (National Designation)	*Within the Site*	*Part of the Gwent levels as described above, with three special features:* • Reen and ditch habitat • Insects and other invertebrates • Shrill carder bee
Gwent Levels – Nash and Goldcliff SSSI (National Designation)	*Partially within the Site at NW corner*	*Part of the Gwent levels as described above, with three special features:* • Reen and ditch habitat • Insects and other invertebrates • Shrill carder bee

Site Name	Proximity to Scoping Red Line Boundary	Description
Severn Estuary (Wales) SSSI (National Designation)	*20m south*	*The Severn Estuary lies at the mouth of four major rivers (the Severn, Wye, Usk and Avon) and many lesser rivers. The immense tidal range (the second highest in the world) and classic funnel shape make the Severn Estuary unique in Britain and very rare worldwide. The intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important in Britain. The estuarine fauna includes: internationally important populations of waterfowl; invertebrate populations of considerable interest; and large populations of migratory fish.*
Magor Marsh SSSI (National Designation)	*1.2km north*	*Magor Marsh is the last relatively natural area of fenland on the Gwent Levels. It is understood that water voles were released here by Gwent Wildlife Trust between 2012 and 2013 (Gwent Wildlife Trust (2013)).*
Newport Wetlands SSSI (National Designation)	*1.2km west*	*Newport Wetlands SSSI is part of the Newport Wetlands NNR, which was constructed to meet the commitment by the UK Government to create "a substantial area of wetland habitat on the shores of the Severn Estuary" as part of the compensation for the loss of the Taf/Ely Estuary SSSI following the construction of the Cardiff Bay Barrage.* *Newport Wetlands SSSI has a number of special features including:* • Reens and ditches • Reedbeds • Higher plants • Over-wintering birds • Insects and other invertebrates
Newport Wetland National Nature Reserve (NNR) (NationalDesignation)	*1.2km west*	*Newport Wetlands is best known for its range of wetland birds. This reserve at the mouth of the river Usk was opened in 2000 to compensate for loss of extensive mudflats with the completion of the Cardiff Bay barrage.* *It stretches from Goldcliff to Uskmouth and was once an ash covered wasteland for the neighbouring coal-fired Uskmouth power station.*

Site Name	Proximity to Scoping Red Line Boundary	Description
		The reserve covers 4.38 sq km (438 hectares) and provides a variety of habitats including reedbeds, saltmarsh, saline lagoons and lowland wet grassland. *In 2008 it was designated as a National Nature Reserve.*
Spencer Works 3 Site of Importance in Nature Conservation (SINC) *(Local Designation)*	300m	Marshy grassland with wet drains.
Elver Pill Reen Grassland & Pond SINC *(Local Designation)*	300m	Lagoon with mosaic of swamp and marshy and dry semi-improved neutral grassland; supports Cetti's warblers.
Bridewell Common Field SINC *(Local Designation)*	800m	Designated for its species rich grassland, floodplain pastures, mature willow and hedgerows interest.
Gwent Wetland Reserve SINC *(Local Designation)*	950m	Mosaic of wet grassland reed beds, open water, hedgerows and saline lagoon, which supports internationally important numbers of wildfowl as well as UK BAP Priority species such as water vole, great crested newt and brown hare.
Blackwall Lane Field SINC *(Local Designation)*	1km	Designated for its Priority Habitat[96] of neutral and lowland species interest.
Greenmoor Pool SINC *(Local Designation)*	1.1km	Formerly standing water which now supports reed swamp (UKBAP Priority Habitat), which itself supports bird populations including Cetti's warbler.

96 Priority Habitats are defined as habitats are a range of semi-natural habitat types that were identified as being the most threatened and requiring conservation action under Section 42 of the Natural Environment and Rural Communities Act (2006)https://www.biodiversitywales.org.uk/Section-7.

Site Name	Proximity to Scoping Red Line Boundary	Description
Caldicot Moor Meadow SINC *(Local Designation)*	1.2km	Small flat field on Caldicot Moor containing SI neutral sward with good herb diversity.
Land at Barecroft Common SINC *(Local Designation)*	1.5km	Designated for its lowland species-rich grassland and semi-improved grassland interest.
Barecroft Fields SINC *(Local Designation)*	1.6km	Designated for its Priority Habitat lowland species-rich grassland with vascular plants including *Thalictrum flavum* and *Cirsium dissectum* interest.
Breezy Bank to Rockfield Farm SINC *(Local Designation)*	1.6km	Designated for its narrow strip of broadleaved woodland and scrub neighbouring unimproved grassland with scrub, tall herb communities and hedgerows interest.
Bluehouse Farm SINC *(Local Designation)*	1.6km	Designated for its botanically interesting damp and dry grassland interest.
Bowkett Field, Barecroft SINC *(Local Designation)*	1.7km	Designated for its Priority Habitat lowland species-rich marshy grassland with bird interest.
Solutia Site SINC *(Local Designation)*	1.85km	A series of improved and semi-improved grasslands with traditional ditches and ponds; site supports a range of species including nesting birds such as Cetti's warbler, and invertebrates including hairy dragonfly (*Brachyton prantense*).
Grange Road SINC *(Local Designation)*	1.9km	Designated for its neutral grassland, watercourse, scattered scrub and hedgerow with ancient woodland indicator species interest
Former Steel Works Site off Queensway Meadow SINC *(Local Designation)*	1.95km	Designated for dragonflies, as well as mosaic habitat (H20) for freshwater, grassland and woodland

Baseline Surveys

8.4.3 A desk-based study included a data enquiry to the South-East Wales Biodiversity Records Centre (SEWBReC) in January 2024 for records of protected and notable species within 2km of the Scoping Red Line Boundary, extended to 10km for bat species.

8.4.4 To date, a number of habitat and species surveys have been undertaken following best practice guidance, as detailed in **Table 8-2**. Note that bird surveys are discussed in **Chapter 9: Ornithology**.

8.4.5 Surveys planned to be carried out at the Site include a Phase 1 Habitat Survey covering the cable route and connection, update GCN eDNA survey of all accessible ponds within 250m of site boundaries and spring survey of all water courses and ditches within the site boundaries for water vole and otters.

Table 8-2 Baseline Survey Methods

Survey Type	Date(s)	Methods
Phase 1 Habitat Survey	***2019*** *-14th, 23rd and 24th July, 14th and 15th August, 23rd and 25th September.*	• Walkover in accordance with JNCC Phase 1 Habitat Survey methodology (JNCC, 2010[97]) to identify, describe and map all habitats, record a comprehensive botanical list for each habitat and record any habitats or features of ecological interest; and • Extended to record protected/ notable species, including badger.
UK Habitat Classification survey	***2023*** *– 17th, 18th, 25th and 26th July.*	• Walkover in accordance with UK Habitat Classification (UKHab) (UKHab Ltd, 2023[98]); and • Extended to record protected/ notable species, including badger.
Hedgerow Assessment	***2019 and updated in 2023*** *– dates as above*	• Hedgerows assessed under the wildlife and landscape criteria of the Hedgerow Regulations 1997. This involved recording woody species, woodland flora and associated features to assess whether the hedgerow was 'Important'.

97 JNCC (2010) *Handbook for Phase 1 Habitat Survey - a Technique for Environmental Audit.* JNCC, Peterborough, ISBN 0 86139 636 7.

98 UKHab Ltd (2023) *UK Habitat Classification Version 2.0* https://www.ukhab.org.

Survey Type	Date(s)	Methods
National Vegetation Classification (NVC) survey	***2023*** *– 25th – 27th July*	• Reens were sampled across the Site in accordance with NVC survey methodology (Rodwell 1995[99] and 2006[100]), to gain a representative picture of community variation across the Site.
Tree potential roost feature (PRF) assessment	***2019*** *– 20th and 21st May, 12th September* ***2021*** *– 15th and 16th February*	• Trees were inspected from ground-level in accordance with BCT guidance (Collins, 2016[101]) in 2019; and • All trees that were categorised as low, medium or high bat roost potential were inspected aerially in accordance with BCT guidance (Collins, 2016) in 2021.
Bat activity surveys	***2020*** *– April - October* ***2023 –*** *April - October*	• Monthly walked transects and automated detector surveys in accordance with BCT guidance (Collins, 2016).
Great crested newt survey	***2019*** *– 20th & 21st May* ***2020*** *– 2nd, 9th and 20th April, 7th, 16th and 24th May.* ***2023*** *– 6th June*	• Habitat Suitability Index (HSI) and eDNA (15 locations in 2019); • Presence/ absence survey of Pond 1 (positive for eDNA) in May 2020; and • Habitat Suitability Index (HSI) and eDNA (covering additional 7 reen sampling locations and 3 further ponds in 2023).
Dormouse survey	***2020*** *– March - October* ***2023 –*** *April - October*	• Dormouse nest tube survey in accordance with the Dormouse Conservation Handbook (Bright *et al*., 2006[102]), with 300 tubes deployed.
Riparian mammal survey	***2024 –*** *4th – 19th March*	• Survey of reens, searching for otter signs (footprints, runs, trails, spraint (faeces), anal jelly, urine burns, food remains, flattened grass (sometimes with spraint), slides couches and holts).

99 Rodwell, J.S. (ed.) (1995) *British Plant Communities. Volume 4: Aquatic communities, swamps and tall-herb fens.* Cambridge University Press.

100 Rodwell, J.S. (ed.) (2006) *National Vegetation Classification: Users' Handbook.* JNCC.

101 Collins, J. (ed.) (2016) *Bat Survey for Professional Ecologists: Good Practice Guidelines (3rd edition).* The Bat Conservation Trust, London.

102 Bright P.W., Morris P.A. and Mitchell-Jones A. (2006) *Dormouse Conservation Handbook, 2nd Edition*. English Nature, Peterborough.

Survey Type	Date(s)	Methods
		• Signs for water vole were targeted in areas where the habitat was suitable, in accordance with Dean *et al* (2016[103]); and • Camera traps were used in targeted areas.
Aquatic invertebrate survey	***2020*** *– 20th – 24th May and 29th – 2nd June.* ***2023*** *– 3rd – 5th June and 29th – 31st July.*	• Sampling followed the protocols in Palmer et al. (2013[104]), with each location comprising three sample points laid out along a reen; and • Samples sites were selected on habitats with greatest invertebrate interest (e.g. ditches with shallow margins and a diverse flora).
Terrestrial invertebrate survey (including shrill carder bee)	***2020*** *– 16th – 24th July and 12th – 13th August* ***2023*** *– 3rd – 5th June and 29th – 31st July.*	• Methods broadly followed Drake *et. al.*, 2007[105], using a butterfly net, sweeping with a heavy-duty entomological sweep net or tapping specific invertebrate foodplants over a tray; • For the bumblebee surveys, all *Bombus* species recorded in each survey unit/sub-unit were noted, with the number of Shrill and Brown-banded Carder Bumblebees being counted, along with the flower species at which they were seen foraging; and • Samples sites were selected on habitats with greatest invertebrate interest (e.g. stands of relatively semi-improved or unimproved species-rich grassland; short ruderal vegetation etc.).

103 Dean M., Strachan R., Gow D. and Andrews R (2016) *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series).* Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.

104 Palmer M., Drake C.M. & Stewart N. (2013). *A manual for the survey and evaluation of the aquatic plant and invertebrate assemblages of grazing marsh ditch systems,* Version 6. Buglife, Peterborough.

105 Drake C.M., Lott D.A., Alexander K.N.A. and Webb J. (2007) *Surveying terrestrial and freshwater invertebrates for conservation evaluation*. Natural England Research Report NERR005. Natural England, Peterborough.

8.4.6 Reptile surveys were scoped out as it was considered that with appropriate avoidance and mitigation, significant impacts on reptiles would be unlikely. The intensive management of the fields precludes the presence of reptiles in the majority of the fields, with suitable habitat limited to vegetation surrounding reens and hedgerows, which will be retained within buffers. Common species grass snake and slow worm may be present in these areas in low numbers, however there is no suitable habitat for adder or rare reptiles. There were 60 records of reptiles within 2km of the Site returned by SEWBReC in the last 10 years. None of these records were within the Site; the nearest of these records were for grass snake and slow worm, approximately 350m north of the Site. Considering proportionality under BS42020, the presence of small numbers of common reptiles can be assumed and a survey would not add additional value to the assessment. Therefore, surveys to ascertain the likely presence/ absence of reptiles were not undertaken.

8.4.7 Surveys for European eel and migratory fish were also scoped out as impacts to reens are proposed to be minimised due to the provision of non-developable buffers which will be enhanced. Furthermore, reen enhancements will increase water quality for eels and fish with timing able to be controlled to minimise any immediate impacts.

Baseline Conditions

Habitats

8.4.8 The Site is located across approximately 548 hectares (ha) of predominantly agricultural farmland on the Gwent Levels. The predominant land use is improved grassland used for grazing livestock with fields dominated by perennial rye-grass and crested dog's-tail with occasional to frequent common forbs and other grasses. Small numbers of semi-improved grassland and marshy grassland fields are also present supporting a higher plant diversity. Due to the geographical location of these fields, the grasslands all qualify as Coastal and Floodplain Grazing Marsh Habitat of Principal Importance (HPI) in the Environment (Wales) Act 2016, Section 7 Biodiversity Lists.

8.4.9 Several fields comprise cropland (maize, barley and grass leys), which is largely in intensive agricultural management with a low diversity of arable weeds. Fields are generally very large and lack field margins other than stands of rank grassland and tall ruderal vegetation at hedgerow margins. The arable fields are not considered to be ecologically valuable and are not HPIs.

8.4.10 The fields are largely divided by an extensive network of reens and ditches. The reens and ditches are one of the features of the SSSI designation; in particular the aquatic and open water emergent plants and aquatic invertebrates feature in the SSSI citation. Targeted surveys showed that the reens and ditches vary in habitat quality from late successional banks with limited evidence of aquatic influences in the bankside communities which were becoming scrub encroached to bankside habitats dominated by tall emergent species (primarily common reed). Much of the network is shaded by hedges and/or have become dried out. However, most of the larger reens and some field ditches are still at least partially unshaded, permanently inundated and with a more diverse aquatic flora. The ditches and reens, are all representative of the priority habitat coastal floodplain and grazing marsh HPI.

8.4.11 Native hedgerows are present on numerous field boundaries, largely associated with an adjacent ditch or reen. In places these are in double rows either side of a ditch or reen. Occasionally mature trees are present within hedgerows including ash, oak and crack willow. Hedgerows are Habitats of Principal Importance in the Environment (Wales) Act 2016, Section 7 Biodiversity Lists.

8.4.12 Two ponds are present across the Study Area. Ponds have the potential to meet the criteria of the Pond Habitat of Principal Importance in the Environment (Wales) Act 2016, Section 7 Biodiversity List.

Amphibians

8.4.13 SEWBReC returned 24 records of great crested newt (GCN) within 2km of the Site between 1993 and 2023. eDNA sampling of six ponds and 20 slow-moving ditches within the study area, found GCN DNA present within three samples (one onsite pond, one onsite ditch and one offsite pond) located towards the western end of the Site. Given the distance between these ponds (>500m) they are not considered likely to form a meta-population. The fields are considered to be suboptimal for this

species, however the network of hedgerows and ditches provide potential commuting, shelter and foraging habitat.

Badgers

8.4.14 Fifteen records of badger were returned from SEWBReC. Evidence of badger was recorded within the Site including two setts, prints and latrines. These are located at the far east of the Site and in the Redwick locality.

Bats

8.4.15 The data search with SEWBReC provided over 1904 bat records within the 10km search area, with 446 of these from the past 10 years. Records show a broad assemblage of 15 species of bats in the area. The data was filtered to include those records listed as 'roost records' within a 4km radius of the Site as this distance is equal to or exceeds the core sustenance zone for most species except barbastelle (BCT, 2020)[106]. There were 28 roost records within 4km and none within the Site.

8.4.16 During activity surveys, at least nine species were recorded commuting and/or foraging within the Site, with transects indicating that bats favour the boundary hedgerows and reens, with little activity over the open fields. The majority of activity was from common pipistrelle and this species was widespread and abundant across the Site, with calls recorded during typical emergence times indicating that there are multiple roosts in close proximity to the Site. Annex II species (lesser horseshoe, barbastelle and greater horseshoe) were recorded in very low numbers and after typical emergence times in both years, indicating that these species are travelling to the Site to forage on an occasional basis.

8.4.17 No evidence of roosting was identified during aerial tree inspections, however suitable roosting features were identified and due to the transitional nature of tree roosting activity, these trees may be used at other times of year and in the future.

106 BCT (2020) Core Sustenance Zones and habitats of importance for designing Biodiversity Net Gain for bats. Bat Conservation Trust, London.

Dormice

8.4.18 SEWBReC provided 13 records of hazel dormouse within 2km of the Site, including one record within the boundary, south-east of Summerleaze. Several records were returned from a strip of woodland to the north of the Llanwern steel works.

8.4.19 Evidence of dormice was found during nest tube surveys in both the 2020 and 2023 surveys. Locations were widely distributed however due to the network of hedgerows throughout the Site it is considered possible that all hedgerows on Site might be utilised by dormice.

European Eel

8.4.20 European eel is part of a notable sub feature for the SAC (European designated site) and a feature of the Severn Estuary Ramsar. Twenty three records of European eel occur within the desk study data. Historic monitoring data suggests presence on Elver pill, Windmill, Cold harbour and Yoke reen (NRW fisheries team, pers.comm., 29/07/24). As part of the DAS exercise, NRW agreed that eel presence across the Site's waterways could be assumed.

Invertebrates

8.4.21 SEWBReC provided over 2000 records of invertebrates within the search area including 71 species listed under the Environment (Wales) Act 2016, Section 7 Biodiversity Lists. 211 records pertain to shrill carder bee, a species that features on the SSSI designation.

8.4.22 During the invertebrates surveys, 384 species were recorded, of which 18 are notable species (IUCN International or UK threatened or near threatened; Section 7 Species of Principal Importance in Wales; or Red Data Book (RDB), Nationally Rare (NR) or Nationally Scarce (Na, Nb, N, NS, pNS). The overall assessment indicated that the aquatic and grassland pollinator community of invertebrates is of high ecological importance, however both are currently in sub-optimal condition, with grassland habitats and their associated population of the shrill carder bumblebee being very small and severely threatened (only nine worker bees recorded). Open ditch margins, ruderal vegetation, hedgerows and dead wood habitat features were the key locations for invertebrate assemblages that include some important species.

Riparian Mammals

8.4.23 Evidence of otter was found on several reens/ ditches, with activity focused on five key watercourses – Yoke Reen, Cock Street reens, Mead Lane, Monk's Ditch and the sea wall south of Mead Lane. Signs indicated otter were moving from the north to the south and the sea wall area. Camera trapping indicated that otters are using the main reens to disperse, commute and forage with no confirmed holts or resting places.

8.4.24 Evidence of water vole was found on a single reen at the northern edge of the Site. Holes and chewed vegetation were recorded but no latrines found. A single incidental sighting was made during a bird survey in 2020; however, this is now offsite (c. 300m north).

Other Notable Species

8.4.25 Other notable species potentially present on site and capable of being impacted include hedgehog, harvest mouse and brown hare.

8.4.26 Thirty three records of brown hare were returned as part of the data search and they were relatively ubiquitous across the Site, present within fields and field edges.

8.4.27 Hedgehogs have not been seen during site visits but can be assumed to be present at least at low density within the hedgerow and field margin habitats, with 42 records present in the desk study data.

8.4.28 Seven harvest mouse records were returned as part of the data search and a single incidental record made to the east of Windmill Reen during the survey work. Harvest mice are associated with hedgerows, long uncultivated grass, ditch banks and field boundaries, rather than open fields and their presence is therefore likely confined to field edges.

8.5 Proposed Assessment Methodology

Relevant Legislation and Guidelines

8.5.1 The ecological assessment will take into account the following legislation:

- The Habitats Directive;92/43/EEC;
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- Wildlife and Countryside Act 1981 (as amended);
- Natural Environment and Rural Communities Act (NERC) 2006;
- The Protection of Badgers Act 1992; and
- Environment (Wales) Act 2016.

8.5.2 Policy:

- Future Wales: the National Plan 2040;
- Planning Policy Wales;
- Technical Advice Note (TAN) 5: Nature Conservation and Planning;
- Monmouthshire Local planning policy - Monmouthshire County Council Local Development Plan (LDP) 2011-2021 or its successor (currently in preparation);
- Newport Local planning policy – Newport Local Development Plan (LDP) 2011- 2026;
- Overarching National Policy Statement for Energy (EN1), specifically in relation to Section 4.6 Environmental and Biodiversity Net Gain and Section 5.4 Biodiversity and Geological Conservation; and
- National Policy Statement for Renewable Energy Infrastructure (EN-3).

8.5.3 Other relevant guidance:

- Local Biodiversity Action Plans (BAP), including The Greater Gwent Nature Recovery Action Plan (undated) and Newport City Council's Local BAP (undated);

- Biodiversity and Ecosystem Resilience Forward Plans for Monmouthshire and Newport;
- British Standard BS42020: Biodiversity - Code of Practice for Planning and Development; and
- BRE (2014) National Solar Centre Biodiversity Guidance for Solar Developments.

8.5.4 The approach taken to the assessment will follow CIEEM's Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland 2018 (updated April 2022).

8.5.5 The approach will also take into account the Step-Wise Approach (with reference to the DECCA Framework) to assess impacts, in accordance with Edition 12 of Planning Policy Wales (February 2024[107]). A detailed explanation of this policy is set out in the relevant chapter of this Scoping Request. However, the key steps in the process are as follows:

1) Avoid
2) Minimise
3) Mitigate/restore
4) Compensate

8.5.6 The DECCA Framework is similarly explained and refers to the resilience of ecosystems in the following regards:

- Diversity
- Extent
- Condition
- Connectivity
- Adaptability to change

[107] Llywodraeth Cymru/ Welsh Government (2024) *Planning Policy Wales. Edition 12*.

8.5.7 The Ecology Environmental Statement (ES) chapter will provide the ecological assessment. The ES chapter will be supported by Technical Appendices detailing the desk study results, consultation, survey methodologies and results (including figures, tables, photographs, maps, and appendices).

8.5.8 The chapter will include measures to mitigate likely adverse effects that cannot be avoided, either by sensitive design or applied techniques, and will outline measures to enhance biodiversity, as well as the requirement for associated monitoring and adaptive management. Additionally, residual effects will be assessed following the implementation of appropriate mitigation.

8.5.9 A cumulative assessment will be undertaken to identify effects that might not be significant on their own but become significant when considered cumulatively with effects from other plans or developments. The list of projects/ plans to be considered will be decided in consultation with relevant consultees.

General Approach

8.5.10 The assessment methodology has been developed with reference to the CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom[108] and from considerable experience of EcIA relating to similar developments throughout the UK.

8.5.11 These guidelines set out the process for assessment through the following stages:

- Describing the ecological baseline;
- Identifying and evaluating 'Important Ecological Features' (IEFs);
- Identifying and characterising the likely effects on IEFs during construction, operation and decommissioning;
- Determining the significance of effects in the absence of mitigation;
- Describing mitigation, compensation and/or enhancement measures associated with the development and assessing residual significance;

108 CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, version 1.3*. Chartered Institute of Ecology and Environmental Management, Winchester.

- Assessing cumulative effects with other projects/ plans; and
- Identification of monitoring requirements.

8.5.12 The baseline for this assessment comprises the habitats, species and designated sites within the Site plus those within the Zone of Influence (ZoI) of the Site. The ZoI describes the area over which construction, operational and decommissioning activities associated with the Proposed Development could influence identified ecological features/receptors. The ZoI varies for different ecological features depending on its sensitivity to an environmental change.

Determining Value

8.5.13 The importance and sensitivity of ecological features will be determined based on CIEEM Guidelines. Whilst the legal protection afforded to habitats and species does not necessarily reflect actual biodiversity value, the assessment methodology will fully acknowledge statutory requirements, policy objectives, rarity, rate of decline and local or intrinsic nature conservation value.

8.5.14 Important Ecological Features will be defined on a geographical scale (*international, national (Wales), regional, county or local*) according to:

- The statutory and non-statutory designated sites present, and their associated qualifying features/species;
- Habitats and species of conservation concern, including those of Principal Importance on the S42 List in Wales and the Local Biodiversity Action Plan (LBAP) which may be present on the Site or in the surrounding area; and
- The local distribution of protected species in the area, for which the Site may support suitable habitat.

8.5.15 Features not meeting the criteria of being 'important' within CIEEM's geographic frame of reference will be scoped out of the assessment as it will be considered that impacts upon them are unlikely to be significant (in terms of legislation, policy or nature conservation value).

Identifying Effects and Determining Magnitude

8.5.16 The assessment will be undertaken in accordance with the CIEEM guidelines (2018[109]). This differs from the approach used for other environmental disciplines, where the significance of an effect is based on a combination of the magnitude of the change and the sensitivity of the receptor.

8.5.17 The potential effects of the Proposed Development on IEF's will be characterised, taking into account relevant aspects of ecosystem structure and function, according to the following terms:

- positive or negative;
- extent;
- magnitude;
- duration;
- frequency and timing; and
- reversibility.

8.5.18 As per the guidelines, only those characteristics relevant to understanding the ecological effect of the impacts and determining its significance are described.

Determining Significance

8.5.19 For the purpose of ecological impact assessment, a 'significant effect' is an effect that either, supports or undermines biodiversity conservation objectives, irrespective of the value of the ecological receptor. Once a significant effect has been identified (i.e. it is considered likely to affect the integrity / favourable conservation status of an ecological feature), the importance of the receptor will be used to help determine the geographical scale at which the effect is significant.

8.5.20 As stated in the CIEEM guidelines (2018) "the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important. For example, an effect on a species which is on a national list of species

109 CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, version 1.3*. Chartered Institute of Ecology and Environmental Management, Winchester.

of principal importance for biodiversity may not have a significant effect on its national population". Where a significant effect on integrity / favourable conservation status is not predicted for a given geographical level, consideration will be given to whether an effect may be significant at lower geographical levels.

8.6 Description of Likely Significant Effects

8.6.1 Significant effects upon the ecological features present within the ZoI may arise either directly or indirectly in the absence of mitigation.

8.6.2 Direct impacts include land take, disturbance, fragmentation and killing/ injury of species. Indirect impacts include habitat degradation which can affect conservation status (e.g. as a result of pollution or lighting).

8.6.3 The ES will include a separate shadow Habitats Regulations Appraisal (HRA) to assist the competent authority in conducting the Appropriate Assessment that will be required prior to determination of the application.

8.6.4 The potential effects scoped into the assessment are presented in **Table 8-3** and includes an initial assessment of whether significant effects are likely on each IEF.

8.6.5 Where no likely significant effects are predicted on an IEF, these will be scoped out of further assessment in the ES chapter.

8.6.6 Note that effects on birds including those associated with the Severn Estuary SPA/ Ramsar and other designated sites are addressed in the **Chapter 9: Ornithology**.

Table 8-3 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Severn Estuary Ramsar/ SAC/ SSSI	*Construction*	✔		*Potential for indirect impacts as a result of pollution/ siltation which could effect both qualifying habitats and migratory fish by smothering vegetation and effects on water quality within the estuary.*
	Operation		✔	*Operation phase considered unlikely to have adverse effects.*

Element	Phase	Scoped In	Scoped Out	Justification
River Usk SAC	*Construction and Operation*		✔	*Given the distance from the project to the SAC (3.7km), it is considered that the project would have no direct impact to either the SAC itself or significant indirect effects.*
Wye Valley and Forest of Dean Bat Sites SAC	*Construction and Operation*		✔	*The Site lies outside the 'Sensitive Locations' detailed within the Wye Valley and Forest of Dean Bat SAC: Development Management – Horseshoe Bat activity survey and assessment guidance (2021). Given the distance from the Scoping Red Line Boundary to the SAC (9.5km), and that the site is outside the core sustenance area (4km) for horseshoe bats from the SAC roosts, it is considered that the project would have no direct impact to either the SAC itself or no significant indirect effects.*
Gwent Levels (covering Magor and Undy SSSI, Redwick and Llandevenny SSSI, Whitson SSSI and Nash and Goldcliff SSSI)	*Construction*	✔		*The special interests of the SSSI are primarily dependent on water quality, water quantity, the drainage regime and management regime of both the drains and field.* *The construction phase will result in temporary disturbance to the SSSI e.g. piled installation of solar panels, access tracks and cable installation. This is highly unlikely to physically impact the notified reen features other than at crossing points but may result in indirect effects e.g. pollution.*
	Operation	✔		*The installation of the solar panels has the potential to temporarily affect SSSI qualifying feature shrill carder bee in the absence of mitigation.*

Element	Phase	Scoped In	Scoped Out	Justification
				There is potential for beneficial or adverse effects to the SSSI notified features as a result of the Proposed Development during operation depending on the management practices undertaken. Beneficial effects will occur due to the removal of one side of double hedges to provide more sunlight to the reens.
Magor Marsh SSSI	*Construction and Operation*		✔	*Given the distance (1.2km north) it is considered unlikely that there will be direct effects. The designated site is upstream, meaning that indirect impacts via waterways will be highly unlikely.*
Newport Wetlands SSSI/ NNR	*Construction and Operation*		✔	*Given the distance (1.2km west) it is considered unlikely that there will be direct or indirect effects.*
Habitats	*Construction*	✔		*Permanent loss of habitat for the grid yard, solar array feet and access. Temporary damage during installation.*
	Operation	✔		*There is potential for beneficial or adverse effects to the retained habitats as a result of the development depending on the management practices undertaken.*
Hedgerows	*Construction*	✔		*Small scale permanent removal of hedgerows may be required to create new access points.*
	Operation	✔		*Loss due to reduction in double hedgerows to enhance reens.*
Roosting bats	*Construction*	✔		*Potential adverse effects as a result of lighting during construction phases. Direct loss of roosts considered unlikely as access routes can be routed to avoid trees.*
	Operation		✔	

Element	Phase	Scoped In	Scoped Out	Justification
				Operation phase considered unlikely to have adverse effects as trees with bat roost potential will be targeted for retention.
Commuting/ foraging bats	*Construction*	✔		*Potential adverse effects as a result of lighting during construction phases.*
	Operation	✔		*There is potential for beneficial or adverse effects to the retained habitats as a result of the development depending on the management practices undertaken. There is also potential for collision risk with panels.*
Amphibians	*Construction*	✔		*Small scale removal of habitat at reen crossings may result in direct killing/ injury. Habitat fragmentation may occur as result of new access tracks.*
	Operation	✔		*During operation, there is potential for beneficial or adverse effects as a result of long-term management practices undertaken.*
Dormice	*Construction*	✔		*During hedgerow removal there are risks associated with killing/ injury, loss of nest sites and reduction in foraging habitat. Fragmentation effects are considered unlikely as one side of double hedgerows will be retained.*
	Operation		✔	*No impacts are anticipated during operation.*
Otter	*Construction*	✔		*Potential adverse effects as a result of lighting during construction phases. Potential for disturbance if holts are present in areas of work (e.g. reen crossings).*
	Operation	✔		*Operational impacts are limited to potential fragmentation of*

Element	Phase	Scoped In	Scoped Out	Justification
				habitats due to fence installation, for otters crossing terrestrial habitat.
Water vole	*Construction*	✔		*Potential adverse effects during installation or reinforcement of reen crossings which could directly impact burrows and foraging areas.*
	Operation		✔	*No significant impacts are predicted during the operational phase as once infrastructure is in place, no impacts will occur to banks and watercourses.*
Aquatic invertebrates	*Construction*	✔		*Habitat loss at reen crossing reducing overall habitat provision.*
	Operation	✔		*During operation, there is potential for beneficial effects as a result of long-term management practices undertaken.* *Potential for aquatic invertebrates to lay eggs on panels, reducing overall reproductive success.*
Terrestrial invertebrates	*Construction*	✔		*Habitat loss or disturbance reducing overall habitat provision.*
	Operation	✔		*During operation, there is potential for beneficial or adverse effects as a result of long-term management practices undertaken*
Reptiles	*Construction*	✔		*Small scale removal of habitat at reen crossings may result in direct killing/ injury. Habitat fragmentation may occur as result of new access tracks.*
	Operation	✔		*During operation, there is potential for beneficial or adverse effects as a result of*

Element	Phase	Scoped In	Scoped Out	Justification
				long-term management practices undertaken.
European eel	*Construction*	✔		*There is a risk of localised effects from pollution and minor siltation associated with ditch/reen crossings and culverting works.*
	Operation	✔		*During operation, there is potential for beneficial or adverse effects as a result of long-term management practices undertaken.*
Badger	*Construction*	✔		*Adverse effects during the construction phase are limited to potential for entrapment in excavations. As setts can be created at any time there is also the risk of setts being located in areas of impact.*
	Operation	✔		*Operational impacts are limited to potential fragmentation of habitats due to fence installation.*
Hedgehog	*Construction*	✔		*Adverse effects during the construction phase are limited to potential for entrapment in excavations.*
	Operation	✔		*Operational impacts are limited to potential fragmentation of habitats due to fence installation.*
Brown hare	*Construction*	✔		*Temporary displacement during construction phase.*
	Operation	✔		*Brown hare are likely to recolonise the application area during the operation phase, however depending on the type of fencing required, this may be limited to reen/ ditch buffers. Potential for overall loss of habitat.*
Harvest mouse	*Construction*	✔		*Potential disturbance during installation or reinforcement of reen crossings which could directly impact nests.*
			✔	

Element	Phase	Scoped In	Scoped Out	Justification
	Operation			*No significant impacts are predicted during the operational phase due to provision of reen buffers.*

8.7 Opportunities for Enhancing the Environment

8.7.1 The scheme offers opportunities to significantly enhance the quality of the Gwent Levels SSSI's (covering parts of Magor and Undy SSSI, Redwick and Llandevenny SSSI and Whitson SSSI), in particular notified features: 'reen and ditch habitat', 'insects and other invertebrates' and 'shrill carder bee'. The current intensive agricultural management of the largely pastoral landscape could be enhanced to reduce livestock density and any reliance on pesticides or fertilisers. Buffers to reens of semi-natural habitat will reduce run-off of nutrient enriched water entering the reens, and allow sensitive management for terrestrial invertebrates. In addition, the removal of the southern hedgerow where double hedgerows exist on east-west running hedgerows will allow light to reach the reen, which would be expected to result in increased plant and fauna diversity within the reen. A mitigation and enhancement plan will be agreed with NRW.

8.7.2 The sensitive management of the entire site under a Landscape and Ecology Management Plan also has the potential to enhance the Site for other species for which the Site is currently sub-optimal due to management practices. This includes plant flora, reptiles, amphibians, brown hare and other species.

8.7.3 The Applicant has proposed to reinstate historic ditch boundaries which would represent an enhancement to baseline conditions and restoration of the historic landscape pattern.

8.8 Mitigation

8.8.1 The following mitigation summarises the likely measures that will be considered as part of the detailed design and environmental assessment:

- The layout will reflect, where feasible, a preference for the retention and protection of higher value habitats including scrub, mature trees, higher quality grassland and watercourses. Losses of important vegetation will be compensated for through the planting/ creation of new habitats;
- A Construction Environmental Management Plan (CEMP) will be implemented with sensitive timing of works, detailed method statements and measures to protect reens from pollution and siltation;
- Construction methods to avoid significant adverse impacts to retained habitats;
- Existing farm access tracks will be used wherever possible during construction, maintenance and decommissioning; improvements to these tracks including possible widening will be required. These will aim to utilise existing hedgerow gaps wherever possible. Any hedgerow lost during the creation of an access will be replaced within the scheme;
- New reen crossings will be designed to minimise impacts to habitats and riparian species, sited away from sensitive locations (such as water vole burrows) and will avoid fragmentation effects;
- The reens will be buffered to protect them from deterioration, avoid impacts to faunal species and to provide opportunities for habitat enhancement;
- The reen buffers will be designed to provide high value, semi-natural habitat;
- There will be no obstruction of reens;
- Gaps below fencing to prevent fragmentation for mobile species such as badger, otter, hedgehog and brown hare;
- Mature trees, particularly those with potential for roosting bats will be retained;

- Cabling will be directionally drilled below ground to avoid disturbance to above-ground habitat and watercourses;
- A detailed drainage strategy will be required to show no impacts on the reens or downstream ecological receptors;
- Mitigation licences for impacts to dormouse/ great crested newt habitat with appropriate compensatory habitat where required;
- Creation of new habitats to support and enhance existing faunal populations;
- A Landscape & Ecology Management Plan (LEMP) will be implemented post-construction to include sensitive management of reens and buffers, low intensity grazing regime and sensitive hedgerow management to enhance site for the range of fauna and flora it supports; and
- A decommissioning plan would be developed prior to the end of the project detailing sensitive methods of decommissioning.

8.8.2 The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

8.9 Limitations and Assumptions

8.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The findings will be based upon available information and field survey findings at the time. As with any surveys of this kind, the information collected is not intended to be a record of every species present.
- Due to the presence of livestock at the time of survey, static bat monitoring devices have not been located in areas of open grassland. However, information on bat activity within grassland locations has been obtained through transect surveys and will be reported within the technical appendices of the ES chapter.

- Identification of bat calls to species level is not always possible due to a variety of factors. In particular there is considerable overlap between echolocation calls of bat species in the *Myotis* genus. As such, recordings of *Myotis* during static monitoring survey have been identified to genus level only for the purpose of this study.
- Some surveys did not fully cover fields due to the presence of livestock including calves at foot. It is considered that sufficient data has been gathered across remaining fields to infer any results from inaccessible locations to inform the forthcoming assessment and any mitigation measures.
- Surveys for reptiles have not been undertaken, however given the habitats present and the current land use, a small population is assumed present. Suitable mitigation and compensation can be designed, without significant adverse impacts on the population.

9.0 Ornithology

9.1 Introduction

9.1.1 This Chapter of the Scoping Report sets out the approach to the ornithology assessment.

9.1.2 The Ornithology Chapter of the ES will consider the likely effects of the Proposed Development on ornithological features within and surrounding the Site during its construction, operation and decommissioning phases. The chapter will set out a detailed baseline and assess the effects likely to arise both alone and in-combination with other relevant projects, together with any avoidance, mitigation and compensation measures necessary to reduce these in accordance with nature conservation legislation and planning policy. The chapter will also describe enhancements to contribute to local and national conservations priorities.

9.1.3 This section of the Scoping Report sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available. This excludes other ecological receptors which are addressed separately in Section 9 of this Scoping Report.

9.2 Consultation

9.2.1 A request for non-statutory pre-application advice was made to Natural Resources Wales (NRW) on 2 July 2024, with a meeting also being held on 14 August. Following the meeting a further request was made covering distinct issues and directed to the relevant specialists within the organisation.

9.2.2 The request for advice covered the following matters of relevance to the proposals:

- Ornithology:
- Determining Functionally Linked Land for (FLL) for the purposes of the Habitat Regulations Assessment; and
- Seeking agreement on the principles of land management for mitigating impacts on lapwing.

9.2.3 NRW provided a formal response on 27 September 2024 (ref:CAS-264330-X0X8), provided in **Appendix 8A: NRW Consultation**.

9.3 Study Area

9.3.1 The Study Area incorporates areas where significant effects could have potential to occur throughout the life of the Proposed Development and has been extended for certain components to take into consideration populations of more mobile species, with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) EcIA guidance[110]. The Study Area is as follows:

- Land within the Scoping Red Line Boundary;
- A desk-based search within 10km of the Red Line Boundary for international / European designated sites;
- A desk-based search within 2km of the Red Line Boundary for other statutory designated sites and non-designated sites; and
- A desk-based search within 2km of the Red Line Boundary for records of notable bird species.

9.3.2 The baseline survey work also encompassed additional land due to changes in the red line boundary during the course of the initial design stage.

9.4 Baseline Conditions

Desk Based Assessment

9.4.1 A desk-based study included a data enquiry from South-East Wales Biodiversity Records Centre (SEWBReC) in January 2024 for designated sites and bird species within 2km of the Scoping Red Line Boundary. Data was requested from the British Trust for Ornithology (BTO). This included Monthly Core Counts at Redwick, Undy and Magor Reserve during 2014-2018. An updated data set will be obtained for the submission.

110 CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, version 1.3*. Chartered Institute of Ecology and Environmental Management, Winchester.

9.4.2 A search was made of the UK governments on-line tool Multi-Agency Geographic Information for the Countryside (MAGIC) for International/ National Site Network sites up to 10km from the application Site, relating to birds only. A summary is provided in **Table 9-1** below.

9.4.3 A full list of sites not designated for birds are listed in the **Chapter 8: Ecology**.

Table 9-1 Designated Sites Scoped in For Ornithological Interest

Site Name	Proximity to Site	Description
Severn Estuary Ramsar	20m south	The Ramsar site covers over 24,000 hectares (ha) and meets the following Ramsar criteria: • Ramsar criterion 1 Due to immense tidal range (second-largest in world), this affects both the physical environment and biological communities. Habitats Directive Annex I features present include: • H1110 Sandbanks which are slightly covered by sea water all the time • H1130 Estuaries • H1140 Mudflats and sandflats not covered by seawater at low tide • H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) • Ramsar criterion 3 Due to unusual estuarine communities, reduced diversity and high productivity. • Ramsar criterion 4 This site is important for the run of migratory fish between sea and river via estuary. It is also of particular importance for migratory birds during spring and autumn. • Ramsar criterion 8 The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon, sea trout, sea lamprey, river lamprey, allis shad, twaite shad and eel use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad and twaite shad which feed on mysid shrimps in the salt wedge. • Ramsar criterion 5

Site Name	Proximity to Site	Description
		Assemblages of international importance: Species with peak counts in winter: 70919 waterfowl (5 year peak mean 1998/99-2002/2003) • Ramsar criterion 6 Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): **Species with peak counts in winter**: • Tundra swan • Greater white-fronted goose • Common shelduck • Gadwall • Dunlin • Common redshank Species/populations identified subsequent to designation for possible future consideration under criterion 6. **Species regularly supported during the breeding season**: • Lesser black-backed gull **Species with peak counts in spring/autumn:** • Ringed plover **Species with peak counts in winter:** • Eurasian teal • Northern pintail
Severn Estuary Special Protection Area (SPA)	20m south	The Severn Estuary qualifies under: • Article 4.1 of the Birds Directive 2009/147 by regularly supporting an internationally important wintering population of Bewick's swan. • Article 4.2 as a wetland of international importance by regularly supporting in winter over 20,000 waterfowl. • Article 4.2 by regularly supporting in winter internationally important numbers of the following 5 species of migratory waterfowl: • European white-fronted goose • Shelduck • Gadwall • Dunlin • Redshank • The Severn Estuary also supports nationally important wintering populations of a further 10 species: • Wigeon • Teal

Site Name	Proximity to Site	Description
		• Pintail • Pochard • Tufted duck • Ringed plover • Grey plover • Curlew • Whimbrel • Spotted redshank. • In addition, during passage periods, the estuary supports nationally important numbers of ringed plover, dunlin, whimbrel and redshank. • The Severn Estuary also supports a nationally important breeding population of a migratory species: lesser black-backed gull.
Severn Estuary (Wales) SSSI	20m south	The Severn Estuary lies at the mouth of four major rivers (the Severn, Wye, Usk and Avon) and many lesser rivers. The immense tidal range (the second highest in the world) and classic funnel shape make the Severn Estuary unique in Britain and very rare worldwide. The intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important in Britain. The estuarine fauna includes: internationally important populations of waterfowl; invertebrate populations of considerable interest; and large populations of migratory fish.
Magor Marsh SSSI	1.2km north	Magor Marsh is the last relatively natural area of fenland on the Gwent Levels. It is an important site for breeding water and marsh birds.
Newport Wetlands SSSI	1.2km west	Newport Wetlands SSSI is part of the Newport Wetlands NNR, which was constructed to meet the commitment by the UK Government to create “a substantial area of wetland habitat on the shores of the Severn Estuary” as part of the compensation for the loss of the Taf/Ely Estuary SSSI following the construction of the Cardiff Bay Barrage. Newport Wetlands SSSI has a number of special features including: • Reens and ditches • Reedbeds • Higher plants • Over-wintering birds Insects and other invertebrates

Site Name	Proximity to Site	Description
Newport Wetland National Nature Reserve (NNR)	1.2km west	Newport Wetlands is best known for its range of wetland birds. This reserve at the mouth of the river Usk was opened in 2000 to compensate for loss of extensive mudflats with the completion of the Cardiff Bay barrage. It stretches from Goldcliff to Uskmouth and was once an ash covered wasteland for the neighbouring coal-fired Uskmouth power station. The reserve covers 4.38 sq km (438 hectares) and provides a variety of habitats including reedbeds, saltmarsh, saline lagoons and lowland wet grassland. In 2008 it was designated as a National Nature Reserve.
Elver Pill Reen Grassland & Pond SINC	300m	Lagoon with mosaic of swamp and marshy and dry semi-improved neutral grassland; supports Cetti's warblers.
Bridewell Common Field SINC (& Wildlife Trust reserve)	800m	Designated for its species rich grassland, floodplain pastures, mature willow and hedgerows interest. Supports birds including snipe, stonechat and reed bunting.
Gwent Wetland Reserve SINC	950m	Mosaic of wet grassland reed beds, open water, hedgerows and saline lagoon, which supports internationally important numbers of wildfowl as well as UK BAP Priority species such as water vole, great crested newt and brown hare.
Greenmoor Pool SINC	1.1km	Formerly standing water which now supports reed swamp (UKBAP Priority Habitat), which itself supports bird populations including Cetti's warbler.
Land at Barecroft Common SINC	1.5km	Designated for its lowland species-rich grassland and semi-improved grassland interest. Supports nesting birds including lapwing and curlew
Bowkett Field, Barecroft SINC	1.7km	Designated for its Priority Habitat lowland species-rich marshy grassland with bird interest.
Solutia Site SINC	1.85km	A series of improved and semi-improved grasslands with traditional ditches and ponds; site supports a range of species including nesting birds such as

Site Name	Proximity to Site	Description
		Cetti's warbler, and invertebrates including hairy dragonfly (*Brachyton prantense*).

Baseline Surveys

9.4.4 A range of bird surveys have been undertaken following best practice guidance, as detailed in **Table 9-2**.

Table 9-2 Baseline Survey Methods

Survey Type	Date(s)	Methods
Winter bird surveys	*October 2019 – March 2020* *October 2020 – March 2021* *October 2022 – March 2023*	• Covering the panelled areas and comprising four surveys per month in October and March to increase effort in the passage months with two surveys per month from November to February. • Based on a methodology for census of lowland waders (Gilbert *et al*., 1998[111]); half to coincide with a high tide and half to coincide with a low tide.
Nocturnal bird surveys	*October 2019 – March 2020* *October 2020 – March 2021* *October 2022 – March 2023*	• Once per month. • To record species, particularly waders, which may move and feed in the hours of darkness in response to tidal influence. • Incidental sightings of other species such as owls and cryptic species (such as woodcock) that are mainly active at night were recorded.
Breeding bird survey	*April – June 2019* *April – July 2020* *April – July 2023*	The survey was conducted once per month following a method based on Gilbert *et al*., (1998) and increased to twice per month from 2020.

111 Gilbert G., Gibbons D.W. and Evans J. (1998) *Bird Monitoring Methods: A manual of techniques for key UK species.* RSPB, Sandy.

Baseline Conditions

Wintering Birds

9.4.5 The data search with SEWBReC returned just under 6,000 bird records within the Study Area; taking into account species likely to utilise the Site during the winter and passage seasons this is c. 135 species. This includes species dependent on open areas for foraging and are listed in the SPA designated and/or those that are potentially breeding (for species which are present year-round), for example barn owl, common crane, curlew, grey partridge[112], lapwing, lesser black-backed gull, meadow pipit, oystercatcher, ringed plover, shelduck, skylark and yellow wagtail, amongst others.

9.4.6 Across the winter surveys, a total of 76 notable species were recorded. Of these, eight species are specifically named in the SPA/ Ramsar designation (dunlin, shelduck, teal, wigeon, ringed plover, curlew, gadwall and grey plover), 34 species are waterbirds and therefore can be considered to be a part of the SPA 'Waterbird Assemblage'. Two clusters of fields are immediately apparent as having higher counts than elsewhere: one to the south of Mead Farm near Redwick and the other to the south of Summerleaze.

9.4.7 The remaining species are notable either as Schedule 1 species and/or listed as red or amber on the UK and/or Welsh Birds of Conservation Concern (BoCC). This included Schedule 1 species barn owl and kingfisher.

9.4.8 Other notable species included lapwing, recorded in half the low tide and high tide surveys and two thirds of nocturnal surveys, generally in small groups of a few individuals but with some records of larger groups.

Breeding Birds

9.4.9 The data search from SEWBReC returned 140 species of birds in the spring and summer period from an area within 2km of the Site. Of the species in the SEWBReC records, 42 have the potential to breed on Site considering the habitats present.

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112 This species is likely only present as the result of releases for shooting estates in the area.

9.4.10 Fifty eight notable species were recorded during the surveys, with 25 species confirmed as breeding on Site including barn owl, bullfinch, dunnock, gadwall, greenfinch, house sparrow, lapwing, linnet, little egret, mallard, mistle thrush, shelduck, skylark, song thrush, starling, teal, whitethroat and wigeon. There were 13 species that were probably breeding though cormorant[113], marsh harrier and peregrine are more likely to be breeding in habitats off Site and then foraging on Site. A further nine species were recorded as 'possibly' breeding but black-headed gull, house martin and swift are more likely to be foraging on Site but breeding beyond the Scoping Red Line Boundary given the habitats present.

9.4.11 Notable ground nesting species that are (at least possibly) breeding on site include skylark, curlew, oystercatcher and meadow pipit. Lapwing were confirmed as breeding in both 2020 and 2023. In 2020, occupied nests were recorded in five fields with records from a further 18 fields that could indicate breeding. In 2023, only one occupied nest was recorded but recently fledged young were observed in a further two fields and behaviour indicative of breeding in in another five fields.

9.4.12 Schedule 1 species that are (at least possibly) breeding on or close to the Site include Cetti's warbler, barn owl and kingfisher.

9.4.13 Part of SPA and RAMSAR designations is for eight species of wildfowl and wader that are supported by the Severn Estuary whilst on migration. Of these eight species, three were recorded at least as 'possible' breeding and only ringed plover was recorded as on passage. In addition, the waders common sandpiper, green sandpiper and whimbrel were recorded on passage.

9.5 Proposed Assessment Methodology

Relevant Legislation and Guidelines

9.5.1 The ecological assessment will take into account the following legislation:

- The Birds Directive;
- The Ramsar Convention on Wetlands 1971;

[113] Cormorant and grey heron are colonial nesters with large, conspicuous nests in tree and no nest sites were recorded during the surveys.

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- Wildlife and Countryside Act 1981 (as amended);
- Natural Environment and Rural Communities Act (NERC) 2006; and
- Environment (Wales) Act 2016.

9.5.2 Policy:

- Future Wales: the National Plan 2040;
- Planning Policy Wales;
- Technical Advice Note (TAN) 5: Nature Conservation and Planning;
- Overarching National Policy Statement for Energy (EN1), specifically in relation to Section 4.6 Environmental and Biodiversity Net Gain and Section 5.4 Biodiversity and Geological Conservation;
- National Policy Statement for Renewable Energy Infrastructure (EN-3);
- Monmouthshire Local planning policy - Monmouthshire County Council Local Development Plan (LDP) 2011-2021 or its successor (currently in preparation); and
- Newport Local planning policy – Newport Local Development Plan (LDP) 2011- 2026.

9.5.3 Other relevant guidance:

- Local Biodiversity Action Plans (BAP), including The Greater Gwent Nature Recovery Action Plan (undated) and Newport City Council's Local BAP (undated);
- Biodiversity and Ecosystem Resilience Forward Plans for Monmouthshire and Newport;
- British Standard BS42020: Biodiversity - Code of Practice for Planning and Development; and
- BRE (2014) National Solar Centre Biodiversity Guidance for Solar Developments.

9.5.4 The approach for the assessment will follow CIEEM's Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland 2018 (updated April 2022).

9.5.5 The approach will also take into account the Step-Wise Approach (with reference to the DECCA Framework) to assess impacts, in accordance with Edition 12 of Planning Policy Wales (February 2024[114]). A detailed explanation of this policy is set out in the relevant chapter of this Scoping Request. However, the key steps in the process are as follows:

1) Avoid
2) Minimise
3) Mitigate/restore
4) Compensate

9.5.6 The DECCA Framework is similarly explained and refers to the resilience of ecosystems in the following regards:

- Diversity
- Extent
- Condition
- Connectivity
- Adaptability to change

General Approach

9.5.7 The Ornithology ES chapter will provide the ecological assessment of ornithological features. The ES chapter will be supported by Technical Appendices detailing the desk study results, consultation, survey methodologies and results (including figures, tables, photographs, maps, and appendices).

9.5.8 The chapter will include measures to mitigate likely adverse effects, either by sensitive design or applied techniques, and will outline measures to enhance

[114] Llywodraeth Cymru/ Welsh Government (2024) *Planning Policy Wales. Edition 12.*

biodiversity, as well as the requirement for associated monitoring and adaptive management.

9.5.9 A cumulative assessment will be undertaken to identify effects that might not be significant on their own but become significant when considered in combination with effects from other plans or developments. The list of projects/ plans to be considered will be decided in consultation with relevant consultees.

9.5.10 The assessment methodology has been developed with reference to the CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom[115] and from considerable experience of EcIA relating to similar developments throughout the UK.

9.5.11 These guidelines set out the process for assessment through the following stages:

- Describing the ecological baseline;
- Identifying and evaluating 'Important Ecological Features ' (IEFs);
- Identifying and characterising the likely effects on IEFs during construction, operation and decommissioning;
- Determining the significance of effects in the absence of mitigation;
- Describing mitigation, compensation and/or enhancement measures associated with the development and assessing residual significance;
- Assessing cumulative effects with other projects/ plans;
- Assessing residual effects; and
- Identification of monitoring requirements.

9.5.12 The baseline for this assessment comprises the species, habitats on which they rely and designated sites within the Site plus those within the Zone of Influence (ZoI) of the Site. The ZoI describes the area over which construction, operational and decommissioning associated with the Proposed Development could influence identified ecological features/receptors. The ZoI varies for different ecological

115 CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, version 1.3*. Chartered Institute of Ecology and Environmental Management, Winchester.

features depending on its sensitivity to an environmental change.

Determining Value

9.5.13 The importance and sensitivity of ornithological features will be determined based on CIEEM Guidelines. Whilst the legal protection afforded to birds does not necessarily reflect actual biodiversity value, the assessment methodology will fully acknowledge statutory requirements, policy objectives, rarity, rate of decline and local or intrinsic nature conservation value.

9.5.14 Important Ecological Features (IEF) will be defined on a geographical scale (international, national (Wales), regional, county or local) according to:

- The statutory and non-statutory designated sites present, and their associated qualifying features/species;
- Species of conservation concern, including those of Principal Importance on the S42 List in Wales and the Local Biodiversity Action Plan (LBAP) and Birds of Conservation Concern, which may be present on the Site or in the surrounding area; and
- The local distribution of bird species in the area, for which the Site may support suitable habitat.

9.5.15 Features not meeting the criteria of being 'important' within CIEEM's geographic frame of reference will be scoped out of the assessment as it will be considered that impacts upon them are unlikely to be significant (in terms of legislation, policy or nature conservation value).

Identifying Effects and Determining Magnitude

9.5.16 The assessment will be undertaken in accordance with the CIEEM guidelines (2018[116]). This differs from the approach used for other environmental disciplines, where the significance of an effect is based on a combination of the magnitude of the change and the sensitivity of the receptor.

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116 CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, version 1.3*. Chartered Institute of Ecology and Environmental Management, Winchester.

9.5.17 The potential effects of the Proposed Development on IEF's will be characterised, taking into account relevant aspects of ecosystem structure and function, according to the following terms:

- positive or negative;
- extent;
- magnitude;
- duration;
- frequency and timing; and
- reversibility.

9.5.18 As per the guidelines, only those characteristics relevant to understanding the ecological effect of the impacts and determining its significance are described.

Determining Significance

9.5.19 For the purpose of ecological impact assessment, a 'significant effect' is an effect that either, supports or undermines biodiversity conservation objectives, irrespective of the value of the ecological receptor. Once a significant effect has been identified (i.e. it is considered likely to affect the integrity / favourable conservation status of an ecological feature), the importance of the receptor will be used to help determine the geographical scale at which the effect is significant.

9.5.20 As stated in the CIEEM guidelines (2018) "the scale of significance of an effect may not be the same as *the geographic context in which the feature is considered important. For example, an effect on a species which is on a national list of species of principal importance for biodiversity may not have a significant effect on its national population".* Where a significant effect on integrity / favourable conservation status is not predicted for a given geographical level, consideration will be given to whether an effect may be significant at lower geographical levels.

9.6 Description of Likely Significant Effects

9.6.1 Significant effects upon the ecological features present within the ZoI may arise either directly or indirectly in the absence of mitigation.

9.6.2 Direct impacts include loss of foraging and loafing areas for wintering birds, loss of nesting habitat, habitat modification, disturbance to wintering and nesting birds, fragmentation, collision risk and destruction of nests/ eggs of ground-nesting birds. Indirect impacts include habitat degradation which can affect conservation status (e.g. as a result of pollution or lighting).

9.6.3 In relation to the SPA/ Ramsar/ SSSI, the assessment will consider the direct effects of disturbance to breeding and non-breeding birds within the designated site, as well as the indirect effects to them through impacts to 'functionally linked land' e.g. modification of land that SPA/ Ramsar birds use, that is outside the boundary of the designation.

9.6.4 The ES will include a separate shadow Habitats Regulations Appraisal (HRA) to assist the competent authority in conducting the Appropriate Assessment that will be required prior to determination of the NSIP application.

9.6.5 The potential effects scoped into the assessment are presented in **Table 9-3** and includes an initial assessment of whether significant effects are likely on each IEF.

9.6.6 Where no likely significant effects are predicted on an IEF, these will be scoped out of further assessment in the ES chapter.

Table 9-3 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Severn Estuary Ramsar (ornithological features) and SPA	*Construction*	✔		*An assessment will be made on noise disturbance to birds on protected sites by construction personnel and vehicles. In addition, potential spillages/ siltation effects on habitats within the designation on which they rely will be assessed. Impacts from visual disturbance can be scoped out due to the high sea wall between the Site and the estuary.*
	Operation		✔	*The operational phase is unlikely to cause direct or indirect effects as by nature solar schemes do not create noise or damage once in place. Impacts from visual disturbance e.g. from maintenance personnel, can be scoped out due to the high sea wall between the Site and the estuary.*
Wintering bird assemblage (functionally linked to SPA)	*Construction*	✔		*Potential for effects to winter foraging and loafing areas for wintering birds that are part of the SPA assemblage both from disturbance during construction and as the large fields become unavailable to them due to the presence of the solar panels.*
	Operation	✔		*Overall loss of foraging and loafing areas in particular in fields close to the sea wall. Fields without solar arrays which could be used as functionally-linked land are at risk of short-term and periodic disturbance by maintenance personnel and vehicles.*

Element	Phase	Scoped In	Scoped Out	Justification
Wintering bird assemblage (non-SPA)	*Construction*	✔		*Potential for disturbance to foraging areas of species such as thrushes, finches and buntings due to construction vehicles and personnel.*
	Operation	✔		*Due to potential hedgerow removal for reen enhancement, there will be an overall loss of foraging habitat for wintering birds such as thrushes. The presence of solar panels may also reduce the area in which wintering birds forage.*
Ground-nesting birds (excluding lapwing)	*Construction*	✔		*Impacts to consider will include destruction of nests by moving plant and personnel and disturbance of adults off nests leading to increased predation of nests. This includes species such as skylark, meadow pipit, oystercatcher and shelduck.*
	Operation	✔		*There will be an overall loss of available habitat for ground-nesting birds, which generally require open areas with good visibility.*
Breeding lapwing	*Construction*	✔		*Destruction of nests by moving plant and personnel. Disturbance of adults off nests leading to increased predation of nests.*
	Operation	✔		*There will be an overall loss of available nesting habitat for lapwing, as they need areas with clear line of sight to nest. Access by maintenance personnel to panelled areas also has the potential to cause disturbance to nesting lapwing.*

Element	Phase	Scoped In	Scoped Out	Justification
Schedule 1 birds (Barn owl and Cetti's warbler)	*Construction*	✔		*Disturbance of nests by personnel and moving plant, potentially leading to nest failure. Removal of nesting habitat during habitat removal (e.g. at reen crossings).*
	Operation	✔		*The assessment will consider impacts such as reduced foraging areas for barn owl and overall reduction in nesting habitat for Cetti's warbler during reen enhancements.* *It is considered unlikely that maintenance activities during the operational phase will have adverse effects on Schedule 1 species.*
Other breeding birds	*Construction*	✔		*Destruction of nests during habitat removal (e.g. hedgerows and at reen crossings).*
	Operation	✔		*Overall reduction in nesting habitat due to removal of one side of double hedgerows to enhance reens. There is potential for beneficial or adverse effects as a result of long-term management practices undertaken.*

9.7 Opportunities for Enhancing the Environment

9.7.1 The Site has considerable ornithological interest, as described above and as such a number of fields will be included in the scheme for enhancement for breeding birds (especially lapwing) and wintering waders and wildfowl. The proposed enhancement would involve a suite of measures to increase the carrying capacity of these fields. Full details are yet to be confirmed and will be the subject of a separate document in the form of an Landscape Ecological Management Plan.

9.7.2 Other changes which will result in enhancements for birds include the reduction in pesticides to the fields which will lead, over time, to a greater diversity of plant species and a concomitant increase in the diversity and abundance of invertebrates.

9.7.3 The creation of buffers along the reens consisting of strips of grassland, managed for wildlife, can be expected to increase the abundance of insects and seed-rich plants. This will be of benefit to many other winter-foraging species of conservation concern in addition to thrushes including species such as greenfinch, linnet and reed bunting and help to mitigate the loss of hedgerow habitat. The buffers, which can be managed to support tussocky grassland, will increase potential for small mammals and therefore enhance the Site for foraging barn owl.

9.7.4 Reen enhancement, including the reduction of shading will lead to increased invertebrate prey for foraging birds and may increase nesting opportunities for water fowl.

9.8 Mitigation

9.8.1 Likely mitigation for the Proposed Development will entail:

- A Construction Environmental Management Plan (CEMP) to ensure that the construction phase is carefully planned to avoid significant impacts, including:
- Implementing measures to prevent ground-nesting species such as skylark from nesting in the areas to be panelled. Such measures would include keeping the sward very short in the fields and using deterrents such as raptor kites;
- Surveying and buffering nest sites of Schedule 1 species (e.g. barn owl) during the breeding season;
- Utilise acoustic barriers where necessary (e.g. at nesting Cetti's warbler sites); and
- An Ecological Clerk of Works will be on Site, throughout the works but most importantly during the bird breeding season to undertake pre-works checks for nests.
- Utilising existing farm access tracks wherever possible during construction, maintenance and decommissioning to minimise impacts to breeding habitat within reens and hedgerows. Whilst improvements to these tracks including possible widening will be required, tracks will aim to

utilise existing hedgerow gaps wherever possible and only very small scale hedgerow loss will be required;

- It may not be possible to avoid the disturbance effect from operation of the Site but it will be possible to minimise it by routing access tracks so that they don't run along the boundaries of fields used by wintering birds. These should also avoid any known barn owl nesting sites. In addition, thick and tall hedgerow boundaries should be maintained to screen the Site from the fields used by wintering SPA birds;
- Habitat creation for loss of breeding and foraging habitat, including infill hedgerow planting in gaps of retained hedgerows;
- Panel installation to reduce unnecessary land take and allow grassland to be maintained below to provide foraging habitat;
- Panel installation to have clearance between rows and the arrays themselves are partially transparent, which will permit vegetation growth beneath and continue to provide bird foraging and potential nesting habitat;
- By design solar panels will be positioned at an inclined angle and this, along with the large gaps between rows this will enable birds to distinguish the surface from a water body;
- Buffers along all reens to provide habitat for foraging and reduce disturbance to reen-nesting birds;
- No new lighting regime will be introduced adjacent to any watercourses to prevent impacts to nocturnal fauna;
- Setting aside fields that are most important to winter birds and breeding lapwing. Ecological enhancement of these set-aside fields;
- Compensation measures to be implemented before construction of any of the solar infrastructure;
- Outline Landscape and Ecological Management Plan (oLEMP) to ensure sensitive management to retained, created and enhanced habitats; and

- Lapwing Management Plan which provides specific details of management of habitat to support wintering and breeding lapwing.

9.8.2 The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

9.9 Limitations and Assumptions

9.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- Survey results and assessment are based on the information available and collected during the study period(s), and within the resources available for the project. However, the possibility of important ecological features being missed due to survey timings, absence during surveys or the year of survey cannot be ruled out.
- Much of the Site is currently managed as pastoral farmland. Surveyors deviated from the planned survey route when livestock were deemed dangerous for safe access to fields. In these circumstances' fields were observed from the field gate or from the vantage point provided by the sea wall and therefore not likely to have significantly affected the validity of results.
- Carrying out surveys at specific tidal states during the short days of winter imposed some restrictions and some surveys were carried out in suboptimal weather conditions. Given that data has been collected over multiple years, it is considered that population assemblages can be deduced across the survey areas.

10.0 Water Environment and Flood Risk

10.1 Introduction

10.1.1 This Chapter presents a review of the potential significant effects of the Proposed Development during construction, operation and decommissioning with respect to the Water Environment and Flood Risk.

10.1.2 This Chapter describes:

- The overall baseline conditions (Section 10.3);
- The proposed assessment methodology (Section 10.4) that includes legislation, policy and technical guidance, scope of the Environmental Impact Assessment (EIA) methodology and flood risk assessment methodology;
- Description of likely significant effects (Section 10.5);
- The opportunities for enhancing the environment (Section 10.6);
- The proposed mitigation (Section 10.7);
- The limitations and assumptions (**Section 10.8**).

10.2 Consultation

10.2.1 A data request was sent to Natural Resources Wales (NRW) to establish the current water environment and flood risk baseline for the Proposed Development area. Further data collection and engagement will be undertaken with NRW and the relevant Lead Local Flood Authorities (LLFAs) (Newport City Council and Monmouthshire County Council) (including in their role as Sustainable Drainage Approving Body (SAB)) to discuss and agree the proposed flood risk assessment approach; watercourse crossings; and outline drainage strategy. A summary of the technical engagement will be provided in the Preliminary Environmental Information Report (PEIR).

10.3 Study Area

10.3.1 The Study Area for water environment and flood risk is defined as the geographic area where direct and indirect effects of the Proposed Development on hydrology, hydrogeology and flood risk receptors may occur.

10.3.2 A distance of up to 0.5 kilometres (km) from the Scoping Red Line Boundary is considered appropriate for the assessment of direct effects such as the overland migration of runoff to a surface water feature. A further 1km buffer is considered appropriate for the assessment of indirect effects such as the transport of pollutants to downstream receptors and as such a 1.5km distance forms the Study Area for this assessment.

10.3.3 The Study Area shown on **Figure 10-1** extends 1.5km from the Scoping Red Line Boundary. This nominated area of interest has been assessed to be conservative and sufficient for the purposes of this baseline appraisal, based on hydrological knowledge of the area and professional experience ensuring that all relevant aspects are considered. It is considered that any potential impacts on water environment and flood risk receptors would be negligible (and therefore scoped out) beyond 1.5km downstream of the Scoping Red Line Boundary. The Study Area will be reviewed and amended in response to such matters as refinement of the Proposed Development's design and the identification of additional impact pathways, and also in response where appropriate to feedback from consultation.

10.4 Baseline Conditions

Introduction

10.4.1 This section provides a high-level review of the current baseline environmental characteristics for the Proposed Development and surrounding areas, with particular reference to the water environment and flood risk. The baseline conditions will be confirmed through review of additional data sources, site visit and consultation with stakeholders during the next stages of the EIA.

Data Sources

10.4.2 The principal data sources of information used to define the baseline conditions on which the assessment scope has been based are presented in the **Table 9-1**.

Table 10-1 Data Sources Used to Inform the Water Environment and Flood Risk Baseline Conditions

Organisation	Data Source	Data provided
British Geological Survey (BGS)	GeoIndex Onshore[117]	Aquifer Designation
British Geological Survey (BGS)	Geology Viewer[118]	Geology
Cranfield University	LandIS Soilscapes viewer[119]	Soil classification
Local Ordnance	OS mapping[120]	Topography and spring locations
Welsh Government	Data Map Wales[121]	Source Protection Zones (SPZs) Site designations
Natural Resource Wales (NRW)	Water Watch Wales Map Gallery[122]	Water Framework Directive (WFD) classifications
Natural Resource Wales (NRW)	Development Advice Map[123]	Flood zones as defined by the Development Advice Map (DAM)
Natural Resource Wales (NRW)	Flood Map for Planning[124]	Location of main rivers and flood defences, and flood risk from rivers, sea, reservoirs and surface water sources

Geology, Topography and Land Use

10.4.3 The Proposed Development and Study Area are located on the Gwent levels in south Wales and lie within the Newport City Council and Monmouthshire County Council local authority areas. The Gwent Levels are a low-lying, flat and expansive coastal plain extending up to the Severn Estuary. The typical elevation of the Gwent

117 BGS GeoIndex Onshore (available online http://mapapps2.bgs.ac.uk/geoindex/home.html [Accessed December 2024].
118 BGS Geology Viewer (available online https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/ [Accessed December 2024].
119 Cranfield University LandIS Soilscapes viewer (available online http://www.landis.org.uk/soilscapes/ [Accessed December 2024].
120 Local Ordnance Survey (OS) mapping.
121 Welsh Government Data Map Wales (available online https://datamap.gov.wales/maps/ [Accessed December 2024].
122 NRW Water Watch Wales (available online https://waterwatchwales.naturalresourceswales.gov.uk/en/ [Accessed December 2024].
123 NRW DAM (available online https://maps.cyfoethnaturiolcymru.gov.uk/ [Accessed December 2024].
124 NRW Flood Map for Planning (available online https://flood-map-for-planning.naturalresources.wales/ [Accessed December 2024].

Levels is between 5 to 6 metres (m) AOD (5.9m to 5.1m AOD north to south and 6.3m to 5.6m AOD east to west).

10.4.4 The area is mostly rural comprising numerous agricultural fields bordered by drainage channels (reens) or agricultural field ditches. The closest residential developments are Redwick located on the northern edge of the central part of the Proposed Development area; Whitson located approximately 200m from the western border of the Scoping Red Line Boundary; and Undy located approximately 800m north of the eastern part of the Site.

10.4.5 The Dwr Cymru Welsh Water Sewage Treatment Works is located in the east of the Proposed Development area, nestled between the boundary of the Proposed Development area and Mill Reen. It is assumed that the WWTW outfalls to the Mill Reen.

10.4.6 The M4 is located approximately 1.9km to the northeast, and the South Wales Main Line and A4810 are located approximately 1-1.5km to the north. The Gwent Europark industrial estate is located immediately north of the A4810.

10.4.7 Evidence from the BGS Geology Viewer data shows the bedrock geology within the Proposed Development area to comprise 'Mercia Mudstone Group – Mudstone' sedimentary bedrock; and superficial geology within the Scoping Red Line Boundary to comprise 'Tidal Flat Deposits - Clay and silt' sedimentary superficial deposits.

10.4.8 The LandIS Soilscapes viewer indicates that the soils within the Scoping Red Line Boundary are loamy and clayey soils of coastal flats with naturally high groundwater. The soil is described as naturally wet, meaning that in low-lying sites, permeable soils are often affected by high groundwater.

10.4.9 Further information regarding ground conditions is provided with **Chapter 11: Ground Conditions**.

10.4.10 The BGS GeoIndex Onshore data shows the bedrock aquifer designation across the Study Area as Secondary B aquifer with low vulnerability; and the superficial deposits as unproductive strata with low vulnerability.

10.4.11 Secondary B aquifers are described as mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers. Unproductive strata are largely unable to provide usable water supplies and are typically unlikely to have surface water and wetland ecosystems dependent on them.

10.4.12 Low vulnerability areas are described as providing the greatest protection to groundwater from pollution. They are likely to be characterised by low-leaching soils and/or the presence of low-permeability superficial deposits.

10.4.13 Data Map Wales indicates that the Scoping Red Line Boundary is not located within or in close proximity to a Source Protection Zone.

10.4.14 Water Watch Wales indicates one Groundwater Dependent Terrestrial Ecosystem (GWDTE) within the study area. This is located approximately 600m north (upstream) of the Scoping Red Line Boundary at the Magor Marsh nature reserve that is managed by the Gwent Wildlife Trust.

Hydrology

10.4.15 The Gwent levels are drained by a network of agricultural drainage ditches and reens network towards the Severn Estuary via tide-locked outfalls. The water levels within the network are adjusted by pumps, sluices and penstocks. In the summer, water levels are kept high to provide drinking water for stock and in winter the boards are removed to allow floodwater to drain into the Severn Estuary. The vast network of reens and drainage ditches that cross the Gwent Levels are managed and maintained by the Internal Drainage District (IDD) team within NRW.

10.4.16 Several designated Main Rivers flow through or within close proximity to the Scoping Red Line Boundary. These are summarised in **Table 10-2** below and illustrated in **Table 9-1**.

Table 10-2 Main Rivers within the Study Area

Watercourse	Data Source
Elver Pill reen	Flows north to south immediately adjacent to the Scoping Red Line Boundary. Approximately 2.4km long. Discharges to the Severn Estuary.

Watercourse	Data Source
Windmill reen (Yoke reen)	Flows north to south through the Scoping Red Line Boundary. Approximately 2.8km long. Discharges to the Severn Estuary. The upper reaches of Windmill reen are called Yoke reen.
Cold Harbour reen	Flows north to south through the Scoping Red Line Boundary. Approximately 2. 6km long. Discharges to the Severn Estuary.
Mill reen	Flows north to south immediately adjacent to the Scoping Red Line Boundary. Approximately 8.1km long. Discharges to the Severn Estuary.
Monks Ditch	Flows north to south approximately 500m to the west of the Scoping Red Line Boundary. Likely to be hydraulically connected to watercourses that flow through the Site. Approximately 9. 6km long. Discharges to the Severn Estuary.
Collister Pill	Flows north to south approximately 970m to the east of the Scoping Red Line Boundary. Likely to be hydraulically connected to watercourses that flow through the Site. Approximately 1.3km long. Discharges to the Severn Estuary.
Back Ditch	Flows west to east alongside the banks of the Severn Estuary, immediately adjacent to the Scoping Red Line Boundary. Approximately 7.5 km long. Discharges to the Elver Pill reen, Windmill reen and Cold Harbour reen and Collister Pill in the Study Area.
New Middle Road reen	Flows east to west immediately adjacent to the north of the Scoping Red Line Boundary. Approximate length 1.6 km. Discharges to Elver Pill reen and Yoke reen (Windmill reen).
Ridings & 100 Perches	Flows north to south, located north of A4810 with total length of approximately 2km. Discharges to New Middle Road reen.
Petty reen & Stutwall Link	Flows west to east, located along A4810. Approximately 2.7 km long. Discharges to Cold Harbour.

10.4.17 Other named watercourses within or immediately adjacent to the Study Area include Hare's reen; Parish reen; Crabtree reen; Meres reen; Bowleaze reen; Cock Street reen; Cockenton reen; South Row reen; Whitewall reen; Prat reen and Chapel reen. The location of these reens is illustrated in **Figure 10-1**.

10.4.18 There are no known flow gauging stations along the watercourses within the Scoping Red Line Boundary. This will be confirmed during consultation with the relevant authorities and updated in the PEIR as required.

Designations

10.4.19 The Gwent Levels consists of a series of six Sites of Special Scientific Interest (SSSIs). The Scoping Red Line Boundary is located within the following three Gwent Levels SSSIs:

- Gwent Levels – Whitson SSSI[125];
- Gwent Levels - Redwick and Llandevenny SSSI[126]; and
- Gwent Levels – Magor and Undy SSSI[127].

10.4.20 The network of reens and water management practices in the Gwent Levels support a range of aquatic plants which in turn, support other wildlife. A diverse community of aquatic and terrestrial insects, invertebrates, otters and water voles inhabit the reens, ditches and their banks. Further information regarding the designation is provided with **Chapter 8: Ecology**.

10.4.21 The Severn Estuary is located to the south of the Scoping Red Line Boundary and is designated as SSSI, Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar. These sites are designated for their internationally important numbers of overwintering birds.

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125 Gwent Levels: Redwick and Llandevenny SSSI, [Online], available at: https://naturalresources.wales/media/646109/SSSI_0563_SMS_EN0012ca0.pdf [Accessed December 2024].

126 Gwent Levels: Redwick and Llandevenny SSSI, [Online], available at: https://naturalresources.wales/media/646109/SSSI_0563_SMS_EN0012ca0.pdf [Accessed December 2024].

127 Gwent Levels – Magor and Undy SSSI. [Online], available at: https://naturalresources.wales/media/676549/sssi_0307_sms_en001.pdf [Accessed Augst 2024].

Water Abstractions

10.4.22 Data Map Wales Licensed Water Abstractions dataset shows no licensed groundwater or surface water abstractions within the Study Area for the Proposed Development.

10.4.23 Data request will be made to the relevant Local Planning Authorities to request any data held regarding private water supplies within the Study Area.

Water Discharges

10.4.24 Data Map Wales Permitted Discharges dataset shows several permitted discharges to surface waters within the Study Area for the Proposed Development as follows:

- Five associated with the Gwent Europark that discharge site drainage and sewage to the adjacent reen network, indicated to be connected to Petty reen and New Middle Road reen.
- Two associated with the Dwr Cymru Welsh Water Magor Sewage Treatment Works immediately adjacent to (but outside of) the Site boundary but within the eastern extent of the Scoping Red Line Boundary, discharging to Mill reen and the Severn Estuary.
- One private discharge of treated sewage effluent from a domestic property to a tributary of Prat reen, immediately adjacent to (but outside of) the Scoping Red Line Boundary in the east of the Site.
- Private discharges of treated sewage effluent from two domestic properties to Mill reen approximately 700m and 900m north of the Scoping Red Line Boundary.

Water Quality

10.4.25 Surface water and groundwater bodies within the Scoping Red Line Boundary are monitored against the objectives of the Water Framework Directive (WFD). The Scoping Red Line Boundary is located in the Severn River Basin District.

10.4.26 The watercourses within the Study Area are located within the Usk management catchment and reens East operational catchment. Three of the watercourses within the Study Area are monitored against the objectives of the WFD: Monks Ditch -

source to Wainbridge; Monks Ditch - Wainbridge to mouth (also known as Windmill reen as referenced in this report); and Mill reen - source to R Severn Estuary. A summary of Cycle 3 (2021) monitoring results as summarised on the Water Watch Wales Rivers and Waterbodies Map is presented in **Table 10-3**.

Table 10-3 Water Framework Directive Monitoring Data: River Waterbodies (Cycle 3)

	Mill reen - source to R Severn Estuary	Monks Ditch - Wainbridge to mouth	Monks Ditch - source to Wainbridge
Water Body ID	GB109056026860	GB109056026810	GB109056026850
Designation	Artificial	Artificial	Artificial
Overall status	Moderate	Moderate	Moderate
Ecological status	Moderate	Moderate	Moderate
Chemical status	High	High	High

10.4.27 The Severn Estuary along the southern boundary of the Scoping Red Line Boundary is classified as a transitional and coastal waterbody (TRaC). The waterbody is located within the Wye TRaC management catchment and Severn Lower operational catchment. A summary of Cycle 3 (2021) monitoring results as summarised on the Water Watch Wales Rivers and Waterbodies Map is presented in **Table 10-4**.

Table 10-4 Water Framework Directive Monitoring Data: Transitional and Coastal Waterbodies (Cycle 3)

	Severn Lower TRaC
Water Body ID	GB530905415401
Designation	Heavily Modified
Overall status	Moderate
Ecological status	Moderate
Chemical status	Moderate

10.4.28 Groundwater within the Scoping Red Line Boundary is part of the Usk management catchment. The entirety of the Scoping Red Line Boundary and the majority of the wider Study Area is located within the Usk Devonian Old Red Sandstone groundwater body. A small area in the north-east of the Study Area (in the vicinity of Magor and Undy) is located within the Usk and Wye Southern Carboniferous

Limestone groundwater body. A summary of Cycle 3 (2021) monitoring results as captured on the Water Watch Wales Rivers and Waterbodies Map is presented in **Table 10-5**.

Table 10-5 Water Framework Directive Monitoring Data: Groundwater Waterbodies (Cycle 3)

	Usk Devonian Old Red Sandstone	Usk and Wye Southern Carboniferous Limestone
Water Body ID	GB40902G201700	GB40901G206300
Overall status	Good	Good
Quantitative status	Good	Good
Chemical status	Good	Good

10.5 Flood Risk

10.5.1 Flood risk from all sources for the Proposed Development is summarised in **Table 10-6** below.

Table 10-6 Sources of Flood Risk

Flood Risk Source	Comments
Fluvial and Tidal Flood Risk	Review of the DAM web-based viewer shows the entirety of the Proposed Development area and a majority of the wider Study Area to be located in Zone C1, defined as land with a 0.1% (1 in 1,000) AEP or greater risk of flooding from river, tidal or coastal sources, but which is developed and served by significant infrastructure, including flood defences. Review of the Flood Map for Planning shows the entirety of the Site and majority of the wider Study Area is located in Flood Zone 3 associated with flooding from the sea, although this mapping also shows that the wider Study Area is protected by flood defences embankments located along the banks of the Severn Estuary. The Shoreline Management Plan short term and long-term policy for this area is shown to be 'Hold the Line' with no coastal erosion risk predicted. The form, condition and standard of protection provided by the flood defences along with their planned maintenance policies will be investigated further to inform the PEIR, as this detail has not currently been determined for this stage of the EIA. Review of the Flood Map for Planning shows the majority of the Site and Study Area is located in Flood Zone 1 associated with flooding from rivers. The eastern extent of the Site and Study Area is shown to be located in Flood Zones 2 and 3. This is indicated to be attributable to Mill reen, Whitewall reen, Old Convenient reen and Pratt reen.

Flood Risk Source	Comments
	The Study Area is located within the Coast at the Caldicot Levels Flood Warning Area and Coast from Aberthaw to Severn Bridge Flood Alert Area.
Surface Water	Review of the Flood Map for Planning indicates that the vast majority of the Study Area is at very low risk of flooding from surface water sources, with an AEP of less than 1 in 1,000 (0.1%).
Groundwater	The bedrock underlying the Site is classified as merica mudstone group – mudstone[128] which consists of undifferentiated Triassic rock units[129] which falls within the class of 2C meaning it is a low productivity aquifer. Groundwater flood risk has not yet been assessed but will be reviewed to inform the PEIR.
Sewers	Food risk from sewerage systems has not yet been assessed but will be reviewed to inform the PEIR. It is considered likely however that given the rural nature of the Proposed Development that sewer flood risk will be low.
Artificial	Review of the Flood Map for Planning indicates that the Study Area is not at a risk of flooding from reservoirs
Historical	Data Map Wales illustrates no recorded flood extents within the Study Area. This will be reviewed further via consultation with the relevant LLFAs and Strategic Flood Consequences Assessments to ensure a robust review of historical flood extents.

Flood Risk Receptors

10.5.2 Land use within the Site and Study Area comprises agricultural fields which are predominantly used for pasture and arable use that would be classified as less vulnerable development in accordance with Technical Advice Note 15: Development and Flood Risk [130] . A number of farm holdings, residential dwellings, the Appletree Day Nursery, industrial land to the north and the more substantial villages of Whitson, Redwick, Summerleaze, Magor and Undy are located in the Study Area that would be classified as highly vulnerable. The Dwr Cymru Welsh Water Magor

128 BGS GeoIndex Onshore - GeoIndex - British Geological Survey (bgs.ac.uk) [Accessed December 2024].

129 Mangomaps Groundwater Productivity - UK - Interactive Web Map (mangomap.com) [Accessed December 2024].

130 Technical Advice Note 15: Development and Flood Risk (2004) https://www.gov.wales/technical-advice-note-tan-15-development-and-flood-risk-2004 [Accessed December 2024].

Sewage Treatment Works and Safehaven Caravan Storage site are also located in the Study Area that would be classified as less vulnerable.

10.5.3 The Proposed Development would comprise a Solar Farm that will not have permanent staff located on the Site, with the solar arrays lifted off the ground and sensitive equipment can be located with respect to flooding potential. The Proposed Development is therefore classified as less vulnerable.

10.6 Proposed Assessment Methodology

10.6.1 This section describes the approach for the assessment of the effects of the Proposed Development on water environment and flood risk receptors. The proposed approach will be confirmed with NRW and the LLFAs.

10.6.2 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: The Environmental Impact Assessment Methodology.** This section describes how this methodology will be applied, and adapted as appropriate, to address the specific conditions of the Site in relation to the water environment and flood risk.

Relevant Legislation and Guidelines

10.6.3 Relevant key legislation and policy for undertaking assessment of development effects on the water environment and flood risk receptors is listed in **Table 10-7**.

Table 10-7 Legislation and Policy Relevant to the Water Environment and Flood Risk

Document	Description
Legislation	
Water Resources Act 1991 as amended by the Water Act 2003[131]	The Water Resources Act regulates water resources, water quality and pollution, and flood defence. It states that it is an offence to cause or knowingly permit pollution of controlled waters. Part II of the Act provides the general structure for the management of water resources.

131 Water Resources Act 1991 as amended by the Water Act 2003, [Online], available at: https://www.legislation.gov.uk/ukpga/2003/37/contents [Accessed December 2024].

Document	Description
Land Drainage Act 1991[132] and 1994[133]	Sets out the powers and duties held by the relevant authorities associated with flood risk, as well as the responsibilities for maintenance to reduce flood risk. Consent must be obtained for any works which may affect flow within an ordinary watercourse.
Flood and Water Management Act 2010[134]	Created the role of LLFA to coordinate local flood risk management, including review and approval of surface water management systems. Schedule 3 of the Act introduces National Standards for SuDS against which proposed drainage systems should comply.
Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009[135]	The Water Resources Act regulates water resources, water quality and pollution, and flood defence. Part II of the Act provides the general structure for the management of water resources.
Environment (Wales) Act 2016[136]	Aims to enable resources in Wales to be managed in a more proactive, sustainable and joined-up way and to establish the legislative framework necessary to tackle climate change. Includes provisions relating to land drainage and establishes a Flood and Coastal Erosion Committee which oversees and provides guidance on wider risks and benefits of flood and coastal erosion risk management in Wales.
Environment Act 2021[137]	Part of a recent legal framework for environmental protection, specifically targeting water quality and biodiversity enhancement.
Environmental Permitting (England and Wales) Regulations 2016 (as amended)[138]	Makes it an offence to knowingly permit a water discharge activity unless complying with an exemption or environmental permit. Sets out a process to manage

132 Land Drainage Act (1991) [Online], available at: https://www.legislation.gov.uk/ukpga/1991/59/contents [Accessed December 2024].

133 Land Drainage Act (1994) [Online], available at: https://www.legislation.gov.uk/ukpga/1994/25/contents [Accessed December 2024].

134 Flood and Water Management Act (2010) [Online], available at: https://www.legislation.gov.uk/ukpga/2010/29/contents [Accessed December 2024].

135 Water Resources Act (1991) (Amendment) (England and Wales) Regulations 2009 [Online], available at: https://www.legislation.gov.uk/uksi/2009/3104/contents [Accessed December 2024].

136 Environment (Wales) Act (2016) [Online], available at: https://www.legislation.gov.uk/anaw/2016/3/contents [Accessed December 2024].

137 Environment Act (2021) [Online], available at: https://www.legislation.gov.uk/ukpga/2021/30/contents [Accessed December 2024].

138 Environmental Permitting (England and Wales) Regulations (2016) (as amended) [Online], available at: https://www.legislation.gov.uk/uksi/2016/1154 [Accessed December 2024].

Document	Description
	works that have the potential to affect a watercourse under NRW's jurisdiction.
The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017)[139]	The WFD Regulations provide a framework for managing the water environment through environmental objectives and a summary of the programmes of measures required to achieve those objectives.
The Groundwater Regulations (England and Wales) (2009)[140]	Introduces legislation on groundwater in England and Wales and provides rules on the granting of permits by NRW. Additionally, creates an offence for the discharge of hazardous substances or non-hazardous pollution without a permit.
Groundwater (Water Framework Directive) (England) Direction (2016)[141]	Sets out instructions to NRW on obligations to protect groundwater.
Policy	
The Overarching National Policy Statement for Energy (EN-1) (2024)[142] and National Policy Statement for renewable energy infrastructure (EN-3) (2024)[143]	Sets out the Government's policy for delivery of major energy infrastructure and will be the primary basis for decision making. EN-1 states that "these effects could lead to adverse impacts on health or on protected species and habitats and could, in particular, result in surface waters, groundwaters or protected areas failing to meet environmental objectives established under the Water Framework Directive."

139 The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017) [Online], available at: https://www.legislation.gov.uk/uksi/2017/407/contents [Accessed December 2024].

140 The Groundwater Regulations (England and Wales) (2009) [Online], available at: https://www.legislation.gov.uk/ukdsi/2009/9780111480816 [Accessed December 2024].

141 Groundwater (Water Framework Directive) (England) Direction (2016) [Online], available at: https://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksiod_20151623_en.pdf [Accessed August 2024].

142 The Overarching National Policy Statement for Energy (2024) available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf [Accessed December 2024].

143 National Policy Statement for Renewable Energy Infrastructure (EN-3) (2024) [Online], available at: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3 [Accessed December 2024].

Document	Description
National Development Framework (Future Wales: The National Plan 2040)[144]	This is the national development framework for Wales, which has development plan status. **Policy 8 – Flooding** The policy sets out the requirement for sustainable development which puts a priority on nature-based flood management solutions, as well as supporting strategic growth and regeneration in National and Regional Growth Areas. **Policy 19 – Strategic Policies for Regional Planning** The policy states that environmental consideration when planning developments and managing resources is vital, on a strategic and local scale. Environmental issues identified must be fully assessed and addressed. **Policy 33 – Cardiff, Newport and the Valleys** This policy sets out the ambitions for the Cardiff, Newport and Valleys region of Wales. This is inclusive of development and growth strategies with reference to natural resources, climate change, flooding and biodiversity.
Planning Policy Wales Edition 12(2024)[145]	PPW sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales.
Technical Advice Note 15 Development and Flood Risk[130]	TAN 15: Development and Flood Risk (2004) was produced by the then Welsh Assembly Government (now the Welsh Government). TAN15 provides technical guidance which supplements the policy set out in Planning Policy Wales in relation to development and flooding, providing a framework within which risks arising from both river and coastal flooding, and from additional run-off from development in any location, can be assessed. Consultation on an updated version of TAN15 ended in April 2023 and the responses are being reviewed. The draft update includes a range of changes to the guidance, in particular it removes reference to the

144 National Development Framework (Future Wales: The National Plan 2040) [Online], available at: https://www.gov.wales/sites/default/files/publications/2020-11/working-draft-national-development-framework-document-september-2020.pdf [Accessed December 2024].

145 Planning Policy Wales 12th edition (2024) [Online], available at: https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf [Accessed December 2024].

Document	Description
	Development Advice Map (DAM) and refers to a Wales Flood Map held by NRW. However, the consultation draft states that TAN15 (2004) remains current until such a time that the replacement is confirmed.
Newport City Council Local Development Plan (adopted 2015)[146]	Local planning policy that highlights key objectives for the local council, which include the following policies relating to the water environment and flood risk: • GP1 General Development Principles – Climate Change • GP5 General Development Principles – Natural Environment
Monmouthshire County Council Adopted local development plan (adopted 2014)[147]	Local planning policy that highlights key objectives for the local council, which include the following policies relating to the water environment and flood risk: • Strategic Policy S12- draws together specific sustainability issues in relation to efficient resource use and flood risk and provides a framework for sustainable growth which seeks to enable development that both mitigates the causes of climate change and is able to adapt to its likely effects. • Policy SD1 - Renewable Energy sets out requirements for renewable energy schemes
The National Strategy for Flood and Coastal Erosion Risk Management in Wales (2020)[148]	The National Strategy for FCERM in Wales, as required under the Flood and Water Management Act 2010, set out the management approach for risks associated with flooding and coastal erosion across Wales over a 10-year period. NRW are responsible for managing the flood risks from the main rivers and sea across Wales; whilst LLFAs are responsible for managing risks associated with surface water, groundwater and ordinary watercourses.
Sustainable Drainage (SuDS) Statutory Guidance,	The SuDS Statutory Guidance establishes the requirements of Schedule 3 of the Flood and Water

146 Newport Local Development Plan (2011-2026) [Online], available at: https://www.newport.gov.uk/documents/Planning-Documents/LDP-2011-2026/LDP-Adopted-Plan-January-2015.pdf [Accessed December 2024].

147 Monmouthshire Local Development Plan 2011 – 2021 [Online], available at: https://www.monmouthshire.gov.uk/planning-policy/local-development-plan-2011-2021/ [Accessed December 2024].

148 The National Strategy for Flood and Coastal Erosion Risk Management in Wales [Online], available at: https://www.gov.wales/sites/default/files/publications/2020-11/the-national-strategy-for-flood-and-coastal-erosion-risk-management-in-wales.pdf [Accessed December 2024].

Document	Description
Welsh Government Guidance (2019)[149]	Management Act 2010; a framework for the approval and adoption of surface water management systems serving new developments. The SuDS Approval Bodies (SABs) are assigned under the same Act, which give local authorities the responsibility to approve drainage systems for new developments. The overall objective of the legislation is to deliver effective, multi-purpose SuDS, which will remain effective for the lifetime of the development.

Proposed Surveys / Site Visits

10.6.4 A hydrology and flood risk walkover survey will be undertaken by a WSP hydrologist. The objective of the walkover is to visit areas identified within the desk-based review as being of particular hydrological, hydrogeological or flood risk interest. This includes any areas with potential to impact the water environment or be at risk of flooding due to the proximity of certain construction and operational activities to watercourses and flood zones.

10.6.5 The walkover survey will comprise a non-intrusive survey and no monitoring of water quality, sediment, flow or levels is proposed.

EIA Methodology

General Approach

10.6.6 This section describes the proposed approach for the assessment of the effects of the Proposed Development on the water environment and flood risk receptors.

10.6.7 The significance of an effect resulting from the Proposed Development is primarily determined by the value of a given water feature and the magnitude of the effect. For example, in terms of the surface water environment, the key determinants of magnitude relate to surface water quantity (level and flow) and water quality. Depending on the effects on surface water flows, there may also be indirect effects on downstream morphology and sediment dynamics, river water quality and flood risk. Additionally, residual effects will be assessed following the implementation of

149 Sustainable Drainage (SuDS) Statutory Guidance Welsh Government (2019) [Online], available at: https://www.gov.wales/sites/default/files/publications/2019-06/statutory-guidance.pdf [Accessed December 2024].

appropriate mitigation. The method and criteria used to determine value, magnitude, and significance of effect are described in the sections below.

Determination of Significance

10.6.8 The EIA Regulations[150] recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIA Regulations[149] identify those environmental resources that warrant investigation as those that are "*likely to be significantly affected by the development*".

10.6.9 The EIA Regulations[149] do not define significance, and it will be necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.

10.6.10 **Table 10-8** details the basis for assessing receptor sensitivity. The value of water features is normally related to the importance of the surface water or groundwater feature that might be at risk from effects. The criteria used by WSP in the assessment of water feature value are qualitative so professional judgement by the assessor has been required.

Table 10-8 Establishing the Sensitivity of Water and Flood Risk Receptors

Sensitivity	Criteria	Receptor type	Examples
High	Features with a high yield, quality or rarity with little potential for substitution.	Aquatic environment	Conditions supporting a site with an international conservation designation (Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar Site), where the designation is based specifically on aquatic features.

150 The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017), [Online], available at: https://www.legislation.gov.uk/uksi/2017/572#:~:text=10.,provided%20in%20the%20environmental%20statement [Accessed December 2024].

Sensitivity	Criteria	Receptor type	Examples
			Watercourse having a WFD classification shown in a RBMP and Q95 ≥ 1. 0 m^3/s.
	Water use supporting human health and economic activity at a regional scale	Water use	Regionally important public surface water or groundwater supply (and associated catchment/GWMU) or permitted discharge. Groundwater locally supports GWDTE. Source Protection Zone 1.
	Features with a high vulnerability to flooding	Flood risk	Land use type defined as 'Emergency Services' in the TAN15 development categories.
Medium	Features with a medium yield, quality or rarity, with a limited potential for substitution.	Aquatic environment	Conditions supporting a Site with a national conservation designation (e.g., SSSI, National Nature Reserve (NNR)), where the designation is based specifically on aquatic features. Watercourse having a WFD classification shown in a RBMP and Q95 <1.0m3/s.
	Water use supporting human health and economic activity at a local scale.	Water use	Local public surface water and groundwater supply (and associated catchment) or permitted discharge. Licensed non-public surface water and groundwater supply abstraction (and associated groundwater catchment) which is relatively large relative to available resource, or where raw water quality is a critical issue, e.g., industrial process water, or permitted discharge. Groundwater supports GWDTE. Source Protection Zone 2.
	Features with a medium vulnerability to flooding.	Flood risk	Land use type defined as 'Highly vulnerable development' in the TAN15 development categories.
Low	Features with a low yield, quality or rarity, with some potential for substitution.	Aquatic environment	Conditions supporting a Site with a local conservation designation (e.g., SINC, Local Nature Reserve (LNR), County Wildlife Site (CWS)), where the designation is based specifically on aquatic features, or an undesignated but highly/moderately

Sensitivity	Criteria	Receptor type	Examples
			water-dependent ecosystem, including a Local Wildlife Site (LWS) and a GWDTE. Watercourses not having a WFD classification shown in a RBMP and Q95 >0.001m3/s.
	Water use supporting human health and economic activity at household / individual business scale.	Water use	Licensed non-public surface water and groundwater supply abstraction (and associated catchment) which is relatively small relative to available resource, or where raw water quality is not critical, e.g., cooling water, spray irrigation, mineral washing or permitted discharge. Unlicensed potable surface water and groundwater abstraction (and associated catchment) e.g., private domestic water supply, well, spring or permitted discharge. Source Protection Zone 3.
	Features with a low vulnerability to flooding.	Flood risk	Land use type defined as 'Less vulnerable development' in the TAN15 development categories excluding water compatible development equivalent.
Very Low	Commonplace features with very low yield or quality with good potential for substitution.	Aquatic environment	Conditions supporting an undesignated and low water-dependent ecosystem, including an LWS, GWDTE and pond. Watercourses not having a WFD classification shown in a RBMP and Q95 ≤0.001m3/s.
	Water use does not support human health, and of only limited economic benefit.	Water use	Unlicensed non-potable surface water and groundwater abstraction (and associated catchment) e.g., livestock supply. Unproductive strata.
	Features that are resilient to flooding.	Flood risk	Land use type defined as 'Other' paragraph 5.3 in the TAN15 development categories which are 'water compatible' development equivalent and undeveloped land.

10.6.11 **Table 10-9** details the basis for assessing magnitude of change. The magnitude of

change on water environment and flood risk receptors is independent of the value of the receptor, and its assessment is semi-quantitative and based professional judgement.

Table 10-9 Establishing Magnitude of Change

Magnitude	Criteria	Receptor Type	Examples
High	Results in major change to feature, of sufficient magnitude to affect its use/integrity.	Aquatic environment	Deterioration in river flow regime, morphology, or water quality, leading to sustained, permanent or long-term breach of relevant objectives or non-temporary downgrading (deterioration) of WFD status (including downgrading of individual WFD elements) or dependent receptors, or resulting in the inability of the water body to attain Good status in line with the measures identified in the RBMP.
		Water use	Complete or severely reduced water availability and/or quality, compromising the ability of water users to abstract.
		Flood risk	Change in flood risk resulting in potential loss of life or major damage to the property or infrastructure.
Medium	Results in noticeable change to feature, of sufficient magnitude to affect its use/integrity in some circumstances.	Aquatic environment	Deterioration in river flow regime, morphology, water quality, groundwater levels or groundwater flows leading to periodic, short-term and reversible breaches of relevant objectives, or potential temporary downgrading of status of water body status (including potential temporary downgrading of individual WFD elements) or dependent receptors, although not affecting the ability of the water body to achieve future WFD objectives.
		Water use	Moderate reduction in water availability and/or quality, which may compromise the ability of the water user to abstract on a temporary basis or for limited periods, with no longer-term impact on the purpose for which the water is used.

Magnitude	Criteria	Receptor Type	Examples
		Flood risk	Change in flood risk resulting in potential for moderate damage to the property or infrastructure.
Low	Results in minor change to feature, with insufficient magnitude to affect its use/integrity in most circumstances.	Aquatic environment	Slight change in river flow regime, morphology, water quality, groundwater levels or groundwater flows but remaining generally within objectives, and with no short-term or permanent change to status of WFD water body (of overall status or element status) or dependent receptors.
		Water use	Minor reduction in water availability and/or quality, but unlikely to affect the ability of a water user to abstract.
		Flood risk	Change in flood risk resulting in potential for minor damage to property or infrastructure.
Very Low	Results in little or no change to feature, with insufficient magnitude to affect its use/integrity	Aquatic environment	No or very slight change in river flow regime, water quality, groundwater levels or groundwater flows and no consequences in terms of COs or status of WFD surface water body or dependent receptors.
		Water use	No, or very slight change in water availability or quality and no change in ability of the water user to exercise licenced rights or continue with small private abstraction.
		Flood risk	Increased frequency of flood flows, but which does not pose an increased risk to property or infrastructure.

10.6.12 The significance of water-related effects is derived by considering both the value of the feature and the magnitude of change. In this assessment, effects will be considered to be significant or not significant according to the matrix in **Table 10-10**, with 'Major' and 'Moderate' effects taken to be 'Significant'. Significance can be 'Beneficial', 'Adverse' or 'Neutral'.

Table 10-10 Significance Evaluation Matrix

		Magnitude of change			
		High	Medium	Low	Negligible
Sensitivity/ importance /value	**Very high**	Major (Significant)	Major (Significant)	Major (Significant)	Minor (Not significant)
	High	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)
	Medium	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)

Proposed Assessment Methodology

10.6.13 The Proposed Development has the potential to affect the water environment and flood risk during the construction, operation and decommissioning phases. Further activities that are proposed to be undertaken for the Environmental Statement (ES) is outlined below:

- Consultation with NRW and the LLFAs to establish the principal water environment and flood risk issues associated with the Proposed Development;
- Site walkover to ascertain the baseline conditions on Site and in the Study Area;
- Assessment of the potential impacts related to the construction, operation and decommissioning phases of the Proposed Development; and

- Identification of measures to avoid, minimise or mitigate predicted impacts.

10.6.14 The assessment will focus upon defining the characteristics and subsequent potential impacts upon surface water, flood risk and groundwater receptors, including the wider hydrological catchments as categorised by NRW under the WFD. This catchment-based approach enables due consideration to be given to both individual locations where interactions occur and any cumulative impacts within additional water body areas.

Surface Water and Groundwater Resources

10.6.15 At this stage, the assessment of potential impacts that may arise during construction, operation and decommissioning of the Proposed Development is expected to be a qualitative assessment that considers risks to the quality of surface water receptors associated from pollutants and physical modifications that may arise during construction, operation and decommissioning. The potential impacts of the Proposed Development on groundwater receptors will also be a qualitative assessment undertaken with respect to identified groundwater abstractions and other groundwater dependent receptors.

10.6.16 The assessment will broadly follow the simple assessment criteria provided in DMRB Volume 11 Section 3 Part 10 (LA 113).

10.6.17 No water quality sampling, sediment sampling, level monitoring, flow modelling or other qualitative analysis is proposed at this time.

Flood

10.6.18 Potential impacts of the construction, operation and decommissioning phases on flood risk will be assessed in a standalone Flood Consequences Assessment (FCA), which will be submitted as part of the ES. The findings of this assessment will be cross-referenced in the ES.

10.6.19 The assessment will be undertaken in accordance with PPW and its supporting TAN15[128]. The assessment will comprise a qualitative assessment informed by review of readily available data held by NRW and the LLFAs. It is not proposed to undertake quantitative analysis (including modelling or manipulation of existing models) to assess temporary flood risk impacts during construction or

decommissioning, or permanent impacts during operation or post-decommissioning.

10.6.20 The assessment of flood risk during operation will take the potential effects of climate change into account. At this stage it is proposed that this is informed by the NRW Flood map for Planning, relevant SFCAs and information that can be provided by NRW and the LLFAs. The Proposed Development would be designed with an operational life of 40 years.

10.6.21 Construction works are envisaged to be carried out over a period of up to 18 months. Considering the relatively short period of time for construction, it is not proposed to consider the effects of climate change for construction related impacts.

10.6.22 The FCA will be supported by a standalone drainage strategy that sets out how surface water runoff will be managed during operation of the Proposed Development. The management of surface water flood risk during construction of the Proposed Development is not proposed to be discussed in the FCA and instead will form part of the outline Code of Construction Practice (CoCP).

10.7 Description of Likely Significant Effects

Potential Receptors

10.7.1 The water environment receptors identified during this high-level assessment which could potentially be affected by the Proposed Development comprise of:

- Aquatic environment receptors – watercourses;
- Water resources receptors – water supplies, groundwater resources and abstractions. GWDTEs; and
- Flood risk receptors - people, property, and infrastructure at risk of flooding, including the Proposed Development.

10.7.2 The potential water environment receptors are summarised in **Table 10-11** and presented in **Figure 10-2**.

Table 10-11 Potential Receptors

Receptor	Reasons for consideration
Aquatic environment receptors	
Monks Ditch, Windmill reen (Yoke reen) and Mill reen	Watercourses defined as Main Rivers and WFD monitored waterbodies. Potential for direct and indirect impacts on water quality and flow.
Elver Pill reen, Cold Harbour reen, Collister Pill, Back Ditch, New Middle Road reen, Ridings & 100 Perches, Petty reen & Stutwall Link	Watercourses defined as Main Rivers. Potential for direct and indirect impacts on water quality and flow.
Hare's reen, Parish reen, Crabtree reen, Meres reen, Bowleaze reen, Cock Street reen, Cockenton reen, South Row reen, Whitewall reen, Prat reen and Chapel reen.	Watercourses defined as Ordinary Watercourses. Potential for direct and indirect impacts on water quality and flow.
Water resources receptors	
Usk Devonian Old Red Sandstone	WFD groundwater body. Potential for impacts on WFD status as a result of changes to groundwater quality.
Usk and Wye Southern Carboniferous Limestone	WFD groundwater body. Potential for impacts on WFD status as a result of changes to groundwater quality.
Private water supplies	Potential for indirect impact associated with changes to groundwater flow and quality.
Magor Marsh nature reserve	GWDTE. Potential for indirect impact associated with changes to groundwater flow and quality.
Flood risk receptors	
Residential properties, childcare facilities, vulnerable industry/business properties	Land use type defined as highly vulnerable development under the TAN15[130] guidance. Potential for increased flood risk due to changes in surface water runoff rates and volumes, watercourse crossing, and (in the east of the Site) changes to fluvial flood conveyance and storage.
Agricultural land, sewage treatment works, less vulnerable industry/business properties	Land use type defined as less vulnerable development under the TAN15[130] guidance. Potential for increased flood risk due to changes in surface water runoff rates and volumes, watercourse crossing, and (in the east of the Site) changes to fluvial flood conveyance and storage.

Receptor	Reasons for consideration
The Proposed Development	Land use type defined as less vulnerable development under the TAN15[130] guidance. Potential for flood risk due to location of development in areas identified to be at risk of flooding.

Likely Significant Effects

10.7.3 The likely significant effects on the water environment and flood risk for the construction, operational and decommissioning phases of the Proposed Development that will be taken forward for assessment in the Environmental Statement are summarised below and in **Table 10-12**.

Construction

10.7.4 During construction, it is considered likely that significant effects to surface water features, groundwater features and flood risk could arise from:

- Pollution risks to adjacent watercourses and to ground from spillage of fuels or other harmful substances that may spill directly into or migrate to downstream surface water and groundwater receptors (including private water supplies);
- Pollution risk to adjacent watercourses from sedimentation caused by surface water runoff from areas of bare earth, construction materials such as aggregate, stockpiles of topsoil or discharge of groundwater dewatering, with potential transport to downstream receptors;
- Direct impact to watercourses associated with required watercourse crossings, diversions or other physical modifications;
- Impact to quality attributes and WFD classification of the WFD monitored waterbodies within the Study Area of the Proposed Development;
- Direct impact or changes to groundwater aquifers and groundwater private water supplies, either within the footprint of the Proposed Development or as a result of changes to groundwater flows and levels associated with potential dewatering activities;

- Loss or changes to GWDTEs as a result of severance of habitat or as a result of changes to groundwater flows and levels associated with dewatering activities; and
- Potential for increased flood risk associated with temporary works in areas identified to be at risk of flooding or creation of groundwater flow barriers from intrusive earthworks that extend below the groundwater table.

Operation

10.7.5 During operation, it is considered likely that significant effects to surface water features, groundwater features and flood risk could arise from:

- Polluted surface water runoff and spillage risks that may migrate or be discharged to surface water features or groundwater resources either directly or via the proposed drainage system;
- Impact to quality attributes and WFD classification of the WFD monitored waterbodies within the Study Area of the Proposed Development
- Increased rates and volumes of surface water runoff or changes to catchment hydrology from a change to current land use;
- Increased flood risk to people, property and infrastructure located in the Study Area from changes to flood flow conveyance and storage.
- Flood risk to the Proposed Development from construction of the Proposed Development in areas identified to be at risk of flooding.

Decommissioning

10.7.6 For the purpose of this assessment, it has been assumed that the Proposed Development would be decommissioned and dismantled at the end of the operational lifetime. Potential impacts that may arise during the decommissioning phase are considered to be the same or less significant to those discussed above for the construction phase. All cables would be cut at depth below ground level and left in the ground, thus reducing the overall impact of decommissioning on sensitive features. It is also proposed that any new crossing points would remain in-situ to avoid damage or disturbance to watercourses.

Summary

Table 10-12 Elements Scoped in or out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Quality of surface water and groundwater resources	Construction, Operation and Decommissioning	✓		Construction and decommissioning works have the potential to impact the quality of water resources from increased pollution risk and any potential works to surface water features. The methodology of construction and details of the proposed works are uncertain at this stage. Operation of the Proposed Development has the potential to pose risk to the quality of the water resources from routine runoff and spillage. Details of operational activities are uncertain at this stage.
Private water abstractions	Construction, Operation and Decommissioning	✓		There is the potential for physical impacts to private abstractions located within the Proposed Development area and Study Area that may be impacted during construction (surface water and groundwater quality and flow). It is considered unlikely that the Proposed Development would pose a permanent risk to private abstractions during operation, but as details of the proposed works are uncertain at this stage this is currently scoped in.
GWDTE	Construction, Operation and Decommissioning		✓	It is considered unlikely that the Proposed Development would pose risk to the identified GWDTE that is located upstream of the Site.
WFD Water Bodies	Construction, Operation and Decommissioning	✓		There is the potential for direct and indirect impacts on WFD waterbodies based on available information for the Proposed Development and the proximity of identified WFD waterbodies.

Element	Phase	Scoped In	Scoped Out	Justification
Flood risk receptors	Construction, Operation and Decommissioning	✓		Construction, operation and decommissioning of the Proposed Development may temporarily or permanently increase surface water runoff, reduce watercourse flow conveyance, reduce the capacity of the existing floodplain storage and/or impact the existing flood flows.
Proposed Development	Construction, Operation and Decommissioning	✓		Part of the Proposed Development site is located within an area identified to be at flood risk.

10.8 Opportunities for Enhancing the Environment

10.8.1 Opportunities for enhancing the water environment and flood risk are considered limited at this stage of the assessment. However, the Proposed Development may offer opportunity to enhance or reinstate the network of drainage features within the Site. This will be considered further during the course of the assessment and in consultation with NRW and the LLFAs.

10.9 Mitigation

10.9.1 Potential impacts to the water environment and flood risk arising from the Proposed Development will be avoided as much as possible through the design process and through careful construction and the use of standard good practice measures. The assessment will therefore be undertaken on the basis that a number of standard measures are assumed to be in place during construction and therefore are considered to be 'embedded mitigation'. These measures include the use of appropriate drainage design, the use of runoff and sediment control measures where necessary and through the implementation of good working practice and adherence to a Construction Environmental Management Plan (CEMP), an outline of which will be provided in the ES.

10.9.2 The CEMP will include as a minimum:

- Adoption of best practice pollution prevention, drainage control, and waste management procedures;
- Control of drainage and sediment runoff from excavation areas and any access tracks;
- Agreement on watercourse crossing schedule (method and type of structure);
- Control of drainage and sediment runoff during the construction of watercourse crossings (where applicable);
- Control of concrete pouring; and
- Appropriate design of foundation installation, the management of soil water levels and the potential to generate excessive quantities of groundwater contaminated sediments.

10.9.3 It is expected that buffer distances to watercourses will be maintained at a minimum of 7m from top of bank across the Site.

10.9.4 The approach to watercourse cable crossings has not yet been agreed however the proposed method will be informed by the sensitivity of the watercourse, with trenchless construction techniques applied where appropriate.

10.9.5 Within the Scoping Red Line Boundary, existing internal tracks, points of access and field gates would be utilised during construction and operation, as required, however, in cases where these tracks need to be upgraded, or new tracks constructed a Type 1 track would be constructed to provide access. The internal tracks would be 5 m wide and comprised of compacted stone.

10.9.6 It is anticipated that the internal tracks would be routed outside of the yet to be determined designated buffer zones for watercourses, except for instances where they are crossing from one field to another. Where there will be a requirement to cross a watercourse, different temporary methods may be required dependent on the ground conditions and environmental constraints present within the Site. All scenarios would include a drainage trench up to 0.7m deep running along the length of the road.

10.9.7 An outline drainage strategy for the operation phase will be produced as part of the FCA to accompany the ES.. The strategy will incorporate the use of appropriate SuDS techniques as required, treating and infiltrating/attenuating surface water run-off generated from the Site, prior to discharging into the local surface water network at an agreed rate. The anticipated impact to water quality during the operation phase is anticipated to be minimal.

10.9.8 The solar arrays will be mounted above ground level to minimise loss of flood storage. At this stage it is assumed the panel modules would be mounted on structures with a clearance level above ground level (agl) of up to approximately 1.0m, and a maximum upper height of 3.52m agl. The height of the arrays will be informed by predicted flood levels over the operational life of the Proposed Development.

10.9.9 There would be a separation distance of approximately 1-2 cm between the rows of modules. The gaps will be maintained between each panel on the arrays to prevent an accumulation of rainwater runoff and to replicate greenfield response.

10.10 Limitations and Assumptions

10.10.1 The scope of the assessment is based on a high-level review of desk-based baseline information and will be confirmed through review of additional data sources, site visit and further consultation with stakeholders (NRW, LLFAs) during the next stages of the EIA. A site visit will be conducted to confirm the desk reviews of the hydrological baseline environment and review if the local mapped surface water features are hydrologically active.

10.10.2 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The scope of this chapter is based on the Scoping Red Line Boundary and will be reviewed and amended in response to such matters as refinement of the Proposed Development.
- Residual risk is that which remains after the flood risk management measures set out above have been taken into account. It is anticipated that as the assessment of potential impacts would inform the design of the

Proposed Development and best practice measures would be implemented during the construction, operation and decommissioning of the Development, that significant residual effects upon the hydrological environment would be avoided. However, if potential significant residual effects to the geological and water environment are identified through the assessment process described above, suitable mitigation measures will be set out in the subsequent EIA.

- A FCA will be produced in accordance with the TAN15[130] as the Study Area is within Flood Zone 3. The FCA will be produced to accompany the full EIA report and will demonstrate how flood risk to the Proposed Development and any potential to increase flood risk to third parties due to the Proposed Development, will be managed over its lifetime. As part of this, the effects of climate change will be given due consideration. The FCA will include an outline surface water drainage strategy. The most suitable surface water drainage strategy for the Study Area will be ascertained by undertaking a high-level SuDS Assessment considering the SuDS hierarchy.

11.0 Ground Conditions

11.1 Introduction

11.1.1 This Chapter considers the potentially significant effects of the Proposed Development during Construction, Operation and Decommissioning on soil resources including agricultural land, geology, land contamination receptors (humans, the water environment, ecology, property), and mineral resources.

11.1.2 This Chapter includes the following information:

- The baseline conditions for soils, agricultural land, geology, land contamination, and minerals are described in **Section 11.4**.
- The proposed assessment methodology is in **Section 11.5**. Two methodologies are provided, one used for assessing effects on soils, including agricultural land, geology and mineral receptors, and one for assessing effects on land contamination receptors (this looks at potential changes in contaminated land risk to receptors due to the Proposed Development).
- The effects identified as potentially significant, and effects proposed to be scoped out are detailed in **Section 11.7**.
- Proposed mitigation measures are detailed in **Section 11.8**.
- Limitations and assumptions are explained in **Section 11.9**.

11.2 Consultation

11.2.1 No consultation has been undertaken to date in relation to the ground conditions aspects considered in this Scoping chapter. Consultation will be undertaken with the local planning authorities to inform the Phase 1 Geoenvironmental Desk Study for the Proposed Development.

11.3 Study Area

11.3.1 Likely effects of the Proposed Development on soil resources including agricultural land, geology and mineral receptors include temporary and permanent effects during construction. Temporary effects can occur during construction activities including vehicle/plant movements, and soil excavation. Permanent effects can include removal of rock or soil for construction of buildings / infrastructure, covering of rock or soil with structures or hardstanding, or sterilization of mineral resources due to permanent development. In general, the type of effects described above will occur within the Proposed Development application boundary, as rock, minerals and soils are geographically discrete. However, for EIA Scoping, an external zone of influence (ZoI) of 250 metres (m) beyond the Proposed Development Scoping Red Line Boundary (onshore only) shown in **Figure 11-1**, has been applied for soil resources including agricultural land, geology and mineral receptors. This ensures that potential effects on offsite geological features, minerals and soil resources including agricultural land are considered. These effects could include fragmentation of soil resources / agricultural land or geological features (e.g., due to hard development within the Proposed Development site).

11.3.2 Furthermore, the hydrogeological effects of construction activities such as dewatering excavations, if needed, could extend beyond the Proposed Development application boundary to affect offsite soil resources and agricultural land. Consideration of hydrogeological effects is included in **Chapter 10: Water Environment and FRA**.

11.3.3 The Study Area for land contamination receptors shown in **Figure 11-2** includes the Proposed Development Scoping Red Line Boundary (the Site) and, for the purposes of scoping the impact assessment, a 500m ZoI beyond the boundary, including the Severn Estuary, to include assessment of potential effects on surface water and ecology in the estuary due to potential contaminant migration. This ZoI is selected as a likely maximum (worst-case) distance beyond which it is unlikely a receptor could potentially be significantly impacted by contaminants migrating from the Scoping Red Line Boundary, or that offsite land contamination could migrate to significantly impact land within the Scoping Red Line Boundary. The ZoI has been set with consideration of the potential for contaminant degradation, dilution and

dispersion in the environment, using the information on the Site and the surrounding area as detailed in the baseline in **Section 11.3** to define an initial conceptual model, as explained in **paragraph 11.3.4.**

11.3.4 The assessment of potential effects on land contamination receptors is based on a conceptual model which considers:

- the environmental setting of the Proposed Development boundary and Study Area (including, but not limited to, geology, hydrogeology and hydrology);
- the nature and extent of identified potential contamination sources, potential receptors (e.g., humans – human health, groundwater or surface water – controlled waters, ecology – including designated conservation areas, or property – such as grazing livestock); and
- available pathways for receptors to be exposed to contaminants.

11.3.5 Land contamination receptors can be affected by development due to ground disturbance in areas where existing contamination is present, as changes to the ground can expose contaminants and result in the creation of new contaminant migration pathways. Changes in land use can also result in the introduction of new land contamination receptors. Land contamination can be caused by construction work, such as due to fuel or oil spills from construction plant or storage tanks, or by cross-contamination of excavated materials.

11.3.6 At a later stage of the assessment, based on information obtained through further desk-based assessment and surveys, or design changes, it may be possible to refine the Study Area in regard to land contamination receptors (i.e., reducing the zone of influence).

11.4 Baseline Conditions

11.4.1 The following sections described the baseline conditions relevant to this Chapter.

Land Use

11.4.2 The Site is entirely within the Gwent Levels, a flat and low-lying landscape, typically at <10m above Ordnance Datum (AOD), created by reclamation of marshland and intertidal areas, used for agriculture, and drained by reens (ditches). The land is predominantly pasture. Ecological survey completed for the Proposed Development identifies this as mainly improved grassland[151], with some land used for cereal production (including maize, ryegrass ley, and barley[1]). In addition to crop growing, other agricultural activities within the Scoping Red Line Boundary and / or Study Area are likely to include dairy farming, sheep and cattle rearing, and horse grazing[152].

11.4.3 The Wales Coast Path runs along the coastline southwest to northeast, immediately southeast of the Site, and beyond this there is a seawall along the Severn Estuary.

11.4.4 Commercial land uses within the Proposed Development application boundary are limited. The Whitson Substation (covering ~4.0 hectares (ha) in total) is in the northwest of the Scoping Red Line Boundary. There are some commercial and industrial land uses in the Study Area, including a sewage works immediately northeast of the Proposed Development application boundary and Llanwern Works (former steelworks) complex 530m north (for further details of the steelworks see **paragraph 11.4.34**). The Llanwern solar farm is adjacent to the Site in the west, and a small substation (~0.3 ha) associated with the solar farm is within the Scoping Red Line Boundary, approximately 350 metres (m) southeast of the Whitson Substation.

Soils and Agricultural Land

11.4.5 The LandIS Soilscapes map indicates the soil type within the Scoping Red Line Boundary predominantly comprises loamy and clayey soils of coastal flats with naturally high groundwater (type 21), these soils have medium carbon storage

151 GE Consulting (2024) Figure: Future Energy Llanwern PEA Update 2023.
152 Natural Resources Wales (2014). National Landscape Character: NLCA34, Gwent Levels.

potential and support wet brackish coastal flood meadow habitat. They are typically drained to enable agricultural use. The lighter soils present can support a wide range of crops and are highly productive as they contain much available water and are stoneless and flat. Heavier soils present are less easily worked and favour grass.

11.4.6 The Welsh Government Peatlands of Wales map[153] does not show any peatland within the Scoping Red Line Boundary or the Study Area for soils. In Wales deep peat is defined as having a thickness of >0.4m organic material in the upper 0.8m of a soil profile, or >0.3m thickness of organic material resting directly on bedrock[154]. The Scoping Red Line Boundary is likely to avoid peat meeting the definition of deep peat. Some peat may be present locally at depth, as layers within alluvial deposits (see **paragraph 11.4.13**) in the Scoping Red Line Boundary. Given the recorded depths, this peat is unlikely to be disturbed by the Proposed Development.

11.4.7 The Agricultural Land Classification (ALC) system provides a method for assessing the quality of farmland in England and Wales[155]. Land is divided into five grades, of which 1 is the best and 5 is the worst. Grade 3 is subdivided into Subgrades 3a and 3b.

11.4.8 The Predictive Agricultural Land Classification (ALC) Map 2[156] shows most of the site to be ALC grade 3b (see definitions in **Table 11-1**), with localised areas of grade 4 shown east of Elver Pill Reen and south of Redwick. The Welsh Government requires ALC survey for proposed developments where the predictive map indicates that best and most versatile (BMV) land (ALC grades 1, 2 or 3a) is present. Based

153 Welsh Government (2022) Peatlands of Wales. Online. Available at: https://datamap.gov.wales/layers/geonode:peatlands_of_wales_scg8. [Accessed December 2024].

154 Natural Resources Wales (2020) National Peatland Action Programme, 2020-2025. Online. Available at: https://cdn.cyfoethnaturiol.cymru/media/692545/national-peatlands-action-programme.pdf. [Accessed December 2024].

155 Ministry of Agriculture, Fisheries and Food (1988) Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land. Online. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20130402151656/http:/archive.defra.gov.uk/foodfarm/landmanage/land-use/documents/alc-guidelines-1988.pdf. [Accessed December 2024].

156 Welsh Government (2019) Predictive Agricultural Land Classification (ALC) Map 2. Online. Available at: https://datamap.gov.wales/layers/inspire-wg:wg_predictive_alc2. [Accessed December 2024].

on the predictive ALC map showing grades 3b and 4, the Site has limited potential to include BMV land. As described in **paragraph 11.4.2** most agricultural land within the Proposed Development application boundary is pasture and some fields are used to grow cereal crops.

11.4.9 The Welsh Government also publishes the results of detailed ALC field surveys[157], however, these are limited in coverage and there are no reports available within the Site. Within the Study Area for agricultural land and soils immediately north of the Site, a post 1988 ALC survey identified non-agricultural land (land associated with Llanwern Steelworks) and Grade 4 land to the east and west of this.

Geology

11.4.10 The BGS 1:50,000 scale mapping on the GeoIndex shows no artificial or made ground in the Scoping Red Line Boundary, however, reworked natural materials and potentially imported material are likely to be present within parts of the Scoping Red Line Boundary given the historical land reclamation activity and the extensive artificial drainage network and access tracks serving the Gwent Levels farmland (see also **paragraph 11.4.2**).

11.4.11 Superficial geology shown across the Site, and within most of the 250m ZoI, comprises Holocene era tidal flat deposits. These are mainly mud flat and sand flat deposits, forming extensive nearly horizontal marshy land in the intertidal zone that is alternately covered and uncovered by the rise and fall of the tide. They consist of unconsolidated sediment, mainly mud and/or sand[158].

11.4.12 Bedrock is the Mercia Mudstone Group, comprising usually red, less commonly green-grey, mudstones and subordinate siltstones with thick halite-bearing units in some basinal areas. Thin beds of gypsum/anhydrite are widespread, and thin sandstones are also present.

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157 Welsh Government (2017) Post 1988 Agricultural Land Classification (Wales) Surveys. Online. Available at: https://datamap.gov.wales/layers/inspire-wg:Post_1988_ALC_Wales_Surveys. [Accessed December 2024].

158 BGS. The BGS Lexicon of Named Rock Units. Online. Available at: https://webapps.bgs.ac.uk/lexicon/lexicon.cfm?pub=TFD. [Accessed December 2024].

11.4.13 Review of BGS borehole records within the Scoping Red Line Boundary confirms some localised subsurface peat layers of up to approximately 4m in thickness. No made ground was recorded within the Site, however, the presence of made ground was recorded south of the Scoping Red Line Boundary near the seawall. The Mercia Mudstone Group bedrock was encountered at depths ranging from 10.67m bgl to 14.0m bgl. A summary of the logs reviewed is provided below.

- A BGS borehole record in a field close to the Wales Coast Path in the southwest of the Scoping Red Line Boundary[159] encountered topsoil and silty clay to 3.7m bgl, underlain by peat to 5.5m bgl (1.8m thickness), then silty clay to 12.2m bgl, silt and gravel to 14.0m bgl, where the 'red marl' Mercia Mudstone Group bedrock was encountered.
- A BGS borehole approximately 25m southeast of the southeast area of the Scoping Red Line Boundary[160], close to the seawall, records made ground extending to 5.6m below ground level (bgl). The made ground comprised clay with gravel to 0.5m bgl, sandy silty clay with some concrete content to 2.5m bgl, and sandy silty clay with pockets of find sand and occasional organic pockets to 5.6m bgl. This made ground is likely to be associated with the construction of the seawall and coastal path.
- A BGS borehole record in the north of the Scoping Red Line Boundary[161] includes logs for a series of trial bores, mainly located further north (offsite) within the Llanwern Steelworks. One borehole within the Scoping Red Line Boundary went to 16.2m bgl, encountering 0.15m of topsoil, underlain by clay to around 5.5m bgl, a 2.0m thick layer of black fibrous peat was then encountered, extending to 7.5m bgl, the peat was underlain by sand with clay and peat inclusions, then sandy gravel and shells, then sand with

159 BGS. BGS ID: 385304: BGS Reference: ST38SE2, British National Grid (27700): 339560, 182910. Available at: https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/385304. [Accessed December 2024].

160 BGS. BGS ID: 387087: BGS Reference: ST48SW4, British National Grid (27700): 343290, 184430. Online. Available at: https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/387087. [Accessed December 2024].

161 BGS. BGS ID: 385060: BGS Reference: ST38NE38, British National Grid (27700): 339880, 185080. Online. Available at: https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/385060. [Accessed December 2024].

shell fragments to 12.2m bgl. A gravel layer was encountered between 12.2m bgl and the base of the borehole at 16.2m bgl. A deeper borehole c.400m north of the Site (ST 3966 8573) recorded bedrock of marl at 11.4m bgl.

11.4.14 A BGS borehole record approximately 28m northeast of the Scoping Red Line Boundary, east of Whitson Substation[162], encountered 0.15m of topsoil, underlain by soft clay to 4.72m bgl, then 4.12m thickness of peat. The peat extended to 8.84m bgl and was underlain by alluvium (soft clay) to 10.67m, which was directly underlain by bedrock of the Mercia Mudstone Group (referred to in the log as Keuper Marl).

Geodiversity

11.4.15 Information on DataMap Wales confirms that there are no Geological Conservation Review (GCR) sites or Regionally Important Geodiversity Sites (RIGS) within the Study Area.

Minerals

11.4.16 The BGS GeoIndex does not identify mineral extraction sites within the Site. The river terrace deposits (superficial sand and gravel) immediately southeast of the Scoping Red Line Boundary in the Severn Estuary are identified as a mineral resource.

11.4.17 The Monmouthshire County Council Local Plan[163] and Newport City Council Local Plan[164] show the Scoping Red Line Boundary and Study Area are not within a Mineral Safeguarding area.

11.4.18 The Coal Authority Interactive Map confirms that the Scoping Red Line Boundary and Study Area are not within a Coal Mining Reporting Area.

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162 BGS. BGS ID: 385034: BGS Reference: ST38NE12, British National Grid (27700): 337448, 185496. Online. Available at: https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/385034. [Accessed December 2024].

163 Monmouthshire County Council (2024) Interactive Local Development Plan Map, Online. Available at: https://www.monmouthshire.gov.uk/planning-policy/interactive-local-development-plan-mapping/ [Accessed December 2024].

164 Newport City Council Local Development Plan (2011), Online. Available at: https://www.newport.gov.uk/en/Planning-Housing/Planning/Planning-policy/Local-Development-Plan/Local-Development-Plan.aspx [Accessed December 2024].

Hydrogeology

11.4.19 The BGS aquifer classification mapping for Wales (BGS GeoIndex) shows that the tidal flat deposits underlying the Site are classed as unproductive strata, indicating they generally have low permeability, and the bedrock underlying the Site is classed as a secondary B aquifer. The secondary B aquifer classification indicates mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers.

11.4.20 The Study Area lies within the Severn groundwater body for the Usk Devonian Old Red Sandstone. Cycle 3 monitoring from 2015 reported on DataMap Wales records that the overall quality of the aquifer was good.

11.4.21 Information on DataMap Wales confirms that the site is not within a groundwater source protection zone (SPZ).

Hydrology

11.4.22 There are numerous reens within the Site and in the Study Area, typically running in a grid pattern along field boundaries. The reens are man-made drainage channels, managed by the Caldicot and Wentlooge Levels Internal Drainage Board. Named reens within the Site include Elver Pill Reen, Windmill Reen, Daycroft Reen, Cold Harbour Reen, Mill Reen and Prat Reen running generally northwest to southeast and discharging to the Severn Estuary at Portland Ground.

11.4.23 The Mill Reen – source to River Severn Estuary in the Usk management catchment was classed by Natural Resources Wales as having overall moderate water quality in 2021 (i.e., not meeting the target of 'good' status)[165]

11.4.24 The flood risk of the Site and surrounding land is described in detail in **Chapter 10: Water Environment and FRA**.

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165 Welsh Government (2019) Data Map Wales https://datamap.gov.wales/maps/new?layer=geonode:nrw_wfd_cycle_3_classifications#/. [Accessed December 2024].

Ecology

11.4.25 The presence of ecological receptors with potential to be impacted by the Proposed Development is discussed in detail in **Chapter 8: Ecology**.

11.4.26 The Site is located within the Gwent Levels, which are designated as a Site of Special Scientific Interest (SSSI) (Gwent Levels - Redwick and Llandevenny). The citation[166] states that:

11.4.27 "The Gwent Levels constitute the lowlands between Cardiff and Chepstow and are drained by an ordered network of drainage ditches. They are an example of one of the most extensive areas of reclaimed wet pasture in Great Britain…The Gwent Levels reens are rich in plant species and communities, many of which are rare or absent in other Levels systems. This is due to the variety of reen types and their management regimes and the timing of the management which results in a staggered programme across the Levels. The regular maintenance of some reens provides conditions for submerged species… and openwater emergents… to flourish. Others are less intensively managed and some have become completely overgrown by weeds and hedges."

11.4.28 The Severn Estuary SSSI is immediately beyond the southern boundary of Gwent Levels SSSI. The Severn Estuary is also designated as a Ramsar Site, a Special Area of Conservation (SAC) and a Special Protection Area (SPA). The Ramsar citation[167] includes that: "The Severn Estuary is a large estuary with extensive intertidal mudflats and sandflats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh with freshwater ditches and occasional brackish ditches. The seabed is rock and gravel with subtidal sandbanks."

11.4.29 DataMap Wales records no Local Nature Reserves (LNR) or National Nature Reserves (NNR) within the Scoping Red Line Boundary or the Study Area.

166 Local Environmental Records Centres (LERC) Wales. Online. Available at: http://citations.lercwales.org.uk/sssi/571. [Accessed December 2024].

167 Joint Nature Conservation Committee (JNCC). Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11081.pdf [Accessed December 2024].

Land Contamination

11.4.30 To date, Monmouthshire County Council has not declared any land to be "Contaminated" under Part IIA of the Environmental Protection Act 1990[168]. A 2016 report on contaminated land in Wales[169] records that two sites were determined as statutory contaminated land in Newport in 2011, however, no further details of the sites are provided and none can currently be obtained via the Newport City Council website.

11.4.31 Based on the review of data, as detailed in **Table 11-1** recent and historical land uses have been identified on the Site and in the Study Area (500m buffer around the Scoping Red Line Boundary) that have the potential to have resulted in land contamination. These are summarised below.

11.4.32 Most of the Site comprises agricultural fields. Although fields are generally likely to be free of significant contamination, agricultural activities can result in contaminants being released to ground due to the use of fuels and oils, chemicals, sewage sludge application, herbicides and pesticides, or ad hoc waste disposal / tipping to ground. Farm buildings or sheds with asbestos content can be a potential source of contamination if in poor condition, derelict or demolished on the site. Where they occur, contaminants on agricultural land will typically only be present as small-scale localised contamination, or as diffuse low-level contamination.

11.4.33 The National Grid 275kV Whitson Substation is in the northwest of the Scoping Red Line Boundary. According to aerial imagery on Google Earth Pro the substation was present by 1985, oil-filled equipment and oil filled cables are likely to be present. The substation site is old enough to have used oils with polychlorinated biphenyl (PCB) content.

168 Monmouthshire County Council. Contaminated Land. Online. Available at: https://www.monmouthshire.gov.uk/contaminated-land/. [Accessed December 2024].

169 Natural Resources Wales (2016) The State of Contaminated Land in Wales. Online. Available at: https://naturalresourceswales.gov.uk/search?lang=en&query=contaminated%20land. [Accessed December 2024].

11.4.34 A small substation is present southeast of the Whitson Substation, within the Scoping Red Line Boundary (ST 37573 85248 associated with existing solar farm to its south and southeast, which are adjacent to the Scoping Red Line Boundary. Based on aerial photography (Google Earth Pro) this dates from 2020 and is likely to relate to an adjacent solar farm immediately southwest of the Site which was present by 2021.

11.4.35 Part of the cable corridor for the Proposed Development runs adjacent to a solar farm in the west of the Site (at ST 38739 84163).

11.4.36 The Study Area for land Contamination includes land approximately 35m northeast of the Scoping Red Line Boundary and the Whitson Substation was historically part of the Llanwern Steelworks (ponds and open storage of stockpiled raw material or wastes are visible on aerial photography from 2004). Part of North Row, included in the north of the Scoping Red Line Boundary, is immediately southeast of land that appears to have been used as former ponds associated with the steelworks. The main steelworks process was north of Queen's Way (the A4810) (now 'Llanwern Works' with various commercial operations present) and is outside the Study Area for land contamination, except for its southeastern corner, however, industrial developments south of the road are connected to that site by pipelines (a pipe bridge is visible). Although the steelworks is largely demolished, the area is still in industrial use, operators south of the A4810 road include Air Products, Newport Galvanisers, Tarmac Llanwern (concrete plant) and Hanson Cement. North of the A4810 was the main operational area of the steelworks. Some steel production is still undertaken. TATA Steel produce strip steel for UK and European markets via the pickle line and cold mill at Llanwern Steelworks. Processes undertaken by TATA include pickling and oiling of hot rolled coils of steel, cold rolling of hot rolled pickled steel, galvanising and an automotive finishing line[170]. Newport City Council planning application information[171] indicates contaminated land remediation has taken place on a former

[170] TATA Steel. Online. Available at: https://www.tatasteeleurope.com/construction/sustainability/performance-at-our-sites/llanwern. [Accessed December 2024].

[171] Newport City Council. Planning Portal. Available at: https://documents.newport.gov.uk/PublicAccess_LIVE/SearchResult/RunThirdPartySearch?FileSystemId=PL&FOLDER1_REF=24/0468. [Accessed December 2024].

coking works area in the west of the steelworks, northwest of the Study Area for land contamination. Contaminants associated with steelworks and coking works include heavy metals, inorganic compounds such as fluoride, ammoniacal liquor, cyanide, sulphates and phosphates, and organic compounds such as phenols, tars, fuels and oils[172].

11.4.37 A sewage works is immediately east of the Scoping Red Line Boundary (at ST 43705 84991).

11.4.38 The Mead Farm which includes large sheds and outbuildings is 25m north of the Proposed Development application boundary (at ST 40715 83916). Large farms with outbuildings are located at Sea St Lane 65m northeast north of the Proposed Development application boundary (at ST 41321 83939) and S Row immediately northwest of the Site (at ST 41742 84030). A commercial site, South Wales Sports Grounds Limited, is immediately east of the Scoping Red Line Boundary at Pill St (at ST 42710 85011), and agricultural and/or commercial land uses are visible at Mill Reen north of the Scoping Red Line Boundary (at ST 43372 85407).

Table 11-1 Data Sources

Data Provider	Data Source	Description of Data
British Geological Survey (BGS)	Onshore GeoIndex[173]	Includes superficial and bedrock geology maps and borehole records, aquifer classifications, information on mineral extraction.
Coal Authority	The Coal Authority Interactive Map[174]	Shows whether sites are in a Coal Authority Reporting Area and provides information on former mining features.

172 Department of the Environment (1995) Industry Profile: Metal manufacturing, refining and finishing works. Online. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20140328084622/http://publications.environment-agency.gov.uk/pdf/SCHO0195BJKT-e-e.pdf. [Accessed December 2024].

173 BGS. GeoIndex. Online. Available at: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/. [Accessed December 2024].

174 The Coal Authority. The Coal Authority Interactive Map. Online. Available at: https://mapapps2.bgs.ac.uk/coalauthority/home.html. [Accessed December 2024].

Data Provider	Data Source	Description of Data
Welsh Government	DataMap Wales[175]	Provides public sector data for Wales including maps and downloadable spatial data including peat, agricultural land classification, aggregate resources areas and geological conservation sites. In regard to agricultural land classification, the Welsh Government advises that where the Predictive Agricultural (ALC) Map shows the potential presence of best and most versatile land (Grades 1, 2 or 3a), an agricultural land classification survey will typically be required to support a planning application.
National Library of Scotland	Digital Resources: Map Images[176]	Viewable historical Ordnance Survey maps for Wales from 1800s up to c.1970s.
Cranfield Environment Centre	Land Information System (LandIS) Soilscapes Viewer[177]	Soil map.
Defra	MAGIC Interactive Map	Provides details of statutory and non-statutory designated sites in Wales, including nature conservation designations, and groundwater source protection zones.

11.5 Proposed Assessment Methodology

11.5.1 This section describes the approach for the assessment of the ground condition related effects of the Proposed Development on receptors.

11.5.2 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: The Environmental Impact Assessment Methodology**. This section describes how this methodology will be applied, and adapted as appropriate, to address the specific conditions on the Scoping Red Line Boundary in relation to ground conditions. Two assessment methodologies are described, one for impacts on land contamination receptors and one for impacts on soil, geology, and minerals

175 Welsh Government. Data Map Wales. Online. Available at: https://datamap.gov.wales/. [Accessed December 2024].

176 National Library of Scotland. Digital Resources: Map Images. Online. Available at: https://www.nls.uk/digital-resources/. [Accessed December 2024].

177 Cranfield Environment Centre. LandIS Soilscapes Viewer. Online. Available at: http://www.landis.org.uk/soilscapes/. [Accessed December 2024].

receptors.

11.5.3 The temporal scope of the assessment covers the construction, operation and decommissioning phases of the Proposed Development.

Relevant Legislation and Guidelines

11.5.4 Relevant legislation and guidance for undertaking assessment of development effects on ground conditions receptors is listed in **Table 11-2**.

Table 11-2 Policy, Legislation and Guidance Relevant to Ground Conditions

Policy / Legislation / Guidance	Description
Policy	
National Policy Statement[178]	National energy infrastructure planning policy is set out in National Policy Statement (2023) (NPS). EN-1, 'Overarching National Policy Statement for energy' and EN-3. NPS explains how soil resources may be impacted by the construction, operation and decommissioning of energy infrastructure, and how pre-existing contamination within a development must be considered to ensure that the site is suitable for its intended use. NPS also details how to assess and mitigate harm, such as through the use of a Soil Management Plan, and says that development should consider opportunities for enhancement, such as considering opportunities for early remediation, if this is needed based on risk assessment findings.
Planning Policy Wales, Edition 12[179]	The 2024 Planning Policy Wales Distinctive and Natural Places chapter, page 124, states that decisions on planning applications must consider the policy topics of the Distinctive and Natural Places theme, including "opportunities in all areas to improve the resilience of ecosystems are taken by addressing problems such as, building on floodplains, diffuse pollution, soil compaction and sealing, ensuring the protection of peat resources" and "opportunities to improve health and well-being are taken, in particular, to… ensure water sensitive design, address soil carbon management… so as to improve capacity for adaptability to the challenges of climate change such as flood risk and increased temperatures". Chapter 6, Section 6.4 Biodiversity and Ecological Networks

178 Department for Energy Security and Net Zero (2023) National Policy Statement for energy infrastructure. Online. Available at: https://www.gov.uk/government/collections/national-policy-statements-for-energy-infrastructure [Accessed December 2024].

179 Welsh Government (2024) Planning Policy Wales, Edition 12. Online. Available at: https://gov.wales/planning-policy-wales [Accessed December 2024].

Policy / Legislation / Guidance	Description
	states that development proposals must consider the need to: "safeguard protected species and species of principal importance and existing biodiversity assets from direct, indirect or cumulative adverse impacts that affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water, air and soil, including peat". Chapter 6, Section 6.9.16 Land Contamination states that "Whenever development or re-development potential exists the planning system will be the preferred means of addressing potential land contamination." 6.9.17 states that where land potentially meets the definition of contaminated land under Part 2A, the onus will remain with the developer to ensure that the land is suitable for its proposed use and will not meet the legal definition of contaminated land under Part 2A. Section 6.9.19 states that "Where land contamination issues arise, the planning authority will require evidence of detailed investigation and risk assessment prior to the determination of the application" as well as "If contamination cannot be overcome satisfactorily, the authority may refuse planning permission." **Minerals** See 'Minerals' note below in relation to the Caerphilly County Council Development Plan.
Future Wales: The National Plan 2040 (February 2021)[180]	The National Development Framework Future Wales – the National Plan 2040, sets out the Welsh Government's land use priorities and provides a national land use framework. Policy 9 – Resilient Ecological Networks and Green Infrastructure states that the Welsh government will work with partners "to identify areas which should be safeguarded and created as ecological networks for their importance for adaptation to climate change, for habitat protection, restoration or creation, to protect species, or which provide key ecosystems services, to ensure they are not unduly compromised by future development; and, identify opportunities where existing and potential green infrastructure could be maximised as part of placemaking, requiring the use of nature-based solutions as a key mechanism for securing sustainable growth, ecological connectivity, social equality and well-being". Protection of soil resources during development, in the context of protecting existing habitats or soil reuse for habitat restoration / improvement is therefore of relevance to the Project.

180 Welsh Government (2021) Future Wales: The National Plan 2040. Online. Available at: https://www.gov.wales/future-wales-national-plan-2040. [Accessed December 2024].

Policy / Legislation / Guidance	Description
	Policy 17 – Renewable and Low Carbon Energy and Associated Infrastructure states that all proposals should demonstrate that "they will not have an unacceptable adverse impact on the environment". Policy 18 – Renewable and Low Carbon Energy Developments of National Significance states that the following criteria should be met for such developments: that "there are acceptable provisions relating to the decommissioning of the development at the end of its lifetime, including the removal of infrastructure and effective restoration".
Newport City Council Local Development Plan (adopted 2015)[181]	Local planning policy that highlights key objectives for the local council, which include the following policies relating to ground conditions: General Development Principles (GP) 5 – Natural Environment, paragraph 3.31: "Land identified as being of higher agricultural quality (Grades 1, 2 and 3a) will be protected from development unless there is no alternative site and the developer demonstrates that there is a proven need for the proposal." GP7 – Environmental protection and Public Health, paragraph 3.45: "The potential impact of a proposed development will be assessed against the appropriate standards set out in the relevant legislation and regulations where it is considered to be a material planning consideration," with material considerations including land contamination.
Monmouthshire County Council Adopted local development plan (adopted 2014)[182]	Local planning policy that highlights key objectives for the local council, which include the following policies relating to ground conditions: Local planning policy that highlights key objectives for the local council, which include the following policies relating to ground conditions: EP1 – Amenity and Environmental Protection: "seeks to prevent development proposals that would result in unacceptable risk or harm due to … water pollution, contamination or land instability." Paragraph 6.2.25: "Given the importance of agriculture to Monmouthshire's rural economy it is recognised that there is a

181 Newport City Council (2015) Newport Local Development Plan 2011-26 Adopted Plan. Online. Available at: https://www.newport.gov.uk/documents/Planning-Documents/LDP-2011-2026/LDP-Adopted-Plan-January-2015.pdf [Accessed December 2024].

182 Monmouthshire County Council (2014) Monmouthshire County Council Adopted Local Development Plan: 2011-2021. Online. Available at: https://www.monmouthshire.gov.uk/app/uploads/2017/05/Adopted-Local-Development-Plan-with-PDF-tags.pdf [Accessed December 2024].

Policy / Legislation / Guidance	Description
	need to protect the best and most versatile agricultural land from inappropriate development.”
Legislation	
The Environment (Wales) Act 2016[183]	The Act makes provisions within Wales for the planning and managing of natural resources at national and local level.
Well-being of Future Generations (Wales) Act (2015)[184]	The Act does not refer explicitly to soils or land contamination; however, it requires public bodies in Wales to think about the long-term impact of their decisions. It requires them to act in accordance with sustainable development principles, with the aim of achieving well-being goals, including maintaining and enhancing a biodiverse natural environment with healthy functioning ecosystems that support social, economic, and ecological resilience and the capacity to adapt to change (for example climate change).
Environmental Protection Act (1990)[185]	Part 2A of the Act makes provision for the improved control of pollution arising from certain industrial and other processes. Part 2A of the Act provides the regulatory basis for the identification, designation, and remediation of contaminated land.
Water Resources Act 1991[186] as amended by the Water Act 2003[187]	The Water Resources Act 1991 states that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter controlled waters.
The Environmental Damage (Prevention and Remediation) (Amendment) (Wales) Regulations 2015[188]	Regulations implementing the European Union (EU) Directive on environmental liability setting out the principles for prevention and remedy of environmental damage.

183 UK Government (2016). Environment (Wales) Act 2016. (Online). Available at: https://www.legislation.gov.uk/anaw/2016/3/contents/enacted. [Accessed December 2024].

184 UK Government (2015). Well-being of Future Generations (Wales) Act 2015. (Online). Available at: https://www.gov.wales/well-being-future-generations-act-essentials-html. [Accessed December 2024].

185 UK Government (1990). Environmental Protection Act 1990. (Online). Available at: https://www.legislation.gov.uk/ukpga/1990/43/contents. [Accessed December 2024].

186 UK Government (1991). Water Resources Act 1991. (Online). Available at: https://www.legislation.gov.uk/ukpga/1991/57/contents. [Accessed December 2024].

187 UK Government (2003). Water Act 2003. (Online). Available at: https://www.legislation.gov.uk/ukpga/2003/37/contents. [Accessed December 2024].

188 Welsh Government (2015) The Environmental Damage (Prevention and Remediation) (Amendment) (Wales) Regulations 2015. (Online). Available at: https://www.legislation.gov.uk/wsi/2015/1394/made. [Accessed December 2024].

Policy / Legislation / Guidance	Description
Health and Safety at Work etc. Act 1974[189]	The Health and Safety at Work etc. Act and regulations made under the Act place responsibilities upon employers to carry out a risk assessment for every work activity and to document it. Besides carrying out a risk assessment, employers also need to: make arrangements for implementing the health and safety measures identified as necessary by the risk assessment; appoint competent people to help them implement the arrangements; set up emergency procedures; provide clear information and training to employees; and work together with other employers sharing the same workplace. Land contamination poses a hazard to groundworkers and potentially others in proximity to the construction work. Appropriate risk assessments must be carried out and arrangements made to protect the health and safety of workers directly involved in groundworks for the Proposed Development and other human receptors who could be affected.
The Construction (Design and Management) Regulations 2015[190]	The Construction (Design and Management) Regulations (CDM) place specific duties on clients, designers, and contractors, so that health and safety is considered throughout the life of a construction project from its inception to its subsequent final demolition and removal. They include the requirement to appoint a Principal Designer and Principal Contractor to co-ordinate health and safety aspects during construction. Under the CDM regulations, designers must avoid foreseeable risks so far as reasonably practicable by: eliminating hazards from the construction, cleaning, maintenance, and proposed use and demolition of a structure; reducing risks from any remaining hazard; and giving collective safety measures priority over individual measures. Construction of the Proposed Development will fall under the requirements of the Regulations requiring consideration of health and safety to be incorporated into the design of the Proposed Development components and at construction stage.

189 UK Government (1974) Health and Safety at Work etc. Act 1974 (Online). Available at: https://www.legislation.gov.uk/ukpga/1974/37/contents. [Accessed December 2024].

190 UK Government (2015) The Construction (Design and Management) Regulations 2015. (Online). Available at: https://www.legislation.gov.uk/uksi/2015/51/contents/made. [Accessed December 2024].

Policy / Legislation / Guidance	Description
Control of Asbestos Regulations 2012	The Control of Asbestos Regulations 2012 (CAR 2012) apply to employers who carry out work which disturbs, or is likely to disturb, asbestos. This includes groundworks where there is asbestos present or suspected to be present in the ground as loose fibres or as asbestos containing materials (ACMs).
Guidance	
Welsh Government, Guidance to Chief Planning Officers on Agricultural Land Classification Reports[191]	States that Local Planning Authorities are required to consult with the Welsh Government before granting planning permission for any proposals which do not accord with the Development Plan and will involve the loss (both permanent and temporary) of 20 hectares or more of BMV land. This includes losses which are less than 20 hectares but likely to lead to further losses amounting cumulatively to 20 hectares or more.
Welsh Government, Guidance to Chief Planning Officers on Best and most versatile agricultural land and solar PV arrays[192]	Clarifies that in accordance with Welsh Government policy, where BMV land is identified within a proposed solar PV array development, considerable weight should be given to protecting such land from development, because of its special importance, and unless other significant material considerations indicate otherwise it will be necessary to refuse permission. This notes that the Provisional ALC map for Wales is not accurate at a site specific scale, and information should be obtained from a detailed ALC survey.
Welsh Government, Guidance to Chief Planning Officers on Agricultural Land Classification Reports[193]	States that Local Planning Authorities are required to consult with the Welsh Government before granting planning permission for any proposals which do not accord with the Development Plan and will involve the loss (both permanent and temporary) of 20 hectares or more of BMV land. This includes losses which are less than 20 hectares but likely to lead to further losses amounting cumulatively to 20 hectares or more.
Welsh Government, Guidance: Agricultural land classification:	Explains that in Wales, agricultural land is categorised into one of the following grades: • grade 1: excellent quality agricultural land;

191 Welsh Government (2016). Agricultural Land Classification Reports. (Online). Available at: https://www.gov.wales/agricultural-land-classification-reports. [Accessed December 2024].

192 Welsh Government (2022). Best and most versatile agricultural land and solar PV arrays. (Online). Available at: https://www.gov.wales/best-and-most-versatile-agricultural-land-and-solar-pv-arrays. [Accessed December 2024].

193 Welsh Government (2016) Agricultural Land Classification Reports. (Online). Available at: https://www.gov.wales/sites/default/files/publications/2018-11/agricultural-land-classification-reports.pdf [Accessed December 2024].

Policy / Legislation / Guidance	Description
predictive map[194]	• grade 2: good quality agricultural land; • grade 3a: good to moderate quality agricultural land; • grade 3b: moderate quality agricultural land; • grade 4: poor quality agricultural land; and • grade 5: very poor quality agricultural land. Planning policy defines grades 1 to 3a as the 'best and most versatile' agricultural land. This is about 10 to 15% of the land in Wales. Planning applications should include survey evidence when they cover grade 1, 2 or 3a land. This map was used to check the grade of land to help decide whether a survey was needed.
Environment Agency, Land Contamination Risk Management (LCRM)[195]	LCRM provides a technical framework for applying a risk management process when dealing with land affected by contamination.
Development of Land Affected by Contamination: A Guide For Developers, Version 4[196]	The guidance outlines the information planning authorities require on the land contamination status of proposed development sites and how associated planning conditions will be discharged. The document sets out best practice for land contamination management procedures, these follow a phased approach and requires the development and refinement of a conceptual model. The process starts at initial desk based assessment ('Phase 1' or 'Preliminary Risk Assessment'), then may progress to site investigation, to remediation options appraisal, development of a remediation strategy and implementation and verification of remediation, as set out in LCRM, which has been adopted by Natural Resources Wales. For sites where preliminary risk assessment identifies potentially unacceptable risks, site investigation is typically needed prior to construction. As a minimum, after the new development has been completed, the land should be suitable for its new use and not meet the legal definition of

194 Welsh Government (2023). Guidance: Agricultural land classification: predictive map. (Online). Available at: https://www.gov.wales/agricultural-land-classification-predictive-map. [Accessed December 2024].

195 Environment Agency (2020) Land contamination risk management (LCRM) How to assess and manage the risks from land contamination (Amended 2023). (Online). Available at: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm. [Accessed December 2024].

196 Welsh Land Contamination Working Group (2023) Development of Land Affected by Contamination: A Guide For Developers. Available at: https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/advice-for-developers/land-contamination/?lang=en. [Accessed December 2024].

Policy / Legislation / Guidance	Description
	Contaminated Land under the Part 2A regime.
CAR-SOIL: Control of Asbestos Regulations 2012, Interpretation for Managing and Working with Asbestos in Soil[197]	Provides interpretation and guidance to all involved in the management of asbestos in both soils and construction and demolition arisings in accordance with the Control of Asbestos Regulations 2012 (CAR 2012). Requirements include the use of measures to prevent the spread of asbestos during construction work. Most of the site is undeveloped agricultural land and likely to be free of asbestos, however localised asbestos is possible on farmland where old farm buildings or structures have been present (and demolished or derelict and in poor conditions) or where unrecorded excavation and infilling of ground has taken place. If asbestos is encountered during ground disturbance then appropriate management measures are needed.
CL:AIRE, Definition of Waste: Development Industry Code of Practice (DoWCoP), Version 2, 2011[198]	The Definition of Waste: Development Industry Code of Practice (DoWCoP) is a voluntary Code launched in September 2008 (applicable to England and Wales) and updated in 2011 to provide a clear, concise, and auditable process to enable the sustainable remediation and development of land and suitable reuse of recovered materials/resources, including topsoil, subsoil, and potentially contaminated soil, that may initially be classified as waste/contaminated, by the use of a Materials Management Plan (MMP). Use of an MMP and compliance with the DoWCoP can also enable the transfer of soils between donor and receptor sites to reduce the potential for soils to be sent to landfill.
Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[199]	Outlines guidance and legislation concerning the use of soil in construction projects, before offering stage by stage guidance on the use, management, and movement of soil on site, and the completion of appropriate soil resource surveys to inform the site working strategy (e.g., Site Waste Management Plan or Material Management Plan) and for the construction phase preparation of a Soil Resource Plan. The document is out of date regarding the legislation and guidance it references,

197 Joint Industry Working Group (JIWG) (2016). CAR-SOIL. Control of Asbestos Regulations 2012. Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials. Industry Guidance. (Online). Available at: https://www.claire.co.uk/projects-and-initiatives/asbestos-in-soil. [Accessed December 2024].

198 CL:AIRE (2011) The Definition of Waste: Development Industry Code of Practice. Available at: https://www.claire.co.uk/projects-and-initiatives/dow-cop. [Accessed December 2024].

199 Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Available at https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites. [Accessed December 2024].

Policy / Legislation / Guidance	Description
	however it still a good source of best practice guidance for the protection of soil resources on construction projects.
CIRIA C665 Assessing risks posed by hazardous ground gases to buildings[200]	Provides guidance on ground gas monitoring and assessing the level of risk posed by ground gas, including mine gas, to developments. Ground gas can arise from natural sources such as peat deposits.
Welsh Government, Welsh Soil Evidence Review[201]	There is no Welsh guidance for the protection of soils in construction, however, this document identifies pressures on soils including loss of soil to development, and notes that there is a need to monitor the type, extent and location of soil sealing and land take in Wales and the impact of loss on soil functions and agricultural land capability.
Highways England, Design Manual for Roads and Bridges (DMRB) LA 109 - Geology and Soils[202]	Sets out the approach to assessing and reporting the effects of highway projects on geology and soils used on Highways England projects. As a published approach to assessing the effects of developments on soil in EIA, this can be adapted for use on other projects. The guidance stops short of providing a methodology to assess the effects of a project on agricultural land and soil functions.
Institute of Environmental Management & Assessment (IEMA) (2022) IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment[203]	Provides information and guidance on how the practical implications of soil functions, soil biodiversity, soil health, ecosystem services and natural capital should be applied within the overarching framework of climate change, to incorporate them effectively into the EIA process.

[200] CIRIA (2007) Assessing risks posed by hazardous ground gases to buildings (C665). Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx? [Accessed December 2024].

[201] Welsh Government (2022) Welsh Soil Evidence Review. (Online). Available at: https://www.gov.wales/sites/default/files/publications/2022-08/review-welsh-soil-evidence_0.pdf. [Accessed December 2024].

[202] DMRB (2019) LA 109 Geology and soils. Online. Available at: https://www.standardsforhighways.co.uk/search/adca4c7d-4037-4907-b633-76eaed30b9c0. [Accessed December 2024].

[203] Institute of Environmental Management & Assessment (IEMA) (2022) IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment. Online. Available at: https://www.shropshire.gov.uk/media/27336/cd-910-iema-land-and-soils-guidance.pdf [Accessed December 2024].

Policy / Legislation / Guidance	Description
Institute of Civil Engineers (ICE), The Environmental Impact Assessment Handbook - A Practical Guide for Planners, Developers and Communities (3rd Edition)[204]	Provides an approach to assessing the potentially significant effects of development projects on soil and defines the sensitivity of different soil types to handling during construction projects. The guide notes that soil is a non-renewable resource, and that disturbance should be limited as far as possible, that soil is particularly prone to structural degradation if it is handled when too wet, and that adverse effects can be mitigated by following best practice guidance, such as the Defra 2009 Code of Practice for the Sustainable Use of Soils on Construction Sites.
Welsh Government, The Impact of Solar Photovoltaic (PV) Sites on Agricultural Soils and Land[205]	This Welsh Government commissioned study is part of an evidence-based assessment of the impact of solar PV development on BMV agricultural land and associated soils. This provides information relating to the potential effects of solar farms on soil resources and can be used to inform the assessment of likely significant effects on agricultural land and soils in EIA.
CIRIA C809 Sustainable Management of Surplus Soil and Aggregates from Construction[206]	CIRIA C809 provides guidance on the avoidance and management of surplus soils and aggregates arising during construction and development projects, to help projects comply with the principles of the Waste Hierarchy, circular economy, sustainability, zero landfill, and net zero objectives. As waste policy is devolved in the UK, CIRIA C809 sets out relevant legislation, guidance and tools for the sustainable management of surplus soils for the devolved administrations including Wales. In Wales (and England), a key element of sustainable management of surplus soils is compliance with the CL:AIRE (2011) Definition of Waste: Development Industry Code of Practice (DoWCoP) and the use of a Materials Management Plan, which must demonstrate: “protection of human health and the environment, suitability of the material’s use, certainty of the material’s use”, and the “quantity (minimum necessary) of material to be used”. Where used in accordance

204 Institute of Civil Engineers (ICE) (2019). The Environmental Impact Assessment Handbook - A Practical Guide for Planners, Developers and Communities (3rd Edition). Available at: https://www.icevirtuallibrary.com/doi/pdf/10.1680/eiah3e.61415.fm. [Accessed December 2024].

205 Welsh Government (2023) The impact of solar photovoltaic (PV) sites on agricultural soils and land. (Online). Available at: https://www.gov.wales/soils-policy-evidence-programme-all-documents. [Accessed December 2024].

206 Department for Environment, Food and Rural Affairs (Defra), (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Online. Available at: https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites. [Accessed December 2024].

Policy / Legislation / Guidance	Description
	with the DoWCoP, an MMP must be reviewed by a Qualified Person (listed as such by CL:AIRE).
Defra (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.[207]	Outlines current guidance and legislation concerning the use of soil in construction projects, before offering stage-by-stage guidance on the use, management, and movement of soil on site, and the completion of appropriate soil resource surveys to inform the site working strategy (e.g., Site Waste Management Plan or Material Management Plan) and for the construction phase preparation of a Soil Resource Plan.
Institute of Quarrying, (2021). Good Practice Guide for Handling Soils in Mineral Workings.	Includes measures for successful soil management on mineral extraction sites that can be applied to other types of development to help ensure that excavated soils are retained in a suitable condition for successful reinstatement to enable land restoration back to agricultural or other sensitive uses soil reinstatement. Includes details of wetness tests to confirm that soils are suitably dry for handling, use of suitable machinery for soil handling.

Proposed Desk Based Assessment

11.5.5 A Phase 1 Contaminated Land Desk Study will be completed for the Proposed Development. This will assess the site's land contamination status.

Proposed Surveys and Site Visits

11.5.6 The Phase 1 Contaminated Land Desk Study will include a Site walkover to inform the development of a preliminary conceptual site model and environmental risk assessment.

EIA Methodology

Land Contamination Approach

11.5.7 The effect of the Proposed Development will be assessed through desk-based studies to understand the baseline environment relevant to soil, geology and contamination status. Consultations with NRW and the LPAs will be undertaken to obtain more local detailed information.

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207 Institute of Quarrying, (2021). Good Practice Guide for Handling Soils in Mineral Workings. Online. Available at: https://www.quarrying.org/soils-guidance. [Accessed December 2024].

Risk Assessment

11.5.8 With respect to potential contaminated land, the process of managing land contamination, as set out in the Environment Agency guidance Land Contamination: Risk management (LCRM), is based on risk assessment. The assessment of risks from contaminated land is based upon the identification and subsequent assessment of a contaminant linkage. A contaminant linkage requires the presence of a:

- source of contamination;
- receptor that can be adversely affected by the contamination; and
- pathway capable of exposing a receptor to the contaminant.

11.5.9 The risk assessment aims to assess the significance of each potential contaminant linkage. The key to the classification is that the designation of risk is based upon the consideration of both of the following.

- The magnitude of the potential consequence (for instance, severity). It takes into account both the potential severity of the hazard and the sensitivity of the receptor.
- The magnitude of probability (for instance, likelihood). It takes into account both the presence of the hazard and receptor and the integrity of the pathway.

11.5.10 The definitions for the qualitative risk assessment have been taken from "Guidance for the Safe Development of Housing on Land Affected by Contamination" Annex 4 R&D Publication 66: 2008 Volume 2. These are based upon CIRIA C552[208].

11.5.11 The likelihood classifications for the contaminant linkages being realised is presented in **Table 11-3**.

208 CIRIA (2001) C552 Contaminated Land Risk Assessment, A Guide to Good Practice. Online. Available at https://www.brebookshop.com/samples/142102.pdf [Accessed December 2024].

Table 11-3 Likelihood Classifications for Contaminant Linkages

Classification	Definition	Examples
High Likelihood	There is contaminant linkage and an event will appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution	a) Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden.
Likely	There is contaminant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.	a) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space.
Low Likelihood	There is contaminant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event will take place and is less likely in the shorter term.	a) Elevated concentrations of toxic contaminants are present in soils at depths >1m in a residential garden, or 0.5-1.0m in public open space.
Unlikely	There is contaminant linkage, but circumstances are such that it is improbable that an event will occur even in the very long-term.	a) Elevated concentrations of toxic contaminants are present below hardstanding.

11.5.12 The magnitude of the potential consequence of a contaminant linkage gives an indication of the sensitivity of a given receptor to a particular source or contaminant of concern under consideration. It is based on full exposure via the linkage being examined. The classification of consequence is presented in **Table 11-4**.

Table 11-4 Classification of Consequence

Classification	Human Health	Controlled Water	Ecology	Property / Structures/ Crops and Animals	Examples
Severe	Highly elevated concentrations likely to result in “significant harm” to	Equivalent to Environment Agency (EA) Category 1 pollution incident including	Major damage to aquatic or other ecosystems, which is likely to	Catastrophic damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated Land Statutory Guidance as

Classification	Human Health	Controlled Water	Ecology	Property / Structures/ Crops and Animals	Examples
	human health as defined by the EPA 1990, Part 2A, if exposure occurs.	persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.	result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.		death, life threatening diseases (e.g. cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants from site. Highly elevated concentrations of Hazardous or priority substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).
Medium	Elevated concentrations which could result in	Equivalent to EA Category 2 pollution incident including	Significant damage to aquatic or other ecosystems,	Significant damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated

Classification	Human Health	Controlled Water	Ecology	Property / Structures/ Crops and Animals	Examples
	"significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs.	significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.	which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.		Land Statutory Guidance as death, life threatening diseases (e.g. cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions.
Mild	Exposure to human health unlikely to lead to "significant harm".	Equivalent to EA Category 3 pollution incident including minimal or short-lived effect on water quality; marginal effect on amenity value, agriculture or commerce.	Minor or short-lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that will endanger the long-term maintenance of the population.	Minor damage to crops, buildings or property.	Exposure could lead to slight short-term effects (e.g. mild skin rash).
Minor	No measurable effects on humans.	Equivalent to insubstantial pollution incident with no observed effect on water quality	Equivalent to insubstantial pollution incident with no observed effect on water quality	Repairable effects of damage to buildings, structures and services.	The loss of plants in a landscaping scheme.

Classification	Human Health	Controlled Water	Ecology	Property / Structures/ Crops and Animals	Examples
		or ecosystems.	or ecosystems.		

11.5.13 A matrix is then used to generate a risk level based on the likelihood compared to the classification of consequence, as shown in **Table 11-5.**

Table 11-5 Risk Matrix

		Likelihood			
		Unlikely	**Low likelihood**	**Likely**	**High likelihood**
Potential consequence	Severe	Moderate/low risk	Moderate Risk	High Risk	Very High Risk
	Medium	Low	Moderate/low risk	Moderate Risk	High Risk
	Mild	Very low risk	Low Risk	Moderate/low risk	Moderate Risk
	Minor	Very low risk	Very low risk	Low Risk	Low Risk

11.5.14 The overall risk definitions are summarised in **Table 11-6**.

Table 11-6 Risk Definitions

Risk	Definition
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.
High	Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm will be severe, and if any harm were to occur it is more likely, that the harm will be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier.

Risk	Definition
	Some remediation works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised will normally be mild. It is unlikely that the site owner/or occupier will face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
Very Low	It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised will normally be mild or minor.

11.5.15 Where a risk classification of moderate or greater has been determined, it is considered that the source–pathway–target contaminant linkage requires some form of risk management or intervention.

11.5.16 As the first step, such risk management or intervention would normally take the form of either further investigation, with the additional knowledge gained allowing the risk to be more accurately assessed and potentially the classification may be lowered. However, if the risk classification remains at moderate or above then remediation, in the form of embedded mitigation, may be required to reduce or remove the source of contamination or disrupt the pathway to the target or receptor.

Significant Evaluation Methodology

11.5.17 To use risk assessment as the basis for the evaluation of the significance of effects in relation to land contamination, it is necessary to evaluate the change in risk from baseline conditions to those during and following the Proposed Development. In order to define the baseline, risk the initial assessment and classification of risk is carried out for the Study Area in its pre-development state. A separate assessment of risk will then be conducted for the Proposed Development post-development (including environmental measures inherently embedded in the development) to enable an evaluation of the change in risk due to the Proposed Development.

11.5.18 **Table 11-7** uses the risk classification pre- and post-development as the basis for a significance evaluation matrix for the purposes of EIA.

Table 11-7 Land Quality (Contamination) Significance Evaluation Matrix*

		Risk Post-Development (Including Embedded Measures)					
		Very low	**Low**	**Moderate / Low**	**Moderate**	**High**	**Very high**
Potential consequence – existing receptors	Very high	Major Positive (Significant)	Major Positive (Significant)	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)
	High	Major Positive (Significant)	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)
	Moderate	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)
	Moderate / low	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)
	Low	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)

		Risk Post-Development (Including Embedded Measures)					
		Very low	Low	Moderate / Low	Moderate	High	Very high
	Very low	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	Major Negative (Significant)
No receptor present pre-development	N/A	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	Major Negative (Significant)	Major Negative (Significant)

*Risks that remain at moderate, high or very high post-development are unlikely to be considered acceptable and further mitigation will be required to enable the development to proceed.

11.5.19 If the embedded measures are effective the risks post development should be less than moderate or the risks from the Proposed Development are likely to be considered unacceptable.

11.5.20 However, there may be circumstances where development can proceed, and moderate and above risks remain, e.g. groundwater contamination where cost benefit analysis indicates that remediation is not warranted.

11.5.21 Guidance on the protection of the environment will be used to assist with the development of mitigation e.g. NRW and CIRIA. The assessment will be based on the implementation of those mitigation measures identified, which will feed into the construction environmental management plan (CEMP), method statements and procedures for the Proposed Development.

11.5.22 The Environmental Statement Chapter will summarise the findings of the desk study and any relevant ground investigation / surveys, this forming the baseline against which the potential impact of the Proposed Development, alone and cumulatively with other developments, will be assessed. The assessment will be based on both receptor importance and the nature and magnitude of the impact because of the Proposed Development and all mitigation considered necessary will be identified and residual effects with this in place will be determined and assessed.

Soils, Geology and Minerals Approach

11.5.23 The methodology for the assessment of effects on soil, geology and mineral receptors will be undertaken in general accordance with the IEMA Guidelines for Assessing Impacts on Land and Soil (IEMA, 2022), and other best practice guidance including the DMRB LA 109 guidance for geology and soils (DMRB, 2019), as outlined below.

11.5.24 The magnitude / consequence of the loss or damage to soil, geology or mineral resources is based upon the:

- Likely nature and scale of soils effects (positive, neutral or negative) during the construction and the operational phases of the project;
- Likelihood of the Proposed Development to result in significant effects; and
- Issues requiring further assessment and the methods to be applied.

11.5.25 Regarding soil, the assessment considers impacts on soil functions. The sensitivity of soil functions to development impacts following mitigation is determined with reference to likely changes in soil properties resulting from the development, such as the soil's physical properties (e.g., soil depth, structure, drainage), chemical properties (e.g., soil organic matter, stored carbon and pH), and biological properties (e.g., soil biota diversity and population).

11.5.26 The sensitivity of the soil on the Site, assigned on the basis of the desk-based information, and the classifications in **Table 11-8**, is assessed at the EIA Scoping stage to be high based on the land being a designated SSSI.

11.5.27 There are interactions between soils and receptors covered in other EIA Scoping Chapters, including **Chapter 7: Cultural Heritage and Archaeology**, **Chapter 8: Ecology**, **Chapter 10: Water Environment and FRA** and **Chapter 14: Climate Change Resilience**.

Table 11-8 Sensitivity Classifications for Soils, Geology and Minerals

Value / Sensitivity	Description example
Very high	**Biomass production:** ALC Grades 1 & 2 or LCA Classes 1 & 2 (for Wales all BMV [Grade 1, 2 and 3a] is considered Very High*). **Ecological habitat, soil biodiversity and platform for landscape:** Soils supporting protected features within a European site (e.g., SAC, SPA, Ramsar); Peat soils; Soils supporting a National Park, or Ancient Woodland. **Soil carbon:** Peat soils, soils with potential for ecological/landscape restoration.
High	**Biomass production:** ALC Grade 3a (for Wales all BMV is considered as Very high*), or LCA Grade 3.1. **Ecological habitat, soil biodiversity and platform for landscape:** Soils supporting protected features within a UK designated site (e.g., UNESCO Geoparks, SSSI or AONB, Special Landscape Area, and Geological Conservation Review sites); Native Forest and woodland soils; Unaltered soils supporting semi-natural vegetation (including UKBAP Priority habitats or Section 6 habitats in Wales). **Soil carbon:** Organo-mineral soils (e.g., peaty soils).
Medium	**Biomass production:** ALC Grade 3b or LCA Grade 3.2. **Ecological habitat, soil biodiversity and platform for landscape:** Soils supporting protected or valued features within non-statutory designated sites (e.g. Local Nature Reserves (LNR), Local Geological Sites (LGSs),

Value / Sensitivity	Description example
	Sites of Nature Conservation Importance (SNCIs), Special Landscape Areas; Non-Native Forest and woodland soils. **Soil carbon:** Mineral soils.
Low	**Biomass production:** ALC Grades 4 & 5 or LCA Grades 4.1 to 7 or Urban soils. **Ecological habitat, soil biodiversity and platform for landscape:** Soils supporting valued features within non-designated notable or priority habitats/landscapes. Agricultural soils. **Soil carbon:** Mineral soils.
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions.

*All BMV land in Wales is considered 'Very High' sensitivity due to the Planning Policy Wales[209] '…considerable weight should be given to protecting such land [BMV] from development'.

11.5.28 The classification of impact magnitude on soil, geology or mineral receptors is defined in **Table 11-9**.

Table 11-9 Magnitude Classifications Soils

Magnitude	Description example
Major	Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20ha or loss of soil-related features set out in **Table 11-8** above, as advised by other topic specialists in EIA team (including effects from 'temporary developments'*). or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20ha or gain in soil-related features set out in **Table 11-8** above, as advised by other topic specialists in EIA team (including effects from 'temporary developments'*).
Moderate	Permanent, irreversible loss of one or more soil functions or soil volumes, over an area of between 5 and 20ha or loss of soil-related features set out in **Table 11-8** above, as advised by other topic specialists in EIA team (including effects from 'Temporary Developments'*). or Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20ha or gain

209 Welsh Government (2024) Planning Policy Wales. Online. Available at: https://www.gov.wales/planning-policy-wales. [Accessed December 2024].

Magnitude	Description example
	in soil-related features set out in **Table 11-8** above, as advised by other topic specialists in EIA team.
Minor	Permanent, irreversible loss over less than 5ha or a temporary, reversible loss of one or more soil functions or soil volumes), or temporary, reversible loss of soil-related features set out in **Table 11-8** above, as advised by other topic specialists in EIA team. or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 5ha or a temporary improvement in one or more soil functions due to remediation or restoration or off-site improvement, or temporary gain in soil-related features set out in v above, as advised by other topic specialists in EIA team.
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.
No change	No loss / reduction (or gain / improvement) of soil function(s).

* Temporary developments can result in a permanent impact if resulting disturbance or land use change causes permanent damage to soils.

11.5.29 The matrix used to evaluate the significance of potential effects on soil, geology or mineral receptors based on the receptor sensitivity compared to the impact (effect) magnitude, as shown in **Table 11-10**.

Table 11-10 Soil, Geology and Minerals Significance Evaluation Matrix*

		Nature of impact (magnitude/ probability/ reversibility)				
Magnitude	**Description example**	**No change**	**Negligible**	**Minor**	**Moderate**	**Major**
	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

11.6 Description of Likely Significant Effects

11.6.1 The likely significant effects on ground conditions receptors to be taken forward for assessment are summarised in **Table 11-11**.

Table 11-11 Likely Significant Ground Conditions Effects

Activity	Effect	Receptor
Construction		
Construction activities – construction of permanent development features*	Permanent development (e.g., substation) requiring land take, loss of agricultural land, soil removal / soil sealing.	Soil (topsoil and subsoil) Agricultural land
Construction activities – excavations, temporary or permanent displacement of soil, soil storage, use of plant and machinery in areas of temporary and permanent development	Compaction of soil by vehicles or during stockpiling during temporary development activities (e.g., access, laydown, compounds) leading to damage to soil, degradation of agricultural land. Erosion of soil during temporary development activities, leading to loss of organic matter in runoff, damage to soil. Spills or leaks of fuels, oils or chemicals from plant, vehicles and equipment resulting in releases of pollutants to ground.	Soil (topsoil and subsoil) Agricultural land Controlled water: Surface water (freshwater reens)
Construction activities – disturbance to ground potentially affected by land contamination during temporary and permanent development	Mobilisation of contaminants due to ground disturbance e.g., dust generation, contaminated run-off, creation of new pollutant migration pathways during excavation or construction, failure to manage and segregate excavated materials appropriately	Human health: future site users and adjacent site users (by direct contact, inhalation or ingestion pathways) Controlled water: Surface water (freshwater reens) Ecology: onsite SSSI Property (crops, grazing animals, built environment including services) Soil (topsoil and subsoil)

Activity	Effect	Receptor
	Identification and remediation of contaminated land to allow the development to proceed	Human health: future site users and adjacent site users (by direct contact, inhalation or ingestion pathways) Controlled water: Surface water (freshwater reens) Ecology: onsite SSSI Soil (topsoil and subsoil)
Operation		
Presence of PV panels on land and changes to agricultural activities	Changes to soil health / soil structure and soil function – positive or negative.	Soil (topsoil and subsoil) Agricultural land
Maintenance of the PV panels	Use of plant and equipment with potential to damage soils (e.g. compaction) or to spill or release contaminants (e.g., fuels and oils)	Soil (topsoil and subsoil) Agricultural land
Decommissioning		
****Removal of PV panel infrastructure (including solar panels, frames and piles / beams)**	Removal of PV panel infrastructure (notably PV panel piles) potentially requiring disturbance to topsoil across a large area	Soil (topsoil and subsoil) Agricultural land
***The permanent loss of soil and agricultural land due to 'hard development' (e.g., covering of soil or removal of soil to construct a substation) is only assessed once as an effect that occurs during construction.** ****Other decommissioning effects are likely to be similar to the construction effects defined above and these effects are not expected to be larger than during construction.**		

11.6.2 **Table 11-12** details the receptors/effects that have been scoped in for assessment or scoped out from the ground conditions assessment because the potential effects are not considered likely to be significant.

Table 11-12 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Effects on soils	Construction, Operation and Decommissioning	✓		Potential for direct physical impacts during temporary construction activities, or due to permanent development. Potential for changes to soils as a result of the presence of the solar panels during the operational phase, or due to maintenance activities during operation (physical change to soil due to vehicles/plant causing compaction). Potential for leaks/spills of fuels or oils from vehicles/plant.
Effects on agricultural land (agricultural as land national / regional / local resource)	Construction, Operation and Decommissioning	✓		Provisional ALC mapping indicates that no BMV land is present on the Site. However, the Proposed Development will have the potential to affect a large area of potentially ALC grade 3b agricultural land.
Effects on land contamination	Construction, Operation and Decommissioning	✓		The Site is in an area with some surrounding industrial and commercial land uses which have the potential to have impacted soil and groundwater in the vicinity of the Site, with potential for onsite migration. Some localised potential contaminated land sources are present on the Site including a substation. Sensitive receptors including surface water and ecological receptors are present.
Effects on geology (geodiversity)	Construction, Operation and Decommissioning		✓	In the absence of Geological Conservation Review (GCR) sites and Regionally Important Geodiversity Sites (RIGS) within the Proposed Development or in the Study Area, it is considered that the

Element	Phase	Scoped In	Scoped Out	Justification
				project would have no direct impact on geological receptors or significant indirect effects on geological resources in the surrounding area.
Effects on geology (ground stability)	Construction, Operation and Decommissioning		✓	The stability of the ground, in so far as it affects land use, is a material consideration that is taken into consideration in planning application decisions. Land stability in relation to the ground conditions on the Site will be addressed throughout the design and construction process by compliance with the Construction (Design and Management) Regulations 2015 and will be informed by the geo-environmental desk study, and any further relevant surveys undertaken. It will not be considered further during the EIA process.
Effects on mineral resources	Construction, Operation and Decommissioning		✓	The Proposed Development will not interact with river terrace deposits (superficial sand and gravel) immediately southeast of the Site in the Severn Estuary. Given this, and the absence of Mineral Safeguarding areas or existing mineral extraction sites within the Proposed Development Scoping Red Line Boundary and minerals Study Area, it is considered that the Proposed Development would have no direct impact on mineral resources or significant indirect effects on mineral resources in the surrounding area.

11.7 Opportunities for Enhancing the Environment

11.7.1 At present, no opportunities for enhancing the environment in relation to ground

conditions receptors have been identified, however, this will be reassessed at the next stage of the EIA. The assessment of land contamination effects will consider the potential for the Proposed Development to result in a lowering of contaminated land risk, if present, through risk assessment and potentially investigation and remediation. The assessment of effects on soil resources will also consider the potential for improvements in soil health as a result of the Proposed Development.

11.8 Mitigation

11.8.1 The main mitigation measures that will be taken into account in the environmental assessment on ground conditions are as follows:

- Although the Predictive Agricultural Land Classification Map 2 does not indicate BMV land within the Proposed Development application boundary, an Agricultural Land Classification (ALC) survey will be completed to confirm the baseline ALC grades present and obtain information on the soils present. This is due to the large area of agricultural land potentially affected by the Proposed Development. The ALC survey would inform soil handling during the Proposed Development, and reinstatement planning (for construction and decommissioning). The ALC survey would inform a soil management plan containing soil management measures in general accordance with the Defra guidance[32] and other relevant guidance such as the Institute of Quarrying 2021 Good Practice Guide for Handling Soils in Mineral Workings[210].
- Completion of a Contaminated Land (Preliminary Risk Assessment) Desk Study – this ensures that the ground conditions, including the presence and location of known or potential land contamination, are well understood and communicated to those with design input to the Proposed Development at a sufficiently early stage of the design, helping to avoid the need for significant design changes in response to unexpected ground conditions later.
- Compliance with industry good practice including LCRM for the assessment of risks from contaminated land.

11.8.2 The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

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210 Institute of Quarrying, (2021). Good Practice Guide for Handling Soils in Mineral Workings. Online. Available at: https://www.quarrying.org/soils-guidance. [Accessed December 2024].

11.9 Limitations and Assumptions

11.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- No ALC surveys have been completed for the purposes of this Scoping report. ALC survey scope will be confirmed during the next stage of the EIA and through discussion with relevant consultees.
- The land contamination status of the site has not yet been confirmed by undertaking a Phase 1 desk study (also referred to as preliminary risk assessment) in accordance with industry guidance. This will be completed for the Environmental Statement.

12.0 Traffic and Transport

12.1 Introduction

12.1.1 This Chapter assesses the potential impact of the Future Energy Llanwern Solar Farm on traffic and transport and the extent to which this may affect the relevant sensitive receptors, such as roads, public transport, and active travel routes, during the construction, operational and decommissioning phases. Given the scale of the Proposed Development, with an output exceeding 350MW, it is proposed that the potential traffic and transport impacts on the adjacent surroundings are quantified and assessed within the Environmental Impact Assessment and reported in the Environmental Statement (ES). The Proposed Development will be constructed on approximately 548.3 hectares (ha) of agricultural land between the villages of Redwick and Undy within the local authority jurisdiction areas of Monmouthshire County Council and Newport City Council.

12.2 Consultation

12.2.1 No consultation specific to traffic and transport has been undertaken to date. Consultation will be undertaken through the Scoping and EIA process. Consultation will be undertaken with Monmouthshire County Council's (MCC) and Newport City Council's (NCC) Highway Authorities to understand the extent of assessment required for the construction phase, which is most critical for transport.

12.3 Study Area

12.3.1 The Proposed Development is located on the Caldicot Levels, an area of low-lying wetland situated between Newport and Caldicot (~11 kilometres (km) south-east of Newport and ~8km south-west of Caldicot). The Site spans across two Local Authority administrative areas: MCC and NCC. The boundary line between both Councils dissects Summerleaze north-south, with Newport to its west and Monmouthshire to it east.

12.3.2 Located along the coastline, the Site is bordered to its south by the River Severn. West to east, the Site spans from Whitson, through Redwick and Summerleaze, to just south of Undy (bordering Safehaven Caravan Storage Park). The land upon which the Solar Farm is proposed is currently used as farmland/fields.

12.3.3 The Study Area shown on **Figure 12-1** will include the roads within the Scoping Red Line Boundary which will be used for access and/or as a delivery route. It also includes any roads which are utilised as the haul route for deliveries up to the principal road network, i.e. principal A-roads and/or the Motorway. This Study area has been identified as it is expected that these receptors are likely to be affected by the construction, operation and decommissioning of the Proposed Development. The receptors within the Study Area include:

- Pill Street (Partially within the Scoping Red Line Boundary, ST42611 85064) ;
- Sea Street Lane (Partially within the Scoping Red Line Boundary, ST 41300 84044);
- Half Acre Lane (Partially within the Scoping Red Line Boundary, ST 37727 83698);
- Broad Street Common (Partially within the Scoping Red Line Boundary, ST 38552 85031);
- The Ramp / The Causeway (Outside the Scoping Red Line Boundary, ST 43670 86213);
- S Row (Partially within the Scoping Red Line Boundary, ST 42146 84618);
- Green Street (Partially within the Scoping Red Line Boundary, ST 42484 85006);
- B4245 (Outside the Scoping Red Line Boundary);
- Newport Road (Outside the Scoping Red Line Boundary);
- Redwick Road (Outside the Scoping Red Line Boundary);
- Whitewall (Outside the Scoping Red Line Boundary);
- Barecroft Common (Outside the Scoping Red Line Boundary);
- Mead Lane (Within the Scoping Red Line Boundary, possible route to laydown area, ST 40842 84026);
- A4810 (Outside the Scoping Red Line Boundary);

- N Row (Partially within the Scoping Red Line Boundary, ST 40530 84708); and
- Whitson Common Road / Porton Road (Partially within the Scoping Red Line Boundary, ST 37754 83572/ST 337784 183561).

12.3.4 The following Plate, **Figure 12-1**, highlights the roads which will be subject to consideration as part of the EIA.

12.4 Baseline Conditions

12.4.1 A desktop review of the current transport conditions has been undertaken utilising the following resources:

- Google Maps;
- OS Maps;
- Newport City Council's Rights of Way map;
- Monmouthshire County Council's Public Rights of Way Map; and
- DataMapWales.

Land Use

12.4.2 The land within and around the Scoping Red Line Boundary mainly comprises agricultural land/farmland. Although there are no residential properties within the Site, a number are situated just outside of the boundary.

12.4.3 The Site is situated within what is known as The Gwent Levels Site of Special Scientific Interest (SSSI). The Gwent Levels comprise of six separate, bordering SSSIs , three of which exist within the Scoping Red Line Boundary:

- Whitson;
- Redwick and Llandevenny; and,
- Magor and Undy

12.4.4 The Caldicot Levels are classified as one of The Registered Landscapes of Outstanding and of Special Interest in Wales.

12.4.5 From a review of aerial photography, is can be seen that multiple solar farms already exist in Whitson. One accessed from Chapel Road, one accessed from Parish reen/Monkscroft reen via Whitson Road and one accessed from N Row.

Highway Network

12.4.6 The M4 is located approximately 4km to the North of the Scoping Red Line Boundary, with the closest junction being 23A at Magor Interchange.

12.4.7 The A4810 is the closest A-road to the Site, located less than 700 metres (m) away at its nearest point to the Scoping Red Line Boundary. The A4810 is accessible via J23A off the M4.

12.4.8 Surrounding the Scoping Red Line Boundary, there are a number of classified unnumbered and unnamed roads. These roads are single lane roads, farm tracks and/or residential access routes. Typically, these lanes do not have formal footways, are partially or fully asphalted and are of the national speed limit (60mph).

12.4.9 Although the majority of these roads and tracks are unnamed, those which are named and either run through the Scoping Red Line Boundary or are directly adjacent are as follows:

- Whitson Road (ST 37098 84367);
- Whitson Common Road (ST 37754 83572);
- Porton Road (ST 37784 83561);
- Broad St Common (ST 38552 85031);
- Mead Lane (ST 40842 84026);
- N Row (ST 39402 85420);
- Cock Street (ST 40039 84892);
- S Row (ST 42146 84618);
- Sea Street Lane (ST 41300 84044);
- Half Acre Lane (ST 37727 83698);
- Pill Street/Green Street (ST 42611 85064/ST 42484 85006); and,

- The Ramp / The Causeway (ST 43670 86213).

Incidents

12.4.10 A review of CrashMap has been undertaken to investigate the traffic incidents that have occurred in recent years. The review has found that two incidents have occurred within the Scoping Red Line Boundary.

12.4.11 The first incident recorded was located near to Whitson Road's junction with Broad Street Common (approximately 1.5km north of Whitson). This was classified as 'Fatal' and occurred in 2018. One vehicle was involved, and the incident resulted in one casualty.

12.4.12 An incident of 'Slight' severity occurred along Pill Street in Summerleaze in 2019, within the Scoping Red Line Boundary. Two vehicles were involved in this incident, which resulted in one casualty.

12.4.13 Within the Study Area, incidents have also been recorded in Goldcliff, Undy and Magor, and along the A4180. Most of these incidents are classified as 'Slight'.

12.4.14 A look at the wider network from the Scoping Red Line Boundary to the nearest principal A-roads and/or the M4, shows that there are more collisions within Magor (north-east of the Site), and several along the A4810. Any vehicles travelling to the Site will need to use either the A4810 or travel through Magor from the M4. Additional consideration will be given to the severity of collisions and identification of any clusters which will indicate an issue with the highway.

Car Parks

12.4.15 There are no formal public car parks within the immediate area of the Site. Whilst there is a village hall in Redwick which has a car park, this is not a public car park, and the hall may discourage its use for parking by construction staff.

12.4.16 The nearest public car park is in Magor, approximately 1km from the north-easternmost section of the Site Boundary.

12.4.17 There are no appropriate locations for informal parking to occur along the C roads within the Proposed Development area.

Maritime

12.4.18 The closest major port to the Site is Newport, 10km north-west. The most direct route via road that is suitable for Heavy Goods Vehicles (HGVs) between the two locations is via the A48 and A4810 or the M4 and A4810.

Active Travel Links

Walking

12.4.19 A number of footpaths that are Public Right of Ways (PRoW) are located within the Scoping Red Line Boundary. Noting that the Site lies on the boundary between Monmouthshire and Newport, the PRoWs located within the Site are as follows:

- Newport: 392/15A/1, 392/15/1, 392/14/1, 392/26/1, 392/27/1, 404/5/1, 404/6/1, 404/7/1, 404/3/1 Footpaths and 392/GL3/1 and 392/GL2/1 Green Lanes; and
- Monmouthshire: 372/58/2, 372/58/1, 372/59/1, 372/58/5, 372/58/3 and 372/56/1.

12.4.20 The Wales Coastal Path is situated just outside the southern edge of the red line boundary.

Cycling

12.4.21 The National Cycle Network (NCN) Route 4 runs adjacent to the Scoping Red Line Boundary for the majority of its route through the area (along Broad Street Common > N Row > Church Row > S Row > Pill Street > The Causeway). The NCN Route 4 briefly routes within the Site on Pill Street, N Row, and Broad St Common.

Public Transport

12.4.22 There are two bus stops located in Whitson along Whitson Common Road (immediately west of the site) – Capel ar Lan y Mor and Porton Road. These are served by the SJ14 service, a school bus service which runs from Goldcliff to St Joseph's RC School Monday-Friday (on school days only). The service departs from these stops at approximately 07:55 and returns at approximately 15:55.

12.4.23 There are no bus stops or services serving Redwick or Summerleaze.

12.4.24 North of the A4810 on Llanwern Road (circa 1-2 miles north of the site), the Tesco Distribution Centre bus stop is served by the number 5 and X74 bus services, both of which are run by Newport Bus. Service 5 routes from Newport City Centre to Gwent Europark, extending to Magor from 18th August 2024. There are four services a day Monday to Friday and a reduced service on Saturdays. The X74 service from Newport City Centre to Chepstow runs hourly Monday-Friday and operates a reduced timetable on Saturdays and Sundays. However, at the Tesco distribution Centre stop, the service is more limited.

12.4.25 The bus stops located along the B4245 through Magor (circa 3 miles from the site) are served by the following services, all operated by Newport Bus;

- 74: Newport to Chepstow – twice a day;
- 75: Sudbrook to Magor – once every two hours; and,
- T7 (on behalf of Traws Cymru): Magor – Chepstow – Bristol Service – twice a day.

12.4.26 The nearest train station to the Site is Severn Tunnel Junction (circa 5 miles from the centre site), located on the Maesteg to Cheltenham Spa Line. Services from Severn Tunnel Junction include Cheltenham Spa, Maesteg, Cardiff Central, Penzance, Gloucester, Taunton, Portsmouth.

Sensitive Receptors

12.4.27 The initial work has identified the following likely sensitive receptors:

- Pedestrian routes within and across the Site, in particular the impact on PRoWs in the area, specifically the Wales Coastal Path;
- Cycle routes around the Site; and,
- Key road links (as identified as the Study Area above), in particular, resident access around the Site.

12.4.28 The sensitive receptors are summarised in **Table 9-1**.

Table 12-1 Sensitive Receptors

Receptor	Description	Reason
Public Rights of Way (PRoW):	Newport : 392/15A/1, 392/15/1, 392/14/1, 392/26/1, 392/27/1, 404/5/1, 404/6/1, 404/7/1, 404/3/1 Footpaths and 392/GL3/1 and 392/GL2/1 Green Lanes Monmouthshire : 372/58/2, 372/58/1, 372/59/1, 372/58/5, 372/58/3 and 372/56/1.	The PRoW identified are within the Site and will be kept open where possible, however, may be required to be temporarily or permanently closed and/or diverted during the phases of construction of the Solar Farm. This will need to be agreed with relevant PRoW officer to agree mitigation and temporary closures.
National Cycle Network (NCN) Routes	National Cycle Network (NCN) Route 4 runs within the Scoping Red Line Boundary (along Broad Street Common > N Row > Church Row > S Row > Pill Street > The Causeway). This NCN Route 4 routes within the Site area on Pill Street, N Row, and Broad St Common.	As Pill Street, N Row, and Broad Street Common will be utilised for deliveries and access, the impact on the NCN will need to be assessed and mitigation provided if necessary..
Highway network	The highway network as detailed above in Section 12.3.	Increases in HGVs associated with the construction of the Proposed Development will impact on access to the Site by residents and users of the highway network. The impacts on these links will be considered in the ES relative to the percentage increase in traffic volumes, impact on safety, severance, etc. (detailed further in **Chapter 4: The Environmental Impact Assessment Methodology**)

12.4.29 These will be reviewed in more detail as part of the PEIR.

12.5 Proposed Assessment Methodology

Relevant Legislation and Guidelines

12.5.1 The transport and traffic chapter will be prepared in full consideration of IEMA Guidelines and current national, regional, and local policies. This includes those detailed within **Table 12-2**.

Table 12-2 National, Regional and Local Policies

Policy	Relevance to this Study
Wales National Delivery Transport Plan (March 2023)	This sets out how Wales will deliver against the priorities and ambitions set out in Llwybr Newydd. As part of this, it provides a full list of programmes and interventions to be delivered.
Planning Policy Wales (PPW) Edition 12 (2024)	Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. The document highlights that low carbon electricity must become the main source of energy in Wales and that in order to ensure that future demand can be met, significant investment will be needed in energy generation infrastructure. It also notes that the planning system should secure an appropriate mix of energy provision to maximise benefits to the economy and communities.
National Policy Statement for Renewable Energy (EN-3)	EN-3 states the applicants of Solar Farms needs to consider the following in relation to Accessibility: • Suitability of access routes to the site for construction and operation; • Access for delivery of solar arrays and associated infrastructure during construction; • On-site access routes; • Connections to highway; and, • Assessment of impacts along the access routes required. In terms of PRoW, EN3 states that impacts on PRoW are to be considered, including possible temporary or permanent closures, or diversions to enable construction or operation; however, applicants are expected to keep PRoW open during construction where practical and safe and to keep users safe. PRoW access should be maintained where practicable and safe and that options for enhancement post construction are available, these should be considered. A PRoW Management Plan may be required to detail how these will be managed through the construction of the Proposed Development. Construction impacts will need to be considered, including details related to the transport of materials, structures, components, etc., to the Site, on-site compound/storage, impact of vehicle

Policy	Relevance to this Study
	movements on the local highway, impact on existing infrastructure, cumulative impacts with neighbouring sites, etc. Mitigation for the above will need to be provided, including but not limited to, provision of a outline Construction Traffic Management Plan (oCTMP), restrictions on deliveries by time/size, and improvements of the network to accommodate the development.
Technical Advice Note 18 (Transport)	This note sets out the land use planning policies of the Welsh Assembly Government. On assessing impact and managing implementation, it is highlighted that transport assessments should be used to assess the suitability of an application in terms of travel demand and impact. On planning for transport infrastructure, the Note highlights that smaller scale freight movements, particularly those serving developments near residential areas or in town centres, need to strike a balance between the need to protect the vitality of the local economy, and the overall quality of life for local residents. It advises that local authorities may wish to consider the potential for attaching conditions restricting hours of access when determining such applications.
Llwybr Newydd: the Wales Transport Strategy 2021)	The strategy is centred around the principle of achieving an integrated approach to transport, which will ensure that transport can address key issues to deliver wider commitments. It aims to create 'an accessible, sustainable and efficient transport system' where 45% of journeys are undertaken by sustainable modes by 2040.
Active Travel (Wales) Act Guidance (2021)	The Active Travel (Wales) Act requires the Welsh Government and Local Authorities in Wales to actively promote, provide, and develop walking and cycling routes. Although there are no proposed future routes within or bordering the site, there are proposed future routes within the wider study such as in Magor and Undy and along the A4810.
The Well-Being of Future Generations (Wales) Act (2015)	The Well-being of Future Generations (Wales) Act 2015 requires public bodies in Wales to consider the well-being of future generations in decision-making and gives a legally-binding common purpose – the seven well-being goals – for national government, local government, local health boards and other public bodies. It details the ways in which these bodies must work, and work together, to improve the well-being of Wales.
South East Wales Transport Alliance Regional Transport Plan (2010)	This provides a 15-year long-term strategy up to 2025 of how to improve regional transport in Southeast Wales and help deliver the social, economic and environmental objectives of the Wales Spatial Plan and the Wales Transport Strategy.

Policy	Relevance to this Study
Monmouthshire Local Development Plan (2011 – 2021)	The LDP sets out the Council's vision and objectives for the development and use of land in Monmouthshire, together with the policies and proposals to implement them over a 10-year period to 2021 Providing increased opportunities for renewable energy is part of the 'Valuing our Environment' objective. Policy SD1 also sets out the criteria which proposals for renewable energy schemes will be assessed against.
Newport Local Development Plan (2011-2026)	The plan intends to guide development in Newport up to 2026. There is a strategic policy on renewable energy - CE10 Renewable Energy – which states that renewable energy schemes will be considered favourably, subject to there being no overriding environmental and amenity considerations. It highlights that care should be taken in assessing proposals for renewable energy projects in sensitive, designated areas.

Proposed Desk Based Assessment

12.5.2 The proposed desk-based assessment elements of the ES will include:

- Review of collision data;
- Review of automatic traffic counts data (see proposed surveys);
- Review of policy relevant to transport in the area; and,
- Review of google earth to understand where access may be a concern.

Proposed Surveys/Site Visits

12.5.3 It is proposed to undertake Automatic Traffic Counts along the key roads around the Site which will be directly impacted by vehicle movements attributed to the construction of the Proposed Development, including:

- Whitson Common Road/Porton Road (Partially within the Scoping Red Line Boundary, ST 37754 83572 & ST 337784 183561)
- Pill Street/Green Street (Partially within the Scoping Red Line Boundary, ST 42611 85064 & ST 42484 85006);
- Sea Street Lane (Partially within the Scoping Red Line Boundary, ST 41300 84044);

- Half Acre Lane (Partially within the Scoping Red Line Boundary, ST 37727 83698);
- Broad Street Common (Partially within the Scoping Red Line Boundary, ST 38552 85031);
- The Ramp / The Causeway(Outside the Scoping Red Line Boundary ST 43670 86213);
- S Row (Partially within the Scoping Red Line Boundary, ST 42006 84483);
- B4245 (Outside the Scoping Red Line Boundary);
- Redwick Road (Outside the Scoping Red Line Boundary, ST 42467 86919);
- Mead Lane (Within the Scoping Red Line Boundary, possible route to laydown area, ST 40272 83575);
- A4810 (Outside the Scoping Red Line Boundary); and,
- N Row (Partially within the Scoping Red Line Boundary, ST 40530 84708).

12.5.4 The routes have been selected because they are within the Scoping Red Line Boundary and likely to have an increase in vehicle traffic during construction. Other routes outside the Scoping Red Line have been identified for traffic surveys as they will be directly impacted by the Proposed Development and provide links to the wider principal distribution network (i.e. A-roads and the Motorway).

12.5.5 The purpose of the surveys is to identify the volumes of traffic currently utilising the network around the Site and to identify the speeds users are travelling. This will inform design of any accesses into the Site, and will enable the assessment of the impacts of the Site on delays/congestion, safety and collisions, severance, air quality, noise, etc.

12.5.6 Collision data will be obtained for the Study Area to understand if there are any safety issues in the area. The Study Area for collisions will be within the roads within the Scoping Red Line Boundary, and connections to the principal A road network.

Traffic Movements

12.5.7 Traffic movements associated with the Proposed Development have been estimated based on a recent 49.9MW solar farm application. The figures have been proportionately increased to reflect the current working capacity of the site.

12.5.8 **Table 12-3** details the estimated figures per activity, assuming an 18-month construction period.

Table 12-3 Construction Traffic Movements

Activity	Type of Vehicle	Updated Total Deliveries
Solar Modules & Mounting Structures	16.5m Articulated	902 (1,804 two-way movements)
Inverters	10m Rigid	79 (158 two-way movements)
DNO Cabinet	12m Rigid	8 (16 two-way movements)
Customer Switchgear	10m Rigid	8 (16 two-way movements)
Access Tracks – Temporary Ground Reinforcement	10m Rigid / Tipper Trick	526 (1,052 two-way movements)
Storage Compound	10m Rigid	8 (16 two-way movements)
Other (Cabling, Construction Material, Waste)	12m Rigid	353 (706 two-way movements)
General Front End	JCB by Low Loader	8 (16 two-way movements)
Crane Delivery	Low Loader	1 (2 two-way movements)

12.5.9 The average per day movements is 8, based on a 6-day working week over 18 months.

12.5.10 The above will be utilised as part of the assessment of the impacts of the Proposed Development; however, it should be noted that these remain as preliminary numbers which will be finalised through the assessment process.

12.6 EIA Methodology

12.6.1 The significance criteria for those aspects that will be assessed in the transport chapter will be as per the IEMA guidance for transport and movement[211] follows:

- **Road vehicle drive and passenger delays**: Delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the network. This will be assessed in the Transport Assessment (TA) through localised junction capacity assessments.
- **Road user and pedestrian safety**: A review of personal injury collisions in the surrounding area will be undertaken. The review will seek to identify the types and causes of collision, as well as identify if there are any collision clusters. The relative increase in vehicle trips attributed to the site will be reviewed against the existing traffic flows to understand the likely impact on any identified collision clusters.
- **Severance of communities**: Changes of traffic flow of 30%, 60% and 90% will have slight, moderate and substantial effects on severance. It will be deemed significant at the point of slight impacts on severance, i.e. where traffic increases by 30% or more.
- **Non-motorised user delay**: There are no set thresholds to define pedestrian delay, and assessors are required to use professional judgement to determine whether pedestrian delay is a significant effect.
- **Non-motorised amenity**: The thresholds for judging the significance of changes in pedestrian amenity will be where the known traffic flow is doubled or halved.
- **Fear and intimidation on and by road users**: There are no commonly agreed thresholds for estimating levels of fear and intimidation from known traffic and physical conditions but suggests thresholds based on total traffic flows, number of HGVs and traffic speeds.

12.6.2 The residual effects will be assessed following the implementation of appropriate

211 Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement (December 2024)

mitigation. Additionally, the potential effects of Noise related to traffic is considered in **Chapter 13: Noise**.

Construction Traffic Management Plan

12.6.3 A outline Construction Traffic Management Plan (oCTMP) will be provided to seek agreement on construction/delivery vehicle routing, type and frequency and all other matters relevant to the construction and maintenance programme. On this basis, the proposed oCTMP will comprise:

12.6.4 A Site visit to confirm existing access arrangements and characteristics of the surrounding neighbourhood. As part of the Site visit photos and notes will be taken which record the locations of existing street furniture and signage which may require relocation through the construction works;

12.6.5 A description of the works, inclusive of the construction programme and ongoing maintenance requirements;

- A detailed description of the access arrangements;
- Swept path analysis drawing to demonstrate that the largest legal lorry vehicle can safely access the Site;
- Contact details of who will be responsible for the oCTMP;
- Information of how road users and pedestrians will be accommodated for any new access(es);
- Details on how the roads will be kept clear of mud, silt, water runoff and damage due to the operations of the Site;
- Details on workforce parking;
- Details of any Traffic Regulation Orders, Road or Footway closures and any other details which will require further liaison and agreement with the Local Highway Authority;
- Details of the route for the construction and servicing/maintenance vehicles;
- Details on the type and frequency of the construction and servicing/maintenance vehicles that will be used; and

- Details on general management issues, including:
- Neighbourhood Consultation;
- Impact on Other Highway Users; and
- Delivery Booking System (construction phase).

12.7 Description of Likely Significant Effects

Construction Stage

12.7.1 There is potential for the following likely significant, localised effects during construction:

- There could be a significant uplift in HGV traffic using the Strategic Road Network (SRN) and local road network. This uplift in HGV traffic could impact typical journey times and could possibly cause congestion. There may be a need for access junction formalisation and improvements to the wider network to ensure that larger HGV vehicles can be accommodated.
- There may be a need to transport abnormal loads on the local network, in particular any cranes for construction. These abnormal loads may require alternation to the natural / built environment to accommodate loads. The abnormal loads will also likely require traffic management and agreement on dates / times for movement with all relevant highway authorities.
- Required access for construction vehicles on the local network (i.e. access lanes through properties surrounding the Scoping Red Line Boundary) may restrict access to existing land and/or properties surrounding the Site.
- There could be a need to implement road diversion, and this could increase journey times for locals and visitors to the area.
- There are opportunities around Mead Lane (where the culvert crosses over pipes) which could be considered to help reduce the impact of HGVs on local communities. This could include levelling out the road either side of the culvert and providing alternative routes.
- A review of the suitable access points to the development will be considered, for both HGVs and the transportation of abnormal loads to

Site. Similarly, to ensure access, a review of the suitable location for a construction compound (based on the predicted workforce numbers, materials and equipment) will also be considered.

Operation and Maintenance Stages

12.7.2 There is potential for the following localised effects during the operational stage of the Proposed Development:

- In the event of the panels requiring replacement or refurbishment, there could be a need for additional transporting loads on the local highway network. However, it is not expected that these loads will carry significant impacts on the local highway network.

Decommissioning Stage

12.7.3 There is potential for the following likely significant, localised effects during decommissioning:

- There could be a significant uplift in HGV traffic using the SRN and local road network. This uplift in HGV traffic could impact typical journey times and could possibly cause congestion.
- There may be a need to transport abnormal loads on the local network. These abnormal loads may require alteration to the natural / built environment to accommodate loads. The abnormal roads will also likely require traffic management and agreement on dates / times for movement with all relevant highway authorities.
- Required access for vehicles similar to those used for construction on the local network (i.e. access lanes for properties adjacent to the Scoping Red Line Boundary) may restrict access to existing land and/or properties surrounding the Site.
- There could be a need to implement route diversions, and this could increase journey times for locals and visitors to the area.

12.7.4 Further assessment may be required to understand the full impact on the local highway network during these phases, for example, a Transport Assessment, including junction assessments and microsimulation modelling and Traffic Management Plans, including details on any traffic management requirements, type, and frequency of different deliveries.

Matters to be Scoped Out

12.7.5 No specific elements of Terrestrial Transport will be scoped out at this time.

Element	Phase	Scoped In	Scoped Out	Justification
Highway Network and receptors	Construction and Decommissioning	✔		The A4810 is the closest A-road to the Site, located less than 700 metres (m) away at its nearest point to the Scoping Red Line Boundary. Increases in HGVs associated with the construction and decommissioning of the Proposed Development will impact residents and users of the highway network. This will be assessed as per IEMA Guidance for transport and movement.
Highway Network and receptors	Operation		✔	Transportation of loads to the Site will be minimal during the operational period and only required for replacement infrastructure and minor maintenance activities. It is not anticipated that these loads will result in significant impacts on the local highway network or the relevant receptors.

Element	Phase	Scoped In	Scoped Out	Justification
Active Travel Links	Construction, Operation and Decommissioning	✔		There are a number of PRoWs across the Site which will be kept open where possible, however, may be required to be temporarily or permanently closed and/or diverted. The National Cycle Network (NCN) Route 4 runs adjacent to the Scoping Red Line Boundary therefore the impact on the NCN will need to be assessed and mitigation provided if necessary

12.8 Opportunities for Enhancing the Environment

12.8.1 The following is a list of potential opportunities for enhancing the environment with regards to terrestrial transport.

- Access junction formalisation and improvements to the wider network to support larger HGV traffic will be considered.
- Improvements to reen crossings along the routes to/from/around the Site.
- Opportunities around the Mead Lane culvert crossing over pipes will be considered to reduce the impact of HGVs on local communities, in particular Redwick. Opportunities could include levelling out the road either side of the culvert, providing alternative routes (i.e. along existing farm track and into a field via an existing access at the southern-most boundary of the Site.

12.9 Mitigation

12.9.1 The development is expected to generate HGV and private vehicle trips in the local area. However, none of the impacts are expected to be significant.

12.9.2 Liaison with Public Rights of Way officers in the two Local Authorities will ensure that any requirements for diversions and/or temporary closures of PRoW routes are supported and compliant.

12.9.3 The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

12.9.4 A draft Travel Plan will be included as part of the PEIR, and the ES, which will encourage car sharing and alternatives to arriving by private car, including encouraging the adoption of mini buses for staff.

12.10 Limitations and Assumptions

12.10.1 Key limitations in terms of transport around the Site will be the capacity of the network to accommodate HGV movements for construction equipment and materials. This can be addressed by undertaking swept path assessments to demonstrate that HGVs can manoeuvre safely within the area.

12.10.2 The number of vehicle movements to the site is an estimate based on other nearby sites that have obtained planning permission. Whilst this an accepted, standardised industry approach, this is considered an assumption which will involve some uncertainty. A true reflection of vehicle movements will be obtained once a contractor is appointed.

13.0 Noise and Vibration

13.1 Introduction

13.1.1 This Chapter assesses the potential noise, and vibration impacts to nearby sensitive receptors from the construction, operation and decommissioning of the Future Energy Llanwern Solar Farm. The construction, operation and decommissioning of solar farms do not typically generate high levels of noise and vibration in absolute terms. However, given the scale of the Proposed Development, which covers a significant area of around 548.3 hectares (ha), and with an electrical output exceeding 350 MW, it is proposed that the potential noise and vibration impacts on nearby sensitive receptors are quantified and assessed within the Environmental Impact Assessment and reported in the Environmental Statement (ES).

13.1.2 The Proposed Development will be constructed on agricultural land between the villages of Redwick and Undy within the administrative areas of Monmouthshire County Council and Newport City Council.

13.2 Consultation

13.2.1 At this time no consultation has been undertaken on the Proposed Development or the associated likely effects due to noise and vibration arising from its construction and operation. It is therefore intended that this Scoping Report will form the basis for commencement of consultation with Monmouthshire County Council, Newport City Council and other stakeholders.

13.3 Study Area

13.3.1 Study areas have been defined for each aspect of the Proposed Development requiring assessment. Determination of the extent of the study areas is based on appropriate guidance, where available, and professional judgement has been applied where there is a lack of specific guidance on the determination of study areas (e.g. there is no specific guidance on determination of study areas for construction, operational or decommissioning noise).

13.3.2 In general, the closest sensitive receptors to proposed construction activities and operational plant, which fall within the respective study areas, will be the focus of the assessment. This is on the basis that ensuring appropriate control of noise and vibration as set out below. Where necessary, the study areas may be expanded, or additional receptors within the study area considered, where sensitive receptors closer to the Scoping Red Line Boundary are found to be subject to likely significant effects due to noise or vibration. Types of receptors are discussed further in **Section 13.4**.

13.3.3 The proposed study areas are set out in the list below and are shown in **Figure 13-1**.

- **Construction noise and vibratio**n: the study area for this aspect has been determined using professional judgement and experience of similar schemes as an area approximately 300 metres (m) distance from the Scoping Red Line Boundary.
- **Construction traffic noise:** in accordance with relevant guidance on assessing noise from road traffic contained in Design Manual for Roads and Bridges (DMRB) LA111: Noise and vibration, the study area for this aspect is defined as an area approximately 50 m distance from road transport routes that may be used during the construction phase.
- **Construction traffic vibration:** no study area for groundborne vibration arising from construction traffic is defined. The relevant guidance document which sets out criteria for the assessment of airborne noise from road traffic (DMRB)1 scopes out assessment of vehicle induced vibration (for new roads), on the basis that the road surface will be free from irregularities that would give rise to vehicle induced vibration. There are no specific and accepted methods contained in any relevant technical guidance, policy or standards for predicting vehicle induced vibration. It is therefore proposed that assessment of groundborne vibration arising from construction traffic be scoped out of the assessment. This is discussed further below in paragraphs 13.2.4 to 13.2.6.
- **Operational noise from plant associated with the photovoltaic (PV) panels (transformers, inverters, intermediate substations)**: the study

area for this aspect has been determined using professional judgement and experience of similar schemes as an area approximately 500 m distance from the Scoping Red Line Boundary.

- **Operational noise from new plant required for the grid connection (e.g. transformers, switchgear, etc.)**: the study area for this aspect has been determined using professional judgement and experience of similar schemes as an area approximately 1000 m distance from the Scoping Red Line Boundary.
- **Operational vibration**: no study area for operational vibration is defined because there is no rotating equipment or other sources of operational vibration forming part of the Proposed Development that would have the potential to give rise to any significant effects at any location. It is therefore proposed that assessment of operational vibration be scoped out of the assessment.

Construction Noise and Vibration and Construction Traffic Noise

13.3.4 The proposed study areas set out above for construction noise and vibration (including traffic) have been determined using appropriate guidance as set out in **Section 13.4.**

13.3.5 In accordance with the relevant guidance, if the assessments indicate likely significant effects, the study areas may be expanded to include other sensitive receptors close to the boundary of the study area.

Construction Traffic Groundborne Vibration

13.3.6 A study area for vibration arising from construction traffic movements has not been defined. Significant effects due to vibration arising from construction traffic movements are considered unlikely. Whilst there was guidance on assessing groundborne vibrations due to road traffic provided within the superseded DMRB (HD 213/11), this has now been removed from the updated DMRB (LA 111)[212] guidance, which states:

"Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant

adverse effects".

13.3.7 There were a number of issues associated with the assessment of groundborne vibrations outlined in the superseded guidance. The issues noted were the level of detail required to accurately predict groundborne vibrations, that traffic induced groundborne vibrations are caused by irregularities in the road surface (the maintenance of surfaces of public highways is outside of the control of developers), and that, even near heavily trafficked roads, measured groundborne vibration levels are typically equivalent to those caused by internal activities within dwellings such as closing doors, operating domestic appliances and walking on suspended wooden floors.

13.3.8 On the basis of the above, and as the revised DMRB (LA 111) [212] document contains the nationally approved assessment methodology, it is proposed that the assessment of groundborne vibrations due to construction traffic is scoped out of this assessment.

Operational Noise

13.3.9 The proposed study areas set out above for operational noise from both plant associated with the PV panels and the plant required for the grid connection have been determined using professional judgement and experience of similar schemes, as there is no relevant guidance setting out the spatial extents of study areas that should be considered when assessing operational noise. In general, it is unlikely that industrial sound would give rise to significant effects to receptors at distance of 1000 m and beyond. This distance has therefore been applied for the assessment of operational noise from new plant required for the grid connection.

13.3.10 A reduced buffer of 500 m is appropriate for plant associated with the PV panels, which is likely to emit lower noise levels than noise associated with the grid connection plant. The plant associated with the PV panels will also be distributed over a wider area, which will also reduce the potential for significant noise effects at nearby sensitive receptors.

Decommissioning Noise

13.3.11 A study area for noise and vibration arising from decommissioning the Proposed Development has not been defined. The effects arising as a result of the

decommissioning phase are considered similar to or of less magnitude when compared to the construction effects discussed above.

13.4 Baseline Conditions

13.4.1 A desktop study has been undertaken to consider likely baseline conditions in the vicinity of the study area and to identify the nearest sensitive receptors. The data source used in the desktop study was aerial imagery accessed via Google Earth Pro, the Scoping Red Line Boundary indicated in drawing 'Scoping Red Line Boundary'' and Environmental Noise Mapping 2022 data.

13.4.2 The nearest noise sensitive receptors to the Site are detailed below in **Table 9-1** and are shown in **Figure 13.1**. The receptors identified in **Table 9-1** are the closest to the Scoping Red Line Boundary and are therefore those likely to have the greatest potential to experience significant effects during the construction and operation of the Proposed Development. As discussed above, additional receptor locations may be considered and/ or the Study Area expanded to include other key receptor locations, where appropriate and necessary to do so. With regard to recreational routes, it is proposed that National Trails / Recreational routes and dwellings (Residential) will be considered as sensitive receptors within the assessment, but footpaths and bridleways constituting Public Rights of Way (PRoWs) would not be considered as sensitive receptors within the assessment. This reflects the expectation of amenity and recreational value associated with established recreational routes.

Table 13-1 Receptors

ID	Receptor	Type	Approximate coordinates (OSGB36 National Grid)	
			Easting, m	Northing, m
R01	South Wales coast path	Recreation route	339558	182879
R01	South Wales coast path	Recreation route	341720	183500
R01	South Wales coast path	Recreation route	343410	184482
R02	Court Farm, Whitson Road	Residential	337071	184985
R03	Bali-Hai, Half Acre Lane, Whitson	Residential	337792	183714
R04	Porton Road, Whitson	Residential	338204	183337

ID	Receptor	Type	Approximate coordinates (OSGB36 National Grid)	
			Easting, m	Northing, m
R05	Cottage Farm, Whitson	Residential	338954	182646
R06	Grangefield Farm	Residential	338898	184948
R07	Dwelling at Tonew Kennels, Rush Wall	Residential	340019	185695
R08	Greenfield House, Cock Street	Residential	340042	184946
R09	North Row House	Residential	340276	184900
R10	Mead Farm, Mead Lane	Residential	340736	183926
R11	Church Farm, Redwick	Residential	341137	184031
R12	The Gables, Redwick	Residential	341320	184048
R13	Great House	Residential	341662	184136
R14	Fir Tree Farm	Residential	341835	184273
R15	Summerleaze Farm	Residential	342561	184963
R16	Yew Tree Cottage	Residential	342686	185088
R17	Pill Farm	Residential	343356	185462
R18	The Summer House, Hawthorn Cottage	Residential	343698	186019
R19	Greenfield	Residential	343833	185910
R20	Cherry Tree House, Chapel Farm	Residential	344282	185357

13.4.3 The environment in the immediate vicinity of the receptors identified above is predominantly rural, but also contains a significant industrial element and important transport infrastructure. Within approximately 2 kilometre (km) of receptors there is the M4 motorway, the South Wales mainline railway, the Llanwern Works and a number of existing and planned solar farms.

13.4.4 The majority of the receptors are isolated dwellings which are located a significant distance from nearby settlements and major noise sources. For example, the only receptors within, or close to, a village are those receptors (Mead Farm, Church Farm, The Gables, Great House, Fir Tree Farm) in or near Redwick, a small village approximately 1 km north of the shore of the Severn Estuary and 9 km east of Newport. Hawthorn Cottage and Greenfield situated to the north-east are in closest proximity to a town (Magor, approximately 1 km north), the M4 motorway (approximately 2 km north and north-west) and the South Wales Mainline railway (approximately 1 km north). The western most receptor (Court Farm) is the receptor in closest proximity to existing industry, with the National Grid Whitson Substation being approximately 500 m to the north and the Llanwern Works approximately 1.3 km to the north.

13.4.5 Based on the above, the existing sources of environmental noise which are considered likely to characterise the baseline ambient noise environment in the vicinity of the receptors identified in **Table 9-1** consist primarily of road traffic. Sound from the existing substation and from the Llanwern Works may also contribute to the ambient noise environment at Court Farm.

13.4.6 Noise mapping results indicate that road traffic on the local highway network is likely to be the most significant source of environmental noise at the majority of sensitive receptors listed in **Table 9-1**. Road traffic noise from vehicle movements on the M4 does not appear to be the most significant contributor to the baseline environment. Vehicle movements on the local road network in proximity to the receptors are predicted to be the dominant source of existing transport noise, as the mapping indicates that daytime road traffic may be giving rise to sound levels above 50 dB LAeq,16h at receptors in close proximity to local road links (for example, the roads in and around Redwick).

13.4.7 Based on the review of the noise mapping data above, and considering the distance from the majority of sensitive receptors listed in **Table 9-1** to nearby sources of environmental noise, it is anticipated that ambient noise environments in the vicinity of the receptors would, for the majority of the time, tend to be characterised by low noise levels typical of agricultural areas.

13.5 Proposed Assessment Methodology

Relevant Legislation and Guidelines

13.5.1 The legislation presented in **Table 13-2** is relevant to the assessment of the effects on noise and vibration receptors:

Table 13-2 Legislation Relevant to Noise and Vibration

Legislation	Context
Control of Pollution Act 1974 (CoPA)[212]	Makes provision for the agreement of noise levels and methods of working with Local Authorities such that working in accordance with the agreement is a defence against any prosecution under the Act. The Act established the concept of "Best Practicable Means" (BPM) as a defence against prosecution under the Act. The Act also enables the preparation of approved codes of practice (COP) for various sources.
Environmental Protection Act 1990 (EPA)[213]	Further establishes the BPM defence. The Act also establishes that noise from premises and also individual vehicles on the public highways can be a statutory nuisance if they are a nuisance or prejudicial to health. The Act also clarifies that noise from road traffic on the public highway is not a nuisance. Road traffic is different to the 'individual vehicle' considered above as road traffic consists of a mixture of numerous vehicles originating from, and travelling to, different locations, and is therefore 'anonymous', i.e. sound from road traffic cannot be attributed to any one particular construction site or operational facility. Conversely, an individual vehicle may be identifiable and associated with, for example, a specific commercial or industrial operation.

13.5.2 Key national policy relevant to the assessment of noise and vibration is outlined below in **Table 13-3**.

212 UK Government (1974). Control of Pollution Act 1974. (online) Available at: https://www.legislation.gov.uk/ukpga/1974/40 [Accessed December 2024].

213 UK Government (1990). Environmental Protection Act 1990. (online) Available at: http://www.legislation.gov.uk/ukpga/ 1990/43/contents [Accessed December 2024].

Table 13-3 Policy Relevant to Noise and Vibration

Policy	Context
National Policy Statements (NPSs)	NPS EN-1[214] advises that applicants include a noise assessment to consider both construction and operation effects where appropriate. Reference is made to Welsh Government's overarching noise policy set out in 'Noise and Soundscape Action Plan 2018 to 2023'[215].
	NPS EN-3[216] advises that proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of the inclusion of any necessary mitigation to avoid noise effects. With regard to solar schemes, it is noted that care should be taken to avoid cumulative effects where the network connection is sited next to existing electricity network infrastructure and that worst-case impacts due to construction traffic on potential construction traffic routes should be assessed. The potential for cumulative noise effects due to additional plant required for the network connection and noise from existing electricity network infrastructure is addressed in the proposed methodology for assessing operational noise. The methodology proposed to assess operational noise, outlined in **Section 13.5**, is that provided in BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound[217]. The methods provided in BS 4142 address the potential for cumulative noise effects through determination of existing baseline conditions and consideration of context, including consideration of the level and character of the

214 Department for Energy Security and Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). (Online) Available at: https://assets.publishing.service.gov.uk/media/655dc190d03a8d001207fe33/overarching-nps-for-energy-en1.pdf [Accessed December 2024].

215 Welsh Government (2018). Noise and Soundscape action Plan for Wales 2018 – 2023. (Online) Available at: https://www.gov.wales/sites/default/files/publications/2019-04/noise-and-soundscape-action-plan.pdf [Accessed December 2024].

216 Department for Energy Security and Net Zero (2023). Overarching National Policy Statement for Renewable Energy Infrastructure (EN-3). (Online) Available at: https://assets.publishing.service.gov.uk/media/655dc352d03a8d001207fe37/nps-renewable-energy-infrastructure-en3.pdf [Accessed December 2024].

217 British Standards Institution (2019). Methods for rating and assessing industrial and commercial sound. Available at: https://knowledge.bsigroup.com/products/methods-for-rating-and-assessing-industrial-and-commercial-sound?version=standard [Accessed December 2024].

Policy	Context
	specific sound (i.e. noise from any new or additional plant) in relation to the level and character of the residual sound (i.e. the existing ambient sound before the addition of the specific sound, including the extent of any pre-existing impacts and the potential for these to increase with the addition of the specific sound). The potential for impacts due to road noise from construction traffic during the construction phase will be assessed as set out in **Section 13.5.**
Planning Policy Wales (PPW)	PPW[218] sets out the land use planning policies of the Welsh Government, supplemented by Technical Advice Notes (TANs). PPW sets out the importance of fully considering potential noise impacts from new energy infrastructure when making planning decisions. Guidance around soundscapes promote a holistic approach to achieving well-being goals by considering the context of the sound in a given environment, and not just the absolute level of a sound.

13.5.3 The technical guidance contained in **Table 13-4** is relevant to the assessment of noise and vibration effects.

Table 13-4 Technical Guidance Relevant to Noise and Vibration

Technical Guidance	Context
Guidelines for environmental noise impact assessment[219]	Contains guidance on undertaking EIA for noise, including guidance on criteria for ambient noise changes.
Calculation of Road Traffic Noise (CRTN)[220]	Describes the procedures for calculating road traffic noise.

218 Welsh Government (2021). Planning Policy Wales. Edition 12. (Online) Available at: https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf [Accessed December 2024].

219 IEMA Guidelines for environmental noise impact assessment. https://www.communities.heidelbergmaterials.co.uk/sites/default/files/2024-08/CD6.4%20Institute%20of%20Environmental%20Management%20%26%20Assessment%20%28IEMA%29%20Guidelines%20for%20Environmental%20Noise%20Impact%20Assessment%20-%20November%202014_194885551_1.pdf [Accessed December 2024].

220 HMSO (1988). Calculation of Road Traffic Noise. Available at: https://trid.trb.org/view/291939 [Accessed December 2024}.

Technical Guidance	Context
Design Manual for Roads and Bridges (DMRB) LA111: Noise and vibration[212]	Provides guidance on the assessment of impacts that road projects may have on levels of noise and vibration. Provides criteria for assessing changes in road traffic noise levels, which will be used in the assessment of increases in road traffic noise due to vehicle movements associated with the Proposed Development.
ISO 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors: Part 2 Engineering method for the prediction of sound pressure levels outdoors[221]	Describes the method of calculating the attenuation of sound to predict environmental noise levels.
Guidelines for Environmental Impact Assessment [222]	Presents guidance on how the assessment of noise effects should be presented within the Environmental Impact Assessment (EIA) process. The Institute of Environmental Management and Assessment guidelines cover aspects such as scoping, baseline, prediction and examples of significance criteria.
BS 5228-1:2009+A1:2014 Noise and vibration on construction and open sites. Part 1: Noise[223]	Provides a recommended scope for construction noise assessment (the ABC Method) as presented in Annex E. The ABC Method relies on determining threshold values for potential significant effects at noise sensitive receptors based upon the results of ambient sound monitoring.
BS 5228-2:2009+A1:2014 Noise and vibration on construction and open	Provides methods and criteria for assessing groundborne vibration, which may be used when considering the potential for significant effects due to construction vibration.

221 International Standards Organisation (2024). International Standard ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors. Available at: https://www.iso.org/standard/74047.html [Accessed December 2024].

222 Institute of Acoustics, Institute of Environmental Management and Assessment (2016). Guidelines for Environmental Noise Impact Assessment. Available at: https://www.ioa.org.uk/system/files/proceedings/s_turner_iema-ioa_noise_impact_assessment_guidelines_-_update.pdf [Accessed December 2024].

223 British Standards Institution (2014). British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise. Available at: https://knowledge.bsigroup.com/products/code-of-practice-for-noise-and-vibration-control-on-construction-and-open-sites-noise?version=standard [Accessed December 2024].

Technical Guidance	Context
sites. Part 2: Vibration[224]	
BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound[217]	Standard for determining magnitude of impact of operational noise.
BS 7445 – Description and Measurement of Environmental Noise[225,226]	Standards setting out general methods for carrying out, and reporting of, environmental noise surveying.

Operational noise

13.5.4 The assessment of operational noise effects on dwellings will be undertaken with reference to BS 4142.

13.5.5 The assessment of operational noise effects to users of the South Wales Coast Path will be undertaken through a noise change assessment, and by consideration of the spatial extent to which different sections of the path are exposed to operational noise.

13.5.6 The assessment of impacts to soundscape will be undertaken, for dwellings, through consideration of context in accordance with BS 4142. Potential impacts to soundscape at the South Wales Coast Path will be undertaken qualitatively, based

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224 British Standards Institution (BSI, 2014). British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration. Available at: https://knowledge.bsigroup.com/products/code-of-practice-for-noise-and-vibration-control-on-construction-and-open-sites-vibration?version=standard [Accessed December 2024].

225 British Standards Institution (2003). BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Basic quantities and procedures. Available at: https://knowledge.bsigroup.com/products/description-and-measurement-of-environmental-noise-guide-to-quantities-and-procedures?version=standard [Accessed December 2024].

226 British Standards Institution (1991). BS 7445-2:1991 Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use. Available at: https://knowledge.bsigroup.com/products/description-and-measurement-of-environmental-noise-guide-to-the-acquisition-of-data-pertinent-to-land-use?version=standard [Accessed December 2024].

on the findings of the baseline survey and the predicted operational noise levels.

Assessment of Effects Methodology

Proposed Surveys / Site visits

13.5.7 A program of baseline acoustic monitoring is proposed that will focus on determining baseline sound levels at locations representative of those receptors considered likely to currently experience the lowest baseline ambient sound levels, and the likely highest construction and/or operational sound levels due to the construction and operation of the Proposed Development. The baseline survey programme will be agreed with the Local Planning Authorities (LPAs), Monmouthshire County Council and Newport City Council, through the submission and review of a Survey and Monitoring Plan (SMP).

13.5.8 Representative baseline sound levels will be determined based on the results of the baseline monitoring which will be undertaken in accordance with the methods and guidance provided in BS 74451:2003, BS 7445-2:1991, BS 4142:2014+A1:2019 and BS 5228:2009+A1:2014. The representative baseline sound levels will inform the assessment of potential noise effects during the construction, operation and decommissioning phases of the Proposed Development.

13.5.9 Noise levels due to the construction and operation of the Proposed Development will be predicted based on details of the plant requirements and proposed locations of construction activities and operational plant.

Significance Criteria

Sensitivity of receptors

13.5.10 **Table 13-5** below details the basis for assessing receptor sensitivity which has been produced on the basis of experience of assessing similar facilities and the application of professional judgement, taking into account the draft guidance in ‘Noise and Soundscape Plan for Wales 2023 – 2028 (Consultation draft)’.

Table 13-5 Establishing the Sensitivity of Receptors

Sensitivity	Examples
High	Hospital operating theatres, recording studios, outdoor recreation areas where tranquillity is intrinsic to the location (e.g., *'Green Flag Award winning sites and tranquil local nature reserves'*).
Medium	Dwellings, schools, hotels, outdoor recreation areas where tranquillity may be valued but is not intrinsic to the location.
Low	Offices.
Negligible	Industrial and commercial premises.

Determining magnitude of change – Construction activity vibration

13.5.11 If significant sources of construction vibration (i.e. piling and/ or use of vibratory rollers) are proposed or cannot be ruled out, then levels of construction vibration would be predicted and assessed at dwellings listed in **Table 9-1** using the methods and criteria discussed in BS 5228-2:2009+A1:2014. If percussive piling and the use of vibratory rollers can be ruled out, then there would not be any likely significant effects due to construction vibration.

Determining magnitude of change – Construction activity noise (dwellings)

13.5.12 The determination of the magnitude of change due to construction noise is based on the ABC method, provided in Annex E of BS 5228-1:2009+A1:2014. The method relies on comparing predicted noise levels with a significance threshold determined based on the measured baseline sound levels during the period when works would take place. Construction noise levels will be predicted on the basis of the information provided regarding the construction schedule and construction methods and the results of the baseline monitoring.

13.5.13 The activities with the greatest potential to generate noise emissions are anticipated to occur during normal construction hours (i.e., weekday daytimes), however there is potential that Horizontal Directional Drilling (HDD) may be required, and this typically entails some noise emissions during the night-time, as HDD requires that pumps run continuously to ensure that drilled bore sections do not collapse.

13.5.14 Though the baseline survey is yet to be undertaken, as outlined in **Section 13.3**, it is anticipated that absolute levels of baseline ambient noise levels are likely to be low. Therefore, it is expected that the majority of receptors potentially affected by construction noise would fall into the lowest threshold categories in accordance with the ABC method and would therefore have the lowest thresholds of significance detailed in the ABC method in Annex E of BS 5228-1. **Table 13-6** details the basis for assessing magnitude of change in accordance with the ABC method in BS 5228 1.

Table 13-6 Establishing the Magnitude of Change Due to Construction Noise (dwellings)

Magnitude	Criteria	Semantic
High	Noise levels exceeding BS 5228-1 threshold for a duration which triggers the requirement to provide additional noise insulation/ temporary rehousing.	Construction noise levels very much greater than baseline and disruptive.
Medium	Noise levels exceeding BS 5228-1 threshold for a duration which does not trigger the requirement to provide additional noise insulation/ temporary rehousing.	Construction noise levels greater than baseline and potentially disruptive.
Low	Noise levels equal to, but not exceeding, BS 5228-1 threshold.	Construction noise levels just greater than baseline. Very unlikely to be disruptive.
Negligible	Noise levels not exceeding BS 5228-1 threshold.	Construction noise levels may be just above or below baseline noise levels, but not disruptive.

Determining magnitude of change – Construction activity noise (recreation routes)

13.5.15 The methods and criteria provided in BS 5228-1:2009+A1:2014 do not address potential impacts to outdoor areas used for recreation, and there are no nationally accepted guidelines for assessing noise impacts to receptors of this type. However, given that such receptors are at least of medium sensitivity, as set out in **Table 13-5**, when determining the magnitude of change from construction noise, it is considered appropriate to initially apply the same criteria for magnitude of change provided in **Table 13-6**, and to consider the potential for ambient noise change, which is discussed below under paragraph 13.4.21. Following these initial steps, professional

judgement will be applied for the final determination of the magnitude of change from construction noise to outdoor locations used for recreation.

13.5.16 The approach detailed above in paragraph 13.5.15 for addressing potential impacts to outdoor areas used for recreation is considered to provide a robust assessment. This is on the basis that the other receptor types listed in **Table 13-6** are typically considered to be of a greater sensitivity to noise impacts due to the permanent nature of receptors located in, for example, dwellings and hospitals, as compared to the temporary and transient nature of receptors at outdoor areas used for recreation.

Determining magnitude of change – Construction road traffic noise

13.5.17 The assessment of construction road traffic noise will be undertaken with reference to CRTN18 and DMRB19. **Table 13-7** provides the proposed impact magnitude categories for assessing increases of road noise on the local highway network due to construction traffic, based on the guidance contained within DMRB and using professional judgement. The Basic Noise Level (BNL) is the calculated sound level due to road traffic, accounting for the traffic flow, speed and percentage of Heavy Goods Vehicles (HGVs), at 10 m from the carriageway edge, as set out in CRTN.

Table 13-7 Establishing the Magnitude of Impact at Receptors Due to Increased Road Traffic Noise Associated with the Proposed Works

Magnitude	Increase in BNL of Closest Public Road used for Construction Traffic, dB
High	Greater than or equal to 5.0
Medium	Greater than or equal to 3.0 and less than 5.0
Low	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

Determining magnitude of change – Ambient noise change due to construction and operational noise at outdoor recreation areas

13.5.18 The criteria for increases in ambient noise are based on guidance contained in IEMA's 'Guidelines for environmental noise impact assessment'[219] and are provided below in **Table 13-8**. A change in sound level of +3 dB is considered to be a just noticeable change, for the majority of the population, for sounds of a similar character. As such, increases of up to +2 dB will tend to be imperceptible. On this basis, increases of 0 dB (i.e., no ambient noise increase) indicate an impact of negligible magnitude, increases up to +2 dB are considered to indicate an impact of low magnitude, increases between +3 to +5 dB indicate an impact of medium magnitude and increases equal to, or in excess, of +6 dB indicate an impact of high magnitude.

Table 13-8 Establishing the Magnitude of Change Due to Ambient Noise Change Due to Construction and Operational Noise at Outdoor Recreation Areas

Magnitude	Noise Change, dB	Description
High	>= +6	Perceptible and noticeable increase in ambient noise level.
Medium	+3 to +5	Perceptible ambient noise increase.
Low	+1 to +2	Increase in ambient noise levels tending to be imperceptible.
Negligible	0	No increase in ambient noise levels.

Determining magnitude of change – Operational noise

13.5.19 Table 13-9 below provides the magnitude of change categories for assessing operational noise, based on the results of the initial estimate of impact undertaken in accordance with BS 4142:2014+A1:2019. The final determination of magnitude of change depends on consideration of the context, as required by the method detailed in the standard.

Table 13-9 Magnitudes for Operational Site Noise

Magnitude	Initial Estimate of Impact
High	Rating levels significantly exceeding (+8 dB, or more, above) Receptor background sound levels. Final determination of magnitude of change subject to consideration of context.
Medium	Rating levels moderately exceeding (+3 to +7 dB above) Receptor background sound levels. Final determination of magnitude of change subject to consideration of context.
Low	Rating levels just exceeding (+1 to +2 dB above) Receptor background sound levels. Final determination of magnitude of change subject to consideration of context.
Negligible	Rating levels equal to, or lower than, background sound levels. Final determination of magnitude of change subject to consideration of context.

Decommissioning noise and vibration

13.5.20 The environmental effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works. Therefore, the likely significance of effects relating to the construction phase assessment will be applicable to the decommissioning phase.

Determination of significance

13.5.21 **Table 13-10** below provides the matrix which will be used to determine the significance of effects based on the sensitivity of the receptor and the predicted magnitude of change.

13.5.22 The additional diagonal of 'potentially significant' effects reflects the complex nature of noise impact assessment, which often relies not only on the difference between the predicted sound level and the baseline sound level, but also on absolute levels, the total ambient sound level, and other factors such as the time of day, the character of the sound, the duration that a sound may be present for, etc. This approach allows for appropriate application of professional judgement in cases where there are various factors to consider when determining the significance of effects.

13.5.23 The residual effects associated with the Proposed Development will be assessed following the implementation of appropriate mitigation.

Table 13-10 Significance Evaluation Matrix

	Magnitude of Impact

		High	Medium	Low	Negligible
Receptor Sensitivity	**High**	Major (Significant)	Moderate or Major (Potentially significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Moderate or Major (Potentially significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Negligible	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

13.6 Description of Likely Significant Effects

Construction and Decommissioning

13.6.1 In general, construction of solar farms does not entail intensive works or extensive plant requirements. However, import of components / materials may generate a significant number of construction traffic movements, such as the construction of the Proposed Substation. Activities in the construction compound may generate noise emissions that could affect nearby receptors. Upgrading of roads can entail the generation of construction vibration, where the use of vibratory rollers is required. Open cut trenching and HDD may be required for the construction phase. HDD typically entails continuous working and can therefore be a source of daytime and night-time construction noise. If required, piling activities may be a source of construction noise and vibration. All the above possible sources of construction noise and vibration have the potential to give rise to significant effects.

13.6.2 The effects arising as a result of the decommissioning phase are considered similar to or of less magnitude to those described for the construction phase above. Such effects include construction traffic, noise and vibration from construction activities and will be considered within the assessment for construction noise and vibration.

Operation

13.6.3 Solar farms do not typically emit high levels of operational noise; however, the scheme includes a high number of lower noise level plant items intermediate between the PV panels and the grid connection (transformers, inverters, intermediate substations). The new equipment required to provide the grid connection (e.g. transformers, switchgear, etc.) will also emit operational noise that could affect nearby receptors. The micro siting of intermediate plant between the PV panels and the grid connection will be important to ensure that significant effects are avoided.

13.6.4 The intermediate plant items between the PV panels and the grid connection, and the new equipment required to provide the grid connection, will not result in any likely significant operational vibration emissions.

Summary

13.6.5 In summary, **Table 13-11** below sets out the elements to be scoped in and scoped out of further assessment. At this time, with the exception of operational vibration, there is insufficient information available on the construction methods and micro siting of operational equipment to scope out any element relating to airborne noise.

Table 13-11 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Construction activity noise	*Construction and Decommissioning*	✔		There is currently insufficient information available to determine that noise from construction activities will not give rise to likely significant effects.
Construction activity vibration	*Construction and Decommissioning*	✔		There is currently insufficient information available to determine that vibration from construction activities will not give rise to likely significant effects.

Element	Phase	Scoped In	Scoped Out	Justification
Construction road traffic noise	*Construction and Decommissioning*	✔		There is currently insufficient information available to determine that noise from construction road traffic would not give rise to likely significant effects.
Construction road traffic groundborne vibration	*Construction and Decommissioning*		✔	Groundborne vibration from road traffic is scoped out, as set out under paragraph 13.2.13, because there is no methodology available for predicting and assessing it. Groundborne vibration from road traffic is primarily due to irregularities in the road surface which is not within the control of the Applicant. Irregularities in the road surface should be minimised through normal maintenance overseen by the Highway Authority.
Operational noise	*Operation*	✔		There is currently insufficient information available to determine that operational noise would not give rise to likely significant effects.
Operational vibration	*Operation*		✔	The operational plant would not give rise to groundborne vibration and there is therefore no potential for likely significant effects due to operational vibration.

13.7 Opportunities for Enhancing the Environment

13.7.1 At this time, based on the information available, the Proposed Development presents no opportunities for enhancing the baseline noise and vibration environment.

13.8 Mitigation

13.8.1 Where the assessment identifies likely significant effects, mitigation will be specified to reduce the effects such that they are not significant. Examples of the types of mitigation and Best Practicable Means (BPM) that could be applied, if required, are set out in **Table 13-12**, below. The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

Table 13-12 Examples of Mitigation that may be Applied should likely Significant Effects be Identified

Element	Example of Mitigation that could be Applied, if Necessary
Construction activity noise	Use alternative construction methods. Reduce intensity of construction works. Select quieter plant. Provide temporary noise barriers.
Construction activity vibration	Use alternative construction methods. Reduce intensity of construction works. Select plant with lower vibration emissions.
Construction road traffic noise	Use alternative route. Reduce intensity of construction programme to reduce number of vehicle movements generated over a specific period.
Operational noise	Specify alternative siting of intermediate plant between PV panels and grid connection to avoid noise sensitive locations. Select quieter plant.

13.9 Limitations and Assumptions

13.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- There is currently limited information available on:
- Baseline conditions:

  Baseline traffic flow data,

  Baseline noise levels.
- Construction and Decommissioning activities:
- Locations of specific construction activities (construction compound, HDD sites, road improvements, etc.),

- Plant requirements,
- Construction traffic flow data.
- Operational plant:
- Locations of intermediate plant (transformers, inverters),
- Locations of substations and additional plant for grid connection,
- Noise emission data for all operational plant.

13.9.2 To address the limitations identified above, the following approach will be taken:

- Baseline conditions:
- Receive baseline traffic flow data from the authors of the Transport assessment.
- Agree approach to baseline noise monitoring through preparation and submission of SMP to the LPAs. Carry out baseline monitoring in accordance with agreed SMP.
- Construction activities and operational plant:
- Current design information at the time of preparing this EIA Scoping Report is preliminary. The assessment presented in the Preliminary Environmental Information (PEIR) and ES will include the latest design information available at the time.
    - Where design information is not available, reasonable worst-case assumptions will be made.

14.0 Climate Change Resilience

14.1 Introduction

14.1.1 The Proposed Development will be constructed on approximately 548.3 ha of agricultural land between the villages of Redwick and Undy within the local authority jurisdiction areas of Monmouthshire County Council and Newport City Council. This Chapter assesses the Proposed Development's vulnerability to climate change. The vulnerability assessment accounts for embedded design measures and adaptive capacity measures to demonstrate improved resilience to climate change.

14.2 Consultation

14.2.1 No specific consultation been undertaken to inform the production of this chapter and in determining the baseline information, which has been based on publicly available data and follows good practice guidance. Consultation with respect to flood risk is considered within **Chapter 11: Water Environment and Flood Risk**.

14.3 Study Area

14.3.1 The Study Area is defined as the boundary of the Proposed Development and includes all temporary and permanent assets and human receptors such as the construction workforce and Operation and Maintenance (O&M) personnel.

14.4 Baseline Conditions

14.4.1 The IEMA Guidance[227] identifies the need for the baseline to consider:

- The current climate baseline (defined by historic climate conditions) to provide an indication of past vulnerability; and
- The future climate baseline (short term extremes and long-term variation) to assess the vulnerability of the Proposed Development to climate change.

[227] Institute of Environmental Management and Assessment (2020). Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation (Online). Available at: https://www.iema.net/resources/reading-room/2020/06/26/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020 [Accessed December 2024].

14.4.2 This section provides an overview of the current baseline conditions and the projected future changes in climate variables for the Study Area, which has been undertaken using publicly available data sources outlined in Table 14-1.

Table 14-1 Data Sources

Source	Summary	Coverage of Study Area
State of the UK Climate Report 2023[228]	Provides a summary of the observed UK climate trends.	Applicable to the UK to provide the UK context for the current baseline.
Met Office Wales: Climate[229]	This document describes the main features of the climate for the region over a 30-year average period of 1981 – 2010.	Applicable to the region where the Site is situated to provide the baseline conditions for the regional climate.
Met Office records for UK Climate averages[230]	Provides historical observed climate data.	Data captured from the Usk climate station located approximately 10 miles (16 km) from the Site Boundary. This provides the local conditions for the current baseline.
UKCP18 Climate Projections[231]	Provides climate change projection data for the 25 km grid square for probabilistic projections.	The Climate Risk Indicators and UKCP18 websites were used to extract climate

228 Kendon, M. et al. (2024). State of the UK Climate 2023. International Journal of Climatology 44(S1) pp.1-117. DOI 10.1002/joc.8553. Available at: https://rmets.onlinelibrary.wiley.com/doi/10.1002/joc.8553 [Accessed December 2024].

229 Met Office (2016). Wales: Climate (Online). Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/weather/regional-climates/wales_-climate-met-office.pdf [Accessed December 2024].

230 Met Office. (2021). UK Climate Averages – *Usk* (Online). Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcjyjuwdv [Accessed December 2024].

231 Met Office (2018). UK Climate Projections 2018. Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/ [Accessed December 2024].

Source	Summary	Coverage of Study Area
UK Climate Risk Indicators[232]	Provides climate change projection data and indicators.	projection data for the future climate baseline of Monmouthshire and Newport Counties. This is representative of the entire Study Area. Where quantitative data is unavailable, UKCP18 Factsheets have been used.
UKCP18 Derived Projections of Future Climate over the UK[233]	Describes derived projection trends where 25 km data is unavailable.	
UKCP18 Fact Sheet: Soil Moisture and the Water Balance[234]	Summarises UKCP18 data over land for soil moisture.	
UKCP18 Fact Sheet: Wind[235]	Summarises UKCP18 data over land for wind metrics.	
UKCP18 Fact Sheet: Snow[236]	Summarises UKCP18 data over land for snow metrics.	

232 Nigel Arnell et. al., (2021). The Climate Risk Indicators (Online). Available at: https://uk-cri.org/ [Accessed December 2024].

233 Met Office (2019). UKCP18 Factsheet: Derived Projections (Online). Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-derived-projections.pdf [Accessed December 2024].

234 Pirret, J.S.R., Fung, F., Lowe, J.A., McInnes, R.N., Mitchell, J.F.B. and Murphy, J.M. (2020). UKCP Factsheet: Soil Moisture. Met Office. Available from: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18_factsheet_soil_moisture.pdf [Accessed December 2024].

235 Fung F, Bett P, Maisey P, Lowe J, McSweeney C, Mitchell JFB Murphy J, Rostron J, Sexton D and Yamazaki K. UKCP18 Factsheet: Wind. Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-derived-projections.pdf [Accessed December 2024].

236 Pirret JSR, Fung, F, Kendon E, Lowe J (2021). UKCP18 Factsheet: Snow. Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18_factsheet_snow_jul-2021.pdf [Accessed December 2024].

Source	Summary	Coverage of Study Area
National Tidal and Sea Level Facility[237]	Historic sea level trends.	Used to infer the current baseline sea level data from Newport as the closest location providing current data.

Current Baseline

UK Context

14.4.3 According to the latest State of the UK Climate Report 2023[228], the UK's climate is changing, with recent decades warmer, wetter, and sunnier than the 20th century on a national and local scale. This report highlights that the UK land temperatures have warmed by 1.25 °C compared to 1961-1990, which is at a broadly consistent, though slightly higher, rate than the observed change in global mean land temperatures (1.15 °C). The key findings from the report are:

- Six of the 10 years in the most recent decade (2014–2023), have been in the top-ten warmest for the UK.
- 2023 was the second warmest year on record; the mean temperature for 2023 was 9.97 °C, which is 0.83 °C above the 1991–2020 long-term average.
- In terms of the highest maximum temperatures, the most recent decade (2014–2023) was 35.6 °C, 2.1 °C higher than 1991–2020 and 4.3 °C higher than 1961–1990, showing greater increases in extremes than when comparing the changes in annual means.
- The UK's average lowest minimum temperature for the most recent decade 2014–2023 was −14.6 °C, 0.9 °C higher than 1991–2020 and 4.4 °C higher than 1961–1990.
- The number of ‘warm days’ (daily maximum temperatures above 25 °C) have increased by 63% for the most recent decade (2014 – 2023)

237 National Tidal and Sea Level Facility (2024). Sea Level Trends (Online) Available at: https://ntslf.org/products/sea-level-trend-charts?name=Newport [Accessed December 2024].

compared to 1961-1990 and ‘very hot days’ (daily maximum above 30 °C) have trebled, again showing greater increases in the trends for extreme events.

- The most recent decade (2014-2023) has had 6 fewer days of air frosts and 11 fewer days of ground frosts when compared with 1991-2020 and 17/28 fewer air/ground frost days when compared to 1961-1990.
- The UK’s annual precipitation shows large annual variability inherent to the UK climate, with some decadal variability. Two years in the most recent decade (2014–2023) have been in the top-ten wettest, and there has been a marked increase in winter rainfall in the last few decades coupled with a slight increase in autumn rainfall.
- The number of days of rain greater than or equal to 10 mm (‘very wet days’) for the UK during 2023 was 41 days. This was 6 days more than the 1991–2020 long term average. This suggests an increase in the number of days of widespread heavy rain in the last few decades. However, caution is needed in this interpretation due to the large annual and decadal variability in UK rainfall.
- Summer rainfall has increased, coupled with a slight increase in spring rainfall. There is no obvious reducing trend in the occurrence of top-ten driest months, seasons or years in the last three decades.
- Three years in the most recent decade 2014–2023 have been in the top-ten sunniest in the UK series; and this is the sunniest 10-year period.
- Despite the warming climate, impactful snow events are still to be expected but their number and severity have declined since the 1960s.
- There is a marginal downward trend of annual mean wind speeds, falling from ~18.5 km/h in 1970 to ~17 km/h in 2023.
- A measure of ‘storminess’ can consider large-scale systems affecting the UK, with the most recent decades recording fewer occurrences of maximum gust speeds as a factor of ‘storminess’. However, it is difficult to infer trends due to considerable annual and decadal variations.

- Since the beginning of the 20th century, sea levels in the UK have risen by about 1.5 mm/year, but observational evidence suggests the rate is increasing which is consistent with estimates of global sea level rise.
- There were 16 extreme storm-surge events in 2023; however, it is difficult to discern trends due to the number of factors that affect extreme sea level in the UK (a combination of storm surges, waves, tides and the mean sea level).

Regional Climate

14.4.4 Wales is characterised by its maritime climate, which is often cloudy, wet and windy; however, due to variations in topography there can be localised differences. Higher temperatures at low altitudes occur around or near to the coasts, with the highest temperatures in July an average daily maximum of 21 °C in the east of Powys and Monmouthshire[229].

14.4.5 The hilly nature of Wales and cloud cover affects average annual sunshine, however coastal areas especially in the southeast can experience a greater amount of sunshine at an average annual total of 1700 hours of sunshine.

14.4.6 Rainfall in Wales tends to be associated with Atlantic Lows which are more vigorous in autumn and winter; convection from solar surface heating can form shower cloud and thunderstorms particularly in summer. Cardiff experiences on average 11 days of thunder a year, compared to 15 – 20 days at many places across England. Coastal areas and areas close to the border with England are drier than the rest of Wales.

14.4.7 The occurrence of snow is linked closely with temperature, with snowfalls rarely occurring if the temperature is higher than 4 °C. However, snow is rare near sea level in Wales as reflected in the average number of snow lying days in Wales at around 5 or less around the coasts. Rare events have occurred where heavy snowfalls, even at coastal locations, were combined with strong winds where severe drifting was experienced.

14.4.8 Coastal Wales is windy, especially in the winter months where mean speeds and gusts are the strongest. Coastal areas experience on average 15 days or more of gales each year; however, places sheltered by hills or in urban areas will have fewer days of gales.

Local Climate

14.4.9 The nearest Met Office climate station to the Proposed Development is Usk climate station[230] and the data has been used to understand the historic baseline conditions associated with the Site (1981 – 2010) and how climate change has already impacted the Study Area by comparing with the current baseline conditions associated with the Site (1991 – 2020).

Precipitation - rainfall

14.4.10 Average seasonal rainfall recorded at Usk, southwest England and south Wales, and the UK for the periods 1981 – 2010 and 1991–2020 are presented in **Table 14-2**. It demonstrates that the local weather is drier than both the region and the UK average year-round. It also shows an increase in average precipitation for both the summer and winter seasons at the Study Area from the historic baseline to the current baseline. This is also reflected at the regional and national level.

14.4.11 As described in **Chapter 11: Water Environment and Flood Risk**, the Flood Map for Planning shows the majority of the Site and Study Area is located in Flood Zone 3 associated with flooding from the sea. The eastern extent of the Site and Study Area is shown to be located in Flood Zones 2 and 3. This is indicated to be attributable to Mill Reen, Whitewall Reen, Old Convenient Reen and Pratt Reen. The study area is at very low risk of flooding from surface water sources, with an Annual Exceedance Probability (AEP) of less than 1 in 1,000 (0.1%).

14.4.12 No historic flooding events have been recorded within the Study Area.

Table 14-2 Average Seasonal Rainfall (mm)

Season	Average seasonal rainfall (1981-2010) (mm)			Average seasonal rainfall (1991-2020) (mm)		
	Usk Climate Station	SW England and S Wales	UK	Usk Climate Station	SW England and S Wales	UK
Summer (June, July, August)	197	243	238	218	261	253
Winter (December, January, February)	337	377	328	354	395	345

Precipitation – snow

14.4.13 The area local to the Study Area experiences less snow days than the surrounding areas[230], largely due to the low-lying coastal nature of the Study Area in relation to the rest of the region.

Temperature

14.4.14 **Table 14-3** shows the long-term average seasonal mean temperature for Usk, southwest England and south Wales, and the UK for 1981 – 2010 and 1991–2020. It shows that the Study Area is warmer than both the region and the UK average for the summer, which is reflective of its coastal location. An increasing trend in temperature is also apparent across both seasons within the Study Area.

Table 14-3 Average Seasonal Temperature (°C)

Season	Average seasonal temperature (1981-2010) (°C)			Average seasonal temperature (1991-2020) (°C)		
	Usk Climate Station	SW England and S Wales	UK	Usk Climate Station	SW England and S Wales	UK
Summer (June, July, August)	16.1	15.1	14.4	16.3	15.3	14.6
Winter (December, January, February)	4.8	4.9	3.7	5.3	5.2	4.1

Relative humidity

14.4.15 The average relative humidity can be inferred for the Study Area from the average maps at Usk4. The Study Area has experienced an average relative humidity of approximately 76-80% in the summer, lower than the rest of Wales. In winter the average relatively humidity is higher than in summer, at approximately 82-86%, again lower than the rest of the region.

Wind

14.4.16 Although the regional baseline is more exposed due to the coastal environment, the Study Area is generally well sheltered when compared to more exposed areas of the country and experiences on average lower wind speeds than the surrounding areas[229,230]. In general, the strongest winds are associated with the passage of deep depressions across, or close to, the UK. The frequency and strength of these depressions is greatest in the winter, especially from December to February, and this is when mean speeds and gusts (short duration peak values) are strongest.

Sea Level Rise

14.4.17 The National Tidal and Sea Level Facility at the nearest tide gauge station at Newport[237](approximately 7km west from the Site) has been recording sea level data

since 1993, with the last update in 2023. The annual average data shows that sea level has risen from 7021 mm in 1994 to 7144 mm in 2010, the last year of complete data. It is anticipated to have risen since then, but the data is incomplete and should be used with caution.

14.4.18 As described in **Chapter 11: Water Environment and Flood Risk**, the entirety of the Site is located in Flood Zone 3 associated with flooding from the sea, although it also shows that this area is protected by flood defence embankments located along the banks of the Severn Estuary. The form, condition and standard of protection provided by the flood defences along with their planned maintenance policies will be investigated further to inform the PEIR, as part of the water environment and flood risk assessment.

Future Baseline

14.4.19 The UK Climate Projections 2018 (UKCP18)[231] probabilistic projections for Representative Concentration Pathways (RCP) 8.5 (high emission scenarios) have been used to infer future changes in a range of climate variables that may affect the vulnerability of the Proposed Development to climate change. The Climate Risk Indicators (CRI)[232] utilises the UKCP18 Projections and allows for a range of climate related indicators to be derived. The CRI data for the counties of Monmouthshire and Newport has been used to inform this assessment, as it is considered to represent the Study Area.

14.4.20 The future climate has been presented for the 2030s (2020-2049) and the 2060s (2050-2079) to identify the anticipated climate conditions across the construction period and a design life of 40 years. These projections are provided against the baseline data provided in the Existing Baseline section for the periods of 1981-2010 (historic baseline used for model reference), and 1991-2020 (current climate) as an indication of change from the model baseline period.

14.4.21 Although the assessment has been undertaken for the 50th percentile (i.e. the median, or central estimate) the 10th and the 90th percentiles are presented here to illustrate the full range of projected outcomes.

14.4.22 For the UK, climate change is projected to lead to warmer, wetter winters and hotter, drier summers, with an increase in the intensity and frequency of extreme events

such as heatwaves, drought, extreme rainfall leading to flash flooding, storms and wind events. The information presented below illustrates how the climate may evolve within the Study Area of the Proposed Development over the design life of the assets.

Rainfall and temperature

14.4.23 **Table 14-4** provides an overview of current and projected summer and winter temperature and rainfall for the location of the Proposed Development.

Table 14-4 Temperature and Rainfall Trends

Climate variable	Model Reference (1981-2010)	Current Baseline (1991-2020)	Measure of change within RCP8.5	RCP8.5 50th percentile (10th-90th percentile)	
				2030s	2060s
Average Summer temperature (°C)	16.1	16.3	°C change	1.4 (0.5-2.3)	3.4 (1.5-5.3)
Average Winter temperature (°C)	4.8	5.3	°C change	0.9 (0.2-1.6)	2.0 (0.8-3.3)
Min Winter temperature (°C)	1.4	1.8	°C change	0.9 (0.2-1.8)	2.1 (0.7-3.6)
Max Summer temperature (°C)	21.6	21.7	°C change	1.6 (0.5- 2.7)	3.8 (1.6-6.1)
Average Summer rainfall (mm)	197	218	% change	-10.0 (-26.6-6.3)	-25.5 (-48.2-3.5)
Average Winter rainfall (mm)	337	354	% change	7.0 (-3.0-18.8)	16.5 (-0.8-37.2)

14.4.24 Indicators of climate risk are shown in **Table 14-5**. These provide an indication of specific thresholds which are projected to change in the future. The indicators presented in **Table 14-5** are provided against the model reference period of 1981–2010. These indicators are unavailable for the current baseline period (1991–2020).

Table 14-5 Climate Risk Indicators

Climate indicator	Model Reference (1981-2010)	RCP8.5 50th percentile (10th-90th percentile)	
		2030s	2060s
Met office heatwave[238] (events per year)	0.5	1.1 (0.7-1.8)	2.8 (1.2-4.4)
Very hot days[239] (days per year)	0	0.1 (0.0-0.2)	0.4 (0.0-2.5)
Heat stress[240] (days per year)	0.0	0.3 (0.1-0.8)	2.1 (0.4-7.0)
Wildfire events[241] (days per year)	12.4	21.3 (11.8-36.0)	41.7 (17.0-73.5)

Precipitation - snow

14.4.25 Rising winter temperatures are likely to reduce the amount of precipitation that falls as snow and the number of days with lying snow. Snowfall data is unavailable for the probabilistic Projections (25 km) of UKCP18; however, the UKCP18 Factsheet[236] describes a decrease in falling and lying snow relative to the baseline 1981 – 2000 of around 80% and 100% respectively under RCP8.5.

238 A UK heatwave threshold is met when a location records a period of at least three consecutive days with daily maximum temperatures meeting or exceeding the heatwave temperature threshold. The threshold for the local area is 25 ^{o}C.

239 A very hot day is defined as days with the maximum temperature over 35°C.

240 Days with shade Wet Bulb Globe Temperature (WBGT) above 25°C.

241 Days with Met Office Wildfire Index at the Very High Fire Severity level or above.

Humidity

14.4.26 Relative humidity is a function of air temperatures and water vapour content. Changes in relative humidity are expected to decrease in summer due to high temperatures and drying and increase in winter due to wet winters and the increase in water vapour.8

Soil Moisture

14.4.27 **Table 14-6** indicates the projected changes in soil moisture for the summer and winter months for the Wales region. Changes in soil moisture are anticipated to be at the greatest in summer and autumn, with little change during winter and spring. These dry periods are anticipated to be longer and deeper with climate change, as it is a function of increased evaporation due to higher temperatures and a decrease in precipitation[236]. This is reflected in **Table 14-6**.

Table 14-6 Soil Moisture Content Projections

Climate variable	RCP8.5 50th percentile (10th-90th percentile)	
	2030s	2060s
Soil Moisture (% change - Winter)	-0.2 (-0.9-0.7)	-0.1 (-0.9-0.6)
Soil Moisture (% change - Summer)	-12.7 (-25.7 – -9.6)	-24.6 (-38.3 – -20.6)

Wind

14.4.28 UKCP18 depicts a wide spread of future changes in mean surface wind speed; however, there is large uncertainty in projected changes in circulation over the UK and natural climate variability contributes to much of this uncertainty. It is therefore difficult to represent regional extreme winds and gusts within regional climate models.

14.4.29 In terms of storms, the analysis presented here is a summary of expected changes in storm patterns under a changing climate. A storm is defined by the Met Office as

a wind event measuring 10 or higher on the Beaufort scale[242] (equivalent to a wind speed of 27 m/s or 60 mph).

14.4.30 Studies[243] relating to future projections of storms suggest that climate driven storm changes are less distinct in the northern than southern hemisphere. However, such is the wide range of inter-model variation, robust projections of changes in storm track are not yet possible and there is low confidence in the direction of future changes in the frequency, duration or intensity of storms affecting the UK.

Sea level rise and flood risk

14.4.31 Sea level projections from the marine projections data point at the Newport tidal gauge location are shown in **Table 14-7** which depicts the projected sea level rise for the end of the 2030s climate period (2049) and 2060s climate period (2079).

Table 14-7 Sea Level Rise Projection (m)

Climate variable	RCP8.5 50th percentile (10th-90th percentile)	
	2030s	2060s
Sea level rise (m)	0.29 (0.22-0.36)	0.55 (0.42-0.72)
Soil Moisture (% change - Summer)	-12.7 (-25.7 – -9.6)	-24.6 (-38.3 – -20.6)

14.4.32 Further information regarding sea level rise all flooding from all sources can be found in **Chapter 11: Water Environment and Flood Risk**.

242 Met Office (n.d). Beaufort wind force scale. Available at: https://www.metoffice.gov.uk/weather/guides/coast-and-sea/beaufort-scale [Accessed December 2024].

243 Slingo, J. (2021) Latest Scientific Evidence for Observed and Projected Climate Change. In: The Third UK Climate Change Risk Assessment Technical Report [Betts, R.A., Haward, A.B. and Pearson, K.V. (eds.)]. Available at: https://www.ukclimaterisk.org/publications/technical-report-ccra3-ia/ [Accessed December 2024].

14.5 Proposed Assessment Methodology

Relevant Legislation and Guidelines

14.5.1 The IEMA Guidance[227] outlines that the scoping stage should identify the key climatic variables relevant to the Proposed Development and likely effects; however, it is not prescriptive in how this is undertaken.

14.5.2 The Overarching National Policy Statement for Energy (EN-1)[244] sets out the basis of decision making for the delivery of major energy infrastructure including that the Applicant should demonstrate a high level of climate resilience built-in from the outset and can be adapted over their predicted lifetimes to remain resilient to a credible maximum climate change scenario. This CCR Scoping Chapter utilises the RCP8.5 climate change scenario as a risk-adverse approach. The vulnerability assessment as described below accounts for embedded design measures and adaptive capacity measures to demonstrate improved resilience to climate change.

14.5.3 The National Policy Statement for Renewable Energy Infrastructure (EN-3)[245] sets out further specific considerations for solar PV in that Applicants should consider how plant will be resilient to the increased risk of flooding and the impact of high temperatures. This is incorporated into the vulnerability assessment described below.

14.5.4 The future baseline presented in **Section 14.4** has therefore been analysed to provide an understanding of the climate trends that have the potential to affect the Proposed Development. The climate variables have been assessed for the time periods across the Proposed Development lifetime of 40 years.

14.5.5 The vulnerability assessment is the outcome of an assessment of sensitivity and exposure of the receptors identified to the climate trends presented in **Section 14.6**. The vulnerability assessment has been undertaken for all phases of the Proposed

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244 Department of Energy Security and Net Zero (2023). Overarching National Policy Statement for Energy (EN-1) (Online). Available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf [Accessed December 2024].

245 Department of Energy Security and Net Zero (2023). National Policy Statement for Renewable Energy Infrastructure (EN-3) (Online). Available at: https://assets.publishing.service.gov.uk/media/65a7889996a5ec000d731aba/nps-renewable-energy-infrastructure-en3.pdf [Accessed December 2024].

Development in order to identify the impacts with a likely significant effect.

14.5.6 The exposure and sensitivity of the receptor to climate impacts is assigned a level of vulnerability as shown in the matrix in **Table 14-8**.

Table 14-8 Vulnerability Matrix for Scoping

Sensitivity	Exposure Low	Medium	High
Low	Low vulnerability	Low vulnerability	Low vulnerability
Moderate	Low vulnerability	Medium vulnerability	Medium vulnerability
High	Low vulnerability	Medium vulnerability	High vulnerability

14.5.7 Sensitivity refers to the degree of response of the receptor to a change and its capacity to accommodate and recover from a change should it be affected. The typical 'sensitivity' of receptors to climate variables considers the impact of the climate on the specific receptors, considering any embedded design measures at this stage. Sensitivity is rated as high, moderate, or low. 'High sensitivity' implies that the receptor will lose much of its original form and function; 'moderate sensitivity' implies that the receptor is able to tolerate some climatic conditions without being fully altered though remains susceptible to be altered to some extent and 'low sensitivity' implies that projected changes in the climate variables have little influence on the receptor.

14.5.8 Exposure is the nature and degree to which climate variations may pose a risk to the Proposed Development. The 'exposure' of receptors to projected change in climate variables based on the current climate and the future projections identified in the baseline information presented in **Section 14.4** is rated as high, medium or low. The construction phase is assessed as exposure to the climate trends of the '2030s' (2020-2049), the operational phase considers the climate trends for the '2030s' (2020-2049) and 2060s (2050-2079) and the decommissioning phase is considered under the '2060s' climate period.

14.5.9 On completion of the vulnerability assessment, climate variables in the construction, O&M and decommissioning phases to which the Proposed Development is likely to have a low vulnerability are scoped out of further assessment as no potential for likely significant effects is identified. Climate variables to which the Proposed Development is likely to have a medium or high vulnerability are taken forward for further assessment at the next stage as these variables are identified as having the potential for likely significant effects.

14.6 Description of Likely Significant Effects

Construction Phase

14.6.1 The exposure to climate change trends and hazards during the construction phase is considered low due to the short timeframe. Therefore, in accordance with **Table 14-8**, the construction phase is scoped out from further assessment.

14.6.2 Response to extreme weather conditions during the construction phase will be managed through use of an outline Construction Environmental Management Plan (oCEMP).

Operational Phase

14.6.3 The receptors considered as part of the assessment during the operational and maintenance phase include:

- PV modules;
- PV mounting structure;
- Mechanical and Electrical (M&E) equipment including transformers and substations;
- Access tracks; and
- Operational and maintenance staff.

14.6.4 PV modules can be sensitive to high temperatures, becoming increasingly inefficient, which can be exacerbated when coupled with high humidity. PV modules are also sensitive when exposed to wind, particularly windstorm events with large wind gusts, lightning and driving rain.

14.6.5 M&E equipment associated with the operation of the Proposed Development, such as transformers and substations, can also be sensitive to high temperatures, which can lead to overheating and potential failures. High temperatures can also lead to degradation of surfacing material of the access tracks. M&E equipment can also be sensitive to flooding, as contact with water and abrasion caused by debris can damage the M&E equipment supporting the Proposed Development.

14.6.6 The foundations of the solar PV and associated equipment are sensitive to ground movement resulting from changes in soil moisture associated with climate change.

14.6.7 All equipment has the potential to become increasingly exposed to wildfires, anticipated to increase with climate change. The vulnerability assessment is contained within **Table 14-9**.

14.6.8 Section 14.7 details the approach to the In-Combination Climate Impacts (ICCI) assessment.

Decommissioning

14.6.9 The duration of the decommissioning period is anticipated to be short (<18 months). The receptors as part of the decommissioning activities include personnel, plant and machinery, and the decommissioning activities (programme). Climate change trends are likely to become more intense or the frequency of the climate change events may increase by the time of the decommissioning phase. However, the decommissioning phase activities are unlikely to be sensitive to these changes as there will be a tolerable level of delays to the decommissioning programme to account for extreme weather and climate change events. This will be managed by legislative requirements at the time of decommissioning.

Table 14-9 Vulnerability Assessment during Operation and Maintenance

Receptor	Climate variable	Associated hazard and impact	Exposure (at 2060s)	Sensitivity	Vulnerability and description of design control measures
PV Modules	Temperature and humidity	High temperatures and humidity	Medium	Low	Low - The proposed panels are monocrystalline HJT cell panels which have the highest temperature coefficient in comparison to others on the market. This allows the cells to remain at a greater efficiency in high temperatures. The panels will be raised ca. 0.8 – 1 m above ground level to allow for natural air circulation and the grazing of sheep.
	Wind	Direct damage during storm conditions including high winds.	Medium	Low	Low - The modules will be low-lying and on the mounting structure which will have 1-1.5 m deep foundations, subject to ground conditions. They will be installed as per manufacturer's specification and wind load testing carried out through the construction phase.

Receptor	Climate variable	Associated hazard and impact	Exposure (at 2060s)	Sensitivity	Vulnerability and description of design control measures
	Wildfire	Direct damage from high temperatures during wildfire or decreased output from associated smoke conditions.	Medium	Low	Low – the solar panels will be monitored remotely and the site is covered by CCTV; this will allow any fire to be quickly identified
	Rainfall	Damage to the solar PV modules from flooding.	Low	Low	Low – the solar panels are considered to have low sensitivity to flooding and the Site benefits from existing coastal defences. The Flood Consequence Assessment (FCA) undertaken as part of the PEIR and ES will identify additional mitigation measures to protect the assets from flood risk increasing with climate change.

Receptor	Climate variable	Associated hazard and impact	Exposure (at 2060s)	Sensitivity	Vulnerability and description of design control measures
Mounting structure	Wind	High winds affecting structural integrity of mounting structure.	Low	Medium	Low - The detailed design of the foundations will be based on ground conditions identified through a range of surveys to ensure the structure is appropriately anchored.
	Wildfire	Direct damage from high temperatures during wildfire.	Medium	Low	Low – the Site is covered by CCTV; this will allow any fire to be quickly identified.
	Rainfall	Changes in soil moisture content resulting in ground movement.	Medium	Low	Low - The detailed design of the foundations will be based on ground conditions identified through a range of surveys. The materials used are also resistant to corrosion and are strong enough to withstand small ground heave.

Receptor	Climate variable	Associated hazard and impact	Exposure (at 2060s)	Sensitivity	Vulnerability and description of design control measures
M&E	Temperature and humidity	Enclosed M&E equipment are sensitive to increasing temperatures as there is a small possibility that equipment might overheat and fail in extreme weather events.	Medium	Low	Low - during the detailed design and procurement of equipment, the operating temperature ranges will be considered. Routine maintenance will identify failing components which will be replaced. Performance of modules and componentry is also monitored remotely to identify any faults or failures.
	Wildfire	Direct damage from high temperatures during a wildfire event.	Medium	Low	Low – the solar panels will be monitored remotely and the Site is covered by CCTV; this will allow any fire to be quickly identified.

Receptor	Climate variable	Associated hazard and impact	Exposure (at 2060s)	Sensitivity	Vulnerability and description of design control measures
	Rainfall	Changes in soil moisture content resulting in ground movement.	Medium	Low	Low - The detailed design of the foundations will be based on ground conditions identified through a range of surveys. Routine maintenance will identify areas of damage which may need early replacement.
		Damage to equipment from flooding.	Low	Medium	Low – the Flood Consequence Assessment (FCA) undertaken as part of the PEIR and ES will identify additional mitigation measures to protect the assets from flood risk increasing with climate change.
Access Tracks	Temperature and humidity	High temperatures resulting in degrading of surfacing material of access tracks.	Medium	Low	Low - During the detailed design and procurement, the specifications of access tracks will consider ambient temperatures. Routine maintenance will identify areas of damage which may need early replacement.

Receptor	Climate variable	Associated hazard and impact	Exposure (at 2060s)	Sensitivity	Vulnerability and description of design control measures
	Wildfire	Direct damage from high temperatures during a wildfire event.	Medium	Low	Low – the Site is covered by CCTV; this will allow any fire to be quickly identified. All areas of the site would be readily accessible in the event of a fire.
	Rainfall	Changes in soil moisture content resulting in ground movement.	Medium	Low	Low - the detailed design of the access roads will be based on ground conditions identified through a range of surveys.
Operation and Maintenance Staff	Temperature and humidity	Hot and humid working conditions.	Low	High	Low – Operational procedures will set out that maintenance tasks are planned around unsafe working conditions associated with climate change events.
	Wind	Windy working conditions.	Low	Medium	
	Wildfire	Unsafe working conditions.	Low	High	

Table 14-10 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Vulnerability to climate change of the Project assets.	Construction		✔	The exposure to climate change during the construction period is considered to be low.
Vulnerability to climate change of the Project assets.	Operation		✔	The mitigation measures detailed in Table 14-8 demonstrate that the Proposed Development is resilient to climate change across the lifecycle of the assets. Critical infrastructure will be designed to be resilient to climate change for the life of the asset.
Vulnerability to climate change of the Project assets.	Decommissioning		✔	The decommissioning receptors are considered to be of low sensitivity and will be managed by legislative requirements at the time of activity.
In-combination Climate Impacts (ICCI)	Operational	✔		The potential impact of climate change on the effects reported in the topic chapters of the ES will be assessed during the ES and are therefore scoped in.

14.7 Opportunities for Enhancing the Environment

14.7.1 An In-combination Climate Impacts (ICCI) assessment is undertaken by assessing how identified receptors in the surrounding environment are affected by future climate parameters, informed by the future climate baseline. Inclusion of an ICCI assessment has been scoped in, but this will be addressed at PEIR or ES stage and captured within the relevant chapters as part of the assessments for their environmental topics. The ICCI assessment will identify if any reported effects will

be exacerbated or ameliorated by the effects of climate change and identify further mitigation where required. It will also assess embedded measures to improve the resilience of the environment within the Study Area to climate change, such as nature-based solutions.

14.8 Mitigation

14.8.1 The design and control measures employed to reduce the vulnerability of the Proposed Development to climate change are tabulated in **Table 14-9**. The residual effects associated with the Proposed Development will be assessed following the implementation of appropriate mitigation. The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

14.9 Limitations and Assumptions

14.9.1 Climate change, by its very nature, is associated with a range of assumptions and limitations through uncertainty in climate models regarding how global climatic trends will be reflected at the regional scale. The future baseline represents projections under one future scenario (RCP8.5) and cannot be treated as a prediction. Data for the 10%, 50% and 90% probability levels for the high emissions scenario (RCP8.5) have been used in the assessment to highlight uncertainty and ensure a conservative assessment of risk. The 10%, 50% and 90% probability levels correspond to the low, central and high changes in the probabilistic projection. Leading climate change data from the UKCP18 programme has been used to explore trends and magnitude of change at the regional scale.

15.0 Greenhouse Gas Assessment

15.1 Introduction

15.1.1 This Chapter considers the impacts of the Proposed Development in terms of the Greenhouse Gases (GHGs) caused directly or indirectly during its construction, operation and decommissioning. It sets out the proposed methodology for the GHG assessment and the means by which the significance of any impacts will be assessed. This includes activities that may be avoided or displaced as a result of the Proposed Development such as other grid electricity production activities.

15.1.2 The requirement to consider a project's impact on, and vulnerability to, Climate Change results from Schedule 4 of the EIA Regulations[246]. The EIA Regulations require:

"A description of the likely significant effects of the development on the environment resulting from… the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change".

15.1.3 As such this chapter considers the impacts and effects of the Proposed Development in terms of the contribution to climate change, through a GHG emissions assessment.

15.2 Consultation

15.2.1 No consultation has been conducted to date with respect to GHG emissions arising from the Proposed Development. Stakeholder consultation is not typically required to be carried out as the GHG assessments data is generally available from public sources or the project design team. The assessment will take into account any issues relating to the assessment of GHG emissions identified in a Scoping Opinion response from the relevant Planning Authority.

246 UK Government. (2017). Schedule 4 of the EIA Regulations 2017. [Online], Available at: https://www.legislation.gov.uk/uksi/2017/571/schedule/4/made [Accessed December 2024].

15.3 Study Area

15.3.1 The assessment of GHG emissions is not restricted by geographical area, instead focussing on any increase or decrease in emissions as a result of the Proposed Development, wherever that may be. This includes:

- Construction emissions from the Proposed Development but also relating to the transport of materials to and from the Site and their manufacture. This may be distant from the Proposed Scheme location, for example, GHG emissions associated with the manufacture of concrete and steel in terms of embodied carbon and energy in the production process.
- Operation emissions (increase or reduction) which result from the operation of the Proposed Scheme and any shifts in energy usage that may occur. In this case, GHG emissions include those for embodied emissions arising from materials and waste for the operation of the Proposed Scheme, operational energy and water use.
- Decommissioning emissions are not only associated with the dismantling and removal of infrastructure but also extend to the transportation of materials away from the Site. These emissions may occur at locations separate from the Proposed Development itself. For instance, GHG emissions can result from the disposal or recycling of solar components, considering their embodied carbon and energy from the production process.

15.4 Legislation and Guidance

15.4.1 This assessment will be completed in line with relevant legislation and by application of best practice guidance as summarised here:

15.4.2 A summary of legislation and guidance relevant to this topic are given in **Table 15-1**. The Policies summarised include overarching national policies and guidance.

Table 15-1 Policy and Guidance

Policy	Policy Context
The Overarching National Policy Statement for Energy (EN-1) (2024))[247]	Sets out the Government's policy for delivery of major energy infrastructure and will be the primary basis for decision making. EN-1 states that "Wind and solar are the lowest cost ways of generating electricity, helping reduce costs and providing a clean and secure source of electricity supply (as they are not reliant on fuel for generation). Our analysis shows that a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar.[248] " and that "Government has committed to reduce GHG emissions by 78 per cent by 2035 under Carbon Budget Six[249] According to the Net Zero Strategy this means that by 2035, all our electricity will need to come from low carbon sources, subject to security of supply, whilst meeting a 40-60 per cent increase in demand."
Planning Policy Wales (PPW) (Edition 12) (2024) [250]	Acknowledges Wales has been set a 95% net zero target for 2050 by the Climate Change Committee and how nationally, the intention is to go beyond this to become fully net zero.

247 The Overarching National Policy Statement for Energy (2024) available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf [Accessed December 2024].

248 Modelling 2050 – Electricity System Analysis (2020) [Online], available at: https://www.gov.uk/government/publications/modelling-2050-electricity-system-analysis [Accessed December 2024].

249 Carbon Budget Six (2021) [Online], available at: https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035 [Accessed December 2024].

250 Welsh Government (2024). Planning Policy Wales [Online], available at: https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf [Accessed December 2024].

Policy	Policy Context
Welsh Energy Targets (2017)[251]	Detail the renewable energy targets which form part of the commitment for a more sustainable future. These included a target of producing 70% of the electricity consumed in Wales from renewable sources by 2030. In January 2023 the Welsh Government released a consultation document for the review of Wales' renewable energy targets, which proposed updating the target from 70% to 100% by 2035 and with 1.5 GW to be locally owned within this timescale; these targets have now been adopted.
Net Zero Wales (2021)[252]	Set the requirement for Wales to meet the required average reduction of 37% in GHG against the baseline for Carbon Budget two (CB2) in order to reach Net Zero GHG emissions by 2050.
Prosperity for All: A Low Carbon Wales (2019)[253]	Welsh Government declared a climate change emergency on 29 April 2019[254] signalling their commitment to addressing climate change. This was further cemented with the publication of Prosperity for All: A Low Carbon Wales[255] which was published March 2019 and detailed 100 policies and proposals with the aim of achieving the 2020 interim emissions targets.

251 Welsh Energy Targets (2017), [Online], available at: https://www.gov.wales/sites/default/files/publications/2019-06/energy-generation-2017-report.pdf [Accessed December 2024].

252 Net Zero Wales (2021), [Online], available at: https://www.gov.wales/sites/default/files/publications/2021-10/net-zero-wales-summary-document.pdf [Accessed December 2024].

253 Prosperity for All: A Low Carbon Wales (2019), [Online], available at: https://www.gov.wales/sites/default/files/publications/2019-06/low-carbon-delivery-plan_1.pdf [Accessed December 2024].

254 Welsh Environmental and Climate Change Emergency (2019), [Online], available at: https://www.gov.wales/welsh-government-makes-climate-emergency-declaration [Accessed December 2024].

255 Prosperity for All: A Low Carbon Wales (2019), [Online], available at: https://www.gov.wales/sites/default/files/publications/2019-06/low-carbon-delivery-plan_1.pdf [Accessed December 2024].

Policy	Policy Context
Draft Climate Change Act 2008 (2050 Target Amendment) Order (2019)[256]	Furthered the UK's commitment and required a change in the reduction of greenhouse gas emissions outlined in the Climate Change Act 2008 from 80% to 100% compared to 1990 levels.
Guidance	
Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA) (2022)[257]	The requirement to consider this topic has resulted from the 2014 amendment to the EIA Directive. The aim of this guidance is to assist practitioners with addressing GHG emissions assessment and mitigation in statutory and non-statutory EIA.
National Planning Practice Guidance (2021)[258]	The guidance highlights the importance of and advises how to identify suitable climate change mitigation and adaptation measures in the planning process. This would require the implementation of appropriate measures by the local planning authorities.

256 Draft Climate Change Act 2008 (2050 Target Amendment) Order (2019), [Online], available at: https://commonslibrary.parliament.uk/research-briefings/cbp-8590/ [Accessed December 2024].

257 IEMA (2022) Assessing Greenhouse Gas Emissions and Evaluating Their Significance 2nd Edition. [Online], available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010056/TR010056-001649-Climate%20Emergency%20Planning%20and%20Policy%20-%20Appendix%20A%20-%20IEMA%20Guide-%20Assessing%20Greenhouse%20Gas%20Emissions%20and%20Evaluating%20their%20Significance,%20Version%202,%20Feb%202022.pdf [Accessed December 2024].

258 Ministry of Housing, Communities and Local Government and Department for Levelling Up, Housing and Communities. (2021). Planning Practice Guidance. [Online], available at: https://www.gov.uk/government/collections/planning-practice-guidance [Accessed December 2024].

Policy	Policy Context
The GHG Protocol (Various)[259]	The GHG Protocol establishes comprehensive global standardised frameworks to measure and manage GHG emissions from private and public sector operations, value chains and mitigation actions.
Publicly Available Specifications (PAS) 2080 (2023)[260]	A standard for managing carbon in building and infrastructure. It looks at the whole value chain and aims to reduce carbon and cost through intelligent design, construction and use.
Royal Institution of Chartered Surveyors (RICS) Whole Life Carbon Assessment for the Built Environment (2017)[261]	This RICS professional statement addresses the need for technical details of numerous aspects influencing whole life carbon calculations for built projects. It is intended to standardise whole life carbon assessment for built projects.

Baseline Conditions

15.4.3 The assessment baseline for GHG emissions in Wales is established using the Environment (Wales) Act 2016[262]. No additional data is gathered to inform the baseline. The scope covers existing GHG emissions before the construction, operation and decommissioning of the Proposed Development.

259 Greenhouse Gas Protocol. (Various). Available at: https://ghgprotocol.org/ [Accessed December 2024].

260 PAS 2080 :2023. (2023) Publicly Avalable Specifications : 2080 Carbon management in Infrastructure. [Online], available at: https://www.bsigroup.com/en-GB/standards/pas-2080/ [Accessed December 2024].

261 Royal Institution of Chartered Surveyors (RICS), (2017). Whole Life Carbon Assessment for the Built Environment. Available at: https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the--built-environment-november-2017.pdf [Accessed December 2024].

262 Environment (Wales) Act (2016), [Online], Available at: https://www.legislation.gov.uk/anaw/2016/3/contents [Accessed December 2024].

15.4.4 Specific targets and allocations in Wales include achieving net zero emissions by 2050. Additionally, Carbon Budget 2 (2021-2025)[249] targets an average of 37% below the baseline with a credit ('offset') limit of 0%. Carbon Budget 3 (2026-2030)[263] aims for an average of 58% below the baseline, with a 2030 target for an emissions reduction of 63% against the baseline. A 2040 target for an emissions reduction of 89% against the baseline and a 2050 target for an emissions reduction of at least 100% against the baseline ('net zero') are also established.

15.4.5 The future baseline for GHG emissions in Wales considers the impact of relevant Welsh Government policies throughout the project's lifetime and aligns with the established carbon budget trajectory. This ensures that future emissions reductions are measured against a realistic scenario that reflects ongoing efforts towards decarbonization. Notably, the Welsh Government's commitment to decarbonization is evident through the Welsh Energy Targets (2017)[248] with its ambitious renewable energy goals, PPW (Edition 12)[247] acknowledging the net zero target and aiming to exceed it, the 2019 climate emergency declaration, and the "Prosperity for All: A Low Carbon Wales"[250] document outlining specific decarbonization policies. These efforts ensure the baseline reflects a future with ongoing action towards achieving net zero emissions.

Existing Baseline

15.4.6 The current assessment looks at GHG emissions originating from the project Site itself. Given the Site's current use as agricultural fields primarily for grazing and arable crops (pasture and planting), these are negligible existing emissions. The change in GHG emissions associated with the Proposed Development will be evaluated against national, regional and local targets for decarbonisation (the future baseline).

15.4.7 To provide a context for GHG emissions arising from the Proposed Development, baseline data for local, regional and UK emissions is provided in **Table 15-2**.

263 Climate Change Targets and Carbon Budgets (2021) [Online], available at: https://www.gov.wales/climate-change-targets-and-carbon-budgets [Accessed December 2024].

Table 15-2 Emissions Estimates (2022) for Monmouthshire and Newport and the UK

Emissions Sources	Monmouthshire Council ($ktCO_2e$)	Newport Council (ktCO2e)	UK (ktCO2e)
Industry Electricity	10	80	11,642
Industry Gas	36	86	14,197
Large Industrial Installations	0	36	26,157
Industry 'Other'	18	31	10,347
Industry Total	**64**	**233**	**62,343**
Commercial Electricity	26	45	19,073
Commercial Gas	6	38	12,543
Commercial 'Other'	3	6	2,280
Commercial Total	**35**	**89**	**33,896**
Public Sector Electricity	4	7	3,611
Public Sector Gas	9	16	7,019
Public Sector 'Other'	1	2	1,064
Public Sector Total	**14**	**26**	**11,694**
Domestic Electricity	31	43	20,500
Domestic Gas	66	126	53,288
Domestic 'Other'	43	22	10,477
Domestic Total	**140**	**191**	**84,265**
Road Transport (A Roads)	137	80	44,173
Road Transport (Motorways)	76	170	23,978

Emissions Sources	Monmouthshire Council ($ktCO_2e$)	Newport Council (ktCO2e)	UK (ktCO2e)
Road Transport (Minor Roads)	75	150	41,783
Diesel Railways	7	9	1,593
Transport 'Other'	10	6	3,129
Transport Total	**305**	**415**	**114,656**
Landfill	2	64	13,473
Waste 'Other'	7	10	5,260
Waste Total	**9**	**74**	**18,733**
Other Total (LULUCF[264] and agriculture)	**210**	**53**	**50,340**
Grand Total*	**777**	**1,078**	**375,929**

*Note: individual emission entries have been rounded, so rounding errors may occur in combined totals.

Future Baseline

15.4.8 In terms of the future baseline, in the 'no development' scenario for the Proposed Development where it is not developed, the future baseline will be determined by the current GHG emissions from the Site. Since there is no physical development or activity at the Site in this specific scenario, GHG emissions before construction and operation are considered as zero. This comprehensive evaluation ensures a thorough examination of potential emissions across different scenarios and energy sources.

264 Land use, land use change and forestry: the category of GHG emissions and removals resulting from human-induced land use such as settlements and commercial uses, land-use change, and forestry activities.

15.5 Proposed Assessment Methodology

15.5.1 The assessment approach considers the likely magnitude of GHG emissions (or avoided emissions) in comparison to the baseline without the Proposed Development. It considers emissions throughout the lifecycle of the Proposed Development addressing:

- Construction phase - e.g. embodied emissions associated with materials, transportation of materials to Site and waste/arisings from the Site, and the construction process; and
- Operation phase - e.g. process operations and use of energy for ancillary facilities, lighting and controls, as well as avoided emissions from the Proposed Development.
- Decommissioning phase – e.g. emissions associated with the process of dismantling of the Proposed Development and environmental restoration.

15.5.2 For all PAS 2080[260] lifecycle stages and sub-stages of the Proposed Development, the assessment will include the following:

- collection of available data/information on the scale of GHG emitting activities (e.g. tonnes concrete, litres of fuel, kWh electricity) and GHG emitting activities for the baseline and for the Proposed Development. In each case this will cover the whole study period (minimum design life of 40 years); and
- calculation of the GHG emissions by applying a suitable emissions factor (per unit of emissions generating or avoidance activity).

15.5.3 Emissions calculations will focus on emissions annually and throughout the Proposed Development's lifecycle. Values will be reported as tonnes of CO2equivalents (tCO2e).

15.5.4 The residual effects associated with the Proposed Development will be assessed following the implementation of appropriate mitigation.

15.5.5 The assessment of construction and operation impacts will be undertaken in line with the following guidance:

- IEMA guidance for assessing GHG emissions for EIA[257];
- PAS 2080:2023[260];
- RICS Whole Life Carbon Assessment for the Built Environment[261];
- GHG Protocol[259]; and
- IPCC Guidelines for National Greenhouse Gas Inventories[265] .

Sensitive Receptors

15.5.6 The impacts of GHG emissions relate to their contribution to global warming and climate change. These impacts are global and cumulative in nature, with every tonne of GHG emissions contributing to impacts on natural and human systems. GHG emissions result in the same global effects wherever and whenever they occur and, therefore, the sensitivity of different human and natural receptors is not considered.

Significance Criteria

15.5.7 The methodology adopted will attribute a significance of effect level based on the sensitivity/value of the affected receptor(s) and the magnitude of change arising from the Proposed Development. Any magnitude of emitted or avoided GHG emissions makes a cumulative contribution to climate change. As there is only one receptor 'the climate'', it has a consistent sensitivity (high) no matter the location of the emissions source.

15.5.8 Significance of GHG impacts is assessed in line with IEMA guidance[253]: "a development's emissions should be based on its net impact over its lifetime, which may be adverse, beneficial or negligible". The evaluation of significance is not solely based on the magnitude of GHG emissions but whether the Proposed Development contributes to reducing GHG emissions relative to a comparable baseline consistent with achieving net zero by 2050.

15.5.9 With regards to assigning significance, IEMA guidance provides five distinct levels of significance as outlined below. Major or moderate adverse effects and beneficial effects are considered significant; minor adverse and negligible effects are considered to be not significant.

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265 IPCC. (2006). Guidelines for National Greenhouse Gas Inventories. Available at: https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html [Accessed December 2024].

- **Major adverse (Significant):** the project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.
- **Moderate adverse (Significant):** the project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
- **Minor adverse (Not Significant):** the project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
- **Negligible (Not Significant):** the project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
- **Beneficial (Significant):** the project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

15.5.10 In order to provide context to the GHG emissions, and as set out in the IEMA guidance, the estimated GHG emissions arising from the Proposed Development will be compared with the respective Welsh carbon budgets. Further contextualisation on more local or sector carbon budgets will also be considered where relevant.

15.6 Description of Likely Significant Effects

Construction Phase

15.6.1 In accordance with the PAS 2080[260] lifecycle stages for carbon management in buildings and infrastructure, the possible likely significant effects associated with the construction phase include those elements set out in **Table 15-3**.

Table 15-3 Construction Phase – Potential Emission Sources

Lifecycle Stage Impacts (with Codes as Per PAS 2080[260])	Potential Sources of Emissions (Not Exhaustive)
Product Stage (manufacture and transport of raw materials to suppliers) (A1-3)	Embodied emissions associated with extraction and manufacturing of the required raw materials.
Transport of Materials to Site (A4)	Emissions from fuel and electricity used in vehicles transporting materials to Site.
Plant and Equipment Use during Construction (A5)	Emissions from fuel and electricity used in plant and equipment on the Site.
Transport of Construction Waste (A5)	Emissions from fuel/energy used in vehicles transporting waste materials from construction, demolition (existing infrastructure) and excavation, to destinations away from the Site.
Disposal of Construction Waste (A5)	GHG emissions released during treatment and disposal of construction waste arisings.
Land use, land use change and forestry (A5)	Change in emissions associated with the clearance and disposal of vegetation during construction of the Proposed Development.

Operation Phase

15.6.2 In relation to the PAS 2080[260] lifecycle stages, the possible likely significant effects associated with the operation phase include those elements set out in **Table 15-4**.

Table 15-4 Key Sources of Potential Emissions in Operation Phase

Lifecycle Stage Impacts (with codes as per PAS 2080[260])	Potential Sources of Emissions (Not Exhaustive)
Operation (B1)	Emissions attributable to products and materials (such as the use of refrigerants if applicable) over the life cycle of the Proposed Development.
Maintenance, Repair, Replacement, Refurbishment (B2-5)	Embodied emissions associated with maintenance, repair, replacement and refurbishment of equipment and infrastructure for operation of the Proposed Development, and related emissions from use of plant.
Operational Energy Use (B6)	Emissions from the use of energy for the Proposed Development (e.g. grid/network energy supplies for ancillary buildings, lighting, fuel for backup generators and fuel for site vehicles etc.)
Operational Water Use (B7)	Emissions from the use of water for the Proposed Development. (e.g. process operations, cleaning and maintenance activities etc.)
Land use, land use change and forestry (B8)	Change in emissions associated with the release or sequestration of CO2 associated with a change in land use during operation of the Proposed Development.
Other Operational Processes (B8)	Embodied emissions associated with use of process consumables for the Proposed Development (e.g. addressing micro-cracking, preventing internal corrosion)

Decommissioning Phase

15.6.3 In relation to the PAS 2080[260] lifecycle stages, the possible likely significant effects associated with the operation phase include those elements set out in **Table 15-5**.

Table 15-5 Key Sources of Potential Emissions in Decommissioning Phase

Lifecycle Stage Impacts (with codes as per PAS 2080[260])	Potential Sources of Emissions (Not Exhaustive)
Deconstruction (C1)	Emissions attributable to dismantling of components (such as the use of energy consuming machines in dismantling)
Transport of materials (C2)	Embodied involved in moving the solar plant components to appropriate facilities (such as recycling centres or landfills) contributes to emissions. Transport emissions depend on the distance and mode of transportation.
Processing (C3)	Emissions can arise during material recovery or recycling. For instance, energy-intensive processes like melting down metals for reuse can release emissions.
Disposal (C4)	Emissions may occur during landfilling, incineration, or other disposal methods. For example, incineration releases greenhouse gases.

Scope

15.6.4 A summary of the proposed scope for the GHG assessment is presented in **Table 15-6**.

Table 15-6 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Product Stage (manufacture and transport of raw materials to suppliers) (A1-3)	Construction	✓		Raw materials required for Proposed Development would result in embodied emissions that have the potential to have material impacts.
Transport of Materials to Site (A4)	Construction	✓		Construction phase emissions from fuel/energy consumption due to the delivery of material to Site have the potential to be significant.
Plant and Equipment Use during Construction (A5)	Construction	✓		Emissions from plant and equipment used during construction of the Proposed Development have the potential to be significant.
Transport of Construction Waste (A5)	Construction	✓		Emissions from fuel/energy consumption associated with the transport of waste arisings may have potential material impacts.

Element	Phase	Scoped In	Scoped Out	Justification
Disposal of Construction Waste (A5)	Construction		✓	Emissions from the disposal and degradation of waste materials are expected to be minimal as they will predominantly comprise inert waste from excavation or surplus concrete and recyclable materials. This element is therefore scoped out of the assessment.
Land use, land use change and forestry (A5)	Construction		✓	A review of the Proposed Development location indicates that it is agricultural land. There will be minimal impact due to construction activities. As a result, this element is scoped out of the assessment.
Operation (B1)	Operation		✓	The Proposed Development is not expected to make extensive use of materials that would release GHG emissions, so this element is scoped out of the assessment.

Element	Phase	Scoped In	Scoped Out	Justification
Maintenance, Repair, Replacement, Refurbishment (B2-5)	Operation	✓		The Proposed Development will require scheduled maintenance and refurbishment activities requiring replacement parts, with the potential for material impacts from embodied carbon and use of equipment.
Operational Energy Use (B6)	Operation		✓	No significant additional energy supplies are required for the operation of the Proposed Development.
Operational Water Use (B7)	Operation		✓	No significant water consumption is required for the operation of the Proposed Development.
Land use, land use change and forestry (B8)	Operation		✓	The impact of the Proposed Development in disturbing the existing land is minimal and so land use change effects are also anticipated to be minimal and are scoped out.
Other Operational Processes (B8)	Operation		✓	Embodied emissions associated with use of process consumables for the Proposed Development are negligible.

Element	Phase	Scoped In	Scoped Out	Justification
Deconstruction of the Proposed Development (C1)	Decommissioning Phase		✓	Disassembly of components is considered a low impact activity.
Transport to end-of-life facilities (C2):	Decommissioning Phase		✓	Transport of any decommissioned components will be limited and localised.
Processing (C3)	Decommissioning Phase		✓	Components will be re-purposed or recycled.
Disposal (C4)	Decommissioning Phase		✓	The majority of any components removed from Site will be re-used or recycled.
Supplementary information beyond the infrastructure lifecycle (D2)	Exported utilities	✓		The Proposed Development will provide a significant source of renewable electricity generation.

15.7 Opportunities for Enhance the Environment

15.7.1 Some of the opportunities that can be looked at for enhancing the environment are evaluating changes in vegetation, to encourage biodiversity and potentially enhance sequestration capacity.

15.8 Mitigation

15.8.1 In line with IEMA guidance[257], it is important to incorporate measures to reduce GHG emissions at an early stage, this means that mitigation should be considered at all stages of design, not just as part of the EIA process. The sections below outline likely proposed GHG reduction measures for construction and operation of the Proposed Development.

15.8.2 The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

Construction Phase

15.8.3 Relevant design, mitigation and enhancement measures will be identified in the ES, which may include:

- Early-stage design and specification for construction of the Proposed Development with a view to minimising future GHG emissions, using the PAS 2080:2023 standard for carbon management in buildings and infrastructure[260] as a basis for design optimisation, with consideration of the carbon reduction hierarchy during design and construction:
- Avoid: aligning the outcomes of the Proposed Development and/or programme of work with the net zero transition at the system level and evaluate the basic need at the asset and/or network level;
- Switch: assess alternative solutions and then adopt one that reduces whole life emissions through alternative scope, design approach, materials, technologies for operational carbon reduction, among others, while satisfying the whole life performance requirements; and
- Improve: identify and adopt solutions and techniques that improve the use of resources and design life of an asset/network, including applying circular economy principles to assess materials/products in terms of their potential for reuse or recycling after end of life.
- Maximising the opportunity to use more sustainable materials by identifying in procurement documentation, that materials and products with

reduced embodied carbon emissions, and materials/resources featuring recycled content are preferred (where safe and of sufficient integrity for engineering).

- Designing, specifying and constructing the Proposed Development with a view to maximising the operational lifespan and minimising the need for maintenance and refurbishment (and thus reducing the frequency of releasing associated GHG emissions).
- Specifying efficient mechanical and electrical equipment (such as cables, structures, mounts) that is long-lasting and chosen for its durability and energy efficiency credentials.
- Using locally sourced materials where available and practicable to minimise the distance materials are transported from source to Site.
- Using more modern and efficient construction plant and delivery vehicles, and/or those powered by lower carbon fuels or electricity.

Operation Phase

15.8.4 Relevant design, mitigation and enhancement measures will be identified in the ES, which may include:

- Specifying high efficiency mechanical and electrical equipment such as cables, structures, mounts
- Maximising the operational effectiveness (efficient PV panels) and minimising the parasitic load.
- Establish effective systems for energy monitoring and sub-metering for key components of the Proposed Development for optimisation of operational conditions.
- Maximising the operational lifespan and minimising the need for maintenance and refurbishment (and all associated emissions).
- Maximising the potential for reuse and recycling of materials/elements at the end-of-life stage.
- Operating, maintaining and refurbishing the Proposed Development using energy efficient equipment.

Decommissioning

15.8.5 Relevant design, mitigation and enhancement measures for decommissioning may include:

- Maximising the potential for reuse and recycling of materials/elements at the end-of-life stage.
- Ensuring proper deconstruction of temporary equipment on the site and partial removal and disposal of materials and equipment.
- Using sustainable modes to transport deconstruction wastes and materials to a nearby recycling facility, energy recovery facility or landfill, as appropriate.

Beyond the Infrastructure Lifecyle

15.8.6 The Proposed Development will generate renewable electricity across its entire lifetime. This provides a benefit in terms of displacing more carbon intensive forms of generation on the wider national grid. The net positive significant effect will be determined via comparisons to the potential emissions released from an alternative fossil-fuel generating stations (such as a combined cycle gas turbine plant).

15.9 Limitations and Assumptions

- In the Product Stage (A1 – A3 stages), embodied carbon will be calculated using the RICS methodology and the ICE Database for raw material supply and manufacture of project assets.
- In the construction Transport (A4), the GHG emissions associated with the transport of materials, vessels, equipment, and workers will be estimated using DEFRA Emissions Factors Toolkit, industry benchmarks, and DfT data.
- During the construction Process (A5), the GHG emissions related to installation works, and plant equipment will be calculated based on available information or industry benchmarks.
- GHG emissions during the operation stage will be estimated based on available data from the Applicant, including O&M activities, embodied carbon of raw materials.

- Where specific data is unavailable, assumptions will be made to characterise GHG emissions, using proxy information and relevant case studies. All assumptions will be explicitly stated in the EIA Report for transparency.

16.0 Socio-Economics, Tourism and Recreation

16.1 Introduction

16.1.1 This Chapter considers the impacts of the Proposed Development on socio-economics during construction. operation and decommissioning and identifies potential significant effects. It sets out the proposed methodology that will be applied for the socio-economic assessment and identifies impacts that can be scoped out of the assessment. Where necessary, further assessment will be presented in the Environmental Statement (ES), if required.

16.2 Consultation

16.2.1 There has been no specific consultation carried out to date in relation to socio-economic, tourism and recreation. It is anticipated that feedback in relation to this topic will be gained following consultation on this EIA Scoping Report, both for this Chapter and related Chapters including **Chapter 5: Landscape and Visual Impact Assessment**, **Chapter 7: Cultural Heritage, Chapter 13: Noise and Vibration** and **Chapter 12:Traffic and Transport**.

16.2.2 The methodology adopted for the socio-economic and amenity assessment will align with the proposed methodology described in **Chapter 4: The Environmental Impact Assessment Methodology** and will take into account feedback following scoping and subsequent stakeholder engagement with local authorities as part of the DCO process.

16.3 Study Area

16.3.1 Socio-economic, tourism and recreation impacts are likely to be experienced at a range of spatial levels. There are no legislative or applicable best practice guidance to inform the production of socio-economic assessments or to stipulate how a study area for the purposes of environmental assessment is to be defined.

16.3.2 Based on industry best practice, two study areas defined upon the geographical area where socio-economic, tourism and recreation effects are likely to occur with the

potential to be significant in the context of the EIA Regulations[266] have been adopted:

- **Socio-economic and Labour Market Study Area** – potential labour market and associated socio-economic effects will be assessed within the relevant Local Authority Areas within which the Site lies: Newport City Council and Monmouthshire County Council. Beyond this, any likely effects would be limited by the size of the regional and Welsh/UK economies so would not be of significance in the context of the EIA Regulations.
- **Recreation and Tourism Study Area** – Impacts on recreational and tourist receptors could occur either from direct impacts – where the land required for the proposals overlaps with the receptor, or indirect effects amenity affects such as noise or visual impact, impact on receptors outside of the project boundaries. The visual impacts of the proposals will cover the greatest area and therefore the Recreation and Tourism Study Area will correspond to the Landscape and Visual Impact Assessment Study area identified in **Chapter 5: Landscape and Visual Impact Assessment**. This is currently proposed at a 5km radius from the Site boundary.

16.4 Baseline Conditions

16.4.1 Following definition of the Study Areas, a preliminary overview of the baseline conditions of the Site are now presented. The following sources have been identified:

- Mapping information;
- Local, regional and national economic and social indices databases, policy documents and strategies;
- Publicly available information on receptors;

266 The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017), [Online], available at: https://www.legislation.gov.uk/uksi/2017/572#:~:text=10.,provided%20in%20the%20environmental%20statement [Accessed December 2024].

- Nomis (http://www.nomisweb.co.uk) / data obtained from the Office for National Statistics;
- Newport City Council;
- Monmouthshire County Council; and
- Welsh Government Statistics and Research.

16.4.2 A summary of the relevant national and local planning policies to this topic are given in **Table 16-1**. The Policies summarised include overarching national policies, and policies from Planning Policy Wales (PPW) and other relevant Technical Advice Notes which form material considerations.

Table 16-1 Policy, Legislation and Guidance Relevant to Socio-Economics

National Policy	Context
Overarching National Policy Statement for Energy (EN-1)[267]	*Section 5.13 sets out an overall approach to energy infrastructure from a socio-economic perspective.* *Has influenced this EIA Scoping Chapter as a whole.*
	Section 5.13.3 details some of the likely economic impacts that should be considered as part of any assessment. *Presentation of the likely significant effects, including potential economic impacts, is present in **Section 16.5**.*
	Section 5.13.10 states that it may be concluded "that limited weight is to be given to assertions of socio-economic impacts that are not supported by evidence (particularly in view of the need for energy infrastructure as set out in the NPS". *Baseline evidence is provided in **Section 16.3**.*
Future Wales: The National Plan 2040[268]	*Policy 17 sets out national policies that accord with the relevant NPS and legislation, particularly Well-being of Future Generations Act and the Socio-Economic Duty Equality Act. Policy 17 of the National Plan states that proposals are to describe "the net benefits the scheme will bring in terms of social,*

267 Department of Energy and Climate Change (2011) Overarching National Policy Statement for Energy (EN-1), [Online], available at: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1 [Accessed December 2024].

268 Welsh Government/Llywodraeth Cymru (2021) Future Wales: The National Plan 2040 [Online], available at: https://www.gov.wales/future-wales-national-plan-2040 [Accessed December 2024].

National Policy	Context
	economic, environmental and cultural improvements to local communities". *Policy 17 of the National Plan is considered within relevant sections of this Chapter: baseline reporting, proposed assessment methodology, description of likely significant effects, opportunities for enhancing the environment and mitigation.*
Planning Policy Wales[269]	*Paragraphs 2.27 to 2.28 describes how to assess the sustainable benefits of development of which key social and economic factors are highlighted in paragraph 2.28*
	In considering the delivery of good design holistically, paragraph 3.14 discusses the need for an appropriate site and context analysis. The process seeks to ensure that the potential relationship between the impacts of construction and operation of a proposed development upon a surrounding area are known, including socio-economic impacts.
	Paragraph 4.5.3 to 4.5.seeks to protect recreational spaces, including formal and informal open green spaces as well as playing fields, from being lost by development.
	Paragraph 5.0.2 recognises the development of land will be necessary for economic activity including for the powering and heating of home, business and communities by low carbon energy sources.
	Paragraph 5.1.1 recognises that good infrastructure "plays a pivotal role in maintaining the economic well-being in Wales". Where areas are served by poor infrastructure these can be evidence by negative impacts upon quality of life, prosperity, and the well-being of communities.
	Paragraph 5.5.1 recognises tourism as a potential catalyst for regeneration.
	Paragraph 5.5.5 recognises that "long-distance routes, rights of way, disused railways, waterways and other green infrastructure are important tourism and recreational facilities, both in their own right and as a means of linking attractions".
	Paragraph 5.7.6 to 5.7.7 recognises the "importance of decarbonisation and the sustainable use of natural resources, both as an economic driver and a commitment to sustainable

269 Welsh Government/Llywodraeth Cymru (2024). Planning Policy Wales [Online], available at: https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf [Accessed December 2024].

National Policy	Context
	development. Paragraph 5.7.7. lists possible benefits of renewable and low carbon energy.
	Paragraph 5.9.8 requires authorities to "take into account the cumulative impact of renewable and low carbon energy development and their associated infrastructure, for example grid connections".
	All PPW policy matters are considered within relevant sections of this Chapter: baseline reporting, proposed assessment methodology, description of likely significant effects, opportunities for enhancing the environment and mitigation.
Technical Advice Note 23 – Economic Development[270]	*Although the TAN primarily considers "B" class uses, paragraph 1.1.2 of the TAN provides further definition to the term "economic development" clarifying that it comprises of development which generates an economic activity which "directly generates wealth (output), jobs and income" as well as providing or sustaining existing jobs or creating new jobs.*
	Paragraph 1.2.1 recognises that the "economic benefits associated with development may be geographically spread out beyond the area where the development is located".
	Section 2 discusses the appropriate weighing to be attributed to economic benefits in development management. The Section provides guidance to decision makers on the tests to understand the economic impacts of the proposal. This includes: considering the availability of alternative land (locational flexibility; job accommodated at the site providing an approximate measure of the development's contribution to the wider economy; and special merit i.e. would the proposed development make any contribution to policy objectives.
	All TAN 23 policy matters are considered within relevant sections of this Chapter: baseline reporting, proposed assessment methodology, description of likely significant effects, opportunities for enhancing the environment and mitigation.
	Policy GP4 General Development Principals – Highways and Accessibility ensures that appropriate access for pedestrians, cyclists and public transport is provided by development

270 Welsh Government/Llywodraeth Cymru (2014) Technical Advice Note 23 – Economic Development [Online], available at: https://www.gov.wales/technical-advice-note-tan-23-economic-development [Accessed December 2024]

National Policy	Context
	proposals. This includes seeking to avoid transport severance that may result to walking and cycling infrastructure.
	Policy GP7 General Development Principles – Environmental Protection and Public Health restricts development which would cause or result in unacceptable harms to health, the environmental, local amenity or public health and safety.
	Policy T5 Walking and Cycling provides and protects a network of safe walking and cycling routes.
	Policy T6 Public Rights of Way Improvement improves and seeks to extend the public rights of way network with an "emphasis on sustainability and access for all".
	Policy T7 Public Rights of Way and New Development requires the retention, or provision of a suitable alternative, of any footpaths, bridleways or cycleways affected by development proposals.
Newport Local Development Plan (LDP) 2011-2016[271]	*Policy T8 All Wales Coast Path requires all development proposals to protect and enhance the All Wales Coast Path. To also encourage the provision of additional routes to the coast path.*
	Policy CF1 Protection of Playing Fields, Land and Buildings Uses for Leisure, Sport, Recreation and Play resists proposals resulting in the loss or redevelopment of playing fields, land and buildings, used for sport, recreation, areas of play and community uses unless those uses are surplus to requirements or alternative provision will be made.
	CF12 Protection of Existing Community Facilities resists the loss or change of use of buildings currently used for community facilities unless those uses are surplus to requirements or alternative provision will be made.
	All local policy matters with the Newport City Council LDP are considered within relevant sections of this Chapter: baseline reporting, proposed assessment methodology, description of likely significant effects, opportunities for enhancing the environment and mitigation.

271 Newport City Council/Cygnor Dinas Casnewydd (2015) Newport Local Development Plan 2011-2026 [Online], available at: https://www.newport.gov.uk/documents/Planning-Documents/LDP-2011-2026/LDP-Adopted-Plan-January-2015.pdf [Accessed December 2024]

National Policy	Context
Monmouthshire County Council Adopted Local Development Plan 2011-2021[272]	*Policy S8 – Enterprise and Economy supports development proposals that seek to deliver the Council's vision for sustainable economic growth.*
	Policy S10 – Rural Enterprise supports the diversification of the rural economy outside of settlement boundaries subject to causing no unacceptable harms to the surrounding landscape, historic, cultural, heritage, biodiversity or local amenity value.
	Policy S11 – Visitor Economy provides or enhances sustainable forms of tourism that are proposed and to resist development proposals that would have an "unacceptable adverse impact on features and areas of tourism interest and their settings, or that would result in the unjustified loss of tourism facilities".
	Policy S13 – Landscape, Green Infrastructure, and the Natural Environment provides a decision-making framework to determine impacts to landscape and green infrastructure assets, in addition to supporting ecological connectivity. Clause 4) seeks to integrate these features to create "multi-functional, interconnected spaces that offer opportunities for recreation and healthy activities such as waking and cycling".
	Policy S16 – Transport promotes sustainable, safe forms of travel through increasing the provision for walking and cycling.
	Policy S17 – Place Making and Design requires all development to contribute to creating "high quality, attractive and sustainable places".
	Policy CRF1 – Retention of Existing Community Facilities resists the change of use of loss of community facilities unless in permitted circumstances.
	Policy CRF3 – Safeguarding Existing Recreational Facilities and Public Open Space resists the loss of land or facilities with open space, recreation and allotment garden uses unless: there is a surplus of such land or sufficient alternative provision is made.
	Policy RE3 – Agricultural Diversification supports proposals contributing to agriculture or its diversification, including where the proposed benefits of the scheme would sustain employment or the rural economy. The Policy is also supportive of renewable

272 Monmouthshire County Council/Monmouthshire Sir Fynwy (2014) Monmouthshire County Council Adopted Local Development Plan 2011-2021 [Online], available at: https://www.monmouthshire.gov.uk/app/uploads/2017/05/Adopted-Local-Development-Plan-with-PDF-tags.pdf [Accessed December 2024]

National Policy	Context
	energy schemes where they meet the requirements of Policy SD1.
	Policy SD1 – Renewable Energy supports renewable energy schemes, including solar, subject to consideration of amenities of nearby residents, in terms of noise, dust, odour or increases in traffic, and the wider environmental, economic, social and community benefits.
	Policy EP1 – Amenity and Environmental Protection requires development proposals that would "cause or result in unacceptable risk/harm to local amenity, health, the character/quality of the countryside or interests of nature conservation, landscape or built heritage importance" to be resisted unless measures can be taken to overcome any significant risk.
	All local policy matters with the Monmouthshire County Council LDP are considered within relevant sections of this Chapter: baseline reporting, proposed assessment methodology, description of likely significant effects, opportunities for enhancing the environment and mitigation.

Current Baseline

16.4.3 This section summarises the relevant baseline conditions to inform this socio-economic, tourism and recreation (including amenity) assessment.

The Site

16.4.4 As described within **Chapter 2: Description of the Nature and the Purpose of the Project.,** the Proposed Development falls within the administrative boundary of Newport City Council and Monmouthshire County Council. The Site is located within the vicinity of a number of villages including: Goldcliff 1.7km to the west, Whitson 200m to the west and Redwick 51 m north of the Scoping Red Line Boundary.

16.4.5 The Site lies within the Gwent Levels[273], which consists of an inter-tidal zone of saltmarshes, mudflats and sands, along the northern coastline of the Severn Estuary. However, the Site is currently used as agricultural land. According to The

273 The Living Levels/Lefelau Byw Landscape Partnership, Living Levels Historic Map [Online]. Available at: https://www.livinglevels.org.uk/historic-map-viewer [Accessed December 2024].

Predictive ALC Map for Wales[274], using the Ministry of Agriculture Fisheries and Food (MAFF) 198815 classification. The Predictive Map tool identified that the majority of the Site falls within Grade 3b, with pockets of Grade 4. ALC is reviewed further in **Chapter 11: Ground Conditions**.

16.4.6 The Gwent Levels comprises of a series of Site of Special Scientific Interest (SSSI) designations; the Site lies entirely within three of the SSSI designations:

- Gwent Levels: Whitson[275];
- Gwent Levels: Redwick and Llandevenny[276]; and
- Gwent Levels: Magor and Undy[277].

16.4.7 A further SSSI designation, Magor Marsh[278], lies 1.23 km to the north of the Site.

16.4.8 The Site also directly bounds, although falls out with of, the Severn Estuary Ramsar Site, Special Protection Area (SPA), Special Area of Conservation (SAC) and SSSI.

16.4.9 There is an extensive Public Right of Way (PRoW) network existing within and around the Site and summarised in **Table 16-2** which includes the *"South Wales Coast to Severn Estuary*" section of the Wales Coast Path bounding the Scoping Red Line Boundary to the south.

16.4.10 Relevant baseline conditions are presented for the Socio-economic and Labour Market and Tourism and Recreation Study Areas where information is available.

274 The Predictive ALC Map for Wales, [Online], available at: https://www.gov.wales/agricultural-land-classification-predictive-map [Accessed December 2024].
275 Gwent Levels – Whitson SSSI, [Online], available at: https://naturalresources.wales/media/636520/SSSI_0148_SMS_EN0013223.pdf [Accessed December 2024].
276 Gwent Levels - Redwick and Llandevenny SSSI, [Online], available at: https://naturalresources.wales/media/646109/SSSI_0563_SMS_EN0012ca0.pdf [Accessed December 2024].
277 Gwent Levels – Magor and Undy SSSI. [Online], available at: https://naturalresources.wales/media/676549/sssi_0307_sms_en001.pdf [Accessed December 2024].
278 Magor Marsh SSSI [Online], available at: https://www.visitwales.com/attraction/nature-or-wildlife/magor-marsh-sssi-1914400 [Accessed December 2024].

Data at the Welsh national level has been used as comparator for the Study Areas, as appropriate.

Socio-Economic and Labour Market Study Area Baseline

Population

16.4.11 The Study Area has a total population of 255,400 with the population aged between 16-64 representing 61.04% (155,900)[279]. This figure is marginally higher than the population aged between 16-64 for the whole of Wales (60.95%)[279].

Economic Activity

16.4.12 Economic activity rate is a measure of the labour market opportunities available in the area[280]. The economic activity rates of the 16-64 aged population of the Study Area is 78.40%[281] which is marginally higher than the rate of the Welsh national figure (76.20%)[281].

Employment Structure

16.4.13 Referring to the 16-64 aged population of the Study Area, the highest level of people in employment by occupation are employed in “professional occupations” at 24.91% (28,600)[281] which is marginally higher than the Welsh national figure at 22.58% (331,500)[281].The breakdown by occupation then differs from national figures, with the Study Area showing a second highest figure in “elementary occupations” at 17.60% (20,200)[281] and a third highest figure in “associate professional occupations” at 12.98% (14,900)[281]. At the Welsh national level, “associated professional occupations” at 14.13% (207,500)[281] is the second highest occupation and the third highest is “skilled trade occupations” at 10.22% (150,100)[281].

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279 ONS (2022) Local Authority Based by Five Year Aged Band. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/adhocs/15432ts007acensus2021agebyfiveyearagebands [Accessed December 2024].

280 The economic activity rate measures the percentage of the population, both in employment and unemployed that represents the labour supply regardless of their labour status. The figure represents the degree of success of the area in engaging people in productive activity.

281 ONS (2022) Annual Population Survey. Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/methodologies/annualpopulationsurveyapsqmi. [Accessed December 2024].

16.4.14 Comparatively, employment in the "skilled trade occupations" and "process plant and machine operatives" across the Study Area falls below Welsh national level figures at 6.62% (7,600)[281] and 4.88% (5,600)[281], respectively.

16.4.15 In respect to broad employment industries, the largest proportion of people in employment across the Study Area work in "Health" at 15.13% (17,000)[282] which is largely proportionate to the Welsh national figure at 15.23% (196,000)[282]. The second largest industry, collectively, across the study area relates to "Part G" industries, comprising of "Motor Trades", "Wholesale" and "Retail" at 14.2% (15,750)[282], with the third highest industry being "Manufacturing" at 10.68% (10,000)[282]. Despite, Monmouthshire comprising of a substantial rural area, "Agriculture, Forestry and Fishing" accounts 0.71% (700) across the Study Area against the Welsh national figure of 1.17%[282].

Skills and Qualifications

16.4.16 Overall, Newport is reasonably proportional to Wales, although marginally higher in most cases, to national figures. The percentage of people in Newport with an "NVQ1+" (87.16%) is higher than the whole of Wales (85.79%) with a difference of 1.3%. Conversely, the percentage of people with an "NVQ3+" (56.31%) is lower than the whole of Wales (58.04%).

16.4.17 Comparatively, Monmouthshire is shown to have higher levels of educational attainment than for the whole of Wales. The percentage of people in Monmouthshire with an "NVQ1+" (91.03%) is higher than the whole of Wales (85.79%) with a difference of 1.3%. Notably, the percentage of people with an "NVQ4+" (52.52%) is higher than for the whole of Wales (38.57%).

Key Business Sector: Construction

16.4.18 Gross Value Added (GVA) is a measure of the value of goods and services produced in the area. The ONS produce regular updates on the GVA produced by industry at regional levels; the most recent data was published in 2019 which reported 2018

282 ONS (2022) Business Register and Employment Survey. Available at: https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/businessregisterandemploymentsurvey [Accessed December 2024].

data[283]. In 2018, it was estimated that the gross value added (GVA) per construction worker was £345 million[283]. In 2018, 7,000 people were employed in the Construction Sector[284] in the Study Area with a gross wage/salary per construction worker of £49,285.71.

16.4.19 In 2022 across the Study Area, some 4,700 people were employed in the Construction Sector representing 4.23% of the total jobs across the Study Area[282]. This falls only marginally below the Welsh national figure of 4.82% (62,000) of jobs in construction[282].

Key Business Sector: Tourism

16.4.20 In 2018, it was estimated that the gross value added (GVA) worker in the Accommodation and Food and Beverage Sector was £172 million[283]. In 2018, 9,000 people were employed in this sector[284] in the Study Area with a gross wage/salary per worker of £19,111.11.

16.4.21 In 2022[282], across the Study Area some 8,500 people were employed in the Accommodation and Food and Beverage Sector[285] in 2022.

Economic Importance of Tourism and Recreation

16.4.22 Visit Wales have previously studied the extent the level of employment in the tourism industry[286] through utilisation of the UK Standard Industrial Classification identifying sub-classes which fall into the following sub-sectors: accommodation for visitors; food and beverage services, sporting and recreational activities; cultural activities; passenger transport; travel agencies and other reservation activities; and country

283 ONS (2019) Regional gross value added (balanced) by industry: local authorities by NUTS1 region: UKL Wales. Available at: https://www.ons.gov.uk/economy/grossdomesticproductgdp/datasets/regionalgrossvalueaddedbalancedbyindustrylocalauthoritiesbyitl1region [Accessed August 2024].

284 ONS (2019) Business Register and Employment Survey. Available at: https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/businessregisterandemploymentsurvey [Accessed December 2024].

285 For the purpose of this baseline, the ‘tourism and recreation’ sector also encompasses the accommodation and food services sectors.

286 Wales Visitor Economy Profile: 2021. Summary of employment, earnings, enterprises, expenditure, and output data relating to the tourism and hospitality industries in Wales for 2021. Welsh Government

specific tourism activities[287]. The key findings of the Visit Wales 2021[286] report were that tourism as a proportion of all employment in Wales has fluctuated between 2015 to 2020. The 2022 figures show a fall in the number of employees from 151,000 (11.30%) to 137,545 (10.69%) in 2020[286]. Overall, the study found that the largest proportion of tourism industries exist in North and Mid-Wales, with the South-East of Wales showing the lowest proportion of employment in the sector.

16.4.23 With respect to the Study Area, this decline has also been experienced between 2020 to 2022, with a fall in the working age population in tourism related industries from 11,500 in 2020 to 10,355 in 2022[282]. The 2022 figure, of 10,355, accounts for 9.22% of all employment in the Study Area and 7.53% of all employment in Wales[282].

Characteristics and Assets

16.4.24 To inform the preliminary baseline, relevant recreation and tourism receptors have been identified from baseline work undertaken within **Chapter 5: Landscape and Visual Impact Assessment**, **Chapter 7: Cultural Heritage** within the 5km study area identified.

Table 16-2 Recreation and Tourism Receptors

Receptor Group	Baseline Information
Designated walking and other recreational routes	The Wales Coast Path, Sustrans Cycle Route 4, Open Access Land and the local Public Rights of Way network.
Outdoor tourist destinations	Dewstow Gardens and Grottoes, Major Marsh Nature Reserve, Wilcrick Hill Fort, Pencoed Castle and Beechwood Park.

16.5 Proposed Assessment Methodology

16.5.1 In the UK, there is no dedicated legislation which details the scope of socio-economic assessments or specifies appropriate standards and thresholds for determining significance effects.

287 The Visit Wales study included 45 UK Standard Industrial Classifications, accounting for seven sub-sectors of Tourism Industries in Wales. The full list of industries included can be found in Table 5.1 of the Wales Visitor Economy Profile: 2021 (annex).

Assessment Methodology

16.5.2 To ensure consistency with other topics, the assessment methodology outlined in the forthcoming sections follows the general significance evaluation methodology outlined in **Chapter 4: The Environmental Impact Assessment Methodology.** However, the consideration of sensitivity and magnitude of effect has been amended to be suitable for the socio-economics and tourism and recreation receptors and effects that will be relevant to this subject.

16.5.3 The assessment will consider the potentially significant effects on socio-economics, tourism and recreation (including amenity) that may arise from the construction and operational phases of the Proposed Development. In line with standard EIA practice, the sensitivity of receptors is considered against the magnitude of change to determine the significance of effect. Significance determination is drawn from references to information about the nature of the development, the receptors that could be significantly affected and their sensitivity, importance, or value, together with the magnitude of change likely to occur.

16.5.4 The method adopted for this assessment draws upon publicly available information and is based upon:

- Establishing the baseline conditions to determine the existing socio-economic characteristics, in accordance with the defined Study Areas;
- Defining receptor sensitivity to the Proposed Development, where possible. The sensitivity of a receptor is derived from the importance or value of the asset, which may be determined by legislation, policy of otherwise as qualified by professional judgement;
- Identifying the potential change that a receptor would experience as a result of a Proposed Development, with consideration given to its magnitude, temporal scope (e.g. short/long term, temporary/permanent) and valency (for example, if the change is adverse or beneficial);
- Identifying the significance of potential socio-economic effects;
- Identifying mitigation measures where significant adverse effects are predicted; and

- Identifying any residual effects after mitigation.

16.5.5 The assessment will be based on professional judgement and will draw on experience of similar projects where applicable.

16.5.6 In order to avoid duplication with other technical chapters, this assessment will not consider visual amenity, traffic and noise effects upon individual receptors such as residents, local communities and individual tourists. Instead, this assessment will be addressed in **Chapter 5: Landscape and Visual Impact Assessment**, **Chapter 13: Noise and Vibration**, and **Chapter 12: Traffic and Transport** respectively.

Approach to Assessment: Socio-Economic and Labour Market Effects

Sensitivity

16.5.7 The availability of labour and skills is critical in accommodating the demands, needs and requirements of the Proposed Development. Adequate labour and skills capacity results in low sensitivity, while limited labour and skills capacity would result in high sensitivity.

16.5.8 Sensitivity criteria relative to labour market and socio-economic effects is shown in **Table 16-3**.

Table 16-3 Determining Receptor Sensitivity (Socio-Economic and Labour Market)

Receptor Group	Criteria
High	Where there is some requirement for technical specialist input, which is difficult to source at a national level and / or where there is limited labour or skills available at the local level. Where the economy has little capacity to manage adverse changes to its operations
Medium	Where there is limited requirement for very technical specialist input, which is difficult to source at a national level, and/or where there are some constraints to the availability of labour or skills at the local level. Where the economy has capacity to manage adverse changes to their operations.
Low	Where there no requirement for technical specialist input, and / or where there is a readily available labour force and skills. Where the economy or land uses have substantial capacity to manage adverse changes to their operations.

Magnitude

16.5.9 The magnitude of change on identified labour market and socio-economic receptors is determined using the criteria outlines in **Table 16-4**, below.

Table 16-4 Magnitude of Effects (Socio-Economic and Labour Market)

Magnitude of effects	Criteria
High	An impact that would be very adverse/beneficial and is very likely to affect the operations of businesses.
Medium	An impact that would be adverse/beneficial and is likely to affect the operations of businesses.
Low	An impact that would be adverse/beneficial and that may have some effect on the operations of businesses.
Negligible	An impact that is anticipated to have a slight effect (either adversely or beneficially) and is unlikely to have any effect on the operations of businesses.

Approach to Assessment: Tourism and Recreation Effects

16.5.10 Tourism and recreation (including amenity) effects relates to the benefits and well-being that users gain from using a resource for their intended function. Tourism and recreational receptors to be considered and assessments will also be receptors identified in **Chapter 5:Landscape and Visual Impact Assessment**, **Chapter 7:Cultural Heritage** and **Chapter 12:Traffic and Transport**.

Table 16-5 Receptor Sensitivity (Tourism and Recreation)

Receptor sensitivity	Criteria
Very High	Where the receptor or resource is defined as being of National (UK) status.
High	Where the receptor or resource is defined as being of National (Welsh) status.
Medium	Where the receptor or resource is defined as being of regional status.
Low	Where the receptor or resource is defined as being of local status.

Magnitude

16.5.11 The magnitude of change on identified labour market and socio-economic receptors is determined using the criteria outlines in **Table 16-6.**

Table 16-6 Magnitude of Effects (Tourism and Recreation)

Magnitude of effects	Criteria
High	An impact that would be very adverse/beneficial and is very likely to affect the operations of tourist attractions or recreational uses/users (including amenity).
Medium	An impact that would be adverse/beneficial and is likely to affect the operations of tourist attractions or recreational uses/users (including amenity).
Low	An impact that would be adverse/beneficial and that may have some effect on the operations of tourist attractions or recreational uses/users (including amenity).
Negligible	An impact that is anticipated to have a slight effect (either adversely or beneficially) and is unlikely to have an effect on the operations of tourist attractions or recreational uses/users (including amenity).

Determination of Significance

16.5.12 The overall approach to determining the significance of effects aligns to the "significance test" as described in **Chapter 4: The Environmental Impact Assessment Methodology**. The significance evaluation matrix is shown in **Table 16-7**.

Table 16-7 Significant Evaluation Matrix

		Magnitude of change			
		High	**Medium**	**Low**	**Negligible**
Sensitivity/importance/value	**Very high**	Major (Significant)	Major (Significant)	Major (Significant)	Minor (Not significant)
	High	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)
	Medium	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)

16.6 Description of Likely Significant Effects

16.6.1 The Proposed Development has the potential to result in effects to the environment. These effects relate to key stages of the project during construction, operation and decommissioning. Having regard to the preliminary baseline conditions presented above, the characteristics of the Site (and the details of the Proposed Development in **Chapter 2: Description of the Nature and the Purpose of the Project**) this Section sets out those effects which are likely to be significant with **Table 16-7**, clarifying the elements proposed to be scoped into a more detailed assessment and thus to be scoped out.

Construction

16.6.2 The construction phase of the development has the potential to have effects upon the relevant labour market area at a local level. Those effects can potentially result from the generation of employment directly associated with the construction of the Proposed Development (direct employment effects), generation of employment from related construction supply chain effects (indirect employment effects) or from other forward linkages, i.e. from households/businesses benefiting from the direct or indirect employment spend on other goods and services in the community (induced employment effects). As noted, within **Chapter 2: Description of the Nature and the Purpose of the Project**, the construction phase is approximated to occur over an 18-month period comprising of site preparation, including the construction of temporary roadways, compounds and management of traffic, and the construction of the solar infrastructure. Although effects are not considered likely to be permanent, it is considered to potentially result in significantly beneficial benefits from the generation of employment opportunities, especially where these can be provisioned from within the local area. These potential local effects are proposed to be scoped into the socio-economic assessment considering impacts across the Socio Economics and Labour Market Study Area.

16.6.3 The construction phase also has the potential to cause direct, indirect or induced effects to local services (i.e., hospitality and retail). However, there are three major urban centres within an hour's drive of the sites with facilities to provide these services. Due to the length of time of the construction phase, it is not expected that there would be an influx of construction workers at any particular time which would

put these services under strain and it is therefore proposed that this element is scoped out from further assessment.

16.6.4 The construction phase also has the potential to have direct, and indirect effects, upon recreational users and tourism related businesses within the Recreation and Tourism Study Area. Therefore, this matter is proposed to be scoped into the socio-economic assessment except for direct effects (i.e. potential for closures/diversions) on the public rights of way network. This will be covered within **Chapter 12: Traffic and Transport** for all phases of the development. This assessment will draw upon, the technical assessments undertaken in the following Chapters: **Chapter 5: Landscape and Visual Impact Assessment**; **Chapter 7: Cultural Heritage and Chapter 13: Noise and Vibration.**

16.6.5 The construction of the Proposed Development has the potential to result in direct and indirect effects upon land-use resources. **Chapter 2: Description of the Nature and the Purpose of the Project** notes that the Site is comprised of a cluster of agricultural fields uses for pasture and arable use. However, the land is predominantly grade 3b in terms of agricultural classification and is not, therefore, considered to be best and most versatile agricultural land. For this reason, assessment of the development upon land-use resources is proposed to be scoped out of the socio-economic assessment. Any residual considerations toward best and most versatile agricultural land resulting from the Proposed Development would be assessed, in a policy context, within the accompanying Planning Statement.

Operation

16.6.6 The operational phase of the Proposed Development may have direct, indirect and induced impacts to the employment/labour market although these would be limited to a small number of permanent staff and then occasional staff required for maintenance and servicing type activities. It is expected that the operational staff would average less than 10 at any one time and therefore the effects on the employment / labour market would be too small to be considered significant and are proposed to be scoped out of the EIA.

16.6.7 The operational phase of the Proposed Development may also have longer-term impacts in respect to indirect effects upon recreational users and tourism related

businesses within the Recreation and Tourism Study Area. As with the construction phase assessment, this matter is proposed to be scoped into the socio-economic assessment and will be limited to receptors immediately impacted by the Proposed Development. This assessment will draw upon, the technical assessments undertaken in the following Chapters: **Chapter 5: Landscape and Visual Impact Assessment**; **Chapter 7: Cultural Heritage**; and **Chapter 13: Noise and Vibration**.

16.6.8 The operational phase is also anticipated to generate significant business rate revenue on an annual basis which will be retained by Newport City Council and Monmouthshire County Council. At this stage, no further details of this are known. This matter is proposed to be scoped into the socio-economic assessment.

16.6.9 The operation phase may result in significant beneficial effects from inward investment directly resulting from the Proposed Development consent. Such inward investment may be as a result of obligated or voluntary developer contributions and may be connected to the Proposed Development by a legal agreement. At this stage there are no known or anticipated requirements for any developer contributions and the final parameters of the Proposed Development are not confirmed. However, in the event it becomes apparent that developer contributions would be required, or are intended, this matter is proposed to be scoped into the socio-economic assessment.

16.6.10 The operation of the Proposed Development has the potential to result in direct and indirect effects upon land-use resources. As noted above, the land is predominantly grade 3b in terms of agricultural classification and is not, therefore, considered to be best and most versatile agricultural land. For this reason, assessment of the development upon land-use resources is proposed to be scoped out of the socio-economic assessment. Any residual considerations toward best and most versatile agricultural land resulting from the Proposed Development would be assessed, in a policy context, within the accompanying Planning Statement. It is intended that agricultural land is retained and used for grazing where possible.

Decommissioning

16.6.11 As described within **Chapter 2: Description of the Nature and the Purpose of the Project**, the assessment will assume that Proposed Development would be decommissioned at the end of the operational lifetime of 40 years. Impacts which arise from decommissioning aspects of the Proposed Development are likely to be similar in nature to those during the construction phase and therefore the proposed scope is the same as for the construction phase.

Activities or Impacts Scoped Out of the Assessment

16.6.12 A number of potential activities and related impacts have been proposed to be scoped out from further assessment in **Table 16-8** due to no likely significant effect. These judgements with respect to no likely significant effect at this EIA scoping stage have been made based on the knowledge of the baseline environment, the nature of planned works and the wealth of evidence on the potential for impact from such projects more widely.

Table 16-8 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Direct, indirect, and induced employment/labour market effects.	Construction and Decommissioning	✔		There is the potential for there to be significant beneficial benefits from the generation of employment opportunities at the local level during the Construction and Decommissioning phases.
Direct effects from business rates	Operation	✔		The Proposed Development will likely generate significant business rates, at an annual basis, during operation. The effects of this will be assessed.
Direct effects from inward investment	Operation	✔		Whilst the final parameters of the Proposed Development are unconfirmed, the assessment will consider the effects of any linked developer contributions.

Element	Phase	Scoped In	Scoped Out	Justification
Indirect effects upon recreational uses.	Construction, Operation and Decommissioning	✔		The assessment will consider the effects upon recreational use and tourism related business. These effects may be limited to receptors immediately impacted by the development drawing upon technical assessments in the **Chapter 5:Landscape and Visual Impact Assessment**; **Chapter 7:Cultural Heritage**; and **Chapter 13:Noise and Vibration.**
Direct, indirect, and induced employment/labour market effects.	Operation		✔	The numbers of employees and operational spend will not bring about any potential significant effects during the operational phase.
Direct, indirect and induced effects on local services and tourism businesses (i.e. hospitality and retail)	Construction, Operation and Decommissioning		✔	It is expected that with three major urban centres within an hours drive of the Proposed Development, effects on hospitality or retail services will not be of a level to be considered significant.
Direct and indirect effects on land-use (agricultural resource)	Construction, Operation and Decommissioning		✔	The Site comprises of agricultural land however this is pre-dominantly graded as 3b agricultural land. On the whole, the Site is not considered best and most versatile agricultural land all phases of the Proposed Development are proposed to be scoped out from further assessment.

16.6.13 It should also be noted that amenity and health effects on population (i.e. residential properties) will be considered within the relevant chapters of the EIA, with an overall view then being considered within the intra-project assessment. These impacts therefore will not be covered in this chapter.

16.7 Opportunities for Enhancing the Environment

16.7.1 As is described in **Chapter 4: The Environmental Impact Assessment Methodology**, any embedded design principles will be identified and embedded within the design of the Proposed Development to reduce or offset the potential consequences of the Proposed Development. Where potential significant environmental effects are identified, following application of the embedded measures, then "additional measures" will be considered.

16.8 Mitigation

16.8.1 As noted within **Chapter 2: Description of the Nature and the Purpose of the Project, Table 2-1**, there are a range of embedded mitigation principles which will be considered in the environmental assessment, which are not exhaustive.

16.8.2 In the case that significant adverse effects are predicted to a receptor (even when taking into account embedded mitigation) then further mitigation measures will be outlined to avoid, prevent, or minimise those impacts. The assessment will determine if there are any residual effects following application of embedded and additional measures and will latterly conclude if those effects are significant or not.

16.8.3 Having regard of the design strategy for the Proposed Development, and all proposed embedded design principles, no further mitigation or enhancement measures are proposed, or are considered necessary at this stage. This position may change as the design progresses and baseline reporting continues.

16.9 Limitations and Assumptions

16.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

16.9.2 Where possible, the latest data (2022 onwards) will be sourced to inform baseline reporting and analysis. However, to assess the GVA of key industries in the Study

Area, the baseline reporting has been required to rely upon data from 2018 and, as this is not considered current data, this is acknowledged as a limitation.

17.0 Other Environmental Topics

17.1 Introduction

17.1.1 The following Chapter provides a summary of the other environmental topics that have been considered during the preparation of this EIA Scoping Report. The Chapter aims to address the other environmental topics that will not be significantly affects by the Proposed Development and as such can be addressed without requiring individual standalone chapters.

17.2 Air Quality

Baseline Conditions

17.2.1 The Project is located within the administrative areas of Newport City Council and Monmouthshire County Council, who undertake routine ongoing monitoring of ambient air quality monitoring as part of their Local Air Quality Management responsibilities under Part IV of the Environment Act (1995)[288] (Ref. 19).

17.2.2 There are no Air Quality Management Areas (AQMAs) within the vicinity of the Site which indicates that it is not located within an area where the concentrations of nitrogen dioxide (NO_2) or fine particulate matter (PM_{10}) exceed their annual mean air quality objective. The nearest AQMAs are within Newport City Council's jurisdiction, located within the city centre, approximately 5.2km to the North West and 5.6km to the West of the Site[289]. There are AQMAs within the jurisdiction of Monmouthshire County Council, the nearest of which being Chepstow AQMA, located roughly 11.4km to the North East of the Site.

288 HMSO (1995) Environment Act 1995. Available at: https://www.legislation.gov.uk/ukpga/1995/25/pdfs/ukpga_19950025_en.pdf [Accessed December 2024].

289 Defra (2024) UK Air – Air Information Resource. Available at: https://uk-air.defra.gov.uk/aqma/maps/ [Accessed December 2024].

17.2.3 In 2022, there were 90 NO_2 diffusion tube monitoring sites operated by Newport City Council[290]. None of these monitoring sites measured concentrations above the objective value of of 40 µg/m[290].

17.2.4 In 2022, there were 47 NO_2 diffusion tubes operated by Monmouthshire County Council across 45 roadside locations[291]. None of these diffusion tubes recorded concentrations above the objective value of 40 µg/m[290], in fact the highest recorded concentration was 33.9 µg/m[290].

17.2.5 Description of Likely Significant Effects The potential air quality impacts of the Proposed Development are considered to be:

- Impacts of dust arising during the construction and decommissioning phases of the Proposed Development; and
- Impacts of vehicle and plant emissions during the construction and decommissioning phases of the Proposed Development.

17.2.6 Following the construction phase, minimal air quality impacts are expected to arise from the Proposed Development. There will be minimal vehicle movements to and from the Site, and emissions from on-site infrastructure is not anticipated.

17.2.7 The potential impacts from dust emissions arising from activities during the construction and decommissioning phases of the Proposed Development have been considered using an approach based on the Institute of Air Quality Management's (IAQM) guidance (2014)[292] for assessing impacts from such activities. This is a screening assessment and a risk-based qualitative assessment approach and is applied for air quality assessments throughout the UK. Mitigation measures will be identified and incorporated into the Outline CEMP (oCEMP).

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290 Newport City Council (2023) 2023 Air Quality Progress Report. Available at: https://live.newport.gov.uk/sites/default/files/media/media-documents/Newport%20air%20quality%20annual%20progress%20report%202023.pdf [Accessed December 2024]

291 Monmouthshire County Council (2023) 2023 Air Quality Progress Report. Available at: https://www.monmouthshire.gov.uk/app/uploads/2024/01/MCC_APR_2023_FINAL_27-09-23.pdf [Accessed December 2024]

292 Institute of Air Quality Management (IAQM) (2014) Guidance on the Assessment of Dust from Demolition and Construction. Available at: http://iaqm.co.uk/wpcontent/uploads/guidance/iaqm_guidance_report_draft1.4.pdf [Accessed December 2024].

17.2.8 Potential sensitive receptors were identified with regards to the construction and decommissioning of the Proposed Development based on a review of aerial photography, construction and decommissioning phasing plans and OS mapping, and considered the following guidance, including:

- Institute of Air Quality Management (IAQM) (2014) Guidance on the Assessment of Dust from Demolition and Construction[292]; and
- Defra (2018) Local Air Quality Management Technical Guidance (TG16)[293].

17.2.9 Owing to the nature and scale of construction that will occur, and the number of plant vehicles required detailed in **Table 9-1** below, plant emissions during the construction and decommissioning phases are anticipated to make up a small source of emissions relative to ambient local conditions in the Site's surrounding area. However, based on advice provided in the IAQM Guidance (2014)[292], mitigation measures for plant and motorised equipment will be recommend and incorporated into the oCEMP.

17.2.10 The anticipated number of vehicles that will be in operation during the construction and decommissioning phases of the Proposed Development has been considered in the context of the guidance published by Environmental Protection UK (EPUK) / IAQM (2017), IAQM (2014) and EPUK (2010). The latter sets out the criteria to establish the need for an air quality assessment for the construction phase of a development as being *"Large, long-term construction sites that would generate large HGV flows (>200 movements per day) over a period of a year or more."*

17.2.11 An initial assessment of traffic movements has been undertaken on the basis of the Applicants previous solar farm applications, with traffic flows increased to reflect the proposed capacity of the Site and accounting for the size of the Site. **Table 9-1** assumes an 18 month construction period and sets out the anticipated traffic flows associated with the construction of the Proposed Development.

293 Defra (2018) Local Air Quality Management Technical guidance (TG16). Available at: https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf [Accessed December 2024].

Table 17-1 Anticipated Traffic Flows (18 Month Construction Period)

Activity	Type of Vehicle	Total Traffic Flows
Solar Modules & Mounting Structures	16.5m Articulated	902 (1,804 two-way movements)
Inverters	10m Rigid	79 (158 two-way movements)
DNO Cabinet	12m Rigid	8 (16 two-way movements)
Customer Switchgear	10m Rigid	8 (16 two-way movements)
Access Tracks - Temporary Ground Reinforcement	10m Rigid / Tipper Truck	526 (1,052 two-way movements)
Storage Compound	10m Rigid	8 (16 two-way movements)
Other (Cabling, Construction Material, Waste)	12m Rigid	353 (706 two-way movements)
General Front End	JCB by Low Loader	8 (16 two-way movements)
Crane Delivery	Low Loader	1 (2 two-way movements)
Total Deliveries		**1,893 (average of 8/day)**

17.2.12 It is therefore anticipated that significant air quality impacts are not predicted during the construction of the Proposed Development associated with the traffic movements as set out by the IAQM Guidance (2014)[292] which identifies sites predicting >200 movements per day as requiring further assessment.

17.2.13 Human receptors that would be sensitive to dust soiling and changes in air quality have been identified within the immediate area of the Scoping Red Line Boundary. These include the villages of Redwick, Whitson and Summerleaze, as well as singular rural properties. Whilst sensitive ecological receptors are located within the Site, which include the Caldicot Levels SSSI and Severn Estuary SPA and Ramsar. It should be noted that an assessment of construction effects in relation to the designated sites will be undertaken, as set out in **Chapter 9: Ecology.**

17.2.14 The potential sources of dust emissions associated with the construction of the Proposed Development include earthworks, which are anticipated to be minimal, construction activities, including the proposed substation, installation of cables and upgrading and construction of internal access tracks.

Mitigation

17.2.15 Based on the initial review of potential sources of dust, through good site practice and the implementation of suitable mitigation measures, the effect of dust would be significantly reduced and therefore, significant effects are not likely. The Proposed Developments construction and decommissioning phases will be subject to air quality mitigation measures associated with dust control which will be incorporated into the oCEMP which are included within the commitments register. Therefore, a separate ES chapter covering air quality is not considered necessary and is scoped out of the ES.

17.3 Land Quality

17.3.1 This Section will consider the effects on land-use that has the potential to arise as a result of the construction and operation of the Proposed Development.

17.3.2 An Agricultural Land Classification (ALC) survey of the Site will be undertaken and will refer to the Ministry of Agriculture, Fisheries and Food guidelines[294]. It should be noted that the Proposed Development will result in a change to the dominant land-use across the Site, which is predominantly used for grazing pasture and arable use, to that of energy generation using solar PVs.

17.3.3 The physical effects of the Proposed Development on existing land-use patterns will be considered within **Chapter 11: Ground Conditions** of the ES which will include an assessment of the sensitivity of land-use receptors, with reference to the ALC survey results and the subsequent status of the land as not best and most versatile (BMV) agricultural land. Therefore, identifying any potential significant adverse effects as a result of changes to land quality associated with the Proposed Development.

294 Agricultural Land Classification of England and Wales: Revised criteria for grading the quality of agricultural land (ALC011) (1998) Online, available at https://publications.naturalengland.org.uk/publication/6257050620264448 [Accessed December 2024].

17.3.4 Therefore, Land Quality will not be included within the assessment as a separate ES Chapter and will form part of **Chapter 11: Ground Conditions** where necessary.

17.4 Major Accidents or Disasters

17.4.1 Paragraph (8) of Schedule 4 of the EIA Regulations[289] and EU Directive 2014/52/EU[295] require that the ES should include a description of the expected significant effects deriving from the vulnerability of the Proposal to risks of major accidents and/or disasters which are relevant to the Proposed Development.

17.4.2 The scope for the EIA to consider major accidents and disasters is initially considered in **Table 17-2 below**. Major accidents or disasters have been scoped in where they represent a risk to the Proposed Development, either from the proposed location or from the project itself. A high risk is considered to be where there is reasonable likelihood of the accident or disaster occurring, or where the effect of the accident or disaster will lead to the requirement for mitigation which is beyond the usual scope of construction or operational activities. Where an accident or disaster has been scoped in, the ES chapter(s) identified will consider the matter in more detail. This further detail may show that no further assessment is needed, or it may lead onto an appropriate level of assessment and/or identification of appropriate mitigation.

295 EU Directive 2024/52/EU (2014), [Online], available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&rid=1 [Accessed December 2024].

Table 17-2 Major Accidents and Disasters

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Biological hazards: epidemics	Very low	Very low	Out	The probability of epidemics which will affect the construction, operation or decommissioning of the Proposed Development is considered to be very low.	N/A
Biological hazards animal and insect infestation	Very low	Very low	Out	The probability of animal and insect infestations which will affect the construction, operation or decommissioning of the Proposed Development is considered to be very low.	N/A
Earthquakes	No	No	Out	Any earthquakes in the vicinity of the Proposed Development will be of a very small magnitude and the design of panel foundations etc. is adequate to withstand such low magnitude events.	N/A
Tsunamis / tidal waves / storm surges	Negligible	Low	In – storm surges could damage the panels	The Proposed Development proximity to the coast means there is the potential for storm surges to affect the panels.	Chapter 11: Flood Risk and Water Environment

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Famine / food Insecurity	Negligible	Very low	Out	The probability of famine / food insecurity which will affect the construction, operation or decommissioning of the Proposed Development is considered to be negligible as the siting of the development is outside of BMV. However, there have been examples of solar schemes impacting food security as they are often sited on agricultural land.	N/A
Displaced populations	Negligible	Very low	Out	The probability of displaced populations affecting the construction, operation or decommissioning of the Proposed Development is considered to be negligible. However, there have been examples of solar schemes impacting food security as they are often sited on agricultural land.	N/A
Landslide / subsidence	Negligible	No	Out	The Site of the Proposed Development is located within the Severn Estuary, however the probability of landslides and subsidence affecting the construction, operation or decommissioning of the Proposed Development is considered to be negligeable.	N/A

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Severe weather: storms	Medium	No	In – severe weather could cause damage to the panels.	The operation of the Proposed Development could be affected by severe weather events.	Chapter 15: Climate Change Resilience
Severe weather: droughts	Negligible	No	Out	The probability of severe drought occurring in the vicinity of the Proposed Development is considered to be very low. Additionally, panels will be unaffected by drought conditions.	N/A
Severe weather: extreme temperatures	Low	Very Low	In – severe cold weather could lead to ice or snow build-up on panels.	Ice and snow build up could decrease PV efficiency.	Chapter 15: Climate Change Resilience
Floods	Medium	Medium	In – a flood risk assessment will be undertaken as part of the EIA	The Proposed Development could increase the potential of flooding. Furthermore, damage to panels or infrastructure from flooding, or increase in flood risk elsewhere from development in flood zone. The extensive reen network across the Site could lead to increased risk of flooding.	Chapter 11: Flood Risk and Water Environment

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Terrorist incidents	No	No	Out	The probability of terrorist incidents which will affect the construction, operation or decommissioning of the Proposed Development is considered to be very low.	N/A
Cyber attacks	No	No	Out	The probability of a cyber-attack which will affect the construction, operation or decommissioning of the Proposed Development is considered to be very low.	N/A
Disruptive industrial action	No	No	Out	The probability of disruptive industrial action which will affect the construction, operation or decommissioning of the Proposed Development is considered to be very low.	N/A
Public disorder	No	No	Out	The probability of public disorder affecting the construction, operation or decommissioning of the Proposed Development is considered to be negligible.	N/A
Wildfires and Urban Fires	No	No	Out	The probability of wildfires and urban fires affecting the construction, operation or decommissioning of the Proposed Development is considered to be negligible.	N/A

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Severe space weather	No	No	Out	The probability of severe space weather[296] affecting the operation or decommissioning of the Proposed Development is considered to be negligible.	N/A
Poor air quality events	No	No	Out	Abnormal loads or an increase in traffic could lead to an increased risk of air pollution during the construction and decommissioning phases. The road network may not be suitable for the increased levels of traffic; however, this is considered a temporary is and therefore negligible.	N/A
Transport accidents	No	Yes	In – abnormal loads and increase in traffic from construction.	Abnormal loads or an increase in traffic could lead to an increased risk of accidents during the construction and decommissioning phases. The road network may not be suitable for the increased levels of traffic, further increased the risk of an accident.	**Chapter 13: Traffic and Transport**

296 Space weather describes changing environmental conditions in near-Earth space. Magnetic fields, radiation, particles and matter, which have been ejected from the Sun, can interact with the Earth's upper atmosphere and surrounding magnetic field to produce a variety of effects.

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Industrial accidents	No	Yes	In – potential from construction and maintenance activities.	Manual labour, working at height and use of specialist plant all bring risk of industrial accidents during the construction and decommissioning phases. Relevant UK health and safety legislation will be adhered to; Site construction management practices will include, but are not limited to, temporary diversions of public rights of way, relevant signage and fencing of potentially hazardous construction areas where appropriate.	Construction activities are covered by separate H&S legislation and guidelines. Solar Farm Site selection and design, Chapter 11: Water Environment and Chapter 9: Ecology.

17.5 Human Health and Population

17.5.1 The Proposed Development will be designed to minimise any risk to human health resulting from its operation. Additionally, all related infrastructure and equipment will be maintained to ensure no risk to human health arises as a result of the operation of the Proposed Development. The Proposed Development will be constructed in accordance with the relevant best practice guidelines and will be subject to routine monitoring, maintenance and servicing by staff during its operation.

17.5.2 The relevant interactions with human health during the construction, operation and decommissioning of the Proposed Development will be considered within the following environmental topic assessments of the ES:

- Visual Amenity (see **Chapter 5** of this EIA Scoping Report).
- Ground Conditions (see **Chapter 11** of this EIA Scoping Report);
- Traffic and Transport (see **Chapter 12** of this EIA Scoping Report);
- Noise and Vibration (see **Chapter 13** of this EIA Scoping Report); and
- Air Quality (See **Section 17.1** of **Chapter 17** of this EIA Scoping Report).

17.5.3 The elements which have been scoped in and scoped out of the assessment and are relevant to Human Health and Population are set out **in Table 17-3**.

17.5.4 As interactions with human health will be considered elsewhere within individual topics of the ES highlighted above, it is not considered necessary to provide a separate Chapter in the ES relating to Human Health.

Electromagnetic Fields

17.5.5 With specific regard to Electromagnetic Fields (EMF), Power frequency electric, magnetic and EMFs arise from generation, transmission, distribution and use of electricity and occur around power lines and electric cables and around domestic, office or industrial equipment that uses electricity. Electric fields are the result of voltages applied to electrical conductors and equipment. Magnetic fields are produced by the flow of electric current however, there is the potential for such fields to be blocked by hard infrastructure and planting such as fences, shrubs and buildings can block electric fields. It should be noted that most materials do not readily block magnetic fields. The intensity of both electric and magnetic fields diminishes with increasing distances from the source.

17.5.6 The planning system does not have a statutory provision relating to the production of EMFs. The Power Lines: Demonstrating compliance with EMF public exposure guidelines' published by DECC in 2012 includes guidelines for both public and occupational exposure published by the International Commission on Non – Ionizing Radiation Protection (ICNIRP) in 1998. As such, DECC guidance states that *"overhead power lines at voltages up to and including 132 kV, underground cables at voltages up to and including 132 kV and substations at and beyond the publicly accessible perimeter"* are not capable of exceeding the ICNIRP exposure guidelines and therefore no assessment is required for these and other types of infrastructure listed on the Energy Networks Association website. Therefore, the scope of the assessment of the EMA in relation to the EIA will be limited to cables associated with the Proposed Development that exceed 132kV.

Table 17-3 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Landscape elements within the Study Area.	*Construction*	✔		Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**
Visual Receptors within the Study Area: nearby settlements (residents); transport routes (primarily minor roads); recreational routes (including PRoW, Wales Coast Path, Sustrans Cycle Route 4); and recreational and tourist destinations.		✔		Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**
Landscape elements within the Study Area.	*Operation*	✔		Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**
Visual Receptors within the Study Area: nearby settlements (residents); transport routes (primarily minor roads); recreational routes (including	*Operation*	✔		Please refer to **Chapter 5: Landscape and Visual**

Element	Phase	Scoped In	Scoped Out	Justification
PRoW, Wales Coast Path, Sustrans Cycle Route 4); and recreational and tourist destinations.				**Impacts Assessment**
Visual Receptors within the Study Area: nearby settlements (residents); transport routes (primarily minor roads); recreational routes (including PRoW, Wales Coast Path, Sustrans Cycle Route 4); and recreational and tourist destinations.	*Decommissioning*	✔		Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**
Receptors outwith the ZTV	*Construction, Operation and Decommissioning*		✔	Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**
Indirect effects upon National Landscape Character Areas (NLCAs)	*Construction, Operation and Decommissioning*		✔	Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**
Indirect effects upon landscape and visual receptors beyond 5km	*Construction, Operation and Decommissioning*		✔	Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**
Cumulative effects beyond 5km	*Construction, Operation and Decommissioning*		✔	Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**
Individual Residential Properties beyond 1 km	*Construction, Operation and Decommissioning*		✔	Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**

Element	Phase	Scoped In	Scoped Out	Justification
Indirect effects on Seascape Character	*Construction, Operation and Decommissioning*		✔	Please refer to **Chapter 5: Landscape and Visual Impacts Assessment**
Effects on soils	Construction, Operation and Decommissioning	✔		Please refer to **Chapter 11: Ground Conditions**
Effects on agricultural land (agricultural as land national / regional / local resource)	Construction, Operation and Decommissioning	✔		Please refer to **Chapter 11: Ground Conditions**
Effects on land contamination	Construction, Operation and Decommissioning	✔		Please refer to **Chapter 11: Ground Conditions**
Effects on geology (geodiversity)	Construction and Operation		✔	Please refer to **Chapter 11: Ground Conditions**
Effects on geology (ground stability)	Construction and Operation		✔	Please refer to **Chapter 11: Ground Conditions**
Effects on mineral resources	Construction and Operation		✔	Please refer to **Chapter 11: Ground Conditions**
Highway Network and receptors	Construction and Decommissioning	✔		Please refer to **Chapter 12: Traffic and Transport**
Highway Network and receptors	Operation		✔	Please refer to **Chapter 12: Traffic and Transport**

Element	Phase	Scoped In	Scoped Out	Justification
Active Travel Links	Construction, Operation and Decommissioning	✔		Please refer to **Chapter 12: Traffic and Transport**
Construction activity noise	Construction and Decommissioning	✔		Please refer to **Chapter 13: Noise and Vibration**
Construction activity vibration	Construction and Decommissioning	✔		Please refer to **Chapter 13: Noise and Vibration**
Construction road traffic noise	Construction and Decommissioning	✔		Please refer to **Chapter 13: Noise and Vibration**
Construction road traffic groundborne vibration	Construction and Decommissioning		✔	Please refer to **Chapter 13: Noise and Vibration**
Operational noise	Operation	✔		Please refer to **Chapter 13: Noise and Vibration**
Operational vibration	Operation		✔	Please refer to **Chapter 13: Noise and Vibration**

17.6 Telecommunications, Television Reception and Utilities

17.6.1 Owing to the nature of the Proposed Development, there is the potential of affecting utility infrastructure located below ground level through the installation of cabling and other infrastructure, however due to the nature of the Proposed Development there is a limited ability to affect above ground telecommunications.

17.6.2 In order to identify existing infrastructure constraints, a detailed desk-based assessment was undertaken to inform **Chapter 2: Description of the Nature and the Purpose of the Project** and **Figure 2-1** as well as identify any existing infrastructure constraints. Consultation with relevant telecommunication and utility providers will be undertaken and will include stakeholders from water, gas and electricity utility providers and telecommunications providers. The information obtained from the desk-based assessment and consultation will be used to inform the siting and design of the Proposed Development along with appropriate mitigation measures to ensure the protection of existing infrastructure which has the potential to be affected by the Proposed Development.

17.6.3 As detailed above, relevant measures will be incorporated into the Proposed Developments design, it is therefore considered that significant impacts are not expected during either construction, operation or decommissioning of the Proposed Development and that a separate ES chapter relating to telecommunications, television reception and utilities is not considered necessary and is therefore scoped out of the ES.

17.7 Waste

17.7.1 The description of development chapter of the ES (Chapter 2) will provide a description of the potential streams of construction waste and the estimated volumes of waste produced. Furthermore, the oCEMP will set out how waste will be managed on-site, and how opportunities for recycling will be explored.

17.7.2 All the electrical infrastructure such as PV modules, racks, inverters, transformers and other supporting infrastructure will be manufactured offsite and delivered to the Site ready for installation and therefore construction and assembly waste is expected to be minimal.

17.7.3 Moreover, significant material is not expected to be removed from the Site during the construction phase owing to the lack of demolition, and relatively little waste associated with solar PV farms, except for general waste associated with office/administrative activities.

17.7.4 Large scale earth works are not anticipated as result of the construction, operation or decommissioning of the Proposed Development. If soil contamination is found, this may require the removal of soils from Site for treatment or disposal, as it is not practical to treat this on-site. However, where possible, soil arisings will be balanced through a cut and fill exercise to retain volumes on Site.

17.7.5 An Excavated Materials Management Plan will be included within the oCEMP which will include details of how excavated materials will be managed, how waste will be managed in accordance with the waste hierarchy, good practice measures for managing waste in construction and the roles and responsibilities of the construction contractor.

17.7.6 With regards to the operational phase, an analysis of the main waste streams will be provided. Relatively little waste is expected to be generated by the operation of the Proposed Development owing to the nature of the development.

17.7.7 During decommissioning, site infrastructure will be removed and recycled, or it will be disposed of in accordance with good practice, as detailed in **Section 2.8** of **Chapter 2: Description of the Nature and the Purpose of the Project**.

17.7.8 Although anticipated waste quantities are not yet known it is considered that significant waste impacts are not expected during either construction, operation or decommissioning of the Proposed Development as set out above and that a separate ES chapter covering waste is not considered necessary.

17.8 Assessment of Heat and Radiation

17.8.1 Paragraph 5(c) Schedule 4 of the EIA Regulations[297] requires “a description of the likely significant effects of the development on the environment resulting from... the emission of heat and radiation”.

17.8.2 Due to the nature and extent of the Proposed Development and given the processes and measures that are in place as part of the Proposed Development, no relevant pathway or receptors have been identified that could lead to significant effects from temperature. Effects related to heat and radiation are not considered to be significant and it is therefore proposed that this topic be scoped out of the EIA. No significant sources of radiation are anticipated and as such it is proposed to scope this topic out of the ES.

17.8.3 The effects of heatwaves, extreme weather and other external hazards will be considered within **Chapter 14: Climate Change Resilience**.

297 The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017), [Online], available at: https://www.legislation.gov.uk/uksi/2017/572#:~:text=10.,provided%20in%20the%20environmental%20statement [Accessed December 2024].

18.0 Cumulative Effects

18.1 Introduction

18.1.1 This Chapter explores the potential for cumulative effects as a result of the Proposed Development. Schedule 4 of the EIA Regulations[298] requires the consideration of the potential impact of inter-relationships and cumulative effects of 'existing and/or approved development' with the Proposed Development.

18.1.2 The Cumulative Effects Assessment (CEA) was developed based on the methodology outlined in **Chapter 4: The Environmental Impact Assessment Methodology**, in accordance with the EIA Regulations[299] and PINS NSIP: Advice on Cumulative Effects Assessment Guidance[299].

18.1.3 A CEA is being carried out which examines the result of the combined impacts from the Proposed Development with other developments on the same single receptor or resource. The CEA also considers the interaction of environmental aspect effects occurring, as a result of the Proposed Development.

18.1.4 In line with the recently updated guidance, a long list of developments has been prepared and represents Stage 1 of the CEA. As such, the list of cumulative projects considered in the inter-relationship effects are presented within **Section 18.2**.

18.1.5 In order to ensure a collaborative approach to the CEA, this Chapter contains a request for the respective GIS layers for the projects to be provided by the Local Planning Authorities.

298 The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017), [Online], available at: https://www.legislation.gov.uk/uksi/2017/572#:~:text=10.,provided%20in%20the%20environmental%20statement [Accessed December 2024].

299 Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. (Online). Available at: Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment - GOV.UK [Accessed: December 2024].

18.2 Stage 1: Longlisted Other Developments

18.2.1 **Table 18-** lists the ‘other0 developments’ identified for inclusion in the Cumulative Effects Assessment.

Table 18-1 Longlisted Other Developments

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
1	Newport City Council	23/1109	Proposed Residential Development Of 20 Apartments, Landscape Planting And Associated Works	Land To South And West Of Cul De Sac At Marryat Walk Newport South Wales	Approved - 01/05/2024	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=S5ASFSLCJ0N00&activeTab=summary	1
2	Newport City Council	23/0989	Proposed Ground Mounted Solar Development And Associated Works	Land South Of Docks Way Disposal Site Docks Way Newport South Wales	Approved - 07/08/2024	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=S3EKXSLCIRT00&activeTab=summary	1
3	Newport City Council	23/0949	Battery Energy Storage System With Associated Infrastructure And Works	Land At Uskmouth Power Station West Nash Road Nash Newport South Wales	Approved - 11/01/2024	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=S2SA6GLCFKE00&activeTab=summary	1
4	Newport City Council	23/0878	Proposed Electricity Substation Compound (132/33/11KV), Including A Switch-	Land To The South And East Of Celtic Way Celtic Lakes Newport South Wales	Approved - 07/02/2024	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=S1R8TGLCHHA00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Room Building And Outdoor Electrical Equipment, Enclosed By A Security Fence, With Associated Infrastructure Including Access, Landscaping, Drainage And Earthworks				
5	Newport City Council	23/0858	Provision Of An Underground Electricity Transmission Circuit	Celtic Technology Centre Celtic Way Celtic Lakes Newport NP10 8BE	Approved - 06/12/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=S1E4KHLCN3600&activeTab=summary	1
6	Newport City Council	23/0752	Redevelopment works which include upgrading 11no. Existing pitches to serviced pitches, upgrade of motor van waste point and service points. Extension to toilet block to provide compliant accessible shower	Tredegar House, Caravan Club Site Pencarn Way Duffryn Newport NP10 8TW	Approved - 07/02/2024	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RZYFHALCM5600&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			room and associated works including respacing of pitches to provide fire separation and siting of static caravan to provide on-site manager accommodation				
7	Newport City Council	23/0639	Conversion of existing buildings, raising height of roof of existing building and insertion of new dormers and construction of part 3 storey extension and part 1.5 storey extension to the rear to create 13no. Residential units (resubmission of 20/0996)	58 Stow Hill Newport NP20 1JG	Approved - 13/11/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RYCV7NLCKKL00&activeTab=summary	1
8	Newport City Council	23/0477	Proposed Class B1(C)/B2/B8 Development (Phase 1) Together With Associated	Orb Works Stephenson Street Newport South Wales NP19 0RB	Approved - 10/04/2024	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RW58KNLCMM300&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Demolition/Elevational Treatment, Parking, Landscaping, Drainage, Ecological Enhancement And Provision Of Improved Pedestrian/Cyclist Facilities				
9	Newport City Council	23/0327	Construction Of A 3-Storey New Teaching Block Incorporating Junior Teaching Accommodation, Ancillary Facilities, And Inclusion Zone, And Landscape Reconfiguration	St Andrews Primary School Jenkins Street Newport NP19 0GR	Approved - 07/07/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RTGXVULCLJJ00&activeTab=summary	1
10	Newport City Council	23/0163	Residential Development Of 43 Units	Newport Export Packing Queens Hill Newport South Wales NP20 5HJ	Approved - 05/09/2024	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RQY4H0LCM0D00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
11	Newport City Council	23/0091	Demolition of existing retail park (class A1) and erection of 1 no. Retail unit (class A1) with associated access and serving arrangements and car parking	Newport West Retail Park Docks Way Newport South Wales NP20 2NZ	Approved - 05/10/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RPGKS2LCLJN00&activeTab=summary	1
12	Newport City Council	22/1033	Demolition of existing buildings and the construction of 30 no. Apartments along with associated parking and external areas (amended plans received)	Gwent Car Sales Crawford Street Newport NP19 7AY	Approved - 03/07/2024	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RKCMFJLCGP200&activeTab=summary	1
13	Newport City Council	22/0823	Installation Of A 230 MW Battery Energy Storage System (BESS)	Uskmouth Power Station West Nash Road Nash Newport South Wales NP18 2BZ	Approved - 07/12/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RH5T2LLCK9200&activeTab=summary	1
14	Newport City Council	22/0756	Demolition of public house and construction of 12no. Affordable apartments and	The Ferns Club 57 Liswerry Road Newport NP19 4LG	Approved - 16/03/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RG3JC7LCLWV00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			8no. Affordable houses together with associated car parking and amenity areas				
15	Newport City Council	22/0576	Construction of 10 no. Residential apartments and associated works	9 Gold Tops Newport NP20 4PH	Approved - 05/04/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RDNVRGLCG0300&activeTab=summary	1
16	Newport City Council	22/0551	Erection of porsche centre, 1no. Satellite showroom, 1no. Satellite service centre (SUI generis Use) and Associated Works	Land On The North Side Of Lakeside Drive Coedkernew Newport South Wales	Approved - 02/11/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RD9OP2LCLAQ00&activeTab=summary	1
17	Newport City Council	22/0526	Retention and completion of 12 no. Residential apartments (use class C3), with solar panels, associated access, parking and landscaping (resubmission following refusal of application 21/1038)	Car Park Hill Street Newport South Wales	Approved - 09/09/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RD24GMLCJWN00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
18	Newport City Council	22/0438	Erection Of A Class A1 Foodstore With Associated Access, Car Parking And Landscaping	R J Mason Transport Ltd Albany Street Newport South Wales NP20 5NJ	Approved - 17/03/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RBD60CLCHQ600&activeTab=summary	1
19	Newport City Council	22/0350	Change Of Use Of Land To Personal Equestrian Use And Siting Of A Timber Clad Storage Container With Timber Frame Shelter	Land North Of Oaklands Gilvach Lane Llanvaches Newport South Wales	Approved - 11/07/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=R9WP2LLCGY300	1
20	Newport City Council	22/0067	Construction Of Additional Stores Unit And Open Fronted Wash Down Area Together With Portacabin Offices And Other Associated Development	Land West Of Tom Lewis Way Alexandra Docks Newport South Wales	Approved - 10/02/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=R60F45LCHNS00&activeTab=summary	1
21	Newport City Council	21/1134	Development Of 18 Residential Dwellings Along With Associated Parking And Landscaping	Land North Of 51 Orb Drive Newport South Wales	Approved - 20/12/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=R21ZDALCGGP00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
22	Newport City Council	21/1106	demolition of the rear portion of the existing building and later extensions, retention of the listed façade onto stow hill to enable the construction of two buildings (A & B) comprising 37 no. residential apartments, with associated access, parking and landscaping	40 Stow Hill Newport South Wales NP20 1JG	Approved - 18/01/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=R1OMQULCLX400&activeTab=summary	1
23	Newport City Council	21/1084	Demolition Of Existing Structures, Proposed New Teaching Block And Associated Works Including New Car Parking And Drop-Off Arrangements, Flood Lighting To Sports Pitch, Sustainable Drainage, Land Reprofiling And Landscaping	Bassaleg School Forge Road Bassaleg Newport South Wales NP10 8NF	Approved - 03/02/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=R1BWJBLCK6A00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Affecting Public Right Of Way 393/112				
24	Newport City Council	21/1088	Demolition Of The Existing Building And Construction Of 18 Affordable Apartments With Associated Parking And Amenity Areas	Victoria Inn 2 Nash Road Newport South Wales NP19 4NG	Approved - 30/06/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=R1DDDDLC0HZ00&activeTab=summary	1
25	Newport City Council	21/0988	Construction Of A Three Storey Manufacturing And Research And Development Facility And Administration Office, External Plant, Storage And Gas Storage Compound, Car Parking, Sustainable Drainage, Hard And Soft Landscaping, Attenuation Basin And Associated Works.	Plot 1 And Plot 5 Imperial Way Celtic Way Newport NP10 8BE	Approved - 21/07/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QZW65PLCLDR00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
26	Newport City Council	21/0983	Proposed development of 122no. Dwellings, two commercial units (a1 and a3 use classes) and associated works including landscaping, sustainable drainage, car and cycle parking	Car Park Adjacent Endeavour House Usk Way Newport South Wales	Approved - 01/12/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QZVS6ILCLC500&activeTab=summary	1
27	Newport City Council	21/0893	Construction Of A New Leisure Centre (D2) And Community Health And Wellbeing Centre (D1), Including A Swimming Pool Hall	Land To South East Of University Of Wales Newport City Campus Usk Way Newport South Wales	Approved - 08/11/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QYAKBULCJBL00&activeTab=summary	1
28	Newport City Council	21/0718	Construction of the stephenson flood defence scheme, incorporating the construction of 6no. Flood walls (concrete and sheet pile) refurbished	Land South Of Coronation Park Known As Flood Defence Scheme Stephenson Street Newport South Wales	Approved - 04/11/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QVTAENLCICK00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			embankments and paths including the wales coastal path, a highway flood gate, a new 0.7km road, localised ground raising and culvert enhancements to reduce the chance of tidal flood risk from the river usk and landscaping works along the route and at coronation park, newport affecting public rights of way 386/5/1, 401/4/1 and 386/4/1				
29	Newport City Council	21/0360	Proposed New Sports Facilities Including Two All Weather Third Generation (3G) Pitches, Improved Grass Rugby Pitch And Multi Use Games Area,	Bassaleg School Forge Road Bassaleg Newport South Wales NP10 8NF	Approved - 09/07/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QQQF6ILCFNZ00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Sustainable Drainage, Landscaping And Other Associated Works				
30	Newport City Council	21/0346	Proposed Solar Development, New Access And Associated Works	Land To West Of Docks Way Disposal Site Docks Way Newport South Wales	Approved - 01/12/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QQIMK1LCLZP00&activeTab=summary	1
31	Newport City Council	21/0344	Proposed Change Of Use From B2 (General Industrial) And B8 (Storage and Distribution) Use Class With Ancillary B1 (Business) Use To Flexible Use B1 (Business), B2 (General Industrial) And B8 (Storage) To Allow The Subdivision Of The Building To Create 5 New Units And Associated Works	Quinn Radiators Celtic Way Celtic Lakes Newport South Wales NP10 8FS	Approved - 08/07/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QQHH1ALCLQ500&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
32	Newport City Council	21/0207	Retention of 1no. Storage/workshop building ancillary to existing use, 3no. Cabins for retail use and extension of existing hardstanding	Garden Centre Sunnyside Nurseries Chepstow Road Newport South Wales NP18 2JN	Part Granted/ Part Refused - 08/07/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QP3093LCIU500&activeTab=summary	1
33	Newport City Council	20/1176	Erection Of Two Storey Data Centre Buildings Comprising B8 Use And Ancillary B1C Use, Provision Of Emergency Generators, Roof Mounted Air Handling Units, Security Cabin And Vehicle Airlock, Fencing And CCTV, Lighting, Hard And Soft Landscaping, Car Parking And Sustainable Drainage	Land South Of Unit 3 The Courtyard Imperial Park Coedkernew Newport South Wales	Approved - 03/03/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QL10Q8LCM0700&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
34	Newport City Council	20/1138	Proposed construction of 54no. Residential units, access, stopping up of highway, engineering operations, landscaping, drainage and associated works	Land To The East And Adjacent To Telford Street Depot Telford Street Newport South Wales	Approved - 01/12/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QKD3N5LCH6100&activeTab=summary	1
35	Newport City Council	20/0686	93 Western Avenue To 26 Wells Close Shared Use Travel Route (3m Wide) From Bassaleg Road Through Gaer Park Ending At Wells Close Following Existing Unmade Footpath New Crossing Points At Western Avenue and On Bassaleg Road	Land West Of Tredegar Camp Bassaleg Road Newport South Wales	Approved - 21/01/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QE86L3LCJXY00&activeTab=summary	1
36	Newport City Council	20/0478	Demolition of existing office building and	Mill Heath Nursing Home Parret Road	Granted on appeal -	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?a	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			garage/laundry rooms. Construction of new 30no. Bedroom, two storey care home with associated facilities and new single storey office and laundry building.	Bettws Newport NP20 7DQ	06/09/2022	ctiveTab=summary&keyVal=QB3G9GLCLHT00	
37	Newport City Council	20/0321	Demolition Of Teaching Block One And Care Takers Accommodation, Construction Of Teaching Block Six And Sports Hall, Access, Sports Pitches And Associated Works	Ysgol Gyfun Gwent Is Coed Duffryn Way Duffryn Newport South Wales NP10 8BX	Approved - 28/07/2020	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=Q9LSFDLC0HZ00&activeTab=summary	1
38	Newport City Council	20/0237	Construction Of Plasterboard Manufacturing Facility, Associated Development, Create New Accesses Off Tom Lewis Way And	15 Tom Lewis Way Alexandra Docks Newport NP20 2WF	Approved - 05/06/2020	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYY9LCPM592&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Provide Ecological Enhancement Areas				
39	Newport City Council	20/0039	Erection of 4no. Three-storey data centre buildings comprising b8 use and ancillary b1 use, provision of emergency generators, security lodge, hard and soft Landscaping, Internal Access Roads, Car Parking And Sustainable Drainage	Land East Of Celtic Technology Centres Celtic Way Celtic Lakes Newport South Wales	Approved - 10/09/2020	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYY9LCPM809&activeTab=summary	1
40	Newport City Council	19/1312	Change Of Use Of Warehouse (Use Class B2/B8) To A Film Studio (Use Class B1) With Ability To Revert Back To B2/B8 Upon Cessation Of B1 Use	Atlas Elektronik UK Ltd Meadows Road Newport NP19 4SS	Approved - 01/04/2020	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYY9LCPM854&activeTab=summary	1
41	Newport City Council	19/1228	Proposed Mixed Use Development At 133-135	Land Encompassing 133 To 135	Approved -	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?k	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Commercial Street, Partial Demolition Of Ground, First And Second Floor; Retention And Extension Of Existing Ground Floor Units; Conversion Of Remaining Retained Floorspace For Residential Use; Erection Of Rear Extension For Residential Use; And General Refurbishment	Commercial Street Newport	05/06/2020	eyVal=ZZZYY9LCPM930&activeTab=summary	
42	Newport City Council	19/0843	Demolition of existing older persons accommodation block (currently 39no. Bedsits) to provide 47no. Older persons flats, staff room, communal lounge, reception area, car parking,	Tredegar Court Marion Street Newport NP20 2HB	Approved - 07/02/2020	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYALCPM331&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			landscaping and associated works				
43	Newport City Council	19/0768	Demolition Of Existing Vacant Properties, Proposed Residential Development Of 35 Units And Associated Works	Land Encompassing Long Meadow Court Newport South Wales	Approved - 15/01/2020	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYALCPM436&activeTab=summary	1
44	Newport City Council	19/0703	Demolition Of Existing Industrial Units And Construction Of New Industrial Units For B2 (General Industrial) Use	Storage Land The Newport Business Centre Corporation Road Newport NP19 4RF	Approved - 06/02/2020	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYALCPM497&activeTab=summary	1
45	Newport City Council	19/0111	Demolition Of Buildings And Erection Of Class A1 Foodstore With Associated Access, Car Parking And Landscaping	R J Mason Transport Ltd Albany Street Newport NP20 5NJ	Approved - 28/02/2020	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYBLCPM117&activeTab=summary	1
46	Newport City Council	19/0040	Change Of Use Of Part Of Disused Quarry To Holiday Park, Including The	Former Penrhos Quarry Usk Road Caerleon Newport	Approved - 17/12/2019	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?k	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Siting Of Holiday Lodges And Pods With Improved Access, Parking Facilities And Maintenance Building			eyVal=ZZZYYBLCPM198&activeTab=summary	
47	Newport City Council	18/1233	Redevelopment of site and construction of new building to provide 17no. Affordable apartments and associated works	Land To North Of And Adjacent To 57A Lower Dock Street Newport	Approved - 11/11/2019	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYBLCPM254&activeTab=summary	1
48	Newport City Council	18/1231	Construction of three to four storey building comprising 45no. Older persons apartments, community building (d2 use), car parking and associated works	Land South Of 24 To 32 Treberth Crescent Newport	Approved - 15/11/2019	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYBLCPM257&activeTab=summary	1
49	Newport City Council	18/1211	Demolition of apartment building and construction of 12no. Flats and 12no. Houses with	1 Mountbatten Close Newport NP19 9GU	Approved - 19/09/2019	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYBLCPM276&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			associated external amenities and parking				
50	Newport City Council	18/1217	Change Of Use Of Upper Floor From D2 (Assembly & Leisure) To 18 Apartments (C3) With Associated Communal Facilities	Land Encompassing 11 To 14 Upper Dock Street Newport	Approved - 10/11/2020	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYBLCPM274&activeTab=summary	1
51	Newport City Council	18/0756	Proposed free range egg production unit, 3no. Silos and associated works	Castle Farm Bishton Road Bishton Newport NP18 2DZ	Approved - 05/09/2019	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYBLCPM759&activeTab=summary	1
52	Newport City Council	24/0678	Proposed development of 42 no. Dwellings, landscape planting and associated works	Monbank Development Site Cardiff Road Newport South Wales	Awaiting Decision	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=SI3Z8SLCIXY00&activeTab=summary	1
53	Newport City Council	24/0637	Erection Of 14 Flats With Associated Parking, Cycle And Bin Store	Land And Property Formerly Known As Robert Price Transport Yard Corporation Road Newport NP19 0HE	Awaiting Decision	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=SH2JYXLCGL200&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
54	Newport City Council	24/0548	Proposed Equestrian Centre	Land Adjacent To Llanbedr Court Chepstow Road Newport NP18 2AA	Awaiting Decision	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=SFMUX8LCKMQ00&activeTab=summary	1
55	Newport City Council	23/0996	Land On The West Side Of Celtic Way Celtic Lakes Newport South Wales	Land On The West Side Of Celtic Way Celtic Lakes Newport South Wales	Awaiting Decision	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=S3IA8HLCJAS00&activeTab=summary	1
56	Newport City Council	23/0087	Demolition of 2no. Residential buildings and proposed residential development of up to 40 residential units (flats & dwelling houses) with associated works	Land Encompassing 2 To 24 Evens Penkin Hill Newport South Wales	Awaiting Decision	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RPGCDVLCLIQ00&activeTab=summary	1
57	Newport City Council	23/0085	Demolition of 2no. Existing residential buildings and proposed residential development of up to 31 residential units (flats & dwelling houses)	Land North Of Quilter Close Newport South Wales	Awaiting Decision	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RPESSGLCL7100&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			with associated works				
58	Newport City Council	22/0814	Outline Application For The Demolition And Redevelopment Of The Site For Circa 54,000 Square Metres Of Flexible Floorspace For Educational Use, Or Any Other Use Within Use Classes A1 (Shops), A2 (Financial And Professional Services), A3 (Food And Drink), B1 (Business), C1 (Hotels), D1 (Non-Residential Institutions) And D2 (Assembly And Leisure), With All Matters Reserved	Newport Centre Kingsway Newport NP20 1UH	Approved - 06/10/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RH0BXELCJF800&activeTab=summary	1
59	Newport City Council	21/0661	Outline Application (With All Matters Reserved) For	Land To The West And The South Of Mandrake House Tregwilym Road	Approved - 21/12/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?k	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Residential Development	Rogerstone Newport South Wales		eyVal=QUW171LCK4200&activeTab=summary	
60	Newport City Council	18/1181	Outline planning permission with all matters reserved for demolition of ringland centre, 6no. Bungalows and library and construction of approximately 170no. Homes and 1700 square metres of a1/a2/a3 floorspace, landscaping, internal road network, car parking and associated infrastructure	Ringland Centre Ringland Circle Newport	Approved - 03/10/2019	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYBLCPM307&activeTab=summary	1
61	Newport City Council	18/0973	Outline Application For Mixed Use Development Comprising C2 Residential Institutions And C3 Residential And Drive Thru Coffee	Land And Property Formerly Known As Robert Price Transport Yard Corporation Road Newport	Approved - 18/12/2019	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYYBLCPM521&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Shop (A1/A3) Along With Associated Infrastructure And Facilities				
62	Newport City Council	20/0953	Outline Planning Application (With All Matters Reserved) For The Demolition Of Ringland Health Centre, And The Construction Of Newport East Health Centre,Replacement Multi Use Games Area (Muga) And Associated Works	Ringland Health Centre Ringland Circle Newport NP19 9PS	Approved - 08/03/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QHTL42LCLYY00&activeTab=summary	1
63	Newport City Council	24/0537	Reserved Matters Application For A Primary School, Nursery, Aln Learning Resource Base, Mugas, Diversion Of Existing Prow And Other Associated Works Pursuant To 16/0864 Variation	Site Of Future Primary School Great Milton Park Cot Hill Llanwern Newport South Wales	Awaiting Decision	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=SFFAMRLCJZ000&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Of Conditions 02 (Reserved Matters), 03 (Masterplan) And 05 (Design Code) Of Planning Permission 13/0806 For Variation Of Condition (Time Limits) Of Planning Permission 06/0845 For Residential Development (Up To 1100 Dwellings) And Provision Of Primary School, Village Centre, Public Open Space, Landscaping And Associated Infrastructure Works (Affecting Public Rights Of Way 397/3, 397/7, 397/9 And 397/10 Llanwern)				
64	Newport City Council	24/0301	Reserved Matters Application For Phase 5e(1) Relating To Layout,	Llanwern Works Queensway Llanwern Newport South Wales NP19 4QZ	Awaiting Decision	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?k	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Scale, Access, Appearance And Landscaping Pursuant To Outline Planning Permission 06/0471 For A Mixed Use Urban Extension And Details To Partially Discharge Conditions 1 (Reserved Matters), 5 (Infrastructure Phasing Plan), 6 (Formal And Informal Recreation Areas), 8 (Materials), 9 (Hard Landscaping Materials), 10 (Boundary Treatments), 11 (Management Strategy For Maintenance Of Open Space), 12 (Off Street Parking And Cycle Storage), 15 (Emergency			eyVal=SBH636LCJYM00&activeTab=summary	

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Access), 16 (Highways Details), 17 (Green Travel Strategy), 18 (Highways Surface Water Disposal Details), 19 (Noise Assessment), 22 (Street Lighting), 24 (Site Levels), 33 (Surface Water Drainage), 34 (Drainage), 39 (Carbon Reduction Strategy/Sustainability Assessment) And 43 (Access To Open Water For Firefighting Purposes)				
65	Newport City Council	19/1272	Reserved Matters For Access, Appearance, Landscaping, Layout And Scale Pursuant To Outline Planning Permission 18/1181 For Demolition Of	Ringland Centre Ringland Circle Newport	Part Approved with Conditions and Part R	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYY9LCPM890&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Ringland Centre, 6no. Bungalows And Library And Construction Of Approximately 170no. homes and 1700 square metres of a1/a2/a3 floorspace, landscaping, internal road network, car parking and associated infrastructure and partial discharge of standard plans condition and conditions 07 (fume extraction), 10 (waste storage) and 12 (ecological enhancement)				
66	Newport City Council	22/1082	Reserved matters application relating to landscaping, layout, access, appearance and scale for a new primary school	Land Formerly Known As Whitehead Works Mendalgief Road Newport South Wales	Approved 03/08/2023	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RL4V4WLCL1U00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			pursuant to outline permission 19/0439 for the construction of 529no. Residential units, 24no. Assisted living units, pub/restaurant, retail units, primary school and associated landscape and highway infrastructure on land formerly known as whitehead works, and details to partially discharge conditions 18 (noise Mitigation), 23 (Slab Levels), 24 (Materials And Finishes), 25 (Boundary Treatments), 26 (Hard Landscaping Materials), 27 (Landscaping And Management), 29				

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			(Construction Environmental Management Plan), 31 (Noise Assessment, Plant And Equipment), 32 (Highways Details), 35 (Drainage), 36 (Drainage Management), 37 (Bin Storage), 38 (Garage/Parking Facilities), 39 (Footpaths) And 42 (Floodlighting)				
67	Newport City Council	22/0349	Reserved Matters Application Relating To Access, Appearance, Landscaping, Layout And Scale Pursuant To Outline Planning Permission 92/0875 For Erection Of Detached Industrial Building, Offices And Associated Works (As Varied	Land On The North Side Of Bareland Street Magor Newport South Wales	Approved - 28/11/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=R9VGQILCGP400&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			By 18/1234 For Use Of Building For B1 (Business) And/Or B2 (General Industrial) And Partial Discharge Of Condition 02 (Phasing Programme)				
68	Newport City Council	22/0312	Reserved Matters (Layout, Scale, Appearance, Access And Landscaping) Relating To Outline Permission 21/0661 For The Erection Of 40 Dwellings Together With Associated Works	Land To The West And The South Of Mandrake House Tregwilym Road Rogerstone Newport South Wales	Approved - 11/08/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=R9B66YLCL8G00&activeTab=summary	1
69	Newport City Council	21/1176	Reserved Matters Pursuant To 20/0953 Relating To Layout, Scale, Appearance Of Buildings, Means Of Access (Where Not Already Approved)	Ringland Health Centre Ringland Circle Newport South Wales NP19 9PS	Approved - 04/03/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=R2PIJ6LCL8200&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			And Landscaping For Construction Of Newport East Health Centre, Replacement Multi Use Games Area (Muga) And Associated Works And Partial Discharge Of Conditions 2 (Plans), 3 (Ecological Enhancement Scheme), 4 (Cycle Parking Details), 5 (Enclosure Details), 6 (Cemp), 10 (Tree Information), 12 (Tree And Hedge Protection Plan), 15 (Cross Sections), 16 (Landscape Scheme), 17 (Electric Charging Points) And 20 (Waste Storage) Of Outline Planning Permission 20/0953				

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
70	Newport City Council	21/0217	Reserved matters (appearance, landscaping, layout and scale) for 76no. Homes including associated works, roads and infrastructure (18/0507). Partial discharge of conditions 05 (demolition/construction method statement), 06 (carriageway and footway details), 07 (Phased Planting Programme), 08 (Boundary Treatment), 09 (Surface And Foul Water Drainage Strategy), 10 (Materials Plan), 13 (Reserved Matters Details), 14 (Informal And Formal Recreation Details), 15 And 16	Queens Hill Education Centre Queens Hill Newport South Wales NP20 5XN	Approved - 05/08/2021	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QP5BN2LCJ8800&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			(Relationship With Shire Hall), 17 (Cross Sectional And Finished Floor Level Details), 19 And 20 (Noise Surveys/Mitigation Measures), 23 (Tree Protection Plan), 26 (Arboricultural Method Statement), 27 (Appointment Of Arboriculturalist) And 28 (Details For Replacement Planting To Mitigate Loss Of T50) Relating To Outline Permission 18/0507				
71	Newport City Council	19/1301	Reserved matters application (appearance, layout, scale & landscaping) for the construction of 62no. Apartments (c3) and 1no. Residential care building containing	Land And Property Formerly Known As Robert Price Corporation Road Newport	Approved - 06/06/2022	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZYY9LCPM868&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			5no. Bedrooms (c2) pursuant to outline permission 18/0973 for mixed use development comprising c2 residential institutions and c3 residential and drive thru coffee shop (a1/a3) along with Associated Infrastructure And Facilities				
72	Newport City Council	24/0756	The Construction Of 30no Affordable Housing Apartments And Associated External Works And Parking	Land Formerly Known As 21 Kelvedon Street Newport South Wales	Awaiting Decision	https://publicaccess.newport.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=SJY3RGLCMGO00	1
73	Newport City Council	24/0467	Strategic Site H3 - Reserved Matters Application For Sports Pitches, Changing Facilities And Allotments, Associated Infrastructure And	Llanwern Village Development Site Phase 1 Cot Hill Llanwern Newport NP18 2DP	Awaiting Decision	https://licensing.newport.gov.uk/online-applications/applicationDetails.do?keyVal=SDZWPWLCH6500&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Landscaping Pursuant To Outline Planning Permission 16/0864 For Residential Development Of Up To 1100 Dwellings And Provision Of Primary School, Village Centre, Public Open Space, Landscaping And Associated Infrastructure Works Affecting Public Rights Of Way 397/3, 397/7, 397/9 And 397/10, And Details To Discharge Conditions 5 (Building Materials), 6 (Hardscaping Materials), 7 (Boundary Treatments), 12 (Drainage), 21 (Parking) And 24 (Landscaping)				

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
74	Newport City Council	no relevant application	Strategic Site H8	Severn Stiles	unknown	n/a	3
75	Newport City Council	no relevant application	Strategic Site H13	Allt Yr Yn Campus	unknown	n/a	3
76	Newport City Council	no relevant application	Strategic Site H15	Victoria Wharf	unknown	n/a	3
77	Newport City Council	no relevant application	Strategic Site H21	Former Floors 2 Go	unknown	n/a	3
78	Newport City Council	21/0997	Strategic Site H23 - erection of 1no. Detached dwelling house and associated development thereto (Resubmission Of 21/0734)	10 Traston Lane Newport NP19 4RR	Withdrawn	https://licensing.newport.gov.uk/online-applications/applicationDetails.do?keyVal=R052SLLCFIG00&activeTab=summary	3
79	Newport City Council	no relevant application	Strategic Site H24	30-33 High Street	unknown	n/a	3
80	Newport City Council	no relevant application	Strategic Site H30	Rear of South Wales Argus	unknown	n/a	3

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
81	Newport City Council	23/1073	Strategic Site H31 - construction of 3no. Townhouses with associated refuse/recycling/cycle stores, car parking and landscaping	Roman Lodge Hotel - Roman Lodge Hotel Ponthir Road Newport NP18 3NY	Awaiting Decision	https://licensing.newport.gov.uk/online-applications/applicationDetails.do?keyVal=S4WA8OLCIAC00&activeTab=summary	1
82	Newport City Council	no relevant application	Strategic Site H32 - EIA Screening Opinion For A Development Of 100 Houses On The Site Of The Former Sainsburys, Shaftesbury	Former Sainsbury Shaftesbury Street Newport South Wales	Awaiting Decision	https://licensing.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RPP9S2LC0H400&activeTab=summary	3
83	Newport City Council	no relevant application	Strategic Site H34	Bankside Coverack Road	unknown	n/a	3
84	Newport City Council	no relevant application	Strategic Site H45	Lysaghts Parc	unknown	n/a	3
85	Newport City Council	23/0440	Strategic Site H47 - Reserved Matters Application For 176 Dwellings And Associated Works On Phase 4d, Pursuant To Outline	Phase 4D Glan Llyn Development Site Queensway Llanwern Newport South Wales	Awaiting Decision	https://licensing.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RV9RB9LCGUY00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Planning Permission 06/0471 For The Redevelopment Of Site To Create A Mixed Use Urban Extension				
86	Newport City Council	22/0861	Strategic Site H51 - Non-Material Amendment Relating To Reserved Matters Approval 18/1039 For 471 Residential Units	Land Formerly Known As Whitehead Works Mendalgief Road Newport South Wales	Approved - 06/10/22	https://licensing.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RHVQFHLCH6U00&activeTab=summary	1
87	Newport City Council	no relevant application	Strategic Site H52	Old Town Dock Remainder	unknown	n/a	3
88	Newport City Council	20/1230	Strategic Site H54 - Screening Opinion For Outline Residential Development For Proposed Residential Development At Jubilee Park, Rogerstone, Newport	H1-2 Jubilee Park Development Site Tregwilym Road Rogerstone Newport South Wales	EIA Development	https://licensing.newport.gov.uk/online-applications/applicationDetails.do?keyVal=QLQUCZLC0H400&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
89	Newport City Council	no relevant application	Strategic Site H55	Jigsaw Site, Ringland	unknown	n/a	1
90	Newport City Council	22/1033	Strategic Site H61 - demolition of existing buildings and the construction of 30no. Apartments along with associated parking and external areas (amended plans received)	Former Postal Exchange, Mill Street	Approved - 03/07/2024	https://licensing.newport.gov.uk/online-applications/applicationDetails.do?keyVal=RKCMFJLCGP200&activeTab=summary	1
91	Newport City Council	no relevant application	Strategic Site H62	Former Queens Hill School	unknown	n/a	3
92	Newport City Council	no relevant application	Strategic Site H63	Telford Depot	unknown	n/a	3
93	Newport City Council	no relevant application	Strategic Site H64	Uskside Paint Mills	unknown	n/a	3
94	Monmouthshire County Council	DM/2019/01761	Church Road 130 dwellings, associated infrastructure and landscaping.	Land To East Of Church Road Caldicot Monmouthshire	Approved - 05/03/2020	https://planningonline.monmouthshire.gov.uk/online-applications/advancedSearchResults.do?action=firstPage	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
95	Monmouthshire County Council	DM/2022/01042	Construction of 70 homes, sustainable drainage infrastructure, open space, internal roads, paths and parking areas, landscaping and associated plant and infrastructure.	Land At Vinegar Hill Vinegar Hill Undy Monmouthshire	Approved - 05/04/2023	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=RF03NEKYLLT00&activeTab=summary	1
96	Monmouthshire County Council	DM/2021/00357	Provision of 120 dwellings on parcels B and C2.	Rockfield Farm Undy Monmouthshire NP26 3EL	Approved - 21/12/2022	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=QPFT0GKYMPL00&activeTab=summary	1
97	Monmouthshire County Council	DM/2019/01937	Hybrid planning application - Outline planning application for up to 155 dwellings, associated open space and infrastructure with all matters excluding access reserved, of which full planning permission is sought for 72 dwellings,	Land At Vinegar Hill Vinegar Hill Undy Monmouthshire	Approved - 16/06/2022	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=Q1QC73KY00U00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			associated open space and infrastructure.				
98	Monmouthshire County Council	DM/2021/00358	Provision of 5575m2 B1 employment space on parcel C1.	Land At Rockfield Farm Silurian Road Undy Monmouthshire	Awaiting Decision	https://planningonline.monmouthshire.gov.uk/online-applications/advancedSearchResults.do?action=firstPage	1
99	Monmouthshire County Council	DM/2022/00634	Development of an industrial, storage and distribution warehouse, together with ancillary offices (Use Classes B2, B8 & B1) and associated access, parking, landscaping and ancillary infrastructure.	Unit 103 Wales 1 Business Park Newport Road Magor Caldicot Monmouthshire NP26 3DG	Approved - 17/10/2022	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=RAW3WRKYKLN00&activeTab=summary	1
100	Monmouthshire County Council	DM/2021/01717	Erection of a new building comprising 10,015 sq m of manufacturing, laboratory and office accommodation (Use Classes B1 and B2) with ancillary canteen	Magor Brewery Newport Road Magor Caldicot Monmouthshire NP26 3RA	Approved - 25/02/2022	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=R16F0QKYI4W00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			facilities; electrical plant unit; reconfiguration of internal site road, HGV parking and external storage areas; erection of 8 bright beer tanks and associated building (116 sq m); and associated works.				
101	Monmouthshire County Council	DM/2020/00103	Erection of sixteen fermentation vessels, enclosed supporting structure and external stairs; extension of existing high level access walkway; earth works; and temporary works including re-use of existing car park as vessel assembly site, creation of two temporary replacement car parks, temporary	Magor Brewery Newport Road Magor Caldicot Monmouthshire NP26 3RA	Approved - 17/12/2020	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=Q4G931KYHQ700&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			site roads and walkways, and associated works.				
102	Monmouthshire County Council	DM/2024/00889	Development of Bio-CNG vehicle fuelling station comprising fuel dispenser islands, plant compound, landscaping, creation of new accesses and associated development.	Land North Of Unit 2 Wales 1 Business Park Newport Road Magor Monmouthshire	Awaiting Decision	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=SGITLDKYMWR00&activeTab=summary	1
103	Monmouthshire County Council	DM/2023/01045	For a single wind turbine, including access track, crane pad and associated infrastructure.	Proposed Wind Turbine Land South East Of Tesco Distribution Steelworks Access Road A4810 Magor Monmouthshire	Awaiting Decision	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=RYB38IKYIKW00&activeTab=summary	1
104	Monmouthshire County Council	DM/2019/01041	Reserved matters application for the erection of 269 dwellings with ancillary works.	Land Development South Of Crick Road Crick Road Portskewett Monmouthshire	Approved - 26/02/2020	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=PTT5G8KYN2P00&activeTab=summary	1
105	Monmouthshire	DM/2019/01629	Application for reserved matters	Land Development South Of Crick Road	Approved -	https://planningonline.monmouthshire.gov.uk/online-	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
	County Council		pursuant to DM/2018/00696 relating to Layout, Scale, Appearance of Buildings, Means of Access (where not already approved) and Landscaping for the construction of a care home and associated works.	Crick Road Portskewett Monmouthshire	26/02/2020	applications/advancedSearchResults.do?action=firstPage	
106	Monmouthshire County Council	DM/2022/00331	Development of commercial units suitable for use classes B1, B2 and B8 plus associated external works.	Land At Severn Bridge Industrial Estate Pill Row Caldicot Monmouthshire	Approved - 05/10/2023	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=R80WOWKYJVZ00&activeTab=summary	1
107	Monmouthshire County Council	DM/2021/01071	Change of Use to B8 Storage and Distribution	Caldicot Works Forge Row Caldicot Monmouthshire NP26 5XG	Approved - 06/09/2021	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=QUQJOPKYGHY00&activeTab=summary	1
108	Monmouthshire County Council	DM/2023/01030	Proposed residential development of 46 affordable dwellings, car parking,	Land To The North Of Caldicot School, Situated Off Woodstock Way	Approved - 19/03/2024	https://planningonline.monmouthshire.gov.uk/online-applications/advancedSearchResults.do?action=firstPage	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			landscaping and associated works.				
109	Monmouthshire County Council	DM/2018/01071	Provision of light industrial units with all associated works for use within B1, B2, and B8.	Units 2A To 2B Pill Way Severn Bridge Industrial Estate Portskewett Caldicot Monmouthshire NP26 5PU	Awaiting Decision	https://planningonline.monmouthshire.gov.uk/online-applications/advancedSearchResults.do?action=firstPage	1
110	Monmouthshire County Council	DM/2018/02066	Outline application for the construction of 11 dwellings and associated works.	Land Adjacent To Clearview Court Shirenewton Monmouthshire	Approved - 12/02/2021	https://planningonline.monmouthshire.gov.uk/online-applications/applicationDetails.do?keyVal=PJXLE1KYKX000&activeTab=summary	1
111	Monmouthshire County Council	DM/2024/00131	Reserved matters for Eleven Dwellings to include - access, appearance, landscaping, layout and scale.	Land Adjoining Clearview Court Shirenewton Monmouthshire NP16 6AQ	Awaiting Decision	https://planningonline.monmouthshire.gov.uk/online-applications/advancedSearchResults.do?action=firstPage	1
112	Monmouthshire County Council	DM/2022/01042	Strategic Site SAH6 Vinegar Hill, Magor Undy (Application DM/2022/01042 aquired planning permission for part of SAH6) Construction of 70 homes, sustainable	Vinegar Hill, Magor Undy	Approved 05/04/23	https://planningonline.monmouthshire.gov.uk/online-applications/simpleSearchResults.do?action=firstPage	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			drainage infrastructure, open space, internal roads, paths and parking areas, landscaping and associated plant and infrastructure.				
113	Monmouthshire County Council	no relevant application	Strategic Site SAH7 Sudbrook Paper Mill, Sudbrook	Sudbrook Paper Mill, Sudbrook	unknown	n/a	3
114	Torfaen County Borough Council	24/P/0190/FUL	Installation of new 3G sports pitch, changing rooms, spectator stands, car parking, landscaping and associated works.	Former Playing Fields To The West Of Llantarnam Community Primary School, Llantarnam Cwmbran NP44 3XB	Approved - 17/07/2024	https://planningonline.torfaen.gov.uk/online-applications/applicationDetails.do?keyVal=SASJKYQJGBZ00&activeTab=summary	1
115	Torfaen County Borough Council	22/P/0470/FUL	Change of use to school playing fields	Land To The South Of Pentre Lane Llantarnam Cwmbran Torfaen	Approved - 16/03/2023	https://planningonline.torfaen.gov.uk/online-applications/applicationDetails.do?keyVal=RE736IQJKFX00&activeTab=summary	1
116	Torfaen County Borough Council	18/P/0424/RES	Application for reserved matters approval (access, appearance,	Land At Llantarnam Adjacent To Malthouse Lane Llantarnam	Approved - 28/06/2021	https://planningonline.torfaen.gov.uk/online-applications/applicationDetails.do?k	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			landscaping, layout and scale) in respect of 164 dwellings including roads and infrastructure			eyVal=PAMPUAQJJPK00&activeTab=summary	
117	Bristol City Council	20/06176/F	Redevelopment of site to provide 26 units comprising: 8 no. 3-bed houses, 6no. 1-bed apartments, 12no. 2- bed apartments and associated infrastructure. (Major application).	Site For Former Harbour Centre 100 Gloucester Road Avonmouth Bristol BS11 9AQ	Approved - 01/08/2022	https://pa.bristol.gov.uk/online-applications/applicationDetails.do?keyVal=QLP8VBDNM0200&activeTab=summary	1
118	Bristol City Council	24/00779/F	Change of use of existing waste management building to three separate buildings for B2/B8 and sui generis uses. (Major)	Waste Recycling Plant Kings Weston Lane Avonmouth Bristol BS11 8AZ	Awaiting Decision	https://pa.bristol.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=S9IVB7DNLQX00	1
119	Bristol City Council	23/04777/F	Change of use of land to Use Class B8 open storage.(Major)	Former Lorry Park Chittening Industrial Estate Land To West	Awaiting Decision	https://pa.bristol.gov.uk/online-applications/applicationDetails.do?keyVal=S5CSGHDNJOT00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
				Of Chittening Road Bristol BS11 0YB			
120	Bristol City Council	23/02992/F	Erection of a building, comprised of two warehouse units flanking ancillary space for supporting uses, with an external yard for the storage and distribution of tool and plant hire (Use Class B8) along with associated infrastructure.(Major)	Land At Spoil Heap Kings Weston Lane Avonmouth Bristol	Awaiting Decision	https://pa.bristol.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=RYO211DNG8K00	1
121	Bristol City Council	20/02903/P	"Hybrid planning application comprising a mixed commercial/ industrial development for A1, A3, A5, C1, D1, D2, B2 and B8 use classes over seven plots (Area A-G). Full planning	Land At Access 18 Access 18 Bristol BS11 8HT	Approved - 24/02/2022	https://pa.bristol.gov.uk/online-applications/applicationDetails.do?keyVal=QD1BD3DN0DG00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			permission is sought for the development of a hotel within Area F, access works to the site and to the identified proposed development plots, earthworks, ecological enhancements, the diversion of the existing public right of way, landscaping works across the whole site and other infrastructure works to support the proposed development.				
122	Bristol City Council	no relevant application	Site Allocation BSA0111 Land of Ermine Way, Shirehampton	Land of Ermine Way, Shirehampton	unknown	n/a	3
123	Bristol City Council	no relevant application	Site Allocations BSA0101 Part of Henacre Open	Part of Henacre Open Space, Lawrence Weston	unknown	n/a	3

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			Space, Lawrence Weston				
124	Bristol City Council	no relevant application	Site Allocations BSA0102 Land at former Lawrence Weston Campus of City of Bristol College, Lawrence Weston	Land at former Lawrence Weston Campus of City of Bristol College, Lawrence Weston	unknown	n/a	3
125	Bristol City Council	no relevant application	Site Allocations BSA0103 Land to the west and south-west of Deering Close, Lawrence Weston	Land to the west and south-west of Deering Close, Lawrence Weston	unknown	n/a	3
126	South Gloucestershire Council	The 10km buffer only enters a minor area of South Gloucestershire Council, specifically the ward of Piling and Severn Beach.					
127	North Somerset Council	21/P/0301/FUL	Change of use from Assisted Living Development comprising 126 apartments and integrated care, support and well-being facilities for the over 60's age	49 Martingale Way Portishead	Approved - 13/09/2021	https://planning.n-somerset.gov.uk/online-applications/applicationDetails.do?keyVal=QNWRA8LPGU100&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			group (Use Class C2) to 127 non-age restricted apartments (Use Class C3) with associated changes to soft landscaping and car parking, together with 500sqm of commercial/community space under Classes E (Commercial, Business and Service) and/or F (Local Community and Learning); and 350sqm for health/beauty spa (Sui Generis) or medical/health services (Class E (e))				
128	North Somerset Council	18/P/3512/FUL	Residential development comprising no. 26 apartments (C3 use) with associated	Proposed New Building Martingale Way Portishead	Approved - 08/11/2019	https://planning.n-somerset.gov.uk/online-applications/applicationDetails.do?keyVal=PAK9PRLPFH300&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			access, parking and refuse arrangements				
129	North Somerset Council	21/P/1258/FUL	Erection of a 54 bedroom care home and day centre	Land Off Wyndham Way Wyndham Way Portishead BS20 7PJ	Approved - 13/05/2022	https://planning.n-somerset.gov.uk/online-applications/applicationDetails.do?keyVal=QS87RSLPKTQ00&activeTab=summary	1
130	North Somerset Council	23/P/1263/FUL	Demolition of existing care home and erection of 38no. retirement living apartments, including communal facilities, access, car parking and landscaping	Petersfield Elderly Persons Home Church Road South Portishead BS20 6PU	Approved - 28/06/2024	https://planning.n-somerset.gov.uk/online-applications/simpleSearchResults.do?action=firstPage	1
131	North Somerset Council	20/P/2122/FUL	Erection of an extension to existing factory and warehouse premises; remodelling and expansion of vehicle parking and circulation areas and erection of a new gatehouse;	Etex Building Performance Ltd Redland Avenue Easton-in-Gordano North Somerset BS20 0FB	Approved - 09/04/2021	https://planning.n-somerset.gov.uk/online-applications/applicationDetails.do?keyVal=QGCGGYLPHYW00&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			replacement and remodelling of conveyor structure to the north of the main site				
132	North Somerset Council	14/P/1186/RM	Strategic Site H65- Severn Paper Mill - Submission of reserved matters for appearance, landscaping, layout and scale for the erection of a residential development of 117 dwellings pursuant to Outline Planning Permission 12/P/2035/F4 (application to extend time limit for implementation of outline planning permission 08/P/1912/O (Outline planning application for the erection of a residential	Severn Paper Mill	Approved - 21/01/2015	https://planning.n-somerset.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZXGULPJV014&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			development together with associated access, servicing and ancillary works including demolition of existing premises and with the appearance, layout, scale and landscaping reserved for subsequent approval))				
133	North Somerset Council	no relevant application	Strategic Site - South west of Severn Paper Mill	South west of Severn Paper Mill	unknown	n/a	3
134	North Somerset Council	no relevant application	Strategic Site - Old Mill Road	Old Mill Road	unknown	n/a	3
135	North Somerset Council	no relevant application	Strategic Site - Land south of Downside	Land south of Downside	unknown	n/a	3
136	North Somerset Council	16/P/2855/F	Strategic Site - Marine View, Harbour Road	Marine View, Harbour Road	Approved - 09/03/2017	https://planning.n-somerset.gov.uk/online-applications/applicationDetails.do?keyVal=ZZZXGLLPJV605&activeTab=summary	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
137	North Somerset Council	no relevant application	Strategic Site - Harbour Road/ Gordano Gate	Harbour Road/ Gordano Gate	unknown	n/a	3
138	North Somerset Council	no relevant application	Strategic Site - Land at WyndhamWay	Land at WyndhamWay	unknown	n/a	3
139	North Somerset Council	no relevant application	Strategic Site - Site V2 HarbourRoad	Site V2 HarbourRoad	unknown	n/a	3
140	Newport City Council	DNS/3279787 - Craig y Perthi Solar Farm	Erection of a solar farm comprising ground mounted, fixed position solar panels, with a combined installed generating capacity of up to 99.9 MW, underground cabling, grid connection, associated infrastructure, landscaping and environmental enhancements, for a period of up to 40 years.	Land between the M4 Motorway and the South Wales Main Line Railway, near Llanwern, Underwood and Bishton	Awaiting Decision Estimated decision date: 21/04/2025	https://planningcasework.service.gov.wales/case	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
141	Monmouthshire County Council	DNS CAS-01960-J2H3X5 - Magor Net Zero	Renewable Energy & Green Hydrogen Production Facility including ground-mounted solar PV, wind turbine, hydrogen electrolysers, hydrogen and energy storage and ancillary and associated infrastructure and cabling.	Land at Magor, Monmouthsire	Withdrawn	https://planningcasework.service.gov.wales/case	n/a
142	Newport City Council	DNS/3220457 - Rush Wall Solar Park Ltd	The installation of a solar park with an approximate design capacity of 75MW. Development includes ancillary electrical equipment and infrastructure, access tracks, security fencing and CCTV.	Land near the village of Redwick, south east of Newport, Wales on the Caldicot Levels	Dismissed	https://planningcasework.service.gov.wales/dnsdetails	n/a
143	Newport City Council	DNS/3216558 - Wentlooge -	Erection of a Renewable Energy Hub comprising	Land on the Wentlooge Levels to	Dismissed	https://planningcasework.service.gov.wales/dnsdetails	n/a

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
		Renewable Energy Hub	ground mounted solar panels, battery storage units (160 units) with a combined installed generating capacity of up to 125MW, underground cabling, grid connection hub, associated infrastructure, landscaping and environmental enhancements for a temporary period of 40 years	the West of Hawse Lane			
144	n/a	Seabank 3 CCGT	Two additional high efficiency combined cycle gas turbines (CCGT) with a combined capacity of up to 1,400MW that integrate with existing gas and electricity transmission infrastructure and will run in parallel	BS10 7GB	Pre-application	https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN010058	1

ID	Planning Authority	Application Reference	Description of Committed Development	Location/Address	Status	Application Link	Tier
			with the existing 1,100MW of generation capacity giving a total output for the combined Station of up to 2,500MW.				
145	n/a	Avon Power Station 950 MW output	New gas fired power station comprising high efficiency combined cycle gas turbines of up to 1500MW, with additional fast response generators (peaking plant) providing a combined capacity of up to 1800MW	BS10 7ES	Pre-application	https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN010034	1
146	n/a	Portishead Branch Line - MetroWest Phase 1	The project is to rebuild the disused branch line between Portishead and Pill and reintroduce passenger train services to Bristol and beyond.	Portishead	Approved - 14/11/2022	https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/TR040011	1

19.0 Summary

19.1 Introduction

19.1.1 The information included in this Scoping Report is provided to support the Applicants request for a Scoping Opinion from the Secretary of State in relation to the Proposed Development.

19.1.2 The main aspects of the environment likely to be significantly affected by the construction, operation and decommissioning of the Proposed Development have been identified. For each of these identified aspects, the Scoping Report has identified the extent of relevant environmental studies to be undertaken as part of an Environmental Impact Assessment (EIA). The Environmental Statement (ES) will outline the full EIA and will be submitted alongside the application for Development Consent.

19.2 Scope of the Assessment

19.2.1 Likely significant effects of the Proposed Development have been identified according to each EIA aspect. For some of these, further data collection and an assessment will be required in order to determine the significance of the effects. These have been scoped-in and an appropriate level of assessment (i.e. simple or detailed) has been proposed.

19.2.2 For other potential effects it is proposed that they be scoped out of the EIA (i.e. no further data collection or assessment is proposed). These conclusions have been made based on the knowledge of the baseline environment, the nature of planned works and the wealth of evidence on the potential for impacts from such projects more widely.

19.2.3 **Table 19-1** below presents a summary of the proposed scope of the technical aspects as set out within **Chapters 5** to **18**.

Table 19-1 Scope of Technical Topics

Aspect	Phase	Proposed Scope of Assessment
Chapter 5: Landscape and Visual Impact	Construction, Operation and Decommissioning	Assessment of likely effects on Landscape Elements, Host Regional and Local LCAs and visual receptors within the study area to include settlements, transport routes, recreational routes and recreational and tourist destinations. 17 viewpoints have been proposed to cover a range of receptor locations.
Chapter 6: Glint and Glare	Operation	The assessment of glare is proposed of susceptible receptors including road users and residents within 1km of the Proposed Development.
Chapter 7: Cultural Heritage and Archaeology	Construction, Operation and Decommissioning	A historic environment desk-based assessment (HEDBA) will be undertaken, to include a description of known historic assets and a discussion of the potential for further, as yet unknown, historic assets. The assessment will identify the potential direct and indirect effects of the Proposed Development on historic assets. Furthermore, it is proposed to undertake an ASIDOHL to determine the change in historic landscape character of the Gwent Levels Historic Landscape of Outstanding Historic Interest as a result of the operational phase of the Proposed Development.
Chapter 8: Ecology	Construction, Operation and Decommissioning	The Ecology assessment will focus on potential effects associated with the following features: • Severn Estuary Ramsar/ SAC/ SSSI • Gwent Levels (covering Magor and Undy SSSI, Redwick and Llandevenny SSSI, Whitson SSSI and Nash and Goldcliff SSSI) • Habitats • Hedgerows • Roosting Bats • Commuting/ foraging bats • Amphibians • Dormice • Otter

Aspect	Phase	Proposed Scope of Assessment
		• Water vole • Aquatic invertebrates • Terrestrial invertebrates • Reptiles • European eel • Badger • Hedgehog • Brown hare • Harvest mouse The methodology has been developed with reference to the CIEEM (2018)[300] guidelines.
Chapter 9: Ornithology	Construction, Operation and Decommissioning	The Ornithology ES chapter will provide the ecological assessment of ornithological features including: • Severn Estuary Ramsar (ornithological features) and SPA • Wintering bird assemblage (functionally linked to SPA) • Wintering bird assemblage (non-SPA) • Ground-nesting birds (excluding lapwing) • Breeding lapwing • Schedule 1 birds (Barn owl and Cetti's warbler) • Other breeding birds

[300] CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, version 1.3*. Chartered Institute of Ecology and Environmental Management, Winchester.[Accessed December 2024].

Aspect	Phase	Proposed Scope of Assessment
		The methodology has been developed with reference to the CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom and from considerable experience of EcIA relating to similar developments throughout the UK.
Chapter 10 Water Environment and Flood Risk	Construction, Operation and Decommissioning	The assessment will focus on the potential effects of the Proposed Development on aquatic environment receptors (watercourses), water resource receptors (water supplies, groundwater resources and abstractions) and flood risk receptors (people, property and infrastructure at risk of flooding). An assessment of the vulnerability of the Proposed Development to flooding will also be completed. A Flood Consequences Assessment will be completed and supported by a drainage strategy.
Chapter 11: Ground Conditions	Construction, Operation and Decommissioning	Assessments of effects relating to direct physical impacts will be undertaken for potential effects on soils, whilst an ALC survey will be undertaken to support the assessment of effects on agricultural land as a resource. Due to the location of the Proposed Development, there is potential for localised contaminated land, therefore, a Phase 1 Contaminated Land Desk Study will be completed.
Chapter 12: Traffic and Transport	Construction, Operation and Decommissioning	The assessment will focus on the following potential effects of the Proposed Development: • Road vehicle drive and passenger delays. • Road user and pedestrian safety. • Severance of communities. • Non-motorised user delay. • Non-motorised amenity. • Fear and intimidation on and by road users.

Aspect	Phase	Proposed Scope of Assessment
Chapter 13: Noise and Vibration	Construction, Operation and Decommissioning	Baseline noise monitoring is proposed at locations of noise sensitive receptors throughout the Study Area. An assessment of the construction effects will be undertaken including construction traffic movements, and construction activities. In relation to operational effects, it is likely that transformers, inverters and intermediate substations will emit operational noise that could affect nearby receptors, therefore this will be assessed.
Chapter 14: Climate Change Resilience	Construction, Operation and Decommissioning	An In-Combination Climate Impacts assessment is proposed to be taken forward, this will identify if any reported effects will be exacerbated or ameliorated by the effects of climate change and identify further mitigation where required.
Chapter 15: Greenhouse Gas Assessment	Construction, Operation and Decommissioning	The assessment will consider the effects of GHG emissions in comparison to the baseline without the Proposed Development. Focusing on the Construction phase and the associated embodied emissions of materials, transportation, waste and the construction process. Whilst the operation assessment will review maintenance requirements and the embodied carbon associated and the avoided emissions from the Proposed Development due to the production of renewable energy.
Chapter 16: Socio-Economics	Construction, Operation and Decommissioning	Assessment of effects including the direct and indirect effects on the employment and labor market, as well as the direct effects from business rates and inward investment associated with any linked developer contributions. The assessment will consider the effects of the Proposed Development upon recreational use and tourism related business.

19.2.4 **Table 19-2** below provides a summary confirmation of the aspects and matters that are proposed to be scoped out of the EIA.

19.2.5 Cumulative effects resulting from the effects of the Proposed Development and other developments will be assessed in accordance with the guidance and methodologies set out in **Chapter 4: The Environmental Impact Assessment Methodology**. In this Scoping Report, for each aspect, potential impacts of the Proposed Development that may contribute to cumulative effects on resources and receptors are set out in **Chapters 5** to **18**.

Table 19-2 Summary of Activities and Impacts to be Scoped Out of the EIA

Aspect	Phase	Activities and impacts scoped out
Chapter 5: Landscape and Visual Impact	Construction, Operation and Decommissioning	Receptors outwith the ZTV
	Construction, Operation and Decommissioning	Indirect effects upon National Landscape Character Areas (NLCAs)
	Construction, Operation and Decommissioning	Indirect effects upon landscape and visual receptors beyond 5km
	Construction, Operation and Decommissioning	Cumulative effects beyond 5km
	Construction, Operation and Decommissioning	Individual Residential Properties beyond 1 km
	Construction, Operation and Decommissioning	Indirect effects on Seascape Character
Chapter 6: Glint and Glare	Construction, Operation and Decommissioning	The assessment of glare on aerodromes and railway lines
	Decommissioning	Any effect during the decommissioning phase
Chapter 7: Cultural Heritage and Archaeology	Operation	Effects on known and previously unrecorded buried historic assets
	Construction, Operation and Decommissioning	Setting of non-designated above-ground historic assets that lie more than 100m from the Scoping Red Line Boundary.
	Construction and Operation	Scheduled Monuments further than 5km from the Site
	Construction and Operation	Listed Buildings further than 5km from the Site
	Construction and Operation	Non-designated above ground historic assets over 100m from the Site
	Construction and Operation	Non-designated buried historic assets outside of the Site

Aspect	Phase	Activities and impacts scoped out
	Decommissioning	Any effect during the decommissioning phase
Chapter 8: Ecology	Operation	Severn Estuary Ramsar/ SAC/ SSSI
	Construction and Operation	River Usk SAC
	Construction and Operation	Wye Valley and Forest of Dean Bat Sites SAC
	Operation	Gwent Levels (covering Magor and Undy SSSI, Redwick and Llandevenny SSSI, Whitson SSSI and Nash and Goldcliff SSSI)
	Construction and Operation	Magor Marsh SSSI
	Construction and Operation	Newport Wetlands SSSI/ NNR
	Operation	Roosting Bats
	Operation	Dormice
	Operation	Water vole
	Operation	Harvest mouse
Chapter 9: Ornithology	Operation	Severn Estuary Ramsar (ornithological features) and SPA
Chapter 10 Water Environment and Flood Risk	Construction, Operation and Decommissioning	Groundwater Dependent Terrestrial Ecosystem
Chapter 11: Ground Conditions	Construction and Operation	Effects on geology (geodiversity)
	Construction and Operation	Effects on geology (ground stability)
	Construction and Operation	Effects on mineral resources
Chapter 13: Noise and Vibration	Construction	Construction road traffic groundborne vibration
	Operation	Operational vibration

Aspect	Phase	Activities and impacts scoped out
Chapter 14: Climate Change Resilience	Construction	Vulnerability to climate change of the Project assets
	Operation	Vulnerability to climate change of the Project assets
Chapter 15: Greenhouse Gas Assessment	Construction	Disposal of Construction Waste (A5)
	Construction	Land use, land use change and forestry (A5)
	Operation	Operation (B1)
	Operation	Operational Energy Use (B6)
	Operation	Operational Water Use (B7)
	Operation	Land use, land use change and forestry (B8)
	Operation	Other Operational Processes (B8)
	Operation	Deconstruction of the facility (C1)
	Decommissioning	Transport to end-of-life facilities (C2):
	Decommissioning	Processing (C3)
	Decommissioning	Disposal (C4)
Chapter 16: Socio-Economics	Operation	Direct, indirect, and induced employment/labour market effects.
	Construction, Operation and Decommissioning	Direct, indirect and induced effects on local services and tourism businesses (i.e. hospitality and retail)
	Construction, Operation and Decommissioning	Direct and indirect effects on land-use (agricultural resource)
Chapter 17: Other Environmental Topics	Construction	**Air Quality** - Construction traffic emissions
	Construction	**Air Quality** - Earthworks
	Construction	**Air Quality** - Trackout

Aspect	Phase	Activities and impacts scoped out
	Construction	**Air Quality** - Direct and indirect effects associated with the construction of the substation and other supporting infrastructure.
	Construction and Operation	**Major Accidents or Disasters** - Biological hazards: epidemics
	Construction and Operation	**Major Accidents or Disasters** - Biological hazards animal and insect infestation
	Operation	**Major Accidents or Disasters** - Earthquakes
	Construction and Operation	**Major Accidents or Disasters** - Famine / food Insecurity
	Construction and Operation	**Major Accidents or Disasters** - Displaced populations
	Construction and Operation	**Major Accidents or Disasters** - Landslide / subsidence
	Operation	**Major Accidents or Disasters** - Severe weather: droughts
	Construction and Operation	**Major Accidents or Disasters** - Terrorist incidents
	Construction and Operation	**Major Accidents or Disasters** - Cyber attacks
	Construction and Operation	**Major Accidents or Disasters** - Disruptive industrial action
	Construction and Operation	**Major Accidents or Disasters** - Public disorder
	Construction and Operation	**Major Accidents or Disasters** - Wildfires and Urban Fires
	Construction and Operation	**Major Accidents or Disasters** - Severe space
	Construction	**Major Accidents or Disasters** - Poor air quality events
	Construction and Operation	**Human Health and Population -** EMF

19.2.6 **Table 19-3** summarises the approach taken to the topics discussed in **Chapter 17: Other Environmental Topics**, of this EIA Scoping Report.

Table 19-3 Scope of Approach to Other Environmental Topics

Environmental Topic	Proposed Approach
Air Quality	Mitigation measures in relation to dust will be included within the outline Construction Environmental Management Plan (oCEMP). Suitable mitigation measures for construction and decommissioning plant and motorised equipment will be included in the oCEMP. Effect of Scheme operation and operational traffic on air quality is proposed to be scoped out as significant adverse effects are not predicted based on proposed traffic movements.
Land Quality	An Agricultural Land Classification (ALC) survey of the Site boundary will be undertaken with reference to the Ministry of Agriculture, Fisheries and Food guidelines, this will be included within Chapter 11: Ground Conditions of the ES.
Human Health	Human health (including air quality, land quality, noise, transport and access and visual amenity) will be covered by other topic assessments in the ES, additionally, EMFs are proposed to be scoped out.
Major Accidents and Disasters	Where the major accidents and disasters identified are not already being considered within the scope of existing technical assessments, they will continue to be reviewed with the design team to ensure the risks are understood and addressed through design as necessary. However, owing to the scale and nature of the Proposed Development, it is considered there is limited risk or considerable probability of an event interacting with the Proposed Development. As such, it is proposed to scope out Major Accidents and Disasters from the assessment. The ES would note and explain where this approach has been taken.
Telecommunications	Consultation and a desk based study has been undertaken to identify any existing infrastructure constraints, this information has been used to inform the design of the Proposed Development.
Waste	Description of the potential streams of construction, operation and decommissioning waste and estimated volumes will be described within the description of development chapter of the ES.

EIA Scoping Report

Appendix 1A: Glossary

Scoping Report Appendices [PINS Ref: EN010171]

Document Reference: EN 010171 / SCP APP/1A
Revision Number: 1
December 2024
Future Energy Llanwern Limited

Appendix 1A Glossary

Term	Description
Above-Ground Heritage Asset	An above ground building, monument, site, place, area or Landscape identified as having a degree of significance meriting consideration in planning decisions, because of its **Heritage** interest. **Heritage Assets** include **Designated Heritage Assets** and **Non-Designated Heritage Assets.**
Above Ground Installation (AGI)	Equipment relating to the solar scheme which is necessary for its operation and/or maintenance, and which is located in a secure compound above ground level.
Agricultural Land Classification (ALC)	A framework for determining the physical quality of the land at national, regional and local levels. This is based on the long-term physical limitations of land for agricultural use. There are a number of factors that affect the grade, and the main ones are climate, site conditions and soil characteristics, and the interactions between them.
Air Quality Management Area (AQMA)	Air Quality Management Areas (AQMAs) are areas that are likely to exceed the national air quality objective for a specific pollutant. They are determined by **Local Authorities.**
Applicant	The organisation (Future Energy Llanwern Limited) responsible for the submission of the **Development Consent Order (DCO) Application.**
Application	The application for a DCO submitted by the Applicantfor the Scheme by the Applicant to the Secretary of State (SOS) for Department of Energy Security and Net Zero (DEZNZ).
Archaeological Interest	There will be archaeological interest in a **Heritage Asset** if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them.
As Low As Reasonably Practicable (ALARP)	For a **Risk** to be ALARP, the cost, time or effort involved in reducing the Risk further would be grossly disproportionate to the benefit gained.
Authorised Development	The development that is described in Schedule 1 **of the draft Development Consent Order (dDCO).** This is also referred to as the **Proposed Development.**
Baseline	A reference level of existing **Environmental Conditions** against which a project is measured and controlled.
Baseline Studies	Work done to determine and describe the **Environmental Conditions** against which any future changes can be measured or predicted and assessed.

Term	Description
Below-Ground Heritage Asset	Below-ground heritage assets include both known and hitherto unknown buried archaeological remains.
Best and Most Versatile Agricultural Land (BMV)	Defined as Grades 1, 2 and 3a in the Agricultural Land Classification by the revised **National Planning Policy Framework (NPPF)** and **Planning Practice Guidance (PPG).** This is the land which is determined to be most flexible, productive and efficient in response to inputs and which can best deliver future crops for food and non-food uses such as biomass, fibers and pharmaceuticals. Grades 3b, 4, and 5 are used to classify land that is of moderate quality to very poor quality.
Best Available Techniques (BAT)	The available techniques which are the best for preventing or minimising **Emissions** and **Impacts** on the environment.
Biodiversity	The biological diversity of the earth's living resources. The total range of variability among systems and organisms at the following levels of organisation: bioregional, **Landscape**, ecosystem, **Habitats**, communities, **Species**, populations, individuals, genes and the structural and functional relationships within and between these different levels.
Biodiversity Net Gain	Biodiversity Net Gain is an approach to development that leaves **biodiversity** in a better state than before.
Book of Reference	A list of all of the land directly affected by the **Proposed Development**, as well as the owners and occupiers of the affected land and those with an interest in it.
Best Available Technique Reference Documents (BREF) Notes	The European Commission (EC) produces Best Available Technique reference documents or BREF notes. They contain **Best Available Techniques (BAT)** for installations.
Grid Connection Route	Corridor, which represents the maximum extent of land within which the cable route would be located.
Cadw	Cadw is the historic environment service of the Welsh Government which works to protect the historic buildings and structures, the landscapes and heritage sites of Wales.
Climate Change	Large scale, long term shift in the Earth's weather patterns or average temperature.
Combined effects	The interaction and combination of different residual (post-mitigation) environmental effects of the Proposed Development affecting the same Receptor. For example, visual and noise effects during construction affecting the same residential dwelling.
Competent Authority	The relevant **Secretary of State** is the Competent Authority for the purposes of the Habitats Directive and the Habitats Regulation in relation to applications for **Nationally Significant Infrastructure Projects** (NSIPs).

Term	Description
Construction Environmental Management Plan (CEMP)	Document containing the (Register of Environmental Actions and Commitments) REAC setting out methods to avoid, minimise and mitigate impacts on the environment and surrounding area and the protocols to be followed in implementing these measures in accordance with environmental commitments during the **Construction Stage**.
Construction Stage	The stage during which construction works for the **Proposed Development** will take place.
Consultation Documents	The documents submitted to support the formal pre-application consultation under the **PA2008**. They included "plans and maps showing the nature and location of the proposed development" as stated in subsection (4) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009.
Construction Compound	A secure area from which Site work is managed and resourced, including but not limited to temporary offices, workshops, parking and storage areas.
Contaminated Land	Where substances are causing or have a significant possibility to cause significant harm to people, property or protected species; or, where significant pollution is being caused or has a significant possibility of being caused to controlled waters.
Cumulative Effects	The effects of the **Proposed Development** in cumulation with other existing development and/or approved development.
Decommissioning	The final process of shutting down the infrastructure comprised in the Proposed Development when it is no longer required once it has reached end of life.
Development Consent Order (DCO)	A Development Consent Order (DCO) is a Statutory Instrument (SI) made by the Secretary of State (SoS) pursuant to the Planning Act 2008 (as amended) (PA2008).
Development study area	The extent of works within the **Scoping Red Line Scoping Boundary**, including areas required for temporary access, site compounds, working platforms and other enabling activities.
Direct Effect	An effect that is directly attributable to the **Proposed Development**.
Direct Employment	An increase in local employment arising from further economic activity (jobs, expenditure or income) associated with additional local income and local supplier purchases as a result of the **Proposed Development.**
EIA Directive	Directive 85/337/EEC (as amended). The initial Directive of 1985 and its three amendments have been codified by Directive 2011/92/EU of 13 December 2011. Directive 2011/92/EU has been amended in 2014 by Directive 2014/52/EU.

Term	Description
EIA Regulations	The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Environmental Impact Assessment (EIA)	A systematic means of assessing the significance of effects from the Proposed Development, undertaken in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (**EIA Regulations**).
Emission	A material that is expelled or released to the environment. Usually applied to gaseous or odorous discharges to the atmosphere.
Emission Rate	The quantity of a pollutant released from a source over a given period of time.
Enhancement	Measures to improve the environment, such as landscape resource and the **Visual Amenity** of the **Proposed Development** and its wider setting, over and above its Baseline condition.
Environmental Statement (ES)	A statement prepared in accordance with the **EIA Regulations** that includes the information that is reasonably required to assess the likely effects of a development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile.
European Designated Site	An area of land subject to protection through European legislation, including **Special Area of Conservation** (SAC) and **Special Protection Area** (SPA).
Examining Authority (ExA)	Planning Inspector(s) responsible for conducting the examination and recommending a decision on a DCO application to the **Secretary of State** (SoS).
Flood Consequence Assessment (FCA)	An assessment of the consequences of flooding.
Flood Map for Planning	Defines Flood Zones based on annual probability of flooding from Fluvial and tidal sources to inform development planning and flood risk assessment. Nationally consistent delineation of 'high', 'medium' and 'low' flood risk updated by Natural Resource Wales (NRW) as deemed appropriate, typically on a quarterly basis.
Flood Risk Assessment (FRA)	An assessment of the risk of flooding.
Flood Zones	Zones based on the annual probability of flooding from Fluvial and tidal sources, as defined in the **Flood Map for Planning.** Areas are categorised into one of the following: **Flood Zone 1, Flood Zone 2, Flood Zone 3a or Flood Zone 3b**.
Flood Zone 1	This zone comprises land assessed as having less than a 1 in 1,000 (0.1%) annual probability of flooding from rivers or the sea in any year.

Term	Description
Flood Zone 2	This zone comprises land assessed as having between a 1 in 100 (1%) and 1 in 1000 (0.1%) annual probability of flooding from rivers, or between a 1 in 200 (0.5%) and 1 in 1,000 (0.1%) annual probability of flooding from the sea in any year.
Flood Zone 3a	This zone comprises land assessed as having a 1 in 100 (1%) or greater annual probability of flooding from rivers or a 1 in 200 (0.5%) or greater annual probability of flooding from the sea in any year.
Flood Zone 3b	This zone comprises land where water has to flow or be stored in times of flood.
Fluvial	Processes associated with rivers and streams and the deposits and landforms created by them.
Future Baseline	The likely evolution of the baseline without implementation of the **Proposed Development.**
Geographical Information System (GIS)	A system that captures, stores, analyses, manages and presents data linked to location. It links spatial information to a digital database.
Geophysical Survey	Making and interpreting measurements of physical properties of the earth to determine subsurface conditions.
Geotechnical Survey	An investigation to determine the nature and engineering properties of the soil and other materials and to determine soil profiles and property assignments for the purpose of design and construction.
Greenhouse Gas (GHG)	Gases that absorb and emit reflected solar radiation which result in the warming of the Earth's atmosphere. It is absorbed and emitted at specific wavelengths within the spectrum of infrared radiation emitted by the earth's surface, the atmosphere, and clouds. The six main GHGs whose emissions are human caused are: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbon and sulphur hexafluoride. In combination, these GHG emissions are commonly expressed in terms of 'carbon dioxide equivalents' (CO_2e) according to their relative global warming potential. For this reason, the shorthand 'carbon' may be used to refer to GHGs.
Ground Investigations	The physical investigation stage of the **Geotechnical Survey** of which **Geophysical Surveys** may be one element. Comprised of targeted investigations including both intrusive and non-intrusive techniques to prove ground conditions, determine soil / rock parameters and identify hazards associated with the ground conditions to inform a proposed development.
Groundwater	Groundwater is the store of water present beneath Earth's surface in rock and soil pore spaces and in the fractures of rock formations.

Term	Description
Groundwater Source Protection Zone (SPZ)	Also, **Source Protection Zone** (SPZ), defined for 2,000 groundwater sources such as wells, boreholes and springs used for public drinking water supply, show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The SPZ maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which the Environment Agency occasionally apply to a groundwater source.
Habitat	The environment in which populations or individual species live or grow.
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna.
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017 (as amended) which covers the terrestrial environment.
Habitats Regulations Assessment (HRA)	A **Habitats Regulations Assessment** (HRA) refers to the stages of assessment carried out by the competent authority in accordance with **Habitats Regulations** and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) to determine if a project may affect the protected features of a European site and European offshore marine site, before deciding whether to undertake, permit or authorise it.
Haul road	Haul roads are temporary roads provided within a contractor's site area to allow for the movement of construction materials, construction machinery and/or construction labour around the site.
Hazard	Anything with the potential to cause harm, including ill-health and injury, damage to property or the environment; or a combination of these.
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
Heritage Asset	A building, monument, site, place, area or Landscape identified as having a degree of significance meriting consideration in planning decisions, because of its Heritage interest. Heritage Assets include **Designated Heritage Assets** and **Non-Designated Heritage Assets.**
Horizontal Directional Drilling (HDD)	Horizontal directional drilling (HDD) is a **Trenchless** construction method used to install pipes underground without disturbing the ground surface above.
Hydrology	The movement, distribution and quality of water throughout the earth.
Hydromorphology	The physical characteristics of the shape, boundaries and content of a water body.

Term	Description
Impact	A physical or measurable change to the environment attributable to the **Proposed Development**.
Indirect Effect	An effect that results indirectly from the Proposed Development, as a consequence of a '**Direct Effect**', often occurring away from the **Site**, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the **Source** of the **effect**.
Internal Drainage Board	Each internal drainage board is a public body that manage water levels in an area, known as an internal drainage district, where there is a special need for drainage. They undertake works to reduce flood risk to people and property and manage water levels for agricultural and environmental needs within their district.
Internal Influencing Factor	A factor which occurs within the limits of the **Proposed Development** that may present a risk to the Proposed Development.
Inverter	Inverters convert the direct current (DC) electricity collected by the **PV arrays** into alternating current (AC), which allows the electricity generated to be exported to the National Grid.
Jointing Pit	Underground structures constructed at regular intervals along the Grid Connection Cables to join sections of cable and facilitate installation of the cables into the buried ducts.
LAeq	Equivalent Continuous Level. When a noise varies over time, the LAeq is the equivalent continuous sound which would contain the same sound energy as the time varying sound.
Land Cover	The surface cover of the land usually expressed in terms of vegetation cover or lack of it. Related to, but not the same as, **Land Use**.
Land Use	What land is used for, based on broad categories of functional land cover, such as urban and infrastructure use and the different types of agricultural and forestry.
Landscape	An area, as perceived by people, the character of which is a result of the action and interaction of natural and/or human factors.
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significant effect of change resulting from development both on the Landscape as an environmental resource in its own right and on people's views and **Visual Amenity.**
Landscape Character	A distinct, recognisable and consistent pattern of **Elements** in the **Landscape** that makes one Landscape different from another.

Term	Description
LAmax	LAmax is the maximum A - weighted sound pressure level recorded over the period stated. LAmax is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall **LAeq,T** noise level but will still affect the noise environment.
Lead Local Flood Authority (LLFA)	**Local Authority** responsible to taking the lead on local flood risk management as defined within the Flood and Water Management Act 2010.
Likely Significant Effect	The significance of an environmental effect is typically a function of the 'value' or 'sensitivity' of the receptor and the 'magnitude' or 'scale' of the impact. Combining the environmental value of the resource or receptor with the magnitude of change produces a significance of effect category. The definition of a significant effect for each environmental topic will be contained within their respective chapters of the **Environmental Statement**.
Limit of Deviation	These limits show the maximum area within which the **Proposed Development** could be installed. This flexibility is required in order to deal with unforeseen circumstances, such as ground conditions and local features.
Limit of Land to Be Acquired or Used	The limits of land to be acquired or used, as shown on the Land Plans.
Local Development Plan (LDP)	The set of documents and plans that sets out the local authority's policies and proposals for the development and use of land in their area.
Local Nature Reserve (LNR)	A site of importance for wildlife, geology, education or public enjoyment. Some are also nationally important **Site of Special Scientific Interest** (SSSI). Local Nature Reserves must be controlled by the **local authority** through ownership, lease or agreement with the owner.
Local Planning Authority (LPA)	The **local authority** or council that is empowered by law to exercise statutory town planning functions for a particular area of the UK.
Low Voltage Distribution Cables	33 kV cables, which transmit electricity from the Solar Farm to the Future Energy Llanwern Substation.
Land Use, Land Use Change and Forestry (LULUCF)	The category of GHG emissions and removals resulting from human-induced land use such as settlements and commercial uses, land-use change, and forestry activities.
Main River	A watercourse shown as such on the **Flood Map for Planning** and can include any structure or appliance for controlling or regulating the flow of water in, into or out of a main river. Main Rivers are usually larger streams and rivers, but also include smaller watercourses of strategic drainage importance. Main Rivers are under the jurisdiction of the Environment Agency who have powers to carry out flood defence works to Main Rivers.

Term	Description
Major Accident	In the context of the **Proposed Development**, an event that threatens immediate or delayed serious damage to human health, welfare and/or the environment and requires the use of resources beyond those of the Applicant or its contractors to respond to the event. Serious damage includes the loss of life or permanent injury and/or permanent or long lasting damage to an environmental receptor that cannot be restored through minor clean-up and restoration efforts. The significance of this effect will take into account the extent, severity and duration of harm and the sensitivity of the receptor.
Magnitude	A combination of the scale, extent and duration of an effect.
Mean Low Water Springs	The average height of lower low water at spring tides at a location
Mitigation Measures	Actions proposed to prevent, reduce and where possible, offset significant adverse effects arising from the whole or specific elements of the **Proposed Development**.
National Nature Reserve (NNR)	Established to protect sensitive features and to provide 'outdoor laboratories' for research.
National Planning Policy Framework (NPPF)	The document that sets out Government's planning policies for England and how these are expected to be applied. The NPPF was last revised in February 2019.
National Policy Statement (NPS)	Overarching policy designated under the Planning Act 2008 (as amended) (PA2008) concerning the planning and consenting of **Nationally Significant Infrastructure Projects** (NSIPs) in the UK.
Nationally Significant Infrastructure Project (NSIP)	Projects which fall under one of the categories in Part 3 of the Planning Act 2008 (as amended) (PA2008).
Nationally Designated Site	Areas of land subject to project through UK legislation, including Sites of **Special Scientific Interest** (SSSI) and **National Nature Reserves** (NNR)
Noise Action Plan Priority Area (NAPPA)	Areas where people's homes are exposed to a day-evening-night noise level exceeding 73 dB, or where people live alongside concrete trunk roads. These areas are identified as priority areas for intervention in the Noise Action Plan produced by the Welsh Government.
Noise Important Area (NIA)	Noise 'hotspots' as defined by the Noise Action Plan produced by DEFRA. Important Areas are defined as the areas where the 1% of the population that are affected by the highest noise levels are located according to the results of the strategic noise mapping undertaken by DEFRA.

Term	Description
Noise Sensitive Receptor	Any identified Receptor likely to be affected by noise. These are generally human Receptors, and may include residential dwellings, workplaces, schools, hospitals, community facilities, places of worship, recreational spaces and ecological Receptors.
Nomis	Nomis is a service hosted by the Office for National Statistics (ONS) which provides access to the most detailed and up-to-date UK labor market statistics from official sources.
No Observed Effect Level (NOEL)	The level below which no effect from noise or vibration can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
Non-Statutory Consultation	Consultation with stakeholders on the **Proposed Development** which occurs in addition to the **Statutory Consultation** required under the **EIA Regulations**.
Non-Statutory Consultees	Consultees who – whilst not designated in law – are likely to have an interest in a proposed development and will therefore be consulted on the **Proposed Development**.
On-site cables	The cables, which transmit electricity from the transformers to the project substations.
Operational Stage	The stage after which the **Proposed Development** is handed over by the relevant construction contractors and approved for operation. It will remain in its **Operational Stage** until operations cease.
Ordinary Watercourse	Any river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) and passage through which water flows that does not form part of a **Main River**. **The Lead Local Flood Authority** (LLFA) or Internal Drainage Board (IDB) where relevant, has powers for Ordinary Watercourses that are similar to those held by NRW for **Main Rivers**.
Parameters	A limit or boundary which defines the scope of a particular process or activity.
Phase 1 Habitat Survey	An ecological survey technique that provides a standardised system to record vegetation and wildlife **Habitat**. It enables a basic assessment of **Habitat** type and its potential importance for nature conservation.
Planning Inspectorate (PINS)	The Government agency responsible for administering applications for development consent under the Planning Act 2008 (as amended) (PA2008) on behalf of the Secretary of State (SoS).
Planning Policy Wales (PPW)	The document that sets out Government's planning policies for Wales and how these are expected to be applied.

Term	Description
Planning Practice Guidance (PPG)	The Planning Practice Guidance (PPG) provides context and guidance to the National Planning Policy Framework (NPPF). The PPG has been updated to reflect changes to the revised NPPF.
Preliminary Ecological Appraisal (PEA)	Preliminary ecological surveys have a range of purposes; one key use is to gather data on existing conditions, often with the intention of conducting a preliminary assessment of likely impacts of proposed developments or establishing the baseline for future monitoring. As a precursor to a proposed project, some evaluation is usually made within these appraisals of the ecological features present, as well as scoping for notable **Species** or **Habitats**, identification of potential constraints to the **Proposed Development** and recommendations for **Mitigation Measures**.
Preliminary Environmental Information (PEI)	Information which has been compiled by the **Applicant** and is reasonably required for the consultation bodies to develop an informed view of the Likely Significant Environmental Effects of the development (and of any associated development).
Preliminary Environmental Information Report (PEIR)	The Preliminary Environmental Information Report (PEIR) is the report prepared by the Applicant, containing **Preliminary Environmental Information** (PEI).
Primary Mitigation	Modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project, and do not require additional action to be taken.
Priority Habitat	Habitats are a range of semi-natural habitat types that were identified as being the most threatened and requiring conservation action under Section 42 of the Natural Environment and Rural Communities Act
Priority Habitat Inventory	A spatial dataset that describes the geographic extent and location of Natural Environment and Rural Communities Act (2006) Section 41 **Habitats of Principal Importance** (HPI).
Proposed Development	The development for which a **Development Consent Order** (DCO) is sought for the Future Energy Llanwern Solar Farm - comprising the construction, operation, maintenance, and decommissioning of a solar photovoltaic (PV) array electricity generating facility with an installed total capacity of over 350 megawatts (MW) and export connection to the National Grid. The Proposed Development will be located within the Scoping Red Line Boundary and is the subject of the application The Proposed Development is also known as “Future Energy Llanwern”.
PV Array	A PV Array is a distinct grouping of PV Tables. The PV Arrays are arranged within the Solar PV Array Works Area

Term	Description
PV Mounting Structure	The metal frames onto which the PV Panels are attached.
PV Panel	A panel comprising a grouping of photovoltaic (PV) cells connected to each other and set within a single physical frame. The PV Panel is attached to a PV Mounting Structure. Also referred to as a PV Module.
PV Tables	PV Panels mounted onto the PV Mounting Structure forming tables, which are then set out in rows.
Ramsar Site	Wetlands of international importance designated under the Ramsar Convention 1971.
Receptor	A component of the natural, created or built environment such as a human being, water, air, a building, or a plant that has the potential to be affected by the Proposed Development.
Residual Effects	Effects arising from the **Proposed Development** that cannot be mitigated following implementation of **Mitigation Measures**.
Resilience (climate change)	The vulnerability of the Proposed Development to climate change.
Risk	The likelihood of an impact occurring, combined with the effect or consequence(s) of the impact on a receptor if it does occur.
Risk Event	An identified, unplanned event, which is considered relevant to the **Proposed Development** and has the potential to be a **Major Accident** and/or **Disaster** subject to assessment of its potential to result in a significant adverse effect on an environmental receptor.
Rochdale Envelope	The Rochdale Envelope is an acknowledged way of dealing with an application comprising **EIA development,** where details of a project have not been fully resolved by the time the **application** is submitted. The term is used to describe those elements of a scheme that have not yet been finalised, but yet can be accommodated within certain limits and parameters allowing the likely significant effects of a project to be presented in the **Environmental Statement** as a worst case. It also provides the opportunity to assess aspects of a development where the detailed design is to be developed post grant of a DCO and approved by the **local planning authority** under a Requirement.
Scoping	An exercise undertaken pursuant to the **EIA Regulations**, to determine the topics to be addressed within the **Environmental Statement** (ES).
Scoping Red Line Boundary	The boundary considered to be the limits of the Proposed Development, as studied as part of the **Scoping Report.**
Scoping Opinion	The **Secretary of State's** written opinion as to the scope, and level of detail, of the information to be provided in the environmental statement.

Term	Description
Scoping Report	A report prepared by an **Applicant** to provide the information required under the **EIA Regulations** to request a **Scoping Opinion** from the **Secretary of State**.
Secondary Mitigation	Actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent, or through inclusion in the **Environmental Statement** (ES).
Secretary of State (SoS)	In case of the **Proposed Development**, the Secretary of State for Department of Energy Security and Net Zero (DEZNZ)
Sequential Test	Risk based assessment from **National Planning Policy Framework** NPPF to encourage new development towards areas of least flood risk.
Significance	A measure of the importance or gravity of the effect defined by significance criteria specific to the environmental topic.
Significant Observed Adverse Effect Level (SOAEL)	The level above which significant adverse effects on health and quality of life occur as a result of noise or vibration. (see also: **Significance**).
Site	The land within the **Scoping Red Line Boundary** that will be shown on the **Works Plans.**
Site of Importance for Nature Conservation (SINC)	Sites of Importance for Nature Conservation are usually selected within a local authority area and support both locally and nationally threatened **Habitats** and **Species** that are priorities under the county or **UK Biodiversity Action Plan** (BAP).
Site of Special Scientific Interest (SSSI)	A site statutorily notified under the Wildlife and Countryside Act 1981 (as amended) as being of special nature conservation or geological interest. **Site of Special Scientific Interest** (SSSIs) include **Habitats**, geological features and **Landforms**.
Solar Farm	Proposed generating station comprised of solar PV modules mounted on racks and connected via associated infrastructure to the national grid.
Solar PV Array Works Area	The area located within the Solar Farm Site, and which will be the location for the **PV Arrays**, Plant, Solar Stations, Secondary Access Tracks, some Low Voltage Distribution Cables and associated works.
Source Protection Zone 1 (SPZ 1)	Also referred to as 'inner zone'. In relation to contamination risks to groundwater sources, defined by the Environment Agency as the 50- day travel time from any point below the water table to the source. This zone has a minimum radius of 50 meters.

Term	Description
Space Weather	Describes changing environmental conditions in near-Earth space. Magnetic fields, radiation, particles and matter, which have been ejected from the Sun, can interact with the Earth's upper atmosphere and surrounding magnetic field to produce a variety of effects.
Special Area of Conservation (SAC)	Areas of protected habitats and species as defined in the Habitats Directive.
Special Protection Area (SPA)	Sites classified in accordance with Article 4 of the EC Birds Directive (79/409/EEC) which came into force in April 1979. They are classified for rare and vulnerable birds (as listed on Annex 1 of the Directive), and for regularly occurring migratory Species.
Species	A group of interbreeding organisms that seldom or never interbreed with individuals in other such groups, under natural conditions; most species are made up of subspecies or populations.
Study Area	The area around the **Scoping Red Line Boundary** within which impacts could occur and therefore within which specialist assessment is undertaken.
Survey Area	The area within which environmental surveys are undertaken.
Statutory Consultation	The **Planning Act 2008** (as amended) (PA 2008) requires an Applicant to undertake public consultation in advance of submitting a **Development Consent Order** (DCO) application to the **Secretary of State** (SoS). Statutory consultation must occur with 'statutory consultees and the formal consultation period will normally last for 21 days.
Statutory Consultees	Planning law prescribes circumstances where the **Secretary of State** is required to consult specified bodies prior to a decision being made on an application. Includes bodies such as: **Natural Resource Wales**, National Highways, Historic Wales, Parish Councils, among others.
Survey Buffer	An area additional to the core **Survey Area** within which surveys may be required.
Temporary Works	Those parts of the works that allow or enable construction of the **Proposed Development** and which do not remain in place at the completion of the works.
Tertiary Mitigation	Actions that would occur with or without input from the **EIA** feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental **Effects**.

Term	Description
Town and Country Planning Act	The Town and Country Planning Act 1990 (as amended) gives **Local Planning Authorities** in England and Wales the power to regulate and grant permission for local development. It is used to permit development for the **Project** which does not fall under the **Planning Act 2008**.
Townscape	The character and composition of the built environment including the buildings and the relationships between them, the different types of open urban space, including green spaces, and the relationship between buildings and open spaces.
Transect	Survey technique for surveying birds, wintering birds and breeding birds, with surveyors walking pre-defined routes.
Transformers	Transformers control the voltage of the electricity generated across the site before it reaches the proposed substations.
Trenchless	Trenchless technology is the science and engineering of installing underground pipes using techniques which minimise the amount of excavation and associated environmental disturbance associated with Open Cut techniques.
Visual Amenity	Overall enjoyment of a particular area, surroundings, or views in terms of people's activities - living, recreating, travelling through, visiting, or working.
Visual Effect	An effect on specific views and on the general visual amenity experienced by people.
Visual Receptor	Individuals and / or defined groups of people who have the potential to be affected by the **Proposed Development**.
Vulnerability	In the context of the 2014 EU Directive, the term refers to the 'exposure and resilience' of the Proposed Development to the risk of a major accident and/or disaster. Vulnerability is influenced by sensitivity, adaptive capacity and magnitude of impact.
Waste	Any substance or object which the holder discards or intends or is required to discard.
Waste Hierarchy	Sets out the priorities that must be applied when managing waste.
Water Framework Directive (WFD)	European directive which commits member states to achieve good qualitative status of all water bodies.
Water Body	A discrete body of water forming a physical Feature.
Wetlands	Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters.

Term	Description
Wildlife and Countryside Act 1981 (as amended)	The principal piece of UK legislation relating to the protection of wildlife.
Working Width	The temporary boundary within which works are expected to take place.
Zone of Influence (ZOI)	The areas / resources that may be affected by the changes caused by activities associated with a project.
Zone of Theoretical Visibility (ZTV)	A map, digitally produced, showing areas of land within which, the Proposed Development is theoretically visible.

EIA Scoping Report

Appendix 1B: Acronyms and Abbreviations

Other Documents [PINS Ref: EN010171]

Document Reference: EN 010171/ SCP APP/1B
Revision Number: 1
December 2024
Future Energy Llanwern Limited

Appendix 1B Acronyms and Abbreviations

Term	Description
ADS	Archaeological Data Service
AEP	Annual Exceedance Probability
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
AONB	Areas of outstanding natural beauty
APFP	Applications: Prescribed Forms and Procedure
AQMA	Air Quality Management Areas
ASA	Archaeologically Sensitive Area
ASIDOHL	Assessment of the Significance of the Impact of Development on Historic Landscape
BGS	British Geological Survey
BMV	Best and Most Versatile
BNB	Biodiversity Net Benefit
BNL	Basic Noise Level
BPM	Best Practicable Means
BRE	British Research Establishment
CAR	Control of Asbestos Regulations
CCC	City of Cardiff Council
CDM	Construction (Design and Management) Regulations
CEA	Cumulative Effects Assessment
CIfA	Chartered Institute for Archaeologists
CNP	Critical National Priority
COP	Codes of Practice
CRAPW	Central Registry for Aerial Photography Wales
CRI	Climate Risk Indicators
CRTN	Calculation of Road Traffic
CTMP	Construction Traffic Management Plan
CTMP	Construction Traffic Management Plan
DAM	Development Advice Map
DCO	Development Consent Order
DMRB	Design Manual for Roads and Bridges
DNO	Distribution Network Operator

Term	Description
EEA	European Economic Area
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EPA	Environmental Protection Act
EPUK	Environmental Protection UK
ES	Environmental Statement
EU	European Union
FAA	Federal Aviation Administration
FCA	Flood Consequences Assessment
FRA	Flood Risk Assessment
GA	Gwent Archives
GCR	Geological Conservation Review
GHG	greenhouse gas emissions
GIS	Geographic Information System
GVA	Gross Value Added
GWDTE	Groundwater Dependent Terrestrial Ecosystem
GWT	Gwent Wildlife Trust
HCLA	Historic Landscape Character Areas
HDD	Horizontal Directional Drilling
HEBDA	Historic Environment Desk Based Assessment
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HMP	Habitat Management Plan
HV	High Voltage
IAQM	Institute of Air Quality Management's
ICCI	In-combination Climate Impacts
ICE	Institute of Civil Engineers
ICNIRP	Commission on Non – Ionizing Radiation Protection
IDD	Internal Drainage District
IEMA	Institute of Environmental Management and Assessment
IP	Information Paper
IPCC	Intergovernmental Panel on Climate Change
LCRM	Land Contamination Risk Management

Term	Description
LDP	Local Development Plan
LEMP	Landscape and Ecological Management Plan
LNR	Local Nature Reserve
LOHI	Landscape of Outstanding Historic Interest
LPA	Local Planning Authorities
LVIA	Landscape and Visual Impact Assessment
MAFF	Ministry of Agriculture Fisheries and Food
MCC	Monmouthshire County Council
MMP	Materials Management Plan
MW	Megawatts
NCC	Newport City Council
NCN	National Cycling Network
NCN	National Cycle Network
NDF	National Development Framework
NHLS	National Library of Scotland
NLCA	National Landscape Character Areas
NMR	National Monument Record
NNR	National Nature Reserves
NNR	National Nature Reserves
NPS	National Policy Statement
NRW	Natural Resources Wales
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
oCEMP	Outline Construction Environmental Management Plan
PAS	Publicly Available Specifications
PCB	Polychlorinated Biphenyl
PEIR	Preliminary Environmental Information Report
PEIR	Preliminary Environmental Impact Report
PINS	Planning Inspectorate
PPW	Planning Policy Wales
PRoW	Public Rights of Way
PV	Photovoltaic
RAL	Reichs-Ausschuß für Lieferbedingungen Colour Management System

Term	Description
RCP	Representative Concentration Pathways
RHL	Registered Historic Landscape
RIGS	Regionally Important Geodiversity Sites
SAB	Sustainable Drainage Approving Body
SAC	Special Areas of Conservation
SGHAT	Solar Glare Hazard Analysis Tool technology
SLA	Special Landscape Area
SMP	Survey and Monitoring Plan
SPA	Special Protection Areas
SPZ	Source Protection Zone
SRN	Strategic Road Network
SSSI	Sites of Special Scientific Interest
ST	Grid Reference
TA	Transport Assessment
TAN	Technical Advice Note
VL	Veiling Luminance
WFD	Water Framework Directive
WWTW	Welsh Water Sewage Treatment Works
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

EIA Scoping Report

Appendix 8A: NRW Consultation

Scoping Report Appendices [PINS Ref: EN010171]

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		Topic Reference																	
Commitments Reference	Commitment Decsription	LVIA	Glint and G;are	Cultural Heritage and Archaealogy	Eoclogy	Ornithology	Water Environemtn and FRA	Ground Conditions	Traffic and Transport	Noise and Vibration	Climate Chance Resilience	Greenhouse Gas Assessment	Socio-Economics	Other Environmental Topics	Sec uring Mechanism	Timing	Consent Granting Body	Relevant Aplication Documents
C-1	A crossing schedule will be prepared which includes crossing methodology for each crossing of road, rail, public right of way (PRoW) and watercourse.														Requirements	Prior to phase of construction	Planning Inspectorate	
C-2	All aspects of the construction work will be in accordance with the Construction (Design and Management) Regulations 2015.														Requirements	Prior to phase of construction	Planning Inspectorate	All technical chapters other than Glint and Glare
C-3	Following construction, construction compounds will be returned to previous conditions as far as reasonably possible.														Requirements	Prior to phase of construction	Planning Inspectorate	All technical chapters other than Glint and Glare
C-4	Any disposal off-site of excavated material will be undertaken in consultation with the landowner/occupier and in accordance with theWaste Management Regulations.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 18: Other Environmental Topics: Waste
C-5	Signage and/or temporary public rights of way (PRoW) /footpath diversions will be provided during construction.														Requirements	Prior to phase of construction	Planning Inspectorate	Technical Chapters LVIA (5), Traffic and Transport (12) and Socio-economics (16)

C-6	Best practice air quality management measures will be applied as described in Institute of Air Quality Management (IAQM) (2016) guidance on the Assessment of Dust from Demolition and Construction 2016, version 1.1														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 18: Other Environmental Topics: Air Quality
C-7	Core working hours for construction will be 0700 to 1900 Monday to Friday, and 0800 to 1300 on Saturdays, apart from specific circumstances to be set out and agreed in the outline Construction Environmental Management Plan (oCEMP).														Requirements	Prior to phase of construction	Planning Inspectorate	Technical Chapters LVIA (5), Traffic and Transport (12), Noise and Vibration (13) and Socio-economics (16)
C-8	An outline landscape strategy (the Landscape and Environmental Management Plan or 'oLEMP') will be prepared														Requirements	Prior to phase of construction	Planning Inspectorate	Technical Chapters LVIA (5), Ecology (9) and Ornithology (10)
C-9	The oLEMP may include the following: - advance survey of landscape elements and other environmental receptors; - retention plans to ensure the protection of particular landscape elements; - advance landscape works to 'grow' proposed planting as early as possible, where practicable; - restoration of temporary construction works, (post construction); - implementation of landscape works which are likely to include earthworks and drainage, fencing/boundary, colour coordination, hard works, soft works/planting and maintenance; enhancement works; - a maintenance period of five years will be implemented to ensure the establishment of proposed landscape planting works; and - a management plan will be implemented to care for the landscape and environmental measures as part of the on-going operational period.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 5: LVIA
C-10	The oLEMP will be prepared to ensure benefits to the SSSI features along with monitoring and contingency measures to ensure their maintenance.														Requirements	Prior to phase of construction	Planning Inspectorate	Technical Chapters LVIA (5), Ecology (9) and Ornithology (10)
C-11	Solar panel optimisation: Adjusting the orientation, tilt, or spacing of solar panels to minimize glare reflection.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 6: Glint and Glare
C-12	Screening: Implementing physical barriers or vegetation to obstruct the line of sight between the solar farm and sensitive receptors where viable.														Requirements	pre-construction	Planning Inspectorate	Chapter 6: Glint and Glare

C-13	Exploring design options that minimize the visual impact of the solar farm on the surrounding landscape.															Requirements	pre-construction	Planning Inspectorate	Chapter 6: Glint and Glare
C-14	Opportunities for direct enhancement may come through potential mitigation measures, specifically design alterations to preserve historic assets in-situ. This will would be dependent on the preservation state and importance of the encountered archaeological remains being considered.															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 7: Cultural Heritage and Archaeology
C-15	Where feasible, and warranted, design adjustments will be agreed with the Principal Design team, in consultation where necessary with other environmental discipline teams, with an aim to minimise impacts to known and previously unrecorded historic assets.															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 7: Cultural Heritage and Archaeology
C-16	Where design adjustments are not feasible or warranted, an appropriate mitigation strategy will be proposed to reduce or mitigate any significant adverse effects identified.															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 7: Cultural Heritage and Archaeology
C-17	Measures to mitigate effects will normally consist of design adjustments, to allow significant resources to be protected and retained (preservation in situ) or, where this is not feasible, investigation and recording before and during development, with dissemination at an appropriate level (preservation by record).															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 7: Cultural Heritage and Archaeology
C-18	Possible mitigation strategy may follow a phased, iterative approach including a programme of non-intrusive surveys, followed by localised evaluation investigations, such as targeted trial trenching, prior to the commencement of construction where necessary. Dependent on investigation results further mitigation measures may be required this may including targetede monitoring of construction works in the form of archaeological watching briefs.															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 7: Cultural Heritage and Archaeology
C-19	The layout will reflect, where feasible, a preference for the retention and protection of higher value habitats including scrub, mature trees, higher quality grassland and watercourses. Losses of important vegetation will be compensated for through the planting/ creation of new habitats;															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology

C-20	An oCEMP will be required with sensitive timing of works, detailed method statements and measures to protect reens from pollution and siltation.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology
C-21	Construction methods to avoid significant adverse impacts to retained habitats.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology
C-22	Existing farm access tracks will be used wherever possible during construction, maintenance and decommissioning; improvements to these tracks including possible widening will be required. These will aim to utilise existing hedgerow gaps wherever possible. Any hedgerow lost during the creation of an access will be replaced within the scheme.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology
C-23	New reen crossings will be designed to minimise impacts to habitats and riparian species, sited away from sensitive locations (such as water vole burrows) and will avoid fragmentation effects.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology
C-24	The reens will be buffered to protect them from deterioration, avoid impacts to faunal species and to provide opportunities for habitat enhancement. Buffers to reens of semi-natural habitat will reduce run-off of nutrient enriched water entering the reens, and allow sensitive management for terrestrial invertebrates.														Requirements	operation	Planning Inspectorate	Chapter 8: Ecology and Chapter 10: Water Environment
C-25	The reen buffers will be designed to provide high value, semi-natural habitat;														Requirements	operation	Planning Inspectorate	Chapter 8: Ecology
C-26	There will be no obstruction of reens;														Requirements	operation	Planning Inspectorate	Chapter 8: Ecology
C-27	Gaps below fencing to prevent fragmentation for mobile species such as badger and otter;														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology

C-28	Mature trees, particularly those with potential for roosting bats will be retained;														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology
C-29	Cabling will be directionally drilled below ground to avoid disturbance to above-ground habitat and watercourses														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology
C-30	A detailed drainage strategy will be required to show no impacts on the reens or downstream ecological receptors;														Requirements	post construction	Planning Inspectorate	Chapter 8: Ecology
C-31	Mitigation licences for impacts to dormouse/ great crested newt habitat with appropriate compensatory habitat where required.														Requirements	post construction	Planning Inspectorate	Chapter 8: Ecology
C-32	Creation of new habitats to support and enhance existing faunal populations.														Requirements	post construction	Planning Inspectorate	Chapter 8: Ecology
C-33	A oLEMP will be implemented post-construction to include sensitive management of reens and buffers, low intensity grazing regime and sensitive hedgerow management to enhance site for the range of fauna and flora it supports;														Requirements	post construction	Planning Inspectorate	Chapter 8: Ecology
C-34	A decommissioning plan would be developed prior to the end of the project detailing sensitive methods of decommissioning.														Requirements	decomissioning	Planning Inspectorate	All technical chapters other than Glint and Glare
C-35	The removal of the southern hedgerow where double hedgerows exist on east-west running hedgerows will allow light to reach the reen, which would be expected to result in increased plant and fauna diversity within the reen.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology

C-36	An oCEMP to ensure that the construction phase is carefully planned to avoid the more significant impacts, including: - Implementing measures to prevent ground-nesting species such as skylark from nesting in the areas to be panelled. Such measures would include keeping the sward very short in the fields and using deterrents such as raptor kites. - Surveying and buffering nest sites of Schedule 1 species (e.g. barn owl) during the breeding season. - Utilise acoustic barriers where necessary (e.g. at nesting Cetti's warbler sites). - An Ecological Clerk of Works will be on Site, throughout the works but most importantly during the bird breeding season to undertake pre-works checks for nests.															Requirements	Prior to phase of construction	Planning Inspectorate	All technical chapters other than Glint and Glare
C-37	Utilising existing farm access tracks wherever possible during construction, maintenance and decommissioning to minimise impacts to breeding habitat within reens and hedgerows. Whilst improvements to these tracks including possible widening will be required, tracks will aim to utilise existing hedgerow gaps wherever possible and only very small scale hedgerow loss will be required.															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 8: Ecology and 9: Ornithology
C-38	It may not be possible to avoid the disturbance effect from operation of the Site but it will be possible to minimise it by routing access tracks so that they don't run along the boundaries of fields used by wintering birds. These should also avoid any known barn owl nesting sites. In addition, thick and tall hedgerow boundaries should be maintained to screen the Site from the fields used by wintering SPA birds.															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 9: Ornithology
C-39	Habitat creation for loss of breeding and foraging habitat, including infill hedgerow planting in gaps of retained hedgerows.															Requirements	post construction	Planning Inspectorate	Chapter 8: Ecology and 9: Ornithology
C-40	Panel installation to reduce unnecessary land take and allow grassland to be maintained below to provide foraging habitat.															Requirements	post construction	Planning Inspectorate	Chapter 8: Ecology and 9: Ornithology
C-41	Panel installation to have significant clearance between rows and the arrays themselves are partially transparent, which will permit vegetation growth beneath and continue to provide bird foraging and potential nesting habitat.															Requirements	post construction	Planning Inspectorate	Chapter 9: Ornithology
C-42	By design solar panels will be positioned at an inclined angle and this, along with the large gaps between rows this will enable birds to distinguish the surface from a water body.															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 9: Ornithology
C-43	Proposed Development may offer opportunity to enhance or reinstate the network of drainage features within the Site.															Requirements	post construction	Planning Inspectorate	Chapter 10: Water Environment and FRA

C-44	The Proposed Development wll include the use of appropriate drainage design, the use of runoff and sediment control measures where necessary and through the implementation of good working practice and adherence to an oCEMP														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 10: Water Environment and FRA
C-45	oCEMP will include: - Adoption of best practice pollution prevention, drainage control, and waste management procedures; - Control of drainage and sediment runoff from excavation areas and any access tracks; - Agreement on watercourse crossing schedule (method and type of structure); - Control of drainage and sediment runoff during the construction of watercourse crossings (where applicable); - Control of concrete pouring; and - Appropriate design of foundation installation, the management of soil water levels and the potential to generate excessive quantities of groundwater contaminated sediments.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 10: Water Environment and FRA
C-46	It is expected that buffer distances to watercourses will be maintained at a minimum of 7m from top of bank across the Site.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 10: Water Environment and FRA
C-47	Approach to watercourse cable crossings has not yet been agreed however the proposed method will be informed by the sensitivity of the watercourse, with trenchless construction techniques applied where appropriate.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 10: Water Environment and FRA
C-48	Existing internal tracks, points of access and field gates would be utilised where practical, however, in cases where these tracks need to be upgraded or new tracks constructed a Type 1 track would be constructed to provide access. The internal tracks would be 5 m wide and comprised of compacted stone.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 10: Water Environment and FRA
C-49	Where there will be a requirement to cross a watercourse, different temporary methods may be required dependent on the ground conditions and environmental constraints present within the Site. All scenarios would include a drainage trench up to 0.7m deep running along the length of the road.														Requirements	pre-construction	Planning Inspectorate	Chapter 10: Water Environment and FRA
C-50	An outline drainage strategy for the operational phase will be produced as part of the FCA to accompany the ES. The outline drainage strategy is anticipated to be the subject of a planning condition and will be prepared by the contractor before being agreed with NRW and the LLFAs. The strategy will incorporate the use of appropriate SuDS techniques as required, treating and infiltrating/attenuating surface water run-off generated from the Site, prior to discharging into the local surface water network at an agreed rate.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 10: Water Environment and FRA

C-51	The solar arrays will be mounted above ground level to minimise loss of flood storage. At this stage it is assumed the panel modules would be mounted on structures with a clearance level above ground level (agl) of up to approximately 1.0m, and a maximum upper height of 3.52m agl.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 10: Water Environment and FRA
C-52	The height of the arrays will be informed by predicted flood levels over the operational life of the Proposed Development.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 10: Water Environment and FRA
C-53	There would be a separation distance of approximately 1-2 cm between the rows of modules. The gaps will be maintained between each panel on the arrays to prevent an accumulation of rainwater runoff and to replicate greenfield response.														Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 10: Water Environment and FRA
C-54	Agricultural Land Classification (ALC) survey will be completed to confirm the baseline ALC grades present and obtain information on the soils present.														Requirements	Prior to phase of construction	Planning Inspectorate	Chpater 11: Ground Conditions
C-55	The ALC survey will inform a soil management plan containing soil management measures in general accordance with the Defra guidance and other relevant guidance such as the Institute of Quarrying 2021 Good Practice Guide for Handling Soils in Mineral Workings.														Requirements	Prior to phase of construction	Planning Inspectorate	Chpater 11: Ground Conditions
C-56	Completion of a Contaminated Land (Preliminary Risk Assessment) Desk Study – this ensures that the ground conditions, including the presence and location of known or potential land contamination, are well understood and communicated to those with design input to the Proposed Development at a sufficiently early stage of the design, helping to avoid the need for significant design changes in response to unexpected ground conditions later.														Requirements	Prior to phase of construction	Planning Inspectorate	Chpater 11: Ground Conditions

C-57	Compliance with industry good practice including LCRM for the assessment of risks from contaminated land.															Requirements	Prior to phase of construction	Planning Inspectorate	Chpater 11: Ground Conditions
C-58	Liaison with public rights of way officers in the two Local Authorities will ensure that any requirements for diversions and/or temporary closures of PRoW routes are supported and compliant.															Requirements	pre-construction	Planning Inspectorate	Chpater 12: Traffic and Transport
C-59	A draft Travel Plan will be included as part of the PEIR, and the ES, which will encourage car sharing and alternatives to arriving by private car, including encouraging the adoption of mini buses for staff.															Requirements	Prior to phase of construction	Planning Inspectorate	Chpater 12: Traffic and Transport
C-60	An In-combination Climate Impacts (ICCI) assessment is undertaken by assessing how identified receptors in the surrounding environment are affected by future climate parameters, informed by the future climate baseline. Inclusion of an ICCI assessment has been scoped in, but this will be addressed at PEIR or ES stage															Requirements	pre-construction	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-61	ICCI assessment will identify if any reported effects will be exacerbated or ameliorated by the effects of climate change and identify further mitigation where required. It will also assess embedded measures to improve the resilience of the environment within the Study Area to climate change, such as nature-based solutions.															Requirements	pre-construction	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-62	The proposed panels are monocrystalline HJT cell panels which have the highest temperature coefficient in comparison to others on the market.															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-63	The panels will be raised ca. 0.8 – 1 m above ground level to allow for natural air circulation and the grazing of sheep															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-64	The modules will be low-lying and on the mounting structure which will have 1-1.5 m deep foundations, subject to ground conditions. They will be installed as per manufacturer's specification and wind load testing carried out through the construction phase.															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 14: Climate Change Resilience

C-65	The solar panels will be monitored remotely and the site is covered by CCTV; which will allow any fire to be quickly identified															Requirements	Operation	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-66	The Flood Consequence Assessment (FCA) undertaken as part of the PEIR and ES will identify additional mitigation measures to protect the assets from flood risk increasing with climate change															Requirements	pre-construction	Planning Inspectorate	Chpater 10: Water Environment and FRA & Chapter 14: Climate Change Resilience
C-67	The detailed design of the foundations will be based on ground conditions identified through a range of surveys to ensure the structure is appropriately anchored.The materials used are also resistant to corrosion and are strong enough to withstand small ground heave.															Requirements	pre-construction	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-68	During the detailed design and procurement of equipment, the operating temperature ranges will be considered.															Requirements	Operation	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-69	Routine maintenance will identify failing components which will be replaced. Performance of modules and componentry is also monitored remotely to identify any faults or failures.															Requirements	Operation	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-70	During the detailed design and procurement, the specifications of access tracks will consider ambient temperatures. Routine maintenance will identify areas of damage which may need early replacement.															Requirements	pre-construction	Planning Inspectorate	Chapter 12 Traffic and Transport & Chapter 14: Climate Change Resilience
C-71	The detailed design of the access roads will be based on ground conditions identified through a range of surveys.															Requirements	pre-construction	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-72	Operational procedures will set out that maintenance tasks are planned around unsafe working conditions associated with climate change events.															Requirements	Operation	Planning Inspectorate	Chapter 14: Climate Change Resilience
C-73	Early-stage design and specification for construction of the Proposed Development with a view to minimising future GHG emissions, using the PAS 2080:202312 standard for carbon management in buildings and infrastructure11 as a basis for design optimisation, with consideration of the carbon reduction hierarchy during design and construction: - Avoid: aligning the outcomes of the Proposed Development and/or programme of work with the net zero transition at the system level and evaluate the basic need at the asset and/or network level; - Switch: assess alternative solutions and then adopt one that reduces whole life emissions through alternative scope, design approach, materials, technologies for operational carbon reduction, among others, while satisfying the whole life performance requirements; and - Improve: identify and adopt solutions and techniques that improve the use of resources and design life of an asset/network, including applying circular economy principles to assess materials/products in terms of their potential for reuse or recycling after end of life.															Requirements	During Construction	Planning Inspectorate	Chapter 15: GHG Assessment
C-74	Maximising the opportunity to use more sustainable materials by identifying in procurement documentation, that materials and products with reduced embodied carbon emissions, and materials/resources featuring recycled content are preferred (where safe and of sufficient integrity for engineering).															Requirements	During Construction	Planning Inspectorate	Chapter 15: GHG Assessment

C-75	Designing, specifying and constructing the Proposed Development with a view to maximising the operational lifespan and minimising the need for maintenance and refurbishment (and thus reducing the frequency of releasing associated GHG emissions).															Requirements	Prior to phase of construction	Planning Inspectorate	Chapter 15: GHG Assessment
C-76	Specifying efficient mechanical and electrical equipment (such as cables, structures, mounts) that is long-lasting and chosen for its durability and energy efficiency credentials.															Requirements	During Construction	Planning Inspectorate	Chapter 15: GHG Assessment
C-77	Using locally sourced materials where available and practicable to minimise the distance materials are transported from source to Site.															Requirements	During Construction	Planning Inspectorate	Chapter 15: GHG Assessment
C-78	Using more modern and efficient construction plant and delivery vehicles, and/or those powered by lower carbon fuels or electricity.															Requirements	During Construction	Planning Inspectorate	Chapter 15: GHG Assessment
C-79	Relevant design, mitigation and enhancement measures will be identified in the ES, which may include: - Specifying high efficiency mechanical and electrical equipment such as cables, structures, mounts - Maximising the operational effectiveness (efficient PV panels) and minimising the parasitic load. - Establish effective systems for energy monitoring and sub-metering for key components of the Proposed Development for optimisation of operational conditions. - Maximising the operational lifespan and minimising the need for maintenance and refurbishment (and all associated emissions). - Maximising the potential for reuse and recycling of materials/elements at the end-of-life stage. - Operating, maintaining and refurbishing the Proposed Development using energy efficient equipment.															Requirements	Operation	Planning Inspectorate	Chapter 15: GHG Assessment
C-80	The Proposed Development will generate renewable electricity across its entire lifetime. This provides a benefit in terms of displacing more carbon intensive forms of generation on the wider national grid. The net positive significant effect will be determined via comparisons to the potential emissions released from an alternative fossil-fuel generating stations (such as a combined cycle gas turbine plant).															Requirements	Operation	Planning Inspectorate	Chapter 15: GHG Assessment

EIA Scoping Report

Appendix 5A: LVIA Methodology

Scoping Report Appendix [PINS Ref: EN010171]

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Future Energy Llanwern Limited

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1.0 Introduction

1.1.1 The Project-wide approach to the assessment methodology is set out in **Chapter 4: The Environmental Impact Assessment Methodology**. This appendix describes the proposed methodology for the landscape and visual impact assessment (LVIA) for the Proposed Development.

1.1.2 The methodology, presented here as part of the scoping process, may be subject to change as a result of consultation and further development of the assessment process.

1.1.3 This appendix has been structured as follows:

- overview of LVIA methodology;
- iterative assessment and design;
- guidance, data sources and site surveys;
- assessing landscape effects;
- assessing visual effects;
- assessing cumulative landscape and visual effects;
- evaluation of significance;
- nature of effect; and
- visual representations.

1.2 Overview of the LVIA Methodology

1.2.1 The assessment will be undertaken in accordance with the Landscape Institute and IEMA (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3)[1], and other best practice guidance. An overview of the LVIA process is illustrated in **Figure 1-1**.

[1] Guidelines for Landscape and Visual Impact Assessment (Third Edition) (2013) [Online], available at: https://www.shropshire.gov.uk/media/27454/cd-83-glvia-3.pdf [Accessed December 2024].

1.2.2 The LVIA will assess the likely effects of the Proposed Development on the landscape and visual resource, encompassing effects on landscape elements, characteristics and landscape character, designated landscapes, visual effects and cumulative effects.

1.2.3 Essentially, the landscape and visual effects (and whether they are significant) is determined by an assessment of the nature or 'sensitivity' of each receptor or group of receptors and the nature of the effect or 'magnitude of change' that would result from the Proposed Development. The evaluation of sensitivity takes account of the value and susceptibility of the receptor to the Proposed Development. This is combined with an assessment of the magnitude of change which takes account of the size and scale of the proposed change, the geographical extent and the duration of that change. By combining assessments of sensitivity and magnitude of change, a level of landscape or visual effect can be evaluated and determined. The resulting level of effect is described in terms of whether it is significant or not significant and the type of effect is described as either direct or indirect; temporary or permanent (reversible); cumulative; and beneficial, neutral or adverse.

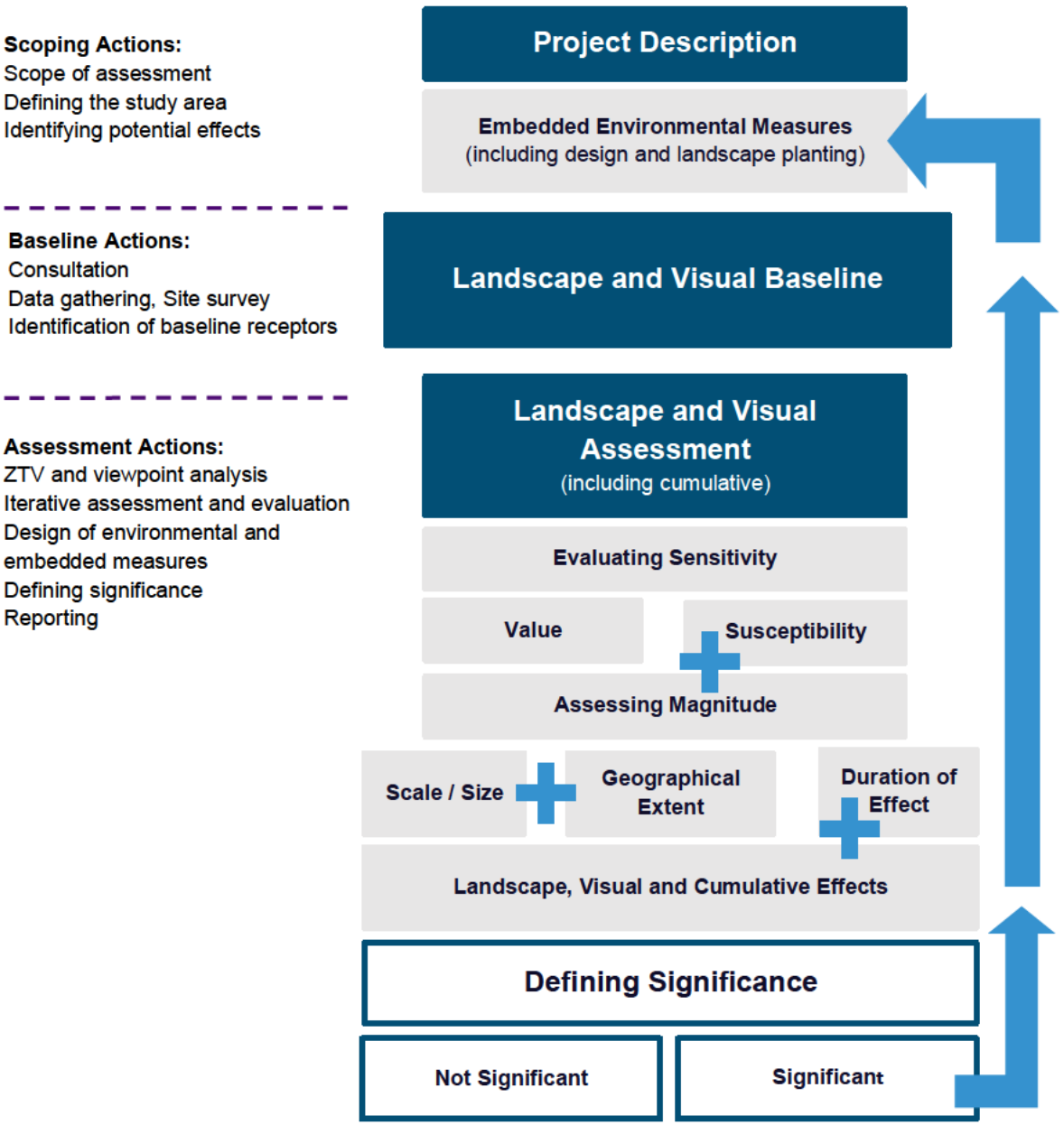


Figure 1-1 Overview of Approach to Landscape and Visual Impact Assessment

1.2.4 The assessment also considers the cumulative effects likely to result from the Proposed Development, and other similar proposed developments.

1.2.5 In each case an appropriate and proportionate level of assessment has been undertaken and agreed through consultation at the scoping stage. The level of assessment may be 'simple' (requiring desk-based data analysis) or 'detailed' (requiring site surveys and investigations in addition to desk-based analysis). The landscape and visual assessment unavoidably involves a combination of quantitative and qualitative assessment and—wherever possible—a consensus of professional opinion has been sought through consultation, internal peer review, and

the adoption of a systematic, impartial, and professional approach.

Defining the Study Area

1.2.6 IEMA Guidance (IEMA, 2015[2] and 2017[3]) recommends a proportionate Environmental Impact Assessment (EIA) focused on the potential likely significant effects of a development.

1.2.7 The LVIA study area must therefore be large enough to capture all likely significant effects. However, not so large that it may be considered disproportionate, if it makes understanding the key impacts of the Proposed Development more difficult by including extraneous baseline information, and hence receptors which are unlikely to be significantly affected by the Proposed Development.

1.2.8 This is supported by the Landscape Institute (GLVIA3) (Landscape Institute, 2013)[1] (paragraph 3.16) which recommends that "The level of detail provided should be that which is reasonably required to assess the likely significant effects'. Paragraph 5.2 also states that 'The study area should include the site itself and the full extent of the wider landscape around it which the Project may influence in a significant manner".

1.2.9 The study area therefore is based on professional judgement which aims to include those areas which are potentially and likely to be significantly affected by the Proposed Development. This judgement is based on early understanding of the local landscape character and the scale of the construction and development proposed within the Site Boundary as well as a review of study areas for similar projects.

1.2.10 The study area has been defined as an area 5km from the Site Boundary. This is illustrated in **Figure 5-1: ZTV and Viewpoint Locations with Designated Landscapes**.

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2 Institute of Environmental Management and Assessment Environmental Impact Assessment Guide to Shaping Quality Development (2015), [Online], available at: https://www.iaia.org/pdf/wab/IEMA%20Guidance%20Documents%20EIA%20Guide%20to%20Shaping%20Quality%20Development%20V6.pdf [Accessed December 2024]

3 Institute of Environmental Management and Assessment Delivering Proportionate EIA (2017), [Online], available at: https://www.iema.net/policy/ia/proportionate-eia-guidance-2017.pdf [Accessed December 2024]

1.2.11 The study area will be reviewed and amended in response to the Proposed Development evolution and refinement of the onshore components, the identification of any additional effects pathways, and in response to consultation.

1.3 Iterative Assessment and Design

Introduction

1.3.1 The LVIA is part of an iterative EIA process which aims to 'design out' significant effects via a range of design and environmental measures including avoidance of effects through the site selection process and subsequent use of landscape design techniques to reduce or eliminate significant effects. Design is an integrated part of the LVIA process and environmental measures related to landscape design and management can be an important tool to mitigate significant effects as well as providing enhancement.

1.3.2 In addition to the EIA process, Schedule 9 of the Electricity Act (1989)[4] includes duties to preserve the natural beauty of the countryside and provide reasonable mitigation.

1.3.3 The EIA process can also call on a range of environmental and technical specialists that contribute other forms of mitigation that may also bring a range of benefits to the Proposed Development. Potentially significant landscape and visual effects and the constraints and opportunities connected with their resolution are identified through the LVIA process. Where possible, mitigation such as design modification or landscape planting schemes are incorporated into the Proposed Development to mitigate landscape and visual effects – these are termed 'embedded environmental measures'.

1.3.4 Embedded mitigation will be recorded and an explanation will be provided of how the measures will be secured as well as documenting the design evolution of the Proposed Development.

[4] Electricity Act (1989), Online, available at: https://www.legislation.gov.uk/ukpga/1989/29/contents [Accessed December 2024].

Site Selection

1.3.5 Site selection is a key component of the design and environmental measures process and includes the use of baseline landscape and visual data and site / field surveys. The design measures will consider the potential to reduce overall landscape and visual effects, as well as the use of other landscape design techniques that can be used during construction, operation and decommissioning.

Potential Effects During Construction

1.3.6 A range of potential effects on the landscape and visual resource are likely during the construction of the Proposed Development. This appraisal of the potential effects helps define the scope and nature of the LVIA methodology. The potential effects likely to result from construction are described below.

- landscape effects:
  - effects on landscape elements, features and patterns (including, but not limited to soils, landform, ground vegetation, hedgerows/field boundaries, trees, woodland and buildings) as a result of land preparation including site clearance and earthworks;
  - effects on landscape character and key characteristics, including perceptual characteristics and qualities as a result of construction activities. The construction activities are likely to include the presence of construction staff and machinery, cranes, vehicle movements, contractors' facilities and site access associated with the Proposed Development; and
  - effects on the special landscape qualities and integrity of designated landscapes as a result of the above construction activities.
- visual effects:
  - effects on the views and visual amenity experienced by people undertaking various activities at various locations, distances and directions from the proposed land preparation and construction activities. These visual effects could be experienced from one location

or sequentially as part of a route through the landscape such as a PRoW.

1.3.7 Mitigation and design responses may include a range of design decisions about the location, form, process and timing of construction related infrastructure / operations to mitigate potential landscape and visual effects (avoid, reduce or compensate) as well as reference to a range of best practice behaviours and processes undertaken as part of construction site operation.

Potential Effects During Operation

1.3.8 The potential effects during operation relate principally to the presence of the Proposed Development, its on-going maintenance and the establishment of planting associated with the landscape design strategy, which forms part of the embedded environmental measures to mitigate significant landscape and visual effects.

1.3.9 The operational period of the Proposed Development is likely to result in a long-term (reversible) effect on landscape and visual receptors. These effects would be partly and increasingly mitigated by the implementation and establishment of the landscape design strategy which will typically be assessed during Years one to five (implementation and establishment) and typically years five to 15 to allow for the growth of vegetation and the prediction of any alteration to the operational effects on landscape and visual receptors. The periods of assessment will be agreed with consultees.

Potential Effects During Decommissioning

1.3.10 The Proposed Development would be decommissioned. This would lead in principle to a reversal of the landscape and visual effects.

1.4 Guidance Data Sources and Site Surveys

Guidance on Methodology

1.4.1 This methodology accords with the guidance set out in the GLVIA3[1]. Where it clarifies or diverges from specific aspects of the guidance, in a small number of areas, reasoned professional justification for this is provided as follows:

- GLVIA3[1] sets out an approach to the assessment of magnitude of change in which three separate considerations are combined within the magnitude of change rating. These are the size or scale of the effect, its geographical extent and its duration and reversibility. This approach is to be applied in respect of both landscape and visual receptors. The Applicant considers that the process of combining all three considerations in one rating can distort the aim of identifying significant effects of the Proposed Development. For example, a high magnitude of change, based on size or scale, may be reduced to a lower rating if it occurred in a localised geographical area and for a short duration. This might mean that a potentially significant effect could be overlooked if due to their limited geographical extents and/or short duration or reversibility;
- The Applicant has chosen to ensure that the description of the assessment of magnitude is therefore clearly explained and decisions regarding the weight to be given to the size or scale of the effect, its geographical extent and its duration and reversibility are fully explained in turn, starting with the size or scale, the geographical extents of the effects, and their duration and reversibility separately. A conclusion is then provided on the overall level of effect by combining with other judgements on sensitivity, to allow a final judgement to be made on whether an effect is significant or not significant; and
- The assessment methodology utilises six word scales to describe the magnitude of change – high, medium-high, medium, medium-low, low, low-very low and zero; which are preferred to the 'maximum of five categories' suggested in GLVIA3 (3.27)[1], as a means of clearly defining and summarising magnitude of change judgements.

1.4.2 These are not new deviations from GLVIA 3[1] and follow practice established on other similar projects.

Data Sources

1.4.3 A list of the data sources used for this assessment is provided in **Chapter 5: Landscape and Visual Impact Assessment** of the EIA Scoping Report.

Desk-based and Site Survey Work

1.4.4 A preliminary desk-based assessment will be undertaken of landscape and visual receptors using a range of map based data and related computer and digital analysis including Zone of Theoretical Visibility (ZTV), digital and/or surface terrain modelling and wireframe and street view software. This information will be used to inform initial assessments and focus the site survey work and likely locations for viewpoint photography and sequential route assessment.

1.4.5 A series of site surveys will be undertaken to verify the initial desk-based assessments which may only require simple assessment techniques to complete. This may be due to receptors falling outside the ZTV or confirmation of screening from vegetation and/or built form that means there would be no view of the Proposed Development.

1.4.6 Site surveys (referring to the Proposed Development) and field surveys (referring to the wider LVIA study area) are likely to include the following.

- site survey verification of landscape elements within the site and recommendations for embedded environmental measures where potentially significant effects are identified;
- field survey verification of the ZTV from landscape and visual receptor locations and transport and recreational routes through the LVIA study area;
- micro-siting of viewpoint locations and recording of panoramic baseline photography and subsequent visual assessment from the assessment viewpoints;
- field survey assessment and verification of likely landscape, visual and cumulative effects.

1.4.7 The viewpoint photography and visual assessment surveys are planned during 2024. Further visual assessment verification surveys are then likely to be undertaken prior to the application, using visualisations for each relevant viewpoint or particular receptor location.

1.4.8 All site survey work will be undertaken in fair weather conditions with good to excellent visibility.

1.5 Assessing Landscape Effects

Introduction

1.5.1 Landscape Effects are defined by the Landscape Institute in GLVIA 3, paragraphs 5.1 and 5.2[1] as follows:

"An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character."

1.5.2 In accordance with GLVIA 3[1] the term 'landscape' encompasses areas of 'townscape' and coastal areas of 'seascape'. In this assessment, the term 'landscape' is used to describe landscape and seascape unless otherwise noted. Areas of landscape are relevant to this assessment and is described as follows.

Landscape Character

1.5.3 GLVIA 3, paragraph 5.4, advises that Landscape Character Assessment should be regarded as the main source for baseline studies and identifies the following factors which combine to create areas of distinct landscape character:

- "the elements that make up the landscape in the study area including:
  - physical influences – geology, soils, landform, drainage and water bodies;
  - landcover, including different types of vegetation and patterns and types of tree cover; and
  - the influence of human activity, including land use and management, the character of settlements and buildings, and pattern and type of fields and enclosure.
- The aesthetic and perceptual aspects of the landscape – such as, for example, its scale, complexity, openness, tranquillity or wildness;

- The overall character of the landscape in the study area, including any distinctive Landscape Character Types or Areas that can be identified, and the particular combinations of elements and aesthetic and perceptual aspects that make each distinctive, usually by identification as key characteristics of the landscape."

Landscape Effects

1.5.4 The potential landscape effects, occurring during the construction, operation and decommissioning periods of the Proposed Development may therefore include, but are not restricted to the following.

- **changes to landscape elements:** the addition of new elements (solar farm) or the removal of existing elements such as trees, vegetation and buildings and other characteristic elements or valued features of the landscape character;
- **changes to landscape qualities:** degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of the landscape character or contribute to the landscape value;
- **changes to landscape character:** landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the addition of new features, the magnitude of which is sufficient to alter the overall landscape character within a particular area;
- **changes to designated landscapes**, including the Special Landscape Areas (SLA) that would affect the special landscape qualities underpinning the designation and its integrity; and
- **cumulative landscape effects:** where more than one development of a similar type may lead to a cumulative landscape effect.

1.5.5 Development may have a direct effect on the landscape as well as an indirect effect which would be perceived from the wider landscape, outside the immediate site area and its associated landscape character.

Evaluation Landscape Sensitivity to Change

1.5.6 The assessment of sensitivity takes account of the landscape value and the susceptibility of the receptor to the Proposed Development.

1.5.7 Landscape sensitivity often varies in response to both the type and phase of the development proposed and its location, such that landscape sensitivity needs to be considered on a case-by-case basis. It should not be confused with 'inherent sensitivity' where areas of the landscape may be referred to as inherently of 'high' or 'low' sensitivity. For example, a National Park may be described as inherently of high sensitivity on account of its designation and value, although it may prove to be less sensitive or susceptible to particular development, and of variable sensitivity across its geographical area. Alternatively, an undesignated landscape may be of high sensitivity to a particular development regardless of the lack of local or national designation.

Value of the Landscape Receptor

1.5.8 The value of a landscape receptor is a reflection of the value that society attaches to that landscape. The assessment of the landscape value will be classified as high, high-medium, medium, medium-low or low and the basis for this assessment will be made clear using evidence and professional judgement, based on the following range of factors:

- **Landscape designations** - A receptor that lies within the boundary of a recognised landscape related planning designation will be of increased value, depending on the proportion of the receptor that is affected and the level of importance of the designation which may be international, national, regional or local. The absence of designation does not however preclude value, as an undesignated landscape receptor may be valued as a resource in the local or immediate environment;
- **Landscape quality** - The quality of a landscape receptor is a reflection of its attributes, such as scenic quality, sense of place, rarity and representativeness and the extent to which its valued attributes have remained intact. A landscape with consistent, intact, well-defined and distinctive attributes is considered to be of higher quality and, in turn, higher value, than a landscape where the introduction of elements has detracted from its character;
- **Landscape experience** - The experiential qualities that can be evoked by a landscape receptor can add to its value. These responses relate to a number of factors including cultural associations that may exist in art, literature or history; the recreational value of the landscape, or the iconic status of the landscape in its own right; and its contribution of other values such as nature conservation or archaeology.

Landscape Susceptibility to Change

1.5.9 The susceptibility of a landscape receptor to change is a reflection of its ability to accommodate the changes that will occur as a result of the addition of the Proposed Development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies. Some landscape receptors are better able to accommodate development than others due to certain characteristics that are indicative of capacity to accommodate change. These characteristics may or not also be special landscape qualities that underpin designated landscapes.

1.5.10 The assessment of the susceptibility of the landscape receptor to change will be classified as high, high-medium, medium, medium-low or low and the basis for this assessment will be made clear using evidence and professional judgement. Indicators of landscape susceptibility to the type of development proposed (construction, operation and decommissioning of the Proposed Development) are based on the following criteria:

- **Overall Strength and Robustness** - Collectively the overall characteristics and qualities of a particular landscape result in a strong and robust landscape that is capable of reasonably accommodating the Proposed Development without undue adverse effects on the special landscape qualities (in the case of a designated landscape) or the key characteristics for which an area of landscape character or a particular element it is valued;
- **Landscape Scale and Topography** - The scale and topography are large enough to physically accommodate the development footprint without the requirement of invasive earthworks or drainage. Topographical features such as narrow valleys or more complex and small-scale landforms such as drumlins, incised river valleys/gorges, cliffs or rock outcrops are likely to be more susceptible to this type of development than broad, homogenous topography;
- **Openness** in the landscape may increase susceptibility to change because it can result in wider visibility of the Proposed Development, with enclosed landscapes able to offer a landscape framework with more

screening potential, limiting visibility to a smaller area, although they may also be smaller scale and more complex which would increase susceptibility. In general, landscapes with greater enclosure are likely to be less susceptible to the Proposed Development, than more open landscapes which may be less able to accommodate the Proposed Development and landscape mitigation in the form of planting schemes;

- **Land Cover Pattern** - Ancient and mature or long-established vegetation such as mature trees, woodland and protected hedgerows are likely to be more susceptible to the proposed development, particularly where these elements form part of a valued characteristic landscape pattern or feature. Conversely grassland/or arable crops and field boundaries comprising post and wire fencing, small, gappy hedges or young pioneer trees are likely to be less susceptible because they can be readily reinstated in the case of the cable corridor and are likely to be of lower landscape value;
- **Skyline** - Prominent and distinctive skylines and horizons with important landmark features that are identified in the landscape character assessment, are generally considered to be more susceptible to development such as the Proposed Development in comparison to broad, simple skylines which lack landmark features or contain other infrastructure features;
- **Relationship with other Development and Landmarks** - Contemporary landscapes where there are existing similar developments (converter stations and pylons) or other forms of development (industry, mineral extraction, masts urban fringe/large settlement, major transport routes) that already have a characterising influence result in a lower susceptible to development in comparison to areas characterised by smaller scale, historic development and landmarks (historic villages with dense settlement patterns and associated buildings such as church towers);
- **Rationale** - Some site locations have an obvious visual rationale for the Proposed Development in terms of the available space, access, simplicity and relationship to other similar forms of development. The design quality and embedded environmental measures will be high. Conversely a site

may appear overly constrained and require greater engineering or additional construction activity to accommodate the Proposed Development with lower design quality and few embedded environmental measures;

- **Remoteness, Naturalness, Wildness/Tranquillity** - Notably landscapes that are acknowledged to be particularly scenic, wild or tranquil are generally considered to be more susceptible to development in comparison to ordinary, cultivated or farmed/developed landscapes where perceptions of 'wildness' and tranquillity are less tangible. Landscapes which are either remote or appear natural may vary in their susceptibility to development;
- **Landscape Context and Adjacent Landscapes** - The extent to which the Proposed Development will influence landscape receptors across the study area relates to the associations that exist between the landscape receptor within which the Proposed Development is located and the landscape receptor from which the Proposed Development are being experienced. In some situations, this association will be strong, where the landscapes are directly related. For example, adjacent areas of landscape character may share or 'borrow' a high number of common characteristics. Landscape elements may be linked to or associated with wider landscape patterns such as individual trees forming part of an avenue or pattern of woodland copses, for example. In other situations, the association between adjacent landscapes will be weak. The context and visual connection to areas of adjacent landscape character or designations has a bearing on the susceptibility to development.

Landscape Sensitivity Rating

1.5.11 A sensitivity assessment of the landscape receptor will be made by combining the assessment of the value of the landscape character receptor and its susceptibility to change. The evaluation of landscape sensitivity is described as 'High', 'High-medium' 'Medium' 'Medium-low' or 'Low' and is drawn from the consideration of a range of criteria that indicate landscape value and susceptibility. The basis for the assessment (for example whether it is an overall assessment, or specific to the

location) will be made clear using evidence and professional judgement in the evaluation of sensitivity for each receptor. Criteria that tend towards higher or lower sensitivity are set out in **Table 1-1**.

Table 1-1 Landscape Sensitivity to Change

Value / Susceptibility criteria	Level of value / susceptibility ranging from High to Medium to Low High ⟷ Medium ⟷ Low	
Value – Landscape Value is determined by consideration a range of indicators/criteria with examples as follows:		
Designation:	Designated landscapes/elements with national policy level protection or defined for their natural beauty. Evidence that the landscape/element is valued or used substantially for recreational activity.	Landscapes without formal designation. Despoiled or degraded landscape with little or no evidence of being valued by the community. Elements that are uncharacteristic such as non-natives or self-seeded vegetation that may need to be cleared.
Quality	Higher quality landscapes/elements with consistent, intact and well-defined, distinctive attributes.	Lower quality landscapes/elements with indistinct elements or features that detract from its inherent attributes.
Rarity	Rare or unique landscape character types, features or elements.	Widespread or 'common' landscape character types, features or elements.
Aesthetic/scenic	Aesthetic/scenic or perceptual aspects of designated wildlife, ecological or cultural heritage features that contribute to landscape character.	Limited wildlife, ecological or cultural heritage features, or limited contribution to landscape character.
Perceptual qualities	Landscape with perceptual qualities of wildness, remoteness or tranquillity.	Limited or no evidence that the landscape is used for recreational activity.

Value / Susceptibility criteria	Level of value / susceptibility ranging from High to Medium to Low High ⟷ Medium Low	
Cultural associations	Landscape with strong cultural associations that contributes to scenic quality.	Landscape with few cultural associations.
Susceptibility to change – Landscape Susceptibility is determined by consideration a range of indicators / criteria with examples as follows:		
Strength and robustness	Fragile landscape vulnerable and lacking the ability to accommodate change.	Robust landscape, able to accommodate change or loss of features without undue adverse effects.
Landscape Scale	A smaller scale landscape that may require further engineering to accommodate the development.	A landscape of a suitably large enough scale to accommodate the development.
Openness/Enclosure	An open landscape with limited screening or potential may be of higher susceptibility to the Proposed Development.	An enclosed landscape with screening or potential for mitigation may be of lower susceptibility to the Proposed Development.
Reinstatement	Higher value, characteristic landcover and elements that cannot be easily reinstated or replaced.	Lower value, non-characteristic landcover and elements capable of rapid reinstatement.
Skyline	Distinctive undeveloped skylines with landmark features.	Developed, nondistinctive skylines.
Association	Weak and indirect association. Other development may be of a smaller scale or historic.	Strong or direct association other similar contemporary developments/landscape character.
Rationale	Strong landscape rationale and opportunity with high degree of design quality and/or embedded environmental measures.	Landscape with numerous environmental and technical constraints with lower design quality and/or embedded environmental measures.
Perceptual Qualities	Perceptual qualities associated with particular	Contemporary, cultivated/settled or developed

Value / Susceptibility criteria	Level of value / susceptibility ranging from High to Medium to Low High ⟷ Medium ⟷ Low	
	scenic qualities, wildness or tranquillity.	landscapes are likely to have a lower susceptibility.
Landscape Context	Adjacent landscape character context connected by borrowed character and views.	Host landscape character is separate from surrounding/adjacent landscape character.
Sensitivity to change	**Sensitivity drawn from consideration of the above Value and Susceptibility criteria with the final conclusion on the level of Sensitivity ranging from 'High' to 'Medium' to 'Low'.**	

Landscape Magnitude of Change

1.5.12 The magnitude of change affecting landscape receptors is an expression of the scale of change that would result from the Proposed Development. In assessing the magnitude of change the assessment has focused on the size or scale of change and its geographical extent.

Size or Scale of Change

1.5.13 This criterion relates to the size or scale of change to the landscape that would arise as a result of the Proposed Development, based on the following factors.

- **Landscape Elements:** The degree to which the landscape elements or pattern of elements that makes up the landscape character would be altered by the Proposed Development, through the loss, alteration or addition of elements in the landscape. The magnitude of change would generally be higher if the features that make up the landscape character are extensively removed or altered, and/or if many new components are added to the landscape;
- **Landscape Characteristics**: The extent to which the effect of the Proposed Development change, (physically or perceptually) the key characteristics of the landscape which may be important to its distinctive character. This may include, for example, the scale of the landform, its

relative simplicity, complexity or irregularity, the nature of the landscape context, the grain or orientation of the landscape, the degree to which the receptor is influenced by external features and the juxtaposition of the Proposed Development in relation to these key characteristics;

- **Landscape Character/Designation**: The degree to which landscape character receptors would be changed by the addition of the Proposed Development. If the Proposed Development are located in a landscape receptor that is already affected by other similar development, this may reduce the magnitude of change if there is a high level of integration and the developments form a unified and cohesive feature in the landscape. In the case of designated landscapes, the degree of change is considered in light of the effects on the special landscape qualities which underpin the designation and the effect on the integrity of the designation;
- **All landscapes change** over time and much of that change is managed or planned. Often landscapes will have management objectives for 'protection' or 'accommodation' of development. The scale of change may be localised, or occurring over parts of an area, or more widespread affecting whole landscape character areas and their overall integrity;
- **Distance**: The size and scale of change is also strongly influenced by the proximity of the Proposed Development to the receptor and the extent to which the development can be seen as a characterising influence on the landscape. Consequently, the scale or magnitude of change is likely to be lower in respect of landscape receptors that are distant from the Proposed Development and/or screened by intervening landform, vegetation and built form to the extent that the scale of their influence on landscape receptors is small or limited. Conversely, landscapes closest to the development are likely to be most affected. Host landscapes (where the development is located within a 'host' landscape character unit) would be directly affected whilst adjacent areas of landscape character would be indirectly affected.

Geographical Extent

1.5.14 Landscape effects are described in terms of the geographical extent or physical area that would be affected (described as a linear or area measurement). This should not be confused with the scale of the development or its physical footprint. The manner in which the geographical extent of the landscape effect is described for different landscape receptors is explained as follows.

- landscape elements:
  - the geographical extent of landscape elements may be objectively measured in terms of numbers, area or linear measurement. For example, the number of trees, area of woodland/or length of hedgerow affected may be recorded.
- landscape character/characteristics:
  - the extent of the effects on landscape character will vary depending on the specific nature of the Proposed Development. This is not simply an expression of visibility or the extent of the ZTV. It is a specific assessment of the extent of landscape character that would be changed by the Proposed Development in terms of its character, key characteristics and elements.
- landscape designations:
  - in the case of a designated landscape, this refers to the extent the special landscape qualities of the designation are affected and whether this can be defined in terms of area or linear measurements, or subjectively (with the support of panel and/or peer review) and whether the integrity of the designation is affected.

Duration and Reversibility

1.5.15 The duration and reversibility of landscape effects would be based on the period over which the Proposed Development are likely to exist (during construction and operation) and the extent to which these elements would be removed (during decommissioning) and the effects reversed at the end of that period. Long-term, medium-term and short-term landscape effects are defined as follows:

- long-term – more than 10 years (may be defined as permanent or reversible);
- medium-term – 6 to 10 years; and
- short-term – 1 to 5 years.

Landscape Magnitude of Change Rating

1.5.16 The 'magnitude' or 'degree of change' resulting from the Proposed Development is described as 'High', 'High-Medium', 'Medium', 'Medium-Low', 'Low' or 'Very Low' or 'Zero''. The basis for the assessment of magnitude for each receptor will be made clear using evidence and professional judgement.

1.5.17 The levels of magnitude of change that can occur are defined in **Table 1-2**.

Table 1-2 Landscape Magnitude of Change Ratings

Magnitude of Landscape Change	Examples of Landscape Magnitude
High	• size/scale: A large-scale change and major loss of key landscape elements/characteristics or the addition of large scale or numerous new and uncharacteristic features or elements that would affect the landscape character and the special landscape qualities/integrity of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor. • geographical extent: The size or scale of change would typically, but not always affect a large geographical extent or area and may be close to the proposed development.
High-Medium	Intermediate rating with combination of criteria from high or medium magnitude.
Medium	• size/scale: A medium scale change and moderate loss of some key landscape elements/characteristics or the addition of some new medium scale uncharacteristic features or elements that could partially affect the landscape character and the special landscape qualities/integrity of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor.

Magnitude of Landscape Change	Examples of Landscape Magnitude
	• geographical extent: The size or scale of landscape change would typically, but not always affect a more localised geographical extent at an intermediate distance from the proposed development.
Medium-Low	Intermediate rating with combination of criteria from medium or low magnitude.
Low	• size/scale: A small-scale change and minor loss of a few landscape elements/non key characteristics, or the addition of some new small-scale features or elements of limited characterising influence on landscape character/designations. • geographical extent: There may be a small partial change in landscape character, typically, but not always affecting a localised geographical extent at some distance from the proposed development.
Low-Very Low	Intermediate rating with combination of criteria from low or very low magnitude.
Very Low to Zero	• size/scale: A very small-scale change that may include the loss or addition of some landscape elements of limited characterising influence. The landscape characteristics and character would be unaffected. • geographical extent: Typically affecting a very small geographical extent at greater distance from the proposed development.

Evaluating Landscape Effects and Significance

1.5.18 The level of landscape effect is evaluated through the combination of landscape sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations[5]. This process is assisted by the matrix in **Table 1-5** which is used to guide the assessment.

[5] The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017), [Online], available at: https://www.legislation.gov.uk/uksi/2017/572#:~:text=10.,provided%20in%20the%20environmental%20statement [Accessed December 2024].

1.5.19 Further information is also provided about the nature of the effects (whether these would be direct/indirect; temporary/permanent/reversible; beneficial/neutral/adverse or cumulative).

Significant Landscape Effects

1.5.20 A significant effect would occur where the combination of the variables results in the Proposed Development having a defining effect on the landscape receptor, or where changes of a lower magnitude affect a landscape receptor that is of particularly high sensitivity. A major loss or irreversible effect over an extensive area or landscape character, affecting landscape elements, characteristics and/or perceptual aspects that are key to a nationally valued landscape are likely to be significant.

Non-significant Landscape Effects

1.5.21 A non-significant effect would occur where the effect of the Proposed Development is not defining, and the landscape character of the receptor continues to be characterised principally by its baseline characteristics. Equally a small-scale change experienced by a receptor of high sensitivity may not significantly affect the special landscape quality or integrity of a designation. Reversible effects, on elements, characteristics and character that are of small-scale or affecting lower value receptors are unlikely to be significant.

1.6 Assessing Visual Effects

1.6.1 Visual Effects are concerned wholly with the effect of the development on views, and the general visual amenity and are defined by the Landscape Institute in GLVIA 3, paragraph 6.1 as follows:

"An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern ... is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views."

1.6.2 Visual effects are identified for different receptors (people) who would experience the view at their place of residence, within their community, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:

- visual effect: a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view;
- cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.

1.6.3 The level of visual effect (and whether this is significant) is determined through consideration of the sensitivity of each visual receptor (or range of sensitivities for receptor groups) and the magnitude of change that would be brought about by the construction, operation and decommissioning of the Proposed Development.

Zone of Theoretical Visibility

1.6.4 Plans mapping the ZTV are used to analyse the extent of theoretical visibility of development or part of a development, across the study area and to assist with viewpoint selection. The ZTV does not however, take account of the screening effects of buildings, localised landform and vegetation, unless specifically noted (see individual figures). As a result, there may be roads, tracks and footpaths within the study area which, although shown as falling within the ZTV, are screened or filtered by built form and vegetation, which would otherwise preclude visibility.

1.6.5 The ZTVs provide a starting point in the assessment process and accordingly tend towards giving a ‘worst case’ or greatest calculation of the theoretical visibility.

Viewpoint Analysis

1.6.6 Viewpoint analysis is used to assist the assessment and is conducted from selected viewpoints within the study area. The purpose of this is to assess both the level of visual effect for particular receptors and to help guide the design process and focus the assessment. A range of viewpoints are examined in detail and analysed to determine whether a significant visual effect would occur. By arranging the viewpoints in order of distance it is possible to define a threshold or outer geographical limit, beyond which significant effects would be unlikely.

1.6.7 The assessment involves visiting the viewpoint location and viewing wirelines and photomontages prepared for each viewpoint location. The fieldwork is conducted in periods of fine weather with good visibility and considers seasonal changes such as reduced leaf cover or hedgerow maintenance.

1.6.8 The LVIA therefore includes viewpoint analysis prepared for each viewpoint and presented as supporting evidence in an appendix to the LVIA. A summary table of the findings will also be provided in order of distance from the development site. This summary table will assist in defining the direction, elevation, geographical spread and nature of the potential visual effects and identify areas where significant effects are likely to occur. This approach seeks to provide clarity and confidence to consultees and decision makers by allowing the detailed judgements on the magnitude of visual change to be more readily scrutinised and understood.

1.6.9 The viewpoint analysis is used to assist the visual assessment of visual receptor locations reported in the baseline.

Evaluating Visual Sensitivity to Change

1.6.10 In accordance with section 6.31 to 6.37 of GLVIA3[1], the sensitivity of visual receptors will be determined by a combination of the value of the view and the susceptibility of the visual receptors to the change likely to result from the Proposed Development on the view and visual amenity.

Value of the View

1.6.11 The value of a view or series of views reflects the recognition and importance attached either formally through identification on mapping or being subject to planning designations, or informally through the value which society attaches to the view(s). The value of a view will be classified as high, high-medium, medium, medium-low or low and the basis for this assessment will be made clear using evidence and professional judgement, based on the following criteria.

1.6.12 **Formal recognition** - The value of views can be formally recognised through their identification on OS or tourist maps as formal viewpoints, sign-posted and with facilities provided to add to the enjoyment of the viewpoint such as parking, seating and interpretation boards. Specific views may be afforded protection in local planning policy and recognised as valued views. Specific views can also be cited as being of importance in relation to landscape or heritage planning designations, for example the value of a view would be increased if it presents an important vista from a designed landscape or lies within or overlooks a designated area, which implies a greater value to the visible landscape.

1.6.13 **Informal recognition** - Views that are well-known at a local level and/or have particular scenic qualities can have an increased value, even if there is no formal recognition or designation. Views or viewpoints are sometimes informally recognised through references in art or literature and this can also add to their value. A viewpoint that is visited and appreciated by a large number of people would generally have greater importance than one gained by very few people.

Susceptibility to Change

1.6.14 Susceptibility relates to the nature of the viewer experiencing the view and how susceptible they are to the potential effects of the Proposed Development. A judgement to determine the level of susceptibility therefore relates to the nature of the viewer and their experience from that particular viewpoint or series of viewpoints, classified as high, high-medium, medium, medium-low or low and based on the following criteria:

- **Nature of the viewer** - The nature of the viewer is defined by the occupation or activity of the viewer at the viewpoint or series of viewpoints. The most common groups of viewers considered in the visual assessment include residents, motorists, and people taking part in recreational activity or working. Viewers, whose attention is focused on the landscape, or with static long-term views, are likely to have a higher sensitivity. Viewers travelling in cars or on trains would tend to have a lower sensitivity as their view is transient and moving. The least sensitive viewers are usually people at their place of work as they are generally less sensitive to changes in views;
- **Experience of the viewer** - The experience of the visual receptor relates to the extent to which the viewer's attention or interest may be focused on the view and the visual amenity they experience at a particular location. The susceptibility of the viewer to change arising from the Proposed Development may be influenced by the viewer's attention or interest in the view, which may be focused in a particular direction, from a static or transitory position, over a long or short duration, and with high or low clarity. For example, if the principal outlook from a settlement is aligned directly towards the Proposed Development, the experience of the visual receptor would be altered more notably than if the experience relates to a glimpsed view seen at an oblique angle from a car travelling at high speed. The visual amenity experienced by the viewer varies depending on the presence and relationship of visible elements, features or patterns experienced in the view and the degree to which the landscape in the view may accommodate the influence of the Proposed Development.

Visual Sensitivity Rating

1.6.15 An overall level of sensitivity will be applied for each visual receptor or view – High, High-Medium, Medium, Medium-Low, or Low – by combining individual assessments of the value of the view and the susceptibility of the visual receptor to change. Each visual receptor, meaning the particular person or group of people likely to be affected at a specific viewpoint, is assessed in terms of their sensitivity. The basis for the assessments will be made clear using evidence and professional

judgement in the evaluation of each receptor. Criteria that tend towards higher or lower sensitivity are set out in **Table 1-3**.

Table 1-3 Visual Sensitivity to Change

Value / Susceptibility criteria	Level of value / susceptibility ranging from 'High' to 'Medium' to 'Low' High ⟷ Medium ⟷ Low	
Value - Landscape Value is determined by a range of indicators/criteria with examples as follows:		
Map/tourist information	Specific viewpoint identified in OS maps and/or tourist information and signage.	Viewpoint not identified in OS maps or tourist information and signage.
Facilities	Facilities provided at viewpoint to aid the enjoyment of the view.	No facilities provided at viewpoint to aid enjoyment of the view.
Planning recognition	View afforded protection in planning policy.	View is not afforded protection in planning policy.
Landscape value	View is within or overlooks a designated landscape, which implies a higher value to the visible landscape.	View is not within, nor does it overlook, a designated landscape.
Recognition	View has informal recognition and well- known at a local level, as having particular scenic qualities.	View has no informal recognition and is not known as having particular scenic qualities.
Art/Literature	View or viewpoint is recognised through references in art or literature.	View or viewpoint is not recognised in references in art or literature.
Scenic Quality	View has high scenic qualities relating to the content and composition of the visible landscape.	View has low scenic qualities relating to the content and composition of the visible landscape.
Susceptibility to change – determined by a range of indicators/criteria with examples as follows:		
Activity of the viewer	Viewer who is likely or liable to be influenced by the Proposed Development such as residents, walkers, or tourists, whose main attention and interest are on their surroundings.	Viewer who is un or less likely to be influenced by the Proposed Development such as viewers whose attention is not focused on their surroundings

Value / Susceptibility criteria	Level of value / susceptibility ranging from 'High' to 'Medium' to 'Low' High ⟷ Medium ⟷ Low	
		(e.g. people at work, or team sports).
Nature of the View	Residents that gain static, long-term views of the Proposed Development in their principal outlook.	Viewers who are transient and dynamic, such as those travelling in cars or on trains, where the view is of short duration.
Direction/ Field of View	A view that is focused in a specific directional vista, with notable features of interest in a particular part of the view.	Open views with no specific point of interest.
Visual amenity	Viewers are focused on the experience of a high level of visual amenity at the location due to its overall pleasantness as an attractive visual setting or backdrop to activities.	The visual amenity experienced at the location by viewers is less pleasant or attractive than might otherwise be the case.
Sensitivity:	**Sensitivity drawn from consideration of the Value and Susceptibility criteria to level of Sensitivity ranging from 'High' to 'Medium' to 'Low'.**	

Visual Magnitude of Change

1.6.16 The visual magnitude of change is an expression of the scale of change that would result from the visibility of the Proposed Development. In assessing the magnitude of change the assessment has focused on the size or scale of change its geographical extent and its duration and reversibility which are all stated separately in relation to the assessed effects.

Size or Scale of Change

- An assessment will be made of the size or scale of change in the view that is likely to be experienced as a result of the Proposed Development, based on the following criteria:
- **Distance** - The distance between the visual receptor/viewpoint and the Proposed Development. Generally, the greater the distance, the lower the

magnitude of change, as the Proposed Development would constitute a smaller-scale component of the view;

- **Size** - The amount and size of the Proposed Development that would be seen. Visibility may range from a small or partial visibility of the Proposed Development to all of the Proposed Development being visible. Generally, the larger and greater number of the Proposed Development that appear in the view, the higher the magnitude of change;
- **Screening** - This is also related to the degree to which development may be wholly or partly screened by landform, vegetation (seasonal) and/or built form. Conversely open views are likely to reveal more of a development, particularly where this is a key characteristic of the landscape;
- **Scale** - The scale of the change in the view, with respect to the loss or addition of features in the view and changes in its composition. The scale of the Proposed Development may appear larger or smaller relative to the scale of the receiving landscape;
- **Field of View** - The vertical/horizontal field of view (FoV) and the proportion of view that is affected by the Proposed Development. Generally, the more of the proportion of a view that is affected, the higher the magnitude of change would be. If the Proposed Development extend across the whole of the open outlook, the magnitude of change would generally be higher as the full view would be affected. Conversely, if the Proposed Development extent over a narrow part of an open view, the magnitude of change is likely to be reduced as the Proposed Development would not affect the whole view or outlook. This can in part be described objectively by reference to the horizontal/vertical FoV affected, relative to the extent and proportion of the available view;
- **Contrast** - The character and context within which the Proposed Development would be seen and the degree of contrast or integration of any new features with existing landscape elements, in terms of scale, form, mass, line, height, colour, luminance and motion. Developments

which contrast or appear incongruous in terms of colour, scale and form are likely to be more visible and have a higher magnitude of change;

- **Consistency of image** - The consistency of image of the Proposed Development in relation to other developments. The magnitude of change for the Proposed Development is likely to be lower if it appears broadly similar to other developments in the landscape in terms of its scale, form and general appearance. New development is more likely to appear as logical components of the landscape with a strong rationale for their location;
- **Skyline/Background** - Whether the Proposed Development would be viewed against the skyline or a background landscape may affect the level of contrast and magnitude. For example, skyline developments may appear more noticeable, particularly where they affect open and uninterrupted or undeveloped horizons. Conversely, development may also appear more noticeable when viewed against a darker background landscape, such as forestry. In these cases, the magnitude of change would tend to be higher;
- If the Proposed Development add to an already developed skyline the magnitude of change would tend to be lower;
- **Number** - Generally, the greater the number of separate development components seen simultaneously or sequentially, the higher the magnitude of change and this may lead to whole project effect. Further cumulative effects would occur in the case of separate developments and their spatial relationship to each other would affect the magnitude of change. For example, development that appears as an extension to an existing development would tend to result in a lower magnitude of change than a separate, new development;
- **Nature of Visibility** - The nature of visibility is a further factor for consideration. The Proposed Development may be subject to various phases of development change and the manner in which the development may be viewed could be intermittent or continuous and/or seasonally, due to periodic management or leaf fall.

Geographical Extent

1.6.17 The geographic extent over which the visual effects would be experienced is also be assessed. This is distinct from the size or scale of effect and is described in terms of the physical area or location over which it would be experienced (described as a linear or area measurement). The extent of the effects would vary according to the specific nature of the Proposed Development and is principally assessed through ZTV, field survey and viewpoint analysis of the extent of visibility likely to be experienced by visual receptors. The geographical extent of visual effects is described as per the following examples:

- The geographical extent can be described as an area measurement or proportion of the total receptor affected. For example, effects on people within a particular area such as a golf course or area of common land can be illustrated via a 'representative viewpoint' that represents a similar visual effect, likely to be experienced by larger numbers of people within that area. The geographical extent of that visual effect can be expressed as approximately '5 hectares' or '10%' of the common land or a golf course area;
- The geographical extent can be described as a linear measurement (m or km) according to the length of route affected. For example, effects on people travelling on a route through the landscape such as a road or footpath can be illustrated via a 'representative viewpoint' that represents a similar visual effect, likely to be experienced by larger numbers of people along that route. The geographical extent of that visual effect can be expressed as approximately '2km' or '10%' of the total length of the route;
- The geographical extent of a visual effect experienced from a specific viewpoint may be limited to that location alone. (An example of a 'specific viewpoint' is a public viewpoint recommended in tourist literature such as a well visited hill summit. An example of an 'illustrative viewpoint' is a particular location within a built up or well vegetated area where an uncharacteristically open view exists).

Duration and Reversibility

1.6.18 The duration and reversibility of visual effects would be based on the period over which the Proposed Development are likely to exist (during construction, operation) and the extent to which these elements would be removed (during decommissioning) and the effects reversed at the end of that period. Long-term, medium-term and short-term visual effects are defined as follows:

- long-term – more than 10 years (may be defined as permanent of reversible);
- medium-term – 6 to 10 years; and
- short-term – 1 to 5 years.

Visual Magnitude of Change Rating

1.6.19 The 'magnitude' or 'degree of change' resulting from the Proposed Development is described as 'High', 'High-Medium', 'Medium', 'Medium-Low', 'Low', 'Low-Very Low' and 'Zero'. The basis for the assessment of magnitude for each receptor will be made clear using evidence and professional judgement and some examples of the levels of magnitude of change that can occur on views are defined in **Table 1-4.**

Table 1-4 Visual Magnitude of Change

Magnitude of landscape change	Examples of Visual Magnitude
High	• size and scale: A very large - large and dominant change to the view; • number: Involving the loss/addition of a large number of features/elements; • distance: Typically appearing closer to the viewer in the foreground. • FoV: Affecting a large vertical and wide horizontal FoV; • visibility: Multiple phase development with continuous / sequential visibility; • contrast: Strong contrast with surroundings with little or no screening. • skyline: Visible on the skyline as a new feature; and • consistency of image: Contrasting with other developments, lacking in visual rationale. Typically experienced from representative viewpoints illustrating a visual effect likely to be experienced by larger numbers of people, relative to the

Magnitude of landscape change	Examples of Visual Magnitude
	activity, affecting a large area or length/proportion of route. May also be experienced from a specific viewpoint.
High-medium	Intermediate rating with combination of criteria from high or medium magnitude of change category.
Medium	• size and scale: A medium and prominent change to the view; • number: Involving the loss/addition of a number of features/elements; • distance: Typically appearing in the middle ground; • FoV: Affecting a medium vertical and a medium horizontal FoV; • visibility: Multiple phase development with intermitant/sequential visibility; • contrast: Contrast with surroundings and may benefit from some screening; • skyline: Visible on the skyline along with other features; and • consistency of image: Different from other developments, some visual rationale. Typically experienced from representative viewpoints illustrating a visual effect likely to be experienced by a medium number of people, relative to the activity, affecting a medium area or length/proportion of route. May also be experienced from a specific viewpoint.
Medium-low	Intermediate rating with combination of criteria from medium or low magnitude of change category.
Low	• size and scale: A small/noticeable change, could be missed by casual observer; • number: Involving loss/addition of a small number of features/elements; • distance: Typically appearing in the background; • FoV:Affecting a small vertical and a narrow horizontal FoV; • visibility: Simple, single development, intermittently and infrequently visible; • contrast: Some parity, 'fits' with surroundings and benefits from screening; • skyline: Partly visible on a developed skyline or not visible on the skyline; and • consistency of image: Similar from other developments with visual rationale, appearing reasonably well accommodated within its surroundings. Typically experienced from illustrative viewpoints likely to be experienced by low numbers of people, relative to the activity, affecting a smaller area or length/proportion of route. May also be experienced from a specific viewpoint.

Magnitude of landscape change	Examples of Visual Magnitude
Negligible - Zero	• size and scale: A small or negligible change, need to 'look for it'; • number: Involving the loss/addition of a small number of features/elements; • distance: Typically appearing in the far distance; • FoV: Affecting a small vertical and a very narrow horizontal FoV; • visibility: Simple, single development, intermittently and infrequently visible; • contrast: Blends with surroundings and/or is well screened; • skyline: Partly visible on a developed skyline or not visible on the skyline; and consistency of image: Similar from other developments with strong visual rationale, of appearing well accommodated within its surroundings. Typically experienced from illustrative viewpoints likely to be experienced by low numbers of people, relative to the activity, affecting a smaller area or length/proportion of route. May also be experienced from a specific viewpoint.

Evaluating Visual Effects and Significance

Introduction

1.6.20 The level of visual effect is evaluated through the combination of visual sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations[5]. This process is assisted by the matrix in **Table 1-5** which is used to guide the assessment. The factors considered in the evaluation of the sensitivity and the magnitude of the change resulting from the Proposed Development and their conclusion, will be presented in a comprehensive, clear and transparent manner.

1.6.21 Further information is also provided about the nature of the effects (whether these would be direct/indirect; temporary/permanent/reversible; beneficial/neutral/adverse or cumulative).

Significant Visual Effects

1.6.22 A significant effect is more likely to occur where a combination of the variables results in the Proposed Development having a defining effect on the view or visual amenity or where changes affect a visual receptor that is of high sensitivity.

Non-significant Visual Effects

1.6.23 A non-significant effect is more likely to occur where a combination of the variables results in the Proposed Development having a non-defining effect on the view or visual amenity or where changes affect a visual receptor that is of low sensitivity.

Weather Conditions

1.6.24 The assessment of visual effects is undertaken in clear weather with good to excellent visibility. This means that the viewpoint assessment represents a maximum or fair assessment of the likely visual effects. The same viewpoint may be experienced under less optimal viewing conditions resulting in a significant effect appearing as non-significant, due to the change in the variable weather conditions. Due to the conditions of the assessment the reverse (a non-significant effect appearing as significant) is unlikely to occur.

1.7 Assessing Cumulative Landscape and Visual Effects

1.7.1 NatureScot's guidance, Assessing the Cumulative Impact of Onshore Wind Energy Developments (2021)[6] is widely used across the UK to inform the specific assessment of the cumulative effects of both onshore and offshore windfarms and can be adapted to other forms of development such as solar farms and grid infrastructure. The NatureScot (2021)[5] guidance defines:

- Cumulative effects as the additional changes caused by a Proposed Development in conjunction with other similar developments or as the

[6] Assessing the cumulative landscape and visual impact of onshore wind energy developments (2021), Online, available at: https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments [Accessed December 2024].

combined effect of a set of developments taken together (NatureScot, 2021: p4)[5];

- Cumulative landscape effects are those effects that 'can impact on either the physical fabric or character of the landscape, or any special values attached to it' (NatureScot, 2021, p10)[5]; and
- Cumulative visual effects are those effects that can be caused by combined visibility, which occurs where the observer is able to see two or more developments from one viewpoint and/or sequential effects which occur when the observer has to move to another viewpoint to see different developments (NatureScot, 2021, p11)[5].

1.7.2 The potential cumulative effects of the Proposed Development with other relevant existing, consented or proposed development are described as follows.

- The cumulative effects of the Proposed Development in addition to and in combination with other similar development (Solar Farms) that are either consented/under construction; the subject of a valid planning application; or proposed as part of relevant plans and programmes.

1.7.3 The cumulative assessment methodology for LVIA will be described once the scope of any cumulative assessment is confirmed and agreed through the consultation process.

1.8 Evaluation of Significance

1.8.1 The matrix presented in **Table 1-5** is used as a guide to illustrate the LVIA process. In line with the emphasis placed in GLVIA3[1] upon the application of professional judgement, an overly mechanistic reliance upon a matrix is avoided through the provision of clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape and visual receptor. Such narrative assessments provide a level of detail over and above the outline assessment provided by use of the matrix alone.

1.8.2 The landscape and visual assessment unavoidably, involves a combination of quantitative and qualitative assessment and wherever possible cross references will be made to objective evidence, baseline figures and/or to photomontage visualisations to support the assessment conclusions. Often a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach. Importantly each effect results from its own unique set of circumstances and have been assessed on a case by case basis. The matrix as presented in **Table 1-5** should therefore be considered as a guide and any deviation from this guide will be clearly explained in the assessment.

1.8.3 Significant landscape and visual effects are highlighted in bold and shaded dark grey in **Table 1-5**. They relate to all those effects that result in a **'Substantial', 'Major'** or a **'Major to Moderate'** level of effect. In some circumstances, '**Moderate**' levels of effect (shaded light grey) also have the potential, subject to the Applicant's opinion, to be considered as significant and these exceptions are also highlighted in bold in the text and will be explained as part of the assessment, where they occur. White or un-shaded boxes in **Table 1-5** indicate a non-significant effect.

1.8.4 In those instances where there would be no effect, the magnitude has been recorded as 'Zero' and the level of effect as 'None' or 'No View'. Intermediate levels of magnitude or effect are also used in the LVIA and are shown in **Table 1-5** in italics, for example High – Medium magnitude or Substantial to Major level of effect.

Table 1-5 Evaluation of Landscape and Visual Effects

Magnitude of Change	Landscape and Visual Sensitivity		
Very high	High	Medium	Low
High	Substantial	Major	Moderate
High-Medium	Substantial	Major to Moderate	Moderate to Minor
Medium	Major	Moderate	Minor
Medium-Low	Major to Moderate	Moderate To Minor	Minor
Low	Moderate	Minor	Negligible
Low-Very Low	Moderate to Minor	Negligible	Negligible
Very Low	Minor	Negligible	Negligible
Zero	None/ No View		

1.9 Nature of Effects

1.9.1 The EIA Regulations 2017[5] state that the EIA Report should define "the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development".

1.9.2 Cumulative effects have been described in **Section 1.7**, and "short-term, medium-term and long-term, permanent and temporary" are described in **Sections 1.5** and **1.6** under the heading 'Duration of Effect'.

1.9.3 The definition of the remaining terms used in this assessment is defined here.

Direct and Indirect Effects

1.9.4 Direct landscape effects relate to the host landscape and concern both physical and perceptual effects on the receptor.

1.9.5 Indirect landscape effects relate to those landscapes and receptors which separated by distance or remote from the development and therefore are only affected in terms of perceptual effects. The Landscape Institute also defines indirect effects as those which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.

1.9.6 Visual effects are generally all considered as direct effects. An indirect visual effect may however be used to define a visual effect on a view that is not in the direction of the main view of the viewer as described by the following examples.

- Road users generally face the road directly ahead in the direction of travel and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of travel they may be described as indirect;
- Designed landscapes and vistas/viewpoints may be orientated in a particular direction and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of the designed or main/primary view they may be described as indirect.

1.9.7 Secondary effects (or effects subsequent to an initial effect) are covered in this assessment by indirect effects.

Positive and Negative Effects

1.9.8 Guidance provided by the in GLVIA3[1] on the nature of effect (i.e. beneficial or adverse) states that 'in the LVIA, thought must be given to whether the likely significant landscape and visual effects are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity', but it does not provide guidance as to how that may be established in practice. The nature of effect is therefore one that requires interpretation and, where applied, this involves reasoned professional opinion.

1.9.9 In this assessment the nature of effects refers to whether the landscape and/or visual effect of the Proposed Development is positive or negative (herein referred to as 'beneficial'/'neutral' or 'adverse').

1.9.10 In relation to many forms of development, the LVIA will identify ‘beneficial’ and ‘adverse’ effects by assessing these under the term ‘Nature of Effect’. The landscape and visual effects of large-scale infrastructure are difficult to categorise in either of these brackets as, unlike other disciplines, there are no definitive criteria by which the effects can be measured as being categorically ‘beneficial’ or ‘adverse’. In some disciplines, such as noise or ecology, it is possible to quantify the effect in numeric terms, by objectively identifying or quantifying the proportion of a receptor that is affected and assessing the nature of that effect in justifiable terms. However, this is not the case in relation to landscape and visual effects where the approach combines quantitative and qualitative assessment.

1.9.11 Generally, in the development of ‘new’ energy infrastructure, a precautionary approach is adopted, which assumes that significant landscape and visual effects will be weighed on the adverse side of the planning balance. Unless it is stated otherwise, the effects considered in the assessment will be considered to be adverse. Beneficial or neutral effects may, however, arise in certain situations and are stated in the assessment where relevant, based on the following definitions.

- Beneficial effects contribute to the landscape and visual resource through the enhancement of desirable characteristics or the introduction of new, beneficial attributes. The development contributes to the landscape by virtue of good design or the introduction of new landscape planting. The removal of undesirable existing elements or characteristics can also be beneficial, as can their replacement with more appropriate components;
- Neutral effects occur where the development fits with the existing landscape character or visual amenity. The development neither contributes to or detracts from the landscape and visual resource and can be accommodated with neither beneficial or adverse effects, or where the effects are so limited that the change is hardly noticeable. A change to the landscape and visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation;

- Adverse effects are those that detract from the landscape character or quality of visual attributes experienced, through the introduction of elements that contrast, in a detrimental way, with the existing characteristics of the landscape and visual resource, or through the removal of elements that are key in its characterisation.

1.10 Glint and Glare

1.10.1 The Department for Communities and Local Government's guidance 'Planning Practice Guidance for Renewable and Low Carbon Energy' (March 2014) notes that "particular factors a local planning authority will need to consider include [inter alia] the effect on landscape of glint and glare".

1.10.2 Glint and glare are defined as follows:

"Glint (specular reflection) may be produced as a direct reflection of the sun from the development.

Glare (diffuse reflection) is a continuous source of brightness in scattered lightwaves. Glare is significantly less intense than glint."

1.10.3 A detailed Glint and Glare Assessment will be undertaken for the Proposed Development which will be separate to the LVIA, and consideration of the potential for glint and glare from the Proposed Development is included as part of the LVIA.

1.11 Visual Representations

1.11.1 ZTVs and visualisations (wirelines or wirelines and photomontages) are graphical images produced to assist and illustrate the LVIA and the cumulative assessment. The methodology used for viewpoint photography and photomontages will be produced in accordance with the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA 3)[1] and the Landscape Institute Technical Guidance Note on Visual Representation of Development Proposals (2019b[7]).

[7] Technical Guidance Note (2019b), Online, Available at: https://www.landscapeinstitute.org/wp-content/uploads/2019/09/LI_TGN-06-19_Visual_Representation-1.pdf [Accessed December 2024]

Methodology for Production of ZTVs

1.11.2 The ZTVs will be calculated using computer software to generate a ZTV of the Proposed Development, to demonstrate the theoretical extent of visibility from any point in the study area.

1.11.3 A 3D computer model will be developed of the existing landscape and key reference using digital terrain data as follows.

- Ordnance Survey Terrain 50: Used to produce the main or standard ZTV plot and wirelines, these tiles provide a digital record of the existing landform of Great Britain, or Digital Terrain Model (DTM) at 10m elevation intervals based on 50m grid squares and models representing the specified geometry and position of the onshore elements. The computer model will include the entire study area and takes account of the effects caused by atmospheric refraction and the Earth's curvature;
- Ordnance Survey light detection and ranging (LIDAR) Composite 2m: Used to produce a more detailed ZTV plots using 2m grid squares with surface features. It therefore takes into account the screening effects of vegetation, buildings or other surface features that may prevent or reduce visibility (insofar as they are represented in the LIDAR data). The computer model will include the entire study area and takes account of atmospheric refraction and the Earth's curvature.

1.11.4 The resulting ZTV plots will be overlaid on Ordnance Survey mapping at an appropriate scale and presented as figures using desktop publishing or graphic design software.

1.11.5 Cumulative ZTV plots based on the intervisibility of the Proposed Development and other relevant developments within the study area will also be produced.

1.11.6 There are limitations in this theoretical production, and these should be considered in the interpretation and use of the ZTV as follows.

- where the ZTV has been calculated using Ordnance Survey Terrain 50 this will not account for vegetation or built form unless added in the form of OS Vectormap data or digitally added and stated on the figure;
- where the ZTV has been calculated using Ordnance Survey LIDAR Composite only those surface features picked up by LIDAR data will be represented;
- the ZTVs are based on theoretical visibility from 2m above ground level;
- the ZTV shows higher to lower visibility based on the amount of the Proposed Development visible as represented by a grid of data points representing the 3D envelope, model or annotation of the Proposed Development; and
- the ZTV does not indicate the decrease in visibility that occurs with increased distance from the offshore elements of the Proposed Development. The nature of what is visible from 2km away will differ markedly from what is visible from 500m away, although both could be indicated in the ZTV as having the same level of visibility.

1.11.7 These limitations mean that while the ZTV is used as a starting point in the assessment, providing an indication of where the Proposed Development would theoretically be visible and tending to present a 'worst case' or over estimate of the theoretical visibility. The information drawn from the ZTV is checked by field survey observation.

Methodology for Baseline Photography

1.11.8 Once a view has been selected, the location is visited, confirmed, and assessed with the aid of a wireline or similar visualisation in the field. A photographic record is taken to record the view and the details of the viewpoint location and associated data are recorded to assist in the production of visualisations and to validate their accuracy.

1.11.9 The following photographic information is recorded:

- date, time, weather conditions and visual range;
- GPS recorded 12 figure grid reference accurate to ~5-10m;

- GPS recorded Above Ordnance Datum (AOD) height data;
- use of a fixed 50mm focal length lens is confirmed;
- horizontal field of view (in degrees);
- bearing to Target Site.

1.11.10 The photographs used to produce the photomontages will be taken with a digital SLR camera set to produce photographs equivalent to that of a manual 35mm SLR camera with a fixed 50mm focal length lens. The photographs will be taken on a tripod with a pano-head at a height of approximately 1.5m above ground.

1.11.11 All the resulting visualisations will be prepared to indicate other cumulative development in order that they may assist the cumulative assessment as well as the LVIA.

1.11.12 Whilst no two-dimensional image can fully represent the real viewing experience, the visualisation aims to provide a realistic representation of the onshore elements, based on current information and photomontage methodology.

Weather Conditions

1.11.13 GLVIA3 para 8.22[1] state – 'In preparing photomontages, weather conditions shown in the photographs should (with justification provided for the choice) be either:

- representative of those generally prevailing in the area; or
- taken in good visibility, seeking to represent a maximum visibility scenario when the development may be highly visible'.

1.11.14 In preparing photomontages for the LVIA, photographs will be taken in favourable weather conditions. Weather conditions shown in the photographs for all viewpoints have, where possible, will be taken during periods of 'very good' or 'excellent' visibility conditions, seeking to represent a maximum visibility scenario when the developments may be highly visible.

Methodology for Production of Visualisations

1.11.15 A photomontage is a visualisation which superimposes an image of a Project upon a photograph or series of photographs. Photomontage is a widespread and popular visualisation technique, which allows changes in views and visual amenity to be illustrated and assessed, within known views of the 'real' landscape.

1.11.16 To create the baseline panorama, the frames are individually cylindrically projected and then digitally joined to create a fully cylindrically projected panorama using Adobe Photoshop or PTGui software. This process avoids the wide-angle effect that would result should these frames be arranged in a perspective projection, whereby the image is not faceted to allow for the cylindrical nature of the full 360° view but appears essentially as a flat plane. Tonal alterations are made using Adobe software to create an even range of tones across the photographs once joined.

1.11.17 The photographs are also joined to create planar projection panoramas using PTGui software. These are used in the creation of the 53.5° field of view (FoV) photomontages. In some views, more than one 53.5° FoV panorama may be shown to accommodate the full width of the Proposed Development.

1.11.18 Visualisations that illustrate the Proposed Development, set within a computer-generated image of the landform will be used in the assessment to predict its theoretical appearance. This will be produced with a combination of Resoft WindFarm and 3D AutoCAD and will be based on a terrain model with a 2m data grid (2m Lidar data). There are limitations in the accuracy of DTM data so that landform may not be represented precisely and may result in differences in visibility, however, the use of 2m Lidar data minimises these limitations.

1.11.19 Rendering of the Proposed Development in the photomontages is as photorealistic as possible to the conditions shown in each viewpoint photograph. There is some variation in the appearance and visibility between the viewpoints, as they are rendered to suit the conditions shown in each of the different viewpoint photographs, which have some unavoidable degree of variation in terms of lighting and weather conditions. The key requirement is that the Proposed Development will be rendered with sufficient contrast against the skyline backdrop to illustrate its maximum visibility scenario in each image. Photomontages will be prepared to depict how the Proposed

Development would appear in excellent visibility conditions to illustrate the worst-case. The full suite of viewpoint photomontages should be viewed to gain an impression of the likely visual effects of the Proposed Development.

1.11.20 Visualisations will be produced for the agreed viewpoints identified in the LVIA and photomontages will aim to provide a photorealistic image of the appearance of the Proposed Development. 3D model representations are combined with the baseline view photographs to create a photorealistic rendered photomontage image of the development.

1.11.21 The baseline photographs and cumulative wireline visualisations shown for each viewpoint cover a 90° field of view (or in some cases, up to 360°), which accords with guidance. These are cylindrically projected images and should be viewed flat at a comfortable arm's length.

1.11.22 The 53.5° field of view wirelines and photomontages are prepared using a planar projected image and should also be viewed flat at a comfortable arm's length. These images are each printed on paper 841 x 297mm (half A1) which provides for a relatively large-scale image.

1.11.23 Visualisations of the Proposed Development will show, from each viewpoint, the existing baseline panorama and a wireframe or annotated panorama or photomontage.

1.11.24 The completed set of visualisations and accompanying data are then presented as figures using desktop publishing/graphic design software.

1.11.25 The photographs and other graphic material such as wirelines and photomontages used in this assessment are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.

Illustration of Landscape Planting Strategy

1.11.26 Visualisations will be prepared to illustrate the landscape design strategy which is proposed as an embedded environmental measure within the Proposed Development. This is likely to include landscaping illustrated in Year one (implementation) and at a later date during the establishment (between Years five to 15).

Limitations of Visualisations

1.11.27 The photomontage visualisations used in the LVIA are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.

1.11.28 The photomontage visualisations of the Proposed Development (and any development proposal) have a number of limitations when using them to form a judgement on visual effect. These include:

- a visualisation can never show exactly what a development will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
- the images provided give a reasonable impression of the scale and the distance to the Proposed Development, but can never be 100% accurate to the as constructed effect;
- a static image cannot convey movement or reflection from the sun;
- the viewpoints illustrated are representative of views in the area but cannot represent visibility at all locations;
- to form the best impression of the effects, these images are best viewed at the viewpoint location shown;
- the images must be printed and viewed at the correct size (841mm x 297mm);

- images should be held flat at a comfortable arm’s length. If viewing these images on a wall or board at an exhibition, stand at arm’s length from the image presented to gain the best impression;
- it is preferable to view printed images rather than view images on screen. Images on screen should be viewed using a normal PC screen with the image enlarged to the full screen height to give a realistic impression; and
- there are practical limitations to shooting viewpoint photographs only in very good or excellent visibility and at particular times of day.

EIA Scoping Report

Appendix 8A: NRW Consultation

Scoping Report Appendices [PINS Ref: EN010171]

Document Reference: EN 010171 / SCP APP/8A
Revision Number: 1
December 2024
Future Energy Llanwern Limited

Contents

Gwent Level Solar (NSIP) Formal Advice (DAS Request) 1

Gwent Level Solar (NSIP) Formal Advice (DAS Request)

[redacted]

Ein cyf/Our ref: CAS-264330-X0X8
Eich cyf/Your ref:

Dyddiad/Date: 27 September 2024

[redacted]Madam/Dear Sir/Madam,

BWRIAD/PROPOSAL: PROPOSED SOLAR FARM ON LAND TO THE SOUTH OF LLANWERN STEELWORKS (APPROX. 2.5KM) COMPRISING THE GWENT LEVELS BETWEEN WHITSON AND UNDY, NEWPORT.

Thank you for consulting Cyfoeth Naturiol Cymru (CNC)/Natural Resources Wales (NRW) about the above proposal.

Further to the recent meeting between NRW and yourselves (insert date), we note and accept the submission of a discretionary planning advice request for the above site. We have considered your enquiry in relation to our Development Planning Consultations Topics document (September 2018). Our advice is provided below for consideration prior to the submission of any planning application.

Please note this advice is in relation to the information submitted to date and does not prejudice any comments or advice in relation to any future planning applications.

1. Marine Ornithologist

A.

i. NRW broadly welcomes the approach to calculating functionally linked land for the Severn Estuary Special Protection Area (SPA), however, we are unable to agree with the suggested method without more information on how the survey data was collected, that will be compared with the WeBS 'moving 5 year average'.

   Prior to agreement, we would need to see the overwintering bird survey reports for the proposed development to consider the results in regard to recent condition assessments of SPA features of the Severn Estuary SPA. This should include all of the data collected in the surveys (not just peak counts of birds) as well as a map indicating where on the site or it's wider footprint, the birds were recorded. We also advise that the tidal and weather conditions at the time of each survey are clearly presented within the report. The report should clearly describe the methods used for field surveys, data recording and any analysis.

   We also advise that the numbers of birds detected on surveys need to be considered against the conservation objectives for the Severn Estuary SPA. Once we have this

information, we will be able to make a more informed decision on the proposed method for identifying functionally linked land.

2. Ecology / Protected Sites

A.

i. Definitive assessments to confirm the baseline conditions of the habitat and species features of the sites across the Gwent Levels have been undertaken. Please see attached two Gwent Levels reports 2010-13 for further information and consideration. This contains maps of the field ditch assessments and the condition of reens from the NRW 2010-13 surveys. In addition to the reports, we have attached three tables of the reen monitoring for the Caldicot Gwent Levels from 2017-2023. The tables compare the submerged flora reen data between 2010-13 and 2017-23 surveys to assess changes in feature condition. Please note that field ditches have not been re-assessed.

   NRW is in the process of undertaking or commissioning grassland surveys across the six Gwent levels to better understand and determine grassland habitat quality. Initial surveys were undertaken at Whitson Site of Special Scientific Interest (SSSI) in 2023/24 using aerial photograph, followed up with site surveys, this work is ongoing and has not been formally written up.

   Various fields within Gwent Levels Whitson SSSI have been identified in NRW surveys as MG5 *Cynosurus cristatus – Centaurea nigra*, some of which are atypical-with damp/inundation elements which raises their ecological value. Species-rich MG6 and MG11 also add to the combination / mixture of habitats. The neutral grassland habitat is of high conservation value in the Gwent Levels and such fields may qualify as SSSI grassland but are not yet notified. Other fields on the Gwent levels provide a complex mix of habitats and being adjacent to a watercourse provides even greater diversity. This mix of habitats and associated species (for instance Shrill carder bee (SCB), *Bombus sylvarum*) raises the combined value of the area and may also quality as a feature. We can see there are areas within the planning boundary that NRW have identified as habitat of interest for further assessment and others that are semi-improved grassland.

   For any surveys we strongly recommend grassland surveys are undertaken across the whole area where development is proposed. Slide 16 of the powerpoint presentation dated August 2024 indicates a Phase 1 Habitat survey has been undertaken. We advise that detailed surveys for the fields with the greatest floral biodiversity is undertaken and that these fields are avoided for development with panels.

   Fields with grips should also be highlighted as part of your survey work. As indicated for the Marshfield development: Grips are part of the Gwent levels historic landscape that is unique to Wales, they provide hydrological connections to the ditches and reens and provide wetter channels in the field which provide habitat for SSSI invertebrate features (see advice under Aquatic Invertebrates). The historic grips which are present on some fields have the potential to be permanently damaged by the proposal and therefore alter the existing drainage patterns. Damage to the grips can affect the hydrological connectivity of the interconnected drainage system and therefore could significantly affect the quantity and flow rate of water entering the SSSI reen and ditch network. In turn, this has the potential to affect the ability of the SSSI flora and fauna to survive in the watercourses.

ii. We refer you to information and advice we have provided for previous solar farm developments on the Gwent Levels. As advised previously, the management of water levels in all the reens (Internal Drainage District (IDD) and main reens), by the IDD is an important part of managing flood risk in the district. Under SSSI consent, as part of flood risk management, the IDD team manage the bankside vegetation (to top of reen banks) and undertake a desilting and deweeding program of IDD reens. Flood Operations team manage the vegetation and desilting of main reens as part of their consented work program.

Landowners are responsible for management of their privately owned ditches. The rotational management of reens and ditches supports the SSSI interest. Under section 16 (S16) of the Environment Act 2016, there are land management agreements across the Gwent levels for landowners. This is where a landowner has signed up to a paid 5 year agreement for management of the land and ditches within their land. This is funded by NRW's land management agreement budget and the capital works has in recent years been funded by Biodiversity and Ecosystem Resilience Fund (BERF) budget and Nature Networks Funding. S16s often have prescriptions specifically for low/no input pasture (inorganic and/or manure).

Capital works by landowners or contractors on S16 land can include ditch management (scrub removal, desilting, deweeding, casting), hay cuts, re gripping fields, culvert improvements, orchard management and restoration of fields. Colonisation of recently managed ditches is better where there is a nearby reen with a good diversity and abundance of flora and fauna. Capital works can also be carried out by landowners as part of their farm practises. In this instance NRW issues consent for the work.

The Heritage Lottery Fund Living Levels partnership has played an important role for education and management across the Gwent Levels. Our Living Levels is currently in development phase which will be a continuation of the original projects, including direct management. Farms that were under Tir Gofal and Glastir (Advanced and Entry level) also had support for the conservation management of grassland and ditch restoration to increase biodiversity.

iii. Positive management / enhancement of fields and ditches across the site should commence prior to construction so that mitigation fields are establishing at an early stage.

We recommend that the most botanically diverse fields should be left for wildlife including the rare SCB with solar panels avoided on these areas. Connectivity between botanically diverse areas and those supporting SCB will be important. From our experience of working with the Llanwern solar development, nutrient testing of fields that are proposed to be enhanced for pollinators should be undertaken to check whether wildflower establishment is likely. Wildflowers will not easily establish on fields which have had high nutrient input and measures would need to be taken to reduce nutrient and increase wildlflower establishment, for example nutrient stripping and yellow rattle in the seed mix. We refer you to the 'Living Levels Project document: Method Statement – Species-rich grassland creation, enhancement, and restoration'.

Late hay cuts (cut and removal) must be undertaken on connected areas across the site. It may be determined that two cuts are needed annually to enhance biodiversity.

There should be wide strips of vegetation alongside reens and ditches that are hay cut.

Ditch management should be undertaken between 1 Sept – 28 Feb to avoid the bird breeding season. Timing of works in this period of the year also avoids disturbance to the ditch flora when it is flourishing. A comprehensive plan for ditch management (scrub removal, deweeding and desilting and if needed casting) should be provided as part of a LEMP. It is preferable to remove scrub / hedge on the southern bank of ditches so that more sunlight reaches the channel.

Structures on site should be designed to limit the use of herbicide – currently at Llanwern we have a request (notice of intent) for a herbicide consent due to weed growth at inverter stations, cable crossing and access routes. Weeds for example are growing up through steps and gravel at the inverter stations. Also at a site meeting the owner raised issues of weeds including nettles and thistles growing under some areas of solar panels, it is not possible to manage the weens safely under panels with hand tools or machinery.

B.

i. Protected Sites

We recommend robust repeatable survey methods to enable clear comparisons between the surveys. The survey for SCB should be comprehensive with thorough survey of field margins which can support bees even when the field is more improved. The survey data should include identification of food plant the bee is foraging on. Areas to support nesting SCB should be identified and mapped. Any development must be able to deliver resilient habitat corridors and to maintain ecological connectivity in the wider environment.

We note there are fields of your site along the sea wall. There must be adequate consideration of functionally linked land that supports features of River Usk and Severn Estuary Special Area of Conservation (SAC), SPA and Ramsar site, given the sensitivity of the features.

The reens and ditches but also the grassland habitats of the Gwent Levels all have functional linkage which means they provide supporting habitat for essential life cycle processes of some or all the features of the SPA, SAC and SSSI, and contributes a proportion of the whole estuary population of various species. Therefore, effects upon these sites could reduce the estuary populations of the species, which may have an adverse effect on site integrity in view of the conservation objectives of the site. For example, given the reen and riparian habitats connect with the River Usk SAC it is known that commuting otters are supported in this wider environment. Otters are a feature of the River Usk SAC as well as being a European Protected Species in their own right. We recommend solar panel construction avoid these fields.

Key case law on functionally linked land is provided in the following Natural England report: Chapman, C. & Tyldesley, D. (2016) Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions. Natural England Commissioned Reports, Number 207. Available online at: http://publications.naturalengland.org.uk/publication/6087702630891520

ii. Protected Species

We note reference to some ecological survey data that is now several years old and would now be considered out of date and could not be relied upon to support a planning application. We refer to CIEEM's 'Advice note on the lifespan of ecological reports and surveys' for further guidance on this matter. Advice-Note.pdf (cieem.net). Whilst the results of historic surveys is useful contextual information about use of the site by

protected species, we advise that surveys over 2 years old are updated and that the impact assessment is based on up to date surveys.

Phase 1 habitat survey

Habitat surveys should accord with the Nature Conservation Committee (NCC) Phase 1 survey guidelines (NCC (1990) Handbook for Phase 1 habitat survey. NCC, Peterborough) and cover the full extent of the proposed application site. We advise that Phase 1 surveys are undertaken and completed during the summer to ensure the best chance of identifying the habitats present, and include target notes to record location of evidence of protected species.

UK Habitat Classification Survey

This is not an accepted method of habitat survey in Wales. We advise that the application site is mapped in Phase 1 format – see above.

Hedgerow Assessment

In the context of dormice, we advise that the condition/favourability of hedgerows for the species is also assessed.

Bats

Since the 2023 publication of BCT's 'Bat Surveys for Professional Ecologists. Good Practice Guidelines 4th Ed', bat surveys carried out to support any planning application should follow these guidelines.

Tree Potential Roost Features

We note the reference to 2019 and 2021 datasets. Given the age of the datasets, the transient nature of tree roosts and the weathering that trees and their roosts are exposed to, we advise updated surveys of the application site in accordance with the above guidance be carried out.

Bat Activity Surveys

We note that bat activity surveys were carried out between April-October in 2023, and it appears that these comprised monthly walked transects and automated detector surveys (in accordance with the 3rd Edition of the survey guidelines). These surveys are currently considered in-date. We advise that the project ecologist assesses the methodology employed for adequacy of approach, and the application includes the results of updated survey data (in accordance with the current guidelines) to address any gaps in the data/survey coverage.

Great Crested Newts (GCN)

We note that surveys for GCN have occurred at across three different years at various locations across the site. Only the 2023 data is considered in date currently. We advise that the planning application is supported by up to date surveys for the full application site. The project ecologist should consider the adequacy of the methodology of the 2023 surveys and carry out update surveys as appropriate.

We advise the use of Habitat Suitability Index (HSI), eDNA and traditional survey techniques, with the latter used to confirm likely population sizes affected by the proposed development where GCN presence has been confirmed. It should be noted that HSI is principally designed to assess the suitability of habitat within ponds for GCN. Careful consideration will therefore have to be given as to how it can be applied to assess the suitability of habitat for GCN within reens and ditches across the application site. For all

waterbodies within the application site, we advise that they are assessed for their functionality for GCN throughout all life cycle stages, including potential use for foraging and newt dispersal throughout the landscape and not just focusing on potential to support breeding GCN. Surveys should be carried out in accordance with English Nature's Great Crested Newt Mitigation Guidelines and NRW's guidance on the use of eDNA testing for GCN licensing:

Great Crested Newts mitigation guidelines (merthyr.gov.uk)

Natural Resources Wales / The use of environmental DNA test for Great crested newt licensing purposes

Dormouse

We note that dormouse surveys were carried out in 2023. These are still considered in-date. Adequacy of the surveys will depend on the survey methodology employed and distribution of tubes across potential dormouse habitat. Where dormouse habitat is present across the site, we advise that the application includes descriptions of its condition/favourability for the species.

Riparian Mammal Survey

We note that only one survey for riparian mammals (water voles and otters) has been carried out, in March 2024. Surveys for water voles accord with the guidance in The Water Vole Mitigation Handbook (Dean et al, Mammal Society 2016). This advises two survey visits at least two months apart in the periods mid-April to end June and July-September. The 2024 survey does not accord with published best practice survey guidance for water voles; we advise that this is addressed.

Water vole surveys targeted to particular locations (E.g. where there will be new or modified reen crossings and buffers thereof) may be sufficient, providing that all solar farm infrastructure will otherwise be situated outside the SSSI reen/ditch buffers AND there are no enhancement works proposed for the reens/ditches themselves.

If however, as we anticipate, the development proposals will include works to restore/maintain the favourable condition of SSSI ditches and reens, we advise that the application includes the results of water vole surveys for all of the ditches and reens concerned.

Surveys for otters should be sufficient to ascertain use of the site across the seasons and whether or not the proposed works shall impact upon a more significant resting place such as a natal site which may be located in dense scrub within 200m of the proposed development works.

C.

This is not a matter for NRW. We refer you to the LPAs ecologist.

D.

This is not a matter for NRW. We refer you to the LPAs ecologist.

E.

Please see attached three guidance documents. We recommend that pre-construction, there is a 1 year baseline, with two samples undertaken in winter and two samples undertaken in summer. On request, we should be able to supply information on flow

directions on site to inform the best place to set up water quality points, including up and downstream sample points. Flow directions in some areas vary in summer and winter. The key risks are increased sediment from construction and fuel spills. Construction can disturb contaminants within the soil so full trigger levels need to be monitored at some locations and / or testing of soil samples preconstruction in the most heavily impacted areas on site. This monitoring would enable us to review whether the measures in the CEMP are working. Water quality points, methods and timescales must be agreed with NRW prior to a program commencing.

F.

i. We support the principles to build flood storage capacity into system but this will need careful consideration to ensure no detriment to existing reens and ditches and their ability hold adequate water to support SSSI features. We advise that further clarification is provided on '*features used as a way of raising water levels'.*

3. Ornithology

A.

i. We note the intention to produce a Lapwing Management Plan to accompany the application with the aim to provide mitigation for any lapwing present. However, our first preference would be for avoidance of the species present. We advise that further consideration is given to fields that currently support breeding lapwing on the application site, and that these fields are avoided for development with panels.

4. Flood Risk and Drainage

a. We consider that for the current TAN 15 (July 2004) the development under Section 5 (Figure 2) would be classed as 'Less Vulnerable'.

b. We note the proposal to mount the ancillary equipment above the 1 in 100 year flood levels allowing for climate change + 300mm freeboard. A baseline in the 1 in 200yr +CC (40yrs) tidal flood level will need to established within the sites in question and apply whichever is the greater i.e. fluvial or tidal, plus at least 300mm freeboard. If the defences are shown to be of a standard that will protect the site from tidal flooding over the 40 year lifetime then fluvial will be the guiding factor.

c. Historically this has been at least 7metres along one side of the channel but both sides preferred. For main and IDD reens in the SSSI the buffer is 12.5m.

5. Planning and Procedural Matters

a. NRW are happy to liaise on any future correspondence for the scheme provided we have capacity. We offer a discretionary planning advice service at a cost of £125 per hours plus VAT.
b. We welcome any correspondence in relation to fundamental matters of planning policy however, the final decision on policy is ultimately a matter for the determining body, in this case PINS.

Other Matters

Please note, the view expressed in this letter is a response to a pre-planning enquiry only. We trust these comments will prove helpful, but they should not set a precedent for any future Natural Resources Wales' response to any formal application for planning permission or other legal consent. Such applications shall be assessed on the information submitted and regulations of relevance at that time. The details contained in this letter are based on the information available to date.

If you have any queries on the above, please do not hesitate to contact us.

Yn gywir / Yours faithfully

[redacted]
Cynghorydd - Cynllunio Datblygu/Advisor - Development Planning
Cyfoeth Naturiol Cymru/Natural Resources Wales

E-bost/E-mail: [redacted]
Ffôn/Phone: [redacted]

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi./Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

EIA Scoping Report Figures

Scoping Report Figures [PINS Ref: EN010171]

Document Reference: EN 010171 / SCP FIG
Revision Number: 1
December 2024
Future Energy Llanwern Limited

Date Saved: 22/11/2024 10:04:08
Document Path: C:\Users\UKJXP782\WSP O365\70109716 - Caldicot Levels Solar Farm DCO - Documents (1)\03 - WIP\Drawings\GIS\70109716-WSP-MD-FG-0015-P02.mxd

N

0 250 500 1,000 1,500 m



Key

Proposed development application boundary

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REVISION	DRAWN	CHECKED	APPROVED	DATE
P02	JP	GG	JEH	22/11/2024
P01	JP	LG	GG	26/08/24
DESCRIPTION: FIRST DRAFT ISSUE				

Client Name:
FUTURE ENERGY LLANWERN LTD

PROJECT TITLE:
FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE:
FIGURE 1.1
PROPOSED SCOPING RED LINE BOUNDARY

STATUS:
DRAFT VERSION

DRAWN:	CHECKED:	APPROVED:	AUTHORISED:
JP	GG	JEH	XXX

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Date Saved: 18/11/2024 13:03:14

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N

Land at Magor

Rush Wall Solar Park

0 250 500 1,000 m

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Key

- Proposed development application boundary
- Other DNS schemes
- 7m reen buffer
- 16m buffer from flood defence
- 12.5m buffer from watercourse
- 10m buffer from top of embankment
- Bird mitigation area
- Tower
- Towers 30m buffer
- Cable to substation
- Substation
- EHV Electric - National Grid electricity transmission line
- EHV Electric - National Grid electricity distribution line
- LV Electric - National Grid electricity distribution line
- HV Electric - National Grid electricity distribution line
- Water main - Welsh Water
- Sewer - Welsh Water
- Communication line - Openreach
- Communication line - National Grid Telecoms
- Communication line - Lumen Technologies
- OHL easement 12m
- Sewer and water main 3.5m buffer
- Telecoms 1m buffer
- Conservation area

Listed Building

- Grade I
- Grade II*
- Grade II

Public Rights of Way

- Bridleway
- Byway
- Footpath
- Restricted byway
- Unknown
- 5m buffer of ProW

REVISION	DRAWN	CHECKED	APPROVED	DATE
P04	JP	LG	GG	18/11/24
P03	JP	LG	GG	31/05/24
P02	JP	LG	GG	03/04/24
P01	JP	LG	GG	15/03/24
FIRST DRAFT ISSUE				

DESCRIPTION

Client Name:
FUTURE ENERGY LLANWERN LTD

PROJECT TITLE:
FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE:
FIGURE 2.1
CONSTRAINTS

STATUS:
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DRAWN:	CHECKED:	APPROVED:	AUTHORISED:
JP	GG	GG	JEH

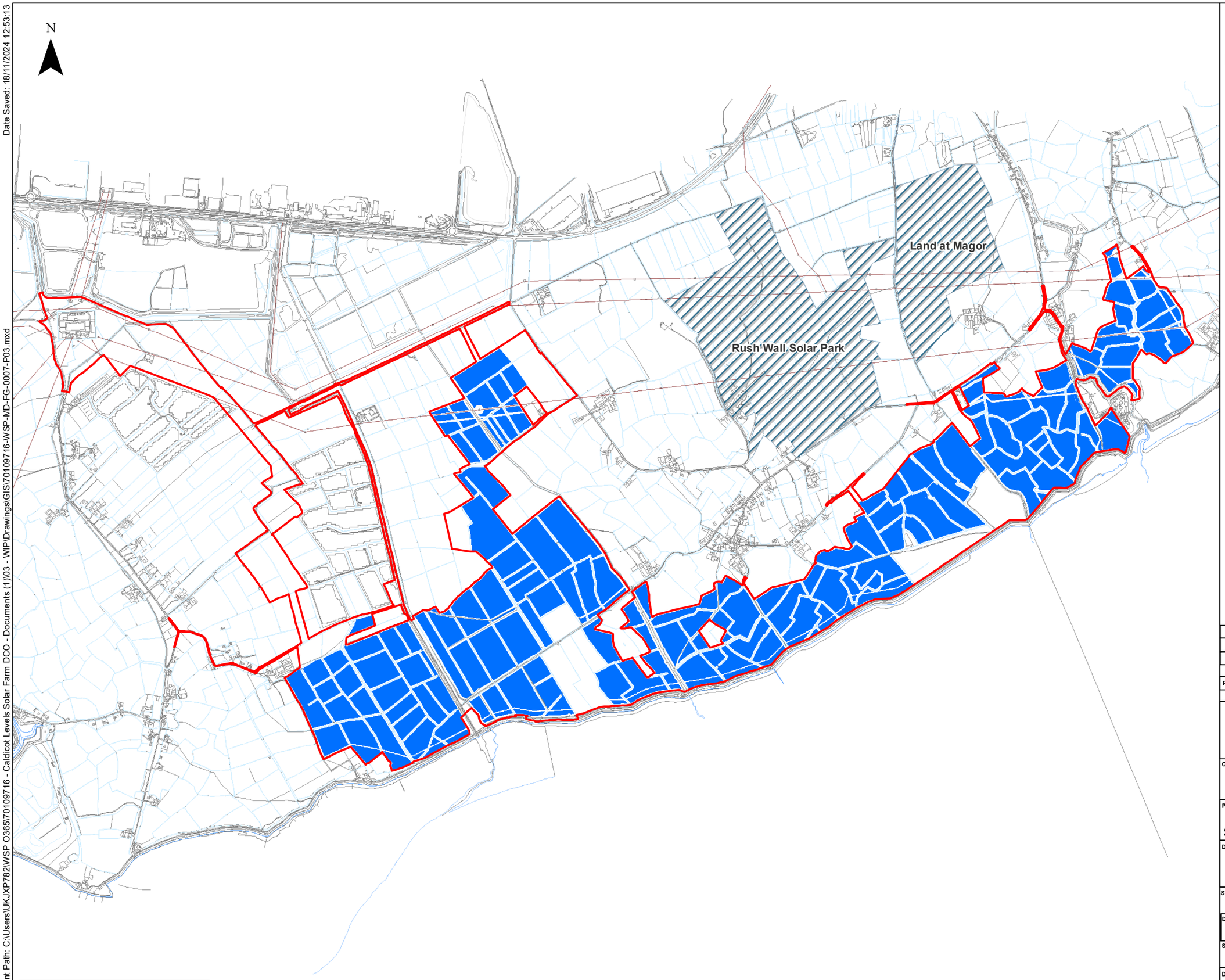
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N



0 250 500 1,000 m

Key

- Proposed development application boundary
- Other DNS schemes
- FEL Developable Area

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P03	JP	GG	JEH	25/11/24
P02	JP	LG	GG	28/03/24
P01	JP	LG	GG	22/03/24
FIRST DRAFT ISSUE				

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PROJECT TITLE:
FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

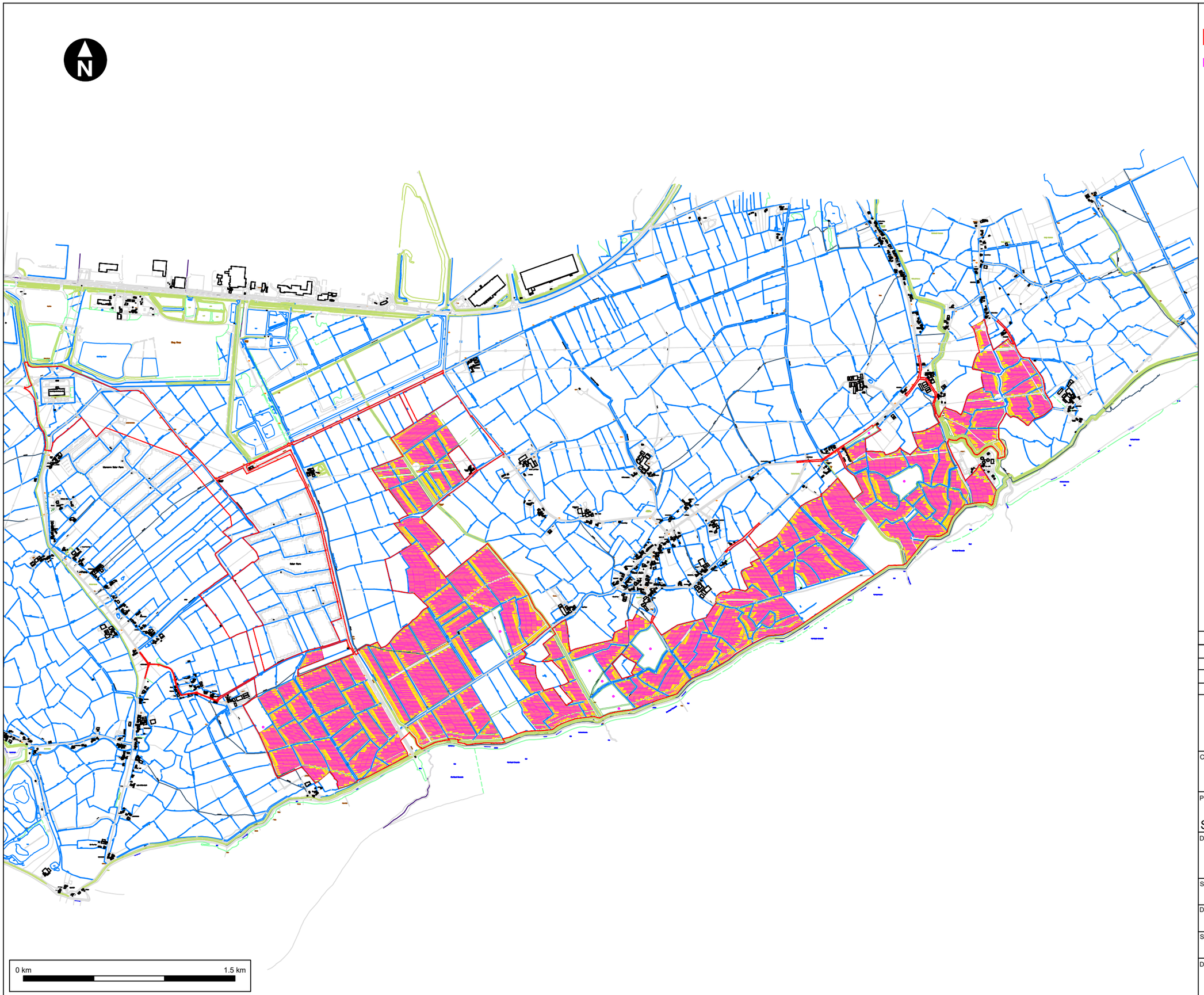
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FIGURE 2.2
DEVELOPABLE LAND

STATUS:
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Key

EIA Scoping application boundary

Solar array

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P01	JP	GG	JH	16/08/2024
FIRST DRAFT ISSUE				

DESCRIPTION

CLIENT NAME:
FUTURE ENERGY LLANWERN LTD

PROJECT TITLE:
FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

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FIGURE 2.3
CAPACITY PLAN

STATUS:
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1: 25,000	25/11/2024	P02

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HUASUN | HETEROJUNCTION TECHNOLOGY

Himalaya G12 Series

700-735W

132-cell Bifacial HJT Half Cell Double-glass Solar Module

Efficiency up to 23.7%



HJT Technology
Combining gettering process and μc-Si technology to ensure higher cell efficiency and higher module power

Up to 95% Bifaciality
Natrual symmetrical bifacial structure bringing more energy yield from the backside.

Sealing with PIB
Integrated coating frames ensuring modules passing the IEC salt-mist test level 8

Suitable for Utility project
Lower BOS cost, lower LCOE

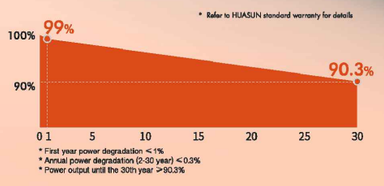
WARRANTY

Product Warranty **15** years

Linear Power Warranty **30** years

Complete System and Product Certifications:

IEC61215, IEC61730
ISO9001:2015 Quality Management System
ISO14001:2015 Environment Management System
ISO45001:2018 Occupational Health and Safety
IEC62941:2019 Terrestrial photovoltaic (PV) modules- Quality system for PV module manufacturing



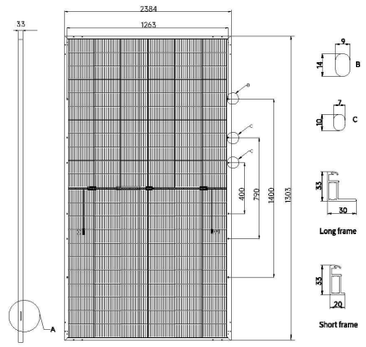
HS-210-B132 700-735W

132-Half-Cell Bifacial HJT Module

- BloombergNEF Tier 1 PV module manufacturer
- Reinsurance underwritten by Ariel Re

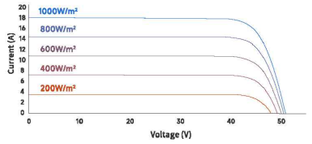
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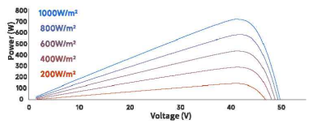
Unit: mm



I-V Curve

(HS-210-B132DS715)





Temperature Characteristics

Temperature Coefficient of Pmax	-0.24%/° C
Temperature Coefficient of Voc	-0.22%/° C
Temperature Coefficient of Isc	+0.04%/° C

Operating Conditions

Nominal Operating Cell Temp.	44±2℃
Operating Temperature	-40~+85℃
Maximum System Voltage	DC1500V (IEC)
Maxiumu Series Fuse Rating	35A
Tolerance of Pmax	0~+3%
Power Selection	0~+5W
Bifaciality	90±5%
Safety Class	Class II

Mechanical Characteristics

Cell Type	HJT
No. of Cells	132 (6x22)
Dimensions	2384 x 1303 x 33 mm
Weight	37.9kg
Junction Box	IP68
Cable	4mm²; +350/-250mm or customized; UV resistant
Connector	MC4 / MC4-Evo2A / PV-H4 / Z4S-abcd / ST4
Frame	Anodized aluminum alloy frame
Max Static Load (front side/rear side)	5400Pa / 2400Pa
Glass	Dual glass, 2.0mm

Electrical Characteristics

STC

HS-210-B132	DS700	DS705	DS710	DS715	DS720	DS725	DS730	DS735
Maximum Power (Pmax/W)	700	705	710	715	720	725	730	735
Module Efficiency (%)	22.5	22.7	22.9	23.0	23.2	23.3	23.5	23.7
Maximum Power Voltage (Vmp/V)	41.78	41.87	41.96	42.05	42.14	42.23	42.32	42.41
Maximum Power Current (Imp/A)	16.76	16.84	16.93	17.02	17.10	17.18	17.26	17.34
Open Circuit Voltage (Voc/V)	49.77	49.87	49.97	50.07	50.17	50.27	50.37	50.47
Short Circuit Current (Isc/A)	17.81	17.90	17.99	18.08	18.17	18.26	18.35	18.44

STC: AM1.5, 1000W/m², 25℃.

BSTC

Maximum Power (Pmax/W)	785	790	796	801	807	813	818	824
Maximum Power Voltage (Vmp/V)	41.92	42.02	42.11	42.20	42.29	42.38	42.47	42.56
Maximum Power Current (Imp/A)	18.73	18.82	18.91	19.00	19.10	19.19	19.28	19.37
Open Circuit Voltage (Voc/V)	49.94	50.04	50.14	50.24	50.34	50.44	50.54	50.65
Short Circuit Current (Isc/A)	19.97	20.07	20.18	20.28	20.38	20.48	20.58	20.68

BSTC: AM1.5, 1000W/m², 135W/m², 25℃.

NOCT

Maximum Power (Pmax/W)	534	538	542	545	549	553	557	561
Maximum Power Voltage (Vmp/V)	39.90	40.00	40.07	40.14	40.23	40.32	40.41	40.50
Maximum Power Current (Imp/A)	13.39	13.46	13.53	13.60	13.67	13.73	13.79	13.86
Open Circuit Voltage (Voc/V)	47.50	47.60	47.69	47.79	47.88	47.98	48.08	48.17
Short Circuit Current (Isc/A)	14.23	14.31	14.38	14.45	14.52	14.59	14.67	14.74

NOCT: AM1.5, 800W/m², 20℃, 1m/s.

Packaging

	40HQ
Modules Per Pallet	33
Pallets Per Container	18
Modules Per Container	594

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NO.99 Qinglu Road, Economic and Technological Development Zone, Xuancheng, Anhui, China
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sales@huasunsolar.com customerservice@huasunsolar.com

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FIRST DRAFT ISSUE

DESCRIPTION

CLIENT NAME:
FUTURE ENERGY LLANWERN LTD

PROJECT TITLE:
FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE:
FIGURE 2.4
INDICATIVE DESIGN OF SOLAR PV MODULES

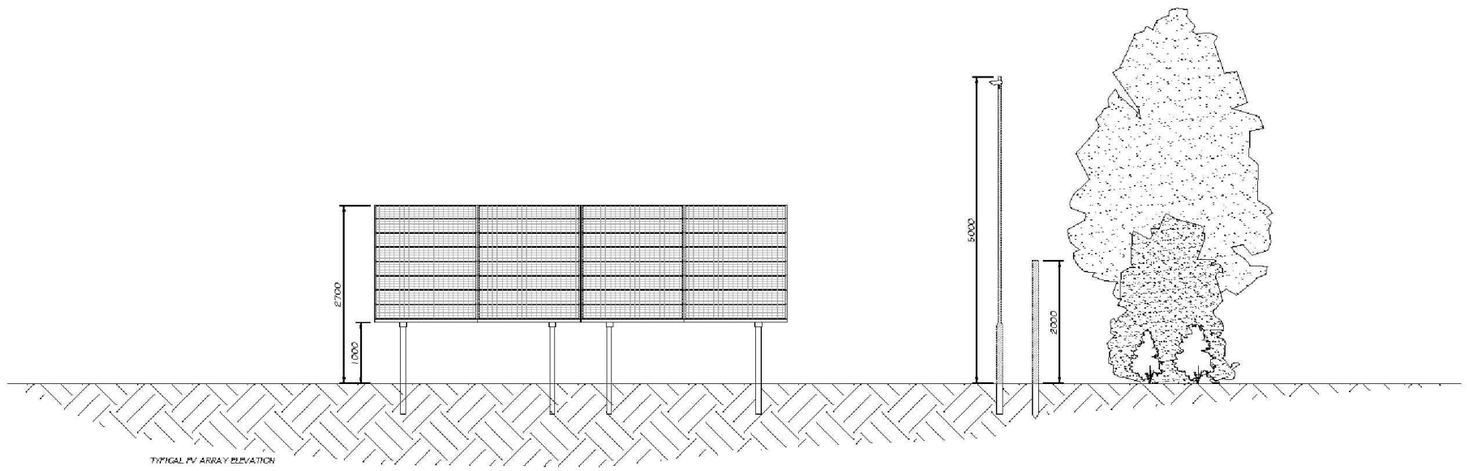
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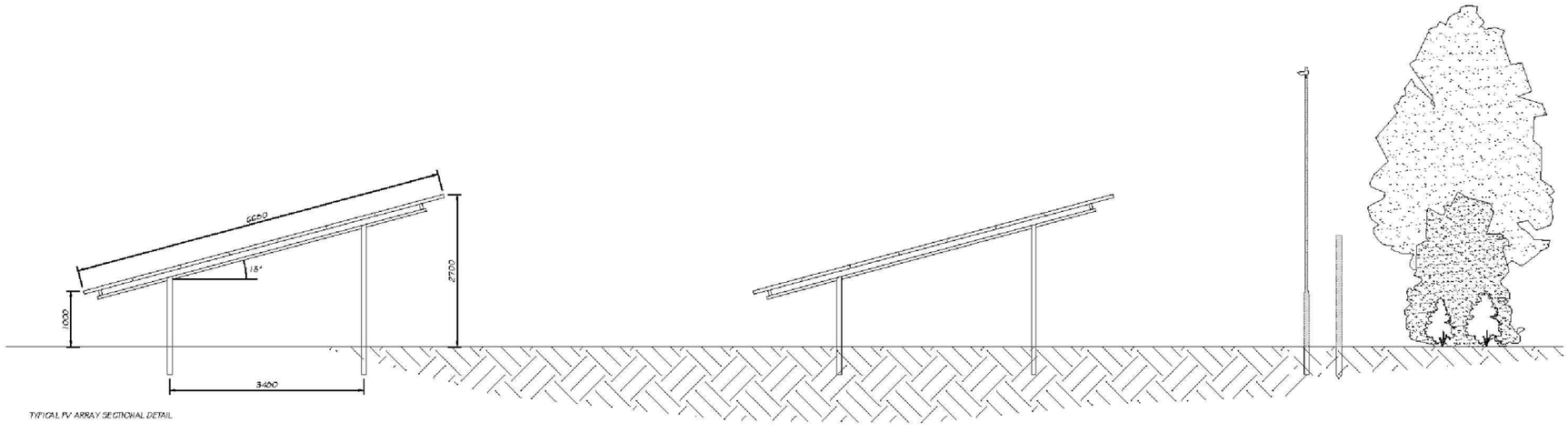
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N/A	06/11/2024	P01

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TYPICAL PV ARRAY ELEVATION



TYPICAL PV ARRAY SECTIONAL DETAIL

0 m 5 m

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DESCRIPTION

CLIENT NAME:
FUTURE ENERGY LLANWERN LTD

PROJECT TITLE:
FUTURE ENERGY LLANWERN
SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE:
FIGURE 2.5
INDICATIVE PANEL ELEVATION

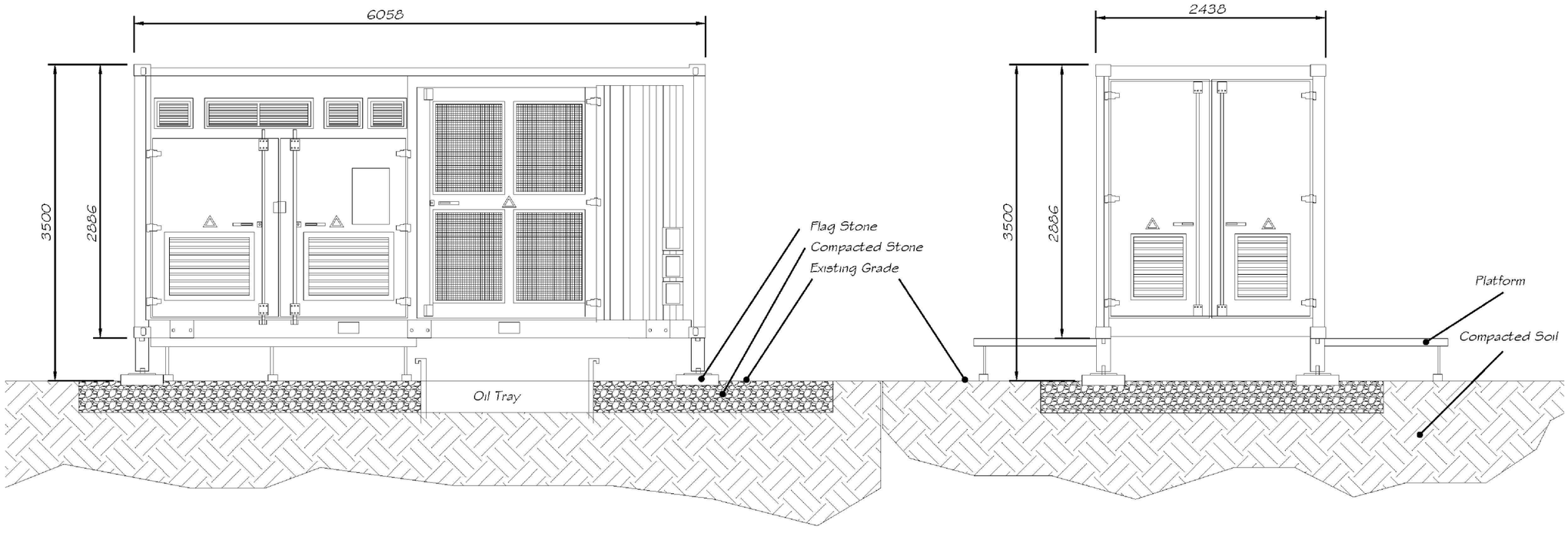
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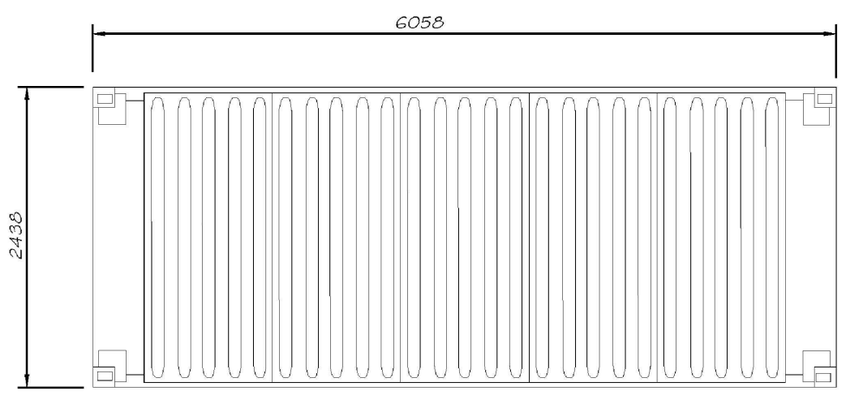
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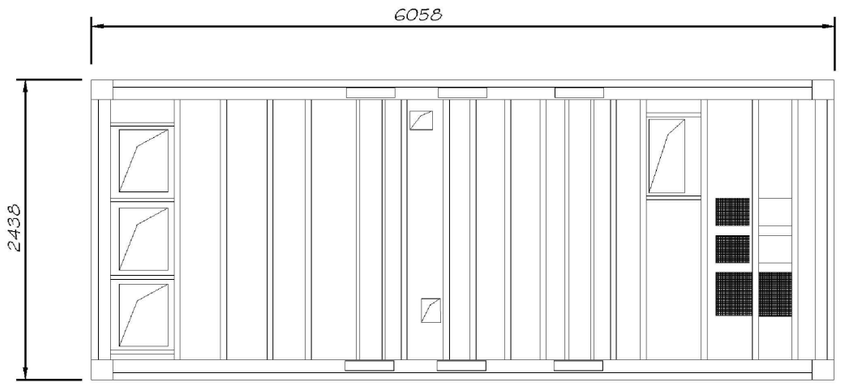
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FRONT VIEW

END VIEW





TOP VIEW

BOTTOM VIEW

0 m 2.5 m

Key

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DESCRIPTION	FIRST DRAFT ISSUE			

CLIENT NAME:
FUTURE ENERGY LLANWERN LTD

PROJECT TITLE:
FUTURE ENERGY LLANWERN
SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE:
FIGURE 2.6
INDICATIVE DESIGN OF INVERTER, TRANSFORMER & SWITCHGEAR STATIONS

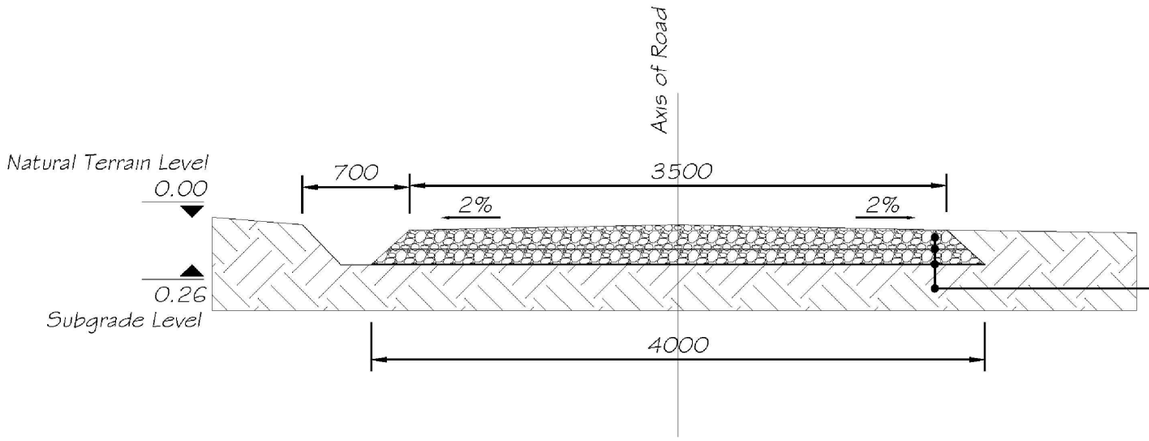
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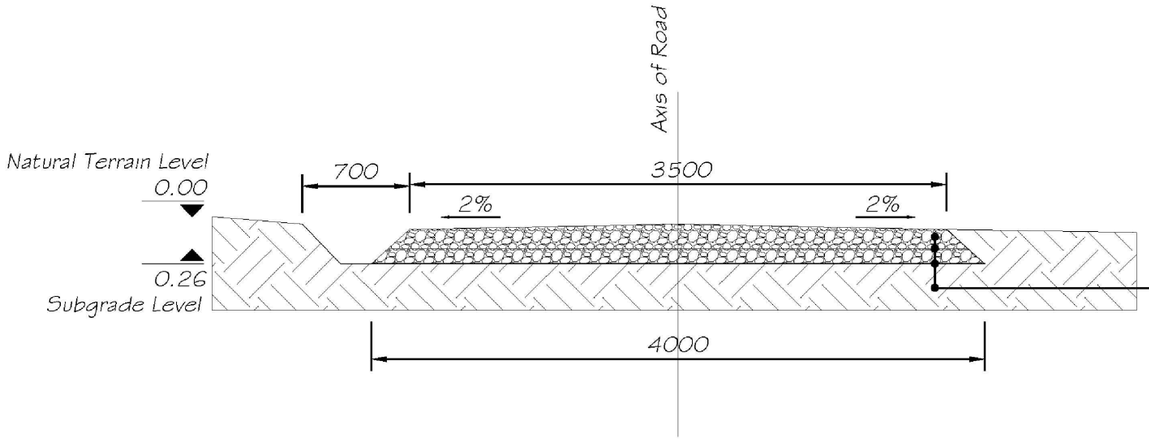
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Base (10 cm)	
-Well graded aggregates* -Compacted 96-98% PROCTOR every 10 cm -Material smaller than 0.425 mm shall be non-plastic as defined by BS 1377-2. -Natural Sand Content of the material smaller than 4 mm shall not be greater than 10% by mass.	*100 % smaller than 40 mm 75 - 99 % smaller than 31.5 mm 40 - 81 % smaller than 16 mm 28 - 66 % smaller than 8 mm 12 - 52 % smaller than 4 mm 6 - 42 % smaller than 2 mm 3 - 32 % smaller than 1 mm 0 - 9 % smaller than 0.063 mm
*aggregate free of carbonate bearing materials	

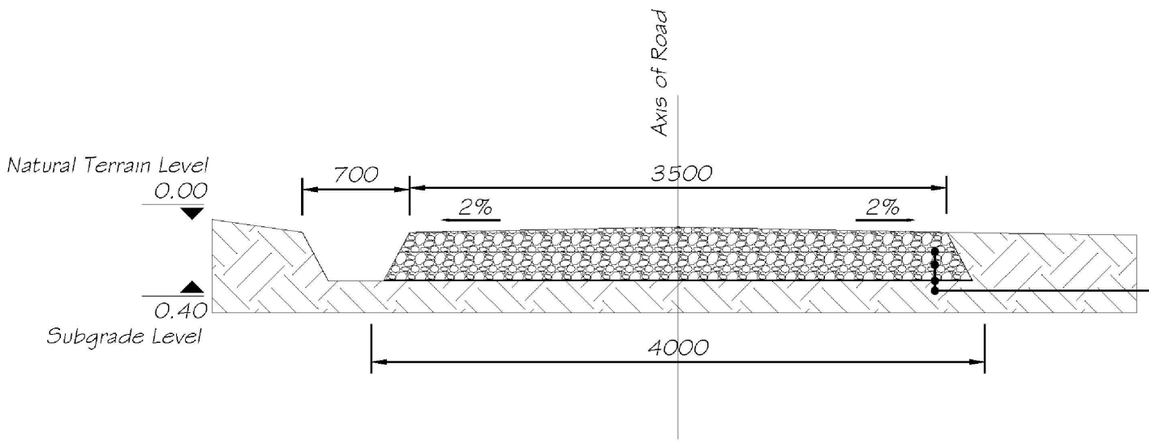
Sub-Base (8 cm + 8 cm)	
-Well graded aggregates* -Compacted 96-98% PROCTOR every 10 cm -Material smaller than 0.425 mm shall be non-plastic as defined by BS 1377-2. -Natural Sand Content of the material smaller than 4 mm shall not be greater than 10% by mass.	*100 % smaller than 63 mm 80 - 99 % smaller than 31.5 mm 66 - 85 % smaller than 20 mm 35 - 68 % smaller than 10 mm 22 - 60 % smaller than 6 mm 16 - 47 % smaller than 2 mm 9 - 40 % smaller than 1 mm 5 - 35 % smaller than 0.5 mm 0 - 9 % smaller than 0.063 mm
*aggregate free of carbonate bearing materials	

Base 100mm
Sub-base 160mm
Terram 1000 Geotextile (or similar approved)
Existing Soil - Subgrade (CBR > 6%



Base (10 + 8 – 8 cm)	
-Well graded aggregates* -Compacted 96-98% PROCTOR every 10 cm -Material smaller than 0.425 mm shall be non-plastic as defined by BS 1377-2. -Natural Sand Content of the material smaller than 4 mm shall not be greater than 10% by mass.	*100 % smaller than 40 mm 75 - 99 % smaller than 31.5 mm 40 - 81 % smaller than 16 mm 28 - 66 % smaller than 8 mm 12 - 52 % smaller than 4 mm 6 - 42 % smaller than 2 mm 3 - 32 % smaller than 1 mm 0 - 9 % smaller than 0.063 mm
*aggregate free of carbonate bearing materials	

Base 260mm
Tensar TX160 Geogrid
Terram 1000 Geotextile (or similar approved)
Existing Soil - Subgrade (CBR > 3%



Base (10 + 10 – 10 + 10 cm)	
-Well graded aggregates* -Compacted 96-98% PROCTOR every 10 cm -Material smaller than 0.425 mm shall be non-plastic as defined by BS 1377-2. -Natural Sand Content of the material smaller than 4 mm shall not be greater than 10% by mass.	*100 % smaller than 40 mm 75 - 99 % smaller than 31.5 mm 40 - 81 % smaller than 16 mm 28 - 66 % smaller than 8 mm 12 - 52 % smaller than 4 mm 6 - 42 % smaller than 2 mm 3 - 32 % smaller than 1 mm 0 - 9 % smaller than 0.063 mm
*aggregate free of carbonate bearing materials	

Base 400mm
Tensar TX160 Geogrid
Terram 1000 Geotextile (or similar approved)
Existing Soil - Subgrade (CBR < 3%

0 m 2.5 m

Key

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REVISION	DRAWN	CHECKED	APPROVED	DATE
P01	JP	GG	JH	22/11/2024
DESCRIPTION	FIRST DRAFT ISSUE			

CLIENT NAME:
FUTURE ENERGY LLANWERN LTD

PROJECT TITLE:
FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE:
FIGURE 2.7
ROAD CONSTRUCTION DETAILS

STATUS:
DRAFT VERSION

DRAWN:	CHECKED:	APPROVED:	AUTHORISED:
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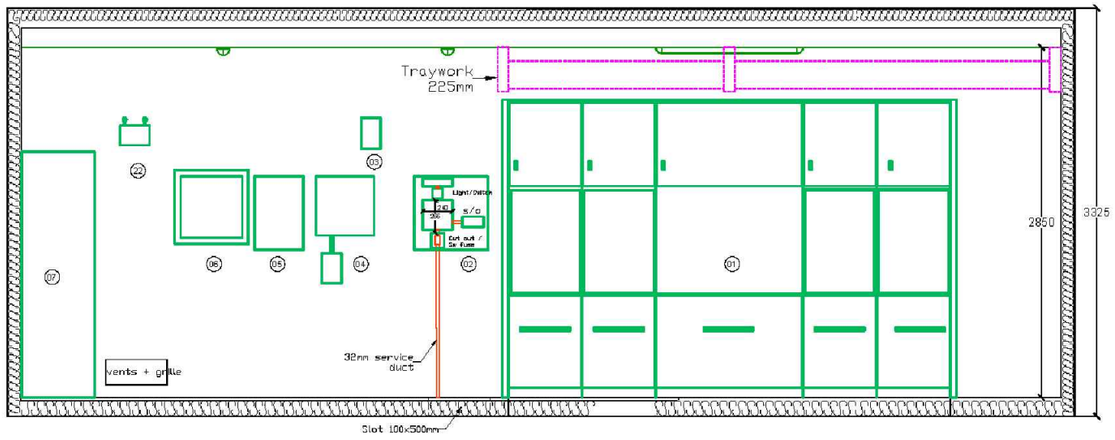
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DRAWING NUMBER:
70109716-WSP-MD-FG-0011-P01

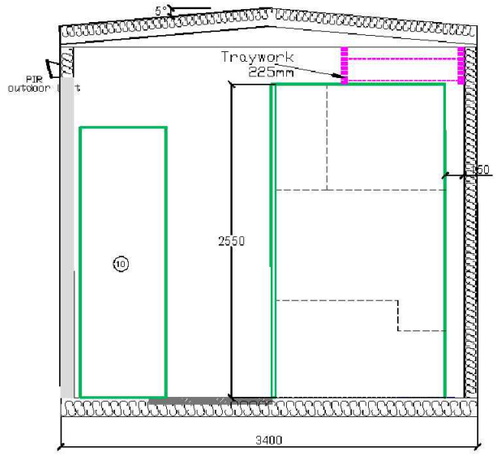
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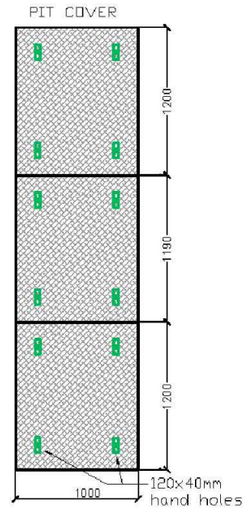
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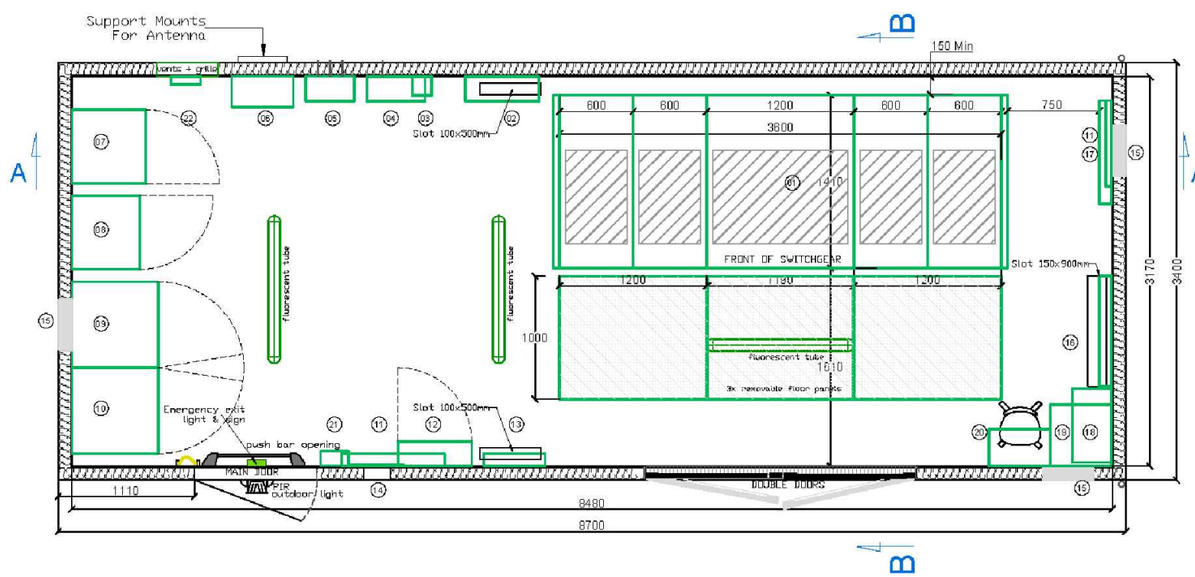
SECTION A-A



SECTION B-B







EQUIPMENT:

1. SWITCHGEAR SCHNEIDER CBGS 0 H2350+200 D1410 W6x600
2. BATTERY CHARGER FUSEBOARD H600 D200 W600
3. 230/110V SW HTR SUPPLY H350 D155 W250
4. LVAC FUSEBOARD H480 D140 W475
5. FAULT RECORDER H600 D200 W400
6. R.T.U. H500 D250 W500
7. 110V DC BATTERY CHARGER H2000 D600 W600
8. PROTECTION PANEL H1800 D550 W600
9. 48V BCH H2000 D700 W700
10. COMMUNICATION CABINET H2200 D700 W700
11. 2x 2.0kW HEATER
12. INTERFACE BOX H600 D200 W600
13. PILOT BOX H800 D100 W500
14. EXTRACT FAN
15. 3x AFP PRESSURE RELIEF VENT420x420
16. EARTH TERMINAL BAR
17. SPACE FOR SW TOOL BOX
18. DEHUMIDIFIER H285 D320 W600
19. FILING CABINET
20. DESK & CHAIR
21. INTRUDER ALARM
22. EMERGENCY TWINS SPOT LIGHTS

0 m — 2.5 m

Key

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000007-33kV-5CBS-DNOC-SUBSTATIONLH-22-DW04.04
Dated 21/12/21

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P01	JP	GG	JH	06/11/2024

FIRST DRAFT ISSUE

DESCRIPTION

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FUTURE ENERGY LLANWERN LTD

PROJECT TITLE:
FUTURE ENERGY LLANWERN
SOLAR FARM EIA SCOPING REPORT

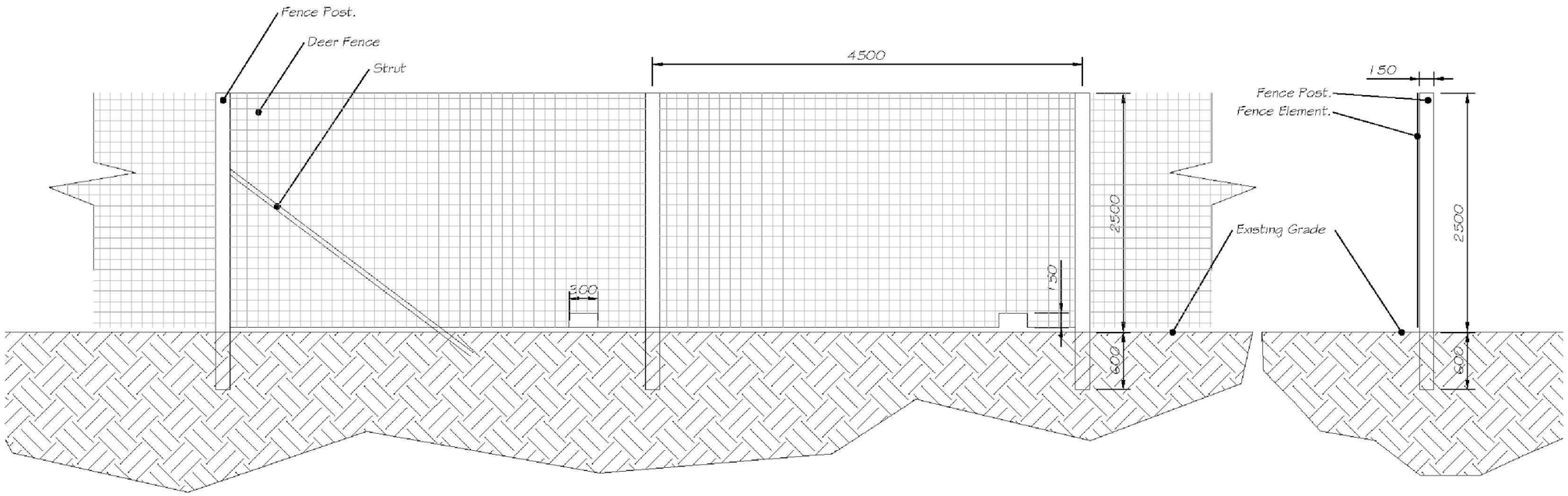
DRAWING TITLE:
FIGURE 2.8
INDICATIVE SUBSTATION
(Sheet 1 of 2)

STATUS:
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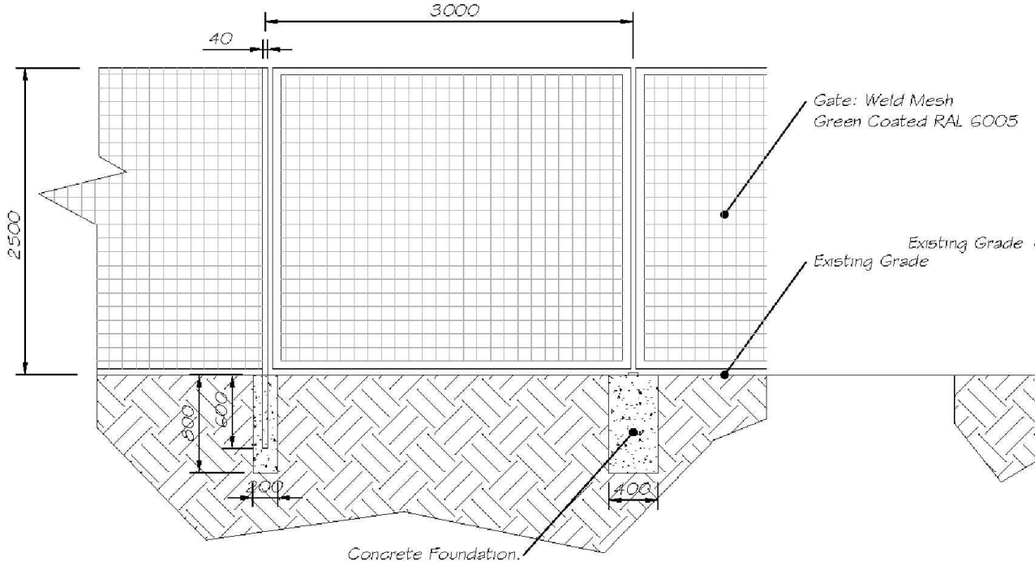
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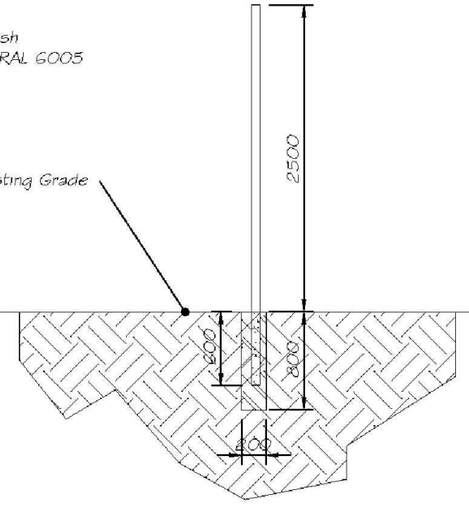


PERIMETER FENCE - ELEVATION

PERIMETER FENCE - SECTION



ACCESS GATEWAY - ELEVATION



ACCESS GATEWAY - SECTION

0 m 2.5 m

Key

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DESCRIPTION

CLIENT NAME:
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PROJECT TITLE:
FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE:
FIGURE 2.9
INDICATIVE PERIMETER FENCE AND GATE DETAILS

STATUS:
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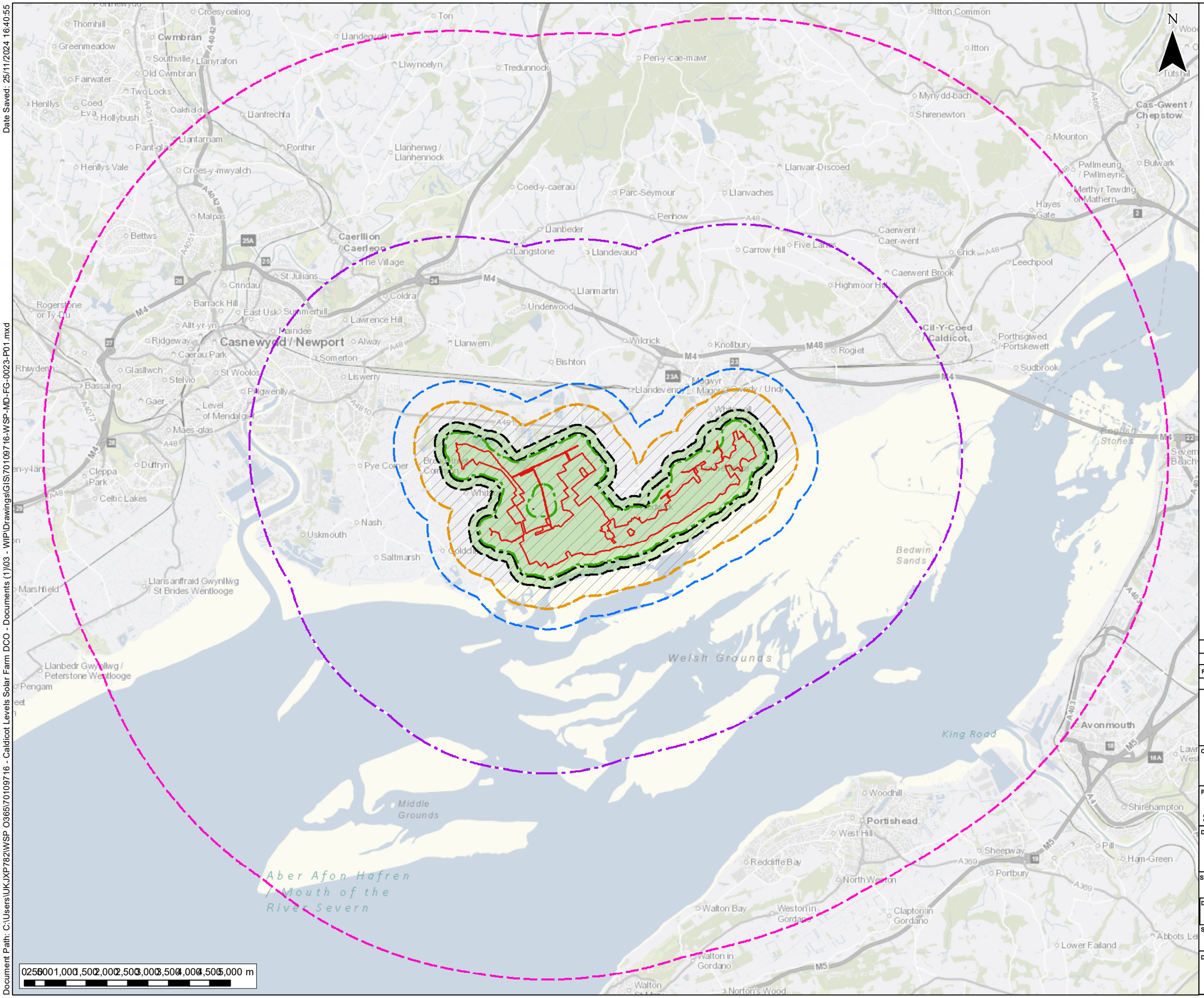
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Key

- Proposed development application boundary
- Ecology and ornithology search area
- Socio-economics and Landscape & visual impact assessment search area
- Historic environment, Water environment and FRA search area
- Glint and glare search area
- Soil resources search area
- Land contamination search area
- Construction noise and vibration search area
- Operational noise search area (new plant associated with photovoltaic panels)
- Operational noise search area (new plant associated with grid connection)

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PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 4.1 CUMULATIVE EFFECTS ASSESSMENT LONG LIST SEARCH AREA EXTENT

STATUS: DRAFT VERSION

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N

VP1 VP2 VP3 VP4 VP5 VP6 VP7 VP8 VP9 VP10 VP11 VP12 VP13 VP14 VP15 VP16 VP17

1km 2km 3km 4km 5km

0 250500 1,000 1,500 2,000 2,500 3,000 m

Key

- Proposed application site boundary
- Landscape and Visual Study Area
- Lines indicating 1km distance buffer from Site boundary
- Woodland
- Sustrans cycle route 4
- Wales Coastal Path
- Special Landscape Area
- Areas where the proposed solar panels may be theoretically visible
- Proposed LVIA viewpoints

Name	VP
Wales Coast Path, Porton House	1
Wales Coast Path - Portland Grounds	2
WCP, west of Magor Sewage Works	3
PRoW, South of Pill Farm	4
Minor road near Summerleaze Farm	5
Sustrans Cycle Route 4, east of Redwick	6
PRoW, Redwick	7
PRoW, Great Porton	8
PRoW, Half Acre	9
Minor road (N Row) west of Tonew Kennels	10
Caldicot Level	11
A4810	12
Whitson	13
PRoW off Chapel Road	14
Magor Marsh Nature Reserve	15
Minor road south of Undy Common	16
Undy	17

This drawing was based on a computer generated Zone of Theoretical Visibility (ZTV). The areas shown indicate the maximum theoretical visibility of the Solar PV Park using 2m Digital Surface Model (DSM) LiDAR. The ZTV also includes an adjustment that allows for the curvature and light refraction of the Earth.

The ZTV was generated using the following parameters:

Solar PV Park height: 3.5m
Viewer height: 1.5m

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Client Name: FUTURE ENERGY LLANWERN LTD

PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 5.1 ZONE OF THEORETICAL VISIBILITY WITH VIEWPOINT LOCATIONS AND DESIGNATED LANDSCAPES

STATUS: DRAFT VERSION

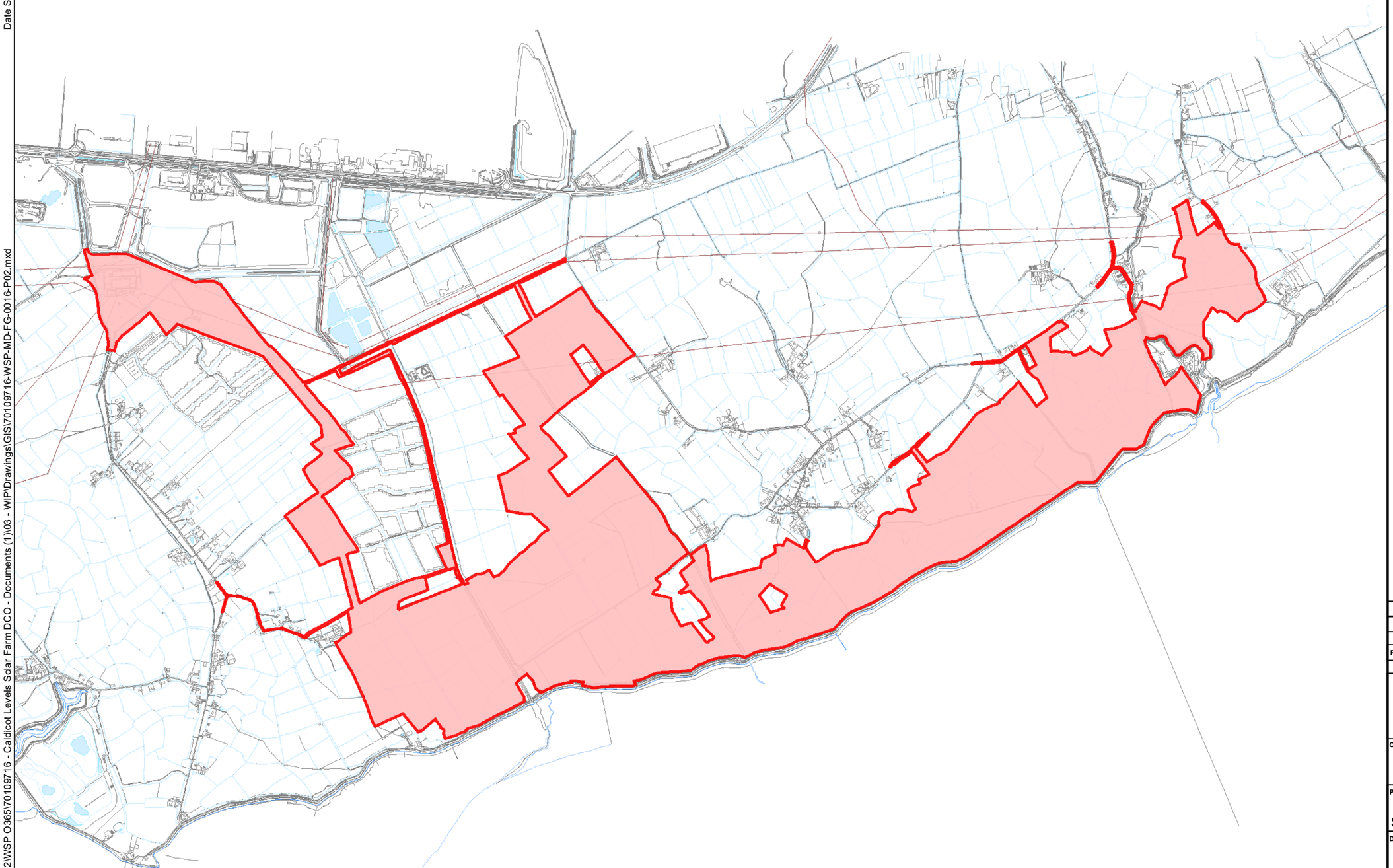
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N



Key

Proposed development application boundary

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P01	JP	LG	GG	05/09/24
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Client Name:
FUTURE ENERGY LLANWERN LTD

PROJECT TITLE:
FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE:
FIGURE 6.1
PROPOSED APPLICATION SITE APPROXIMATELY 548 HA

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N

0 500 1,000 2,000 3,000 4,000 5,000 m

Key

- Proposed development application boundary
- 10km study area

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PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 6.2 STUDY AREA COVERING 10km RADIUS FROM THE PROPOSED SITE

STATUS: DRAFT VERSION

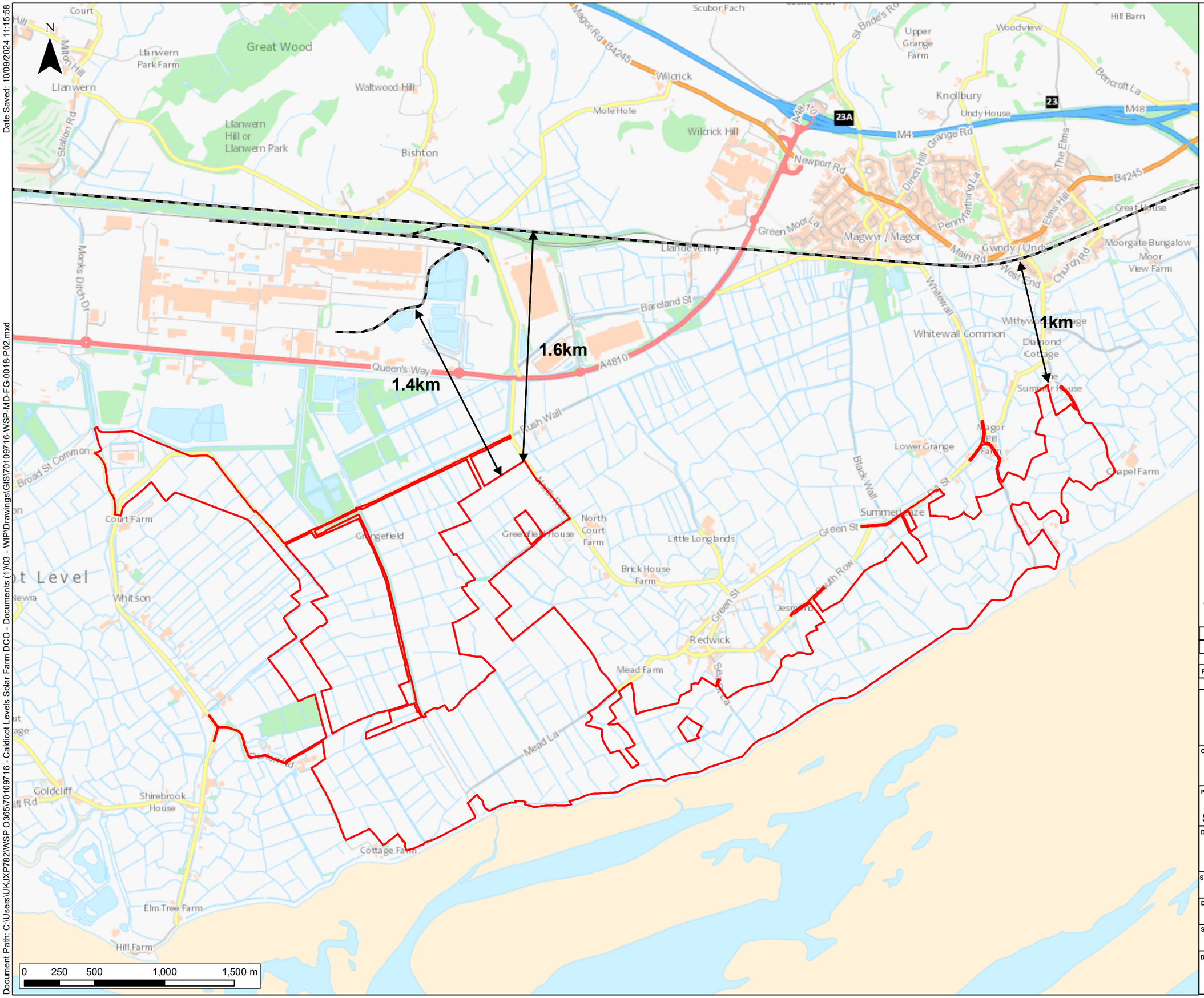
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Key

- Proposed development application boundary
- Railway track

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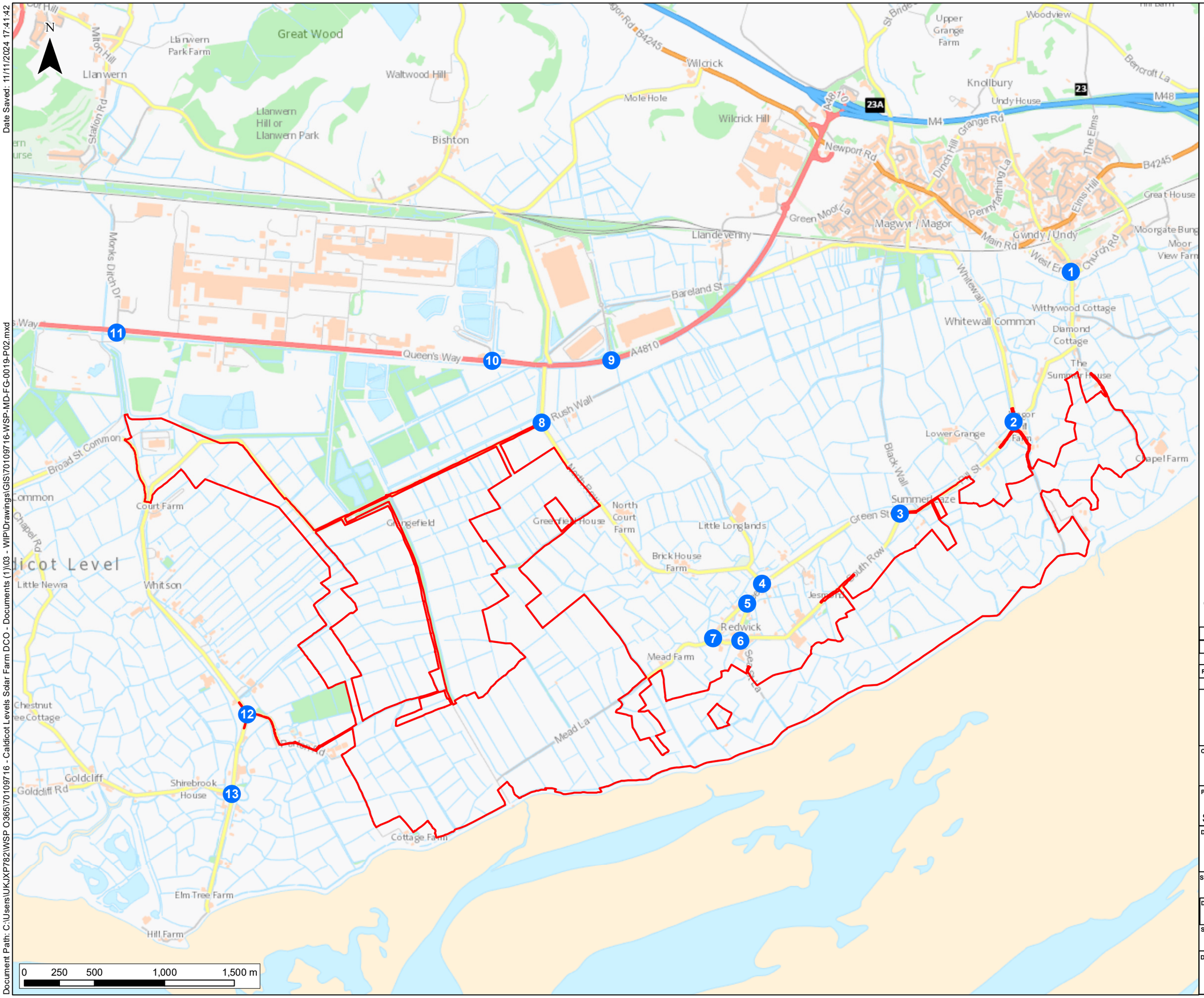
DRAWING TITLE:
FIGURE 6.3
DISTANCE FROM NEAREST TRAIN TRACK TO THE SITE

STATUS:
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Key

- Proposed development application boundary
- Sensitive location for vehicle driver

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Client Name: FUTURE ENERGY LLANWERN LTD

PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 6.4 IDENTIFIED SENSITIVE LOCATIONS FOR VEHICLE DRIVERS

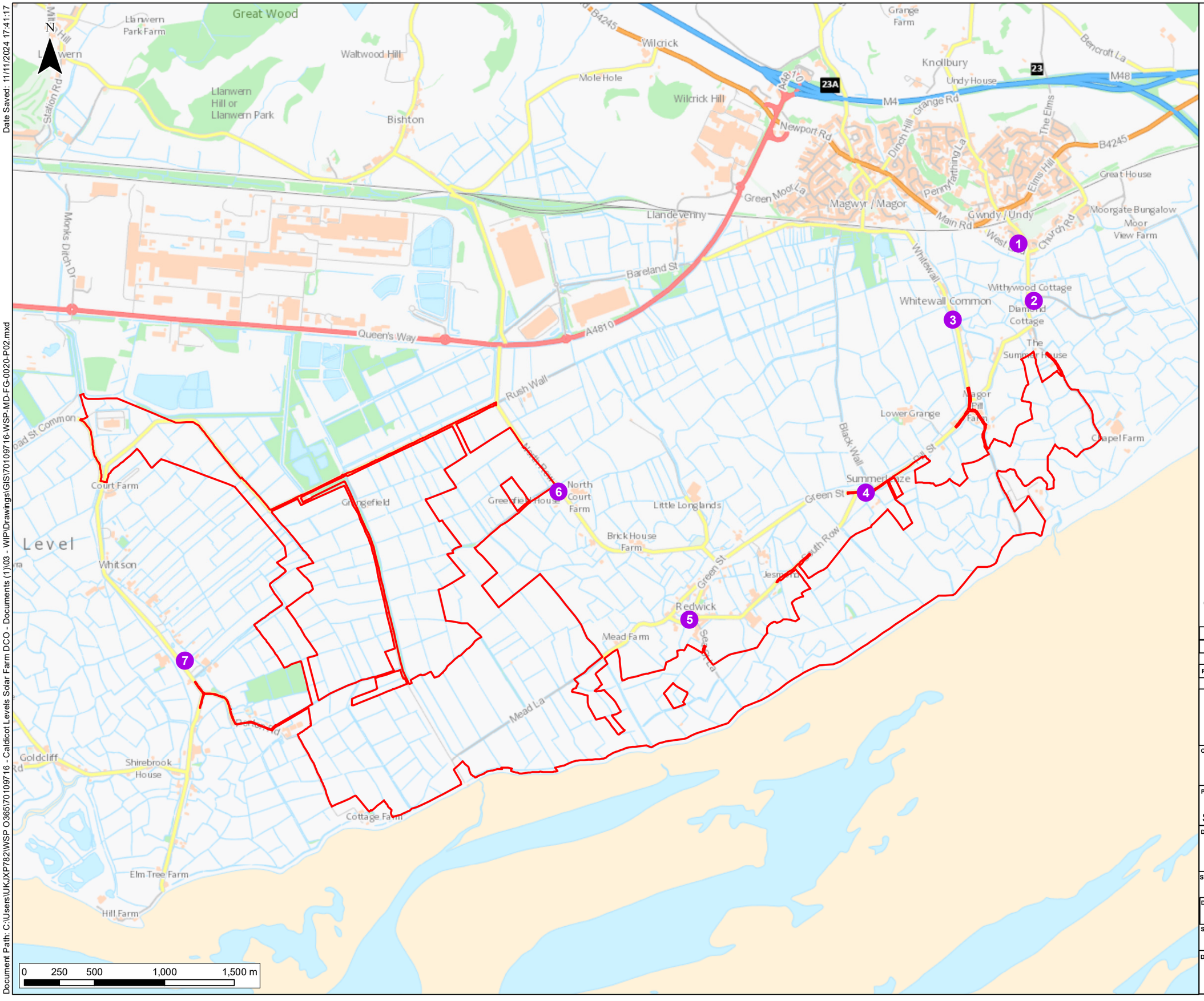
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Key

- Proposed development application boundary
- Dwellings within 1km of the site

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Client Name: FUTURE ENERGY LLANWERN LTD

PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 6.5 IDENTIFIED DWELLINGS WITHIN 1KM OF THE SITE

STATUS: DRAFT VERSION

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N

37 km

20 km

Maes Awyr Caerdydd / Cardiff Airport

Bristol International Airport

Caldicot Levels

Wels Grounds

Aber Afon Hafren / Mouth of the River Severn

0 1 2 4 6 8 km

Key

- Proposed development application boundary
- Airport

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Client Name: FUTURE ENERGY LLANWERN LTD

PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 6.6 IDENTIFIED NEAREST AIRPORTS TO THE SITE

STATUS: DRAFT VERSION

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N

Great Wood
Llanwern Park Farm
Llanwern
Waltwood Hill
Wilcrick
Mole Hole
Wilcrick Hill
Knollbury
Undy House
Llanfihangel near Rogiet
Windmill Cottages
Appaloosa
Llanwern Golf Course
Llanwern Hill or Llanwern Park
Bishton
Llandevenny
Magwyr / Magor
Great House
Moorgate Bungalow
Whitewall Common
Withywood Cottage
Diamond Cottage
Lower Grange
Chapel Farm
Broadstreet Common
Court Farm
Gingefield
North Court Farm
Little Longlands
Brick House Farm
Redwick
Mead Farm
Caldicot Level
Little Newra
Whitson
Chestnut Tree Cottage
Cherry Cottage
Goldcliff
Shirebrook House
Cottage Farm
Elm Tree Farm
Hill Farm
Welsh Grounds

Gwent Levels / Gwastadeddau Gwent

A4810 Queen's Way
M4
M48
A48(T)
B4245
Newport Rd
Green Moor La
Bareland St
Rush Wall
Mead La
Green St
Broad St Common
Chapel Rd
Goldcliff Rd
Station Rd
Marks Ditch Dr
Ring and Way
Mitch Hill
Grange Rd
Ditch Hill
Pennyfarthing La
Elms Hill
The Elms
Main Rd
West End
Church Rd
Whitewall
Black Wall
Summerhouse
Caldicot Rd
Bencroft La

0 250 500 1,000 1,500 m

Key

- Proposed development application boundary
- Study area: 1km
- Registered Historic Landscape

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Client Name:
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PROJECT TITLE:
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DRAWING TITLE:
FIGURE 7.1
GWENT LEVELS REGISTERED HISTORIC LANDSCAPE

STATUS:
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N

0 250500 1,000 1,500 2,000 2,500 3,000 m

Key

- Proposed development application boundary
- Study area: 5km
- Scheduled Monument
- Registered Historic Parks and Gardens
- Conservation Area

Listed Building

- Grade I
- Grade II*
- Grade II

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Client Name: FUTURE ENERGY LLANWERN LTD

PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 7.2 DESIGNATED HISTORIC ASSETS WITHIN 5KM STUDY AREA

STATUS: DRAFT VERSION

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N

HCLA 09 Green Moor

HCLA11 Caldicot Moor

HCLA 10 Magor Lower Grange

HLCA 02 Christchurch/Nash/Whiston Back-fen

HLCA 08 Northern Redwick

HLCA 06 Redwick/Magor/Undy

HLCA 03 Whitson

HLCA 05 Redwick Village

HLCA 07 Redwick Broadmead

HLCA 04 Porton

HLCA 01 Nash/Goldcliff coastal zone

Welsh Grounds

0 250 500 1,000 1,500 m

Key

- Proposed Development application boundary
- Study area: 1km

Historic Landscape Charater Areas

- HLCA 01 Nash/Goldcliff coastal zone
- HLCA 02 Whiston Back-fen
- HLCA 03 Whitson
- HLCA 04 Porton
- HLCA 05 Redwick Village
- HLCA 06 Redwick/Magor/Undy
- HLCA 07 Redwick Broadmead
- HLCA 08 Northern Redwick
- HCLA 09 Green Moor
- HCLA 10 Magor Lower Grange
- HCLA 11 Caldicot Moor

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Client Name: FUTURE ENERGY LLANWERN LTD

PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 7.3 HISTORIC LANDSCAPE CHARACTER AREAS

STATUS: DRAFT VERSION

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N

0 250 500 1,000 1,500 m

Key

- Proposed development application boundary
- Study area: 1km
- Monument (polygon)
- Monument (line)
- Monument (point)

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DRAWING TITLE:
FIGURE 7.4
NON-DESIGNATED HISTORIC ASSETS WITHIN 1KM STUDY AREA

STATUS:
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Key

- Proposed development application boundary
- Study area: 1km

HER

- Event (polygon)
- Event (line)
- Event (point)
- Event (Archive Report)

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DESCRIPTION

Client Name:
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PROJECT TITLE:
FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

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FIGURE 7.5
PREVIOUS INVESTIGATIONS WITHIN 1KM STUDY AREA

STATUS:
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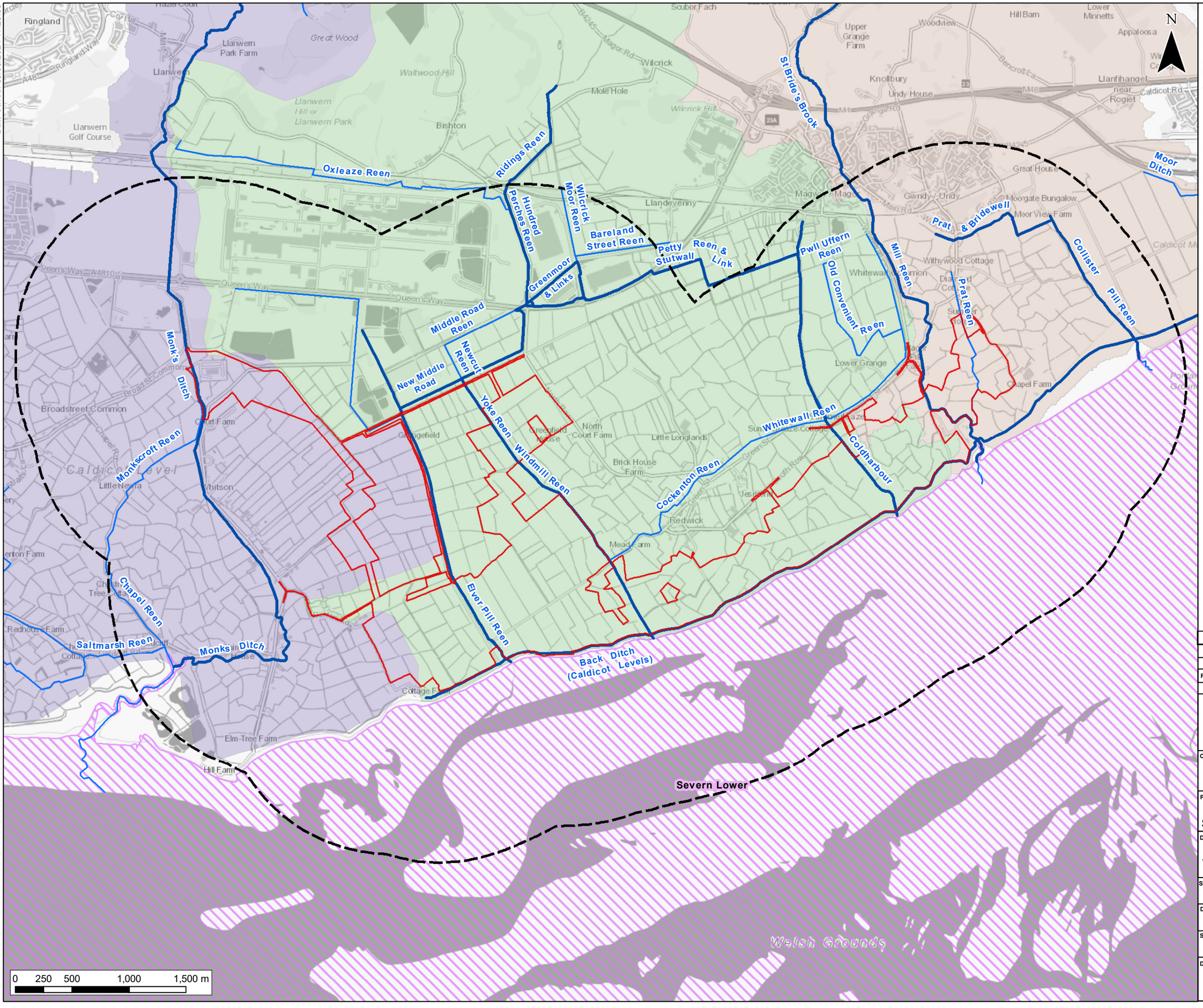
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Key

- Proposed development application boundary
- Study area: Water
- Main river
- Other watercourse

Surface Water Body Catchment

- Mill Reen - source to R Severn Estuary (GB109056026860)
- Monks Ditch - Wainbridge to mouth (GB109056026810)
- Monks Ditch - source to Wainbridge (GB109056026850)

Transitional and Coastal Water Body

- Severn Lower TRaC (GB530905415401)

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Client Name: FUTURE ENERGY LLANWERN LTD

PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 10.1 WATER ENVIRONMENT RECEPTORS

STATUS: DRAFT VERSION

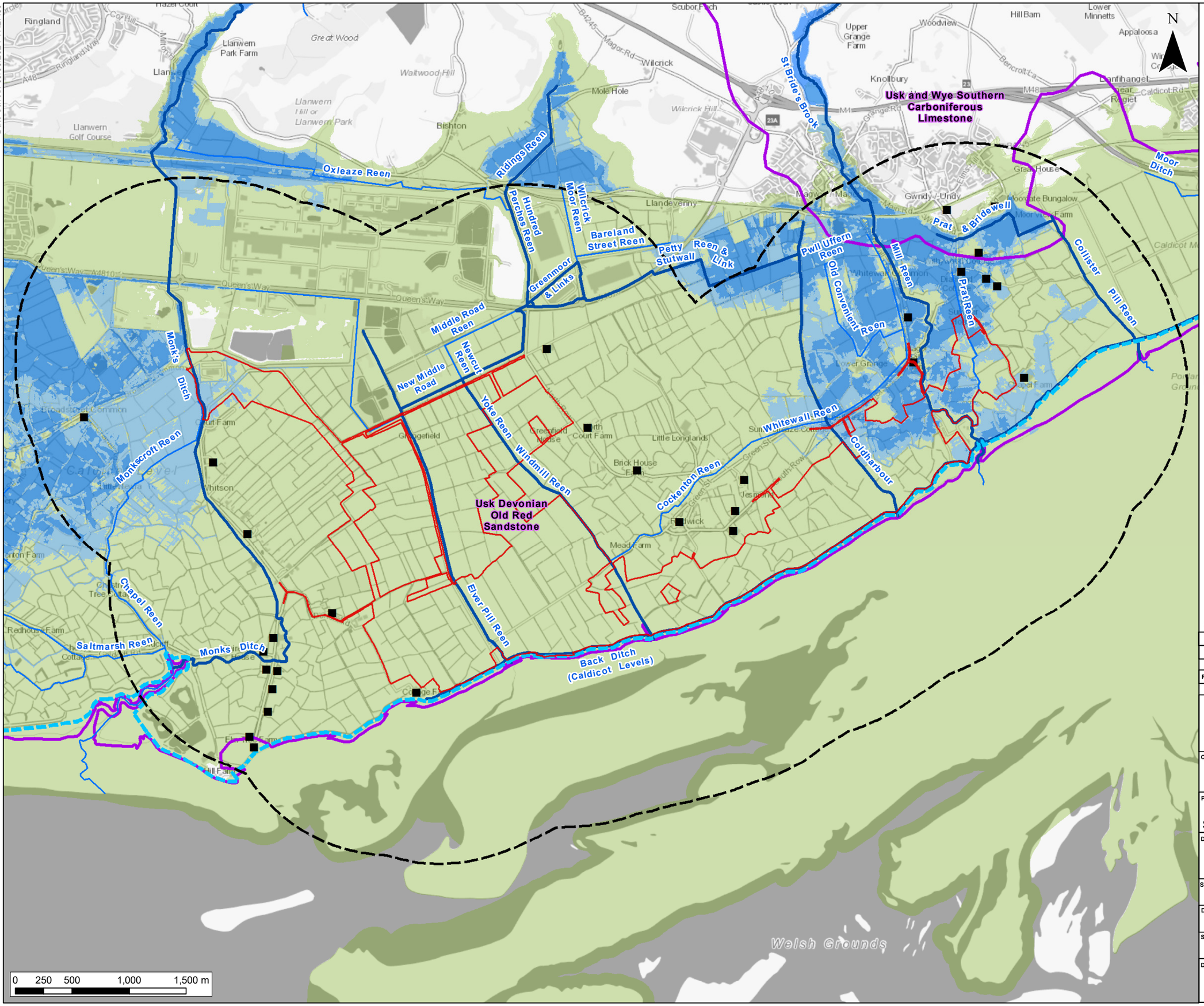
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Key

- Proposed development application boundary
- Study area: Water
- NRW flood defence

Flood Map for Planning: River Flood Zones

- Flood Zone 3
- Flood Zone 2

Flood Map for Planning: Sea Flood Zones

- Flood Zone 3
- Flood Zone 2

Aquatic Receptors

- Main river
- Other watercourse

Flood Risk Receptors

- Flood risk receptor : dwelling

Water Resource Receptors

- Groundwater body catchment

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Client Name:
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DRAWING TITLE:
FIGURE 10.2
FLOOD RISK RECEPTORS

STATUS:
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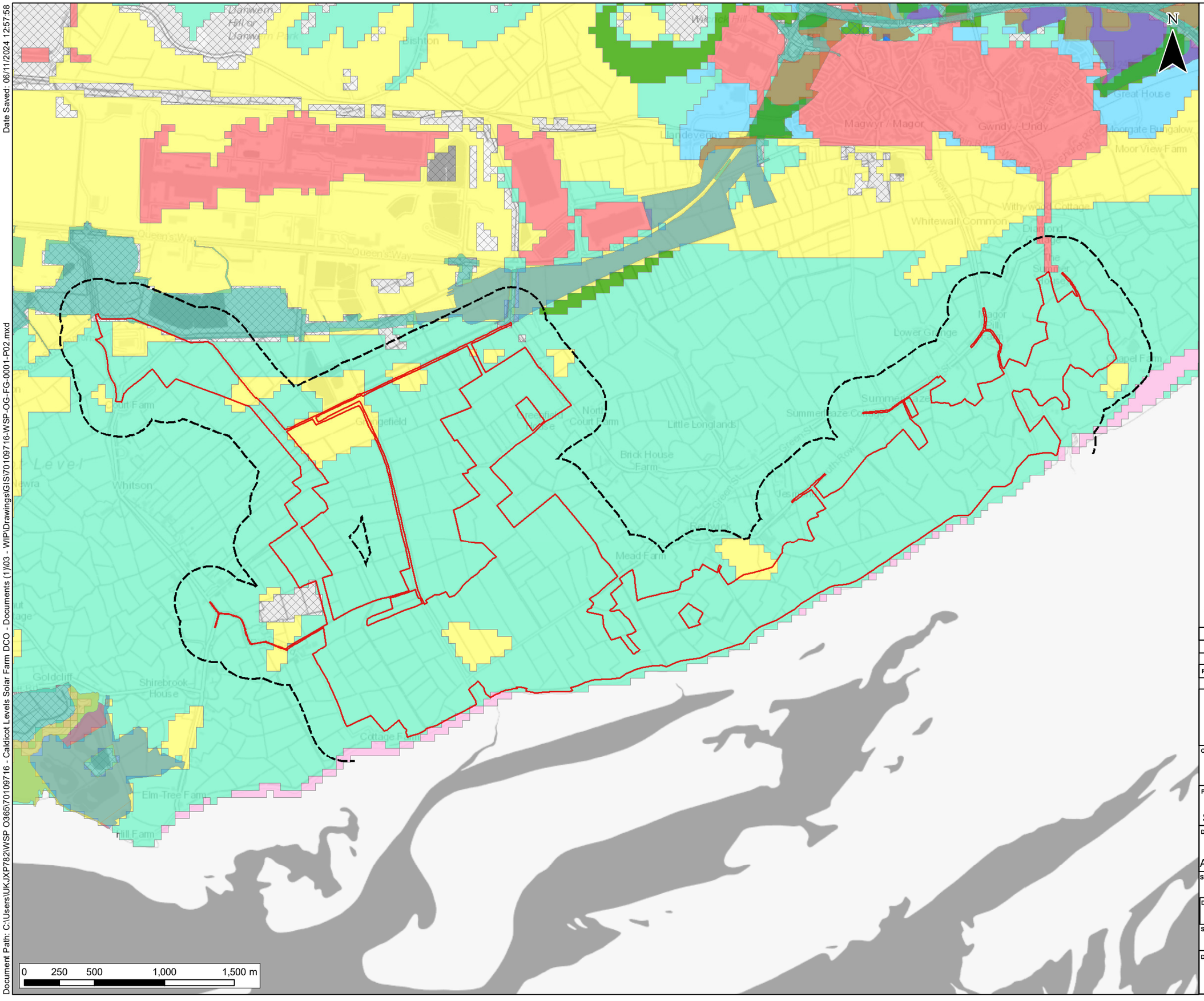
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Key

- Proposed development application boundary
- Study area: Soil, agricultural land, geology and mineral resources

Predictive Agricultural Land Classification (ALC)"

- 1
- 2
- 3a
- 3b
- 4
- 5
- U
- NA

Post 1988 ALC Survey

- Grade 2
- Grade 3a
- Grade 3b
- Grade 4
- Grade 5
- No data
- Non Agricultural
- Not Surveyed

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DRAWING TITLE:
FIGURE 11.1
SOIL, AGRICULTURAL LAND, GEOLOGY AND MINERAL RESOURCES STUDY AREA

STATUS:
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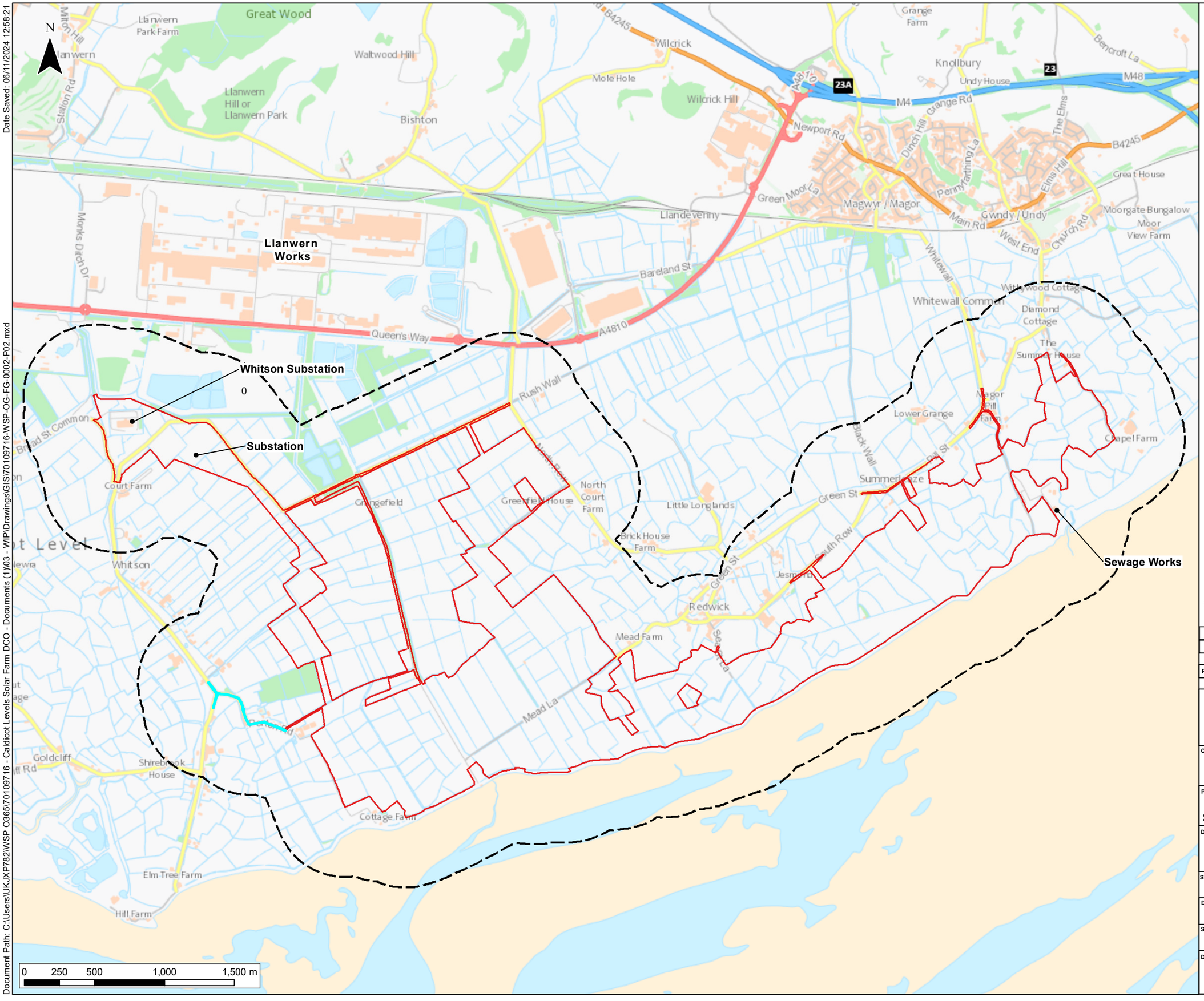
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Key

- Proposed development application boundary
- Study area: Land contamination

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PROJECT TITLE:
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DRAWING TITLE:
FIGURE 11.2
LAND CONTAMINATION STUDY AREA

STATUS:
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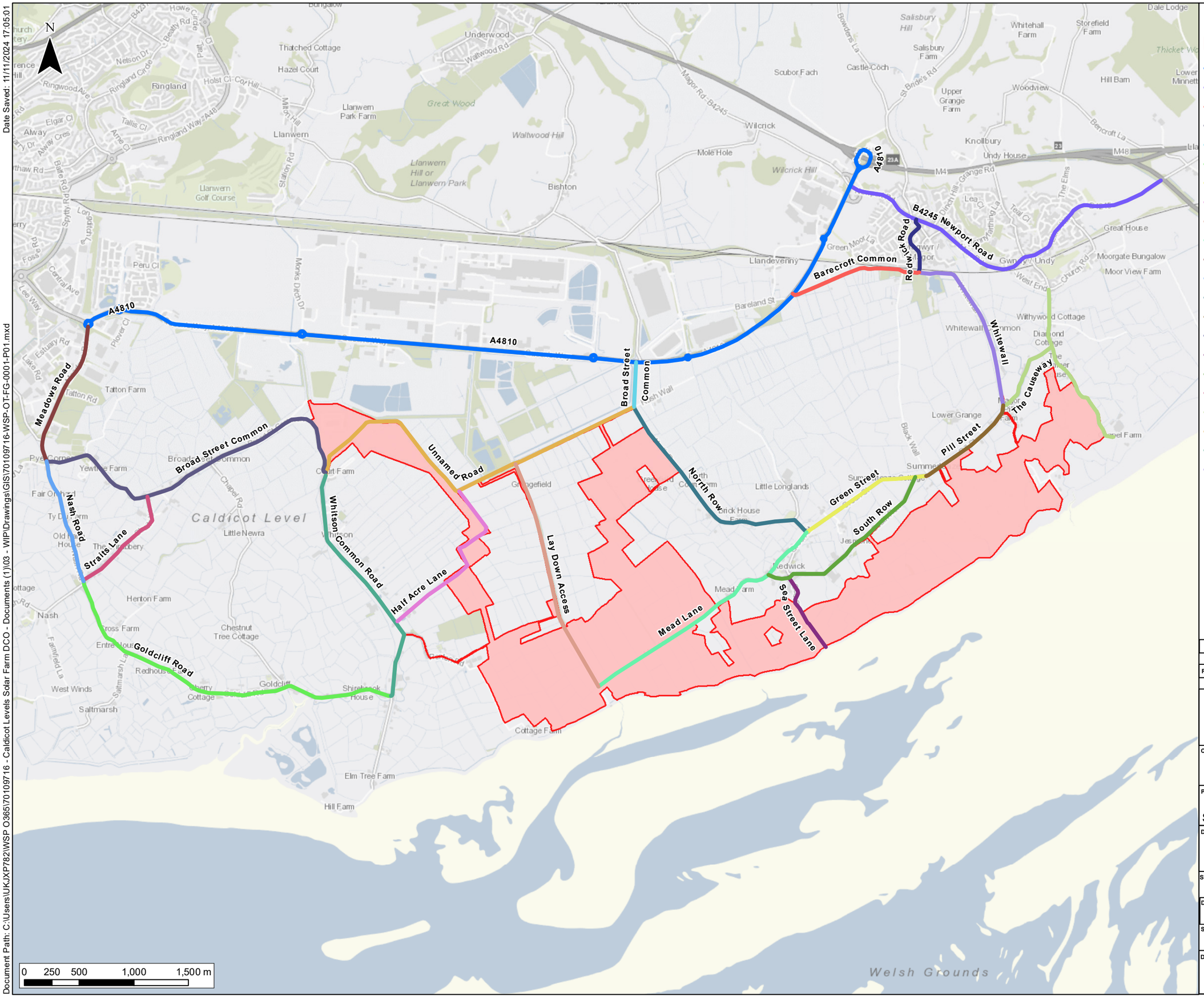
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Key

- Proposed development application boundary
- A4810
- B4245 Newport Road
- Barecroft Common
- Broad Street Common
- Broad Street Common
- Goldcliff Road
- Green Street
- Half Acre Lane
- Lay Down Access
- Mead Lane
- Meadows Road
- Nash Road
- North Row
- Pill Street
- Redwick Road
- Sea Street Lane
- South Row
- Straits Lane
- The Causeway
- Unnamed Road
- Whitson Common Road
- Whitewall

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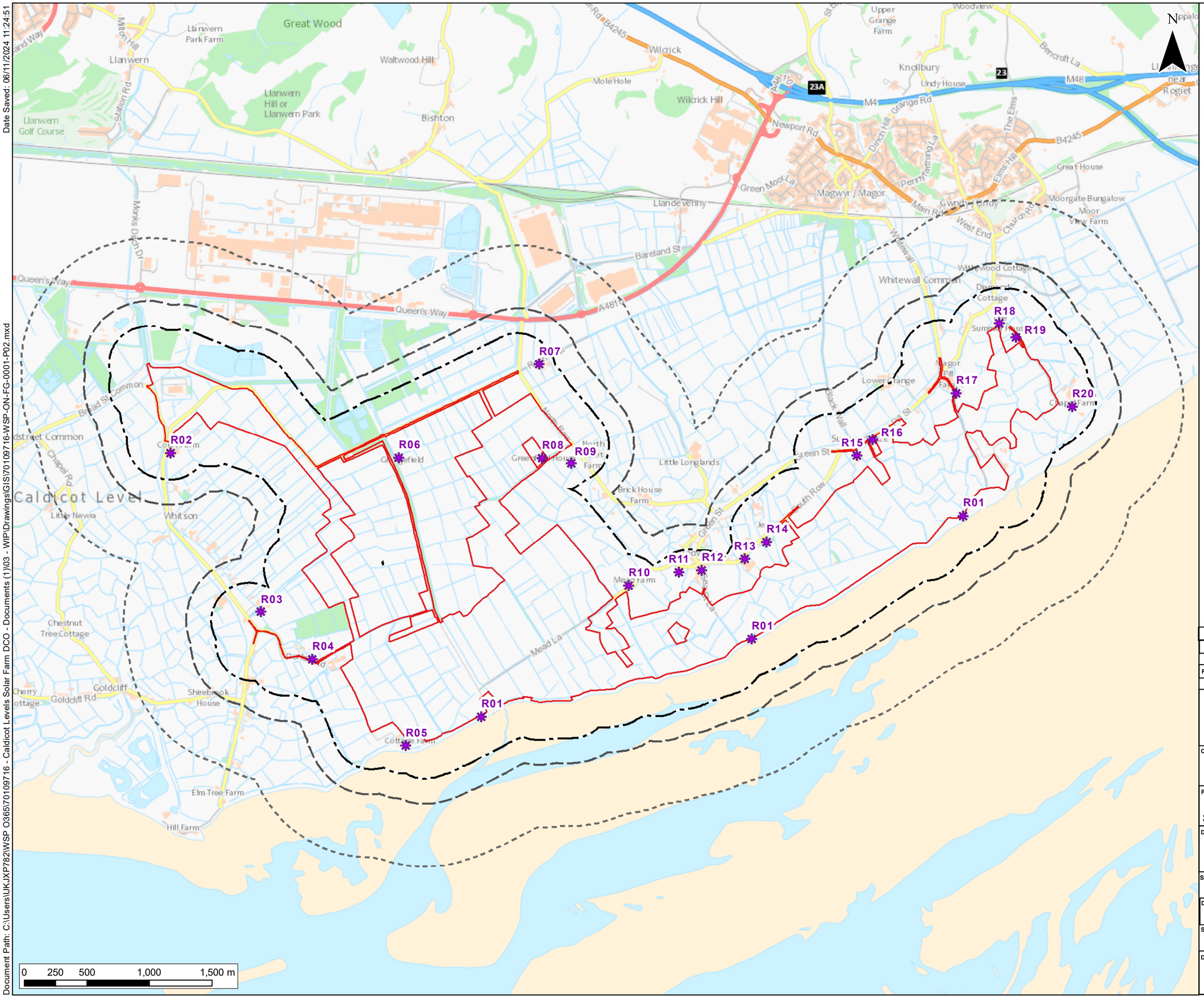
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DRAWING TITLE:
FIGURE 12.1
STUDY AREA - TRANSPORT

STATUS:
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Key

- Proposed development application boundary
- Construction noise and vibration study area
- Operational noise study area (new plant associated with photovoltaic panels)
- Operational noise study area (new plant associated with grid connection)
- Receptor

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Client Name: FUTURE ENERGY LLANWERN LTD

PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 13.1 NOISE AND VIBRATION: STUDY AREAS AND RECEPTORS

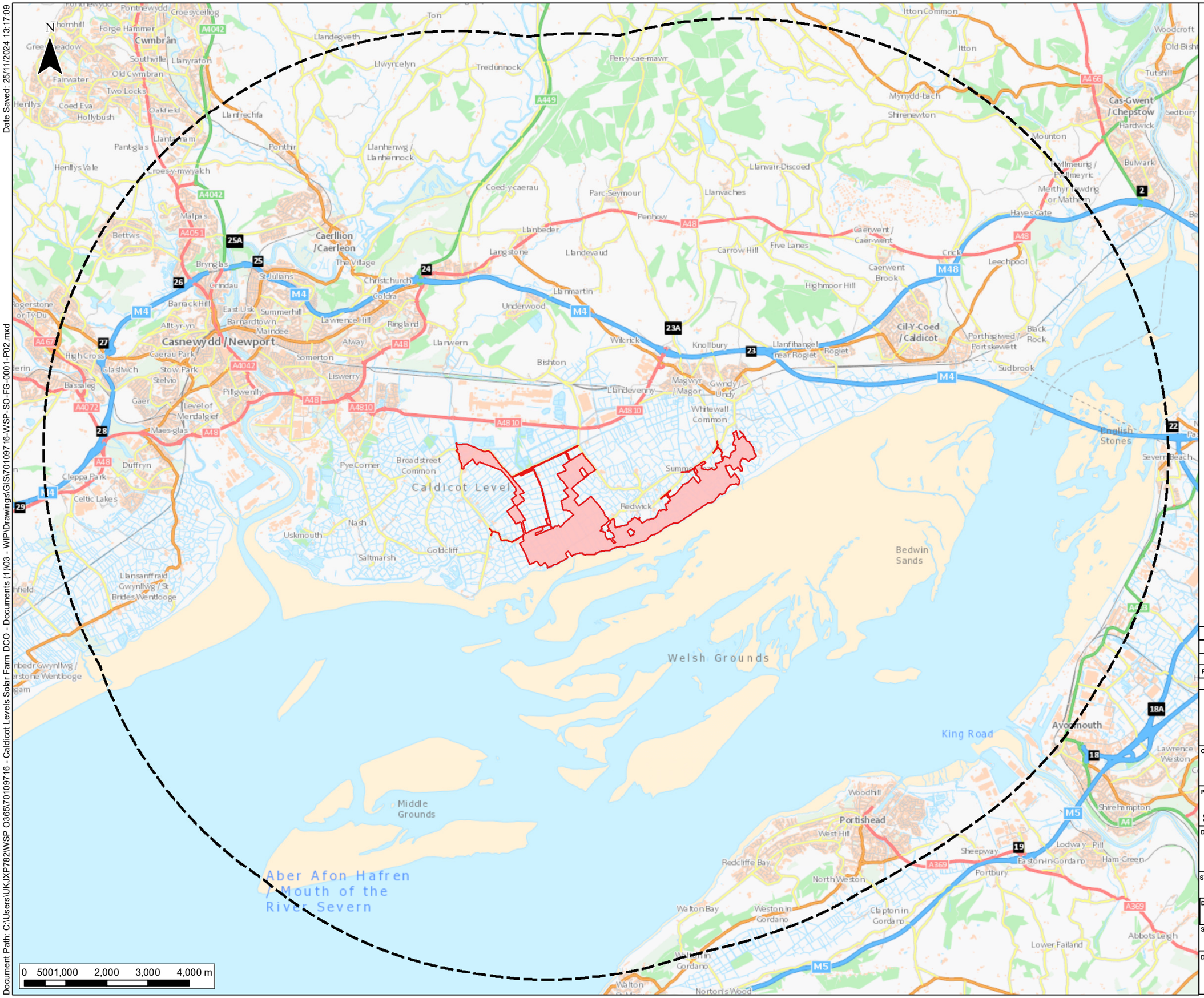
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Client Name: FUTURE ENERGY LLANWERN LTD

PROJECT TITLE: FUTURE ENERGY LLANWERN SOLAR FARM EIA SCOPING REPORT

DRAWING TITLE: FIGURE 18.1 CUMULATIVE EFFECTS ASSESSMENT STUDY AREA

STATUS: DRAFT VERSION

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