Lluest Dolgwiail Wind Farm

Scoping Report

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1 Introduction

1.1 Background and Context

1.1.1 RES ('The Applicant') is preparing an application for the Lluest Dolgwiail Wind Farm ('Proposed Development'), located to the southwest of the village of Llangurig in Powys, Wales. The Site is located within the uplands of the Cambrian Mountains, with the A44 to the north and A470 to the east. Llangurig is the closest settlement and lies some 1.9 km to the northeast of the closest turbine. See **Figure 1.1: Site Location and Context Plan**. This report accompanies a request for an Environmental Impact Assessment (EIA) Scoping Direction from Planning and Environment Decisions Wales (PEDW) in accordance with Regulation 33 of the Town and Country Planning (EIA) (Wales) Regulations 2017 (the "EIA Regulations") with respect to the Proposed Development.

1.1.2 As the scheme comprises an electricity generating station with an installed generating capacity of between 10 and 350 MW, it falls within the definition of a 'Development of National Significance' (DNS) under section 4(1) of the Developments of National Significance (Specified Criteria and Prescribed Secondary Consents) (Wales) Regulations 2016 (as amended), for the purposes of s62(D) of the Town and Country Planning Act 1990, as amended by s19 of the Planning (Wales) Act 2015.

1.1.3 In accordance with the EIA Regulations, a person who is minded to make an application for planning permission for a potential DNS may ask the Welsh Ministers to state in writing the scope and level of detail of the information to be provided in the Environmental Statement (ES) (a "Scoping Direction").

1.1.4 Regulation 33 (2) of the EIA Regulations states that a scoping request must be accompanied by:

(2) A request under paragraph (1) must include-

(a) a plan sufficient to identify the land;

(b) a brief description of the nature and purpose of the development including its location and technical capacity;

(c) its likely significant effects on the environment;

(d) a statement that the request is made in relation to a development of national significance for the purposes of section 62D of the 1990 Act; and

(e) such other information or representations as the person making the request may wish to provide or make.

1.1.5 In addition to the above, Appendix 3 of the PEDW Developments of National Significance: Procedural Guidance sets out that a Scoping Report should include the following information:

- An outline of the main alternatives considered and the reasons for selecting a preferred option;
- Results of desktop and baseline studies where available;
- A record of consultation undertaken with relevant bodies (including any public engagement) to date;
- Referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the proposal;
- Guidance and best practice to be relied upon, and whether this has been agreed with the relevant bodies (for example the statutory nature conservation bodies or local authorities) together with copies of correspondence to support these agreements;
- Methods used or proposed to be used to assess impacts and the significance criteria framework used;
- Any mitigation proposed and the extent to which these are likely to reduce impacts;
- Where impacts from consequential or cumulative development have been identified, how applicants intend to assess these impacts in the ES (for example, a high level assessment of the grid connection where this does not form part of the Proposed Development for a power station);
- An indication of any European designated nature conservation sites that are likely to be significantly affected by the proposed development and the nature of the likely significant impacts on these sites; and
- Key topics covered as part of applicants' scoping exercise; and
- An outline of the structure of the proposed ES.

1.1.6 In accordance with the requirements of Regulation 33, this request for a Scoping Direction is made in relation to a DNS for the purposes of section 62D of the Town and Country Planning Act 1990.

1.2 Need for Development

1.2.1 The science behind climate change is well established and points strongly towards a need to reduce our reliance on fossil fuels in order to avoid negative economic, environmental and social effects. International and European commitments to reducing CO_2 and tackling climate change have been made by all major economies. In response to these issues the UK has made significant, legally binding commitments to increase the use of renewable energy.

1.2.2 There is a strong planning policy direction that much more has to be done through the planning system to meet the greatly enhanced level of renewable energy development that is now required. The Environment (Wales) Act 2016 sets a target to reduce greenhouse gas emissions in Wales by 80% by 2050 and in 2017, the Welsh Government announced a target of meeting 70% of Wales' electricity consumption from renewable electricity sources by 2030 (Welsh Government, 2017). Since declaring a climate emergency in 2019 and responding to advice from the Climate Change Committee, the Welsh Government has set out the target for Wales to be net zero by 2050. The Proposed Development relates directly to both the need and of those commitments.

1.3 The Applicant

1.3.1 RES is the world's largest independent renewable energy company, working across 24 countries and active in wind, solar, energy storage, green hydrogen, transmission and distribution. As an industry innovator for over 40 years, RES has delivered more than 27GW of renewable energy projects across the globe and supports an operational asset portfolio exceeding 41GW worldwide for a large client base.

1.3.2 From its Cardiff office, RES has been developing, constructing and operating wind farms in Wales since the early 1990s. RES has developed and/or built 7 wind farms in Wales with a total generation capacity of 146.55 MW, and currently manages assets totalling 69.4 MW of capacity in Wales.

2 Environmental Impact Assessment

2.1 Environmental Impact Assessment

2.1.1 The EIA Regulations require that before consent is granted for certain types of development, an EIA must be undertaken. The Regulations set out the types of development which must always be subject to an EIA (Schedule 1 development) and other developments which may require EIA if they are above certain thresholds and are likely to give rise to significant environmental impacts (Schedule 2 development).

2.1.2 The Proposed Development falls within Schedule 2 of the EIA Regulations and has the potential to have some significant environmental effects. Therefore, it is the opinion of The Applicant that the Proposed Development qualifies as "EIA Development" and therefore The Applicant will submit an Environmental Statement (ES), in support of a planning application to the Welsh Ministers.

2.1.3 EIA is an iterative process which identifies the potential environmental effects that in turn inform the eventual design of the Proposed Development. It seeks to avoid, reduce, offset and minimise any adverse environmental effects through mitigation. It takes into account the effects arising during the construction, operation and decommissioning phases. Consultation is an important part of the EIA process and assists in the identification of potential effects and mitigation measures.

2.2 Purpose of EIA Scoping

2.2.1 The purpose of EIA Scoping is to consider the scope and level of detail of the information to be provided in the ES and to focus the EIA process on the likely significant environmental effects of a proposal.

2.2.2 The EIA Regulations provides for potential applicants to ask Welsh Ministers to state in writing the information that should be provided within the ES. The 'Scoping Direction' is to be offered following discussion with the consultation bodies.

2.2.3 The Applicant recognises the value of the scoping approach and the purpose of this report is to ensure that relevant issues are identified and to confirm that the assessment process described will meet legislative requirements.

2.2.4 This Scoping Report:

- describes the existing site and its context;

- establishes the format of the ES;
- provides baseline information; and
- describes key issues and the proposed assessment methodologies for various technical assessments to be covered in the ES.

2.2.5 Key questions are included throughout the Scoping Report to help structure the feedback from Ministers and consultees and ensure realisation of the maximum value of the scoping process for all parties.

2.2.6 This Scoping Report will be submitted to PEDW, who will seek opinions from a range of statutory and non-statutory consultees. Where requested, the report can be made available to other interested parties.

2.3 EIA Process and Methodology

Introduction

2.3.1 Environmental Impact Assessment (EIA) is a process, which identifies the potential environmental effects of a development and then seeks to avoid, reduce or offset any adverse effects through mitigation measures. Its key characteristics are that it is:

- Systematic – comprising a sequence of tasks defined both by regulation and by good practice, leading to the use of the information that is gathered to inform decision-making as to whether or not the proposed development should be allowed to proceed;
- Analytical - requiring the application of specialist skills from the environmental sciences;
- Impartial – its aim being to inform the decision maker rather than to promote the project;
- Consultative – with provision being made for obtaining feedback from interested parties including local authorities and statutory agencies;
- Iterative - allowing opportunities for environmental concerns to be addressed during the planning and design of a project; and
- Interactive, whereby the proposals for the key stages of the development are progressively refined in response to environmental as well as technical considerations with a view to minimising the scheme's potential adverse environmental effects and maximising environmental benefits.

2.3.2 The EIA process is an iterative one, but the process can be broken down into the following stages; consultation and scoping; assessment approach and methodology; baseline studies to establish the existing environmental conditions at the site; identification of potential environmental effects; mitigation to avoid or reduce the effects through iterative design process; assessment of residual effects and preparation of the ES.

Consultation and Scoping

2.3.3 As discussed in section 2.2 above, the purpose of EIA Scoping is to consider the scope and level of detail of the information to be provided in the ES and to focus the EIA process on the likely significant environmental effects of a proposal. In addition, the scoping process seeks opinions from a range of statutory and non-statutory consultees which provides helpful feedback and guidance which informs the EIA process and outputs of the ES.

Assessment Approach and Methodology

2.3.4 The assessment approach and methodology identifies the study area assessed and explains why this area is appropriate. It also identifies the criteria for assessing and describing significance, whilst confirming what assessments have been carried out and when. The methodology will provide detailed information of any consultation undertaken both pre and post Scoping. It will also include a section on relevant policy and guidance.

Baseline Conditions Studies

2.3.5 Information relating to the existing environmental conditions will be collected. This may include one or all of the following: desk based assessment, information from consultees, public records and other archive sources. Where site surveys are undertaken the methods of data collection discussed and agreed with the relevant consultees will be provided. Individual data sources will be described in each chapter of the ES.

Identification, Description and Evaluation of Likely Significant Environmental Effects

2.3.6 This section of the EIA process recognises the effects which are likely. The stated methodology is applied to the scheme design and covers the construction, operation and decommissioning of the Proposed Development. The site receptors are identified at this stage in the process, including human receptors and environmental resources such as flora, fauna, the water environment and cultural heritage.

2.3.7 Conclusions about significance are derived with reference to available information about the project description and the site receptors, and to predictions about the impacts which the development proposed would have assuming it is consented, on identified receptors.

2.3.8 In each of the environmental topic chapters, professional judgement is used in combination with relevant guidance to assess the interaction of the receptor's sensitivity (this may be defined in terms of importance, value, rarity, quality) against the predicted magnitude of change to identify a level of effect.

2.3.9 In general terms, and in order to assist consistent interpretation of the final results of the EIA, receptor sensitivity, magnitude of change and level of effect for each environmental topic are categorised. The type of categorisation may be moderated by the individual professional that undertakes the assessment in accordance with relevant guidance documents, judgement and experience. In particular, the divisions between categories of receptor sensitivity, magnitude of change, and level of effect should not be interpreted as definitive.

2.3.10 When determining significance this reflects the relationship between two factors; the magnitude or severity of an effect (i.e. the actual change taking place to the environment); and the sensitivity, importance or value of the resource or receptor. The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the effects can be positive or negative (beneficial or adverse). Magnitude, sensitivity and significance criteria are provided as a guide for specialists to categorise the significance of effects. Where discipline specific methodology is applied that differs from the generic criteria and will be explained within the given chapter under the Assessment Approach & Methodology section.

Mitigation

2.3.11 Mitigation identifies any measures required to prevent, reduce or compensate for significant adverse impacts, or enhance positive effects. It also takes into account the likelihood of the success of the mitigation measures proposed. Where effects cannot be avoided, individual chapters outline appropriate mitigation to reduce these effects or recommend compensatory measures.

Residual Effects

2.3.12 Each chapter of the ES will include a description and evaluation of the residual effects of the development proposed, i.e. those effects which are considered to be significant in terms of the EIA Regulations following the implementation of mitigation measures.

2.4 The Environmental Statement

2.4.1 The ES systematically sets out the assessment methodology, baseline conditions, key impacts and potential mitigation and enhancement measures that have been assessed by consultants of the respective disciplines to address the likely significant effects identified as required by the Town and Country Planning (EIA) (Wales) Regulations 2017.

2.4.2 The ES reports the findings of the assessment of the likely significant environmental effects of the scheme. Although each assessment applies a specific series of matrices and decision-making tools to assist the assessor in determining the significance of predicted effects identified in the ES, the same general approach of information gathering and assessment is undertaken throughout the EIA process.

2.4.3 The ES includes information, as detailed in Schedule 4 of the Town and Country Planning (EIA) (Wales) Regulations 2017, as reasonably required, to assess the environmental effects of the development. The ES provides data to identify and assess any environmental effects of likely significance in relation to the Proposed Development and provides a description of the measures envisaged in order to avoid, reduce or remedy, if possible, significant adverse effects.

2.4.4 The structure of the ES will follow the requirements of the Town and Country Planning (EIA) (Wales) Regulations 2017 and other relevant good practice guidance. Essentially, the ES will comprise the following volumes:

- Volume 1 – Non-Technical Summary;
- Volume 2 – Main Text;
- Volume 3 – Figures
- Volume 4 – Technical Appendices; and
- Volume 5 – Confidential Annex (if required).

2.4.5 Volume 2 will comprise of the following chapters:

- Chapter 1 – Introduction;
- Chapter 2 – Approach to EIA;
- Chapter 3 – Application Site and Proposed Development;
- Chapter 4 – Design Evolution, Alternatives and Planning Policy;

- Chapter 5 – Landscape and Visual Impact Assessment;
- Chapter 6 – Cultural Heritage Assessment;
- Chapter 7 – Ecology Assessment;
- Chapter 8 – Ornithology Assessment;
- Chapter 9 – Geology, Peat, Hydrology and Hydrogeology Assessment;
- Chapter 10 – Acoustic Assessment;
- Chapter 11 - Traffic and Transport Assessment;
- Chapter 12 – Socio Economic Assessment;
- Chapter 13 – Aviation Assessment;
- Chapter 14 – Telecommunications & Shadow Flicker Assessment;
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- Chapter 15 - Schedule of Environmental Mitigation; and
- Chapter 16 – Summary and Conclusions

2.4.6 Each technical chapter (5-17) will include, as a minimum, the following sections:

- Introduction
- Legislation, Policy and Guidance
- Consultation
- Method of Assessment
- Baseline
- Assessment of Potential Effects
- Mitigation
- Assessment of Residual Effects
- Assessment of Cumulative Effects
- Summary
- References

2.5 ES Format

2.5.1 When the EIA process has been completed and the ES prepared it will be made available online, on USB flash drive and hard copy which will be publicly available although, in the interest of sustainability, encouragement of the online format is preferred.

3 The Proposed Development

3.1 Introduction

3.1.1 This section describes the Proposed Development and provides information on its location, physical characteristics, proposed components and design. The wind turbine and infrastructure layout will be subject to an iterative design process as part of the EIA.

3.1.2 The Proposed Development is located on land within Powys, Wales. The Site is located within the uplands of the Cambrian Mountains, with the A44 to the north and A470 to the east. Llangurig is the closest settlement and lies ca. 1.9 km to the northeast of the closest turbine. The Site is primarily comprised of a gently undulating plateau interior that is incised by several watercourses, which drain towards the Wye valley to the east. Other watercourses drain the southern edge of the Site towards the Afon Elan. The site is characterised by sheep grazed grassland with blocks of coniferous forestry, of various scale.

3.1.3 The nearest settlements to the Proposed Development are: Llangurig ca. 1.9 km to the northeast and Aberystwyth ca. 29 km to the west.

3.1.4 The principal components of the Proposed Development are expected to include:

- up to 35 three-bladed horizontal axis wind turbines of up to 230m tip height. The wind turbines would be nominally rated at 7.2 MW;
- at each wind turbine, associated low to medium voltage transformers and related switchgear;
- wind turbine foundations;
- hardstand areas for erection cranes at each wind turbine location;
- a network of on-site tracks including an access track and site entrance from the public road network;
- borrow pits (dependent on availability of stone within the site);
- a substation compound containing electrical infrastructure, control building, welfare facilities and a communications mast;
- a network of buried electrical and communication cables; and
- temporary construction compounds.

3.2 Site Description

3.2.1 The Site forms part of an elevated upland landscape that is undulating, with high points of 526 m AOD near its western and southern edge, 538 m

AOD in its northern edge, and 479 m AOD in its southern part. The Site extends across this higher ground and the eastern slopes face the Wye valley. The gently undulating plateau interior of the Site is incised by several watercourses, which drain towards the Wye valley to the east. Other watercourses drain the southern edge of the Site towards the Afon Elan.

3.2.2 The Site itself is an unremarkable upland landscape characterised by sheep grazed grassland with blocks of coniferous forestry, of various scale but all geometric in shape. The individual forestry blocks connect to a substantial area of forestry plantation extending northwest at Esgair Ychion.

3.2.3 A number of farmsteads and scattered dwellings are located to the east of the Site, typically on the lower and mid slope of the Wye valley along the A470.

3.2.4 The Wye Valley long distance footpath crosses the eastern edge of the Site and whilst predominantly located in the valleys the route at the eastern boundary of the Site marks a contrast where the route crosses an upland landscape, before descending the valley sides and rejoining a route close to the River Wye to the west of Llangurig. National Cycle Route 81 is located to the south of the Site along a minor road within the Nant Elan valley.

3.2.5 In addition, there are numerous footpaths and bridleways with large tracks of the upland landscape subject to Open Access Land agreement. Areas of Open Access Land and Registered Common Land are located within the Site as illustrated on **Figure 3.1: Environmental Designations Plan** and **Figure 11.1: Public Rights of Way**.

3.2.6 The village of Llangurig is located approximately 1.9km to the northeast of the closest turbine. The village has a small Conservation Area which covers St Curigs Church, which is a Grade II* Listed Building.

3.2.7 See **Figure 3.1: Environmental Constraints Plan** for features described above.

3.3 Site Design

3.3.1 The Proposed Development has been informed by an iterative process of design, engineering analysis and examining site suitability issues, commencing with a preliminary constraints analysis exercise taking into account topographical considerations, proximity to local designations and

a robust analysis of environmental considerations. Initially the scheme commenced as a 37 turbine layout which reduced to 35 turbines following the findings of the preliminary peat mapping.

3.3.2 Further survey work includes further guidance following on from landscape and visual impact feasibility assessment and ecological surveys and any relevant constraints as a result of this work.

3.4 Cumulative Development

3.4.1 Within EIA, cumulative effects are generally considered to arise from the combination of effects from the Proposed Development and from other proposed or permitted schemes in the vicinity, acting together to generate elevated levels of effects. Examples of these kinds of effects could include traffic generated from developments affecting the surrounding road network; air quality effects from developments; and discharges to the water environment. The ES will consider the potential for likely significant effects on the environment resulting from committed developments in the area.

3.4.2 As set out within Welsh Office Circular 11/99 'Environmental Impact Assessment' paragraph 46:

"Local planning authorities should always have regard to the possible cumulative effects with any existing or approved development"

3.4.3 Furthermore, Policy 18 of Future Wales requires proposals for renewable and low carbon energy projects to consider the cumulative impacts of existing and consented renewable energy schemes.

3.4.4 Cumulative sites within 30km of the Proposed Development as listed in Table 3.1 and illustrated on **Figure 5.5: Other Wind Energy Developments** will be considered for operational, under construction, consented, and proposed (for those which there is a valid planning application) wind farms.

3.4.5 The approach to how cumulative effects will be considered for each discipline is outlined within each individual topic section below and the detailed methodology will be set out within the relevant chapter of the ES as methodologies may differ slightly from topic to topic. For example, as stated in the landscape section below (Section 5) the Landscape and Visual Impact Assessment chapter of the ES will consider the potential for any cumulative effects to arise within 34 km of the site, but other disciplines

may not have a need to consider committed developments this far from the Proposed Development.

3.4.6 As the cumulative baseline is constantly evolving and the relevant cumulative schemes will vary by topic, the schedule of cumulative sites to be included in the assessment will be finalised following consultation with relevant consultees, in particular Powys County Council (PCC).

Table 3.1 Cumulative sites within 34 km

Wind Farm	Status	Approx distance /direction from Lluest Dolgwiall	Turbines Nos/Blade Tip Height metres (BTH)
Aberedw Energy Park	Scoping / In Planning	31 km southeast	18 turbines / 200 m BTH
Banc Du	Scoping / In Planning	2 km north	7 turbines / 200 m BTH
Bryn Blaen	Operational	3 km north	6 turbines /100 m BTH
Bryngydfa	Scoping / In Planning	23 km east	12 turbines /126.5m BTH
Bryn Gilwern Energy Park	Scoping / In Planning	26 km southeast	16 turbines / 220 m BTH
Bryn Titli	Operational	4 km east	22 turbines / 53.5 m BTH
Carnedd Wen	Scoping / In Planning	26 km north	28 turbines / 200 m BTH
Carno III	Consented	15 km north	13 turbines / 149.9 m BTH
Carno I	Operational	16 km north	56 turbines / 50.6 m BTH
Carno II	Operational	18 km north	12 turbines / 79 m BTH*
Cefn Croes	Operational	1 km west	39 turbines / 100 m BTH
Cemmaes 2	Operational	27 km north	18 turbines / 66m BTH
Esgair Galed	Scoping / In Planning	13 km north	26 turbines / 220 m BTH
Garreg Lwyd	Operational	23 km east	17 turbines / 126 m BTH
Garn Fach	Consented	14 km east	17 turbines / 149.9 m BTH
Hendy Wind Farm	Operational	29 km southeast	7 turbines / 110 m BTH
Llanbrynmair	Scoping	25 km north	15 turbines / 230 m BTH
Llandinam	Operational	13 km east	103 turbines / 45.5 m BTH
Llandinam Extension	Consented	13 km east	35 turbines / 121.2 m BTH
Llangwyryfon	Operational	23 km west	11 turbines / 66 m BTH
Lluest Y Gwynt	Scoping / In Planning	9 km northwest	24 turbines / 180 m BTH
Mynydd Clogau	Operational	24 km northeast	17 turbines / 66 m BTH
Mynydd Gorddu	Operational	20 km northwest	19 turbines / 54 m BTH
Rheidol	Operational	13 km west	8 turbines / 56.7 m BTH

Rhiwlas	Scoping	3 km east	8 turbines /200 m BTH
Tirgwyn	Operational	24 km northeast	12 turbines / 116 m BTH

3.4.7 Assessments will be quantitative where possible, and qualitative where not, based on professional judgement and reasonable assumptions. As part of the Scoping consultation, confirmation is also sought from PEDW on the Proposed Developments to be considered in the cumulative assessment.

3.5 Electrical Layout and Grid Connection

3.5.1 Wind turbines will be electrically connected to each other via inter-array cable circuits. A substation, which would house transformer(s) and associated switchgear, would convert the electricity generated by the wind turbines onto an appropriate voltage for onward transmission onto the National Grid.

3.6 Construction Phase

3.6.1 It is anticipated that the construction phase of the Proposed Development would be completed over a period of approximately 28 months.

3.6.2 Temporary compound(s) would be required during construction. The temporary compound(s) would include site cabins and welfare facilities for construction workers and could also be used as a laydown area for the delivery of some materials.

3.6.3 Stone required to construct any new access tracks could potentially be obtained from on-site borrow pits. The exact location of borrow pits would be dependent upon site surveys, availability of suitable material and proximity to where it is required. Should a suitable borrow pit search area not be identified within the site, The Applicant will need to make provision for the import of aggregate from a suitable off-site source.

3.6.4 All statutory legislation and other best practice guidance would be fully complied with during construction.

3.6.5 Construction mitigation and environmental protection measures would be implemented via a Construction Environmental Management Plan (CEMP).

3.7 Operational Phase

3.7.1 The assessments undertaken to inform the EIA will consider the operational phase of the Proposed Development in perpetuity.

3.7.2 Routine operational and maintenance work would be carried out as necessary.

3.8 Decommissioning Phase

3.8.1 When decommissioning is required, it is considered that the impacts would be less than the impacts experienced during the construction phase.

4 Planning Policy Context

4.1 Introduction

4.1.1 The application will be submitted under the Town and Country Planning Act 1990 as a development of national significance (DNS) and accompanied by a Planning Statement in support of the Proposed Development. The Planning Statement will consider the Proposed Development against identified planning and other policy objectives, concluding with substantiated comments about the extent to which the Proposed Development complies with the aims and objectives of identified plans and policies.

4.1.2 For clarity, the Planning Statement will draw upon the residual effects, post mitigation, of the Proposed Development identified in the various technical chapters of the ES, in discussing the extent to which it complies with the aims and objectives of identified planning, energy and other relevant policy objectives. The planning and energy related documents that will be considered by The Applicant are set out below.

4.2 National Planning Policy

Future Wales: The National Plan 2040

4.2.1 Future Wales: The National Plan 2040 (Future Wales) is the National Development Framework for Wales and sets out the overall context for development planning across the country to 2040. Future Wales was introduced in February 2021 and seeks to provide a strategy for addressing key national priorities through the planning system, inclusive of decarbonisation. It is the primary document in the development plan and is a material consideration in the determination of DNS applications.

4.2.2 Future Wales sets out that Wales can become a world leader in renewable energy technologies, with its wind resources highlighted as well as support for large scale projects and commitment to ensuring that the planning system provides a strong lead for renewable energy development.

4.2.3 Decarbonisation is a key aim of the document, which sets a number of target outcomes including the planning system helping Wales lead the way in promoting and delivering a sustainable decarbonised society. Two of the 'seven key questions' that will form the 'First Review' of the document in determining it's success are 'Has Future Wales supported

decarbonisation', and 'Has Future Wales supported the delivery of renewable energy.'

4.2.4 Of particular note are Policy 17 (Renewable and Low Carbon Energy and Associated Infrastructure) and Policy 18 (Renewable and Low Carbon Energy Developments of National Significance). Policy 17 strongly supports the principle of developing renewable and low carbon energy from all technologies, stating that decision makers must give significant weight to the need to meet Wales' international commitments and targets. It also confirms that in Pre-Assessed Areas for Wind Energy the Welsh Government has already modelled the likely impact on the landscape and has found them to be capable of accommodating development in an acceptable way. There is a presumption in favour of large-scale wind energy development in these areas, subject to the criteria in Policy 18.

4.2.5 Policy 18 sets a number of criteria for assessing such proposals, including no unacceptable adverse impacts on the surrounding landscape outside the pre-assessed areas (particularly on the setting of National Parks and AONBs), no adverse impacts on heritage assets, the proposal including biodiversity enhancement measures, no adverse impacts on the transport network and ensuring that cumulative impacts are considered.

4.2.6 The supportive text to the policies sets out in detail how the policies will support such development. The Planning Statement will provide further detail as to how this support is relevant to the determination of the proposed development.

Planning Policy Wales

4.2.7 Planning Policy Wales (PPW) was republished in February 2024 (Edition 12) and outlines the current land use planning policy for Wales, providing the policy framework for the effective preparation of local planning authorities' development plans. The PPW is supplemented by a series of topic based Technical Advice Notes and is designed to ensure the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales. Alongside Future Wales, the PPW outlines the way in which the planning system can support this delivery through Strategic and Local Development Plans.

4.2.8 PPW confirms that planning applications for onshore generating projects in Wales which have an installed generation capacity of between 10 MW and 350 MW are made directly to the Welsh Government under the

Developments of National Significance (DNS) process and considered under policies in Future Wales.

Green Infrastructure Statement

4.2.9 Planning Policy Wales (Edition 12) places a stronger emphasis on taking a proactive approach to green infrastructure, covering cross boundary considerations, identifying key outputs of green infrastructure assessments, the submission of proportionate Green Infrastructure Statements with planning applications and signposting building with nature standards. There is a requirement to submit Green Infrastructure Statements with all planning applications.

Technical Advice Notes

4.2.10 Alongside the PPW, the Welsh Government provides technical advice on specific land use planning matters through a series of Technical Advice Notes (TANs). A number of TANs are potentially relevant to the Proposed Development and these may be briefly discussed in the Planning Statement, with more detailed commentary reserved for the relevant technical chapters of the ES. At this stage, it is envisaged that the following TANs may be of relevance:

- Technical advice note (TAN) 5: Nature conservation and Planning (2009)
- Technical advice note (TAN) 11: Noise (1997)
- Technical advice note (TAN) 12: Design (2016)
- Technical advice note (TAN) 15: Development and Flood Risk (2023)
- Technical advice note (TAN) 18: Transport (2007)
- Technical advice note (TAN) 24: The Historic Environment (2017)

4.3 Strategic and Local Planning Policy

Energy Policy

4.3.1 According to the United Nations Intergovernmental Panel on Climate Change's fifth assessment report, fossil fuel power generation should be phased out 'almost entirely' by the end of the century to limit global warming to 2 degrees Celsius (°C) above pre-industrial levels. The report states that low carbon electricity supply will have to increase from 30 % currently to more than 80 % by 2050.

4.3.2 Most of the energy policy documents of relevance to the Proposed Development are concerned with reducing the amount of greenhouse gases (GHG) that are emitted as a result of energy production and a related objective of increasing the proportion of energy derived from renewable sources. The Planning Statement will identify and discuss the key aims and objectives of the most pertinent energy policy documents to the Proposed Development, as at the time of ES preparation. The discussion will include relevant European, United Kingdom (UK) and Welsh energy related legislation and policy. It is anticipated that the commentary on energy policy will identify and discuss the following publications:

- The Paris Agreement (2015) - The Paris Agreement within the United Nations Framework Convention on Climate Change sets out a global action plan towards climate neutrality with the aims of stopping the increase in global average temperature to well below 2 ^{0}C above pre-industrial levels, and to pursue efforts to limit global warming to 1.5 ^{0}C. The Paris Agreement introduced Nationally Determined Contributions (NDS's) – national climate plans that include commitments to increasing renewable energy provision.
- The Climate Change Act 2008 - (the 2008 Act) provides a system of carbon budgeting. Under the 2008 Act, the UK committed to a net reduction in greenhouse gas (GHG) emissions by 2050 of 80 % against the 1990 baseline. The Government amended the Climate Change Act in 2019 by introducing a target for at least a 100 % reduction of greenhouse gas emissions (compared to 1990 levels) in the UK by 2050. This is the well known commitment to 'net zero', requiring a major shift to greater renewable energy generation.
- National Infrastructure Strategy – Fairer, Faster and Greener (November 2020) - The Strategy sets out the UK Government's plans to deliver on its ambition, being to: "deliver an infrastructure revolution: a radical improvement in the quality of the UK's infrastructure to help level up the country, strengthen the Union, and put the UK on the path to net zero emissions by 2050".
- The UK Energy White Paper (December 2020) - The UK Government Energy White Paper 'Powering our Net Zero Future' (December 2020) aims to address the transformation of the UK's energy system towards the 2050 target for net zero emissions. The White Paper recognises the progress made to increase deployment of renewables and sees the expansion of renewable technologies as a key contributor to

achieving an affordable clean electricity system by 2050. It states that "Onshore wind and solar will be key building blocks of the future generation mix…We will need sustained growth in the capacity of these sectors in the next decade to ensure we are on a pathway that allows us to meet net zero emissions in all demand scenarios."

- The Carbon Budget Order (June 2021) ensures that Britain will remain on track to end its contribution to climate change whilst remaining consistent with the Paris agreement temperature goal. The Climate Change Committee have advised that the rapid roll out of renewable energy generation will form a key role in achieving this carbon budget.
- The UK Net Zero Strategy (October 2021) - This sets out policies and proposals for keeping the UK on track in relation to carbon budgets and the UK's nationally determined contribution (NDC)8 and establishes the long-term pathway to net zero by 2050. The Strategy confirms that the fundamental approach of the Energy White Paper remains unchanged. A low-cost net zero consistent electricity system is most likely to be composed predominantly of wind and solar generation. The Strategy affirms that the UK needs to continue to drive rapid deployment of renewables so that it can reach substantially greater capacity beyond 2030.
- The British Energy Security Strategy (April 2022) – The strategy focuses on energy supply and states that in the future nuclear will have an expanded role and that renewables have an important role.
- Powering up Britain (March 2023) - On 30 March 2023 the UK Government (Department for Energy Security and Net Zero) published 'Power Up Britain' which comprises a series of documents including an Energy Security Plan and Net Zero Growth Plan. The documents explain how the country will 'diversify, decarbonise and domesticate energy production by investing in renewables and nuclear, to power Britain from Britain.'
- The Environment (Wales) Act 2016 – This set in place an obligation on the Welsh Government to reduce greenhouse gas emissions by 80% against 1990 levels by 2050.
- Climate Emergency declared in Wales (2019)- The Welsh Government has committed to achieving a carbon neutral public sector by 2030
- Net Zero Wales, Carbon Budget 2 (2021) - The plan states that the Net Zero Wales Plan represents a new phase in the country's decarbonisation journey with a new legally binding Net Zero target.

It focuses on Wales's Second Carbon Budget (2021-2025) but looks ahead to Carbon Budget 3 and Wales's 2030 target as well as Net Zero by 2050.

- 100% Renewable Electricity Generation Target – 2035 - On 14 July 2023, the Welsh Minister for Climate Change, Julie James MS, published a summary response to a consultation on Wales's renewable energy targets. In the response, the Minister stated that the Senedd will be adopting the target for Wales to meet the equivalent of 100 % of our annual electricity consumption from renewable sources by 2035, and to continue to keep pace with consumption thereafter.

4.3.3 The Proposed Development is located within the administrative area of Powys County Council. The Powys Local Development Plan (LDP) (2011-2026) was adopted by Powys County Council on the 17th of April 2018.

4.3.4 The principal policy of relevance to the Proposed Development is Policy RE1 (Renewable Energy). This permits proposals for wind energy greater than 25 MW within or close to the Strategic Search Areas[1], subject to criteria 3 to 5. These criteria expect proposals to comply with all other relevant policies in the LDP, require satisfactory mitigation to be in place to reduce the impact of the proposal and its associated infrastructure, and where necessary, seek compensatory benefits in accordance with Policy DM1. All other proposals for renewable and low carbon energy will only be permitted where they can demonstrate they would not prejudice the purpose of the Strategic Search Areas.

4.3.5 The site as a whole appears to be mainly undesignated countryside as per the Council's Policies Map, aside from some sporadic Sand and Gravel Safeguarding Areas. The site is in part close to a Special Area of Conservation (SAC) associated with the River Wye and contains a number of Scheduled Monuments. The relevant policies within the LDP which have informed the proposed assessment scope therefore include:

- SP7 – Safeguarding of Strategic Resources and Assets
- DM1 – Planning Obligations
- DM2 – The Natural Environment
- DM4 – Landscape
- DM5 – Development and Flood Risk

[1] Now revoked and replaced with the Pre-Assessed Areas within Future Wales

- DM6 – Flood Prevention Measures and Land Drainage
- DM7 – Dark Skies and External Lighting
- DM8 – Minerals Safeguarding
- DM10 – Contaminated and Unstable Land
- DM14 – Air Quality Management
- DM15 – Waste Within Developments
- E6 – Farm Diversification
- T1 – Travel, Traffic and Transport Infrastructure
- RE1 – Renewable Energy
- M3 – Borrow Pits
- M5 – Restoration and Aftercare

5 Landscape and Visual

5.1 Introduction

5.1.1 It is acknowledged from the outset that, in common with almost all commercial wind energy developments that some significant landscape and visual effects would occur as a result of the Proposed Development.

5.1.2 A key principle of the European Landscape Convention is that all landscapes matter and should be managed appropriately. It is also acknowledged that landscapes provide the surroundings for people's daily lives and often contribute positively to the quality of life and economic performance of an area.

5.1.3 Therefore, it is proposed that a Landscape and Visual Impact Assessment (LVIA) is undertaken as part of the EIA and an LVIA Chapter be included in the Environmental Statement (ES). The LVIA will be undertaken by a team of Landscape Architects, including a Chartered Member of the Landscape Institute, who are experienced in the assessment of large scale, onshore wind energy projects and are fully familiar with the landscape in the vicinity of the site.

5.1.4 It is proposed that the LVIA will consider the potential effects of the Proposed Development upon:

- Individual landscape features and elements;
- Landscape character; and
- Visual amenity and the people who view the landscape.

The Site

5.1.5 The Proposed Development site forms part of the undulating upland landscape of the Cambrian Mountains, comprised of sheep grazed grassland with geometric blocks of coniferous forestry of various scale. The individual forestry blocks connect to a substantial area of forestry plantation extending northwest at Esgair Ychion.

5.1.6 The A44 is located to the north and A470 to the east. A number of farmsteads and scattered dwellings are located to the east of the Site, typically on the lower and mid slope of the Wye valley along the A470. Llangurig is the closest settlement and lies some 1.9 km to the northeast of the closest turbine.

5.1.7 The nearest main transport routes include the A44 approximately 1.6 km to the north of the closest turbine, and the A470 is also approximately 1.6

km to the east. The Wye Valley long distance footpath crosses the eastern edge of the Site. National Cycle Route 81 is located to the south of the Site along a minor road within the Nant Elan valley. In addition, there are numerous footpaths and bridleways with large tracks of the upland landscape subject to Open Access Land agreement. Areas of Open Access Land and Registered Common Land are located within the Site.

5.1.8 The Site and the proposed indicative turbine locations are shown on **Figure 1.1** and **Figure 3.1**.

5.2 Legislation, Policy and Guidance

5.2.1 The LVIA will be prepared in accordance with the principles of best practice, as outlined in published guidance documents, notably the third edition of the Guidelines for Landscape and Visual Assessment (GLVIA3).

"This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand."

5.2.2 The approach has therefore been developed specifically for this assessment to ensure that the methodology is fit for purpose. Consideration has also been given to the following documents:

- Future Wales: The National Plan 2040 (2021);
- Siting and Designing Windfarms in the Landscape (Scottish Natural Heritage (SNH), 2017);
- Visual Representation of Wind Farms Guidance, Version 2.2, Scottish Natural Heritage (2017);
- Landscape Institute (2019) Technical Guidance Note 02/19, Residential Visual Amenity Assessment.

5.2.3 Full details of the methodology will be provided within the LVIA chapter of the ES.

5.3 Proposed Scope of Assessment

5.3.1 It is proposed that the main objectives of the LVIA will be as follows:

- To identify, evaluate and describe the current landscape character of the site, its surroundings and any notable individual or groups of landscape features within the site;
- To determine the sensitivity of the landscape to the type of development proposed;

- To identify potential visual receptors (i.e. people that would be able to see the Proposed Development) and evaluate their sensitivity to the type of changes proposed;
- To identify and describe any impacts of the Proposed Development in so far as they affect the landscape and/or views of it and evaluate the magnitude of change due to these impacts;
- To identify and describe any mitigation measures (including mitigation which is inherent in the design and layout of the development) that have been adopted to avoid, reduce and compensate for landscape and visual effects;
- To identify and assess any cumulative landscape and visual effects;
- To evaluate the level of residual landscape and visual effects; and
- To make a professional judgement about which effects, if any, are significant.

Distinction between Landscape and Visual Effects

5.3.2 In accordance with the published guidance, landscape and visual effects will be assessed separately, although the procedure for assessing each of these is closely linked. A clear distinction has been drawn between landscape and visual effects as described below:

- Landscape effects relate to the effects of the Proposed Development on physical and perceptual characteristics of the landscape and its resulting character and quality; and
- Visual effects relate to the effects on specific views experienced by visual receptors and on visual amenity more generally.

Study area

5.3.3 The site of the proposed wind farm does not lie within a 'Pre-assessed Area for Wind Energy' identified within Policy 17 of Future Wales, where there is a presumption in favour of development, subject to the criteria of Policy 18.

5.3.4 With reference to 'Using LANDMAP in Landscape and Visual Impact Assessment GN46'[2], based on the preliminary blade tip height, an initial study area of 32 km radius is proposed as illustrated on **Figure 5.1: Landscape Designations and National Landscape Character**.

5.3.5 The cumulative effect of the Proposed Development in association with other wind energy developments will also be considered. It is proposed

[2] Natural Resources Wales. 2023. 'Using LANDMAP in Landscape and Visual Impact Assessments GN46'. Last updated: 11 March 2024

that a slightly larger 34 km radius study area will be adopted to consider cumulative effects, which is considered to represent a proportionate extent of the study area and the limit within which any potential significant cumulative effects could occur.

5.3.6 A digital Zone of Theoretical Visibility (ZTV) model has been produced to illustrate the geographical area within which views of the Proposed Development are theoretically possible and has assisted in draft viewpoint selection. The ZTV was based on a 'bare-earth' scenario, whereby the screening effect of existing vegetation or built features in the landscape are not taken into account. The ZTV was modelled to blade tip height using the currently proposed blade tip height of 230 m, and turbine hub height of 149 m, and is presented at **Figures 5.2: Turbine Blade Tip Height (230m) Zone of Theoretical Visibility,** and **5.3: Turbine Hub Height (149m) Zone of Theoretical Visibility (ZTV).**

5.4 Baseline Conditions

5.4.1 Initial studies have been undertaken to identify the potential landscape and visual receptors to be considered within the LVIA and the viewpoint locations to inform the assessment (15 proposed viewpoints are set out in **Table 5.1**). The viewpoint selection is based on the initial ZTVs (**Figure 5.2 and Figure 5.3**) and knowledge of the area surrounding the site. The proposed number of viewpoints is based on recent project experience of similar scale onshore windfarms in Wales granted permission as Developments of National Significance. Significant visual effects experienced by high sensitivity receptors beyond 15 km from the nearest wind turbine are unlikely to occur.

5.4.2 The key receptors are outlined in turn below. For the final LVIA, detailed baseline information on the landscape and visual resource will be gathered through a combination of desk studies, consultation and field survey.

Landscape Character

5.4.3 Regarding Landscape Character, the most up to date and relevant landscape character assessment covering the study area is the 2014 National Landscape Character Areas (NLCA) published by Natural Resources Wales. The site predominantly falls within the extensive NLCA 21: Cambrian Mountains[3] (**Figure 5.1**), as identified by the published document. Its key characteristics are described as:

[3] Natural Resources Wales. 2014. National Landscape Character NCLA21 Cambrian Mountains.

- “Upland plateau - A band of resistant Silurian grits forming a vast upland, rolling, windswept plateau of moorland hills and incised valleys at the heart of Wales.
- Deep valleys and glacial features - Glaciation gouged deeply dissected U-shaped valleys into the plateau, as well as corries (cymoedd), lakes and moraines. Open moorland and forestry - Thin soils support extensive tracts of sheep grazed grassy moorland – the smooth slopes are interspersed with bracken scrub, wind blown oaks and angular blocks of coniferous forestry.
- Peat bogs, pools - Upland peat deposits give rise to large areas of blanket bog and pools of open water.
- Hedgerow enclosed pastures - Deep valleys on the edges of the moorland, with their distinctive pattern of hedgerow enclosures, lush pastures for stock grazing, and woodland.
- Major reservoirs – notably Nant-y-Moch, Llyn Clywedog, Craig Goch, Penygarreg, Garreg-ddu, Claerwen and Llyn Brianne are features of the valleys, contributing to the landscape’s man-made features.
- Mineral exploitation - Metal ores have been exploited from the prehistoric period with evidence for Bronze Age copper working at Copa Hill, however, most activity relates to extensive lead and silver mining which occurred principally during the 19th and 20th centuries.
- Lack of settlement - Settlement is largely absent, being confined to the lower hillsides and valleys, however, a large number of deserted settlements indicate that settlement was once more widespread than today.
- Natural features - Screes and cliffs, gritstone outcrops, stony summits, bracken scrub and wind blown oaks provide texture in the landscape.
- Panoramic views - from high summits over the moorlands and adjacent lowlands are a feature of the hills.
- Tranquil - The mountains engender a sense of remoteness because of their dark nighttime skies, low population density, relative inaccessibility, the impression of naturalness they impart and the relative lack of visible, built influences.
- Archaeology - The mountains contain a significant scattering of prehistoric monuments, including round barrows, cairns, stone circles and standing stones, Iron Age hillforts and settlements. The fort at Cae Gaer indicates a Roman presence, while the Cistercian abbey of Strata Florida was established on the west side of the mountains in the late 12th century. Its granges covered much of this area as well as part of lowland Ceredigion.”

5.4.4 The easternmost part of the site also falls within NCLA 26: Upper Wye Valley[4], Its key characteristics are described as:

- "A deep valley between major upland areas - with narrow, twisting, spectacular sections, and underlain by Silurian sandstones, shales and mudstones, intersected by older, Ordovician, Llanvirn Series shales.
- Till and boulder clay deposits - south easterly ice flows carved through the valley, leaving behind deposits. Previous courses of the Wye are also displayed in alluvial deposits visible in small cliffs.
- River Wye - entering the area in a wide, open valley and then coursing through a narrow valley as its waters gathers momentum. Fast flowing tributary streams drain from the surrounding uplands.
- Ecologically outstanding - with wetland habitats such as riparian (riverside) woodlands and submerged aquatic plants. It is also home to nationally important species such as the white-clawed crayfish.
- Woodland - Valley sides are often clothed in mixed woodland, with coniferous forestry and improved sheep pasture.
- Floodplain - loamy soils give rise to wet grasslands and rush pasture.
- Field boundaries - enclosed by mature hedgerows with frequent hedgerow trees.
- Settlement is sparse, with the main centres being Rhayader and Llangurig at river crossing points. Elsewhere, scattered small settlements and farmsteads lie on the valley slopes and bottoms along roads. Elan Village (Arts-and-Crafts style), built for the Elan Valley reservoirs construction workers; Medieval remains of Rhayader castle and historic houses and gardens overlooking the Wye.
- The main A470 and A44 roads - run parallel to the river, introducing busy traffic noise and movement into the otherwise spectacular valley landscape."

5.4.5 Other NLCAs within 15 km of the Site are listed by distance from the site as follows:

- 20 Radnorshire Hills (approx. 3 km to the east)
- 19 Severn Valley (approx. 7 km to the northeast)
- 23 Rheidol and Ystwyth Hills and Valleys (approx. 10 km to the west)
- 40 Teifi Valley (approx. 12 km to the west)

5.4.6 National Character Areas will be assessed in detail where the potential for significant indirect effects occurs which is likely to be a function of ZTV coverage, distance from the proposal and field assessment.

[4] Natural Resources Wales. 2014. National Landscape Character NCLA26 Upper Wye Valley.

5.4.7 The LVIA will also include an assessment of the sensitivity of landscape character, based on the Landmap Aspect Areas in accordance with the NRW Landmap GN46[5] in order to identify potentially significant effects.

Landscape Designations

5.4.8 Landscape designations are illustrated on **Figure 5.1**. The site is not located within a nationally or locally designated landscape.

5.4.9 Eryri / Snowdonia National Park is located ca. 25 km to the northwest of the site.

5.4.10 Special Landscape Areas (SLA) are a non-statutory designation applied by local planning authorities in Wales to define areas of high landscape importance within their administrative boundary. The closest is the Northern Uplands adjacent to the western boundary of the Site that is consistent with the area covered by a Historic Landscape Area (assessed within Chapter 6: Cultural Heritage within this Scoping Report).

5.4.11 The following areas with public access are located within the site boundary as illustrated on **Figure 5.4: Environmental Designations.**

- Statutory Access Land
- Registered Common Land
- Wye Valley Way long distance footpath
- Public rights of way

Visual Receptors

5.4.12 A detailed consideration of the potential for effects to the visual amenity of receptors in the landscape surrounding the site will be set out in the LVIA. This visual assessment will be informed by a selection of representative assessment viewpoints which are listed in **Table 5.1**.

5.4.13 The LVIA will focus on the potential effects of the Proposed Development on different visual receptors comprising settlements, footpath users, recognised tourist routes, long distance walking routes, cycle routes, centres for tourism and rail routes.

Residential Visual Amenity

5.4.14 A number of residential properties are located within the vicinity of the Proposed Development. It is proposed that a Residential Visual Amenity

[5] Natural Resources Wales. 2023. 'Using LANDMAP in Landscape and Visual Impact Assessments GN46'. Last updated: March 2023

Assessment (RVAA) will be undertaken as part of the LVIA. This will consider the visual effects on those properties within 1.5 km to 2 km of the Proposed Development and identify any properties where residents could experience adverse visual effects to the degree that the Residential Visual Amenity Threshold (RVAT) could be reached. The findings will be presented in a separate Technical Appendix to the LVIA chapter within the ES.

Proposed Viewpoints

5.4.15 It is proposed that the 15 locations set out in Table 5.1 and shown on **Figure 5.2** and **Figure 5.3** are included as assessment viewpoints in the LVIA. The viewpoints represent visual receptors and landscape designations at a range of distances and directions from the site.

Table 5.1 Proposed LVIA Viewpoints

Viewpoint	Distance and Direction from nearest turbine	OS Grid Reference	Reason for selection
Viewpoint 1 - Minor Road Afon Elan	1.32 km, south	286846 274555	Representative of views from, National Cycle Route 81 within the Elan Valley to the south.
Viewpoint 2 - Yr Allt	1.41 km, west	283524 275987	Representative of local high ground (open access land) to the west.
Viewpoint 3 - Glangwy	1.62 km, north	288977 280049	Representative of views from a campsite near the farmstead of Glangwy, close to the Wye Valley Walk long distance footpath.
Viewpoint 4 - Llangurig (A44)	2.03 km, northeast	291019 279756	Representative of views from the edge of Llangurig settlement to the northeast
Viewpoint 5 - Cwm y Saeson	3.02 km, east	292586 277752	Representative of views from public bridleways and open access land to the east
Viewpoint 6 - Clawdd-du-bach	4.63 km, south	287066 270784	Representative of views from a public Byway on Clawdd Du Mawr Ancient Road.
Viewpoint 7 – Gorn Hill, Llandoidloes	9.57 km, northeast	296785 284609	Representative of views from the public bridleway near the summit of Gorn Hill, west of Llanidloes.
Viewpoint 8 – Waun y Gadair	10.50 km, north	291503 288751	Promoted viewpoint at parking area off B4518
Viewpoint 9 - Moelfre	10.73 km, northeast	299371 282583	Representative of views from the Glyndwr's Way long

Viewpoint	Distance and Direction from nearest turbine	OS Grid Reference	Reason for selection
			distance footpath to the northeast.
Viewpoint 10 - Severn Way Cefnmawr	11.09 km, northeast	296881 286695	Representative of views from the Severn Way long distance footpath to the northeast.
Viewpoint 11 - Pen Pumlumon Fawr	11.18 km, northwest	279002 286942	View from the summit trig point on the Cambrian Way Long Distance footpath route
Viewpoint 12 - Source of the River Severn	11.94 km, northwest	282283 289892	Representative of views from the source of the River Severn on the Severn Way long distance footpath to the northwest.
Viewpoint 13 - Crugyn Llwyd	12.92 km, east	302396 279624	Representative of high point at Crugyn Llwyd within Open Access Land to the west.
Viewpoint 14 - Pen Maenwern Standing Stone	13.40 km, south	286410 262019	Representative of views from local high point within Open Access Land overlooking Claerwen Reservoir to the south.
Viewpoint 15 - Glyndwr's Way, Llechwedd Du	14.43 km, north	286553 293433	Representative of views from higher land south of the village of Dylife.

5.4.16 Each of the representative viewpoints will be visited to evaluate the sensitivity of views. In addition, the study area will also be visited to consider visibility of the Proposed Development as receptors move through the landscape.

5.4.17 The viewpoints will be used as the basis for determining the effects on visual receptors within the study area. The sensitivity of different receptor groups will be set out in the LVIA methodology.

5.4.18 The level of effect experienced by different visual receptors will be determined by considering the sensitivity of the receptors with the magnitude of change resulting from the introduction of the Proposed Development.

Visualisations

5.4.19 Each viewpoint will be illustrated with visualisations prepared in line with SNH Visual Representation of Wind Farms Version 2.2.

Night-time Lighting Assessment

5.4.20 Under Civil Aviation Authority (CAA) Regulations[6] structures over 150 m in height are required to be lit with visible aviation lighting.

5.4.21 In accordance with NatureScot guidance[7] the LVIA will assess the additional visual effects of the aviation lighting in the main body of the LVIA chapter. The additional change introduced by the aviation lighting sill forms a component of the magnitude of change.

5.4.22 The assessment of the visible aviation lighting will be informed by a ZTV of the lit turbines, a turbine lighting intensity ZTV and night-time visualisations from a selection of viewpoints, illustrating the proposed lighting effects.

5.4.23 In line with NatureScot Visualisation Guidance, the viewpoints selected represent locations from where people are most likely to experience the wind farm at night.

5.4.24 It is proposed that the following night-time visualisations will be produced:

- Viewpoint 3 - Glangwy
- Viewpoint 4 - Llangurig (A44)
- Viewpoint 8 - Waun y Gadair

5.4.25 The viewpoints will be used to inform consideration of the potential visual effects on key visual receptors in nearby residential properties, settlements and users of the road network.

5.5 Potential Landscape and Visual Effects

5.5.1 The LVIA will consider the potential effects of the Proposed Development upon:

- Individual landscape features and elements;
- Landscape character;
- Visual amenity and the people who view the landscape; and
- Landscape designations as appropriate.

5.5.2 Effects during the construction and decommissioning phases are considered to be temporary and would have a short duration. Effects associated with the operational phase of the Proposed Development are considered to be long term effects.

[6] Civil Aviation Authority. 2017. DAP Policy 124: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level. Last updated June 2017.

[7] NatureScot. 2017. Siting and Designing Wind Farms in the Landscape, Version 3a. Last updated August 2017.

5.5.3 Following the judgement of the sensitivity of the landscape or visual receptor, the LVIA will provide a judgement as to the magnitude of change and the level of the effect experienced by each receptor, along with a statement to clarify whether the effect resulting from the Proposed Development is significant or not.

Matters Scoped out of the Assessment

5.5.4 In order that the assessment remains proportionate and focuses on the key matters that have the potential to bring about significant effects, it is proposed that the following matters are scoped out of the assessment:

- **Effects on receptors located outside of the ZTV** - The Proposed Development would not result in any effects where there is no predicted visibility;
- **Effects during decommissioning** - Effects during decommissioning would be very similar in nature to those experienced during the construction phase, except in reverse;
- **Effects on settlements beyond 15 km** - Due to the distance from the Proposed Development and the limited theoretical visibility there is no potential for receptors to experience significant visual effects;
- **Effects on public rights of way beyond 15 km** - Due to the distance from the Proposed Development and the limited theoretical visibility there is no potential for receptors to experience significant visual effects;
- **Effects on Historic Landscape Areas (HLAs)** – the Cultural Heritage scoping chapter has evaluated the potential for indirect significant heritage effects on the HLAs within the study area;
- **Effects on the North Uplands Special Landscape Area (SLA)** – Although it is acknowledged that there would be potential for some indirect effects on the SLA to the immediate west and southwest of the Site, Future Wales in defining Priority Areas for wind, SLA's are not considered an in-principal constraint.

5.6 Cumulative Assessment

5.6.1 The LVIA will also consider the potential for any cumulative effects to arise within 34 km of the site. This will include operational, under construction, consented, and proposed (for those which there is a valid planning application) wind farms as set out in **Table 5.2** and illustrated on **Figure 5.5: Other Wind Energy Developments**, and the planning status confirmed with the local planning authorities.

5.6.2 The methodology will follow guidance provided by SNH for assessing cumulative effects. The assessment will be supported by cumulative ZTVs.

5.6.3 In order that the cumulative assessment remains focussed on other developments that have the greatest potential to give rise to significant cumulative effects it is necessary at the outset to decide which developments need to be considered in detail, as to consider all developments within 34 km of the Proposed Development would detract attention from the key issues relating to the application. In this landscape and visual context, it is considered appropriate and proportionate to scope out all turbines under 50 m, and any turbines between 50 m and 80 m which are located over 15 km distance from the Site (as highlighted in grey in **Table 5.2** below).

Table 5.2 Cumulative Sites within 34 km

Wind Farm	Status	Approx distance /direction from Lluest Dolgwiall	Turbines Nos/Blade Tip Height metres (BTH)
Aberedw Energy Park	Scoping / In Planning	31 km southeast	18 turbines / 200 m BTH
Banc Du	Scoping / In Planning	2 km north	7 turbines / 200 m BTH
Bryn Blaen	Operational	3 km north	6 turbines /100 m BTH
Bryngydfa	Scoping / In Planning	23 km east	12 turbines /126.5m BTH
Bryn Gilwern Energy Park	Scoping / In Planning	26 km southeast	16 turbines / 220 m BTH
Bryn Titli	Operational	4 km east	22 turbines / 53.5 m BTH
Carnedd Wen	Scoping / In Planning	26 km north	28 turbines / 200 m BTH
Carno III	Consented	15 km north	13 turbines / 149.9 m BTH
Carno I*	Operational	16 km north	56 turbines / 50.6 m BTH
Carno II*	Operational	18 km north	12 turbines / 79 m BTH*
Cefn Croes	Operational	1 km west	39 turbines / 100 m BTH
Cemmaes 2*	Operational	27 km north	18 turbines / 66m BTH
Esgair Galed	Scoping / In Planning	13 km north	26 turbines / 220 m BTH
Garreg Lwyd	Operational	23 km east	17 turbines / 126 m BTH
Garn Fach	Consented	14 km east	17 turbines / 149.9 m BTH
Hendy Wind Farm	Operational	29 km southeast	7 turbines / 110 m BTH
Llanbrynmair	Scoping / In Planning	25 km north	15 turbines / 230 m BTH
Llandinam	Operational	13 km east	103 turbines / 45.5 m BTH

Wind Farm	Status	Approx distance /direction from Lluest Dolgwiall	Turbines Nos/Blade Tip Height metres (BTH)
Aberedw Energy Park	Scoping / In Planning	31 km southeast	18 turbines / 200 m BTH
Banc Du	Scoping / In Planning	2 km north	7 turbines / 200 m BTH
Llandinam Extension	Consented	13 km east	35 turbines / 121.2 m BTH
Llangwyryfon*	Operational	23 km west	11 turbines / 66 m BTH
Lluest Y Gwynt	Scoping / In Planning	9 km northwest	24 turbines / 180 m BTH
Mynydd Clogau*	Operational	24 km northeast	17 turbines / 66 m BTH
Mynydd Gorddu*	Operational	20 km northwest	19 turbines / 54 m BTH
Rheidol	Operational	13 km west	8 turbines / 56.7 m BTH
Rhiwlas	Scoping / In Planning	3 km east	8 turbines /200 m BTH
Tirgwyn	Operational	24 km northeast	12 turbines / 116 m BTH

*Turbines between 50-80 m tall located over 15 km distance from the proposed Lluest Dolgwiail Wind Farm site scoped out of the detailed cumulative assessment

5.7 Potential Mitigation

5.7.1 Mitigation measures may include:

- avoidance of effects;
- reduction in magnitude of effects; and
- compensation for effects (which may include enhancements to offset any adverse effects).

5.7.2 The primary mitigation adopted in relation to landscape and visual matters is likely to be embedded within the design of the Proposed Development and will comprise the consideration given to avoiding and minimising landscape and visual effects during the evolution of the Proposed Development layout. This is sometimes referred to as 'mitigation by design'.

5.8 Questions

5.8.1 The following are considered to be the key issues which require consideration by the consultees:

- Are there any comments on the proposed study areas?
- Are there any comments on the proposed list of viewpoint locations in **Table 5.1**?

- Are there any further wind farm sites, to those listed in **Table 5.2**, to consider as part of the cumulative assessment?
- Do you agree that matters proposed to be scoped out of the assessment?
- Do you agree that the proposed scope of assessment is appropriate?

6 Cultural Heritage and Archaeology

6.1 Introduction

6.1.1 This Scoping Report Chapter outlines the approach to be taken to the assessment of potentially-significant effects to archaeological and cultural heritage receptors of the Proposed Development.

6.1.2 The baseline presented below has been informed by an initial review of currently-available information, namely Cadw, National Monument Record of Wales (NMRW), and Heneb - Clwyd-Powys Archaeology Historic Environment Record (HER) data.

6.1.3 The scoping of heritage setting assessment has been undertaken by reviewing Cadw, NMRW and HER data in conjunction with the Zone of Theoretical Visibility model prepared for the Landscape and Visual Assessment.

6.1.4 It is anticipated that the forthcoming Environmental Statement Chapter will be supported by the following technical appendices:

- Heritage Technical Baseline with accompanying figures.

6.2 Legislation, Policy and Guidance

Legislation

6.2.1 Scheduled Monuments are protected by the provisions of the Ancient Monuments and Archaeological Areas Act 1979 which relates to nationally important archaeological sites.[8] Whilst works to Scheduled Monuments are subject to a high level of protection, it is important to note that there is no duty within the 1979 Act to have regard to the desirability of preservation of the setting of a Scheduled Monument.

6.2.2 Legislation relating to the built historic environment is primarily set out within the Planning (Listed Buildings and Conservation Areas) Act 1990, which provides statutory protection for Listed Buildings and their settings and Conservation Areas.[9]

6.2.3 The Historic Environment (Wales) Act 2016 made a number of important amendments to the 1979 and 1990 Acts to address the needs of the Welsh

8 UK Public General Acts, Ancient Monuments and Archaeological Areas Act 1979.

9 UK Public General Acts, Planning (Listed Buildings and Conservation Areas) Act 1990.

historic environment. It also introduced several stand-alone provisions for Wales, including the compilation of: a register of historic parks and gardens, a list of historic place names in Wales, and a historic environment record for each local authority area in Wales.

National Planning Policy

6.2.4 National policy is set out within the Welsh Government's 'Future Wales: The National Plan 2040' and 'Planning Policy Wales, Edition 12' (PPW12).

Future Wales: The National Plan 2040 (2021)

6.2.5 Policy 17 of Future Wales provides a presumption in favour of renewable energy development subject to the criteria in Policy 18 which includes: *"6. there are no unacceptable adverse impacts on statutorily protected built heritage assets"*.

Planning Policy Wales, Edition 12 (February 2024)

6.2.6 PPW12 Chapter 6 deals with the historic environment and its contribution to the Welsh Government's seven well-being goals for a sustainable Wales. PPW12 emphasises that the positive management of change in the historic environment is based on a full understanding of the nature and significance of historic assets and the recognition of the benefits that they can deliver in a vibrant culture and economy.

6.2.7 Paragraph 6.1.5 of PPW12 provides that:

"The planning system must take into account the Welsh Government's objectives to protect, conserve, promote and enhance the historic environment as a resource for the general well-being... Conservation Principles highlights the need to base decisions on an understanding of the impact a proposal may have on the significance of an historic asset."

6.2.8 Paragraph 6.1.6 sets out the Welsh Government's specific objectives for the historic environment as follows:

- Protect the Outstanding Universal Value of the World Heritage Sites;
- Conserve archaeological remains, both for their own sake and for their role in education, leisure and the economy;
- Safeguard the character of historic buildings and manage change so that their special architectural and historic interest is preserved;
- Preserve or enhance the character or appearance of Conservation Areas, while at the same time helping them remain vibrant and prosperous;
- Preserve the special interest of sites on the register of historic parks and gardens; and

- Protect areas on the register of historic landscapes in Wales.

6.2.9 In relation to the setting of Listed Buildings, paragraph 6.1.10 provides that:

"There should be a general presumption in favour of the preservation or enhancement of a listed building and its setting, which might extend beyond its curtilage. For any development proposal affecting a listed building or its setting, the primary material consideration is the statutory requirement to have special regard to the desirability of preserving the building, its setting or any features of special architectural or historic interest which it possesses."

6.2.10 In relation to Conservation Areas, Paragraph 6.1.14 provides that:

"There should be a general presumption in favour of the preservation or enhancement of the character or appearance of conservation areas or their settings. Positive management of conservation areas is necessary if their character or appearance are to be preserved or enhanced and their heritage value is to be fully realised."

6.2.11 In relation to Historic Parks & Gardens, Paragraphs 6.1.18 and 6.1.19 provide that:

"Planning authorities should value, protect, conserve and enhance the special interest of parks and gardens and their settings included on the register of historic parks and gardens in Wales. The register should be taken into account in planning authority decision making.

The effect of a proposed development on a registered park or garden, or its setting, is a material consideration in the determination of planning applications."

6.2.12 In relation to archaeological remains, paragraphs 6.1.23 – 6.1.25 provide as follows:

"The conservation of archaeological remains and their settings is a material consideration in determining planning applications, whether those remains are a scheduled monument or not.

Where nationally important archaeological remains are likely to be affected by proposed development, there should be a presumption in favour of their physical protection in situ. It will only be in exceptional circumstances that planning permission will be granted if development would result in direct adverse impact on a scheduled monument (or an

archaeological site shown to be of national importance) or has a demonstrably and unacceptably damaging effect upon its setting.

In cases involving less significant archaeological remains, planning authorities will need to weigh the relative importance of the archaeological remains and their settings against other factors, including the need for the proposed development."

Technical Advice Note 24

6.2.13 'Technical Advice Note 24: The Historic Environment' (TAN24) provides a detailed supplement to PPW12, and as such is consistent with those national policies. It contains detailed guidance on how the planning system considers the historic environment during development plan preparation and decision making on planning and listed building consent applications. It replaces Welsh Office Circulars 60/96, 61/96, and 1/98.

Local Planning Policy

6.2.14 Powys County Council is currently in the initial stages of preparing its new Replacement Local Development Plan, which will cover all of Powys excluding the Bannau Brycheiniog National Park.

6.2.15 In the meantime, however, the adopted Powys Local Development Plan 2011-2026 applies.

6.2.16 Policy SP7 'Safeguarding of Strategic Resources and Assets' states:

"To safeguard strategic resources and assets in the County, development proposals must not have an unacceptable adverse impact on the resource or asset and its operation.

The following have been identified as strategic resources and assets in Powys:

1. Land designated at international, European and/or national level for environmental protection.

2. Historic environment designations, including:

i. Registered Historic Landscapes.

ii. Registered Historic Parks and Gardens.

iii. Scheduled Ancient Monuments and other archaeological remains.

iv. Listed Buildings and their curtilages.

v. Conservation Areas. AND the setting of designations i.-v.

3. Recreational Assets, including:

i. National Trails.

ii. Public Rights of Way Network.

iii. Recreational Trails.

iv. National Cycle Network.

4. The valued characteristics and qualities of the landscape throughout Powys.

5. Sennybridge (Ministry of Defence) Training Area.

6. Mineral Resource Areas.

7. Proposed Strategic Infrastructure Routes (if and when identified)."

6.2.17 Policy RE1 'Renewable Energy' states:

"Proposals for renewable and low carbon energy development will be permitted subject to the following criteria:

1. Within or close to the Strategic Search Areas (SSAs), proposals for wind energy greater than 25 MW will be permitted subject to criteria 3 to 5; all other proposals for renewable and low carbon energy will only be permitted where they can demonstrate they would not prejudice the purpose of the SSA.

2. Within the Local Search Areas (LSAs), proposals for solar PV between 5 – 50MW will be permitted subject to criteria 3 to 5; all other proposals for renewable and low carbon energy will only be permitted where they can demonstrate they would not prejudice the purpose of the LSA.

3. Proposals for all types of renewable and low carbon energy development and associated infrastructure either on their own, cumulatively or in combination with existing, approved or proposed development, shall comply with all other relevant policies in the LDP.

4. Satisfactory mitigation shall be in place to reduce the impact of the proposal and its associated infrastructure. Proposals shall make provision for the restoration and after-care of the land for its beneficial re-use.

5. Where necessary, additional compensatory benefits will be sought by agreement with applicants in accordance with Policy DM1 - Planning Obligations."

6.2.18 The adopted LDP also includes the following Supplementary Planning Guidance documents:

- Renewable Energy (2019);
- Conservation Areas (2020);
- Archaeology (2021); and
- Historic Environment (2021).

Guidance

Assessment of Significance

6.2.19 TAN24 defines heritage significance as: "the sum of the cultural and natural heritage values of a place, often set out in a statement of significance."

6.2.20 Cadw's 'Conservation Principles for the sustainable management of the historic environment in Wales' (2011) defines significance as deriving from a combination of any, some or all of the following four component values:

- Evidential value: deriving from the potential of a place to yield evidence about past human activity;
- Historic value: deriving from the ways in which past people, events and aspects of life can be connected through a place to the present;
- Aesthetic value: deriving from the ways in which people draw sensory and intellectual stimulation from a place; and
- Communal value: deriving from the meaning of a place for the people who relate to it, or for whom it figures in their collective experience or memory.

6.2.21 This approach allows for a detailed and justifiable determination of significance and the values from which that significance derives.

6.2.22 In accordance with the levels of significance articulated in TAN24 and PPW12, the following terminology will be used in the ES Chapter:

- Designated historic assets: Scheduled Monuments, Listed Buildings (Grade I, II* and II), Registered Parks and Gardens (Grade I, II* and II), Registered Historic Landscapes ('Outstanding' or 'Special'), World Heritage Sites, and Conservation Areas;
- Non-designated nationally important archaeological remains: Archaeological remains that are not designated but are still considered to be of a level of significance commensurate with that of a Scheduled Monument; and
- Non-designated historic assets: Assets of less than national importance, including any of special local interest.

Contribution made by Setting to Significance

6.2.23 Setting is defined in TAN24 as: "the surroundings in which [a historic asset] is understood, experienced, and appreciated embracing past and present relationships to the surrounding landscape. Its extent is not fixed and may change as the asset and its surrounding evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect [the] ability to appreciate that significance or may be neutral."

6.2.24 Setting can contribute to, detract from, or have a neutral effect upon the heritage significance of an asset. In addition, whilst a physical or visual connection between a historic asset and its setting will often exist, it is not essential or determinative.

6.2.25 TAN24 states that "setting is not a historic asset in its own right but has value derived from how different elements may contribute to the significance of a historic asset." As such, any impacts will be described within the ES Chapter in terms of how they affect the significance of a historic asset, and any heritage values that contribute to that significance, through changes to setting.

6.2.26 Settings assessment will be undertaken in accordance with the industry-standard methodology provided by Cadw's 'Setting of Historic Assets in Wales' (2017). This guidance promotes a 'stepped' (iterative) approach, as follows:

- Stage 1 - assess which assets would be affected and identify their setting;
- Stage 2 - define and analyse the settings to understand how they contribute to the significance of the historic assets and, in particular, the ways in which the assets are understood, appreciated and experienced[10];
- Stage 3 - assess the effects of the proposed development, whether beneficial or harmful, on that significance or on the ability to appreciate it; and
- Stage 4 - consider options to mitigate or improve the potential impact of a proposed change or development on that significance.

6.2.27 The following resources will be used to inform Stage 1:

- The relevant Cadw Scheduling and Listing descriptions;

10 The guidance includes a (non-exhaustive) check-list of elements that may contribute to a historic asset through setting including: functional and physical relationships, topographic features, physical surroundings, original layout, buried or archaeological elements, views to/from/across, formal or planned vistas, prominence, views associated with aesthetic / functional / ceremonial purposes, historical / artistic / literary / place name / cultural / scenic associations, noise, smell, tranquillity / remoteness / wildness.

- A Zone of Theoretical Visibility model;
- Elevation and contour mapping;
- Modern and historic mapping; and
- Modern and historic aerial imagery.

Assessment of Harm and Benefit

6.2.28 The overriding provision within PPW12 in relation to harm to designated assets (and non-designated assets of equivalent significance) is that there should be a presumption in favour of:

- The physical preservation in situ of Scheduled archaeological remains;
- The preservation and enhancement of Listed Buildings and their settings, and ensuring consistency with the statutory requirement under Section 66(1) of the 1990 Planning Act; and
- The preservation or enhancement of the character or appearance of Conservation Areas or their settings.

6.2.29 PPW12 also provides that any development effects upon the following are material considerations in the determination of planning applications:

- Registered Parks or Gardens, or their setting; and
- Non-designated archaeological remains, with the relative importance of the archaeological remains and their settings to be weighed against other factors, including the need for the proposed development.

6.2.30 Where harm to the significance of a historic asset is identified, the nature and scale of that harm will be discussed, and professional judgment used to determine the acceptability of that level of harm within the context of the above policy provisions.

6.2.31 The following terminology and approach will be used in the ES Chapter:

- Harm to Designated Historic Assets (or to non-designated assets of equivalent significance): The designated asset's significance would be reduced. An attempt will be made to qualify more precisely the nature and level of harm, with reference to PPW12, TAN24 and the heritage values defined by 'Conservation Principles'; all determinations will be fully qualified.
- Harm to Non-Designated Historic Assets: The non-designated asset's significance would be reduced. Professional judgment will be used to define the anticipated level of harm to the significance of non-designated historic assets; all determinations will be fully qualified.
- No Harm: The asset's significance would be preserved.

6.2.32 Heritage Benefit: The asset's significance would be enhanced. This would weigh in favour of the Proposed Development in the planning balance. It would be a desirable outcome, consistent with all key policy objectives and industry guidance provisions.

6.3 Proposed Scope of Assessment

Methodology

Study Area

6.3.1 Given the proposed 230 m to tip height of the proposed turbines, it is considered that a 15 km study area from the Site boundary would be appropriate to identify designated historic assets comprising:

- Scheduled Monuments;
- Listed buildings (all grades);
- Conservation Areas;
- Registered Historic Parks & Gardens;
- World Heritage Sites; and
- Registered Landscapes of Outstanding and of Special Interest.

6.3.2 For non-designated historic assets sources from Heneb – Clwyd-Powys, a 2 km study area from the Site boundary will be utilised.

6.3.3 The Screened Zone of Theoretical Visibility (SZTV: where existing vegetation and built form is taken into account within the modelling) prepared as part of the Landscape and Visual Impact Assessment will be used as a tool of assessment. The SZTV will be utilised to 'sieve' out assets which have no theoretical visibility of the Proposed Development.

6.3.4 It is understood, though, that 'setting' is not a purely visual concept, and therefore assets that fall outside of the SZTV will also be assessed to ensure they do not have an historic associative or functional relationship with the Site which could be impacted by the Proposed Development despite having no theoretical visibility.

6.3.5 Assets beyond the proposed 15 km study area for designated historic assets will be considered with reference to the SZTV. Any assets which may have the potential to experience effects arising from the Proposed Development will be considered within the assessment.

Technical Baseline

6.3.6 A baseline heritage report will be undertaken which will identify the heritage resource within the study areas. The baseline assessment will

consider the archaeology (in terms of scheduled monuments), built heritage and historic landscape resource within the study area. This will include the identification of designated assets and locally significant buildings or structures and locally significant historic landscapes.

6.3.7 The following data sources will inform the Heritage Desk-Based Assessment:

- Cadw for information regarding designated historic assets;
- The National Monuments Record of Wales (NMRW) for information relating to previous archaeological investigations and recorded historic assets;
- Heneb - Clwyd-Powys Archaeology Historic Environment Record (HER) data for information relating to previous archaeological investigations and recorded historic assets;
- Previous published and grey literature reports relating to any archaeological investigations previously undertaken;
- Historic maps and other relevant documentary sources held by Powys Archives and available through The Genealogist, National Library of Wales, and Promap websites;
- The Central Register of Aerial Photographs for Wales, available online through the Welsh Government's Aerial Photography Unit website; and
- Online resources, including geological data from the British Geological Survey, soil data from the Cranfield Soil and Agrifood Institute, and recent satellite imagery available on Google Earth.

6.3.8 The assessment will identify and describe the assets and their significance, including the contribution made by their setting. This will then help to identify which assets have the potential to experience significant effects from the Proposed Development.

6.3.9 The baseline will be supplemented by a site walkover. The site visit will focus on visiting surrounding heritage assets identified in the initial baseline work to assess their setting and relationships with surrounding assets.

6.3.10 Within the baseline report, a number of sieving exercises will take place which will utilise desk-based resources, the results of site visits and professional judgement in excluding from the assessment process those assets which will not experience any impacts and resultant effect from the Proposed Development. This will allow the ES chapter to be a focussed and succinct chapter, discussing only those assets where and effect is

anticipated. In order to assist with the sieving of assets, the Zone of Theoretical Visibility (ZTV) model created by the LVIA team will be used as an aide to assessment, identifying those areas where the turbines will not be visible from.

6.3.11 The Heritage Technical Baseline will consider the known and potential above- and below-ground archaeological resource of the Site as well as the significance and setting of designated historic assets deemed potentially sensitive to change as arising from the Proposed Development.

ES Chapter

6.3.12 The ES Chapter will consider the following in respect of each identified historic environment receptor (asset):

- The asset's significance;
- The anticipated level of harm to that significance (comparable to 'magnitude'); and
- Whether that level of harm would comprise a significant effect.

6.3.13 Determination of each of the above will be undertaken in accordance with a robust methodology, formulated within the context of recent case law, the relevant statute and policy provisions, and professional guidance as set out in the previous section.

6.3.14 The Heritage Desk-Based Assessment and ES Chapter will be informed by Cadw's 'Heritage Impact Assessment in Wales' (2017).

Additional Surveys

6.3.15 It is recommended that the heritage team liaise with the landscape team to identify viewpoints from which photomontages may be required to avoid duplication and to co-locate viewpoints as far as possible.

6.3.16 Historic assets not subject to formal photomontage will still be photographed and the view documented within the baseline assessment and where necessary, wirelines can be used to illustrate views, or lack thereof. However, these photographs will be illustrative only.

6.4 Assessment of Likely Significant Effects

Effects During Construction

6.4.1 Construction of the Proposed Development may include: ground clearance and preparation, creating temporary compounds, laying access tracks, excavation of borrow pits, excavation of foundations for wind turbines and

pads for the substation, inverters and transformers, establishing crane pads, excavating cable trenches, and excavating drainage swales.

6.4.2 These activities could require the demolition or removal of upstanding historic structures and earthworks and/or result in the truncation and/or destruction of buried archaeological remains within the Site. Increased traffic movements and noise could also adversely affect the setting of historic assets.

Effects During Operation

6.4.3 Effects of development caused by change to the setting of historic assets have the potential to arise from the operation of the Proposed Development.

Effects During Decommissioning

6.4.4 Decommissioning of the Proposed Development will include: creating temporary compounds, dismantling wind turbines, re-excavating cable trenches to remove cabling, and transporting infrastructure off-site.

6.4.5 It is considered that there would be no direct physical effects arising from decommissioning as impacts would have been mitigated during the construction phase.

6.4.6 Any effects that arose upon the setting of heritage assets during the construction phase from an increase in construction activity may arise during the decommissioning phase.

Assessment of Significance of Effect

6.4.7 In determining whether any identified harm to heritage significance would translate into a significant effect, professional judgement will be utilised.

6.4.8 Ultimately, a statement of whether any identified harm does or does not represent a significant effect is provided in respect of each cultural heritage receptor using the following terminology: ‘Significant’ or ‘Not Significant’.

Scoping Criteria

Receptors Scoped In to ES

6.4.9 It is the case that all of the historic designated assets within the study area and ZTV (and those outside the ZTV but which have an historic association) will undergo some level of assessment as part of the Technical Baseline as per the Cadw setting guidance which recommends a stepped

approach to assessment. This stepped approach to assessment is set out in the methodology section above.

6.4.10 Following initial assessment of the historic assets within the study areas, it is considered that the following receptors have the potential to experience an effect from the Proposed Development which may be significant – though further research and on-site analysis will be required:

- Scheduled monument RD210 – Cistfean cairns;
- Scheduled monument RD209 – Cistfaen barrows;
- Scheduled monument MG321 – Craig y Lluest cairn cemetery;
- Scheduled monument RD208 – Carn y Groes cairn;
- Scheduled monument MG087 – Carn Bwlch y Cloddiau, Esgair Wen;
- Scheduled monument CD191 – Bryn Diliw Long Hut;
- Scheduled monument CD192 – Nant Diliw Fechan Deserted Rural Settlement;
- Scheduled monument CD204 – Ffos Gau Ring Cairn;
- Scheduled monument CD202 – Nant y Gafod Deserted Rural Settlement;
- Scheduled monument CD203 – Hafod yr Aad Deserted Rural Settlement; and
- Scheduled monument MG322 – Maen Hir cairn cemetery.
- Scheduled monument MG088 – Carn Fach, Esgair Wen;
- Scheduled monument RD207 – Carn Nant-y-ffald cairn;
- Scheduled monument RD208 – Carn Wen cairn;
- Scheduled monument MG627 – Domen Glw Cairn
- Grouping of Scheduled Monuments on Gro Hill, approx. 13km southeast of proposed Site boundary;
- Grade II listed 84289 – Clochfaen; and
- Grade II listed 84290 – Clochfaen Cottage.
- Upland Ceredigion Registered Landscape of Outstanding Historic Interest (HLW (D) 2)
- Llangurig Conservation Area (and listed buildings within including the Grade II* Church of St. Curig);
- Llanidloes Conservation Area;
- Grade I Registered Historic Park and Garden - Hafod
- Direct, physical impacts to non-designated historic assets within the Site that may coincide with Proposed Development infrastructure;

6.4.11 These assets are shown on **Figure 6.4: Historic Assets with The Potential to Experience Effects From Proposed Development.**

Receptors Scoped Out of ES

6.4.12 It is considered that an ASIDOHL2 assessment is not required for this scheme. Whilst there are Registered Landscapes of Outstanding and Special Interest within the study area, it is considered that the EIA assessment process is robust and detailed and performs the same function of the ASIDOHL2 process, but in a slightly different format. Both consider historic asset in detail and what contributes to its significance. They both go on to establish how the asset will be impacted (directly or indirectly through changes to setting), the temporal scope of that impact and its magnitude and then arrives at an assessment of the effect of that impact. The EIA process will also consider the effects in terms of whether the impact/effect would be on the whole asset, parts of the asset and if only on parts of the asset, how would this affect the rest of the area, if at all.

6.4.13 Therefore, although using different methodologies, both the EIA process and the ASIDOHL2 process are tools to assess the impact of developments upon Registered Historic Landscapes and as such, it is considered that a separate ASIDOHL2 is not required.

6.5 Baseline Conditions

Site Description and Context

6.5.1 The Site covers an area of approximately 2,301 ha and is located to the southwest of the village of Llangurig in Powys, Wales. The Site is located within the uplands of the Cambrian Mountains, with the A44 to the north and A470 to the east as shown on the accompanying Site Location Plan. Llangurig is the closest settlement and lies some 1.9 km to the northeast of the closest turbine.

6.5.2 The Site forms part of an elevated upland landscape that is undulating, with high points of 526 m AOD near its western and southern edge, 538 m AOD in its northern edge, and 479 m AOD in its southern part. The Site extends across this higher ground and the eastern slopes face the Wye valley. The gently undulating plateau interior of the Site is incised by several watercourses, which drain towards the Wye valley to the east. Other watercourses drain the southern edge of the Site towards the Afon Elan.

Baseline Survey Information

Designated Historic Assets

Within the Site Boundary

6.5.3 Within the Site boundary are four scheduled monuments:

- RD210 – Cistfean cairns;
- RD209 – Cistfaen barrows;
- MG321 – Craig y Lluest cairn cemetery;
- RD208 – Carn y Groes cairn.

6.5.4 Two Grade II listed buildings:

- 84289 – Clochfaen; and
- 84290 – Clochfaen Cottage.

Beyond the Site boundary

6.5.5 Although not within the Site boundary, there are an additional seven scheduled monuments which are either directly adjacent to the Site boundary or within 50 m:

- MG087 – Carn Bwlch y Cloddiau, Esgair Wen;
- CD191 – Bryn Diliw Long Hut;
- CD192 – Nant Diliw Fechan Deserted Rural Settlement;
- CD204 – Ffos Gau Ring Cairn;
- CD202 – Nant y Gafod Deserted Rural Settlement;
- CD203 – Hafod yr Aad Deserted Rural Settlement; and
- MG322 – Maen Hir cairn cemetery.

6.5.6 Directly adjacent and contiguous with the western Site boundary is the eastern boundary of the Upland Ceredigion Registered Landscape of Outstanding Historic Interest (HLW (D) 2).

6.5.7 The following designated historic assets area located within the 15 km study area:

- 186 Scheduled Monuments;
- Two Grade I listed buildings;
- Thirty Grade II* listed buildings;
- 522 Grade II listed buildings;
- Seven Conservation Areas;
- One Registered Historic Landscape of Outstanding Historic Interest;
- Three Registered Historic Landscape of Special Historic Interest;
- One Grade I Registered Historic Park & Garden;
- One Grade II* Registered Historic Park & Garden;
- Three Grade II Registered Historic Park & Garden.

6.5.8 These assets are shown on **Figures 6.1: Designated Heritage Assets** and **6.2: Historic Landscape Areas**.

6.5.9 Once the preliminary ZTV has been applied to the search area, this has reduced the number of designated historic assets within the study area to:

- 88 Scheduled Monuments;
- One Grade I listed buildings – (8317 – Old Market Hall);
- Five Grade II* listed buildings;
- 220 Grade II listed buildings;
- Three Conservation Areas;
- One Registered Historic Landscape of Outstanding Historic Interest;
- Three Registered Historic Landscape of Special Historic Interest;
- One Grade I Registered Historic Park & Garden;
- One Grade II Registered Historic Park & Garden.

6.5.10 These assets are shown on **Figure 6.3: Designated Heritage Assets with The Potential to Experience Effects From Proposed Development**.

6.5.11 It should be noted that for the area designations, not all of the areas are contained within the ZTV – that is the Proposed Development would not be visible from all areas of the designated area and therefore analysis will need to be undertaken of views out of the asset which may experience impacts from the Proposed Development. For example, the Caersws Basin Registered Historic Landscape of Special Interest is located at the edge of the 15 km study area with the bulk of the asset outside the boundary. The area within the ZTV is very limited indeed and not likely to experience any effects from the Proposed Development.

Non-designated Assets within Site boundary

6.5.12 A review of online sources has noted that there are a large number of records within the Site boundary. The records include assets dating from the prehistoric to the modern period. There are records of cairns within the Site boundary and a large number of the records relate to evidence of peat cutting and localised quarrying. The boundary of the Elan estate runs north-south through the centre of the Site with this boundary marked by boundary post.

6.5.13 There is evidence of agricultural activity within the Site boundary dating from the medieval period onwards, including remnants of agricultural buildings such as sheepfolds and farmsteads.

6.5.14 Every effort will be made to ensure that turbines are not located on the site of any previously recorded feature in the Historic Environment Record.

6.6 Potential Mitigation

Mitigation by Design

6.6.1 During the assessment process, heritage constraints will be highlighted at the earliest opportunity to avoid, as far as possible, direct, physical impacts upon historic assets and impacts arising from changes to setting.

Additional Mitigation

6.6.2 Additional mitigation measures that may be required include the undertaking of archaeological fieldwork to record archaeological features with the potential to experience direct, physical impacts as a result of the Proposed Development.

Enhancement

6.6.3 Opportunities for enhancement in relation to cultural heritage include:

- Disseminating information regarding known and previously unknown historic assets to members of the public by way of enhanced Historic Environment Records, release of publications, community/outreach activities and/or on-site interpretation boards as appropriate.

6.7 Cumulative Effects

6.7.1 The cumulative effect on historic assets of the Proposed Development in combination with other schemes will be assessed within the ES Chapter.

6.8 Questions

- Do you agree with the proposed study areas?
- Do you agree with the proposed methodology?
- Do you agree that the data sources listed to inform the EIA baseline are appropriate?
- Do you agree with the list of receptors proposed as likely to be affected by the Scheme?

7 Ecology

7.1 Introduction

7.1.1 This chapter of the Scoping Report sets out the proposed approach to the assessment of construction, operational and decommissioning effects of the Proposed Development on ecological features. Ornithological effects are considered in **Chapter 8**.

7.2 Legislation, Policy and Guidance

7.2.1 This section presents a summary of the legislation, policy and guidance that will inform the approach to the design and assessment of the Proposed Development.

7.2.2 Particular consideration has been given to habitats and species listed under Annexes 1 and 2 of the Habitats Directive (92/43/EEC), Schedules 5, 8 and 9 of the Wildlife and Countryside Act 1981 (as amended) and Section 7 of the Environment Wales Act (2016) in deriving the detailed approach to the work.

7.2.3 Consideration has also been given to national and local policy, to include Planning Policy Wales (PPW) 12, Technical Advice Note (TAN) 5 Nature Conservation and Planning, Future Wales (The National Plan 2040) and the Powys County Council Local Development Plan (LDP) in informing the proposed assessment scope.

7.2.4 The approach to the collection of ecological data is based on industry standard guidance wherever this is available and applicable to the Site. For example, Phase 1 habitat survey has been completed in accordance with the approach outlined by the Joint Nature Conservation Committee (JNCC, 2010), bat survey will follow NatureScot *et al.* (2021) and otter *Lutra lutra* and water vole *Arvicola amphibius* survey will be based on approaches outlined by Chanin (2003) and Dean *et al.* (2016).

7.2.5 The approach to the ecological impact assessment will be based on Chartered Institute for Ecology and Environmental Management (CIEEM) guidance (2018).

7.3 Proposed Scope of Assessment

Methodology

Study Area

7.3.1 The study area for the desk study extends to 2 km beyond the Site boundary for most ecological features[11], but to 10 km for bats (and sites designated for their bat populations).

7.3.2 Ecological survey work has been largely focused within the Site. For some species, such as water vole and otter, it is proposed to survey potentially suitable habitats within a reasonable search distance[12] around turbines and other infrastructure following a design freeze.

Desk Study

7.3.3 An initial desk study was completed in February 2024. This included a review of aerial imagery, Ordnance Survey maps and the UK Government's 'Magic' website[13] to broadly assess habitat types and connectivity, and a review of species and non-statutory site data from the Biodiversity Information Service (BIS) for Powys for a search area extending to 2 km around the Site (however, this area has been extended to 10 km for bats). This has helped inform the approach to survey work. The BIS data search desk study will be updated prior to submission of the planning application.

Surveys

7.3.4 The proposed scope and specification of ecological surveys is provided below.

Phase 1 Habitat Survey

7.3.5 A Phase 1 habitat survey of the Site was completed in accordance with industry standard guidance (JNCC, 2010) by an expert upland and moorland ecologist in September 2024. This falls within the optimum period for upland vegetation surveys. The survey involved accurately mapping all broad habitat types within the Site boundary. More detailed botanical information was collected than is typical during a Phase 1 habitat survey, with plant communities assigned to National Vegetation Classification (NVC) categories in the field based on the professional judgement of the surveyor[14] [15], and subsequently checked against community types identified by Rodwell (1998). Potential groundwater dependent terrestrial ecosystems (GWDTEs) were identified based on the

[11] Species and designated sites.
[12] 200 m is proposed.
[13] MAGIC (defra.gov.uk)
14 Quadrats were not used.
15 In areas of improved and poor semi-improved grassland, thicket and post thicket stage conifer plantation NVC was not attributed as these habitats are of very limited botanical value.

botanical characteristics of the habitats present. GWDTEs were condition assessed and identified opportunities to improve management for biodiversity.

7.3.6 The survey was 'extended' in order to assess the potential of the Site to support protected species, and to inform the scope and detail of wider ecological survey work required.

7.3.7 The Phase 1 habitat survey for the Site will be updated once a design chill has been reached to include the latest iteration of the developable area. The survey area will be refined to areas within 250 m of turbine locations and other infrastructure as appropriate (SEPA Guidance Note 31).

Bat Survey

7.3.8 Bat activity will be characterised using static acoustic bat detectors in accordance with industry standard guidance (SNH *et al*. 2021). This will involve the seasonal deployment of 19 static acoustic detectors at potential turbine locations (based on the working turbine layout) for a minimum of 10 nights during spring, summer and autumn 2025. Turbine locations for static detectors will be chosen to be representative of the wind farm and will include locations on the periphery and interior of the Site. SM4 or SM Mini-bat full spectrum detectors will be used. A weather station will be deployed for the duration of the survey work, to collect site-specific meteorological data.

7.3.9 Bat roost surveys of trees and buildings within a 250 m perimeter area around proposed turbines will be completed once a design chill has been reached. The aim of the survey will be to identify potential for roosting bats. Further climbed tree surveys and / or emergence / re-entry surveys will then be completed as required.

Great Crested Newt (GCN) Survey

7.3.10 A total of ten ponds have been identified within the Site and a 250 m buffer of the Site, through a combination of review of Google Earth imagery, the MAGIC website, and ponds identified during the Phase 1 survey. An environmental DNA (eDNA) survey will be completed of ponds within 250 m of the developable area in April 2025 to gain presence / absence data on great crested newt (GCN) *Triturus cristatus*. Additional complementary survey techniques will be employed before GCN are presumed absent. All ponds will be subject to Habitat Suitability Index (HSI) scoring, and one or more torching, egg search and terrestrial search surveys depending on their suitability to support GCN.

7.3.11 Pond locations are illustrated on **Figure 7.1: Pond Locations**

Dormouse Survey

7.3.12 Hazel dormouse *Muscardinus avellanarius* is not known to be present locally, with the nearest known population at least 6 km to the east of the Site. The habitats on Site (predominantly unenclosed moorland and commercial plantation forestry) are considered suboptimal for hazel dormouse, whilst connectivity to the wider landscape is limited to the northern part of the Site, with small areas of mixed or broadleaved woodland and hedgerows present away from the developable area. Plantation forestry on site is also fragmented, with a ride and watercourse bisecting the northern forestry block, limiting the opportunities for movement at a Site level. An area of unenclosed moorland with no connecting features (such as hedgerows, stands of bracken, tall ruderal vegetation) divides the northern and central forestry blocks. Across the wider Site, potentially suitable habitat such as broadleaved woodland and hedgerows are present but are heavily fragmented and in poor condition. As such, it is considered that hazel dormouse can be scoped out of the assessment.

Badger Survey

7.3.13 There was no evidence of badger[16] *Meles meles* recorded within the Site during the extended Phase 1 habitat survey, and therefore no further targeted survey for this species is proposed at this stage. A pre-construction check for active setts will be undertaken to confirm any change in the status of badger on Site should the project be consented.

Otter and Water Vole Survey

7.3.14 There are few watercourses within the Site, and these are likely to be relatively remote from turbine locations, as they flow through woodland or along the bases of valleys. The main watercourse is the River Wye which runs north to south along the eastern boundary of the Site, with the remaining minor feeder streams forming the headwaters of the River Wye and the Afon Elan, which flows in a south easterly direction away from the Site.

7.3.15 Surveys for otter and water vole will take in all suitable habitats[17] within the Site. Survey methods for otter will be based on those recommended in

[16] Evidence here refers to latrines, snuffle holes, tracks, footprints or setts.

[17] Approximately 3 km of watercourses, namely the Mytalog Fawr and Mytalog Fach, Nat y Maes, and a 1 km stretch of the River Wye between SN 90826 79675 and SN 90911 78836.

Chanin (2003). Streams (channels and banks) will be systematically surveyed for signs of otter such as droppings ('spraints'), runs and footprints. Particular attention will be given to suitable sprainting areas such as large, flat rocks and areas where otters are likely to enter and leave streams via runs and slides. Water vole surveys will be completed concurrently. Industry standard guidance (Dean *et al.*, 2016) recommends two survey visits for water vole in two different seasons (one spring / early summer and one late summer / autumn). Work will commence in spring 2025.

Red Squirrel and Pine Marten Survey

7.3.16 Approximately 70 ha of conifer plantation is present within the Site, with limited connectivity to woodland in the wider landscape (with connectivity only present to the north of the Site). This extent of forestry and woodland is suitable for both red squirrel *Sciurus vulgaris* and pine marten *Martes martes*, both of which are present within the surrounding area, and are not as constrained by limited habitat connectivity as other species (such as hazel dormouse). A walkover survey targeting habitats suitable for den / drey creation, foraging or shelter (such as forest rides, woodland edge, along streams and around lifted root plates) to search for signs of red squirrel and pine marten will be completed in late winter 2025 (mid-November to December inclusive). If any scats (droppings) are found, they will be collected and sent for DNA analysis to confirm species.

7.3.17 The survey will be supplemented by deployment of trail cameras, red squirrel hair tubes (as recommended in NatureScot Guidance Note 5 (Gurnell *et al.* (2009)) and, following the conclusions of the recent NRW research series report (Shannon *et al.* 2022), feeding stations at suitable locations identified during the walkover. The cameras and feeding stations will be moved on three occasions during the survey period to sample up to 16 locations within the Site (reflecting the survey effort per hectare employed by Shannon *et al.* (2022).

7.3.18 The Vincent Wildlife Trust and Mid Wales Red Squirrel Partnership will also be approached for data on pine marten and red squirrel within the Site and local area.

Adder Habitat Suitability Survey

7.3.19 Due to the likelihood that adder *Vipera berus* will become fully protected if / when the Quinquennial Review of the Wildlife and Countryside Act 1981 is implemented, a habitat suitability survey for this species will be

completed in 2025. The work will be completed by a national expert and informed by the extended Phase 1 habitat survey.

White-clawed Crayfish and Fisheries Surveys

The eastern boundary of the Site borders the River Wye Special Area of Conservation (SAC)[18] see **Figure 7.2: Designated Sites**. The qualifying features of the SAC include Atlantic salmon *Salmo salar*, sea lamprey *Petromyzon marinus*, brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, bullhead *Cottus gobio*, twaite shad *Alosa fallax* and white-clawed crayfish *Austropotamibius pallipes*.

7.3.20 Survey to consider the quality of fish habitat and suitability for SAC species to be present within the Site will be undertaken. This will be informed by a desk-based exercise to identify any barriers to fish movement between the Site and the SAC, and the extent of potentially suitable watercourses within the Site. The desk-based study will also consider potential impacts to the Wye and its catchment resulting from the proposed development and suitable controls and/or mitigation to avoid impacts.

7.3.21 If the emerging design of the Proposed Development indicates that there will be development within 300 m of a watercourse, a fisheries survey (incorporating survey effort for white-clawed crayfish) are proposed to assess potential effects on the River Wye SAC.

7.3.22 Survey for white-clawed crayfish would involve sampling relevant watercourses for environmental eDNA (eDNA) to gain presence / absence data (using the protocol recommended by SureScreen Scientifics[19]).

Assessment of Likely Significant Effects

7.3.23 The assessment will be completed in accordance with CIEEM guidance and will involve:

- Determining important ecological features that require detailed impact assessment through evaluation of desk study and field survey data through:
    - defining the ecological zone of influence of the development.

[18] The Upper Wye Tributaries and the River Wye are also notified as Sites of Special Scientific Interest (SSSI) for supporting internationally important populations of Otter, Atlantic salmon and bullhead.
[19] White Clawed Crayfish - SureScreen Scientifics

- consideration of the importance of ecological features within a defined geographical context (e.g. whether populations are important at the national, regional, county or local levels).

- Characterising and quantifying effects and assessing their significance through:
  - consideration of whether effects are: beneficial, adverse or neutral; their extent, magnitude, duration, reversibility, timing and frequency; and whether there is potential for their significance to be increased cumulatively as a result of other plans or projects.
  - determining the significance of both beneficial and adverse effects. This will be completed in relation to the conservation status of each species at the geographical level at which it has been valued.

7.3.24 The potential of the Proposed Development to affect the Favourable Conservation Status (FCS) of species will be considered, taking account of available data on their Current Conservation Status (CCS) at the national and local level.

7.3.25 The value of any feature that will be significantly affected will then be used to draw conclusions as to what the implications of development are in legislative terms and any additional measures needed to ensure policy compliance (CIEEM, 2018).

Consultation

A Discretionary Planning Advice Service (DPAS) request was submitted to Natural Resources Wales (NRW) on 07 May 2024, however NRW were unable to resource consultation. Further requests for consultation will be submitted throughout the EIA, in addition to the opportunity this Scoping Report provides NRW for comment.

Consultation will also be sought with the Powys County Council (PCC) ecologist. It is proposed that discussions will cover:

- A review of the adequacy of the desk study and field survey proposed / completed.
- The main issues in terms of ecological impact assessment (under the EIA Regulations) and the parallel Habitats Regulations Assessment process.
- How effects can be most effectively mitigated through design and other measures.

- How the Proposed Development might deliver biodiversity net benefit in line with Planning Policy Wales.

Scoping Criteria

Construction

7.3.26 The Elenydd SAC and SSSI borders the south-western boundary of the Site (see **Figure 7.2: Designated Sites**) and comprises a mosaic of habitats including calaminarian grassland, blanket bog and European dry heath. The River Wye SAC and SSSI flows along sections of the eastern boundary of the Site and supports extensive areas of semi-natural riparian habitats, as well as internationally important populations of otter, white-clawed crayfish and fish species. Caeau Clochfaen-Isaf SSSI borders two sections of the eastern boundary of the Site and comprises unimproved acid grassland, damp grassland and wet flushes. Gwaun Llwyn-Gwyn SSSI borders the north-eastern part of the Site and supports a mosaic of habitats including wet rush pasture, acid grassland, heath and flushes.

7.3.27 Designated sites are illustrated on **Figure 7.2**: **Designated Sites**.

7.3.28 Phase 1 survey data indicates a range of the above habitats, and other priority habitats including blanket bog, dry and wet heath, flushes, fens and swamps, upland oakwood and hedgerows are present within the Site. Bog, wet heath, flushes, fens and swamp habitats are widespread on Site though were generally species poor, and considered to be in a degraded state likely as a result of drainage, burning and overgrazing. Dry heath is uncommon on site and is in variable condition; in some areas overgrazing has resulted in this habitat forming mosaics with acid grassland. There are both intact and defunct hedgerows on Site, a small number are moderately species-rich, but most are quite species-poor. Upland Oakwood is heavily fragmented on Site, present as a few small strips and patches of deciduous woodland on the north-eastern, south-eastern, and south-western edges of the site.

7.3.29 Design phase mitigation via the step-wise approach will aim to ensure that there are no significant effects on the hydrology or condition of any designated sites[20] or priority habitats within the Site. There is the potential for significant effects on the condition of designated sites and on priority habitats within the wider Site through indirect impacts such as sedimentation and pollution. Construction phase pollution and / or sediment mobilisation could also potentially affect offsite watercourses.

[20] The potential for hydrological change is likely to be localised due to the damage to the hydrological regime of the Site.

However, good practice prevention and control measures in relation to pollution prevention and soil compaction will be embedded into the Site design and delivered through a Construction Environmental Management Plan (CEMP). These measures will be described in detail within the ES but considered prior to the assessment of the likely effects of the Proposed Development. If likely significant effects are identified then further specific mitigation measures will be detailed prior to determining the likely significance of residual effects.

7.3.30 Impacts to priority habitats on site are anticipated, with some fragmentation and loss of habitat anticipated. There must be consideration of the siting of turbines at the design stage via the step-wise approach, and where impacts are anticipated, appropriate mitigation and/or compensation measures will be required.

7.3.31 The potential for significant effects on protected species will depend on the outcome of proposed survey work. There is potential for killing and injury and the loss of places of shelter for a range of species including otter, water vole, bats and reptiles (including adder) and amphibians.

Operation

7.3.32 The main potentially significant operational phase effect is bat fatality resulting from collision with turbine blades. The assessment will be undertaken with reference to NatureScot *et al.* (2021) which categorises bat species in terms of their collision risk and relative abundance to give an overall population vulnerability level for the species.[21] At the current time, the EcoBat tool (used for standardised interpretation of bat activity data) is not being maintained and has not been available for use since 2022. For this reason, it will not be used to inform the interpretation of bat activity data for this Site. A categorisation of bat activity will instead be derived through comparison with bat activity data collected by BSG Ecology at 106 other sites[22] across Wales, England, Scotland and Ireland.

7.3.33 The assessment of operational effects on bats will be further informed by roost and activity survey work in 2025. However, it is likely that effects on noctule *Nyctalus noctula* and the more common pipistrelles (*Pipistrelles pipistrellus* and *Pipistrellus pygmaeus*) will be the focus of the assessment.

[21] This is based on evidence from the National Bats and Wind Turbines study (Mathews, F., Richardson, S., Lintott, P. & Hosken, D. (2016). *Understanding the risk to European Protected Species (bats) at onshore wind turbine sites to inform risk management*. University of Exeter report to Defra.) and Eurobats data.

[22] These include proposed and operational wind farm sites, proposed energy production sites, proposed residential and infrastructure developments, mineral extraction sites, and other non-development lowland, wetland and island sites.

7.3.34 Effects on habitats and protected species other than bats during operation are likely to be neutral.

Decommissioning

7.3.35 The effects of decommissioning have the potential to be similar to those during the construction phase but are likely to occur over a shorter time period.

7.3.36 There is the potential for damage to semi-natural habitats and killing and injury, disturbance and displacement of protected and priority species using the Site at the time of decommissioning.

7.3.37 It is reasonable to expect that there will be changes in legislation concerning habitats and protected species over the operational life of the Proposed Development. These may be driven by climatic change, government policy concerning land management, increased effectiveness / policing of species protection, ecological research, the spread of reintroduced and non-native species and other factors.

7.3.38 Predictions of potentially significant effects are therefore not possible, with any confidence, over the operational life of the Proposed Development. It follows that effects on protected and priority habitats and species would be best addressed through a decommissioning phase Environmental Management Plan.

Effects Scoped Out

7.3.39 It is likely that effects on the Tan Llwyn Bog Site of Importance for Nature Conservation (SINC) can be scoped out of detailed consideration in the ecological impact assessment, given its distance from the Site (1.5 km).

7.3.40 Detailed consideration of dormouse in the ecological impact assessment can be scoped out given that no records for this species were returned by BIS, the poor connectivity of habitats both on site and to the wider landscape, and the suboptimal habitats on Site for dormouse.

7.3.41 The potential to scope out detailed consideration of effects on other species such as otter, water vole and white-clawed crayfish will depend on the scope and results of forthcoming survey work.

7.3.42 Legislative compliance with regard to other protected and / or priority species, such as reintroduced pine marten populations, red squirrel, hedgehog and badger should be possible to address through construction phase controls and are unlikely to require detailed consideration in the

ecological impact assessment. No evidence of any of these species was recorded during the Phase 1 habitat survey.

7.4 Baseline Conditions

Site Description and Context

7.4.1 The Site is upland in nature and is characterised by a series of ridges and valleys that separate the headwaters of the Afon Ystwyth to the south-west and the River Wye to the east; the highest elevation is approximately 530 m in the central part of the Site, and the lowest is 270 m on the banks of the River Wye in the east. About a quarter of the Site is occupied by mature conifer plantation, and the majority of the remainder is open land; the eastern-most part if the Site is agriculturally improved farmland.

7.4.2 The Site consists of broad, undulating and gently sloping ridges separated by broad, gently sloping valley bottoms, with steep valley sides. A typical sequence of vegetation types across much of the open ground comprises remnant bog vegetation on the broadest ridge tops, grading downslope into wet heath and damp grassland of purple moor-grass, then on the steepest slopes a mosaic of dry grassland, dry heath of gorse and heather, and dense bracken, changing to wet heath and acidic springs on the lower slopes, and finally bog vegetation on the valley floor, with a central stream.

7.4.3 However, longstanding degradation of the vegetation (presumably by heavy grazing, burning, and sometimes artificial drainage) has encouraged the dominance of purple moor-grass across much of the Site (with the exception of the eastern farmland). Similarly, the drier habitats have been impoverished by heavy grazing and possibly burning, causing the loss of heathland (and woodland in the more distant past) and its replacement by acidic grassland. The Site is dissected by streams that form the headwaters of the Afon Ystwyth, flowing to the south-west, and the River Wye, flowing to the south-east.

7.4.4 Land use in the wider area includes extensive open moorland, coniferous plantation woodland, and semi-natural valley woodland and pasture farmland in the valleys. Farm buildings are a feature of the farmland within the Site.

7.4.5 Two Special Areas for Conservation (SAC), the Elenydd SAC and the River Wye SAC, the Elenydd-Mallaen Special Protection Area (SPA) and five SSSIs

are present within 2 km of the Site. The locations of these designated areas in relation to the Site are shown on **Figure 7.2: Designated Sites**.

7.4.6 The Elenydd SAC borders the south-western part of the Site at its closest point. The SAC was designated primarily for its blanket bog and calaminarian grassland habitats. The Site also supports European dry heath, oligotrophic lakes and a population of the internationally rare floating water-plantain *Luronium natans*.

7.4.7 The River Wye SAC flows along sections of the eastern boundary of the Site. The SAC is a montane watercourse with extensive areas of transition mires and quaking bogs. It supports internationally important populations of otter, white-clawed crayfish and seven fish species (including Atlantic salmon, lampreys and bullhead).

7.4.8 SSSIs within 2 km of the Site are as follows:

- Elenydd SSSI borders the south-western part of the Site and is designated for the same reasons as the Elenydd SAC.
- Caeau Clochfaen-Isaf SSSI borders two sections of the eastern boundary of the Site and comprises three separate fields and an area of unimproved hay pasture. Habitats on site include acid grassland, damp grassland and wet flushes.
- Gwaun Llwyn-Gwyn SSSI borders the north-eastern part of the Site. It consists of unimproved pasture associated with river terraces, and supports a range of vegetation types including wet-rush pasture, acid grassland, mesotrophic grassland, heath and flushes.
- Rhagnentydd Gwy Uchaf (Upper Wye Tributaries) SSSI flows along sections of the eastern boundary of the Site. The Upper Wye tributaries support both oligotrophic and mesotrophic aquatic communities in addition to extensive areas of semi-natural riparian habitats. The site also supports internationally important populations of otter, Atlantic salmon and bullhead.
- Afon Gwy (Gwy Uchaf) / River Wye (Upper Wye) SSSI flows along sections of the eastern boundary of the Site. It consists of an extensive linear ecosystem which provides an essential migration route and breeding habitat for a number of nationally and internationally important species. The Upper Wye is an example of upland river typified by rocky and coarse river beds and steep gradients. A clear downstream succession of plant communities is present as a result of variations in geology and flow rate. The SSSI is also notified for

supporting a number of rare bryophyte, flowering plant and lichen species.

7.4.9 One Site of Importance for Nature Conservation, Tal Llwyn Bog SINC, is present within 2 km of the Site, which is classified for its botanical interest, specifically bog-community species including marsh cinquefoil *Potentilla palustris* and round-leaved sundew *Drosera rotundifolia*.

Baseline Survey Information

7.4.10 Priority habitats[23] identified during the Phase 1 habitat survey were upland heathland, blanket bog, upland flushes, fens and swamps, hedgerows and upland oakwood. Priority habitats are illustrated on **Figure 7.3: Priority Habitats**.

- Upland oakwood is present as a few small strips and patches of deciduous woodland on the north-eastern, south-eastern, and south-western edges of the Site. The oakwood on site is highly fragmented and disconnected with the wider landscape.
- Upland heathland comprises a few small patches of dry heath and gorse scrub on steep valley sides, often in a mosaic with acid grassland, and larger areas of degraded wet heath. The majority of these are dominated by soft rushes and are very species poor, though the occasionally some are more floristically diverse, such as those found at higher altitudes in the western part of the site. The majority of wet heath communities were present in valley bottoms across the Site, and were in a degraded state.
- Upland Flushes, Fens and Swamp habitat covers a small but significant proportion of the Site, and includes all the examples of valley-side spring-fed mires, as well as some of peat-filled valley floors where they are influenced by groundwater.
- Blanket Bog occupies a large proportion of the western and southern valleys, and also large parts of some of the eastern valleys.
- Hedgerows are found throughout the far eastern part of the Site; some are moderately species-rich but most appear to be species-poor and are defunct, offering limited connectivity either at the Site level, or within the wider landscape.

[23] Those listed under Section 7 of the Environment Wales Act (2016) or under Annex 1 of the Habitats Directive (The Conservation of Habitats, Flora and Fauna, 92/43/EEC).

7.5 Potential Mitigation

7.5.1 In conjunction with the ornithological assessment, an Outline Habitat Management Plan (OHMP) will be produced for the Site. The OHMP will set out the measures proposed to deliver a net benefit for biodiversity in line with the DECCA Framework (as required by Chapter 6 of Planning Policy Wales (PPW) 12). The OHMP will be developed as a full HMP post-consent, and implemented (along with any monitoring requirements) over the operational life of the Proposed Development. The Step-Wise Approach, which involves avoiding, minimising, mitigating and where necessary compensating for ecological effects will be adopted.

Mitigation by Design

7.5.2 Design phase measures will include:

- Avoidance of any Development infrastructure in areas likely to affect the hydrology or condition of designated sites.
- A stand-off (likely to be 60 m for turbine bases and 50 m for other infrastructure) from all watercourses to reduce the potential for effects on riverine mammals, fish and invertebrates associated with freshwater habitats.
- Avoidance of known areas of blanket bog and localised areas of high quality semi-natural habitat (if present) for turbine placement.

Additional Mitigation

7.5.3 Construction phase mitigation will principally be delivered through input to the Construction Environmental Management Plan (CEMP). Ecological objectives of the CEMP will include:

- Appointment of an ecologist tasked with ensuring compliance with all relevant regulatory and other requirements, method statements and plans, and reporting to the principal contractor and statutory consultees concerning ecological issues.
- Identification of the scope and timing of pre-construction ecological survey work (to be informed by existing data and reconnaissance), and how this will potentially inform the approach to construction work.
- Ecological input to method statements for all components of the work. This should set out to demonstrate how the potential for offences, pollution events and mobilisation of sediment will be avoided.
- The appointment of an appropriately qualified and experienced ecologist to act as an ecological clerk of works for the project.

- The identification of appropriate ecological awareness training for site staff and contractors in respect of the presence of protected and sensitive species and the importance of species-specific mitigation measures.

7.5.4 The requirement for operational phase mitigation will be informed by statistical analysis of the correlation between weather conditions and bat use of the Site. If required, measures could include feathering of turbines at idle and adjustment of cut-in speeds to minimise potential for killing and injury.

Enhancement

7.5.5 In conjunction with the ecological assessment, a policy-compliant biodiversity enhancement plan will be produced and will form part of the Habitat Management Plan (HMP) for the Site. The HMP will aim to deliver a net benefit for biodiversity in line with the DECCA Framework (Planning Policy Wales (PPW) 12). The HMP will be implemented over the operational life of the Proposed Development and may include monitoring requirements.

7.6 Cumulative Effects

7.6.1 Consideration and assessment of cumulative effects with other developments, in particular wind farm sites, within the vicinity of the Proposed Development will be undertaken as part of the EIA.

7.6.2 Previous survey data suggest that the effects of the wind farm on protected species and habitats are likely to be relatively localised, but that the cumulative assessment for bats might reasonably cover all wind farms (and other developments with the potential to impact on bats) within 10 km of the Proposed Development (in accordance with NatureScot (2021) guidance).

7.7 Questions

- Are consultees content with the proposed approach to the ecological desk study and site survey work?
- Can consultees confirm the standoff distance anticipated for watercourses?
- Do consultees agree that detailed consideration of effects on the Tan Llwyn Bog SINC can be scoped out?

- Do consultees agree that survey and detailed consideration of effects on hazel dormouse and badger can be scoped out?
- Can consultees identify any key development projects for consideration within the scope of the cumulative assessment?

8 Ornithology

8.1 Introduction

8.1.1 This chapter describes the proposed scope of the assessment of likely significant effects arising from the Proposed Development on ornithology. It includes consideration of impacts to species present on Site, mitigation, and proposals for bird habitat improvement/restoration in line with Net Benefit for Biodiversity (NBB)[24] where appropriate.

8.1.2 The chapter (and its associated figures and appendices) should be considered in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** and **Chapter 7: Ecology** which details terrestrial ecology, covering habitats and protected and priority non-avian fauna.

8.2 Legislation, Policy and Guidance

Relevant Legislation and Guidance

8.2.1 All nesting birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to disturb them whilst they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

8.2.2 The Conservation of Habitats and Species Regulations 2017 (as amended) places duties on competent authorities (including Local Authorities and National Park Authorities) in relation to wild bird habitat. These provisions relate to Articles 1, 2 and 3 of the Birds Directive[25]. Regulation 10 (3) requires that the objective is the '*preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat, as appropriate, having regard to the requirements of Article 2 of the new Wild Birds Directive…*' Regulation 10 (7) states: '*In considering which measures may be appropriate for the*

[24] Planning Policy Wales 12 (Chapter 6) requires an overall net benefit for biodiversity and ecosystem resilience to be delivered through the planning system in accordance with the Section 6 Duty set out in the Section 6 duty of the Environment (Wales) Act (2016).

[25] EC Directive on the conservation of wild birds (2009/147/EC)

purpose of security or contributing to the objective in [Regulation 10 (3)] Paragraph 3, appropriate account must be taken of economic and recreational requirements'.

8.2.3 In relation to the duties placed on competent authorities under the 2017 Regulations, Regulation 10 (8) states: 'So far as lies within their powers, a competent authority in exercising any function [including in relation to town and country planning] in or in relation to the United Kingdom must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds (except habitats beyond the outer limits of the area to which the Wild Birds Directive applies).'

8.2.4 The approach to ornithological survey has been based on Scottish Natural Heritage[26] (SNH, 2017)[27] guidance for bird survey at onshore wind farms, which represents industry standard guidance for the UK.

8.2.5 Particular consideration has been given to those species listed under Annex 1 of the Birds Directive (2009/47/EC), Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and Section 7 of the Environment Wales Act (2016) in deriving the detailed approach to the work.

8.3 Proposed Scope of Assessment

Survey Methodology

Study area

8.3.1 The study area varies according to species group and survey method in accordance with industry standard (SNH, 2017) guidance. The study area included the entire developable area and extended to a maximum of 2 km beyond the Site boundary to capture data on species for which the Elenydd Mallaen Special Protected Area (SPA) is designated (specifically red kite *Milvus milvus*, peregrine *Falco peregrinus* and merlin *Falco columbarius*).

8.3.2 The extent of the survey area (including the Site boundary) is shown in **Figure 8.1: Survey Area and Vantage Point Survey Locations**.

Vantage Point (VP) Surveys

8.3.3 VP surveys were conducted during the breeding season (April to August 2023 and 2024 inclusive) and non-breeding / winter season (September

[26] Now NatureScot

[27] SNH (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms SNH, Inverness

2023 to March 2024 inclusive and ongoing September 2024 to March 2025). Key principles of VP survey are set out by SNH (2017). These are:

- VPs should be chosen parsimoniously to achieve maximum visibility from the minimum number of survey locations.
- An arc of up to 180 degrees extending up to two kilometres from the observer can be effectively surveyed from each VP.
- VPs are best located outside of the survey area where possible.
- Observers should try to position themselves inconspicuously to minimise their effect on bird behaviour / movement.
- VPs that are located within the survey area should not be used simultaneously with other VP locations which overlook them as the presence of an observer either sitting at or moving to / from the VP could affect bird behaviour.
- At least 36 hours of survey per VP should be conducted per 'season' to enable representative data collection.

8.3.4 Six VP locations were selected for survey of land within the Site during the survey period. Four of the VPs (VPs 1, 2, 4 and 5) were located inside the Site boundary. This was necessary due to the topography of the Site and surrounding land. VP locations are shown in **Figure 8.1: Survey Area and Vantage Point Survey Locations**.

8.3.5 Three hours was spent at each VP location per "watch" where weather conditions allowed, during which time the surveyor scanned a 180 degree viewshed extending up to two kilometres from the observer using binoculars. During VP survey the viewing arc was scanned constantly until a 'target species' was detected. The bird was then followed until it landed or was lost to view. Height bands of 0-30 m, 30-200 m and 200+ m were used for recording flight height. The height range 30-200 m was considered to represent collision risk height.

8.3.6 The following information was recorded for each target species:

- Species
- Time of observation
- Duration of observation
- Count
- Estimated flight height (every 15 seconds)

- Direction of flight
- Estimated distance and direction of bird from the observer
- Flight type and behaviour, where apparent (e.g., flapping / gliding and foraging, displaying, commuting etc.)

8.3.7 SNH Guidance (2017) states that, "In most circumstances … target species will be limited to those species which are afforded a higher level of legislative protection." Target (or 'focal') species at the Site were defined as all Schedule 1 and Annex 1 raptors / owls, waders and wildfowl (excluding re-established greylag goose *Anser anser* and feral Canada goose *Branta canadensis*).

Breeding Raptor Surveys

8.3.8 Surveys followed SNH (2017) guidance, which recommends that surveys for breeding raptors including red kite and peregrine are completed within 2 km of proposed wind farms. For goshawk *Accipiter gentilis* and hobby *Falco subbuteo*, which often nest in plantation habitats, 1 km is applicable.

8.3.9 Surveys of potential breeding areas were completed using a combination of walkover raptor survey and mobile VPs on nine visits between April and July 2023 and 2024 inclusive. During the surveys, habitat features were searched for signs of raptors. Surveys also involved walking along plantation edge and undertaking short VP watches of up to one hour duration over woodland / plantation and quarries.

8.3.10 The survey methods were based on recommendations in SNH (2017) guidance and Hardey *et al*. (2013)[28] and were informed by the emerging results of the ongoing VP survey work. The durations of supplementary VP watches were varied by location depending on the extent to which viewsheds covered the areas in question.

8.3.11 Breeding raptor surveys were conducted by BSG Ecology between April and July 2024 inclusive.

Breeding Wader Surveys

8.3.12 Walkover breeding wader surveys of the moorland habitats extended to a minimum of 800 m beyond the Site boundary (reflecting the findings of

[28] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013). Raptors: a field guide to survey and monitoring (3rd Edition)

Pearce-Higgins *et al*. (2009[29] and 2012[30]) which concluded that displacement effects on curlew extend to 800 m from wind turbines).

8.3.13 Survey was completed in accordance with SNH guidance (2017), which recommends that the Brown & Shepherd (1993)[31] method is applied, but that surveys are repeated on four occasions (based on amendments proposed by Calladine et al. (2009)[32]) during the period April to July (with at least seven days between visits).

8.3.14 Breeding wader surveys were conducted by BSG Ecology between April and July 2023 inclusive and were repeated in 2024.

Breeding merlin surveys

8.3.15 Species specific surveys targeting merlin are to be undertaken in 2025 following the discovery of an apparent territory during the Year 2 surveys.

8.3.16 The methods are based on Hardey *et al*. (2015), adapted to cover a total of three visits to the location of the apparent territory to confirm that the apparent nest site (assumedly a former crow's nest) is still in suitable condition to be used by breeding merlin.

Walkover golden plover surveys

8.3.17 Walkover surveys to assess the utilisation of the Site by passage and/or wintering golden plover have been undertaken in the passage and winter 2024/2025 period.

8.3.18 The surveys followed a bespoke methodology designed to target golden plover during the autumn (October – November 2024 inclusive) and spring (March – April 2025 inclusive), whereby walkover surveys of the Site were conducted twice monthly during passage periods. An additional survey to cover the winter period for any birds still present on Site was undertaken December 2024 following interim results.

8.3.19 Surveys plotted the distribution of any golden plover present on Site, with count and behavioural data collected where possible.

Nightjar surveys

[29] Pearce-Higgins, J.W, Stephen, L., Langston, R.H.W., Bainbridge, I.P., Bullman, R. (2009) The distribution of breeding birds around upland wind farms. Journal of Applied Ecology. Vol. 46, Issue 6, Pages 1323-1331.

[30] Pearce-Higgins, J.W, Stephen, L., Douse, A., Langston, R.H.W. (2012) Greater impacts of wind farms on bird populations during construction than subsequent operation: results of a multi-site and multi-species analysis. Journal of Applied Ecology. Vol. 49, Issue 2, Pages 386-394

[31] Brown, A. F. and Shepherd, K. B. (1993) A method for censusing upland breeding waders. Bird Study, 40, pp. 189-195.

[32] Calladine, J., Garner, G., Wernham, C., & Thiel, A. (2009). The influence of survey frequency on population estimates of moorland breeding birds. *Bird Study*, *56*(3), 381–388.

8.3.20 Areas of suitable breeding habitat for nightjar (defined as permanently open habitat, clear fell and recently re-stocked plantation in accordance with the findings of Scott et al. (1998)[33] were identified. A walked transect with stopping (listening) points was selected, to survey suitable habitat associated with commercial coniferous plantation within 800 m of the developable area.

8.3.21 Surveys to locate churring male nightjars were completed based on the methods outlined in Gilbert et al (1998). The transect survey was undertaken in June 2023 and repeated in July 2023. Each stop was eight minutes duration. If, after three minutes, no churring nightjars had been recorded, audio playback was used for a duration of 1 minute to attempt to elicit a response.

Proposed Scope of Assessment

8.3.22 The approach to the ornithological impact assessment will be based on industry standard Chartered Institute of Ecology and Environmental Management (2018)[34] guidance. Although this is recognised as the industry standard for ecological assessment, the guidance is not prescriptive and does not recommend the use of matrices; rather, it aims to "*provide guidance to practitioners for refining their own methodologies*".

8.3.23 CIEEM recommends that assessment involves:

- Identification of important ecological features in relation to a Site.
- Establishing a Zone of Influence (ZoI) based on desk study, field survey, consultation, an assessment of the sensitivity of ornithological features, consideration of the outline design and liaison with other technical disciplines.
- Assessing the importance of the features within a geographical context
- Identifying the nature of any potential effects
- Assessing the significance of effects with reference to the integrity of sites or ecosystems and / or the conservation status of habitats or species. This will include collision risk analysis using the model developed by SNH (Band *et al.*, 2007)[35]

[33] G.W. Scott, D.C. Jardine, G. Hills & B. Sweeney (1998) Changes in Nightjar Caprimulgus europaeus populations in upland forests in Yorkshire. Bird Study.

[34] CIEEM (2018) GUIDELINES FOR ECOLOGICAL IMPACT ASSESSMENT IN THE UK AND IRELAND Terrestrial, Freshwater, Coastal and Marine

[35] Band, W., Madders, M. and Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M., Janss, G.F.E. & Ferrer, M. (Eds.) Birds and Wind Farms: Risk Assessment and Mitigation, pp 259-275. Quercus, Madrid.

- Applying the Step-Wise Approach, which involves avoiding, minimising, mitigating and where necessary compensating for ornithological effects will be adopted
- Assessment of residual effects

8.3.24 The ornithological features and designated sites identified within the study area would be assigned an ornithological importance using the standards set out by CIEEM. To characterise an impact on a feature, the following parameters would be considered:

- Magnitude
- Extent
- Duration
- Frequency
- Timing
- Reversibility

8.3.25 Characterising and quantifying effects and assessing their significance will be completed through:

- Consideration of whether effects are: beneficial, adverse or neutral; their extent, magnitude, duration, reversibility, timing and frequency; and whether there is potential for their significance to be increased cumulatively as a result of other plans or projects; and
- Determining the significance of both beneficial and adverse effects (this will be completed in relation to the conservation status of each species at the geographical level at which it has been valued).

8.3.26 Any effect that is significant at the district level or above will be considered significant in Environmental Impact Assessment terms.

8.3.27 The flight data collected during the VP surveys will be used to undertake Collision Risk Modelling (CRM) to predict the impact that the operational Proposed Development will have on local bird populations. The Band *et al*. (2007) model is the standard model used to calculate this impact. The predicted annual fatality level generated by the model can be compared with other wind farms, local, regional and national population estimates and the significance of the impact from the wind farm alone and cumulatively can be assessed.

8.3.28 The likelihood of significant displacement and disturbance effects on nesting raptors will be assessed with regard to published disturbance distances, wind farm monitoring studies and professional experience.

8.4 Baseline Conditions

Overview

8.4.1 One year "Year 1" of survey effort has been completed at the Site. Data for this period covered VP and breeding raptor and breeding wader surveys.

8.4.2 Surveys are on-going at the Site, with "Year 2" (covering the period March 2024 – March 2025) data being collected and compiled. This report will outline key findings to date for this period; however, an addendum may be required should any significant findings be made at a later date.

Baseline Surveys

Year 1 (April 2023 to March 2024 inclusive)

8.4.3 In Year 1, data collection took place during the 2023 breeding season (April – August inclusive), and the 2023 / 2024 non-breeding / winter season (September 2023 – March 2024 inclusive). Survey work to inform the assessment was conducted in accordance with industry standard SNH (2017) guidance, supplemented by guidance for raptor survey produced by Hardey *et al.*, (2013).

8.4.4 Additional data collection is on-going at the Site, with a second year (Year 2) of breeding and non-breeding VP surveys, breeding raptor surveys, species specific (merlin) breeding bird surveys, breeding wader surveys, golden plover *Pluvialis apricaria* passage / wintering walkover surveys and nightjar *Caprimulgus europaeus* surveys. Details of the methods can be found under the "Survey Methods" section.

8.4.5 The following comprises a summary of the main ornithological findings at the Site during Year 1.

- The Site is located immediately adjacent to a Special Protected Area (SPA), the Elenydd Mallaen (SPA), which is classified for its importance to breeding red kite, peregrine and merlin.
- There are two Important Curlew Area's (ICA)[36] within 5 km of the Site; ICA 10 (Elenydd) is located approximately 4.5 km to the south-east of the Site boundary, and; ICA 9 (Montgomeryshire) is located approximately 500 m east of the Site boundary.
- The following target species were recorded during the breeding season VP surveys; osprey *Pandion haliaetus*, red kite, hen harrier

[36] These are areas which are classified as of national importance due to their curlew population, as identified within the Wales Action Plan for the Recovery of Curlew by Curlew Wales (conservation partnership).

Circus cyaneus, goshawk, kestrel *Falco tinnunculus*, hobby, peregrine, merlin, golden plover and cormorant *Phalacrocorax carbo*.

- The following target species were recorded during the non-breeding season VP surveys; red kite, hen harrier, goshawk, merlin, golden plover and common snipe *Gallinago gallinago*.
- The following target species were recorded during breeding raptor or breeding wader species; mallard *Anas platyrhynchos*, teal *Anas crecca*, oystercatcher *Haematopus ostralegus*, dotterel *Charadrius morinellus*, lapwing *Vanellus vanellus*, ringed plover *Charadrias hiaticula*, little ringed plover *Charadrias dubius*, common sandpiper *Actitis hypoleucos*, wood sandpiper *Tringa glareola*, curlew and quail *Coturnix coturnix*.

8.4.6 Sixty non-focal species were recorded during the surveys. This included one Schedule 1 species (crossbill *Loxia curvirostra*), 16 red listed Bird of Conservation Concern (BoCC) species, and 10 amber listed Bird of Conservation Concern (BoCC) species.

8.4.7 Table 8.1 provides an overview of species-specific findings at the Site.

Table 8.1 Overview of species-specific findings

Species	Summary
Red kite	Red kite was the most commonly recorded focal species in Year 1, with 406 flights during the breeding season VP surveys, and 35 flights during the non-breeding season VP surveys. There were 11 pairs of red kite within the 2 km study area, with two pairs on Site.
Peregrine	A total of eight flights were recorded across breeding season VP and breeding raptor surveys in Year 1. There was no evidence that the species had attempted to breed on site. A potential failed breeding attempt occurred outside of the survey area (approximately 2.5 km south-east of the Site), with birds present in suitable habitat until 21 May 2023, but not thereafter.

Species	Summary
Merlin	There were ten flights during breeding season VP surveys, and one flight during non-breeding season VP surveys. One active territory was confirmed in the western part of the Site, but the outcome of any breeding attempt was unknown.
Hobby	A total of six flights were recorded across breeding season VP and breeding raptor surveys. There was no evidence that the species had attempted to breed on Site or within 2 km of the Site boundary.
Kestrel	There were 17 flights during breeding season VP surveys, and one flight during non-breeding season VP surveys. There was no evidence that the species had attempted to breed on Site or within 2 km of the Site boundary.
Hen harrier	There were five hen harrier flights during breeding season VP surveys, and one flight during non-breeding season VP surveys. There was no evidence that the species had attempted to breed on Site or within 2 km of the Site boundary.
Osprey	There were three observations of osprey. Observations were on 4 April and 1 May 2023 during breeding season VP surveys, with the third observation on 8 May 2023. It is likely that all observations relate to birds migrating over the site. There was no evidence that the species had attempted to breed on Site or within 2 km of the Site boundary.
Goshawk	There were 27 flights during breeding season VP surveys, and five flights during the non-breeding season VP surveys. The five flights occurred during suitable conditions for displaying birds, and relate to early breeding season (territorial) flights. There were two probable goshawk territories within mature plantation on Site (as indicated by display flights over two separate areas of the Site).

Species	Summary
Golden plover	Golden plover flights were recorded during both breeding and non-breeding season VP surveys (14 and 9 flights respectively), with a maximum count of approximately 1000 birds. Flocks were observed in October and November 2023, and again in March and April 2024, indicating that golden plover predominantly used the open moorland on Site during passage periods.
Snipe	Snipe were recorded infrequently during non-breeding VP surveys. A total of three territories were present within the study area, with one territory on Site (in the valley between Esgair Llwyn-gwyn and Pant-gwyn Hill) and two additional territories outside the Site boundary to the south-west.
Curlew	Curlew were recorded calling on one occasion during breeding VP surveys. One curlew was heard calling approximately 800 m south of the site boundary during breeding wader surveys. There was no evidence that the species had attempted to breed on Site or within the 800 m perimeter of the survey area.
Oystercatcher	One was observed within the study area on 14 April 2023. There was no evidence that the species had attempted to breed on Site or within the 800 m perimeter of the survey area.
Common sandpiper	Two were recorded within the study area (along the river south of Gors Lywd) on 9 May 2023. There was no evidence that the species had attempted to breed on Site or within the 800 m perimeter of the survey area.
Other waders	Calling singletons of dotterel (on 14 April 2023), lapwing (on 23 May 2023), ringed plover (on 4 May 2023), little ringed plover and wood sandpiper (both on 13 July 2023) were recorded during the breeding wader surveys. None were considered to have bred locally.

Species	Summary
Quail	Two separate singing quail were recorded off Site but within the study area between 10 and 17 June 2023. Due to the secretive nature of this species, the outcome of any possible breeding attempt at the Site is unknown.
Cormorant	Cormorant was recorded on five occasions during surveys, with 1 – 3 individuals flying over the Site. There was no evidence that the species had attempted to breed on Site.
Mallard	Three mallard flights were recorded in flight over the Site during the Year 1 breeding wader surveys. There was no evidence that the species had attempted to breed on Site.
Teal	One teal flight was recorded in flight over the Site during breeding wader surveys in Year 1. There was no evidence that the species had attempted to breed on Site.

Interim Results from Year 2 (commencing April 2024)

8.4.8 The following target species have been recorded during the second year of VP surveys to date: golden plover, goshawk, kestrel, merlin, red kite and snipe. Data on the flight duration and time spent at collision risk height is still to be collated.

8.4.9 Breeding wader surveys in 2024 recorded up to five snipe territories and up to four common sandpiper territories. Four of the snipe territories were located within the Site (with three territories on open ground north of Pant-gwyn hill, and the fourth in the east of the Site within the Afon Ysywyth catchment), with a fifth territory located outside the Site boundary on open ground to the north-east of Esgair Elan. The four common sandpiper territories were to the east outside of the Site, along the River Wye.

8.4.10 The locations of the breeding wader territories in Year 2 are shown in **Figure 8.2: Breeding Wader Territory Locations (2024).**

8.4.11 Breeding raptor surveys recorded the following species; red kite (Five confirmed nests of which two were on Site, and a minimum of 13 territories), merlin (one territory), goshawk (up to three territories) and

kestrel (one territory). Peregrine was not found to be present during the 2024 breeding raptor surveys. There were also four active buzzard nests located within 2 km of the Site in Year 2.

8.4.12 The locations of the breeding raptor territories in Year 2 are shown in **Figure 8.3: Red Kite Breeding Locations** and **Figure 8.4: Peregrine and Merlin Breeding Locations**.

8.4.13 Red kite activity during the breeding-season VP surveys was lower than in the first year, with 74 flights recorded.

Interim Collision Risk Modelling

8.4.14 Indicative CRM for the Year 1 period was completed using the current draft turbine layout and specifications, with the results separated by season (breeding season – March – September inclusive and non-breeding season October to February inclusive).

8.4.15 The results for the breeding season (Year 1 only) are as follows:

- Red kite – 6.01 birds corrected[37] annual risk
- Merlin – 0.06 birds corrected annual risk
- Peregrine – 0.12 birds corrected annual risk
- Golden plover – 67.87 birds corrected annual risk

8.4.16 The results for the non-breeding season (Year 1 only) are as follows;

- Red kite – 9.98 birds corrected annual risk
- Merlin – 0.03 birds corrected annual risk
- Peregrine – 0 birds corrected annual risk
- Golden plover – 24.16 birds corrected annual risk

Scoping Criteria

Construction Phase

8.4.17 The extent of the effects of construction on birds will depend upon the timing of disturbing activities, the degree of displacement (spatially and temporally) that occurs, the size, suitability and proximity of habitats available to displaced birds, and their capacity to accommodate them.

8.4.18 Potential for significant construction phase effects are limited to those birds that regularly use the Site for breeding or foraging. In this instance

[37] The corrected annual risk is the annual risk accounting for the avoidance rate and the proportion of time that turbines are operational.

the following species are considered likely to be impacted at the construction phase: goshawk, red kite, merlin, peregrine, kestrel, snipe and wintering / passage golden plover. Additionally, ground nesting birds (such as meadow pipit *Anthus pratensis* and skylark *Alauda arvensis*) that are present within the study area will primarily be considered regarding legislative compliance.

8.4.19 There is the potential for disturbance and displacement impacts to species for which the Elenydd Mallaen SPA is designated. The Site is located within the core foraging ranges of the Elenydd Mallaen SPA populations of red kite, merlin and peregrine, and therefore impacts to the SPA will be scoped into the EIA.

Operational Phase

8.4.20 There are three ways in which birds can be affected by operational wind farms and related infrastructure: through displacement due to ongoing disturbance caused by the turbine towers and moving blades (and by periodic servicing of the turbines), through collision with moving blades or associated infrastructure, e.g. the guy lines of meteorological masts; and through habitat loss/fragmentation in areas used for other infrastructure, such as solar arrays and/or battery energy storage systems (BESS).

8.4.21 Operational impacts on focal species (raptors and waders) present within the Study area will be considered. CRM for all regularly occurring raptor and wader species will be undertaken for the entire survey period.

8.4.22 Species that will be scoped in are: red kite, peregrine, merlin, kestrel, snipe and spring/autumn passage and wintering golden plover. Impacts to the qualifying features of the Elenydd Mallaen SPA are anticipated based on observed flight activity to date and will therefore be scoped in for further assessment.

Decommissioning

8.4.23 The effects of decommissioning have the potential to be similar to those during the construction phase but are likely to occur over a shorter time period.

8.4.24 Species most likely to be disturbed and displaced from the Site during decommissioning are those that breed, roost or forage within it at that time.

8.4.25 It is reasonable to expect that there will be changes in legislation concerning protected species, as well as changes in local populations and distribution over the operational life of the Proposed Development. These

may be driven by climatic change, landscape-scale land management, increased effectiveness / policing of protection, changes in the attitude of land managers to birds, the spread of reintroduced populations, changes on the wintering and staging grounds of migrant species and other factors.

8.4.26 Predictions are not therefore possible, with any confidence, over the operational life of the Proposed Development. It follows that effects on birds would be best addressed through a decommissioning phase Environmental Management Plan.

Effects Scoped In

8.4.27 The following elements have been scoped in for further assessment, with a brief justification provided for each element:

- Elenydd Mallaen SPA: The Elenydd Mallaen SPA is located immediately east of the Site. The species for which the SPA is designated (breeding red kite, merlin and peregrine) occur either on Site or within the study area. The core ranging area for each of these species is larger than the distance between the Site and the SPA, and therefore it is likely that the Site can be considered functionally linked to the Elenydd Mallaen SPA.
- Red kite: Red kite is a S1[38] species under the Wildlife and Countryside Act (1981 as amended). There is a breeding population of red kite on Site and is at risk of disturbance during the construction phase of the project. Additionally, VP survey has demonstrated that red kite uses the entirety of the Site and the local landscape which demonstrates the potential for injury / fatalities to occur via collision with turbines during the operational phase. Red kite is also a species for which the Elenydd Mallaen SPA is designated.
- Merlin: Merlin is a S1 species under the Wildlife and Countryside Act (1981 as amended). Merlin is known to have bred on Site and is at risk of disturbance during the construction phase of the project. Additionally, VP survey has shown that merlin utilised the Site and local landscape for hunting/foraging, which demonstrates the potential for injury / fatalities to occur via collision with turbines during the operational phase. Merlin is also a species for which the Elenydd Mallaen SPA is designated.

[38] Schedule 1 (Wildlife and Countryside Act, 1981) species are afforded additional protections during the breeding season, covering disturbance to, damage to or killing of these species, their nests, eggs and dependent young.

- Peregrine: Peregrine is a S1 species under the Wildlife and Countryside Act (1981 as amended) and is an Annex 1 species under the Birds Directive. Peregrine is known to have bred on Site and is at risk of disturbance during the construction phase of the project. Although flight data has to date suggested low levels of activity on Site by peregrine, there is potential for injury / fatalities to occur via collision with turbines during the operational phase. Peregrine is also a species for which the Elenydd Mallaen SPA is designated.
- Kestrel: Kestrel is an Amber listed BoCC species in Wales. Kestrel was regularly recorded foraging on Site, spending a large proportion of the total flight time at collision risk height, resulting in the potential for injury / fatalities to occur via collision with turbines during the operational phase. One kestrel territory was present in Year 2.
- Golden Plover (passage / wintering): Golden plover is a Red listed BoCC in Wales. Flocks of up to 1000 golden plover use the Site during spring and autumn passage period, with the potential for disturbance during the construction phase of the project, and the potential for injury / fatalities to occur via collision with turbines during the operational phase. The placement and extent of other green infrastructure (such as solar arrays and BESS) may result in displacement resulting from reducing the overall extent of suitable foraging areas. Further baseline data is being collected on the passage / wintering golden plover population present.
- Snipe (breeding): Snipe is an Amber listed BoCC in Wales. There is a breeding population of snipe on Site and is at risk of disturbance and displacement during the construction and operational phases of the project. Although flight data has to date suggested low levels of activity on Site by snipe, there is potential for injury / fatalities to occur via collision with turbines during the operational phase.
- Other breeding bird assemblages on Site: The general breeding bird assemblage on Site includes Red and Amber listed Birds of Conservation Concern (BoCC), predominately passerines or near-passerine species. Impacts to these groups are anticipated during the construction phase. Legislative compliance can be achieved through appropriate mitigation (timing of works, use of an Ecological Clerk of Works (ECoW), methods statement etc). Habitat enhancement principally aimed at other species is also likely to benefit the locally breeding bird community. Impacts to passerines and near-passerines resulting from the operational phase are not anticipated, although the placement and extent of other

infrastructure (such as solar arrays and BESS) may result in displacement resulting from reducing the overall extent of suitable foraging/nesting areas.

Effects Scoped Out

8.4.28 The following elements have been scoped out of further assessment, with a brief justification provided for each element:

- Nightjar: Nightjar is Green listed BoCC species in Wales but Amber listed in the UK[39]. There is a lack of suitable breeding habitat on Site, and nightjar were not recorded during the targeted survey work. It is considered that the project will have no direct or significant indirect impact to breeding nightjar in the local area.
- Curlew: Curlew is a Red listed BoCC in Wales. There are two non-statutory designated areas for curlew within 5 km of the Site: ICA 10 (Elenydd) and (ICA) 9: Montgomeryshire. Curlew was recorded infrequently on Site, with two birds heard during Year 1. There was no evidence that the Site is used by breeding, foraging or roosting curlew. Curlew has not been recorded during Year 2 surveys to date. It is considered that the project will have no direct or significant indirect impact to breeding curlew in the local area.
- Other wader and wildfowl species (excluding snipe and golden plover): three species of waterfowl (mallard, teal and cormorant) and six species of waders (oystercatcher, lapwing, dotterel, ringed plover, little ringed plover, wood sandpiper) were recorded infrequently during surveys. There is a lack of suitable breeding and foraging habitat for these species, and the Site is outside of the known breeding range for dotterel and wood sandpiper. It is considered that the project will have no direct or significant indirect impact to these assemblages.

8.5 Potential Mitigation

8.5.1 Construction phase mitigation will principally be delivered through input to the CEMP. The ornithological objectives of the CEMP will include:

- Appointment of an ecologist to ensure compliance with all relevant regulatory and other requirements, method statements and reporting to the principal contractor and statutory consultees with regards to ornithological issues arising. The ecologist will also act as

[39] Stanbury *et al., (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain*

ecological clerk of works (ECoW) when required during the construction phase.

- Input into method statements for all components of the work, demonstrating how the potential for any offences regarding ornithology will be avoided or mitigated.
- The identification of appropriate ecological awareness training for Site staff and contractors in respect of the presence of protected and sensitive bird species and the importance of species-specific mitigation measures.

8.5.2 In conjunction with the ecological assessment, an Outline Habitat Management Plan (OHMP) will be produced for the Site. The OHMP will set out the measures proposed to deliver a net benefit for biodiversity in line with the DECCA Framework (as required by Chapter 6 of Planning Policy Wales (PPW) 12). The OHMP will be developed as a full HMP post-consent, and implemented (along with any monitoring requirements) over the operational life of the Proposed Development. Any habitat enhancement undertaken on Site will aim to provide more extensive and higher quality breeding and foraging opportunities for birds.

8.6 Cumulative Effects

8.6.1 Consideration and assessment of cumulative effects with other developments, in particular wind farm sites, within the vicinity of the Proposed Development will be undertaken as part of the EIA. The cumulative assessment will consider guidance published by PEDW (Advice Note Seventeen: Cumulative effects assessment")[40], and SNH (2018)[41].

8.6.2 Cumulative effects are most likely to occur to those receptors for which a significant residual effect is predicted, particularly if the core range of these receptors includes other planned, consented or built development. The scope of cumulative assessment will reflect the Ecological Zone of Influence for ornithological receptors identified in the EIA. However, it is considered unlikely that any disturbance, displacement or collision effects would be cumulative beyond 10 km.

[40] Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/ [Accessed 06/12/2024]

[41] Scottish Natural Heritage (2018). Assessing Significance of Impacts from Onshore Wind Farms Outwith Designated Areas. Scottish Natural Heritage, Inverness

8.7 Questions

- Are consultees content with the proposed approach to the ornithological desk study and Site survey work?
- Can consultees identify any key development projects for consideration within the scope of the cumulative assessment?
- Can NRW comment on whether there is a requirement for a DPAS meeting for the project?

9 Geology, Peat, Hydrology and Hydrogeology

9.1 Introduction

9.1.1 This section considers the scope of work required to assess potential significant effects associated with geology, hydrology, hydrogeology and soils including peat during the construction, operational and decommissioning phases of the Proposed Development. The receptors within the Proposed Development boundary relevant to this chapter will include soils, peat, geology, hydrogeology, groundwater dependent terrestrial ecosystems (GWDTE), environmentally designated sites, hydrology, private water supplies (PWS), water resources and areas affected by flood risk.

9.1.2 Following the identification of sensitive receptors, key potentially significant effects will be identified that may arise should the development be given consent, and potential mitigation that would be applied to manage these effects.

9.1.3 The assessment has been overseen by Martin Baines of SLR Consulting Ltd. Martin is a Technical Director (Hydrology and Hydrogeology) employed by SLR and has more than 20 years' experience assessing renewable energy and electrical infrastructure projects and specifically their potential effects on soils, geology, peat and the water environment.

9.2 Legislation, Policy and Guidance

9.2.1 Regard will be given to technical guidance and other codes of best practice during the design phase of the development, in order to limit:

- the potential for contamination of ground and surface waters;
- the potential for flooding to be caused to the existing water environment and surrounding sensitive users; and
- other potential impacts on the water environment.

9.2.2 The proposed assessment method involves a combination of desk-based data gathering, site visits and site-specific data collection followed by data analysis to determine the potential significance of effects.

9.2.3 Key legislation and regulations are listed below.

National Planning Policy

9.2.4 The following UK legislation is considered relevant to the protection of geology, soils, peat and the water environment:

- Environment Act 1995;
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- Planning Policy Wales (PPW), Addressing the Nature Emergency through the Planning System: Updated National Planning Policy for Chapter 6 of Planning Policy Wales. (2023), Welsh Government.
- Planning Policy Wales (Ed.12), 2024;
- Future Wales: The National Plan 2040, 2021;
- Natural Resources Policy (2017), Welsh Government
- Planning (Wales) Act 2015;
- Flood and Water Management Act 2010;
- The Flood Risk Regulations 2009;
- Private Water Supplies (Wales) Regulations 2017;
- The Waste (England and Wales) Regulations 2011
- Environmental Permitting (England and Wales) Regulations 2010; and
- Pollution Prevention & Control (England & Wales) Regulations 2000.

9.2.5 Technical Advice Notes (TANs) have been developed to supplement Planning Policy Wales and to provide guidance on a number of key issues and sensitivities. Of relevance to this assessment is TAN 15: Development and Flood Risk, 2004.

Local Planning Policy

- Powys Local Development Plan 2011 to 2026
  - Policy DM5 – Development and Flood Risk
  - Policy DM6 - Flood Prevention Measures and Land Drainage
  - Policy DM10 – Contaminated and Unstable Land
- Powys Local Development Plan (2011 to 2026) Supplementary Planning Guidance Biodiversity and Geodiversity
- Powys Local Development Plan (2011-2026) Supplementary Planning Guidance Renewable Energy

Guidance

9.2.6 Relevant UK guidance on good practice for construction projects that will be referenced during assessment is detailed in the following documents.

- Control of Water Pollution from Construction Sites (C532), Construction Industry Research and Information Association (CIRIA) 2001;

- Environmental Good Practice on Site (C741), CIRIA 2015;
- NRW, Peatlands learning resource accessed on NRW's website via: https://naturalresources.wales/guidance-and-advice/business-sectors/education-learning-and-skills/looking-for-learning-resources/learning-resources-search-by-topic/peatland-bogs/?lang=en.
- Control of Water Pollution from Linear Construction Projects: Site Guide (C649), CIRA 2006;
- Control of Water Pollution from Linear Construction Projects (C648), CIRA 2006;
- NRW's Guidance for Pollution Protection – Works and maintenance in or near water, version 1.2, February 2018;
- Scottish Government, Scottish Natural Heritage, SEPA (2017) 'Peat Survey Guidance; Developments on Peatland: Site Surveys';
- SEPA Regulatory Position Statement - Developments on Peat (Scottish Environment Protection Agency, 2010);
- Good Practice During Wind Farm Construction, NatureScot (July 2024);
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste (Scottish Renewables and SEPA, 2012);
- The Waste Management Licensing (Scotland) Regulations 2011;
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, January 2017);
- Environment Agency Guidance to Protect Groundwater and Prevent Groundwater Pollution 2017 adopted by NRW; and
- The Suitable Drainage System (SuDS) Manual (C753), CIRIA 2015.

9.2.7 The CIRIA guidance provides help on environmental good practice for the control of water pollution arising from construction activities. It focuses on the potential sources of water pollution from within construction sites and the effective methods of preventing its occurrence.

9.2.8 The NRW pollution protection guidance is part of a wider suite of guidance for pollution prevention (GPP) relating to environmental good practice. The full suite can be found on the NetRegs website at: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/.

9.2.9 The SuDS Manual incorporates the latest research, industry practice and guidance for design, delivery and maintenance of Sustainable Drainage Systems (SuDS).

9.3 Proposed Scope of Assessment

Methodology

Study Area

9.3.1 The area assessed will include the Proposed Development boundary plus a buffer zone of 2 km around the Site. For hydrological receptors, effects downstream from the Proposed Development will be considered beyond 2 km where required, as effects such as pollution can potentially be transmitted downstream for distances greater than 2 km. Peat surveys will be initially focused within the Proposed Development boundary and then Phase 2 peat surveys will be targeted to areas of proposed infrastructure.

Desk Study

9.3.2 An initial desk study will be undertaken to determine and confirm the baseline characteristics by reviewing publicly available information and opensource data from a range of sources relating to soils, peat, geology, hydrology, and hydrogeology. This information may include:

- DataMapWales, Welsh Government and Natural Resources Wales (NRW):
  - Flood Zone and Development Advice Map data relating to flood risk;
  - Spatial Flood Defence data and mapping;
  - Flood Warning and Flood Alert Areas;
  - Main Rivers;
  - Peatlands of Wales Maps:
  - Historic and active landfill sites;
  - Water Framework Directive (WFD) surface water and groundwater classification data; and
  - Groundwater Source Protection Zones (SPZ).
- British Geological Survey (BGS) GeoIndex mapping:
  - Geology – artificial ground, mining, superficial deposits, bedrock;
  - Borehole data; and
  - Aquifer designation and groundwater vulnerability.
  - Department for Environment, Food and Rural Affairs (DEFRA) MAGIC website:
  - Statutory and non-statutory environmental designations.
- Cranfield Soil and Agrifood Institute Soilscapes map viewer:
  - Soil type and character.

- Powys County Council:
  - Registered private water supply users

9.3.3 The desk study will identify sensitive features which may potentially be affected by the Proposed Development and will confirm the geological, hydrogeological and hydrological environment.

Surveys

9.3.4 A hydrological walkover survey will be undertaken to establish a greater understanding of the hydrological receptors found on site. This facilitates confirmation of information gathered as part of the Desk Study process.

9.3.5 The hydrological assessment specialists will liaise closely with the project ecology and geology / geotechnical specialists to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed.

9.3.6 A detailed site visit and walkover survey will be undertaken to:

- verify the information collected during the desk and baseline study;
- undertake a visual assessment of the main surface waters and identify private water supplies in proximity to the Proposed Development;
- identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;
- visit any identified potential GWDTEs (in consultation with the project ecologists); and
- prepare a schedule of potential watercourse crossings.

9.3.7 Initial Phase 1 low resolution peat surveys will be undertaken on a 100 m grid within the Proposed Development boundary to determine the extents of peat. This information would be used in addition to ecological survey data to inform preliminary design of infrastructure locations to avoid peat where possible.

9.3.8 Further Phase 2 detailed probing would be undertaken on proposed infrastructure locations with peat depth surveying undertaken on 50 m spacings with 10 m offsets either side of the track centreline on linear infrastructure (tracks, cable routes) and 10 m spacings across proposed infrastructure.

9.3.9 Peat condition data would be collected in areas of infrastructure located in areas of peat with the survey data and peat condition data used to inform further assessments as detailed in Section 9.5.

9.3.10 The desk study and field surveys will be used to identify potential development constraints and be used as part of the site design.

Assessment of Likely Significant Effects

9.3.11 There are no published guidelines or criteria for assessing and evaluating effects on hydrology or hydrogeology, geology and soils within the context of an EIA. The proposed assessment will therefore be based on a methodology derived from the Institute of Environmental Management and Assessment (IEMA) guidance.

9.3.12 Professional judgement and a qualitative risk assessment methodology will be used to assess the findings in relation to each of these criteria to give an assessment of significance for each potential impact.

9.3.13 Once the impact significance and likelihood of occurrence have been assessed these will then be combined to determine the likelihood of each potential effect occurring. Effects assessed as minor negative or less would be considered not significant in terms of the EIA regulations. If the assessment results in moderate or major negative effects, then this effect would be considered to be significant.

9.3.14 This approach provides a mechanism for identifying the areas where site specific mitigation measures will be required and for identifying mitigation measures appropriate to the risk presented by the development proposals. This method of assessment also allows effort to be focused on reducing risk where the greatest benefit may result.

Receptor Sensitivity and Impact Magnitude

9.3.15 The approach for determining the significance of effects is a two stage process that involves defining the sensitivity of the receptors and the magnitude of the impacts on those receptors.

9.3.16 The criteria for sensitivity used in this chapter are outlined in Table 9.1 below. For the purposes of the assessment of Geology, Soils, Peat, Hydrology and Hydrogeology effects, the categories within the range of 'high' to 'negligible' are considered to appropriately cover the potential receptors. Where a receptor could be placed within more than one category of value, professional judgement has been applied to determine which category is appropriate.

Table 9.1 Receptor Sensitivity

Value	Description	

High	High importance and rarity, national level and limited potential for substitution	Watercourses, water bodies or geology of national importance. Watercourses or water bodies supporting highly sensitive abstractions. Watercourses or water bodies of good chemical status/ high ecological status and/ or high quality targets under the WFD. Watercourses, water bodies or geology with an environmental designation for ecological/ conservation value, for example SAC, Ramsar. Aspects of the proposed development classified as 'highly vulnerable' to flood risk (under TAN15). Soil type and associated land use is highly sensitive (e.g blanket bog) Floodplains within Flood Risk Assessment Wales Map Flood Zone 3, which are narrow and floodplain where a small increase in volume results in a relatively large increase in flood levels. Public potable water supply from either surface or groundwater source. Aquifer is a Principal Aquifer providing regionally important potable water supply and classified as SPZ.
Medium	Medium importance and rarity, district or regional level, limited potential for substitution	Watercourses, water bodies or geology of district or regional importance. Watercourses or water bodies supporting moderately sensitive abstractions. Watercourses or water bodies of good chemical status/ moderate to good ecological status and/ or moderate to high quality targets under the WFD. Soil type and associated land use is of medium sensitivity (e.g arable, commercial forestry). Floodplains within Flood Risk Assessment Wales Map Flood Zone 2 with limited constraints to the watercourse. Private Water Supply (PWS) from a watercourse or water body for potable use or non-drinking water abstraction for agricultural use from either surface or groundwater source. Aquifer is a Principal Aquifer not designated as SPZ.
Low	Low importance and rarity, local or district level	Watercourses, water bodies or geology of local importance. Watercourses or water bodies supporting abstractions of limited sensitivity. Watercourses or water bodies with a chemical water quality status classed as 'fail' or an ecological water quality status classed as 'poor' and/ or moderate quality targets under the WFD. Soil type and associated land use is not sensitive to change (e.g intensive grazing of sheep and cattle). Receptors classified as 'less vulnerable' to flood risk (under TAN15).

		Floodplains within Flood Risk Assessment Wales Map Flood Zone 1 or 2, where any floodplain is wide and a large increase in volume results in a small increase in flood levels. Aquifer is a Secondary A or Secondary B Aquifer.
Negligible	Very low importance and rarity, local level	Watercourses, water bodies or geology of limited local importance. Watercourses or water bodies supporting no recorded abstractions. Watercourses or water bodies with a chemical water quality status classed as 'fail' and an ecological water quality status classed as 'poor', and/ or low quality targets under the WFD. Non-productive geology in terms of groundwater resource.

9.3.17 The criteria for magnitude of impact used in this chapter are outlined in Table 9.2 below.

Table 9.2 Impact Magnitude Definitions

Magnitude	Definition
High	Long term or permanent loss of resource and/or quality and integrity of resource/ attribute; likely to cause exceedance of statutory objectives and/or breaches of legislation; severe damage to key characteristics, features or elements (Adverse)
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major long-term improvement of attribute quality (Beneficial).
	Changes to land resulting in an increase in runoff with flood potential and also significant changes to erosion and sedimentation patterns.
	Major changes to groundwater levels, flow regime and risk of groundwater flooding.
	Permanent degradation and total loss of soils including peat and geology.
Medium	Loss of resource / attribute, but not adversely affecting the overall integrity; partial loss of/damage to key characteristics, features or elements with/without exceedance of statutory objectives or with/without breaches of legislation (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
	Moderate changes to erosion and sedimentation patterns.
	Moderate changes to groundwater levels, flow regime and risk of groundwater flooding.
	Loss of extensive areas of soils and peat habitat, damage to important geological structures/features
Low	Some measurable change in attributes, quality or vulnerability; reversible or minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
	Minor changes to erosion and sedimentation patterns.

	Minor changes to groundwater levels, flow regime and risk of groundwater flooding.
	Minor or slight loss of soils and peat or slight damage to geological structures/ feature.
Negligible	Very minor or no loss or detrimental alteration to one or more characteristics, features or elements; impact of insufficient magnitude to affect the use/integrity of attribute (Adverse).
	Very minor or no benefit to or positive addition of one or more characteristics, features or elements; impact of insufficient magnitude to affect the use/integrity (Beneficial).
	No alteration or very minor changes with no impact to watercourses, hydrology, hydrodynamics, erosion and sedimentation patterns.
	No impact or alteration to existing important soils (inc peat), geological environs.

9.3.18 The likelihood of an effect occurring also needs to be considered in any assessment and is evaluated to three levels: unlikely, possible, or likely. The determination of likelihood is based on professional judgement and past experience of similar developments.

Significance of Effect

9.3.19 The significance of the effect upon Geology, Hydrology and Hydrogeology is determined by correlating the potential magnitude of the impact, sensitivity of the receptor and likelihood, as defined in the matrix presented at Table 9.3. Where a range of significance is presented in Table 9.3, the final assessment for each effect is based upon expert judgement. Effects assessed as major or moderate are deemed to be significant in EIA terms; those assessed as minor or negligible are deemed to be not significant.

Table 9.3 Effect Significance

Sensitivity	Magnitude	Likelihood	Significance
High	High	Likely	Major
		Possible	Major
		Unlikely	Moderate
	Medium	Likely	Major
		Possible	Moderate
		Unlikely	Moderate
	Low	Likely	Moderate
		Possible	Minor
		Unlikely	Minor
	Negligible	Likely	Minor
		Possible	Negligible
		Unlikely	Negligible

Medium	High	Likely	Major
		Possible	Major
		Unlikely	Moderate
	Medium	Likely	Moderate
		Possible	Moderate
		Unlikely	Minor
	Low	Likely	Minor
		Possible	Minor
		Unlikely	Minor
	Negligible	Likely	Minor
		Possible	Negligible
		Unlikely	Negligible
Low	High	Likely	Major
		Possible	Moderate
		Unlikely	Minor
	Medium	Likely	Moderate
		Possible	Minor
		Unlikely	Minor
	Low	Likely	Minor
		Possible	Minor
		Unlikely	Negligible
	Negligible	Likely	Negligible
		Possible	Negligible
		Unlikely	Negligible
Negligible	High	Likely	Moderate
		Possible	Minor
		Unlikely	Minor
	Medium	Likely	Minor
		Possible	Minor
		Unlikely	Minor
	Low	Likely	Minor
		Possible	Negligible
		Unlikely	Negligible
	Negligible	Likely	Negligible
		Possible	Negligible
		Unlikely	Negligible

Scoping of Potential Effects

9.3.20 A summary of the potential effects on geology and the water environment resulting from development of a wind farm is provided below.

Potential Effects During Construction

9.3.21 Without mitigation, effects can arise from the following activities taking place during construction:

- Excavations for tracks, turbines, hardstandings, borrow pits, substation, cable trenches and drainage;
- Sediment management including handling and storage of excavated materials;
- Surface water and drainage management including use, location and sizing of sustainable drainage infrastructure;
- Storage and handling of polluting materials including fuel, oils, preparation and use of concrete, and wastewater from welfare facilities.
- Disturbance and loss of soils and peat during soil stripping, compaction storage and re-instatement; and
- Ground instability (inc. peat slide risk).

9.3.22 The following receptors could potentially be affected:

- Receiving waters (surface water or groundwater);
- Water resources (public and private water supplies);
- Water dependent habitat;
- Land downstream of the Proposed Development (changes to hydrology/ flood risk); and
- Proposed Development infrastructure.

Potential Effects During Operation

9.3.23 Without mitigation, effects can arise from the following activities taking place during operation:

- Runoff and sediment management from unsealed hardstandings and bare ground;
- General site maintenance, including maintenance of drainage infrastructure;
- Temporary changes in natural surface water drainage patterns (effecting water contribution to areas of peat and GWDTE); and
- Storage and handling of polluting materials including fuel, oils, lubricants and wastewater from welfare facilities.

9.3.24 The following receptors could potentially be affected:

- Receiving waters (surface water or groundwater);
- Water resources (public and private water supplies);
- Water dependent habitat; and
- Land downstream of the Proposed Development (changes to hydrology/ flood risk).

Potential Effects During Decommissioning

9.3.25 Without mitigation, effects can arise from the following activities taking place during decommissioning:

- Removal of tracks, turbine foundations, hardstandings, substation and cables;
- Sediment management including handling and storage of excavated materials;
- Removal and reinstatement of surface water drainage infrastructure;
- Storage and handling of polluting materials including fuel, oils, lubricants and wastewater from welfare facilities.

9.3.26 The following receptors could potentially be affected:

- Receiving waters (surface water or groundwater);
- Water resources (public and private water supplies);
- Water dependent habitat; and
- Land downstream of the Proposed Development (changes to hydrology/ flood risk).

Consultation

9.3.27 Consultation and data requests will be conducted with the following key statutory consultees and stakeholders:

- Natural Resources Wales (NRW);
- The Soil Policy Unit of the Welsh Governments Department of Climate Change and Land Quality Advice Service (LQAS);
- Powys County Council; and
- Local landowners and residents.

Potential Effects

9.3.28 A range of potential impacts on geology and the water environment have been identified which may occur during the construction, operation and decommissioning phases. The impacts that have been scoped into the assessment are outlined in Table 9.4, together with a description of any

proposed additional data collection (e.g. site-specific surveys) and/or supporting analyses to enable an assessment of the effect.

9.3.29 Based on the baseline information currently available and the project description, a number of potential impacts have been identified to be scoped out of the assessment. These are detailed in Table 9.5.

Table 9.4 Potential Effects to be Scoped In

Potential Effect	Phase	Description
Generation of turbid runoff which could enter the water environment.	Construction, Operation and Decommissioning	Site activities will include clearance of surface vegetation and topsoil; stockpiling of removed materials; excavations; management of spoil arisings; dewatering of excavations; and reinstatement of land following works.
Changes to surface water runoff patterns which could affect flood risk.	Construction, and Decommissioning	The following activities have the potential to affect flood risk: • Removal of surface vegetation; • Compacting of soils through vehicle movement; • Development of temporary compounds; • Excavations; and • Dewatering of excavations.
Accidental spillages and leakages of oils, fuel and other polluting substances which could potentially enter the water environment.	Construction, Operation and Decommissioning	Potentially polluting materials and wastewater will be present and in use within the site through all stages of work. Appropriate consideration is required to inform their storage, handling and disposal at all stages.
Pollution to groundwater or change to groundwater regime.	Construction, and Decommissioning	Any deep excavation works have the potential for impacting groundwater resources and creating a pathway for pollutants or altering shallow groundwater flow regimes. Linear excavations such as tracks and cable trenches can provide preferential flow paths for groundwater. These require appropriate consideration in design and assessment.
Disturbance and loss of soils and peat	Construction	Phase 1 survey data indicates areas of peat and peaty soils present within the Proposed Development. Disturbance of peat through excavation, transport and temporary storage and re-instatement. Appropriate consideration of all construction activities within or in close proximity to areas of peat and peaty soils to ensure protection and mitigate against disturbance and loss.
Ground instability – Peat Slide Risk	Construction, Operation and Decommissioning	Phase 1 survey data indicates areas of peat and peaty soils present within the Proposed Development. Disturbance of peat through excavation, transport and temporary storage and re-instatement may lead to potential instability and further assessment may be required to confirm peat stability risks.

Table 9.5 Effects to be Scoped Out

Potential Effect	Phase	Description
Physical changes to surface water hydrology.	Operation	Once constructed, no additional changes are anticipated to be introduced.
Contamination of water supply to vulnerable receptors	Operation	Once constructed, no additional changes are anticipated to be introduced.
Modification to groundwater flow regimes	Operation	Once constructed, no additional changes are anticipated to be introduced.
Disturbance and loss of soils and peat	Operation and Decommissioning	Once constructed, no additional changes are anticipated to be introduced.

9.4 Baseline Conditions

Baseline Information

Geology, Soils and Peat

9.4.1 The majority of the Site is underlain by bedrock of the Glanyrafon Formation (mudstone and sandstone, interbedded). The Pysgotwr Grits Formation (sandstone and mudstone) is present across the western extent of the Site, and small areas are noted to the southeast of the Site. The Rhuddnant Grits Formation (sandstone and mudstone) underlies the southwest of the Site, with further small areas noted to the north and east of the Site. The northeastern extent of the Site is underlain by Caerau Mudstones Formation (mudstone).

9.4.2 The main two superficial deposits present across the Site are peat, which is limited to the western area of the Site, and glacial till, which is present across a large proportion of the Site. Small areas of alluvium are also noted across the Site. There are also large areas across the Site where no superficial deposits are present.

9.4.3 Soilscape mapping indicates the Site to be underlain by three main types of soils. Blanket bog peat soils are present to the west of the Site, along with areas of freely draining acid loamy soils over rock. The eastern area of the Site is underlain by very acid loamy upland soils with a wet peaty surface.

9.4.4 Review of the Peatlands of Wales mapping for evidence of Peatland at the Proposed Development indicates areas in the central and western areas of the Proposed Development with a level of confidence of 1, indicating that there is existing data which may indicate potential peat within the Proposed

Development but at the lowest level of confidence. A peatland evidence score defines the level of confidence in the presence of peat in any given grid cell, with those cells scoring more than 2 on this scale of 1-10, captured in the 'Peatlands of Wales' peat distribution map. Review of the Peatlands of Wales mapping indicates that there are very localised mapped peat deposits within the central and western area of Proposed Development and these areas may have peat up to 40 cm in thickness.

9.4.5 Phase 1 peat surveys have been undertaken within the Proposed Development boundary and have confirmed the presence of peat and peaty soils on-site and are provided in Figure 9.1. At this stage it has been assumed the use of the definition of peat soils as >0.3m, based on the definition used for the Peatlands of Wales Welsh Government mapping. At this initial low-resolution survey stage this is considered appropriate.

9.4.6 Based on the results of the initial low resolution survey data collected to date, peat soils are typically absent on steeper slopes and ridges across the Proposed Development and are typically present within areas of gentle slope and localised topographic depressions. Peat soils are typically absent from the hilltops and ridges in the central areas of the Proposed Development at Esgair Ymryson and in the east at Esgair Graig, Nant-yr hendy Hill, and the two tops around Esgair Dernol and to the west of Clochfaen.

9.4.7 Peat soils are more prevalent towards the western extent of the Proposed Development, being found on areas of gentle slope and topographic depressions. Peat deposits are also present in the northern extent of the Proposed Development within Nant y Maes and in topographic lows within the central area of the Proposed Development. More extensive areas of Peat with depths over 3 m were recorded at the westerly flanks of Glan Fedwen, on the southern flank of Esgair Ganol and around Botalog in the west of the Proposed Development.

9.4.8 No areas of mineral extraction are identified, and there are no records of active mining or quarrying within the Site. However, there are five historical records of mines and quarries, within the northeastern area of the Site, which are now ceased.

Hydrogeology

9.4.9 The majority of bedrock underlying the Site is designated as a Secondary A aquifer, described as comprising of *"permeable layers that can support local water supplies, and may form an important source of base flow to rivers"*. A small section of the bedrock to the north and east of the Site is designated as a Secondary B aquifer, described as *"mainly lower*

permeability layers which may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings of eroded layers".

9.4.10 The peat deposits underlying the Site are designated as an Unproductive Aquifer. The till superficial deposits present across the Site are designated as a Secondary (Undifferentiated) aquifer, which are defined as *"aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These only have minor value"*. The small areas of alluvium across the Site are designated as a Secondary A aquifer.

9.4.11 There are no Source Protection Zones (SPZs) on or in proximity to the Site.

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

9.4.12 Groundwater-dependent terrestrial ecosystems (GWDTE) are areas of wetland or marshy ground that are dependent on groundwater to maintain their function as a wetland or marsh area.

Designated Sites

9.4.13 There are ten designated sites within 2 km of the Site. Six of the sites are designated as Sites of Special Scientific Interest (SSSI), two sites designated as Special Areas of Conservation (SAC) and one site designated as a Special Area of Protection (SPA). The sites and distance from the Proposed Development are:

- Caeau Clochfaen-Isaf (Clochfaen-isaf Fields) SSSI – within Site boundary
- River Wye (Upper Wye) / Afon Gwy (Gwy Uchaf) SSSI – within Site boundary
- River Wye / Agon Gwy SAC – within Site boundary
- Gweunydd Nant y Dernol SSSI – 0.5 km
- Rhagnentydd Gwy Uchaf / Upper Wye Tributaries SSSI – 0.15 km
- Elenydd SSSI – 0 km
- Elenydd SAC – 0 km
- Marcheini Uplands, Gilfach Farm & Gamallt – 1 km
- Gwaun Llwyn-gwyn SSSI – 0 km
- Elenydd – Mallaen SPA – 0 km

Hydrology

9.4.14 The Site lies within two WFD Management Catchments; the Wye Management Catchment covers the central and eastern part of the Site, and the Teifi and Ceredigion North Management Catchment covers the western part of the Site.

9.4.15 On a smaller scale, the Site is located within four WFD River Waterbody Catchments:

- Wye (confluence Afon Bidno to confluence Afon Marteg) – overall status Moderate
- Wye (confluence Afon Tarenig to confluence Afon Bidno) – overall status Moderate
- Afon Elan (source to Pont ar Ela) – overall status Poor
- Ystwyth (headwaters to the confluence with the Nant Cell) – overall status Moderate

Private Water Supplies

9.4.16 A data request will be issued to Powys County Council to determine the presence of any PWS within 2 km of the application boundary. A PWS risk screening would be undertaken to determine if any of the identified supply sources would be at risk from development in this area and further site-specific assessment undertaken if any PWS are identified as potentially at risk from the Proposed Development.

Water Resources

9.4.17 The central and eastern part of the Site is located within the Wye Uplands Lower Palaeozoic Groundwater Drinking Water Protection Area (DWPA), and the western part of the Site is located within the North Ceredigion Rheidol Area Groundwater DWPA. Both of these Groundwater DWPAs have a status of 'not at risk'.

9.4.18 There are no lake or river catchment DWPAs that have hydrological connectivity to the Site.

Flood Risk

9.4.19 Flood risk is indicated to be medium to high for rivers within the Site. Areas of flood risk are mainly confined to main watercourse channels. For most of the Site, flood risk from rivers is negligible.

9.4.20 Flood risk for surface water and small watercourses is indicated to be low to high within the Site. Areas of flood risk are mainly confined to the small watercourse channels, with some isolated flood risk areas extending outside of the small watercourse channels.

9.4.21 The Site is not at risk of flooding from the sea.

9.4.22 A separate Flood Consequence Assessment (FCA) report would be prepared as an appendix to the ES chapter.

9.5 Potential Mitigation

9.5.1 Without mitigation, impacts on geology, soils and peat, hydrology and hydrogeology could occur during the life of the Proposed Development. A summary of the potential mitigation measures to manage effects on ground conditions and the water environment are provided below.

Construction

9.5.2 Many construction effects are managed through good development design. This process will use design to avoid sensitive receptors as far as is practicable, including:

- Appropriate standoff buffer for proposed development from all water features;
- Minimisation of watercourse crossings;
- Appropriate design of watercourse crossing structures;
- Avoidance of sensitive groundwater dependent habitats and wetlands;
- Design of sustainable drainage to mimic natural drainage patterns as far as possible;
- Location of construction compounds with appropriate standoff buffer from all water features;
- Management of suspended sediment using temporary measures during construction;
- Careful storage and handling of polluting materials including chemicals and wastewater at all stages;
- Appropriate monitoring of surface water and groundwater at all development stages;
- Careful reinstatement of temporary construction areas following completion of construction works and reinstatement of track and hardstanding margins.
- Adoption of the Step Wise approach to ensure avoidance by design is the primary mitigation for peat. The design evolution will adopt this approach and utilise the peat survey and condition data to avoid and minimise disturbance to peat with appropriate protection of soils and peat during the construction phase detailed in a Soil and Peat Management Plan within the ES and re-use of peat and peat soils within Peatland Restoration if appropriate restoration sites are identified; and
- If the Proposed Development infrastructure layout requires an assessment of peat stability this assessment will be undertaken to

ensure potential stability risks and impacts to peat and other receptors are mitigated;

9.5.3 Implementation of good design can help to avoid potential significant effects relating to geological, soils, peat, hydrogeological and hydrological receptors.

9.5.4 Additional mitigation or good practice measures are likely to be identified during the assessment process.

Operation

9.5.5 Once construction is completed, no further specific mitigation measures are anticipated for the operational phase of the Proposed Development.

Decommissioning

9.5.6 The decommissioning phase will involve the removal of above ground wind farm infrastructure and may include the reinstatement of access tracks. Potential effects from these activities will be similar to the construction phase due to the presence of heavy machinery on site, however there will only be limited, if any, excavation or earthwork activity which will limit the potential for impact.

9.5.7 Potential mitigation measures would be similar to those identified for the construction phase of the development.

9.6 Questions

- Are there any other key stakeholders or stakeholder organisations that should be consulted?
- Are there any additional data sources or guidance documents that should be considered?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree that the impacts described in Table 9.5 can be scoped out?
- For those impacts scoped in (Table 9.4), do you agree that the methods described are sufficient to inform a robust impact assessment?

10 Acoustic

10.1 Introduction

10.1.1 An assessment of potential effects of the Proposed Development with respect to sound and vibration will be undertaken. This will include a full assessment of operational phase (permanent) effects and a discussion of potential construction and decommissioning effects (temporary). An assessment or overview of potential cumulative operational and construction effects will also be provided where required.

10.2 Legislation, Policy and Guidance

10.2.1 Operational sound shall be assessed in accordance with ETSU-R-97, 'The Assessment and Rating of Noise from Wind Farms', and the Good Practice Guide (GPG) to its application issued by the Institute of Acoustics in 2013.

10.2.2 A discussion of the temporary potential effects resulting from the construction and decommissioning of the proposals, in terms of any potential sound and vibration generated, will be provided with reference to BS 5228 Parts 1 & 2.

10.2.3 These documents are consistent with that referenced within current planning policy for Wales (i.e. Planning Policy Wales and Technical Advice Note 11: Noise).

10.3 Proposed Scope of Assessment

10.3.1 The operational assessment will follow the guidance contained within ETSU-R-97 and the GPG, as discussed above and as referenced by current planning policy in Wales. This will involve the undertaking of background sound surveys at up to six residential locations surrounding the Proposed Development, the correlation of any collected data with the corresponding wind speed found at the site and may also make reference to background/baseline sound information collected in support of previous wind farm planning applications in the area (see the **Baseline Conditions** section). Analysis of the collected data and extraction of any other relevant baseline information will inform applicable sound limits at neighbouring residences. These will be compared with expected sound levels associated with the operation of the Proposed Development and the

overall cumulative sound levels associated with all relevant other potential development in the area (see the **Cumulative** section).

10.3.2 An assessment of the potential effects of sound from the operation of the wind farm(s) at specific frequencies, e.g. low frequency sound, or the potential effects of other sound and vibration characteristics due to operation, such as amplitude modulation and vibration will not be undertaken as these aspects are not required to be assessed under current planning guidelines either due to their very limited expected impacts or ongoing and incomplete research into certain matters. However, a generalised discussion of these topics, in relation to current guidance and research will be provided.

10.3.3 The construction of turbines, ancillary electrical equipment, compounds and the corresponding access tracks typically occurs at very large distances from neighbouring residences. The resultant sound and vibration, which would be temporary in nature, is only very rarely cause for concern in terms of the potential for disturbing the inhabitants of neighbouring residences. Whilst the sound and occasional vibration associated with these aspects may well be audible to people residing in the area, the levels would be below established noise limits and planning requirements in this respect. Nevertheless, typical mitigation measures, including the use of 'best practicable means' will be incorporated into the construction practices for the Proposed Development, with a view to reducing noise levels where possible and practical. As a result, sound and vibration associated with construction will only be discussed in generalised terms with reference to standard noise limiting requirements; typical working practices; hours of work, and standard mitigation measures in this respect. A detailed assessment will not be undertaken and a similar rationale can be applied for noise and vibration impacts associated with decommissioning of the Proposed Development.

10.4 Baseline Conditions

10.4.1 The existing character of sound at properties neighbouring the proposals is typical of a rural environment and consists of wind generated sound, along with water running through local streams, sound from traffic, farm machinery, birds, sound from existing turbine development and the occasional overhead aircraft.

10.4.2 Measurements of the existing background sound levels will be undertaken at a selection of up to six residences located closest to the Proposed

Development and the specific locations will be agreed with the representatives of Powys County Council (PCC). Care will be taken to avoid any potential influence from the sound of existing turbines in the area, in accordance with the requirements of ETSU-R-97, which states that existing background sound levels should not be affected by the presence of existing wind farm developments.

10.4.3 Several background sound surveys have been undertaken in support of the planning applications for existing operational wind farms in the area, the latest of which are in accordance with ETSU-R-97 and the GPG discussed above and agreed with relevant consultees at the time. There's no indication that the background noise environment would have changed significantly since the measurements were made and the corresponding results may be referenced where considered appropriate and/or necessary.

10.5 Potential Mitigation

10.5.1 The potential effects of sound, due to operation of the wind farm, will be considered as part of the design process via the application of nominal buffers to neighbouring residences within which turbines will not be placed. The collected baseline/background sound levels will also inform the design of the site, with greater separation distances potentially being required for residences with relatively low background sound levels and similar corresponding acoustic limits. Furthermore, the turbines will be operated in reduced sound modes, if this is necessary to meet the sound limits derived in accordance with ETSU-R-97.

10.5.2 Standard good practice measures to reduce acoustic impact during construction and decommissioning of the site will be implemented in line with the 'best practicable means' defined by the Control of Pollution Act 1974. If additional mitigation measures are required, this will include a reduction in construction activities or traffic during certain periods, the use of less impactful equipment and restriction of construction timings, where considered appropriate.

10.6 Cumulative

10.6.1 An assessment of the operational sound levels associated with the combined impact of the Proposed Development with the existing neighbouring operational Cefn Croes, Bryn Titli and Bryn Blaen wind farm developments will be provided. Two other potential sites known as

Rhiwlas Energy Park and Banc Du Energy Park, which are currently at the scoping stage, may also be included as part of the cumulative assessment depending on their planning status at the time the application for the Proposed Development is submitted. The assessment will also provide suggested planning controls to ensure that, as far as possible, the overall requirements of ETSU-R-97 would be met in practice should the site and other additional schemes become operational. This aspect will be kept under review throughout the design and planning process to ensure the most up-to-date and relevant information is incorporated into the assessment.

10.6.2 Sound and vibration due to the construction and decommissioning of other neighbouring development is unlikely to be present at the same time as that resulting from the Proposed Development. However, if construction and decommissioning activities are undertaken concurrently this would generally amount to an increase in the frequency of traffic (including HGVs) entering the various sites and passing local residences as a result; and, a slight increase in the overall construction noise levels when building out the infrastructure at each of the sites. A detailed assessment will not be undertaken on the basis that all normal controls and best practice is followed in terms of construction techniques and that typical limiting requirements would be met as a result.

10.7 Questions

- Do the consultees agree with the proposed approach to background noise monitoring and the potential use of existing background noise information where necessary and appropriate?
- Do the consultees agree with the proposed assessment methodology?

11 Traffic and Transport

11.1 Introduction

11.1.1 The Traffic and Transport chapter of the EIA will be prepared with reference to the Institute of Environmental Assessment (IEMA) Guidelines '*Environmental Assessment of Traffic and Movement*' (2023) as appropriate.

11.1.2 This section of the Scoping Report sets out the proposed methodology for the assessment of the Proposed Development against transportation matters. In particular, the methodology would consider the potential effects of the Proposed Development on the local and strategic highway network during the construction and operational phases.

11.2 Legislation, Policy and Guidance

11.2.1 The transport effects of the Proposed Development will be considered with reference to local and national policy and guidance contained in the following documents as appropriate:

- Planning Policy Wales document (PPW, 2024).
- 'Future Wales: the national plan 2040' (2021).
- The Overarching National Policy Statement for Energy (EN-1 chapter 15.14 *'Traffic and Transport'*, 2024).
- National Policy Statement for Renewable Energy Infrastructure (EN-3, chapter 2.10 'Solar Photovoltaic Generation', 2023).
- IEMA Guidelines for the Environmental Assessment of Traffic and Movement (2023).
- The Design Manual for Roads and Bridges (DMRB).
- 'Llywybr Newydd: the Wales transport strategy' (2021).
- Technical advice note (TAN) 18: 'Transport', Planning Policy Wales (2007).
- The Powys Local Development Plan (2011-2026), Powys County Council (2018); and
- The Powys Replacement Local Development (2022-2037) 'Integrated Planning and Transport Strategy Background Paper', Powys County Council (2023).

11.2.2 The strategic Traffic Management Plan (sTMP) prepared by RenewableUK Cymru and approved by Welsh Government, which was published in 2021 to provide a strategy for and address the cumulative effects of wind farm development in Mid Wales, will also be referred to within the ES chapter as appropriate.

11.3 Proposed Scope of Assessment

Study Area

11.3.1 The assessment will provide detailed consideration of each of the links to be used by traffic during the construction, operational and decommissioning phases between the Site and the trunk road network.

11.3.2 It is noted that there are 17 Public Rights of Way (PRoW) routes which cross or abut the Site (see **Figure 11.1: Public Rights of Way**). A section of The Wye Valley Trail between Llangurig and Rhayader also routes through the eastern portion of the site.

11.3.3 The National Cycle Network Route 81 briefly routes through the northeastern corner of the site before routing south along the site's eastern boundary and then west along the site's southwestern boundary.

Methodology

11.3.4 The Traffic and Transport chapter would provide an assessment of the predicted effects on the local highway network by using pre-defined significance criteria set out within the IEMA Guidelines. Those criteria will be based on the net change in journeys as a result of construction and operational traffic values and any mitigation to be delivered as part of the proposals.

11.3.5 IEMA rules will be applied to define the threshold effects of development traffic which will inform the scale and extent of the Traffic and Transport chapter work. On this basis, links where the traffic flows are expected to increase by more than 30 % as a result of the Proposed Development will be considered. On links in proximity to sensitive receptors, traffic flow increases of 10 % or more as a result of the Proposed Development will be considered.

11.3.6 Where the predicted increase in traffic and HGV flow is lower than these thresholds, the significance of the effects can be considered to be low or not significant and it is considered that detailed assessment is not required.

11.3.7 A future year of 2029 is proposed for the consideration of temporary construction traffic on the basis that this will represent the period of peak construction.

11.3.8 A future year of 2031 is proposed for the consideration of operational traffic, on the basis that all construction activities at the site will be complete following the conclusion of the 28-month construction period. TEMPro growth rates will be determined through dialogue with Powys County Council (PCC) in due course.

11.4 Assessment of Likely Significant Effect

11.4.1 Assessment of effects is undertaken by assigning a sensitivity to receptors, and magnitude and likelihood criteria to the identified effects. These are then combined using a matrix to assign a level of significance.

11.4.2 The significance criteria would establish the magnitude of any beneficial or adverse effects the Proposed Development will have on the transport network. There are four levels of impact magnitude that will be considered which are negligible, low, medium, and high.

11.4.3 Definitions of magnitude have been derived based on the IEMA guidelines and are shown in Table 11.1.

Table 11.1 – Criteria for Magnitude of Impact

Impact	**Magnitude of Impact / Threshold**			
	Negligible	**Low**	**Medium**	**High**
Traffic Flow	Change in peak or 24 hr traffic within study area by less than 5%	Change in peak or 24 hr traffic within study area between 5% and 15%	Change in peak or 24 hr traffic within study area between 15% and 30%	Change in peak or 24 hr traffic within study area by 30% or more
Accidents and Safety	Number of predicted personal injury collisions (PICs) does not exceed the number of observed PICs.		The number of observed PICs will be compared against the predicted number of PICs that could be expected over the time period of the observed data (e.g., 3 years) in accordance with the COBA Manual (DMRB Volume 13, Section 1, Chapter 4). The calculations will be based on variables including: observed AADT traffic flow, road speed, length of road section and type of road. This analysis will be interpreted with professional judgement and used to	

Impact	Magnitude of Impact / Threshold			
	Negligible	Low	Medium	High
			inform and determine the impact on Accidents and Safety.	
Severance	Change in peak or 24 hr traffic within study area by less than 30%	Change in peak or 24 hr traffic within study area of 30%-60%	Change in peak or 24 hr traffic within study area of 60% - 90%	Change in peak or 24 hr traffic within study area by 90% or more
Non-motorised user Delay	The guidance recommends that professional judgement is used to determine the impact on Pedestrian Delay, considering local factors such as pedestrian activity, visibility, and the physical conditions of the site.			
Driver and Passenger Delay	Change in peak or 24 hr traffic within study area by less than 5%	Change in peak or 24 hr traffic within study area between 5% and 15%	Change in peak or 24 hr traffic within study area between 15% and 30%	Change in peak or 24 hr traffic within study area by 30% or more
Non-motorised user Amenity	Pedestrian Amenity is impacted by traffic flow, composition and width of pavement and is related to fear and intimidation thresholds. As suggested by national guidance a threshold of where traffic or HGV flows have halved or doubled will be used to indicate whether there is a significant effect.			
Fear / Intimidation	No change.	One step change in level, with <400 vehicle increase in average 18hr two-way vehicle flow and/or <500 Heavy Vehicle increase in total 18hr flow	One step change in level, with >400 vehicle increase in average 18hr two-way vehicle flow and/or >500 Heavy Vehicle increase in total 18hr flow	Two step changes in level

11.4.4 The impact magnitudes can have either a beneficial or adverse impact.

Receptor Sensitivity

11.4.5 Sensitive receptors will be identified using the principles set out in the IEMA guidelines (paragraph 1.30) for the categories of effect assessed in this chapter. Any sensitive receptors will be agreed with the Highway Authority in due course.

11.4.6 The criteria proposed for assessing the sensitivity of a receptor are set out in Table 11.2.

Table 11.2 – Criteria for Sensitivity of Receptor

Receptor Sensitivity	Receptor Type
High	Receptors of greatest sensitivity to traffic flows, such as schools, playgrounds, accident blackspots, retirement homes, areas with no footways with high pedestrian footfall.
Medium	Traffic flow sensitive receptors, such as congested junctions, hospitals, shopping areas with active frontages, narrow footways, parks, and recreational areas.
Low	Receptors with some sensitivity to traffic flow, such as conservation areas, listed buildings, tourist attractions, and residential areas.
Negligible	Receptors with low sensitivity to traffic flows, and those distant from affected roads.

Significance of Effect

11.4.7 The Significance of Effect will be determined by combining the predicted magnitude of impact with the assigned sensitivity of the receptor. The Significance of Effect is set out in Table 11.3.

11.4.8 The significance thresholds can be categorised as beneficial (positive, i.e., reduction in traffic flows), negligible (no real impact) or adverse (negative i.e., increase in traffic flows). For the purpose of this chapter, major and moderate significance of effects are considered 'significant', as indicated by the shading in the table below.

Table 11.3 – Significance Matrix

Magnitude of Change	Sensitivity of Receptor				
		High	**Medium**	**Low**	**Negligible**
	High	**Major**	**Major**	**Moderate**	**Negligible**
	Medium	**Major**	**Moderate**	**Minor to Moderate**	**Negligible**
	Low	**Moderate**	**Minor to Moderate**	**Minor**	**Negligible**
	Negligible	**Negligible**	**Negligible**	**Negligible**	**Negligible**

11.4.9 Significance thresholds can also be categorised as temporary or permanent and can have an effect for the short, medium, or long term. The relevant definitions in terms of the longevity of the effect are set out below:

- A short-term effect – an effect that will be experienced for 0-5 years.
- A medium-term effect – an effect that will be experienced for 5-15 years; and
- A long-term effect – an effect that will be experienced for 15 years onwards.

Scoping Criteria

11.4.10 In summary and with reference to the IEMA Guidelines, the Traffic and Transport chapter of the ES will consider the forecast effects of the Proposed Development on the following throughout both the construction, operational, and decommissioning phases of the scheme:

- Severance
- Driver Delay
- Road safety; and
- Hazardous loads/ large loads.

11.4.11 Given that there are anticipated to be limited pedestrian movements affected by construction activities within the vicinity of the site, it is not considered necessary to consider the effects of the Proposed Development on the following, and these are therefore proposed to be scoped out of the assessment:

- Pedestrian delay.
- Non-motorised user amenity; and
- Fear / intimidation.

11.4.12 It is considered that in the context of the application, the impact and effects of hazardous / large loads will receive the most focus within the ES chapter. With reference to the RenewableUK Cymru sTMP (2012), the ES chapter will include a review of the appropriate abnormal indivisible load (AIL) route and carry out swept path analysis on the network as appropriate.

Consultation

11.4.13 Liaison with the appropriate highway authorities, including PCC and Traffic Wales, will take place in due course.

11.5 Baseline Conditions

Site Description and Context

11.5.1 The nearest classified road to the site is the A470 located to the east, which connects between the towns of Rhayader to the south and Llanidloes to the north. This forms part of the North and Mid Wales Trunk Road Agent (NMWTRA) strategic road network and facilitates access to other sections of the strategic road network including the A483 and the A489, both of which form part of the approved construction traffic route as outlined in the RenewableUK sTMP. There are also a number of unclassified rural lanes and private access tracks serving existing farm and forestry land within the site boundary.

Baseline Survey Information

11.5.2 The baseline conditions along the proposed construction route will be reviewed with reference to recorded traffic data and the RenewableUK sTMP document.

11.5.3 At this stage, it is proposed that Annual Average Daily Traffic (AADT) will be assessed on the roads between the site and the trunk road network. A combination of Department for Transport (DfT) traffic counts and Automatic Traffic Count (ATC) surveys will be used to provide baseline flows at each link. The proposed link locations will be determined as the scheme progresses and the access strategy for each of the proposed turbines is established, in consultation with the highway authority as appropriate.

11.6 Potential Mitigation

11.6.1 With regards to the completed and operational Proposed Development, many mitigation measures are embedded into the design of the scheme. If likely significant effects are determined even with such embedded mitigation, where possible, mitigation measures will be proposed so that residual effects are not significant.

11.6.2 The majority of the measures that are likely to be proposed if required will be reflective of the strategy established in the RenewableUK Cymru sTMP (2012) document, such as controls relating to delivery timings and the size of delivery convoys to the site. Further controls and mitigation measures such as off-site works will be considered as the scheme progresses and included within the ES Chapter.

11.6.3 The proposals will also be supported by a Transport Statement (TS) and Outline Traffic Management Plan (OTMP). The TS will summarise the proposed access points and traffic movements expected once the site is operational. The OTMP will summarise the traffic movements anticipated throughout the construction period of the Scheme and the associated mitigation measures to be agreed with the highway authority. A scope for the TS and OTMP will be agreed with the highway authority in due course.

11.7 Questions

- Do you agree with the proposed study area?
- Do you agree with the proposed assessment methodology?
- Do you agree that the RenewableUK Cymru strategic Transport Management Plan for Mid Wales Wind Farms (2012) remains an appropriate reference for the preferred traffic and transport approach to wind farm development at the site?
- Do you agree with the effects that are proposed to be scoped in and out of the EIA?

12 Socio-economic

12.1 Introduction

12.1.1 This chapter of the ES will provide an assessment of the likely significant socio-economic effects generated by the Proposed Development. This will include the identification and assessment of likely effects during the construction phase, during the operational phase, and the decommissioning phase. It will also consider cumulative effects.

12.2 Legislation, Policy and Guidance

12.2.1 A review of national and local policy will be undertaken. This will include the following:

12.2.2 Planning Policy Wales[42] (PPW) published in February 2024, sets out the land use planning policies of the Welsh Government. The primary objective of the PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.

12.2.3 Future Wales: The National Plan 2040[43] published in February 2021 is Wales' national development framework and sets the direction for development in Wales to 2040. It has a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of communities.

12.2.4 The Overarching National Policy Statement for Energy (EN-1)[44] was published in November 2023 by the Department for Energy Security and Net Zero. It states that where an energy project is likely to have socio-economic impacts at local or regional levels, the applicant should undertake and include in their application an assessment of these impacts as part of the Environmental Statement.

12.2.5 The All Wales Plan 2021-2025[45], which outlines how all of Wales will work together to achieve net zero. The Plan sets out pledges that Wales make to target seven areas where action is needed.

[42] Planning Policy Wales: Welsh Government, February 2024.
[43] Future Wales, The National Plan 2040: Welsh Government, February 2021.
[44] Overarching National Policy Statement for Energy (EN-1): Department for Energy Security and Net Zero, November 2023.
[45] All Wales Plan 2021-25 Working Together to Reach Net Zero: Welsh Government, October 2021.

12.2.6 The Review of Wales' Renewable Energy Targets[46], Summary of Consultation Responses published in July 2024 provides a summary of the Welsh Government's consultation on its proposals for revised renewable energy targets for Wales.

12.2.7 In March 2022, the Welsh Government published Stronger, Fairer, Greener Wales: A Plan for Employability and Skills[47]. The aim of the Plan is to set out how the Welsh Government is committed to ensuring all individuals in Wales have a high quality education, access to jobs and to ensure Wales is a place where businesses can thrive.

12.2.8 The Powys Local Development Plan[48] was adopted in April 2018 and sets out the Council's policies for the development and use of land in Powys up to 2026. It identifies a vision and objectives based on an understanding of the characteristics, issues and needs of the county and its communities. LDP Objective 5 seeks to support the conservation of energy and water and to generate energy from appropriately located renewable resources where acceptable in terms of the economic, social, environmental and cumulative impacts.

12.3 Proposed Scope of Assessment

12.3.1 There is no overarching Government guidance that sets out the preferred methodology for assessing the likely socio-economic effects of development proposals. Accordingly, the approach adopted for the assessment will be based on professional experience and best practice, and in consideration of the policy requirements/tests set out within the PPW and the Local Development Plan.

12.3.2 The first step in the assessment will be to identify the sensitivity of the receptors. In socio-economic assessments, receptors are not sensitive to changing environmental conditions in the same way as many environmental receptors are. To address this, the assessment will draw on a combination of measurable indicators (jobs, population, etc.) and a consideration of the importance of the receptor in policy terms to gauge the receptor's sensitivity. The sensitivity criteria proposed to be used in the Socio-Economics ES chapter are presented in Table 12.1.

12.3.3 The magnitude of change upon each receptor will then be determined by considering the predicted deviation from baseline conditions, both before

[46] Review of Wales' Renewable Energy Targets, Summary of Responses: Welsh Government, July 2024.
[47] Stronger, fairer, greener Wales: A plan for employability and skills: Welsh Government, March 2022.
[48] Powys Local Development Plan: Powys Council, April 2018.

and, if required, after mitigation. The magnitude of effect criteria proposed to be used in the Socio-Economics ES chapter are presented in Table 12.2.

12.3.4 Wherever possible, the magnitude of change will be quantified. Where this is not possible, for example, for a number of the social related factors, consideration of magnitude of change will be on a qualitative basis and justified through baseline research, review of relevant policy, and consultation undertaken.

12.3.5 There are no industry standard significance criteria for the assessment of socio-economic effects. The assessment is quantitative where possible. In circumstances where this is not possible, the assessment is qualitative in nature and is based on professional judgement. The significance of effect is identified by combining the sensitivity of the receptor against the magnitude of impact using the matrix in Table 12.3.

Table 12.1: Criteria for Sensitivity of Receptor

Sensitivity	Evidence for sensitivity assessment
High	Evidence of direct and significant socio-economic challenges relating to receptor. Accorded a high priority in local, regional or national economic regeneration policy.
Medium	Some evidence of socio-economic challenges linked to receptor, which may be indirect. Change relating to receptor has medium priority in local, regional and national economic and regeneration policy.
Low	Little evidence of socio-economic challenges relating to receptor. Receptor is accorded a low priority in local, regional and national economic and regeneration policy.
Negligible	No socio-economic issues relating to receptor. Receptor is not considered a priority in local, regional and national economic development and regeneration policy.

Table 12.2: Criteria for Magnitude of Effect

Magnitude of impact	Description / criteria
High	Proposed Development would cause a large change to existing socio-economic conditions in terms of absolute and/or percentage change.
Medium	Proposed Development would cause a moderate change to existing socio-economic conditions in terms of absolute and/or percentage change.
Low	Proposed Development would cause a minor change to existing socio-economic conditions in terms of absolute and/or percentage change.

Magnitude of impact	Description / criteria
Negligible	No discernible change in baseline socio-economic conditions.

Table 12.3: Significance of Effect

Magnitude of change	Sensitivity of receptor				
		High	Medium	Low	Negligible
	High	Major	Major	Moderate	Negligible
	Medium	Major	Moderate	Minor to Moderate	Negligible
	Low	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

12.3.6 Within a 15 km buffer of the Site, there are nine lower super output areas (LSOA - 2021) and eight wards (2023). This includes the Powys 010A LSOA and Llanidloes ward, which the Site is located in. This 15 km radius (see **Diagram 12.1**) makes up the Primary Impact Zone for the socio-economic assessment, as shown in Table 12.4. A secondary impact zone will also be assessed, which will cover Powys local authority.

Diagram 12.1: Map of a 15 km buffer of the Site.

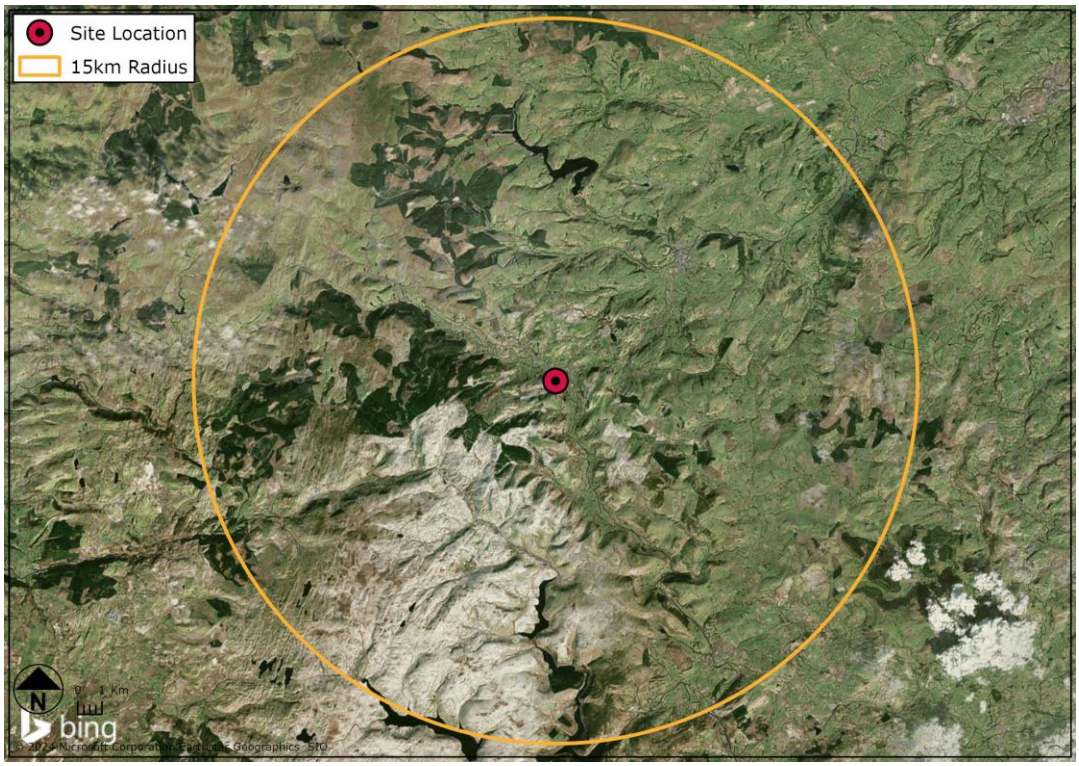

Table 12.4: Study area for the socio-economic assessment

Spatial scale	Title	Justification for inclusion
Primary Impact Zone	Wards located within a 15km buffer	The listed areas all lie within a 15km buffer of the Site, and some impacts may affect this wider scale.
Secondary Impact Zone	Powys Local Authority	The Site is located within the Powys local authority and most impacts are expected to be retained within the local authority.
Comparator Areas		
National	Wales	Looking at the national scale enables analysis to compare the primary and secondary impact zones to the rest of the country in

Spatial scale	Title	Justification for inclusion
		order to further understand the local context.

12.4 Likely Significant Effects

12.4.1 During construction, it is anticipated that the Proposed Development will generate the following socio-economic effects:

- Employment – direct, indirect and induced jobs based in the local and wider impact areas.
- Economic output – measured in gross value added (GVA, generated by the employment supported during the construction phase).
- Accommodation – potential impacts on available accommodation as a result of construction workers required during the construction phase.
- Potential disruption to residents and businesses, as well as the tourism industry.

12.4.2 Once completed and fully operational, it is anticipated that the socio-economic effects associated with the Proposed Development will include the following:

- Employment – direct, indirect and induced jobs based in the local and wider impact areas.
- Economic Output – measured in gross value added (GVA, generated by the employment supported once operational).
- Business rates revenue – measured in terms of the potential business rates generated.
- Tourism – the potential impact on tourism.
- During decommissioning, it is anticipated that the Proposed Development will generate the following socio-economic effects:
- Employment – direct, indirect and induced jobs based in the local and wider impact areas.
- Economic output – measured in gross value added (GVA, generated by the employment supported during the decommissioning phase).

12.4.3 Accommodation – potential impacts on available accommodation as a result of workers required during the decommissioning phase.

12.4.4 Potential disruption to residents and businesses, as well as the tourism industry.

12.5 Baseline Conditions

- **Population**: Between 2013 and 2023 the total population of Powys grew by 1.3 % (1,700). This compares to population growth of 3 % for Wales as a whole. During this time period, the only age group to experience an increase in Powys was the 65+ cohort which increased by 17.1 %, a higher increase than Wales at 13.9 %. In Powys the age group 0-15 decreased by 6.4 % and ages 16-64 decreased by 3.2 %. In Wales as a whole, those aged 0-15 decreased by 0.9 %, whilst those aged 16-64 increased by 0.8 %. As of 2022, the population of the Primary Impact Zone was 17,736. Table 12.5 details the 2023 wards that fall wholly or partly within a 15 km Buffer of the Site. Ward data for 2023 are not available at the time of writing (November 2024).

Table 12.5: 2023 Wards within a 15 km Buffer of the Site

Ward Code	Ward Name	LPA
W05001136	Ithon Valley	Powys
W05001140	Llanbrynmair	Powys
W05001141	Llandinam with Dolfor	Powys
W05001153	Llanidloes	Powys
W05001157	Llanyre with Nantmel	Powys
W05001166	Rhayader	Powys
W05001322	Lledrod	Ceredigion
W05001323	Melindwr	Ceredigion

Source: ONS

- **Employment**: Based on data from the Office for National Statistics, as of 2023, there were 58,000 jobs in Powys. This was a fall of 10.8 % (7,000) since 2015. This compares to an increase of 2.4 % (32,000) in Wales which had 1.4 million jobs in 2023. The Primary Impact Zone experienced no employment change between 2015 and 2022, remaining at 4,000 jobs. Table 12.6 details the 2019 wards that fall wholly or partly within a 15 km buffer of the Site. Employment data are only available for 2019 ward boundaries which are different to 2023 ward boundaries.

Table 12.6: 2019 Wards within a 15 km Buffer of the Site

Ward Code	Ward Name	LPA
W05000286	Beguildy	Powys
W05000288	Blaen Hafren	Powys
W05000310	Llandinam	Powys
W05000324	Llanidloes	Powys
W05000334	Nantmel	Powys
W05000342	Rhayader	Powys
W05000387	Lledrod	Ceredigion
W05000388	Melindwr	Ceredigion

Source: ONS

- **Unemployment**: As of October 2024, the claimant count in Powys was 2.7 %, which has decreased from 2.9 % in October 2021. The latest rate was below the corresponding figures for Wales which fell from 4.3 % in October 2021 to 3.6 % in October 2024.
- **Economic Output**: Between 2012 and 2022, in current prices gross value added (GVA) in Powys grew by 35.4 % (£666 million) to reach £2.6 billion. This was slightly below the 39.4 % growth in GVA that was seen in Wales.
- **Deprivation**: The Proposed Development is located in the 2019 ward Blaen Hafren. Based on data from the Welsh Index of Multiple Deprivation, Blaen Hafren has an overall rank of 1,281 putting it in the top 40 % least deprived LSOAs in Wales (out of 1,909, rank 1 is most deprived and 1,909 is least). Blaen Hafren has its' lowest rank in access to services with an overall rank of 35, putting it in the top 10 % most deprived LSOAs for this domain. It has its highest

rank in community safety with a rank of 1,881, putting it in the top 10 % least deprived LSOAs for this domain.

- **Fuel Poverty (Powys/ Wales)**: The latest fuel poverty information down to a local authority in Wales is for 2018, whereby an estimated 10,000 people (17 %) in Powys lived in fuel poverty compared to 155,000 (12 %) in Wales[49]. Latest data from Wales shows that as of 2021, 14 % of households in Wales were in fuel poverty[50].
- **Accommodation**: Due to the nature of the location of the Site, it would not be suitable for the majority of workers to commute during the construction, therefore workers will likely stay in nearby accommodation. There are a total of 38,134 bedspaces in Powys, with 6,038 serviced, 5,259 self-catering, 24,698 caravan/camping, 1,911 hostel and 228 alternative[51].

12.6 Potential Mitigation

12.6.1 The potential mitigation required as a result of the scheme will be dependant on a more detailed outcome of the socio-economic analysis, based on work undertaken by similar large scale renewable energy schemes. Potential mitigation could include:

- Accommodation strategy
- Health impact assessment
- Equality impact assessment
- Construction Environmental Management Plan
- Employment & skills plan

12.7 Questions

- From a socio-economic perspective are there any other schemes that should be considered for cumulative impacts?
- It is likely that further questions will arise during the consultation process. However, in the first instance it would be helpful if the Council can confirm they are happy with the Proposed Impact Zones outlined in this chapter.

[49] https://commonslibrary.parliament.uk/local-area-data-fuel-poverty/.
[50] Fuel poverty in Wales: interactive dashboard | GOV.WALES.
[51] Llwodraeth Cymru Welsh Government, Summary of Wales bedstock data: situation as at June 2023. August 2022. Available at: Summary of Wales bedstock data: situation as at June 2022 | GOV.WALES.

- It would also be helpful to confirm, of the potential mitigation measures outlined in paragraph 13.5.1, are there any that the Council would definitely expect to see produced for a scheme of this nature.

13 Aviation

13.1 Introduction

13.1.1 The Aviation and Other Issues chapter of the ES will include a description of military and civilian aeronautical and radar issues relating to the Proposed Development.

13.1.2 Radar systems can be susceptible to interference from wind turbines as the blade movement can cause intermittent detection by radars within their operating range. This is particularly relevant where there is a radar line of sight between the radar and the wind turbines. Due to their height, wind turbines can also impact airports and airfields if they protrude into the safeguarding areas above and around them.

13.2 Legislation, Policy and Guidance

13.2.1 The primary guidance in relation to the assessment of wind turbines on aviation in the UK is the Civil Aviation Authority (CAA) Publication (CAP) 764, Policy and Guidelines on Wind turbines (CAA, 2016).

13.2.2 The primary aviation lighting guidance for turbines at 150 metres tip height, or more, is the Air Navigation Order (ANO) 2016, Chapter 2, Lights and Lighting.

13.3 Proposed Scope of Assessment

Consultation

13.3.1 Consultation has been initiated with the Defence Infrastructure Organisation (DIO) who indicated in January 2024 that, based on the pre-application proforma, the Ministry of Defence (MOD) had concerns about the potential impact on the Range Control radar at Aberporth, some 65.7 km from the Proposed Development. The MOD is also likely to request a lighting condition to address the impact on low flying areas, and charting conditions. Further liaison will be undertaken with the MOD and other aviation stakeholders, up to the point that the locations of the wind turbines have been finalised. The ES will present the findings of these consultations, and all responses received, as well as any predicted impacts on aviation, and mitigation required.

13.4 Baseline Conditions

13.4.1 Initial assessments indicate that less than half of the turbines in the development might impact the NATS en route radar at Clee Hill, which is 69.6 km from the Proposed Development. Also, analysis using the latest layout design indicates only sixteen turbines would be visible to the MOD Range Control radar at Aberporth. The Proposed Development is within an area of high priority for military low flying operations. Consultation will be undertaken as necessary with civil and military aviation stakeholders to agree if any mitigation measures are necessary.

13.5 Potential Mitigation

13.5.1 The radar at Clee Hill does not currently have wind farm tolerance but, NATS En Route Limited (NERL) has procured a new radar that is expected to have the capacity to manage the impact of wind farms. This will be agreed through consultation with the NATS.

13.5.2 The impact on the MOD range Control radar at Aberporth is expected to be manageable, with less than half of the turbines partially visible. However, should mitigation be required, it is anticipated that either an upgrade to the existing radar capabilities, or an infill solution would be appropriate. This will be agreed through consultation with the MOD.

13.5.3 The UK Air Navigation Order (ANO) 2016, Article 222, sets out the statutory requirement for the lighting on en-route obstacles, which applies to structures of 150 m or more above ground level. A visible lighting scheme will be agreed with the Civil Aviation Authority (CAA). The MOD is likely to request an infrared lighting scheme for low flying military aircraft in the area and this will be agreed through consultation with the MOD.

13.6 Questions

- Do consultees agree with the approach to aviation and radar interests proposed?

14 Shadow Flicker

14.1 Introduction

14.1.1 An assessment will be undertaken of the likely effects of the Proposed Development on shadow flicker.

14.2 Legislation, Policy and Guidance

14.2.1 There is no guidance on shadow flicker in Welsh planning policy, however, the Update to Shadow Flicker Evidence Base (2011) published by the Department for Energy and Climate Change (DECC) states that assessing shadow flicker effects within ten times the rotor diameter of a wind turbine has been widely accepted across different European countries, and is deemed to be an appropriate area. The study area will therefore encompass all of the properties located within ten times the maximum rotor diameter, in this case, 1620 m.

14.3 Proposed Scope of Assessment

14.3.1 For an accurate assessment of shadow flicker, complex modelling is required taking into account the turbine's dimensions and the movement of the sun throughout the year. Data will be input into the modelling as follows:

- The locations of properties within ten rotor diameters of each proposed wind turbine;
- The locations and dimensions of the proposed turbines;
- The local topography (Ordnance Survey Digital Terrain Model); and
- The estimated dimensions of windows.

14.3.2 The modelling calculates the position of the sun throughout the day in accordance with the curvature of the earth, the time of year and the Proposed Development's position. The software calculates the occurrences of shadow flicker at each identified receptor. Analysis will be conducted to represent a worst-case scenario, namely:

- The sun is shining all day, from sunrise to sunset.
- The rotor plane is always perpendicular to the line from the wind turbine to the sun.
- There are no obscuring features such as trees and vegetation.
- The analysis looks at shadow casting over the building from all directions rather than over vertical orientated windows only; and

- The wind turbine is always operating.

14.4 Baseline Conditions

14.4.1 Shadow flicker is an effect that can occur within buildings situated in relatively close proximity to wind turbines when the shadow from rotating blades passes over a window opening. Shadow flicker intensity is defined as the difference or variation in brightness at a given location in the presence and absence of a shadow. Shadow flicker can be a nuisance to nearby human receptors, and its effects therefore must be considered during the design of the Proposed Development. It only occurs when the turbine is in operation (i.e. sufficient wind speed is present), the sun is low in the sky (dawn, dusk, winter days), there is limited cloud cover, and the turbine lies between the direction of the sun and the building in question.

14.5 Potential Mitigation

14.5.1 Mitigation measures can be incorporated into the operation of the Proposed Development to reduce the instance of shadow flicker. Mitigation measures include planting tree belts between the affected dwelling and the responsible turbine(s) and shutting down individual turbines during periods when shadow flicker could theoretically occur.

15 Telecommunications

15.1 Introduction

15.1.1 This section considers potential issues associated with telecommunications as a result of the Proposed Development during construction, operation and decommissioning phases.

15.2 Assessment Methodology

15.2.1 Wind turbines can cause interference of electromagnetic signals through physical and electrical interference. Physical interference can cut across electromagnetic signals resulting in a ghosting effect which largely affects television and radar. Electrical interference arises as a result of the operation of the generator within the nacelle of the turbine and can also affect communication equipment in proximity to the turbines. Where possible, any potential effects on electromagnetic signals will be mitigated during the turbine layout design by the use of exclusion zones around any electromagnetic links.

15.3 Fixed Links

15.3.1 Ofcom is responsible for the licensing of two-way radio transmitters. It holds a register of most fixed links, which is available on their website. This register will therefore be consulted in order to establish baseline conditions. However, because not all fixed links are published, system operators will also be individually consulted on the potential for the Proposed Development to cause electromagnetic interference. An assessment will be made as to the significance of potential operational effects and where appropriate, suitable mitigation measures will be discussed. The outcome of this assessment will be detailed in the ES.

16 Topics Scoped Out

16.1 Television and Radio

16.1.1 Effects on television and radio have been scoped out of detailed assessment and will not form a chapter of the ES. Since Great Britain has transitioned from analogue to digital transmitters, interference to television and radio signals have ceased to be an issue for most sites.

17 Summary & Conclusions & Non-Technical Summary (NTS)

17.1 Introduction

17.1.1 A summary chapter will be included at the end of the ES, providing a synopsis of the findings of the EIA.

17.2 Non-Technical Summary (NTS)

17.2.1 A Non-Technical Summary (NTS) of the findings will also be prepared, as required by the EIA regulations.

17.2.2 The NTS will detail the main components of the Proposed Development and summarise the main findings of the environmental studies carried out to construct and operate the Proposed Development. The NTS is designed to be an easily readable document to communicate the main elements of the EIA to any interested party, without the need for the reader to have specialist background knowledge. It will also contain plans and mapping that illustrate the extent and geographical location of the Proposed Development.