



Pennant Walters

GLANLLYNFI GARTH WIND FARM

Draft Environmental Statement

Appendix 1A - EIA Scoping Report





Pennant Walters

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EIA Scoping Report





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Scoping Report

PUBLIC

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WSP

The Mailbox

Level 2

100 Wharfside Street

Birmingham

B1 1RT

Phone: +44 23 8010 1700

WSP.com



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1 INTRODUCTION

1.1 OVERVIEW OF THE PROPOSED DEVELOPMENT

- 1.1.1. Pennant Walters Ltd. (the 'Applicant') is seeking planning permission for the construction and operation of up to eight turbines on land to the east of Maesteg in South Wales. The turbines are anticipated to have a height to blade tip of up to 180m.
- 1.1.2. Glanllynfi Garth Wind Farm (the 'Proposed Development') consists of the following elements:
- Up to eight turbines;
 - Substation and transformer housing;
 - Temporary construction compound;
 - Temporary site offices;
 - Crane pads and cabling;
 - Access track for construction; and
 - Overhead line connection (via wooden pole) to agreed Point of Connection (POC) with National Grid Electricity Distribution (NGED).
- 1.1.3. The Development Site comprises two land parcels which will be utilised for the construction and operation of the turbines. The land parcels are referred to as Northern Array (Pwll-yr-Lwrch) and Southern Array (Cynhordy). The Proposed Development and Development Site is described further in **Chapter 2** and shown on **Figure 1.1** (All figures are contained in **Appendix A**).
- 1.1.4. The Proposed Development is located predominantly within a Pre-Assessed Area (PAA) for Wind Energy as defined in the National Development Framework (NDF) – Future Wales: The National Plan 2040 (PAA 9). However, a portion of the Southern Array, including two turbines, is located outside of the PAA.
- 1.1.5. Under the Developments of National Significance (Specified Criteria and Prescribed Secondary Consents) (Wales) Regulations 2016, the Proposed Development meets the thresholds to qualify as a Development of National Significance (DNS). As of 2019, the DNS threshold regarding generating stations comprises all energy generation projects over 10MW. With a minimum proposed capacity of approximately 37MW, the Proposed Development meets this threshold.
- 1.1.6. It is recognised that the Applicant is seeking this EIA Scoping Opinion following the transitional period between consenting regimes in Wales. The Applicant submitted their notification of intent to submit a DNS application on 11 December 2025, which was subsequently accepted by PEDW on 14 December 2025. Therefore, the Proposed Development is being scoped as a DNS.
- 1.1.7. The Proposed Development is predominantly within the administrative boundary of Bridgend County Borough Council (BCBC). As such, BCBC will be considered the lead Local Planning Authority (LPA). However, the access track to the Proposed Development also traverses the Rhondda Cynon Taf County Borough Council (RCTCBC) and Neath Port Talbot Council (NPTC) authority areas (see **Figure 1.2**). These Councils will also be consulted as appropriate.
- 1.1.8. Access to the Northern and Southern Array will be achieved via existing access tracks which serve operational wind farms in the area. Starting north at the A4061, the access tracks travel south through the Pen y Cymoedd Wind Farm, then cross the A4107 and traverse the Llynfi Afan Wind Farm. The Proposed Development may require the access tracks to be upgraded which could inform the proposed scope of the EIA as the design evolves. Where necessary, pre-application engagement will be undertaken to discuss any changes to the scope and methodology of the
-

assessment with statutory consultees. All post-scoping engagements will be recorded in the respective ES chapters.

- 1.1.9. Discussions with the Applicant indicate that the Development Site will require two grid connection points and individual substations with each parcel. The Northern Array will connect to the **66kv** Overhead line that runs adjacent to the western extents of the parcel. The Southern Array will connect to the **66kv** Overhead line that traverses the centre of the parcel. It is envisaged that the Development Site will connect to both Points of Connection via a short overhead line. Both connections have been identified through discussion with National Grid Electricity Distribution (NGED) and form part of the DNS Application.

1.2 THE APPLICANT AND THE PROJECT TEAM

- 1.2.1. This Scoping Report has been prepared on behalf of the Applicant, by WSP UK Ltd (hereafter referred to as 'WSP'), with inputs provided from Wind Farm Aviation Safeguarding.
- 1.2.2. Pennant Walters (the Applicant) is a Walters Group company with a focus on renewable energy having obtained consent for and/or developed a wide variety of schemes including onshore wind, solar, small-scale hydro and battery storage.
- 1.2.3. WSP is registered with the Institute of Sustainability and Environmental Professionals (ISEP) EIA Quality Mark scheme. The scheme allows organisations that lead the co-ordination of EIAs in the UK to make a commitment to excellence in its EIA activities and have this commitment independently reviewed.

1.3 PURPOSE OF THE SCOPING REPORT

- 1.3.1. This Scoping Report has been prepared as part of an EIA relating to the Proposed Development. An EIA is required because the Applicant considers that the Proposed Development meets the criteria for EIA development under The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (No.567 (W.136)) (hereafter referred to as the 'EIA Regulations').
- 1.3.2. The Proposed Development requires an EIA because the Applicant recognises the potential significant environmental effects of a development of this scale and it exceeds the thresholds within Schedule 2 Part 3 (Energy industry) (I) *Installations for the harnessing of wind power for energy production (wind farms)* of the EIA Regulations. This is because the development involves the installation of more than 2 turbines and the hub height of any turbine or height of any other structure exceeds 15 metres (m).
- 1.3.3. This Scoping Report supports a request for a Scoping Direction to Planning and Environment Decisions Wales (PEDW) under Regulation 33 of the EIA Regulations in respect of applications for planning permission to Welsh Ministers as a DNS project.
- 1.3.4. Regulation 33 (2) instructs that a request for a Scoping Direction should 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.

- 1.3.5. The purpose of this Scoping Report is to inform PEDW and statutory consultees on relevant aspects of the proposal prior to the formulation of a formal Scoping Direction. There is no obligation to request a Scoping Direction, however the Applicant has opted to conduct such an exercise in order to ensure that the public are aware of and engaged on the project, and to provide for the accuracy of the EIA in assessing those effects that have the potential to be significant.
- 1.3.6. Regard has been made to Appendix 3: Environmental Impact Assessment of The Planning Inspectorate's procedural guidance for DNS projects (Developments of National Significance Procedural Guidance version 2.2 October 2019), which advises in more detail on information to inform a scoping request. It recommends that the Scoping Report should contain all information required by the 2017 EIA Regulations, plus the following additional 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;
 - 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;
 - key topics covered as part of applicants' scoping exercise; and
 - an outline of the structure of the proposed ES.
- 1.3.7. Proposals for the Development Site include up to eight turbines – the location of which will be considered through the technical and environmental survey work that is taking place and will continue to be undertaken to inform a layout that will be subject to further comment and feedback. Several minor iterative alterations to the design and layout of the proposed wind farm are likely to be considered before finalisation for inclusion in the application documentation as a result of the collation of environmental survey information, sensitivity analyses and consultation feedback. In this light, it is requested that PEDW acknowledges in issuing its Scoping Direction that the potential development submitted at Scoping is likely to change but that the Direction will remain valid unless there are radical alterations (i.e., significant increase in turbine numbers or heights) to the Proposed Development that would warrant a further Scoping exercise).
- 1.3.8. The Scoping Direction to be provided by PEDW will be used to inform the scope and focus of the Environmental Impact Assessment for this proposed DNS.

1.4 STRUCTURE OF THE SCOPING REPORT

- 1.4.1. The remainder of this Scoping Report is structured as follows:
- Chapter 2: The Proposed Development – provides a description of the Development Site and the Proposed Development as it has been considered within this Scoping Report;

- Chapter 3: Legislation and planning policy overview – provides an overview of the legislative and planning policy framework in relation to the Development Site and Proposed Development;
- Chapter 4: The Environmental Impact Assessment process – explains the approach that has been taken to identify the scope of the EIA and how the EIA will proceed;
- Chapter 5: Sets out the proposed scope and methodology for each technical topic where a significant environmental effect is likely to arise as a result of the Proposed Development; and
- Chapter 6: Summary of scope – identifies those effects that are scoped out of the EIA and sets out the proposed content of the Environmental Statement.

1.4.2. This Scoping Report also contains a number of appendices which are referenced throughout the document.

1.4.3. All figures can be found at the end of the report.

2 THE PROPOSED DEVELOPMENT

2.1 INTRODUCTION

- 2.1.1. This section provides a brief description of the nature and purpose of the Proposed Development, including its location and potential technical capacity. These details form the basis for the assessment of likely significant effects upon the baseline situation.

2.2 THE DEVELOPMENT SITE

SITE LOCATION

- 2.2.1. The Proposed Development will be located across two land parcels comprised of semi-improved grassland, marshy grassland and heathland. The location of the two land parcels is identified below:
- Pwll-yr-lwrch (hereafter 'Northern Array') – Grid Reference SS 87102 92887; and
 - Cynhordy (hereafter 'Southern Array') - Grid Reference SS 88988 89854.
- 2.2.2. The nearest settlement is Maesteg, the outskirts of which are approximately 1km to the west of the Northern Array and 1.5km west of the Southern Array. There are a number of isolated residential properties located with 1km of each parcel. Dunraven Forest and Cwmogwr Forest are located immediately adjacent to the eastern boundary of the Northern Array and Southern Array, respectively. The forest areas contain a network of tracks and trails. The Proposed Development will utilise these tracks to connect the land parcels (Northern and Southern Array).
- 2.2.3. A full description of the environmental baseline for technical disciplines is presented in **Chapter 5**.
- ### 2.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT
- 2.3.1. The Proposed Development is to construct and operate a wind farm of up to eight turbines and associated infrastructure including access tracks, transformer and substation and connection via overhead to the agreed PoC with NGED.
- 2.3.2. The combined maximum rated output of the Site will be up to 37MW of electrical power. The maximum rated output of the Development Site will be equivalent to the domestic needs of approximately 24,716 average households¹.
- 2.3.3. The wind farm will be designed with an operational life of 30 years. At the end of this period the Applicant has three options; to decommission the wind farm and dismantle and remove the turbines; to apply for an extension to the operating period using existing equipment; or apply to install new equipment on the Development Site. For the purposes of this assessment, it is assumed that the wind farm will be decommissioned.

¹ Based on average domestic household usage of 3,323 KWh and a capacity factor of 25.34% for onshore wind. See <https://www.renewableuk.com/page/UKWEDEExplained/Statistics-Explained.htm>

KEY COMPONENTS OF THE SCHEME

Turbines

- 2.3.4. The proposed turbines are yet to be selected but the assessment of the application will be based on heights to blade tip of up to 180m and rotor diameter of up to 150m which has been used for scoping initial potential effects. The indicative grid references for each turbine are provided in **Table 2-1**.

Table 2-1 Indicative Turbine grid reference and turbine dimensions.

Turbine	OSGB coordinates (m)		Hub height	Rotor diameter	Tip height
	X	Y			
T1	286782	193133	105m	150m	180m
T2	287425	192976	105m	150m	180m
T3	286685	192693	105m	150m	180m
T4	288422	189841	105m	150m	180m
T5	289446	189945	105m	150m	180m
T6	288914	190379	105m	150m	180m
T7	288694	189429	105m	150m	180m
T8	287380	192525	105m	150m	180m

Turbine Foundations

- 2.3.5. The turbines will be installed on foundations, comprising both stone and concrete. These will be dressed back with topsoil to allow re-vegetation. Turbine foundations could be larger or smaller, depending on imposed loadings, ground conditions and drainage design.

Crane pads

- 2.3.6. Each wind turbine requires an area of hardstanding to be built adjacent to the turbine foundation. This provides a stable base on which to lay down turbine components ready for assembly and erection, and to site the two cranes necessary to lift the three-tower section, nacelle and rotor into place. The crane hardstanding will be left in place following construction in order to allow for the use of similar plant should major components need replacing during the operation of the wind farm. These could also be utilised during decommissioning at the end of the wind farm's life. The total area of hardstanding at each turbine location including the turbine foundations and the crane pad will be approximately 2,640m². It is anticipated that approximately a third of this area will be dressed back with topsoil and landscaped into the surrounding area upon completion of turbine erection.

Site access

- 2.3.7. Access to the Development Site will be achieved via existing access tracks which serve the operational Pen y Cymoedd Wind Farm and Llynfi Afan Wind Farm. Starting north at the A4061, the access tracks travel south through Pen y Cymoedd Wind Farm, then cross the A4107 and

travel through the Llynfi Afan Wind Farm. The Proposed Development may require the access tracks to be upgraded.

Stone and concrete requirements and sourcing

- 2.3.8. Stone materials for track building are expected to be imported from local quarries; no borrow pits are proposed on the Development Site. Concrete for construction of the turbine foundations and substation structures will be imported to site from local batching plants.

Cabling

- 2.3.9. Underground cables will link the turbines to each other. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time, but typically cables will be laid in a trench 750mm deep and 450mm wide.

CONSTRUCTION OF THE PROPOSED DEVELOPMENT

- 2.3.10. The construction period for the wind farm will last approximately 24 months. The construction process will consist of the following principal activities:
- Upgrading of existing tracks as necessary and construction of new access tracks and passing places inter-linking the turbine locations and substation;
 - Potentially remedial works to public highway to facilitate delivery of turbines which will be confirmed following discussion with the Highways Authority;
 - Formation of site compound including a hardstanding and temporary site office facilities;
 - Construction of crane hardstanding areas to facilitate erection of turbines;
 - Construction of turbine foundations and transformer bases where required by the selected turbine;
 - Excavation of trenches and cable laying adjacent to site roads;
 - Connection of an on-site distribution and signal cables;
 - Delivery and erection of wind turbines;
 - Commissioning of site equipment; and
 - Site restoration.
- 2.3.11. Many of these operations will be carried out concurrently, although predominantly in the order identified to minimise the overall length of the construction programme. In addition, development will be phased such that at different parts of the Development Site, the civil engineering works will be continuing whilst wind turbines are being erected. Site restoration will be programmed and carried out to allow restoration of disturbed areas as early as possible and in a progressive manner.

DECOMMISSIONING OF THE PROPOSED DEVELOPMENT

- 2.3.12. The wind farm will be designed with an operational life of 30 years. When dismantling and removing the turbines the bases would be broken out to below ground levels and all cables cut at depth below ground level and left in the ground. This approach is considered to be less environmentally damaging than seeking to remove foundations and cables entirely. Roads would either be left for use by the landowner or covered with topsoil. No stone would be removed from the Development Site. The decommissioning works are estimated to take six months.
- 2.3.13. The turbine components themselves will be taken to an appropriate recycling facility where applicable. Due to the timescales, it is not possible to identify a specific facility at this time.
- 2.3.14. It should be noted that the developer will establish a decommissioning fund during the life of the project.
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OFF-SITE INFRASTRUCTURE

- 2.3.15. All wind farms need to be connected into the grid distribution system. The Applicant has undertaken discussions with National Grid Electricity Distribution (NGED) with regard to the grid connection for the Proposed Development. It is understood that the intention is for NGED to deliver the connection and at the time of writing this Scoping Report, it is assumed that the connection would be overhead (via wooden poles). The connection to the PoC will be included in the DNS Application for the Proposed Development.

3 LEGISLATION AND PLANNING POLICY OVERVIEW

3.1 INTRODUCTION

- 3.1.1. This section provides an overview of the relevant UK legislation and energy policy, devolved Welsh planning policy and the relevant planning policies of the BCBC Local Development Plan. The policy framework will be described in full in a Planning Statement that will accompany the DNS application.

3.2 LEGISLATIVE CONTEXT

- 3.2.1. Relevant Welsh primary legislation on sustainability and climate change includes:
- The Wellbeing of Future Generations (Wales) Act – requires all Wales based public bodies to put long-term sustainability at the forefront of thinking and actions;
 - The Environment (Wales) Act 2016 (as amended) – sets in place an obligation on the Welsh Government to reduce greenhouse gas emissions by 100% against levels in 2050; and
 - The Planning (Wales) Act 2015 – outlines powers given to Ministers to determine strategic energy projects of 10 – 50MW (subsequently amended to 350MW)

3.3 PLANNING POLICY CONTEXT

- 3.3.1. The Environmental Statement will consider planning policy which is relevant to the Proposed Development as summarised in the following sub-sections:

NATIONAL PLANNING POLICY CONTEXT

- 3.3.2. Future Wales: The National Plan 2040 (Future Wales from here on) is the National Development Framework for Wales, setting out the direction for development to 2040. It was published in February 2021. The intention of Future Wales is to provide a clear, long term spatial direction for Government policy, action and investment in Wales. It sets out a framework for addressing key national priorities through the planning system, inclusive of decarbonisation. Future Wales states:

“Future Wales together with Planning Policy Wales will ensure the planning system focuses on delivering a decarbonised and resilient Wales through the places we create, the energy we generate, the natural resources and materials we use and how we live and travel.”

- 3.3.3. Future Wales also states that in respect of renewable energy:

“Wales can become a world leader in renewable energy technologies. Our wind and tidal resources, our potential for solar generation, our support for both large and community scaled projects and our commitment to ensuring the planning system provides a strong lead for renewable energy development, mean we are well placed to support the renewable energy sector, attract new investment and reduce carbon emissions.”

- 3.3.4. Future Wales is the primary document in the development plan and therefore the principal planning policy statement for renewable energy against which the planning application will be assessed.
- 3.3.5. Planning Policy Wales (PPW) published in February 2024 (Edition 12) includes land use planning policies and is supported by topic based Technical Advice Notes. PPW is designed to ensure that the planning system supports the delivery of sustainable development and improves social, economic, environmental and cultural well-being. Alongside Future Wales, PPW outlines the way in which the planning system can support this delivery through Strategic and Local Development Plans. PPW (paragraph 5.9.1) states the following in relation to renewable and low carbon energy:

“Local authorities should facilitate all forms of renewable and low carbon energy development and should seek cross-department co-operation to achieve this. In doing so, planning authorities should seek to ensure their area’s full potential for renewable and low carbon energy generation is maximised and renewable energy targets are achieved. Planning authorities should seek to maximise the potential of renewable energy by linking the development plan with other local authority strategies, including Local Well-being plans and Economic / Regeneration strategies.”

LOCAL PLANNING POLICY CONTEXT

Bridgend County Borough Council

- 3.3.6. The Proposed Development is located primarily within the administrative area of Bridgend CBC. On 13 March 2024, Bridgend CBC adopted the Replacement Local Development Plan (RLDP) 2018-2033².
- 3.3.7. **Table 3-1** summarises the provisions of the key policies (please note, this table is not an exhaustive list of all of the relevant policies, it is simply a summary of those policies of relevance to the Proposed Development).

Table 3-1 – Relevant key local planning policies and their implications

Policy Reference	Commentary
Bridgend Replacement Local Development Plan 2018-2033	
SP1 – Regeneration and Sustainable Growth Strategy	SP1 sets out the spatial strategy for the Council, to help realise their regeneration aspirations whilst balancing the need to deliver future housing requirements. The strategy prioritises the land within or on the periphery of sustainable urban areas. Porthcawl, Maesteg and the Llynfi Valley are denoted as regeneration priorities through their designation as Regeneration Growth Areas.
SP3 – Good Design and Sustainable Placemaking	SP3 requires all development to contribute to creating high-quality, attractive, sustainable places that support active and healthy lives and enhance the community in which they are located, whilst having regard to the natural, historic and built environment.
SP4 – Mitigating the Impact of Climate Change	SP4 requires development proposals to make a positive contribution towards tackling the causes of and adapting to the impacts of Climate Change. The policy includes a number of examples of means to achieving this including encouraging the development of renewable and low/zero carbon energy generation. It goes on to require all proposals to clearly demonstrate how they contribute to climate change mitigation and adaptation.
SP5 – Sustainable Transport and Accessibility	SP5 states that development must be located and designed in a way that minimises the need to travel, reduces dependency on the private car and enables sustainable access to employment, education, local services and community facilities. It must also be

² Bridgend County Borough (2024). Local Development Plan 2018-2033. Available online: [written-statement.pdf](#) (Accessed January 2026).

Policy Reference	Commentary
	supported by appropriate transport measures and infrastructure. Development that would have a negative impact on the safe and efficient operation of the transport network will not be permitted.
PLA9 – Development Affecting Public Rights of Way	PLA9 advises that development must link with and seek to minimise impacts on the PROW network. Any predicted adverse impacts on the character, safety, enjoyment and convenient use of a PROW must be mitigated.
SP13 – Renewable and Low Carbon Energy Development	SP13 states that renewable and low carbon development proposals which contribute to meeting national and local renewable and low carbon energy efficiency targets will be permitted where they meet a number of criteria. These include: a) Where it can be demonstrated that there will be no unacceptable impacts on the natural and historic environment or local communities and that no other unacceptable cumulative impacts will arise; b) The proposal has sought to minimise the landscape and visual impact through its design and micro-siting; c) Provision is made for the appropriate restoration and after-care of the land for re-use; d) The proposal can facilitate a connection to the grid network; e) There would not be an unacceptable impact on access and highway safety; and f) There would not be unacceptable impact on the amenity of residential properties or tourist accommodation.
ENT12 – Development in Mineral Safeguarding Zones	ENT12 sets out a number of requirements for development proposals within mineral safeguarding areas. In terms of permanent development, the policy requires the mineral to be extracted prior to the development, and/or it to be demonstrated that the resource is either of poor quality / quantity that it would not be economical to exploit, or the nature of the development would not prejudice exploitation of the resource.
SP17 – Conservation and Enhancement of the Natural Environment	SP17 seeks to maintain and enhance the landscape quality as part of the natural environment within the County Borough. A high level of protection is afforded to all areas identified as having high and/or unique landscape importance, particularly the nationally important Glamorgan Heritage Coast and the outstanding historic landscapes of Kenfig and Merthyr Mawr Warren, and other regionally and locally important areas designated as 'Special Landscape Areas'. SP17 seeks specifically to protect statutorily designated sites of international or national importance from inappropriate development which directly or indirectly impacts upon them.
DNP1 – Development in the Countryside	DNP1 seeks to protect the countryside from inappropriate development and ensure that only in exceptional circumstances will development be acceptable. The acceptable exceptions are listed in the policy and include renewable energy projects.
DNP5 – Local and Regional Nature Conservation Sites	DNP5 requires development within or adjacent to: Local Nature Reserves, Sites of Importance for Nature Conservation (SINC), or Regionally Important Geodiversity Sites (RIGS) to be compatible

Policy Reference	Commentary
	with the nature conservation or scientific interest of the area, whilst promoting their education role. Development that would have an adverse impact on these sites will not be permitted unless the benefits outweigh the harm and/or the harm can be reduced or removed by mitigation /compensation.
DNP6 – Biodiversity, Ecological Networks, Habitats and Species	DNP6 requires all proposals to provide a net benefit for biodiversity and improved ecosystem resilience. It also requires proposals to maintain, protect and enhance biodiversity and ecological networks / services. Development proposals that result in an adverse effect on the connectivity of biodiversity and ecological networks and/or have a significant adverse effect on the resilience of protected habitats and species will only be permitted in the limited circumstances set out in the policy.
DNP7 – Trees, Hedgerows and Development	DNP7 seeks to protect trees, woodlands and hedgerows and states that development that would adversely impact them will not normally be permitted. DNP7 requires development proposals on sites containing or adjacent to trees to assess the trees in line with BS 5837:2012. Where trees are to be replaced a scheme for tree replacement must be agreed prior to the commencement of development.
DNP8 – Green Infrastructure	DNP8 requires development proposals to integrate, protect and maintain existing green infrastructure assets and to enhance the extent, quality, connectivity and multi-functionality of the green infrastructure network. Where loss or damage is unavoidable, appropriate mitigation and compensation is required.
DNP9 – Natural Resource Protection and Public Health	DNP9 seeks to ensure that the County's natural environment is protected from materially harmful development. This relates particularly to the effect of development on air, noise, light and water quality. DNP9 also seeks to ensure that potential risks to human health are fully identified and assessed.
SP18 – Conservation of the Historic Environment	SP18 states that development proposals must protect, conserve and where appropriate preserve and enhance the significance of historic assets, including their settings.

Other Material Considerations

3.3.8. The Council has also adopted the following Supplementary Planning Guidance (SPG) which will inform the assessment process:

- SPG 07 – Trees and Development³;
- SPG 19 – Biodiversity and Development⁴;
- SPG 20 – Renewables in the Landscape⁵.

³ Bridgend County Borough Council (2008) SPG 07 Trees and Development. Available online: [SPG 07.cdr](#) (Accessed January 2026).

⁴ Bridgend County Borough Council (2014) SPG 19 Biodiversity & Development. Available online: [spg-19-biodiversity-and-development.pdf](#) (Accessed January 2026).

⁵ Bridgend County Borough Council (N.D) SPG 20 Renewables in the Landscape. Available online: [spg-20-renewables-in-the-landscape.pdf](#) (Accessed January 2026).

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- 3.3.9. As noted in Section 1.1, the access road to the Development Site also travels across RCTCBC and NPTC.
- 3.3.10. On the 02 March 2011, RCTCBC resolved to adopt the Rhondda Cynon Taf County Borough Local Development Plan up to 2021⁶.
- 3.3.11. **Table 3-2** below summarises the provisions of the key policies (please note, this table is not an exhaustive list of all of the relevant policies, it is simply a summary of those policies of relevance to the Proposed Development).

Table 3-2 – Relevant key local planning policies and their implications

Policy Reference	Commentary
Policy CS1 – Development in the North	This policy emphasises that in the Northern Strategy Area, the emphasis will be on building strong, sustainable communities.
Policy AW 5 – New Development	This policy sets out a number of criteria for development proposals relating to amenity and accessibility.
Policy AW 6 – Placemaking	AW 6 sets out criteria for development proposals in relation to design and placemaking, in order to ensure that a high standard of design on all new developments across the County Borough is achieved.
Policy AW 8 – Protection and Enhancement of the Natural Environment	AW 8 seeks to protect RCT's distinctive natural heritage from inappropriate development. It advises that proposals which cause harm to the features of a SINC, RIGS or other locally designated sites will only be permitted in limited circumstances, which are outlined in the policy. The policy requires proposals to have no unacceptable impact on features of importance to landscape or nature conservation. It also requires proposals that may affect protected and priority species to demonstrate what measures are proposed for the protection and management of the species and the mitigation and compensation of potential impacts. Development proposals must be accompanied by appropriate ecological surveys and appraisals. Development proposals that contribute to the management or development of Ecological Networks will be supported.
Policy AW 10 – Environmental Protection and Public Health	This policy seeks to ensure that developments are not permitted that would cause or result in a risk of unacceptable harm to health and / or local amenity

⁶ Rhondda Cynon Taf (2011) Local Development Plan up to 2021. Available online: Adopted LDP 2011 (Accessed January 2026).

Policy Reference	Commentary
	due to: air pollution, noise pollution, light pollution, contamination, landfill gas, land instability, water pollution, flooding or any other identified risk to the environment, local amenity and public health and safety, unless mitigation can be provided.

Other Material Considerations

3.3.12. The Council has also adopted the following Supplementary Planning Guidance (SPG) which will inform the assessment process:

- Design and Placemaking – published March 2011⁷; and
- Nature Conservation – published March 2011⁸.

3.3.13. In addition, the Council are preparing a revised Local Development Plan for the period 2022-2037. This process formally began in April 2022. This will replace the current LDP for Rhondda Cynon Taf (2006-2021). The current LDP will remain in force until the Revised LDP is adopted. This plan is in its early plan making stages and cannot inform planning decisions at this stage.

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3.3.14. NPTC adopted their Local Development Plan (2011-2026)⁹ on 27 January 2016.

3.3.15. **Table 3-3** below summarises the provisions of the key policies (please note, this table is not an exhaustive list of all of the relevant policies, it is simply a summary of those policies of relevance to the Proposed Development).

Table 3-3 – Relevant key local planning policies and their implications

Policy Reference	Commentary
Policy SC 1 – Settlement Limits	This policy sets out the circumstances in which development will be permitted outside settlement limits including where it is associated with either agriculture, forestry, minerals or energy generation.
Policy SP 14 – The Countryside and the Undeveloped Coast	This policy seeks to conserve the County Boroughs countryside, landscapes and undeveloped coast, support rural enterprise including tourism and leisure activities and concentrate development in sustainable locations.
Policy SP 15 – Biodiversity and Geodiversity	Policy SP15 states that importance habitats, species and sites of geological interest will be protected, conserved and enhanced and managed through several measures including the identification of internal and national designated sites, the identification and protection of sites of regional and local importance and the protection of important natural heritage features.

7 Rhondda Cynon Taf (2011) Design and Placemaking. Available online: Design and Placemaking 2011 (Accessed January 2026).

8 Rhondda Cynon Taf (2011) Nature Conservation. Available online: Nature conservation (Accessed January 2026).

9 Neath Port Talbot County Borough Council (2016) Local Development Plan (2011-2026). Available online: Ldp_written_statement_jan16.pdf (Accessed January 2026).

Policy Reference	Commentary
Policy EN 6 – Important Biodiversity and Geodiversity Sites	This policy sets out the limited circumstances where development proposals will be permitted which affect Regionally Important Geodiversity Sites (RIGS), Local Nature Reserves (LNRs), Sites of Interest for Nature Conservation (SINCs), sites meeting SINC criteria or sites supporting Local Biodiversity Action Plan (LBAP) or S42 habitats or species.
Policy EN 7 – Important Natural Features	This policy seeks to protect ecologically or visually important natural features such as trees, woodlands, hedgerows / field boundaries, watercourses and ponds.
Policy SP 16 – Environmental Protection	This policy aims to safeguard environmental quality. It requires that proposals do not significantly harm air, water, or ground quality, nor increase pollution levels.
Policy EN 8 – Pollution and Land Stability	Policy EN 8 states that proposals which would be likely to have an unacceptable adverse effect on health, biodiversity and/or local amenity or would expose people to unacceptable risk due to: air, noise or light pollution., contamination, land instability, water pollution will not be permitted. Proposals which would create new problems or exacerbate existing ones will not be acceptable unless mitigation can be provided.
Policy SP 18 – Renewable and Low Carbon Energy	This policy states that A proportionate contribution to meeting national renewable energy targets and energy efficiency targets will be made while balancing the impact of development on the environment and communities. To achieve this a number of measures are set out including encouraging all forms of renewable energy and ensuring that development will not have an unacceptable impact on the environment and amenity of local residents.
Policy TR 2 – Design and Access of New Development	This policy includes a number of criteria for development proposals in relation to design and access. Of relevance is the criteria which requires that development does not comprise the safe, effective and efficient use of the highway network and does not have an adverse impact on high safety or create unacceptable levels of traffic generation.
Policy BE 1 – Design	Policy BE 1 requires all development proposals to demonstrate high quality design which fully takes into account the natural, historic and built environmental context and contributes to the creation of attractive, sustainable places.

Other Material Considerations

3.3.16. The Council has also adopted the following Supplementary Planning Guidance (SPG) which will inform the assessment process:

- Biodiversity and Geodiversity – published May 2018¹⁰;

¹⁰ Neath Port Talbot County Borough Council (2018). Biodiversity and Geodiversity. Available online: [spg_biodiversity_geodiversity_may18.pdf](#) (Accessed January 2026).

- Design – published July 2017¹¹; and
- Renewable & Low Carbon Energy – published July 2017¹².

3.3.17. The Council is currently in the process of producing a new LDP that would operate up to 2038, though this plan is in its early plan making stages and cannot inform planning decisions at this stage.

11 Neath Port Talbot County Borough Council (2017). Design. Available online: [spg_design_july17.pdf](#) (Accessed January 2026).

12 Neath Port Talbot County Borough Council (2017). Renewable and Low Carbon Energy. Available online: [spg_renewable_energy_july17.pdf](#) (Accessed January 2026).

4 THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

4.1 OVERVIEW OF THE PROCESS

- 4.1.1. EIA is a systematic process that must be followed for certain categories of project before they can receive development consent. It aims to identify a project's likely significant effects through the Scoping process, and then assess those effects, which will be reported in an Environmental Statement. This helps to ensure that the predicted effects, and the scope for mitigation measures to reduce them where necessary, are properly understood by the public, PEDW and statutory stakeholders before it makes its decision.
- 4.1.2. The EIA process should be systematic, analytical, impartial, consultative and iterative allowing opportunities for environmental concerns to be addressed in the design of a project. Typically, a number of design iterations take place in response to environmental constraints identified during the EIA process prior to the final design being reached.
- 4.1.3. The EIA process should be based upon on recognised good practice and guidelines specific to each technical area and identify the likely significant environmental effects arising from a proposed development. Consultees are also encouraged to provide confirmation of agreement to the proposed scope in terms of what is included and excluded, the methodology and the receptors identified.

4.2 EIA TERMINOLOGY

IMPACTS AND EFFECTS

- 4.2.1. EIA is concerned with the identification of likely significant effects on the environment. However, the terms impact and effect are often used synonymously, and this can lead to confusion. For clarity, the convention used in this assessment is to use 'impacts' within the context of the term EIA, which describes the process from Scoping through to Environmental Statement preparation to subsequent monitoring and other work. Otherwise, this document uses the word 'effects' when describing the environmental consequences of the Proposed Development. For example, such effects may come about as a result of the following:
 - Physical activities that would take place if the development were to proceed (e.g., vehicle movements during construction operations);
 - Environmental changes that are predicted to occur as a result of these activities (e.g., loss of vegetation prior to the start of construction work or an increase in noise levels). In some cases, one change causes another change, which in turn results in an environmental effect.
- 4.2.2. The predicted environmental effects are the consequences of the environmental changes for specific environmental receptors. For example, with respect to bats, the loss of roosting sites or foraging areas could affect the bats' population size; with regard to people, an increase in noise levels could affect amenity.
- 4.2.3. This assessment is concerned with assessing the significance of the environmental effects of the Proposed Development, rather than the activities or changes that cause them. However, this requires these activities to be understood and the resultant changes identified; often based on predictive assessment work.

TYPE OF EFFECT

- 4.2.4. The 2017 EIA Regulations (Schedule 4, Part 5) require consideration of a variety of types of effect, namely direct / indirect, secondary, cumulative, positive / negative, short / medium / long-term, and permanent / temporary. In the Environmental Statement that will follow this Scoping Report, effects are considered in terms of how they arise, their nature (i.e., whether they are positive or negative) and duration. Each will have a source originating from the Proposed Development, a pathway and a receptor and may fall into one of several categories:
- Direct effects are readily identified because of the physical connection between some element of the development and an affected receptor;
 - Indirect effects require some additional pathway for the effect to arise. For example, a listed building may not be directly affected by any elements of a development, but its setting may be if the development is visible in views from it or when looking towards it; in which case there would be an indirect effect;
 - Secondary effects would typically require further pathway connections, for example, an effect on a receptor population A could have a secondary effect on receptor population B, if B was itself dependent on A in some way, as, for example, a food source; and
 - Cumulative effects arise when the receptors affected by one development are also affected by other developments resulting in the aggregation of environmental effects or the interaction of impacts.
- 4.2.5. Most predicted effects will be positive or negative and will be described as such. However, in some cases it is appropriate to identify that the interpretation of a change is a matter of personal opinion, and such effects will be described as 'subjective'.

TEMPORAL AND SPATIAL SCOPE

- 4.2.6. In its broadest sense, the spatial scope is the area over which changes to the environment would occur as a consequence of the development. In practice, an EIA should focus on those areas where these effects are likely to be significant.
- 4.2.7. The spatial scope varies between environmental topic areas. For example, the effect of a proposed development on the landscape resource and visual amenity is generally assessed within a zone of up to 35km from the wind turbines (and potentially up to 70km for cumulative effects), whilst noise effects are assessed within a much smaller area encompassing those representative properties close to a development site.
- 4.2.8. The temporal scope is stated where known and effects are typically described as:
- Temporary - likely to be related to a particular activity and will cease when the activity finishes. The terms 'short-term' and 'long-term' may also be used to provide a further indication of how long the effect will be experienced; and
 - Permanent – this typically means an unrecoverable change.
- 4.2.9. Effects are generally considered in relation to the following key stages of a proposed development:
- Construction – the effects may arise from the construction activities themselves, or from the temporary occupation of land. Effects are often of limited duration although there is potential for permanent effects. Where construction activities create permanent change, the effects will continue into the operational period;

- Operation – effects may be permanent, or they may be temporary, intermittent, or limited to the life of a proposed development until decommissioning (as in the case of wind power developments which gain planning permission for a defined and finite number of years); and
- Decommissioning – effects may arise from the decommissioning activities themselves, or from the temporary occupation of land. The effects would generally be temporary and of limited duration. Additional permanent change would normally be unlikely unless associated with restoration.

4.3 EIA SCOPING

- 4.3.1. The results of the EIA process are reported in an Environmental Statement and Schedule 4(4) of the EIA Regulations specifies that it should describe those “...*factors...likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape*”.
- 4.3.2. Regulation 4(2) of the EIA Regulations requires the interaction between these factors to be considered. In addition, Regulation 4(4) requires Environmental Statements to consider “...*the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and disasters*”.
- 4.3.3. Establishing which aspects of the environment are likely to be significantly affected by a particular project is captured in the EIA Scoping process which aims to identify those aspects of the environment and associated issues that need to be considered when assessing the potential effects resulting from a proposed development. This recognises that there may be some environmental elements for which the project is unlikely to have a significant effect and hence where there is no need for further investigation to be undertaken as part of the EIA.
- 4.3.4. The scope and assessment methodologies proposed in this Scoping Report are based on recognised good practice and guidelines specific to each topic area. Baseline conditions have been determined through desk-based studies and survey work undertaken to date. The environmental topic chapters identify where significant effects are anticipated as a result of the Proposed Development and take into account:
- Baseline data from surveys;
 - The description of the Proposed Development;
 - Relevant guidance on assessment methodologies; and
 - Any cumulative effects which may arise.

4.4 CUMULATIVE EFFECTS

- 4.4.1. Cumulative effects can arise from the interaction between a proposed development and other developments proposed or under construction. In line with standard practice, for the purpose of the EIA, other wind farm developments which are operational, subject to planning approval or subject to a full and validated planning application will also be included in the consideration of potential cumulative effects (subject to a cut-off point to allow assessments to be undertaken). It should be noted that not all of the cumulative developments would necessarily have a cumulative effect in respect of any particular environmental topic.

4.5 MITIGATION

- 4.5.1. Some mitigation measures to avoid, reduce or offset the consequences of the Proposed Development would be embedded within its design whilst others may require adherence to particular constraints on construction methodology or mode of operation. The final assessment of significance will take into account the mitigation measures and constraints that have been incorporated into the Proposed Development (i.e. it will be the assessment of residual effects).
- 4.5.2. It is likely that the following management plans will be submitted as part of the EIA or as a post-consent condition:
- Outline Construction Environmental Management Plan (CEMP);
 - Outline Habitat Management Plan (HMP); and
 - Outline Construction Traffic Management Plan (CTMP).

4.6 EIA METHODOLOGY

- 4.6.1. The Environmental Statement will identify the assessment methodologies based on recognised good practice and guidelines specific to each of the relevant environmental topic areas where the Proposed Development could result in significant effects. In general terms, the technical studies undertaken for each topic area and chapter included in the Environmental Statement to accompany the planning application would include:
- Collection and collation of existing baseline information about the receiving environment and surveys to fill any gaps in knowledge or to update any historic information, together with identification of any relevant trends in, or evolution of, the baseline;
 - Consultation with experts and relevant consultees as necessary;
 - Consideration of the potential effects of the Proposed Development on the baseline, followed by identification of any additional mitigation measures to seek to avoid or reduce any predicted adverse effects;
 - Assessment and evaluation of any residual significant effects after mitigation measures have been implemented; and
 - Compilation of the Environmental Statement chapter.

SIGNIFICANCE EVALUATION METHODOLOGY

- 4.6.2. The receptors that could be significantly affected and therefore be taken forward for consideration in further detailed assessment in the ES, will be identified. A combination of professional judgement and a topic-specific significance evaluation methodology will be adopted to determine whether the effects on these receptors are significant.
- 4.6.3. In applying this approach to significance evaluation, it is necessary to ensure that there is consistency between each environmental topic in the level at which effects are considered to be significant. Thus, it is inappropriate for the assessment of one topic to conclude that minor effects are significant, when, for another topic, only comparatively major effects are significant.
- 4.6.4. In order to achieve the desired level of consistency, each topic chapter will consider the 'significance test' to inform their decision on whether effects are likely to be significant or not. Alongside this, consideration will also be given to the relevant topic-specific significance evaluation methodologies. This approach will also be adopted for the technical assessments to be included in the ES.
- 4.6.5. For some of the topics to be assessed in the ES, there is published guidance available about significance evaluation. Where such guidance exists, even if in draft, it will be used to inform the

development of the significance evaluation methodologies to be used in the ES. For other topics, it will be necessary to develop methodologies without the benefit of guidance. This will involve technical specialists drawing on their previous experience of significance evaluation in EIA.

Evaluation Matrices

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

Receptor Sensitivity of Value

- 4.6.7. The sensitivity or value of a receptor is largely a product of the importance of an asset, as informed by legislation and policy, and as qualified by professional judgement. For example, receptors for landscape, biodiversity or the historic environment may be defined as being of international or national importance; lower value resources may be designated as being sensitive or important at a county or district level.
- 4.6.8. The use of a receptor would also play a part in its classification. For example, when considering effects on the amenity of a human population, a receptor used for recreational purposes may be valued more than a place of work as the environmental quality of the recreational receptor is more likely to be an important part of that receptor's use.

Magnitude of Change

- 4.6.9. The magnitude of change affecting a receptor that would result from the Proposed Development would be identified on a scale from minor alterations of change, up to major changes or the total or substantial loss of the receptor. For certain topics, the magnitude of change would be related to guidance on levels of acceptability (e.g., for noise), and be based on numerical parameters, whilst for others it will be a matter of professional judgement to determine the magnitude of change, using descriptive terminology.

Determination of Significance

- 4.6.10. The determination of significance is derived with reference to information about the nature of the Proposed Development, the sensitivity or value of receptors that could be affected, together with the magnitudes of change that are likely to occur. For many environmental aspects, significance can be determined by using a matrix (see **Table 4.1**).
- 4.6.11. Variations to this matrix approach, which may be applicable to specific environmental topics (e.g. ecology and ornithology), will be detailed in the relevant 'assessment methodology' sub-section contained in each environmental topic chapter. Definitions of how the categories that are used in the matrix are derived for each topic are also set out in each environmental topic chapter, along with the relevant explanation and descriptions of receptor sensitivity, magnitude of change and levels of effect that are considered significant in terms of the EIA Regulations.
- 4.6.12. In addition, professional judgement is applied in the assessment, as the lines between the sensitivities or magnitudes of change may not be clearly defined and the resulting assessment conclusions may need clarifying.
- 4.6.13. The overall significance matrix that will be used for the EIA is shown in **Table 4-1**. Reference is made to:

- Major effects, which will always be determined as being significant in EIA terms;

- Moderate effects that may be significant, although there may also be circumstances where such effects are considered 'not significant' based on specific scenarios and professional judgement; and
- Minor or negligible effects, which will always be determined as 'not significant'.

4.6.14. Effects can be beneficial or adverse.

Table 4-1 - Example significance evaluation matrix

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

4.7 CONSULTATION

- 4.7.1. Consultation is an essential element of the EIA and DNS application processes and will be reported within the Environmental Statement and application supporting documentation (such as a Pre-Application Consultation Report) as necessary.
- 4.7.2. The Applicant is committed to promoting dialogue with statutory and non-statutory consultees and the local community, seeking to engage with all those with an interest in the Proposed Development to provide transparency during the process.

5 SCOPE OF THE ASSESSMENT

5.1 CONTENT OF THE ENVIRONMENTAL STATEMENT

5.1.1. In accordance with the EIA Regulations and good practice, the Environmental Statement will contain:

- A non-technical summary (which will be available as a standalone document);
- A description of the proposed development comprising information on the need for the development, alternatives that have been considered and a description of the development;
- Information about the consents required if the development is to proceed and the policy context to the development;
- A definition of the EIA process, including the various steps in the EIA process, terminology, and the assessment methodology;
- Separate chapters setting out the assessment relating to each environmental topic, including:
 - A description of baseline conditions, including information about how these might change during the course of the development;
 - A description of any measures that have been incorporated into the proposed development with a view to delivering environmental benefits;
 - The scope of the assessment and the methodologies adopted;
 - Assessments and evaluations of significance of predicted effects - dealing, in turn, with each receptor/resource that has been assessed in detail;
 - A summary of the evaluations of significance; and
 - Proposals for implementing environmental and mitigation measures.
- An assessment of cumulative effects; and
- An appraisal of the effects of the scheme against relevant planning and environmental policies.

5.2 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

5.2.1. This section sets out the proposed scope of the Landscape and Visual Impact Assessment (LVIA) which will assess the likely significant effects, including cumulative effects of the Proposed Development on landscape and visual amenity receptors. A Residential Visual Amenity Assessment (RVAA) will also be included.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

5.2.2. **Table 5-1** lists the relevant planning policies.

Table 5-1 - Relevant policies and their implications - landscape and visual

Policy	Policy context
National planning policy	

Policy	Policy context
Future Wales: The National Plan 2040 ¹³	Policy 17 – Renewable and Low Carbon Energy and Associated Infrastructure notes that there is a presumption in favour of large-scale wind energy development in Pre-Assessed Areas for wind developments (which 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), subject to the criteria in Policy 18. The Proposed Development Site lies partially within Pre-Assessed Area 9. The policy continues by stating that all proposals should demonstrate that they will not have an unacceptable adverse impact on the environment. Policy 18 – Renewable and Low Carbon Energy Developments of National Significance. Proposals qualifying as Developments of National Significance will be permitted subject to Policy 17 and the criteria listed under Policy 18. Of relevance to the LVIA for the Project, item 2 requires that there are no unacceptable adverse visual impacts on nearby communities and individual dwellings. The cumulative impacts of existing and consented renewable energy schemes should also be considered
Planning Policy Wales, Edition 12 ¹⁴	With specific reference to large scale wind developments and the landscape, paragraph 5.9.17 recognises that Future Wales identifies Pre-Assessed Areas where 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 other criteria contained within the policy. General LVIA issues are included in Chapter 6 - Distinctive and Natural Places and more specifically within Section 6.3 Landscape. With regard to statutory landscape designations i.e., National Parks and National Landscapes, paragraph 6.3.5 states that the duty to have regard to their purposes applies to activities affecting these areas whether those activities are located within or outside a National Park or a National Landscape. Paragraph 6.3.12 and 6.3.13 relate to non-statutory designations such as Special Landscape Areas (SLAs) that define local areas of high landscape importance, which may be unique, exceptional or distinctive to the area. Planning authorities should apply these designations where there is good reason to believe that normal planning policies cannot provide the necessary protection. Paragraphs 6.3.19 and 6.3.21 concerns the use of LANDMAP and its role in informing landscape assessments needed to inform local authorities in making local policy, guidance and decision making.
Local Planning Policy	

13 Welsh Government (2021) Future Wales - The National Plan 2040. (Online). Available at: <https://www.gov.wales/future-wales-national-plan-2040-0> (Accessed January 2026).

14 Welsh Government (2024) Planning Policy Wales Edition 12. (Online). Available at: <https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf> (Accessed January 2026)

Policy	Policy context
Bridgend County Borough Local Development Plan 2018-2033 ¹⁵ .	Policy SP13: Decarbonisation and Renewable Energy - Section 1 of this policy permits such development where (amongst other things): <i>“a) It can be demonstrated that there will be no unacceptable impacts on the natural and historic environment or local communities b) the proposal (inclusive of its associated infrastructure) has sought to minimise the landscape and visual impact through its design and micro-siting, particularly where in close proximity to homes and tourism receptors’ f) there would not be unacceptable impact on the amenity of residential properties or tourist accommodation”</i> Section 2 of policy SP13 states that Landscape Character Areas (LCAs) 1, 8 and 12 as suitable for wind and solar energy. The Proposed Development lies within LCA 3¹⁶.
	Policy SP17: Conservation and Enhancement of the Natural Environment states (amongst other things) that <i>“Development which will maintain and, wherever possible, enhance the natural environment of the County Borough will be favoured”</i>. With regard to landscape and visual issues, the policy continues stating <i>“Development proposals will not be permitted where they will have an adverse impact upon:</i> <i>1) The integrity of the County Borough’s countryside;</i> <i>2) The character of its landscape”</i>.
	Policy DNP1: Development in the Countryside – The relevant sections of the policy state <i>“All development outside defined settlement boundaries must ensure that the integrity of the countryside is conserved and enhanced. There is a presumption against development in the countryside, except where it is for:</i> <i>8) Renewable energy projects”</i>.
	Policy DNP4: Special Landscape Areas – This policy identifies nine non-statutory SLA designations, the location and extent of which are shown on Figure 5.2d. The policy states that: <i>“Development in SLAs will only be permitted where:</i> <i>1) It retains or enhances the character and distinctiveness of the SLA;</i> <i>2) The design of the development reflects the building traditions of the locality in its form, materials and details, and/or assimilates itself into the wider landscape; and</i> <i>3) The proposed development is accompanied by a Landscape Impact Assessment (LIA), which takes into account the impact of the development and sets out proposals to mitigate any adverse effects.”</i>

15 Bridgend County Borough Council (2024) Bridgend County Borough Local Development Plan 2018-2033. (Online). Available at: <https://www.bridgend.gov.uk/residents/planning-and-building-control/local-development-plan/adopted-replacement-local-development-plan-2018-2033/> (Accessed January 2026)

16 Bridgend County Borough Council (2014) SPG20 Renewables in the Landscape: Supplementary Planning Guidance (Online). Available at: <https://democratic.bridgend.gov.uk/documents/s2150/Renewables%20In%20The%20Landscape%20appendix.pdf> (Accessed January 2026)

Policy	Policy context
	The policy continues by stating that “ <i>The settings of SLAs will be protected with consideration of the views from those areas to the settlements of the County Borough</i> ”.
	Policy DNP7: Trees, Hedgerows and Development states “ <i>Development that would adversely affect trees, woodlands and hedgerows of public amenity or natural/cultural heritage value, or that provide important ecosystem services, will not normally be permitted. Where trees are to be replaced a scheme for tree replacement must be agreed prior to the commencement of development, including details of planting and aftercare</i> ”.
	Policy DNP9: Natural Resource Protection and Public Health states that Development proposed will only be permitted where it can be demonstrated that they would not cause a new, or exacerbate an existing, unacceptable risk of harm to health, biodiversity and/or local amenity due to a number of factors including light pollution.
Bannau Brycheiniog National Park (BBNP) Authority Local Development Plan 2007-2022 ¹⁷	Policy SP9 - Renewable Energy. Whilst this policy refers to renewable energy schemes within the National Park, the accompanying text at paragraphs 3.16.2.9 and 3.16.2.10 recognises the potential impact of large-scale renewable energy projects located on the peripheries of the National Park which will be judged in accordance with SP2 Major Development in the National Park. Policy SP9 states that proposals for renewable energy schemes will only be permitted where they do not have a significant adverse impact on the Natural Beauty, wildlife, cultural heritage and special qualities of the National Park.
	Policy SP2 - Major Development in the National Park – Strategic Policy. Major development in the National Park should only take place in exceptional circumstances, where proven to be in the public interest. Proposals will be judged against a number of criteria including any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which these could be moderated.

¹⁷ Brecon Beacons National Park Authority (2013) Brecon Beacons National Park Local Development Plan 2007-2022. (Online). Available at: <https://www.beacons-npa.gov.uk/wp-content/uploads/Brecon-Written-Statement.pdf> (Accessed January 2026)

Policy	Policy context
	Policy 12 – Light Pollution. This policy states that proposals where lighting is required, it will be permitted where: the lighting proposed is appropriate to its purpose; and there is not a significant adverse effect individually or cumulatively on a number of criteria including (of relevance to the LVIA), the character of the area and the visibility of the night sky.

Legislation

- Wellbeing of Future Generations (Wales) Act 2015¹⁸;
- Environmental (Wales) Act 2016¹⁹;
- National Parks and Access to the Countryside Act 1949²⁰; and
- Countryside and Rights of Way Act 2000²¹.

Technical Guidance

- 5.2.3. The Landscape and Visual Impact Assessment (LVIA) will be conducted in accordance with the third edition of the Guidelines for Landscape and Visual Impact Assessment²² (hereafter referred to as GLVIA3) produced by the Landscape Institute and the Institute of Environmental Management and Assessment and Technical Guidance Note LITGN-2024-01 - Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3)²³. The guidance in this document is widely regarded by the landscape and planning professions as the ‘industry standard’ and a methodology based on GLVIA3 will be adopted together with best practice and professional experience.
- 5.2.4. The LVIA will also take account of other relevant technical guidance which includes (but is not limited to) the following:
- Using LANDMAP in Landscape and Visual Impact Assessments (GN46)²⁴ (hereafter referred to as GN46);

18 National Assembly for Wales (2015) Well-being of Future Generations (Wales) Act 2015. (Online). Available at: <https://www.legislation.gov.uk/anaw/2015/2> (Accessed January 2026)

19 National Assembly for Wales (2016) Environment (Wales) Act 2016. (Online). Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents> (Accessed January 2026)

20 Parliament of the United Kingdom (1949) National Parks and Access to the Countryside Act 1949. (Online). Available at: <https://www.legislation.gov.uk/ukpga/Geo6/12-13-14/97/contents> (Accessed January 2026)

21 Parliament of the United Kingdom (2000) Countryside and Rights of Way Act 2000. (Online). Available at: <https://www.legislation.gov.uk/ukpga/2000/37/contents> (Accessed January 2026)

22 Landscape Institute and the Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment. 3rd edition. London. Routledge (Accessed January 2026)

23 Landscape Institute (2024) Technical Guidance Note LITGN-2024-01 Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3). (Online). Available at: https://www.landscapeinstitute.org/wp-content/uploads/2024/08/LITGN-2024-01-GLVIA3-NC_Aug-2024.pdf (Accessed January 2026)

24 Natural Resources Wales (2024) Using LANDMAP in Landscape and Visual Impact Assessments GN46. (Online). Available at: <https://naturalresourceswales.gov.uk/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/using-landmap-in-landscape-and-visual-impact-assessments-gn46/?lang=en> (Accessed January 2026)

- Visual Representation of Windfarms (Version 2.2)²⁵;
- Technical Guidance Note (TGN) 06/19 - Visual Representation of Development Proposals²⁶;
- Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments²⁷;
- Technical Information Note 02/2019. – Residential Visual Amenity Assessment²⁸;
- Technical Information Note 04/2020 – Infrastructure²⁹;
- Technical Guidance Note 02/21 - Assessing landscape value outside national designations³⁰;
- Special Landscape Qualities - Guidance on assessing effects³¹;
- Guidance on Aviation Lighting Impact Assessment³²;
- Designing for Renewable Energy in Wales³³; and
- Nationally Significant Infrastructure: Advice on Cumulative Effects Assessment³⁴

BASELINE

5.2.5. A range of desk-based and site-based data will be sourced to undertake the LVIA and cumulative landscape and visual impact assessment (CLVIA), covering landscape and visual receptors and other cumulative wind farm development.

5.2.6. This Scoping Report is to be read in conjunction with the following figures:

- **Figure 5.1a:** LVIA Study Area with Site Boundary and Topographic Map;
- **Figure 5.1b:** LVIA Study Area and Zone of Theoretical Visibility (ZTV) to Blade Tip (1:220,000 scale);
- **Figure 5.1c:** LVIA Study Area and Zone of Theoretical Visibility (ZTV) to Blade Tip with Proposed Viewpoint Locations (1:60,000 scale); and
- **Figure 5.1d:** LVIA Study Area and Zone of Theoretical Visibility (ZTV) with Landscape Designations and National Routes.

25 Scottish Natural Heritage (now NatureScot) (2017) Visual representation of wind farms: Guidance. Version 2.2. (Online). Available at: <https://www.nature.scot/doc/visual-representation-wind-farms-guidance> (Accessed January 2026)

26 Landscape Institute (2019) Technical Guidance Note 06/19 Visual Representation of Development Proposals. (Online). Available at: <https://www.landscapeinstitute.org/visualisation/> (Accessed January 2026)

27 NatureScot (2021) Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments. (Online). Available at: <https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments#Introduction+and+scope+of+this+guidance> (Accessed January 2026)

28 Landscape Institute (2019) Technical Guidance Note 2/19 - Residential Visual Amenity Assessment. (Online). Available at: <https://www.landscapeinstitute.org/technical-resource/rvaa/> (Accessed January 2026)

29 Landscape Institute (2020) Technical Information Note 04/2020 – Infrastructure. (Online). Available at: <https://www.landscapeinstitute.org/news/infrastructure-guidance-updated/> (Accessed January 2026)

30 Landscape Institute (2021) Technical Guidance Note 02/21 - Assessing landscape value outside national designations. (Online). Available at: <https://www.landscapeinstitute.org/publication/tgn-02-21-assessing-landscape-value-outside-national-designations/> (Accessed January 2026)

31 NatureScot (2025) Special Landscape Qualities - Guidance on assessing effects. (Online). Available at: <https://www.nature.scot/doc/special-landscape-qualities-guidance-assessing-effects> (Accessed January 2026)

32 NatureScot (2024) Guidance on Aviation Lighting Impact Assessment. (Online). Available at: <https://www.nature.scot/doc/guidance-aviation-lighting-impact-assessment> (Accessed January 2026)

33 Design Commission for Wales (2023) Designing for Renewable Energy in Wales. (Online). Available at: <https://www.gov.wales/sites/default/files/publications/2023-12/designing-for-renewable-energy-in-wales.pdf> (Accessed January 2026)

34 Planning Inspectorate (2025) Nationally Significant Infrastructure: Advice on Cumulative Effects Assessment (Online). Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment#stage-1-establishing-the-long-list-of-other-existing-and-or-approved-development> (Accessed January 2026)

Preliminary LVIA Study Area

- 5.2.7. A LVIA Study Area of 27km from each of the turbine locations within the Glanllynfi Garth Wind Farm Development Site (refer to Chapter 2: The Proposed Development) has been defined in accordance with NRW's GN46²⁴. This Guidance Note advises that the LVIA Study Area for structures of 176m to 225m should extend to 24km to 28km, and include all other known, existing and consented wind energy developments and applications within this area. The maximum height of the Proposed Development turbines is 180m to blade tip.

Zone of Theoretical Visibility

- 5.2.8. Analysis of the preliminary blade tip Zone of Theoretical Visibility (ZTV) mapping is used to assist the refinement of the Proposed Development and further define the scope of the LVIA. A preliminary ZTV has been generated to inform the Scoping Report and facilitate initial viewpoint selection. This Preliminary ZTV is shown in **Figure 5.1b** (with more detailed background mapping in **Figure 5.1c**) and has been calculated using ReSoft WindFarm computer software. The Digital Terrain Model (DTM) used as part of the ZTV calculation does not take account of built development or vegetation. As these elements can significantly reduce the extent of actual visibility, the ZTVs therefore represent the maximum theoretical visibility of the Proposed Development. As such, the ZTVs are likely to over-estimate the extent of areas from which views of the Proposed Development may be available to visual receptors within their communities, engaged in outdoor recreation or travelling on roads in the LVIA Study Area. The ZTVs therefore provide a starting point in the assessment process.

Current Baseline Conditions

The Site and Immediate Area

- 5.2.9. The Proposed Development would take place over two parcels of land, the location of which is identified below:
- Northern Array (Pwll-yr-Lwrch) – Approximate Central Grid Reference SS 87102 92887; and
 - Southern Array (Cynhordy) – Approximate Central Grid Reference SS 88988 89854.
- 5.2.10. As illustrated in **Figure 5.1a**, the Northern Array is located on the upper slopes of Mynydd Pwll-yr-Lwrch, at elevations of approximately 390m - 410m Above Ordnance Datum (AOD) whilst the Southern Array is located on the slopes of Moel Cynhordy at elevations of approximately 290m – 345m AOD. The land parcels comprise a mix of semi-improved grassland, marshy grassland and heathland. The Nant Cwmdy valley is located between the two land parcels with coniferous forests located towards the upper parts of the valley and deciduous woodland in the southern part of the valley. There are also extensive coniferous forests to the north (Caerau Forest) and east (Garw Forest) of the Development Site. To the west lies the Llynfi Valley in which the town of Maesteg is located and to the east, the Garw Valley where the villages of Blaengarw and Pontycymer are located.
- 5.2.11. Access to the Development Site would be achieved via existing access tracks which serve the operational Pen y Cymoedd Wind Farm and Llynfi Afan Wind Farm. Starting north at the A4061, the access tracks travel south through Pen y Cymoedd Wind Farm, then cross the A4107 and travel through the Llynfi Afan Wind Farm. The Proposed Development may require the access tracks to be upgraded.
- 5.2.12. With regard to Public Rights of Way (PRoW), footpath MAE/4/2 adjoins the eastern boundary of the Northern Array and footpath MAE/59/1 crosses the northwestern corner of the Northern Array. Within the Southern Array, bridleway GWV/30/1 traverses the western part of the land parcel and

Footpath GWV/29/1 crosses the southeastern part of the Southern Array and continues along the boundary. Footpath GWV/36/2 also runs along the northwestern part of the Southern Array.

- 5.2.13. There are no residential properties within the Development Site boundary however there are several residential properties within close proximity to the two land parcels. The nearest settlement is Maesteg, the outskirts of which are approximately 1km to the west of the Northern Array and 1.5km west of the Southern Array.

Landscape Baseline

- 5.2.14. The site falls partially within a Pre-Assessed Area (PAA) for Wind Energy (Area 9) as defined in Future Wales: The National Plan 2040¹³. Policy 17 of Future Wales: The National Plan 2040¹³ states that in PAAs for wind energy, the Welsh Government has already modelled the likely impact on the landscape and considers them to be capable of accommodating development in an acceptable way.
- 5.2.15. With regard to landscape character, at a national level, the Development Site lies within the South Wales Valleys National Landscape Character Area (NLCA) 37, the key characteristics of which are described as follows:
- *“Extensive Upland plateaux – typically wild and windswept, often with unenclosed tracts, running roughly north-south as ‘fingers’ parallel between intervening deep valleys;*
 - *Numerous steep-sided valleys - typically aligned in parallel, flowing in southerly directions, shaped by southward flowing glaciers, leaving behind distinctive corrie ('cwm') and crag features. Major rivers include the Tawe, Taff and Rhymney;*
 - *Ribbon urban and industrial areas in valleys – in places extending up valley sides and to valley heads. The area is sometimes regarded as being part of a ‘city region’. Middle and eastern valleys tend to be the most heavily and continuously developed, e.g., Rhondda Valley. The uplands by comparison have little or no settlement;*
 - *Extensive remains of heavy industry – with a mix of derelict, preserved and largely redeveloped areas, notably for coal mining. Preserved as heritage (World heritage Site) at Blaenavon this typically includes old railway alignments, buildings and former tips;*
 - *Contrast of urban valley activity next to quiet uplands – e.g. busy roads, new developments, traffic noise, night lighting, verses the adjacent wilder, remoter, quieter uplands;*
 - *Large blocks of coniferous plantation and deciduous woodland fringes – covering many steep hillsides and hilltops, most notably in the middle to western portion of the area, providing a softer contemporary landscape where there was once industry;*
 - *Heather, rough grassland and steep bracken slopes – dominate many plateaux and are grazed mainly by sheep. Much is common land;*
 - *Improved pastures on some lower valley sides - grazed by sheep and some dairy cattle;*
 - *Field boundaries - dry stone walls mark the boundary of common land while fields on lower slopes are bounded by dense hawthorn hedges, interspersed with swathes of broadleaved woodland;*
 - *Transport routes restricted to valleys – the intervening topography makes valley to valley travel difficult, except at heads and bottoms of valleys. Occasionally there are roads that climb steeply over passes with dramatic views and ‘hair pin’ bends;*

- *Iconic cultural identity – many popular images of a tough, rugby-playing, religious, radically-minded society still remain associated with the South Wales Valleys, however today's post-industrial, internet-connected reality is somewhat different.*³⁵

5.2.16. With respect to LANDMAP, the Development Site is located in the following host aspect areas:

- Geological Landscape Aspect Areas – CYNONGL035 U Llynfi valley, CYNONGL034 U Garw valley and CYNONGL039 L Llynfi valley;
- Landscape Habitats Aspect Areas – CYNONLH004 and CYNONLH012;
- Visual and Sensory Aspect Areas – CYNONVS811 Garth Hill and CYNONVS813 Garw and Caerau Forest;
- Historic Landscape Aspect Areas – CYNONHL224 H04 Mynydd Caerau and Garw Forest and CYNONHL581 H03 Llynfi Valley Agricultural; and
- Cultural Landscape Services Aspect Areas – CYNONCLS099 Garth Hill and CYNONCLS100 Garw and Caerau Forest.

5.2.17. GN46²⁴ specifically cross references LVIA using LANDMAP data to the concept of landscape value as identified and defined in GLVIA3²². In accordance with GN46, aspect areas for all five aspect layers will be included within the landscape assessment. The selection of which individual aspect areas to included will again be guided by GN46, which specifies processes for 'filtering' the five different types of aspect area.

5.2.18. The Development Site does not lie within any nationally designated landscape, although the Bannau Brycheiniog (Brecon Beacons) National Park (BBNP) is located approximately 15km (at its closest point) to the north as illustrated in **Figure 5.1d**. The Gower National Landscape lies close to the edge of the Study Area, approximately 23km (at its closest point) to the west of the Development Site. The Glamorgan Heritage Coast lies approximately 12km (at its closest point) to the south/ southeast of the Development Site.

5.2.19. The Development Site does not lie within any locally designated landscapes. There are a number of SLAs within the Study Area as evidenced in **Figure 5.1d**, the closest being SLA 10 Foel y Dyffryn to the north west of the Proposed Development, SLA 91 Mynydd Gelli to the north, SLA 11 Northern Uplands to the east, SLA 17 Western Uplands to the southwest and SLA 90 Margam to the west of the Development Site.

Visual Baseline

5.2.20. Visual receptors can be broadly sub-divided into three categories:

- Those who live in the LVIA study area i.e. people within their communities;
- Those who undertake outdoor recreational activities at locations or along routes through the LVIA study area i.e. recreational visual receptors; and
- Those who travel through the LVIA study area i.e. transport visual receptors.

5.2.21. The baseline distribution of these categories of visual receptors will be set out within the Environmental Statement.

³⁵ Natural Resources Wales (2014) NLCA37 South Wales Valleys (Online). Available at: <https://naturalresources.wales/evidence-and-data/maps/nlca/?lang=en> (Accessed January 2026)

Future Baseline Conditions

- 5.2.22. It is likely that the future baseline will alter in the short to medium term as a result of the recent increase in renewable energy applications in south-east Wales. Wind energy developments that are relevant to the cumulative assessment, and their location, will be identified as part of the EIA process.
- 5.2.23. In the long term there is potential for large-scale changes in agricultural practices in response to national or international agricultural and environmental policy. The long-term continuation of the decline of 'family' farms and the amalgamation of farm units into fewer, more intensively managed farm businesses could gradually lead to changes such as amalgamation of fields and the introduction of larger scale, less vernacular agricultural buildings. Should livestock farming continue to decline it is likely there would be a commensurate long-term decline in the management of field boundaries and a subsequent decline in the strength of field patterns, especially on more marginal elevated areas.
- 5.2.24. The UK climate is changing, and climate models indicate that this rate of change could accelerate. The predicted future baseline will alter in response to future climate change, such as, higher temperatures and changes to rainfall patterns and intensity. Many of these changes will, at least initially, be subtle, for example extended growing seasons for certain crops. The following changes with a high likelihood of occurrence could directly or indirectly affect landscape character or levels of visibility:
- Warmer summers and an associated longer growing season potentially affecting the range of crops that can be grown;
 - Wetter winters with consequent local flooding;
 - Decreases in soil moisture in summer and autumn and associated increased potential for drought stress on vegetation, such as hedgerows and hedgerow trees; and
 - Increased levels of tree loss, especially of more mature trees, due to the anticipated increase in the incidences and severity of winter storms and the increased incidence of diseases affecting specific tree species such as chalara for ash trees.

THE SCOPE OF THE ASSESSMENT

- 5.2.25. The methodology, scope of landscape and visual receptors, together with a list of viewpoints representative of the visual receptors is set out below for agreement with the relevant consultees.

Potential Receptors

Zone of Theoretical Visibility and Viewpoint Analysis

- 5.2.26. **Figure 5.1b** (with more detailed background mapping in **Figure 5.1c**) shows a preliminary ZTV that has been calculated based on an indicative layout consisting of up to eight turbines, each with a maximum blade tip height of 180m above ground level (AGL).
- 5.2.27. The proposed photographic viewpoint locations, which are also shown on **Figures 5.1b-d**, are provided from which photomontage visualisations will be prepared to support the LVIA. For the avoidance of doubt, visual and landscape receptors located outside the coloured areas of the ZTV would have no view of any of the proposed turbines (or any other component of the proposed development) and landscape and visual receptors within these areas are consequently scoped out of the LVIA.

Confirmation of Cumulative LVIA Study Area

- 5.2.28. A review has been undertaken of SNH guidance²⁷ on cumulative assessment, GN46²⁴ and information on existing, consented and proposed wind farms within the LVIA search area. A CLVIA study area of 27km radius is considered fit for purpose, being sufficient to assess all potential significant cumulative landscape and visual effects.
- 5.2.29. SNH Guidance recommends that micro-generation turbines (25-50m) within 5km only need to be included if they consist of three or more turbines. In line with SNH guidance all single turbines beyond 10km are also excluded. Despite the uncertainty of their attaining operational status, wind farms at scoping stage will be included if they exhibit high potential to alter the landscape and visual baseline into which the Proposed Development would be introduced or have reached Pre-Application Consultation (PAC) stage with a Draft ES completed.

Viewpoint Selection and Visualisations

- 5.2.30. A preliminary list of LVIA viewpoints (to be refined through fieldwork and consultation) has been identified and is set out in **Table 5-2**. The locations of viewpoints are illustrated in **Figures 5.1b-d**.

Table 5-2 - Proposed LVIA Viewpoints

Viewpoint No	Viewpoint	Co-ordinates	Viewpoint Typology (GLVIA3)/ Principal Receptor(s)	Rationale
1	Maesteg School and National Cycle Route (NCR) 885	285764, 191556	Representative – Residential, community and recreational receptors.	Representative of the views available to users of the NCR 885, footpath users and visitors to the adjacent Maesteg School on the eastern extents of Maesteg. There are also some nearby residential receptors within the settlement. A night-time photograph is proposed from this viewpoint.
2	Tudor Estate, Caerau	285243, 194115	Representative – Residential receptors	Representative of the views available to nearby residential receptors located within Caerau village to the north of Maesteg.
3	Heol Faen, Garth	286504, 190586	Representative – Residential and recreational receptors	Representative of the views available to nearby residential receptors located within Garth village to the east of Maesteg, recreational receptors visiting the small green and road users.
4	Maesteg Welfare Park	284718, 191746	Representative – Residential and recreational receptors	Representative of the views available to nearby residential receptors located within the western part of Maesteg and recreational receptors visiting Maesteg Welfare Park.
5	Heol Cynan, Llangynwyd	286601, 188682	Representative – Residential and recreational receptors and residential motorists	Representative of the views available to nearby residential receptors located within Llangynwyd village (south of Maesteg), recreational receptors visiting the small public open space and equipped play area and residential road users.
6	Pen-y-Foel Hill Summit	291877, 189551	Representative – Recreational receptors	Representative of the views available to walkers on open access land on the summit of Pen-y-Foel located to the east/ southeast of the Proposed Development and within the Northern Uplands SLA.
7	Y Wern, Betws	290102, 187168	Representative – Residential and recreational receptors	Representative of the views available to nearby residential receptors located within Betws village (south of the Proposed Development), recreational receptors visiting the small public open space and equipped play area and residential road users.

Viewpoint No	Viewpoint	Co-ordinates	Viewpoint Typology (GLVIA3)/ Principal Receptor(s)	Rationale
8	Mynydd Llangeinwyr Summit	291945, 193319	Representative – Recreational receptors	Representative of the views available to walkers on open access land on the summit of Mynydd Llangeinwyr located to the east/ northeast of the Proposed Development and within the Northern Uplands SLA.
9	Bryn Park	281332, 192438	Representative – Recreational receptors.	Representative of the views available to visitors to Bryn Park, Bryn Cricket Club and Bryn Welfare Bowls Club. Located to the north of Bryn village. A night-time photograph is proposed from this viewpoint.
10	Bryncwils Road, Sarn	290468, 183605	Representative – Residential receptors and recreational receptors.	Representative of the views available to some residents within Sarn village. The viewpoint also lies adjacent to a small green.
11	Gwelfor, Cefn Cribwr	285162, 182789	Representative – Residential receptors and recreational receptors.	Representative of the views available to some residents within Cefn Cribwr village. The viewpoint also lies adjacent to a small green. A night-time photograph is proposed from this viewpoint.
12	Public open space, south of Brynna Road, Brynbryddan	277501, 192477	Representative – Residential receptors and recreational receptors.	Representative of the views available to nearby residential receptors located within Brynbryddan village (west of the Proposed Development), recreational receptors visiting the public open space and equipped play area and residential road users
13	Wales Coast Path, Ogmore-by-Sea	286213, 175438	Representative – recreational receptors.	Representative of the views available to walkers along the Wales Coast Path and open access land. The viewpoint is located within the Glamorgan Heritage Coast.
14	Clyne Gardens	261202, 190516	Specific – recreational receptors.	Located within the Gower National Landscape and within the Clyne Castle Registered Park and Garden. This viewpoint is from a Significant View identified within the Clyne Castle Registered Park and Garden and is representative of views of visitors to the publicly accessible Clyne Gardens.

Viewpoint No	Viewpoint	Co-ordinates	Viewpoint Typology (GLVIA3)/ Principal Receptor(s)	Rationale
15	Craig Derlwyn, Bannau Brycheiniog National Park	271810, 215382	Representative – recreational receptors.	Representative of views available to walkers visiting the Bannau Brycheiniog National Park.

5.2.31. Due to project timescales and in order to obtain viewpoint photography which represents the maximum visibility scenario in accordance with TGN 06-19²⁶ and GLVIA3²², the viewpoint photography will be undertaken during the winter months (February/Early March 2026). Three night-time viewpoints have also been included in **Table 5-2** (Viewpoints 1, 9 and 11) and night-time photography will be undertaken in accordance with the Guidance on Aviation Lighting Impact Assessment³². Consultees should note that should alternative/ additional viewpoint locations be recommended as part of their response to the Scoping Report, then the photography would likely be undertaken outside of the optimum period for photography whilst trees are in leaf.

5.2.32. Visualisations would be prepared for each viewpoint to accord with SNH guidance²⁵ and include 90° (cylindrical projection) baseline photographs and wirelines (including cumulative wirelines where relevant), and 53.5° (planar projection) photomontages and wirelines.

Potential Receptors

5.2.33. Landscape and visual receptors within the LVIA Study Area most likely to be significantly affected tend to be those which are of higher sensitivity, located closest to the Proposed Development and incurring a direct and/ or higher magnitude of change or level of effect. Viewpoint analysis, which includes an assessment of receptor sensitivity and likely magnitude of change, together with the field survey, will be used as part of the assessment to identify those receptors which are most likely to be significantly affected.

Likely Significant Effects

5.2.34. The likely significant effects that will be taken forward for assessment in the Environmental Statement are summarised below:

- Direct landscape effects on host local landscape character in relation to construction and operation and indirect effects related to visibility of turbines (and proposed grid connection for the host and closest landscape receptors) in relation to:
- National landscape designations: the Special Qualities (SQs) of the BBNP with the following SQs scoped into the LVIA as they relate to visual and perceptual aspects of the BBNP: Special Landscapes: Sweeping grandeur and outstanding natural beauty, Special Landscapes: Contrasting patterns, colours, and textures, Special Experiences: Sounds, sights, smells and tastes, and Special Experiences: Peace, tranquillity and dark skies³⁶.
- National landscape designations: the SQs of the Gower National Landscape, with the following SQs scoped into the LVIA as they relate to visual and perceptual aspects: Landscape, Seascape and Tranquillity³⁷;
- Local landscape designations (SLAs);
- LANDMAP Aspect Areas, as derived from the filtering process set out in GN46²⁴ and where more than 20% of their area falls within the blade tip ZTV.
- Effects on views and visual amenity resulting from visibility of the proposed site preparation and associated infrastructure construction activities within ~2km distance to include for views from tops of adjacent summits and ridgelines, subject to detailed viewpoint analysis.
- Effects on views and visual amenity resulting from visibility and movement of the proposed wind turbines (and proposed grid connection on wooden poles where visible) within a distance of approximately 10km from the proposed turbines. This distance may vary and will be subject to a review of ZTVs and detailed viewpoint analysis as set out in paragraph 5.2.35.

5.2.35. Landscape and visual receptors that would not be significantly affected in the context of the EIA Regulations as a result of the characteristics of the LVIA study area, the distribution of baseline receptors and the characteristics of the Proposed Development, are scoped out from further assessment in the ES. It is proposed that the inclusion or exclusion of receptors from the assessment also be re-scoped following the viewpoint analysis undertaken as part of the LVIA, which will be used to identify a conservative distance or 'threshold' within which significant effects are likely to be sustained. Based on the height of the proposed turbines and experience of other wind farm developments in South Wales, this is anticipated to be a distance of approximately 10km from the proposed turbines but will be confirmed as part of the LVIA.

5.2.36. Landscape and visual receptors that are proposed to be scoped out from further assessment as follows:

- All landscape and visual receptors within the LVIA Study Areas that are outwith the blade tip ZTV would have no view of the Proposed Development and are scoped out.

³⁶ Bannau Brycheiniog National Park Authority (2023) Y Bannau The Future. The Management Plan for Bannau Brycheiniog National Park 2023-2028. (online).

Available at: <https://future.bannau.wales> (Accessed January 2026)

³⁷ Swansea Council (2017) Gower Area of Outstanding Natural Beauty Management Plan 2017. (online). Available at:

<https://www.swansea.gov.uk/article/9104/Gower---managed-in-partnership> (Accessed January 2026)

- Assessment of effects on the BBNP SQs that relate to physical characteristics or those relating to culture and the community, with the following SQs scoped out of the LVIA: Special Communities: An intimate sense of community, Special Communities: A Sense of place and cultural identity, Special Experiences: Enjoyable and accessible, Special Experiences: Sense of discovery, Special Nature: Mosaic of Diversity and Special Nature: Living Landscape.
- Assessment of effects on the Gower National Landscape SQs that relate to physical characteristics or those relating to culture and the community, with the following SQs scoped out of the LVIA: Biodiversity, Geology, Archaeology, Historic Landscapes, Historic Parks and Gardens, Historic Buildings and Conservation Areas, Air Quality, Water Quality, Soil Quality, Public Rights of Way, Access Land and Beaches.
- National Landscape Character Areas. Whilst NLCAs provide landscape context, they are too extensive and generalised to potentially experience significant landscape effects. This approach is advocated by paragraph 5.14 of GLVIA3²² and the smaller landscape character units, as represented by the LANDMAP Aspect Areas are to be taken forward as receptors in the LVIA.
- All LANDMAP Aspect Areas that do not fulfil the criteria set out in GN46²⁴ and where less than 20% of their area falls within the blade tip ZTV will be scoped out of the LVIA.
- Local/ regional receptors beyond 10km distance from the Proposed Development, subject to confirmation of the distance via viewpoint analysis, will be scoped out. This will include local landscape designations, LANDMAP Aspect Areas and all visual receptors, with the exception of users of the Wales Coast Path which is a nationally promoted route.
- All decommissioning activities.
- Registered Landscapes of Historic Interest (including the Margam Mountain and The Rhondda Registered Landscapes of Special Interest). An assessment of effects on Registered Landscapes of Historic Interest will be undertaken by a cultural heritage or historic environment specialist where significant effects are likely to occur (and as agreed through consultation with Cadw). This aligns with the advice provided in paragraph 5.11 of GLVIA3²². As such, an assessment of the effects on Registered Landscapes of Historic Interest is scoped out of the LVIA.
- Cumulative Assessment:
 - Limit the cumulative baseline of all operational and consented wind energy development and other applications for wind energy development to within 27km of the Proposal Development Site;
 - Micro-generation turbines (25-50 m) that are located more than 5km from the Development Site, with those within 5km only to be included if they consist of three or more turbines;
 - Single turbine wind energy developments that are located more than 10km from the Development Site;
 - Scoping stage wind energy developments will be excluded unless they exhibit high potential to alter the landscape and visual baseline into which the Proposed Development would be introduced.

ASSESSMENT METHODOLOGY

5.2.37. A summary of the proposed landscape, visual, Night-time Lighting Assessment and RVAA methodology is set out below with the full methodology in **Appendix B**.

Assessment of Landscape Effects

5.2.38. Landscape Effects are defined by the Landscape Institute in GLVIA3²², paragraphs 5.1 and 5.2 as follows:

“An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner.”

5.2.39. The potential landscape effects occurring during the construction and operational periods may therefore include, but are not restricted to, the following:

- Changes to landscape elements: the addition of new elements (wind turbines) or the removal of existing elements such as trees, vegetation and buildings and other characteristic elements of the landscape character type;
- Changes to landscape qualities: degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of landscape character types/ areas or contribute to the landscape value;
- Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the addition of new features, the magnitude of which is sufficient to alter the overall landscape character within a particular area;
- Changes to designated landscapes: Including nationally and locally designated landscapes that would affect the special landscape qualities underpinning these areas and their integrity; and
- Cumulative landscape effects: where more than one wind farm may lead to a potential landscape effect.

5.2.40. Development may have a direct effect on the landscape as well as an indirect effect which would be perceived from the wider landscape, outside the immediate site area and its associated landscape character/ designation. Landscape effects also have to be recognised in terms of natural and man- made processes which can change or alter the landscape over time.

Assessment of Visual Effects

5.2.41. Visual Effects are concerned wholly with the effect of the development on views, and the general visual amenity, and are defined by the Landscape Institute in GLVIA3²², paragraph 6.1 as follows:

“An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views.”

5.2.42. Visual effects are identified for different receptors (people) who would experience the view(s) at their places of residence, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:

- Visual effect: a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view(s); and
- Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.

5.2.43. The level of visual effect (and whether this is significant) is determined through consideration of the sensitivity of each visual receptor (or range of sensitivities for receptor groups) and the magnitude

of change that would be brought about by the construction and operation of the Proposed Development.

Cumulative Landscape and Visual Impact Assessment

- 5.2.44. The assessment of cumulative effects is essentially the same as for the assessment of the ‘solus’ landscape and visual effects, in that the level of landscape and visual effect is determined by assessing the sensitivity of the landscape or visual receptor and the magnitude of change. Cumulative assessment however considers the magnitude of change posed by multiple developments.
- 5.2.45. The cumulative assessment would accord with NatureScot guidance²⁷ and will be prepared to ensure that, as well as the effects of the Proposed Development (LVIA), the ‘additional’ cumulative effects and the ‘combined’ cumulative effects (CLVIA) are also reported to account for two cumulative Scenarios as follows:
- **Proposed Development:**
Assessed on an individual basis (the LVIA). This part of the assessment may take account of other existing forms of wind farm development that may be present in the landscape, whilst recognising that their influence on landscape character is likely to be time limited. It does not consider the additional or combined cumulative effects and only reports of the effect of the Proposed Development alone;
 - **Scenario 1: Existing + Consented + the Proposed Development:**
The additional and combined cumulative effects of the existing and consented wind energy developments with the Proposed Development will be assessed.
 - **Scenario 2: Existing + Consented + Applications + Scoping Schemes + the Proposed Development:**
The additional and combined cumulative effects of the existing and consented wind energy developments, live applications (which would include schemes at planning appeal) and those at Scoping (where there is a high potential to alter the landscape and visual baseline into which the Proposed Development would be introduced or have reached Pre-Application Consultation (PAC) stage with a Draft ES completed), with the Proposed Development will be assessed.
- 5.2.46. In addition, the cumulative assessment takes account of the timescales, as far as practicable, for the operation of the existing and consented developments and assumes that these will be decommissioned within the operational life of the Proposed Development.

Determining the Significance of Effects

- 5.2.47. The level of landscape and visual effect (and whether this is significant) is determined by assessing the sensitivity of the landscape or visual receptor and the magnitude of change likely to be brought about by the proposed Glanllynfi Garth Wind Farm. The time limited period for the assessment would cover the construction of the wind farm and its operation for a period of 30 years. The assessment process would reflect any iterative design mitigation measures adopted to reduce or ‘design out’ landscape and visual impacts throughout the operation period.
- 5.2.48. In accordance with the relevant EIA Regulations, it is important to determine whether the predicted effects are likely to be significant. Significant landscape and visual effects are highlighted in bold in the text and in most cases, relate to all those effects that result in a ‘Substantial’ or a ‘Substantial / Moderate’ effect as indicated in **Table 5-3**. In some circumstances, ‘Moderate’ levels of effect also have the potential, subject to the assessor’s opinion, to be considered as significant and these exceptions are also highlighted in bold and explained as part of the assessment, where they occur.

- 5.2.49. The type of effect is also considered and may be direct or indirect; temporary or permanent (reversible); cumulative; and positive, neutral or negative. The assessment unavoidably involves a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

Table 5-3 - Evaluation of landscape and visual effects

		Landscape and Visual Sensitivity			
		High	Medium	Low	Very Low
Magnitude of Change	Very High	Major (Significant)	Major (Significant)	Major/Moderate (Significant)	Moderate (Potentially Significant)
	High	Major (Significant)	Major/Moderate (Significant)	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)
	Medium	Major/Moderate (Significant)	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)
	Low	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)
	Very Low	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)
	Zero	None / No View			

- 5.2.50. In accordance with the emphasis placed in GLVIA3²² upon application of professional judgement, the adoption of an overly mechanistic approach through reliance upon a matrix as presented in **Table 5-3** will be avoided. This will be achieved by the provision of clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape and visual receptor over and above the outline assessment provided by use of the matrix. Matrices for landscape and visual effects will be provided as a summary in support of the narrative explanations. Wherever possible cross references will be made to baseline figures and/or to photomontage visualisations to support the rationale.

Residential Visual Amenity Assessment

- 5.2.51. Residential amenity is a planning matter that involves a wide number of effects (such as noise and shadow flicker) and benefits, of which residential visual amenity is just one component. A Residential Visual Amenity Assessment (RVAA) will be undertaken to assess effects on residential visual amenity likely to be experienced at residential properties within 2km of the proposed turbines. The RVAA will be undertaken in accordance with the approach set out in the Landscape Institute's Residential Visual Amenity Assessment: Technical Guidance Note 2/19²⁸.
- 5.2.52. The visual effects on the views from each property/group of properties included in the assessment will be illustrated by a wireline visualisation.

Night-time Lighting Assessment

- 5.2.53. Aviation warning lights attached to turbine hubs and towers are required on all proposed wind turbines ≥150m in accordance with Article 222 of the UK Air Navigation Order (ANO) 2016, subject

to any proposed lighting mitigation strategy. A proportionate Night-time Assessment of the proposed aviation lighting will be undertaken in accordance with NatureScot guidance³². The assessment will be supported by maps indicating the ZTV of any proposed aviation warning lights and baseline photography, wirelines and photomontages from 3 No. (three) Night-time Viewpoints. However, in accordance with NatureScot guidance³², all viewpoints will have the lit turbines noted on the wirelines.

- 5.2.54. A night-time ZTV of the turbine lighting positions would accompany the visualisations to aid the assessment which will be dependent on a Lighting Strategy to be agreed with the CAA. The extent of the night-time study area is likely to be restricted to 10-15km from the outer turbine positions according to the technical criteria of the proposed candidate light fixtures.

Assumptions

- 5.2.55. The LVIA scoping chapter has been drafted on the overarching assumption that a 'reasonable worst-case' scenario is adopted which accords with the approach required under GLVIA3²². An example is the assumption that receptors present at the more distant viewpoints benefit from optimal weather conditions that would facilitate views be available for the required distance to the Proposed Development. Similarly, it is assumed that PRowWs and Access Land identified on Ordnance Survey maps are present on the ground and/or can be readily accessed by recreational receptors (and the LVIA assessors).

5.3 HISTORIC ENVIRONMENT

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.3.1. The historic environment chapter of the ES will consider the potential likely significant effects on historic assets that may arise from the construction and operation and decommissioning of the Proposed Development, including cumulative impacts from other relevant developments in the area.
- 5.3.2. **Table 5-4** lists the planning policy that is relevant to the historic environment and sets out the implications for the scope of the EIA.

Table 5-4 – planning policy relevant to the historic environment assessment

Policy	Policy Context
Planning policy	
Future Wales: The National Plan 2040 (February 2021)	Policy 18 – states that DNS scale renewable energy developments will be permitted provided there are no unacceptable adverse impacts on statutorily protected built heritage assets. Policy 35 – 'Valleys Regional Park' is relevant to south-east Wales. "The Welsh Government supports the establishment of the Valleys Regional Park. Strategic and Local Development Plans should embed its principles into their planning frameworks. The Welsh Government will work with local authorities, the third sector and key partners to support the Valleys Regional Park and maximise opportunities for new development." "The Welsh Government, communities and partners have developed a positive framework through 'Our Valleys, Our Future' to drive change and regeneration. The Valleys Regional Park seeks to maximise the social, economic and environmental potential of the Valleys' natural and cultural

Policy	Policy Context
	historic assets and it is important the planning system supports its delivery.”
Planning Policy Wales, Edition 12 (2024)	National planning policy for Wales is set out in Planning Policy Wales (Edition 12, 2024) (PPW). Chapter 6, ‘Distinctive and Natural Places’, explains how 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 of present and future generations. It also sets out the planning policies for the sustainable management of specific categories of historic assets.
Local planning policy	
The Bridgend County Borough Council Local Development Plan 2018-2033 (adopted on 13 March 2024). Specific local planning policy relevant to heritage is contained within Policy SP 18: Conservation of the Historic Environment (Local Development Plan, 2024).	SP18: Conservation of the Historic Environment Development proposals must protect, conserve, and, where appropriate, preserve and enhance the significance of historic assets, including their settings. In particular, there is a general presumption in favour of the preservation or enhancement of the significance of historic assets and their settings including: World Heritage Sites; Scheduled Monuments; Archaeologically Sensitive Areas and Archaeological Remains; Listed Buildings; Conservation Areas; Historic Parks and Gardens and Historic Landscapes.
Rhondda Cynon Taf County Borough Council (RCTBC) Local Development Plan 2006 – 2021 (adopted March 2011) Specifically local planning policy relevant to heritage is contained within Policy AW7: Protection and Enhancement of the Built Environment	AW7: Development proposals which impact upon sites of architectural and / or historical merit and sites of archaeological importance will only be permitted where it can be demonstrated that the proposal would preserve or enhance the character and appearance of the site. Development proposals which affect areas of public open space, allotments, public rights of way, bridleways and cycle tracks will only be permitted where it can be demonstrated that: 1. There is a surplus of such facilities in the locality; or 2. The loss can be replaced with an equivalent or greater provision in the immediate locality; or 3. The development enhances the existing facility
Neath Port Talbot County Borough Council (NPTCBC) Local Development Plan 2011-2026 (adopted January 2016) Specifically local planning policy relevant to heritage is contained within Strategic Policy SP21 Built Environment and Historic Heritage	SP21: The built environment and historic heritage will, where appropriate, be conserved and enhanced through the following measures: 1. Encouraging high quality design standards in all development proposals; 2. Protecting arterial gateways from intrusive and inappropriate development; 3. Safeguarding features of historic and cultural importance; 4. The identification of the following designated sites to enable their protection and where appropriate enhancement: (a) Landscapes of Historic Interest; (b) Historic Parks and Gardens; (c) Conservation Areas; (d) Scheduled Ancient Monuments; and

Policy	Policy Context
	(e) Listed Buildings and their curtilage.

Legislation

- 5.3.3. Historic assets that are deemed to be of particular importance are given legal protection through legislation. The primary legislation relating to the historic environment is:
- The Historic Environment (Wales) Act 2023 which provides for the protection of monuments, buildings and conservation areas. This Act now includes a range of legal protections and legislative guidelines for the historic environment, such as provisions for archaeological sites, listed buildings, and conservation areas.

Technical Guidance

- 5.3.4. The following technical guidance is considered to be relevant to the Historic Environment assessment:
- Technical Advice Note 24: The Historic Environment;
 - Cadw Heritage Impact Assessment in Wales;
 - Cadw Setting of Historic Assets in Wales;
 - Cadw Managing Historic Character in Wales;
 - ClfA Standard and Guidance for Historic Desk Based Assessment; and
 - ClfA Standard and Guidance for Stewardship for the Historic Environment.

BASELINE

Data Sources

- 5.3.5. An initial desk-based assessment will be undertaken, comprising publicly available data from the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW), and records held by Cadw, in order to determine the present baseline conditions. Data will be collected for a study area of 1km from the Development Site for non-designated sites and a study area extending out to 5km for designated heritage assets as discussed further below. This study will be reappraised and expanded as necessary as part of the EIA process. The extent of the study area and the assets scoped into the assessment, both within and beyond the 5km study area, will be defined using professional judgement, and informed by the results of the site visits, and utilisation of the Zones of Theoretical Visibility (ZTV).
- 5.3.6. The 5km study area is intended as a guide. Assets beyond this study area will also be included on a case-by-case basis where appropriate, e.g., where such assets are of the highest grades and/or where they contribute to current understanding of the historic environment.
- 5.3.7. Regional Gwent Glamorgan Archaeological Trust (GGAT) (Heneb) Historic Environment Record (HER) data acquired for a site at Pwll Yr Lwrch in 2025—which falls within the Northern Array Development Site—will be reviewed to identify non-designated historic assets in and around the Northern Array. The HER dataset includes information on several different aspects of the historic environment including known surviving assets, records of former structures or sites found through documentary evidence and findspots of artefacts. Due to the range of data included within the GGAT HER these records must be considered not only for their historical value but also for their archaeological potential. Many former assets may have already been entirely removed; findspots may indicate former activity but are not, in themselves, evidence for buried archaeological remains. This consideration also takes into account any former archaeological events that may have

occurred within the study area, for example archaeological monitoring or excavation, the data for which is also provided within the GGAT HER dataset at **Appendix C**.

- 5.3.8. A rapid review of publicly available data on the non-designated assets within and around the Northern and Southern Arrays will be undertaken.

Current Baseline

Designated Historic Assets

- 5.3.9. An initial search has been carried out using the Cadw online mapping search³⁸ and has identified one Scheduled Ancient Monument (SAM) located approximately 30m west of the existing access route and 170m north of the Southern Array – Croes y Bwlchdwyn Round Cairn (Cadw reference number GM250) – dating from the prehistoric period. There are no other designated historic assets within the Development Site or the 1km study area.
- 5.3.10. Between 1km and 5km from the Development Site, there are the following designated historic assets:
- Five Conservation Areas, the closest being Maesteg Town Centre, located 1.6km south-west of the Northern Array, and Llangynwyd, located 2.4km south-west of the Southern Array.
 - There are 20 SAMs. The nearest SAM to the southern array is Round Cairn 567m East of Bryn Defaid (Cadw reference GM249) located c. 1km to the north-west, and c. 15m east of the access route. Maesteg blast furnaces (Cadw reference GM418) is the nearest SAM to the northern array located c. 1.8km to the south-west.
 - There are 128 listed buildings, including one Grade I listed building, the Church of St David, Bettws (Cadw reference number 18626) located c. 2.6km south of the Southern Array, and 11 Grade II* listed buildings:
 - Salem Welsh Baptist Chapel (Cadw reference 18495) c. 1.3km west of the northern array,
 - Iron Bridge over River Llynfi (Cadw reference 11331) c. 1.6km south-west of the northern array,
 - Maesteg Sports Centre, The Cornstores (Cadw reference 11257) c. 1.9km south-west of the northern array,
 - Maesteg Council Offices, with flanking walls and piers (Cadw reference 18499) c. 1.7km south-west of the northern array,
 - Bethania Capel y Bedyddwyr Neillduol (Cadw reference 18493) c. 1.9km south-west of the northern array,
 - Llwydarth farmhouse (Cadw reference 11256) c. 2.4km west of the southern array,
 - Church of St Cynwyd (Cadw reference 11243) c. 2.7km south-west of the southern array,
 - Church of St Cein (Cadw reference 18635) c. 3.1km south-east of the southern array,
 - Calcining Kilns and attached abutment at Tondu Ironworks (Cadw reference 20816) c. 4.8km south of the southern array,
 - Lift Tower at Tondu Ironworks (Cadw reference 20817) c. 4.8km south of the southern array,

³⁸ Cadw <https://cadw.gov.wales/advice-support/cof-cymru/search-cadw-records> accessed: Jan 2026

- Former Blast Engine Houses at Tondu Ironworks (Cadw reference 20763) c. 4.8km south of the southern array.
- Two Grade II Registered Historic Parks and Gardens: Tŷ Goetre Hen (Cadw reference number PGW(Gm)65(BRI) and Bryngarw (Cadw reference number PGW(Gm)6(BRI).
- There are two Registered Historic Landscapes (RHL): Margam Mountain (reference number HLW(WGI/MGI)2) located c. 2.9km south-west of the northern array and The Rhondda (reference number HLW(MGI)5) located c. 4.8km north-east of the northern array.

5.3.11. The existing metalled access road intersects with the SAM Clawdd Mawr, Mynydd Caerau (Cadw reference GM231), an early medieval linear earthwork located c. 2.5km north-east from the Northern Array.

5.3.12. In addition, several SAMs and listed buildings are located within 250m of the access route to the Development Site:

- Croes y Bwlchwyn Round Cairn (Cadw reference GM250) c. 30m west of the access route,
- Round Cairn 567m East of Bryn Defaid (Cadw reference GM249) c. 15m east of the access route,
- Mynydd Caerau Round Cairns (Cadw reference GM232) c. 100m east of the access route,
- Bwlch yr Avan Dyke (Cadw reference GM246) c. 100m east of the access route,
- Crug yr Afan Round Cairn (Cadw reference GM233) c. 250m east of the access route,
- Earthwork 360m NNE of Crug yr Avan (Cadw reference GM278) c. 240m east of the access route,
- Pebyll Ring Cairn (Cadw reference GM330) c.185m south-east of the access route,
- Bachgen Carreg Round Cairn (Cadw reference GM234) c. 15m east of the access route,
- Foel Chwern Round Cairn (Cadw reference GM235) c. 300m south-west of the access route,
- Grade II listed Engine House and Fan House at Tower Colliery (Cadw reference 10901) c. 200m west of the access route,
- Grade II listed Headframe and pithead at Tower Colliery (Cadw reference 10902) c. 230m west of the access route.

5.3.13. The north and central stretch of the access route leading to the A4061 is situated within the western extent of The Rhondda Historic Landscape (HLW (MGI) 5).

5.3.14. All designated historic assets within the 1-5km study area are set out in **Figure 5.2** and listed in **Appendix D**.

Non-designated Historic Assets

5.3.15. As noted in 5.3.7, previous archaeological investigations within the study area that inform our understanding of known non-designated historic assets (specifically buried historic assets) is provided within the GGAT HER dataset at **Appendix C**.

5.3.16. Two non-designated historic assets have been identified within the Northern Array, which are listed in **Table 5-5**. There are 36 HER core and 17 HER events records within a 1km Study Area of the Northern Array, primarily dating to the medieval and post-medieval periods that are reflective of industrial, urban and agricultural/ pastoral activities.

5.3.17. A review of publicly available data on RCAHMW and Archwilio maintained by Heneb revealed one non-designated historic asset (Moel Cynhordy, NRPN 305727) within the Southern Array, which is listed in **Table 5-5**. Known historic assets within the 1km Study Area are limited, including features such as the St Paul's Methodist Chapel (NRPN 9557), built in 1885, and a post-medieval dwelling (NRPN 19755) to the east and 19th century coal workings (NRPN 86990) and a pair of medieval

denuded earthwork house platforms (NRPN 408381) to the west. There are also non-designated historic assets within 250m of the access tracks to the Development Site.

- 5.3.18. Cadw (report number 2013/042) and RCAHMW (NRPN 515481) state that on September 29, 1942, a Supermarine Spitfire Mk Vb BM575 crashed at Lletty Brongu Mountain in Moel Cynhordy, around 900m south-east of the Northern Array (National Grid Reference / NGR: SS 88054 91754). No archaeological remains linked to this aircraft have been found at this site, but they might exist in the vicinity. It is understood that sections of wreckage have been unearthed through successive ploughing and fragments associated with the aircraft have been put up for public auction. Recovered human remains of the pilot killed in the crash, Sgt Norman Hugh 'Scotty' MacKay, were buried in a Commonwealth war grave at St. Hilary of Poitiers Churchyard, Killay (Grave no. 203). Nonetheless, fragmentary skeletal remains may be present within the indicative crash site. The remains of this aircraft may be subject to the Protection of Military Remains Act 1986, which would require a licence from the Ministry of Defence prior to and ground disturbance within the crash site.

Table 5-5 - Non-designated historic assets within the Development Site

HER/ Coflein Ref	Effect	Easting	Northing	Period	Type
Northern Array					
GGAT01491.0m	Llynfi and Ogmere Railway	287500	192500	Post-medieval	Railway
Construction and Operation: Turbine erection and operation.	Parish boundaries, Maesteg	287321	192568	Medieval	Hedge
Southern Array					
NRPN 305727	Moel Cynhordy	289100	189770	Medieval/ Post-medieval	House platforms; field boundaries; ancillary structure

Historic Landscape Character

- 5.3.19. The Registered Historic Landscape of Margam Mountain (HLW(WGI/MGI)2) is located c. 2.9km south-west of the Northern Array and reflects a long continuity of human activity from Bronze Age cairns and Iron Age hillforts to Roman roads and medieval religious sites. The region's military history is reflected in sites like Llangynwyd Castle and Graig Fawr radar station, which contrast with the modern industrial scene of Margam Abbey Steel Works and Port Talbot.
- 5.3.20. A section of the Rhondda Registered Historic Landscape (HLW(MGI)5) lies 4.8km north-east of the Northern Array, while most of it coincides with the access route. Early boundaries were marked by Bronze Age cairns, later replaced by significant Iron Age settlements like Hen Dre'r Mynydd and Maendy Camp, which likely had both administrative and residential roles. Throughout the medieval period, the wider landscape was divided into Welsh territorial units, with boundary markers such as cross-dykes and ridgeways. After the Norman Conquest, southern Glamorgan was annexed, while northern areas remained under Welsh control until the 13th century. Remnants of medieval administration include castle sites and place names, while ecclesiastical oversight was centred in Llantrisant parish. In modern times, the landscape has been transformed by the closure and clearance of industrial sites, with Trehafod now serving as the Rhondda Heritage Centre.

- 5.3.21. Additionally, the Development Site falls within the Llynfi and Garw Uplands and Forestry landscape character area as assessed by the Bridgend County Borough. The key heritage characteristics of the area include:
- Disused spoil tips, mines and quarries on hillsides as evidence of the area's industrial past; and
 - Prehistoric round cairns on hill summits, including nationally important cluster on Mynydd Caerau and further examples within Garw Forest. The remains of a medieval platform house are also found on Garth Hill.
- 5.3.22. Apart from forestry, the landscape of the Development Site is mainly rough moorland used for sheep grazing, with enclosed semi-improved pastures on the lower slopes interspersed with areas of purple moor grass and rush pasture. Large enclosures are defined by fencing or by lines of wind-sculpted trees, giving the area a distinctive open and rugged character.
- 5.3.23. The landscape provides expansive views across the county borough and beyond, with the lower slopes providing distant views of wind turbines.

THE SCOPE OF THE ASSESSMENT

Potential Receptors

- 5.3.24. A high-level review of available historic environment information outlined above indicates that affected receptors may include:
- Designated historic assets within 5km of the Development Site (Scheduled Monuments, Listed Buildings, RHL, Conservation Areas);
 - Non-designated built heritage, including locally buildings within 500m of the Development Site; and
 - Buried non-designated historic assets within the Development Site (i.e. discrete archaeological features, residual artefactual remains, human skeletal remains).
- 5.3.25. The Proposed Development could affect historic environment receptors through:
- Direct disturbance of historic assets;
 - Changes to the settings of historic assets, affecting their significance; and
 - Changes to the historic landscape.

Direct Disturbance

- 5.3.26. Any effects arising from direct disturbance to historic assets would be expected to occur during the construction phase and would be considered permanent and irreversible.
- 5.3.27. Direct disturbance would arise only from the construction of the Proposed Development. Therefore, effects on known historic assets will be considered only where these are located within the footprint of the Proposed Development. Direct effects on historic assets outside the footprint of the Proposed Development will not occur and are scoped out.
- 5.3.28. There is a potential for previously unrecorded historic assets to be directly affected by the Proposed Development. Such effects will be considered with reference to a characterisation of the potential presence of such historic assets developed from an understanding of the historic landscape context, and reference to appropriate cartographic and documentary sources.

Effects on Setting

Changes to Setting

- 5.3.29. The setting of historic assets is defined in Cadw guidance³⁹ as:
- “The setting of a historic asset includes the surroundings in which it is understood, experienced and appreciated, embracing present and past relationships to the surrounding landscape”.*
- 5.3.30. Cadw guidance identifies a staged approach to the assessment of effects on settings, with the first stage being the identification of the historic assets which may be affected. In accordance with guidance, this has been done with reference to the Zones of Theoretical Visibility (ZTV) and also considering:
- The location, size and scale of the Proposed Development; and
 - The location of the identified historic assets.
- 5.3.31. On this basis, designated historic assets within 5km of the Northern and Southern Array boundaries which fall within the initial ZTV will be considered for inclusion in the assessment. At distances of 5-10km only the most sensitive and significant designated historic assets which fall within the initial ZTV and have the potential to be significantly affected will be included. Significant effects in these cases are only likely to occur where the proposed turbines may intervene in specific views that make a substantial contribution to the significance of an asset.
- 5.3.32. As a minimum, the historic assets considered for inclusion within the EIA for an assessment of effects on the settings comprise:
- Listed Buildings within 5km within ZTV;
 - Conservation Areas within 5km within ZTV; and
 - SAMs within 5km within ZTV.
- 5.3.33. As set out in 5.3.39, assets situated within the valley-floor settlement of Maesteg, may be scoped out from further assessment based on the limited visual limited with the Proposed Development due to intervening built environment and/or where the setting of the specific assets are characterised by their relationship with the immediate settlement location.

Historic Landscape

- 5.3.34. The Margam Mountain (HLW(WGI/MGI)2) and The Rhondda (HLW(MGI)5) Registered Historic Landscapes fall within the study area. The ZTV model (WSP 2026) indicates that all proposed turbines would be visible from the Margam Mountain RHL (HLW(WGI/MGI)2) whereas it is probable that only glimpse views of one (1) or two (2) of the turbines, and particularly the upper-most of the turbine blades, may be visible from the Treorchy viewpoint within the Rhondda RHL (HLW(MGI)5).
- 5.3.35. It is judged that an Assessment of Significance of the Impact of Development on Historic Landscape (ASIDOHL) should be prepared in relation to setting-relating changes to the Margam Mountain RHL (HLW(WGI/MGI)2). It will be completed in accordance with relevant guidance⁴⁰.

³⁹ Cadw, 2017. Setting of Historic Assets in Wales

⁴⁰ Cadw. (2007). Guide to Good Practice on using The Register of Landscapes of Historic Interest in Wales in the Planning and Development Process. Available at: https://cadw.gov.wales/sites/default/files/2019-05/LandscapesRegisterGoodPractice_EN_0.pdf (Accessed August 2024).

This will be presented in a separate technical appendix, with the results incorporated into the ES assessment.

- 5.3.36. Given the Development Site's distance, contribution to the character of the RHL, intervening topography, and nature of the Proposed Development it is judged that an ASIDOHL would not be required in relation to The Rhondda RHL (HLW(MGI)5).
- 5.3.37. Setting related impacts to historic landscape will be addressed in a comprehensive Historic Environment Desk-Based Assessment.

Likely Significant Effects

- 5.3.38. The likely significant historic environment effects that will be taken forward for assessment in the Environmental Statement are summarised in **Table 5-6**.

Table 5-6 – Likely significant historic environment effects

Activity	Effect	Receptor
Construction: Site preparation and construction of associated infrastructure (tracks, control buildings / substations, contractors' facilities, site access	Direct disturbance to, or loss of, historic assets located within the development footprint.	Known historic assets, and any currently unidentified assets, located within the Development Site.
Construction and Operation: Turbine erection and operation.	Changes to the significance of assets through change to their settings.	Historic assets which fall within the ZTV including the Margam Mountain RHL (HLW(WGI/MGI)2).

- 5.3.39. The effects **scoped out** from further assessment in the Environmental Statement are:
- **Operational effects on known and previously unrecorded buried historic assets** on the basis that once the Proposed Development has been completed no further ground disturbance will occur;
 - **Setting of non-designated above-ground historic assets that lie beyond 500m from the Proposed Development boundary and beyond 250m from proposed access track enhancements.** An assessment of the effect upon the setting of these assets is scoped out on the basis that such assets are not significant enough to warrant such an assessment, and it is considered unlikely that significant environmental effects will arise where these assets are not within or immediately adjacent to the Site. This is in line with proportionality set out in Planning Policy Wales Edition 12.
 - **Setting of designated historic assets where location, distance, intervening topography and built development,** as identified in review of the ZTV, would result in no alterations to their settings and not be affected by the Proposed Development.
 - **Any effect during the decommissioning phase.** Based on the proposed options for decommissioning outlined in **Chapter 2: The Proposed Development**, potential impacts on buried and above historic assets from related activities are thought to be negligible. Any impacts to buried historic assets within the footprint of Proposed Development at construction stage would be permanent and lead to the removal/ degradation of affected assets. Additionally, proposed buried services, including cables, are intended to left in-situ. Likewise, the removal of above ground infrastructure associated with the Proposed Development would revert the setting of above ground historic assets it is existing character. Consequently, the assessment of decommissioning-related effects is scoped out from the Historic Environment chapter.

- 5.3.40. Measures to avoid known assets, including any identified during the assessment, and to identify and record any assets where disturbance cannot be avoided, will be set out to ensure that adverse direct effects can be effectively mitigated.

ASSESSMENT METHODOLOGY

EIA Approach

- 5.3.41. The ES Chapter will set out the planning framework with respect to buried historic assets (archaeological remains), built historic assets and historic landscapes. It will include the methodology for assessing the environmental effects predicted during the construction, and operation (completed development) phases. It will provide a summary overview of the baseline conditions.
- 5.3.42. The EIA will include a description of the research undertaken and results obtained, as well as an assessment of the nature and potential significance of the effects of the Proposed Development. Consideration will be given to any necessary mitigation, following consultation with the Applicant and consultees. All work will be completed in accordance with the Chartered Institute for Archaeologists (CIfA) Code of Conduct and Standard and Guidance for Archaeological Desk-Based Assessments.
- 5.3.43. A Historic Environment Desk-Based Assessment (HEDBA) will be undertaken, detailing existing historic assets (buried archaeological remains, above ground structures, and landscapes of heritage interest) and considering the potential for additional, unknown historic assets. The report will assess the impact of the Proposed Development on the character and setting of historic assets within and beyond the Development Site (e.g. views to and from listed buildings and conservation areas) potentially affected by the proposals. This detailed assessment will be a technical appendix to the EIA and inform the Historic Environment ES chapter.
- 5.3.44. The desk-based study will comprise relevant records and sources of information held at the following repositories:
- Cadw for designated asset data;
 - Heneb: The Trust for Welsh Archaeology (formerly Glamorgan Gwent Archaeological Trust Historic Environment Record);
 - The National Monument Record (NMR), RCAHMW;
 - The National Library of Wales;
 - Glamorgan Archives;
 - British Geological Survey (BGS) for solid and drift geology data;
 - DataMap Wales;
 - Portable Antiquities Scheme (PAS); and
 - Archaeological Data Service (ADS).
- 5.3.45. Relevant published sources and internet sources will also be consulted.
- 5.3.46. In relation to buried historic assets, information within a 1km Study Area will be used to inform the archaeological potential of the Development Site. Information within 250m corridor of the access tracks will also be used to inform archaeological potential within the potential construction footprint of access track enhancement works.
- 5.3.47. The assessment will determine the significance of historic assets within the Development Site and the contribution of setting to that significance, in accordance with guidance provided by Cadw in The Setting of Historic Assets in Wales (2017) and Conservation Principles (2011).

- 5.3.48. The assessment will identify the potential direct and indirect effects of the Proposed Development on historic assets. Specifically, the potential effects on the settings of designated historic assets will be considered primarily within 5km of the Northern and Southern Array boundaries. Additionally, effects on the settings of non-designated historic assets within a 500m radius of the Northern and Southern Array boundaries will be considered. The effects on the settings of designated and non-designated historic assets within a 250m radius of proposed access track enhancement works, during construction, will be considered.
- 5.3.49. A final list of assets with the potential to be subject to indirect effects will be established with reference to calculated ZTVs, wireframe and photomontage visualisations as appropriate. Consultation will be held with Cadw to ensure that potential receptors and effects are appropriately assessed.
- 5.3.50. The ASIDOHL will provide an assessment of potential effects on the Margam Mountain RHL (HLW(WGI/MGI)2). The aim of the assessment will be to provide more detailed information on the extent and nature of effects on the designated historic landscape which would be expected to result from construction and operation of the wind farm.
- 5.3.51. The ASIDOHL methodology adopted will follow the Guide to Good Practice on using The Register of Landscapes of Historic Interest in Wales in the Planning and Development Process Revised (2nd) Edition 2007⁴¹ (hereafter referred to as the ASIDOHL2 guidance). This involves a staged process aimed at arriving at a quantified assessment of the extent to which the proposed development may affect the historic character area on the register. The following five stages of assessment are involved:
- Stage 1: Contextual information;
 - Stage 2: Assessment of direct, physical impacts of development;
 - Stage 3: Assessment of indirect impacts of development;
 - Stage 4: Evaluation of relative importance; and
 - Stage 5: Assessment of overall significance of impact.
- 5.3.52. Within the assessment, a scoring system will be adopted in which each value is given a score, and therefore each impact is quantified in terms of the importance of the element or feature affected and the magnitude of the predicted impact.

Determining the Significance of Effects

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

⁴¹ Cadw, 2007. Guide to good practice on using the register of landscapes of Historic interest in Wales in the planning and development process: Revised (2nd) edition including revisions to the assessment process (ASIDOHL2) accessed at: https://cadw.gov.wales/sites/default/files/2019-05/LandscapesRegisterGoodPractice_EN_0.pdf

- 5.3.54. The EIA Regulations do not define significance, and it will be necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity or value of a receptor and the magnitude of the effect, as set out in **Table 5-7 and 5-8**. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the Proposed Development.
- 5.3.55. For the purposes of assessing the significance of effects in EIA terms, heritage significance has also been assigned to one of four classes of value, with reference to the heritage interests described in Conservation Principles and relying on professional judgement as informed by policy and guidance. The hierarchy given in **Table 5-7** reflects the TAN24 distinction between designated and non-designated heritage assets. TAN24 further distinguishes between designated assets of the highest heritage significance (i.e. scheduled monuments, protected wreck sites, Registered Battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites) and other designated heritage assets. **Table 5-7** details the basis for assessing receptor value (heritage significance).

Table 5-7 - Establishing the heritage significance of assets

Heritage significance	Summary rationale	Examples
High	Asset has significance for an outstanding level of archaeological, architectural, historic and/or artistic interest.	Designated heritage assets or non-designated assets of demonstrably schedulable quality such as World Heritage Sites, Scheduled Monuments. Grade I Listed Buildings. Grade II* Listed Buildings. Grade II Listed Buildings with exceptional qualities in fabric, historical association, and/or association/group value with heritage assets of high significance. Protected Wrecks. Registered Battlefields. Conservation Areas containing very important listed buildings. Grade I and II* Registered Parks and Gardens. Protected heritage landscapes (e.g., ancient woodland or historic hedgerows, heritage Sites of Special Scientific Interest). Burial grounds. Non-designated historic assets (above ground structures, landscape, townscape, buried remains) of national importance.
Medium	Asset has significance for a high level of archaeological, architectural, historic and/or artistic interest.	Grade II Listed Buildings. Conservation Areas. Grade II Registered Parks and Gardens. Locally listed buildings and buildings of regional importance and merit.

Heritage significance	Summary rationale	Examples
		Non-designated historic assets (above ground structures, landscape, townscape, buried remains) of regional importance.
Low	Asset has significance for elements of archaeological, architectural, historic or artistic interest.	Locally Listed Buildings. Non-designated historic assets (above ground structures, landscape, townscape, buried remains, hedgerows) of local importance.
Negligible	Due to its nature of form/condition/survival, cannot be considered as an asset in its own right.	Non-extant Historic Environment Record (HER) references Item with no significant heritage value or interest.

5.3.61. **Table 5-8** details the basis for assessing magnitude of change.

Table 5-8 – Establishing the magnitude of change

Magnitude	Criteria
High	Loss of significance of an order of magnitude that would result from total or substantial demolition/disturbance of a heritage asset or from the disassociated of an asset from its setting.
Medium	Loss of significance arising from partial disturbance or inappropriate alteration of asset which will adversely affect its importance. Change to the key characteristics of an asset's setting, which gives rise to harm to the significance of the asset but which still allows its archaeological, architectural or historic interest to be appreciated.
Low	Minor loss to or alteration of an asset which leaves its current significance largely intact. Minor and short-term changes to setting which do not affect the key characteristics and in which the historical context remains substantially intact.
Negligible	Minor alteration of an asset which does not affect its significance in any discernible way. Minor and short term or reversible change to setting which does not affect the significance of the asset.

5.3.62. The matrix in **Table 5-9** has been prepared to guide the assessment of whether effects on the historic environment for the purposes of EIA are considered to be significant or not. The classification of the effect is judged on the relationship of the magnitude of impact to the assessed heritage significance of the resource. As a general rule, major and moderate effects (shaded in **Table 5-9**) are considered to be significant and minor and negligible effects are considered to be not significant. However, professional judgement is applied, where appropriate, to determine significance of effect

Table 5-9 – Significance evaluation matrix

Heritage Significance of Receptor

		Negligible	Low	Medium	High
Magnitude	Negligible	Negligible	Negligible	Minor	Minor
	Low	Negligible	Minor	Minor	Moderate
	Medium	Minor	Minor	Moderate	Major
	High	Minor	Moderate	Major	Major

Approach to Mitigation

- 5.3.63. The development of the Proposed Development is an iterative process that will take into consideration the potential for effects on historic environment, adopting measures to avoid or minimise impacts where possible in the first instance. Where disturbance cannot be avoided, measures should be taken to ensure the adverse effects are minimised.
- 5.3.64. Where avoidance of impacts to buried historic assets are not possible, an appropriate mitigation strategy will be devised to secure preservation by record (e.g. archaeological monitoring of groundworks) before any loss occurs, which can be agreed in advance with the local planning authority and respective archaeological advisor.
- 5.3.65. Cross-discipline engagement will also be undertaken to ensure that proposed landscape and ecological environmental measures take into consideration the potential opportunities and constraints relevant to the historic environment.

Approach to consultation

- 5.3.66. Where necessary, engagement with relevant stakeholders (Cadw, Heneb, and local planning authority) will be undertaken when refining the scope of the historic environment assessment for the ES.

5.4 BIODIVERSITY

- 5.4.1. This section describes the proposed scope of the assessment of likely significant effects arising from the Proposed Development on biodiversity. The chapter includes consideration of statutory and non-statutory designated sites, terrestrial and freshwater habitats and legally protected and notable species (birds are considered separately under **Section 5.5: Ornithology**).

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.4.2. The following tables set out the relevant policy, legislation and guidance pertinent to the biodiversity assessment, and should be read in conjunction with that set out previously in **Chapter 4** in relation to the EIA.
- 5.4.3. A summary of the relevant legislation is given in **Table 5-10**.

Table 5-10 – Legislation relevant to the biodiversity assessment

Legislation	Legislative context
The Conservation of Habitats and Species Regulations 2017 (as amended) (HMSO, 2010) ⁴²	The Conservation of Habitats and Species Regulations 2017 (“the Habitats Regulations”) transposed the Habitats Directive into English and Welsh law. The Habitats Regulations provided for the designation and protection of European sites, the protection of certain species (referred to as European Protected Species or EPS) and the adaptation of planning and other controls for the protection of European sites. Note that The Conservation of Habitats and Species Regulations 2017 were amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 to reflect the UK’s exit from the EU. These largely carried forward the provisions and terminology of the 2017 Habitats Regulations, and so the term ‘European site’ is currently retained and for all practical purposes the definition is essentially unchanged, although the UK European sites are no longer legally part of the ‘Natura 2000’ network of protected sites, with this being replaced in the UK by the ‘National Site Network’ which comprises all existing Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) and any new SACs and SPAs designated under the 2019 Regulations (Ramsar sites do not form part of the network). For this reason, and to avoid confusion all sites which belong to the ‘National Site Network’ are hereafter referred to as ‘International Sites’. This also has relevance if compensation measures are required for an adverse effect, as the relevant metric is the overall coherence of the ‘National Site Network’. The 2019 Regulations establish management objectives for the ‘National Site Network’ which contribute to the conservation of UK habitats and species that are also of pan-European importance, and to the achievement of their favourable conservation status within the UK.
The Environment (Wales) Act 2016 (Welsh Government, 2016) ⁴³	The Act makes provisions within Wales for the planning and managing of natural resources at national and local level. Section 6 of the Act introduces the biodiversity and resilience of ecosystems duty whereby public authorities are required to seek to maintain and enhance biodiversity so far as it is consistent with the proper exercise of those functions. Section 7 of the Act introduces a list of living organisms and types of habitat in Wales, known as Priority Species or Priority Habitats, which in Wales are considered of key significance to sustain and improve biodiversity.
The Wildlife and Countryside Act 1981 (as amended) (WCA) (HMSO, 1981) ⁴⁴	This Act consolidates and amends existing national legislation to implement the Bern Convention. This piece of legislation remains the primary UK mechanism for statutory site designations (e.g. Sites of Special Scientific Interest) and the protection of individual species listed under Schedules 5 and 8 of the Act, each subject to varying levels of protection.

⁴²HMSO (Her Majesty’s Stationary Office). (2010). The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations).

⁴³Welsh Government (2016). Environment (Wales) Act 2016.

⁴⁴ HMSO. (1981). Wildlife and Countryside Act (as amended by the Countryside and Rights of Way Act 2000). HMSO, Norwich.

Legislation	Legislative context
Countryside & Rights of Way Act 2000 (HMSO, 2000) ⁴⁵	This Act details further measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation.
The Hedgerows Regulations 1997 (HMSO, 1997) ⁴⁶	The Hedgerows Regulations is intended to protect important countryside hedges from damage or destruction.
Protection of Badgers Act 1992 (HMSO, 1992) ⁴⁷	The Protection of Badgers Act provides protection to badgers and their places of shelter (setts).

Table 5-11 – Planning policy relevant to the biodiversity assessment

Policy	Policy context
National planning policy	
Future Wales: The National Plan 2040 (Welsh Government, 2019) ⁴⁸	The Welsh national development framework sets the direction for development in Wales to 2040 and includes a Habitats Regulations Assessment. Policy 9 – Resilient Ecological Networks and Green Infrastructure outlines measures to ensure the enhancement of biodiversity, the resilience of ecosystems and the provision of green infrastructure.
Planning Policy Wales ⁴⁹ – Chapter 6 Distinctive and Natural Places	Chapter 6 of Planning Policy Wales (PPW) sets out the Welsh Government's objectives for Distinctive and Natural Places theme of planning policy topics covers historic environment, landscape, biodiversity and habitats, coastal characteristics, air quality, soundscape, water services, flooding and other environmental (surface and sub-surface) risks. In particular, the Biodiversity and Resilience of Ecosystems section puts emphasis on planning authorities to have regard for the State of Natural Resources Report (SoNaRR) and Area Statements published by Natural Resources Wales. It is referenced in this chapter that a Net Benefit for Biodiversity (NBB) report should be produced to demonstrate that a 'step-wise approach' is being followed in order for the Proposed Development to achieve an NBB. As part of achieving NBB, planning authorities must also consider ecosystem resilience following the DECCA Framework.
Planning Policy Wales – Stepwise approach	Biodiversity enhancements that achieve NBB must be delivered following the implementation of the 'stepwise approach' of firstly avoiding, then minimising, mitigating and, as a last resort, compensating for adverse impacts on the environment that occur as part of a development. Therefore, compensation should only be considered as a last resort,

45 HMSO (2000). Countryside & Rights of Way Act 2000.

46 HMSO (1997). The Hedgerows Regulations 1997.

47 HMSO (1992). Protection of Badgers Act 1992.

48 Welsh Government (2019). Future Wales: The National Plan 2040. [Updated in 2025]. Available at: <https://www.gov.wales/future-wales-national-plan-2040> [Accessed: January 2026]

49 Welsh Government (2024). Planning Policy Wales (PPW) Edition 12.

Policy	Policy context
	where it has been demonstrated clearly that adverse effects on the environment cannot be avoided or fully mitigated. If compensation is necessary, this must be delivered on-site where possible but off-site compensation can be sought if demonstrated that this is not possible. This approach will encourage the consideration of features that may not necessarily be protected, but are crucial for ecosystem functioning, leading to more joined up spaces for nature.
Planning Policy Wales – DECCA Framework	Natural Resources Wales (NRW) have developed a framework for evaluating ecosystem resilience based on five attributes and properties specified in the Environment (Wales) Act 2016. This is referred to as DECCA and comprises the objectives listed: ■ Diversity – maintaining and enhancing diversity at every scale, including genetic, structural, habitat and between-habitat levels. This supports the complexity of ecosystem functions and interactions that deliver services and benefits. ■ Extent – incorporating measures which maintain and increase the area of semi-natural habitat/features and linkages between habitats. In general, smaller ecosystems have reduced capacity to adapt, recover or resist disturbance. ■ Condition – the condition of an ecosystem is affected by multiple and complex pressures acting both as short term and longer-term types of disturbance. Both direct and wider impacts should be considered, for example avoiding or mitigating pressures such as climate change, pollution, invasive species, land management neglect etc. ■ Connectivity – this refers to the links between and within habitats, which may take the form of physical corridors, stepping stones in the landscape, or patches of the same or related vegetation types that together create a network that enables the flow or movement of genes, species and natural resources. Developments should take opportunities to develop functional habitat and ecological networks within and between ecosystems, building on existing connectivity. ■ Adaptability to change – ecosystem resilience is a product of the above four attributes. Adaptability, recovery and resistance to/from a disturbance are defining features of ecosystem resilience. NRW define ecosystem resilience as “<i>An environment that can respond to pressures by resisting, recovering or adapting to change, and is able to continue to provide natural resources and benefits to people</i>”.
Technical Advice Note 5 (TAN5) Nature Conservation and Planning 2009⁵⁰	Welsh Government (WG) policy on positive planning for nature conservation and developments affecting designated sites and habitats, along with protected priority habitats and species. It brings together advice on sources of legislation relevant to various nature conservation topics which may be encountered by local planning authorities. It sets out the

50 Welsh Government (2009). Technical Advice Note 5; Nature Conservation and Planning 2009

Policy	Policy context
	key principles of planning for nature conservation and addresses nature conservation in development control procedures. It also deals with the conservation of protected and priority species. It also outlines that developments that may adversely impact on sites designated for their national nature conservation interest will generally not be permitted.
Local planning policy	
Bridgend County Borough Local Development Plan 2018 – 2033⁵¹, with particular reference to: SP17: Conservation and Enhancement of the Natural Environment	The Bridgend County Borough LDP states the following in relation to Biodiversity: <i>‘...the LDP Strategy will seek to maintain and enhance the biodiversity and resilience of the County Borough’s ecosystems to provide a net benefit for biodiversity through a proactive and resilient approach. This includes native species landscaping, careful location of development, the creation of green corridors, open space management and adopting best practice site design and green infrastructure principles.’</i>
Bridgend County Borough Local Biodiversity Action Plan: Biodiversity and Ecosystem Services Assessment and Revision 2014⁵².	The national strategy for biodiversity is delivered at local level via Local Biodiversity Action Plans (LBAP). Bridgend County Borough’s LBAP: <i>‘sets out to map and quantify the biodiversity and the underlying ecosystem services... shows why the rich biodiversity of the County Borough of Bridgend is so important and how it supplies a wealth of different benefits to the environment, people and the economy of the area. It provides recommendations for how biodiversity and the ecosystem services in the Borough can be enhanced to increase their value to society.’</i>
Bridgend County Borough Council Biodiversity and Ecosystems Resilience Forward Plan 2028-22⁵³	A local plan which works to achieve enhanced biodiversity and resilience of ecosystems as it the duty of all public authorities in Wales under the Environment Act (Wales) Act 2016.

Table 5-12 – Technical guidance relevant to the biodiversity assessment

Technical guidance document	Context
Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine⁵⁴	Sets out the industry standard approach to Ecological Impact Assessment (EclA) for assessing the potential effects of a project on ecological receptors.

51 Bridgend County Borough (BCB) (2024). Bridgend County Borough Local Development Plan 2018 – 2033

52 BCB (2014). Bridgend County Borough Local Biodiversity Action Plan: Biodiversity and Ecosystem Services Assessment and Revision 2014.

53 BCB (2018). Bridgend County Borough Council Biodiversity and Ecosystems Resilience Forward Plan 2028-22.

54 CIEEM (2024) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.

Joint Nature Conservation Committee (2010) Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit; JNCC, Peterborough ⁵⁵	Presents a standardised system for classifying and mapping wildlife habitats in all parts of Great Britain, including urban areas. The Phase 1 habitat classification and associated field survey technique provides a relatively rapid system to record semi-natural vegetation and other wildlife habitats. Each habitat type/feature is defined by way of a brief description and is allocated a specific name, an alpha-numeric code and unique mapping colour. The system has been widely used and continues to act as the standard 'Phase 1' technique for habitat survey across the UK.
Bat Surveys for Professional Ecologists. Good Practice Guidelines (4th Edition) ⁵⁶	A reference guide for ecological consultants working on bat surveys, providing best practice survey and assessment guidance.
Amphibian and Reptile Groups of the United Kingdom (ARG UK) Advice Note 5: Great Crested Newt Habitat Suitability Index ⁵⁷	An advice note which provides best practice information for surveying Great Crested Newts (GCN) <i>Triturus cristatus</i> , including use of a Habitat Suitability Index (HSI) scoring system as means of evaluating habitat quality.

55 JNCC (2016) Handbook for Phase 1 habitat survey – a technique for environmental audit (JNCC, Peterborough). Available at: <https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf> [Accessed: January 2025].

56 Collins (ed.) (2023). Bat surveys for professional ecologists: Good practice guidelines. 4th Edition.: Bat Conservation Trust; London.

57 Amphibian and Reptile Groups of the United Kingdom (2010). ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. ARGUK. Available at: <https://cieem.net/resource/arg-uk-advice-note-5-great-crested-newt-habitat-suitability-index/> [Accessed: January 2026].

BASELINE

- 5.4.5. The baseline described in this section has been informed by a desk study and a suite of initial surveys (Extended Phase 1 Habitat survey, Daytime Bat Walkover (DBW) and Habitat Suitability Index (HSI)) which were carried out across two survey areas referred to in the Preliminary Ecological Appraisal (PEA) report as the 'Sites' (**Appendix E**) and defined as the footprint of the Proposed Development. The extents are shown in Figure 1 of the PEA report. For the purposes of this chapter, these Sites will be distinguished by the terms 'Northern' and 'Southern' Array.

Desk Study

- 5.4.6. Desk study data was sought for the following:
- International Sites⁵⁸ within 10km of the Development Site;
 - International Sites for which bats are a qualifying feature within 30km of the Development Site;
 - Sites of national importance⁵⁹ within 2km of the Development Site;
 - Sites of national importance⁶⁰ which are designated for bats within 10km of the Development Site;
 - Non-statutory sites of importance for nature conservation within 2km of the Development Site;
 - Ancient Woodland Inventory (AWI) parcels within 2km of the Development Site;
 - Priority Habitats listed on Section 7 of the Environment (Wales) Act 2016 within 2km of the Development Site;
 - Records of legally protected and notable species within 2km of the Development Site;
 - Records of bat roosts within 10km of the Development Site; and
 - Waterbodies and watercourses within 500m of the Development Site.
- 5.4.7. Sources of desk study data returned are further detailed within **Table 5-13**.

Table 5-13 – Sources of desk study data

Data	Data source
International Sites, sites of national importance, Priority Habitats	DataMapWales
Sites of national importance, non-statutory sites, AWI parcels, legally protected and notable species records, bat roost records.	South East Wales Biodiversity Records Centre (SEWBRc)
Waterbodies and watercourses	Freely available open source 1:25,000 Ordnance Survey mapping and satellite imagery

58 Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Ramsar sites.

59 Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

60 Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

Baseline surveys

- 5.4.8. The ecological survey programme has been designed to provide sufficient information on legally protected and notable species, and the general status and condition of all habitats within the study area.
- 5.4.9. The Study Area comprises the land within and adjacent to the Development Site, as well as additional habitats outside the Site boundary that were included based on best practice guidance (e.g. ponds within 500m of the Site boundary), that could be impacted by the Proposed Development. The study areas were defined on a precautionary basis to ensure that the Zone of Influence (Zol) relevant to each ecological feature was covered during baseline data collection activities. The ecological features and the study areas applied are described in **Table 5-14** below. As the design process is iterative the study areas will be regularly reviewed to ensure that its extent is suitable to enable the assessment of likely significant effects on the ecological features identified.
- 5.4.10. Details regarding methodology, results and recommendations for the surveys contained in **Table 5-14** and assessments can be found in the PEA report (**Appendix E**).
- 5.4.11. The survey data collected to date, plus recommended future surveys, will provide the basis for a robust Environmental Impact Assessment (EIA) to be completed for the Proposed Development. **Table 5-14** provides further information on the survey programme to date and details regarding methodology, results and recommendations for the surveys and assessments can be found in the PEA report (**Appendix E**).

Table 5-14 – Ecological features and survey scope

Survey/ assessment	Summary of existing data/baseline
Desk study	An ecological desk study was undertaken in February and March 2025 using data purchased from South East Wales Biodiversity Records Centre (SEWBRc) and freely available datasets (available from the Welsh Government funded DataMapWales, aerial imagery and Ordnance Survey mapping). The desk study identified: <u>International Sites</u> Two Special Areas of Conservation (SACs) within 10km of the Northern and/or Southern Array: • Cefn Cribwr Grasslands SAC (8.8km south of the Northern Array and 6km southwest of the Southern Array); and • Blackmill Woodlands SAC (7.7km southeast of the Northern Array and 4.3km southeast of the Southern Array). One SAC designated for bats within 30km of the Northern and/or Southern Array. • Limestone Coast of South West Wales SAC (29km west of the Northern Array and 30.8km west of the Southern Array). <u>Sites of national importance:</u> Two Sites of Special Scientific Interest (SSSIs) within 2km of the Northern and/or Southern Array: • Cwm Du Woodlands SSSI (1.2km south of the Northern Array and 0.4km west of the Southern Array); and • Cwm Cyffog SSSI (4.7km southwest of the Northern Array and 1.7km east of the Southern Array).

	Five SSSIs/Local Nature Reserves (LNRs) which are designated for bats within 10km of the Northern and/or Southern Array: • Frog Pond Wood LNR (10.3km south of the Northern Array and 8.6km southwest of the Southern Array); • Tremains Wood LNR (12.8km southeast of the Northern Array and 9.5km southeast of the Southern Array); • Glyncomel LNR (11.6km east of the Northern Array and 0.4km east of the Southern Array); • Coedymwstwr Woodland SSSI (12.9km southeast of the Northern Array and 9.7km southeast of the Southern Array); and • Craig-y-parciau Woodland LNR (12.9km south of the Northern Array and 9.9km southeast of the Southern Array). <u>Non-statutory sites of importance for nature conservation:</u> A total of 34 Wildlife Sites/Sites of Importance for Nature Conservation (SINCs) and 1 B-Line were recorded within 2km of the Northern and/or Southern Array. The B-Line and the following Wildlife Sites/SINCs were present within the Northern and/or Southern Array: • Craig Du SINC. • Nant-y-Fforest SINC. • Blaen-Cwmdu SINC. <u>Habitats of conservation importance: Ancient Woodland Inventory (AWI) parcels, Priority Habitats and waterbodies/watercourses:</u> A total of 78 parcels of AWI areas were identified within 2km of the Northern and/or Southern Array. Of these, none were present within the Northern or Southern Array, however a Plantation Ancient Woodland Site (PAWS), Ancient Woodland Site of Unknown Category and Ancient Semi Natural Woodland (ASNW) site were recorded immediately adjacent to the Southern Array. A total of 564 parcels of habitats that may contain Priority Habitats were identified within 2km of the Northern and/or Southern Array. Ten standing waterbodies were identified in, or within 500m, of the Northern and/or Southern Array.
Extended Phase 1 habitat survey	The baseline conditions for terrestrial ecology were established through a Preliminary Ecological Appraisal (PEA) completed in 2025. The PEA was informed by an Extended Phase 1 Habitat survey (mapping of habitats and an assessment of their suitability to support protected/notable species) conducted over four days in February and March 2025. <u>Habitats:</u> Twenty-five Phase 1 habitat types were identified across the Northern and/or Southern Arrays. The Northern Array was dominated by largely acidic habitats including acid grassland and heath. The Southern Array comprised a high proportion of improved grassland which were likely derived from acid grassland, however improved through nutrient enrichment and grazing. Woodland and scrub habitats were present in low proportions on the edge of both the Northern and Southern Arrays. Seven Priority Habitats (or possible Priority Habitats) were identified within the Northern and/or Southern Arrays: • Upland heathland; • Rivers; • Upland oakwood; • Lowland mixed deciduous woodland; • Inland rock outcrop and scree habitats; • Upland flushes, fens and swamps; and • Purple moor-grass and rush pastures.

	<u>Protected species:</u> The Northern and/or Southern Arrays have potential to support protected and notable species, including: • Bats (<i>Chiroptera</i> spp.); • Badger <i>Meles meles</i>; • Brown hare <i>Lepus europaeus</i>; • Hedgehog <i>Erinaceus europaeus</i>; • Otter <i>Lutra lutra</i>; • Water vole <i>Arvicola amphibius</i>; • Amphibians; • GCN; • Reptiles; • Invertebrates; • Notable plants; and • Invasive non-native plant species (INNS). All habitats within the Northern and Southern Array were considered suitable to support a variety of INNS species. Both rhododendron <i>Rhododendron ponticum</i> and Indian balsam <i>Impatiens glandulifera</i> were recorded within the Southern Array.
Habitat Regulations Assessment (HRA)	As Cefn Cribwr Grasslands SAC, Blackmill Woodlands SAC, and Limestone Coast of South West Wales SAC were identified within a conceivable (Zol) from the Proposed Development, these International Sites must be screened by the competent authority to determine whether Likely Significant Effects (LSE) are likely to result.
Detailed Botanical Survey	National Vegetation Classification (NVC) surveys are recommended where impacts on Priority Habitats are expected. These surveys will also identify presence of notable plants. As Priority Habitats have been identified in both the Northern and Southern Arrays, NVC surveys are likely to be required.
Bats	A Daytime Bat Walkover (DBW) was undertaken at the same time as the Extended Phase 1 habitat survey and identified: • Eighteen trees were assessed as having Potential Roost Features (PRFs) for bats within the Southern Array. • A further 18 trees and a rocky outcrop were assessed as having PRFs for bats within the Northern Array. • The rocky outcrop was categorised as having low potential to support roosting bats, likely to be used only opportunistically by individual crevice roosting bats. The PEA and DBW has been used to identify further survey requirements to inform an assessment of potential effects arising upon bats potentially roosting within features present within the Northern and/or Southern Array. The following outstanding surveys of both the Northern and Southern Array will be undertaken prior to the assessment: • Bat roosting surveys, in the form of PRF inspection surveys of trees and Preliminary Roost Assessment (PRA) of structures, will be required should trees/buildings with PRFs be proposed for impact. These will aim to establish presence/absence of roosting bats within features proposed for impact. • Bat activity surveys, in the form of automated bat detector surveys and nighttime bat walkover surveys. These will aim to establish bat species present, abundance of bat populations present and the importance of present landscape feature to bats.
Great crested newt	<u>Habitat Suitability Index (HSI) assessment</u> The HSI assessment was conducted on all accessible waterbodies located within 500m of the Northern and/or Southern Array.

	Nine out of the ten standing waterbodies identified within 500m of the PEA Sites were assessed. Two waterbodies returned an 'Average' suitability index, three were 'Below Average', three were 'Poor' and one was found to be absent. Both the Northern and Southern Arrays were considered suitable to support GCN. <u>Presence/absence (environmental DNA (eDNA)) GCN surveys</u> Based on these results, eDNA surveys should be carried out of a total of five standing waterbodies; the two 'Average' waterbodies and the three 'Below Average' waterbodies. This is to establish presence/likely absence of GCN at each waterbody. Surveyors will collect water samples at each of the locations and send to a certified lab for analysis. If the eDNA result is returned as positive, further population surveys will likely be required.
Water vole	The steep sided banks present within the ditches and the above ground dense marshy grassland vegetation in both the Northern and Southern Arrays may provide suitable shelter or protection for water vole. Therefore, the Proposed Development has the potential to injure/kill or disturb water vole, as well as destroy their places of rest. Follow-up riparian mammal surveys to fully understand the extent to which water vole may be using these stretches of streams has been recommended and is yet to be completed. A total of two surveys should be undertaken at least two months apart and of suitable watercourses. One should be carried out between mid-April – June and the other between July – September.

5.4.20. The following further protected species surveys could be scoped out in the PEA, although this does not automatically result in them being scoped out of the assessment:

- Badger – The PEA identified that the Northern and Southern Arrays had suitable (albeit limited) woodland habitat for badgers to excavate setts, as well as foraging suitability across the wider Development Area, however, no setts or signs of badgers were identified during the Phase 1 habitat survey. Owing to the limited amount of suitable habitat for sett-building badgers within the Northern and Southern Arrays, the absence of evidence of badgers during the Phase 1 habitat survey, and the lack of badger records returned from the desk study, it was considered badger are likely to be absent from the Northern and/or Southern Arrays. Further surveys were therefore scoped out and the PEA recommended that habitat removal of suitable habitat is carried out under a Precautionary Method of Works (PMoW).
- Brown hare and hedgehog – Further survey for brown hare and hedgehog were scoped out because the PEA identified that potential risk of killing/injury can be mitigated through following a PMoW.
- Otter – Otter surveys were considered required if works are anticipated within 200m of the Garw Fechan. As works are no proposed within this distance, the requirement for further surveys could be scoped out. Furthermore, the wider habitats within the Northern and Southern Arrays provided a lack of watercourses suitable for otter holt creation. Potential impacts are therefore considered to be negligible for this species. The stream banks within the Northern and Southern Arrays are considered unsuitable for building holts/couches and there are limited foraging opportunities due to the size of the streams and the low capacity to support large populations of fish or other prey such as amphibians and small mammals. For this reason, otter is not discussed further within this scoping chapter and is scoped out of further assessment.
- Reptiles and common amphibians – Due to the widespread nature of reptile species, and the suitability of the habitats identified during the PEA, reptile surveys were scoped out as it can be assumed that reptile species are present in suitable habitats within both the Northern and Southern Arrays. The adoption of a precautionary approach to mitigation during construction will be taken to ensure the avoidance of impacts upon common reptiles. This is considered

appropriate given the extent of suitable habitats present across the study area and beyond, relative to the limited and localised nature of physical impacts upon reptile habitat arising from the Proposed Development. This approach can also be extended to common amphibian species i.e. common frog *Rana temporalis* and common toad *Bufo bufo*, as is set out in the PEA recommendations.

- INNS – No further surveys for INNS have been recommended. This has also been mitigated within the PEA through recommending that habitat removal is carried out under a PMoW to avoid the Proposed Development causing the spread of INNS.
- Terrestrial invertebrates – Invertebrate surveys have been scoped out as the PEA has identified that impacts to invertebrates as a result of the Proposed Development are likely to be minor. This could be determined due to the widespread nature of the habitats present within the Northern and Southern Arrays, and the fact that the Proposed Development is unlikely to lead to isolation of habitats.

5.4.21. Although not usually considered as part of the EclA process, it should be noted that an NBB report will also be produced on receipt of final design information.

5.4.22. No ecological surveys have been carried out to support the development of the access road leading from the north into the Proposed Development boundary. At present it is considered that the access road will follow existing tracks and will likely not require habitat removal or other intrusive activities. As discussions are ongoing, it should be noted that should intrusive works be required to enable the access road development, a further suite of ecological surveys will be required. At the relevant opportunity, the scope of any further ecological surveys to support the development of the access road will be discussed and agreed with the relevant consultees.

THE SCOPE OF THE ASSESSMENT

‘Important Ecological Features’

5.4.23. To begin defining which ecological features will be taken forward to the detailed assessment stage, baseline data will be collected through the desk study and field surveys to determine which of the identified ecological features are 'important' at the level of the project.

5.4.24. The value of sites, species and habitats will be evaluated in line with CIEEM guidelines with reference to their importance in terms of conservation value (which relates to the need to conserve representative areas of different habitats and the generic diversity of species populations); and their legal status. For the purposes of this assessment, sites, species populations, species assemblages and habitats will be valued using the following geographical scale:

- International;
- National (UK or Wales);
- County;
- Local;
- Of value/significance within the context of the Proposed Development (Site); and
- Negligible.

- 5.4.25. Guidelines on EclA⁶¹ note the difficulty of devising valuation criteria that can be consistently applied to designated sites, species and habitats in the same way in all parts of the country. It recommends an approach to valuation that involves systematically evaluating the different values that can be attached to the ecological features under consideration. However, it is beneficial to give examples of the sorts of criteria used in the valuation process, and these are summarised in **Table 5-15** below.

Table 5-15 – Examples of criteria used to evaluate Important Ecological Features (IEFs)

Level of Value	Definition
International	International Sites including Special Protection Areas (SPA), Special Areas of Conservation (SAC), candidate SACs and Sites of Community Importance (SCI). Potential SPAs (pSPA), and Ramsar sites (designated under international convention); and Areas of habitat or populations of species which meet the published selection criteria based on discussions with Natural Resources Wales and field data collected to inform the EclA for designation as a International Site, but which are not themselves currently designated at this level.
National/UK or National/Wales	A nationally designated site including SSSI and National Nature Reserves (NNR); Areas (and the populations of species which inhabit them) which meet the published selection criteria guidelines for selection of biological SSSIs but which are not themselves designated based on field data collected to inform the EclA, and in agreement with NRW; Section 7 (Environment Wales Act (Wales) 2016) habitats and species, Red listed and legally protected species that are not addressed directly in Part 2 of the 'Guidelines for Selection of Biological SSSIs' but can be determined to be of national importance using the principles described in Part 1 of the guidance and/or 1% of the known UK population of a particular species; and Areas of Ancient Woodland e.g. woodland listed within the Ancient Woodland Inventory and ancient and veteran trees.
County (Bridgend County Borough)	LNRs and Non-statutory Designated sites including: SINCs of County Importance; and Areas which based on field data collected to inform the EclA meet the published selection criteria for those sites listed above (for habitats or species, including those listed in relevant LBAP) but which are not themselves designated.
Local	Section 7 (Environment Wales Act (Wales) 2016) habitats and species, Red listed and legally protected species that based on their extent, population size, quality etc. are determined to be at a lesser level of importance than the geographic contexts above;

61 CIEEM (2024) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.

	Common and widespread semi-natural habitats occurring within the study area in proportions greater than may be expected in the local context; and Common and widespread native species occurring within the study area in numbers greater than may be expected in the local context.
Site	Habitats or species with some nature conservation value, however that do not meet the criteria for attaining value at the Local level.
Negligible	Common and widespread semi-natural habitats and species that do not occur in levels elevated above those of the surrounding area; and Areas of heavily modified or managed land uses (e.g. hard standing used for car parking, as roads etc.)

- 5.4.26. It is impractical and inappropriate for an assessment of the ecological effects of a development to consider every species and habitat that may be affected. Instead, it focuses on Important Ecological Features (IEFs) which are the species and habitats present within a defined Zone of Influence (Zoi) of the Proposed Development that are of sufficiently high value that certain impacts upon them, as a result of the development, could result in a significant effect. In the case of this assessment, IEFs will be scoped in where these pathways for potentially significant effects lie within the relevant Zoi, where an IEF holds value at a County level or above or where there are relevant legal considerations.
- 5.4.27. The description and valuation of ecological features will consider any likely changes including, for example, trends in the population size or distribution of species, likely changes to the extent of habitats, and the effects of other proposed developments or land-use changes. Due consideration will be given to ecological features scoped out of this assessment (i.e. those nature conservation sites, species and habitats below County importance) throughout the construction and operation period, with regard to legislative protection and good practice.

Important Ecological Features Scoped into the Assessment

- 5.4.28. Subject to the findings of ongoing survey and analysis work and further refinement of the Proposed Development design, the geographical importance value of designations, habitats and species identified to date for consideration within the EIA are summarised in **Table 5-16**.
- 5.4.29. The likely scope and impacts on IEF's below are predicted in the absence of mitigation. Mitigation measures will follow the Step-wise approach advocated in Planning Policy Wales and will be designed to avoid or reduce the impacts where possible. Where this is not possible, a reduction in effects through mitigation and compensatory measures would be taken.

Table 5-16 – Important ecological features requiring consideration of assessment

Geographical context of importance	Ecological features
International	Cefn Cribwr Grasslands SAC (8.8km south from the Northern Array, and 6km southwest from the Southern Array) Blackmill Woodlands SAC (7.7km southeast from the Northern Array, and 4.3km southeast from the Southern Array). The Limestone Coast of South Wales SAC (designated for Bats) (29km west from the Northern Array, and 30.8km west from the Southern Array).

Geographical context of importance	Ecological features
	As these International Site lie within conceivable Zol from the Proposed Development, a HRA will be required once all aspects of the design are finalised.
National	Cwm Du Woodlands SSSI is located within 2km of the Development Site and is hydrologically connected to the ditch networks within the Northern and/or Southern Array via Nant Cwm-Du. Coedymwstwr Woodland SSSI is partially designated due to the presence of bats roosting within the cave systems. As the PEA has recommended bat activity surveys of the Northern and Southern Arrays., the results of these further bat surveys will allow for a better understanding of how bats use these sites, and therefore if any impacts to the bats recorded within the Coedymwstwr Woodland SSSI are likely to result from the Proposed Development. If effects are identified, Coedymwstwr Woodland SSSI should be scoped into the EIA. Any such implications will be discussed with the relevant consultees. A PAWS (41384), Ancient Woodland Site of Unknown Category (48338) and ASNW (11768) are located adjacent to the Southern Array. These are within the Zol for potential impacts from construction dust pollution. As these three parcels also surround the Garw Fechan watercourse, they also have hydrological connectivity to the Southern Array.
County	A total of three SINC's were identified within the Northern and Southern Arrays and therefore have potential to be impacted directly by habitat loss. These included Craig Du SINC, Nant-y-Fforest SINC and Blaen-Cwmdu SINC's. A further eleven SINC's within 2km have hydrological connectivity to the Northern and/or Southern Arrays and therefore are at risk of habitat degradation via hydrological pollution. These are Disused railway woods SINC, Gelliheblig SINC, Tylacoch North SINC, Tylacoch South SINC, Llwyn-y-brian SINC, Lletty brongu SINC, Garth grassland SINC, Blaen-cwmdu SINC, St John's colliery field SINC, Cemetery fields SINC and Nant cwm-du-bach SINC. Furthermore, all SINC's within 50m should be scoped into the EIA due to potential impacts from construction dust pollution. Priority Habitats may be impacted by habitat loss, water and air-borne pollution and the introduction of INNS, as they are present within the Development Site. Such Priority Habitats (or possible Priority Habitats) recorded within the Northern and/or Southern Arrays included 'Upland heathland', 'Rivers', 'Upland oakwood', 'Lowland mixed deciduous woodland,' 'Inland rock outcrop and scree habitats', 'Upland flushes, fens and swamps', and 'Purple moor-grass and rush pastures'. Protected and/or notable species with populations of County importance following further surveys.
Local	<u>Scoped out:</u> Four LNRs and a B line designation were identified within 10km of the Northern and/or Southern Arrays. The closest was the B line which overlapped entirely with both Arrays. The nearest LNR was Frog Pond Wood LNR which was located 8.8km from the Southern Array. As LNRs are of local importance and also of significant distance from the Development Site, these sites are scoped

Geographical context of importance	Ecological features
	out of the further assessment. Although the B line is present throughout the Development Area, it is also of Local importance. Hedgehog, brown hare, reptiles, common amphibians (common toad). Protected and/or notable species with populations of Local importance following further surveys.
Site	<u>Scoped out:</u> Habitats within the Development Site not including Priority Habitats. Badger, common amphibians (common frog) and invertebrates. Protected and/or notable species with populations of Site importance following further surveys.
Negligible	N/A

Potential Ecological Features Scoped out of assessment

Designations

- 5.4.30. Cwm Cyffog SSSI is located 4.7km southwest from the Northern Array which is considered to be of a sufficient distance from the Development Area, and without impact pathways such as watercourses, so that it, or its features, would not be impacted by the Proposed Development.
- 5.4.31. Four LNRs were identified within 10km of the Development Site which are designated for bats, all of which are valued at 'Local' importance and also of significant distance from the Development Site. They are therefore scoped out at this stage and will not be considered within the EIA.
- 5.4.32. Although the B line is present throughout the Development Area, it is also of 'Local' importance and therefore will also not be considered within the EIA. The PEA report (**Appendix E**) outlines appropriate mitigation and enhancement measures to minimise impact to this feature.

Habitats

- 5.4.33. Effects on common and widespread habitats will not be considered as they do not meet the criteria for requiring full EIA identified in the CIEEM Guidelines; and are therefore not considered to be a material consideration for decision-making.

Protected Species

- 5.4.34. Effects on common and widespread species, as well as those which have a 'Local' or 'Site' population importance will not be considered as they do not meet the criteria for requiring full EIA identified in the CIEEM Guidelines; and are therefore not considered to be a material consideration for decision-making.
- 5.4.35. Badger was considered of Site level importance because although the PEA identified suitable habitat within the Development Site, this was considered limited for sett-building activities. No evidence of badger was identified within the Development Site during the Phase 1 habitat survey nor the desk study. In the PEA, badgers were considered likely absent from the Development Site and so their Site level importance is included on a precautionary basis.

- 5.4.36. Hedgehog, brown hare, reptile species (all native widespread species) and common toad were considered of Local level importance. Although they are species protected under S7 of the Environment (Wales) Act and habitats were suitable across both Arrays, it is not anticipated that impacts to relevant suitable habitat will impact these populations beyond the Site context.
- 5.4.37. Common frog was considered of Site importance because similarly to above, there was suitable habitat across both Arrays. However it is not anticipated that impacts to relevant suitable habitat will impact these populations beyond the Site context. Furthermore, this species is not protected under S7.
- 5.4.38. The terrestrial invertebrate population was considered to be of Site importance as impacts to invertebrates as a result of the Proposed Development are likely to be minor and not anticipated to impact invertebrates beyond the Site context.
- 5.4.39. INNS are not of conservation value and therefore are scoped out of the assessment. However, measures to mitigate the illegal spread of INNS have been considered as part of the embedded measures of this report.

Likely Significant Effects

- 5.4.40. In accordance with the EIA Regulations 2017, the EIA for the Proposed Development will consider those impacts where there is a risk of a likely significant effect only. The following section draws on industry experience and expertise to identify those effect-receptor pathways that may potentially lead to a significant effect.
- 5.4.41. **Table 5-17** sets out the potential significant effects identified to date. These are assessed before the application of any mitigation. Further surveys have been recommended for some of the ecological receptors listed below. The assessment of impacts on these species will be refined on the receipt of appropriate survey data.

Table 5-17 - Potential significant effects to be assessed

Activity	Effect	Zone of Influence	Ecological Features Impacted
Construction			
Permanent or temporary land-take/changes to habitats	Habitats loss (temporary or permanent)	Within the Development Site	Wildlife Sites/SINCs including; Craig Du SINC, Nant-y-Fforest SINC and Blaen-Cwmdu SINC Priority Habitats (and notable plants) Habitats for protected and/or notable species
	Disturbance to bat roosts and/or important populations of bats	Within the Development Site	PRFs identified within the Northern and/or Southern Arrays

Activity	Effect	Zone of Influence	Ecological Features Impacted
	Direct mortality/injury of protected and/or notable species	Within the Development Site	Protected and/or notable species should they be present (as will be determined by further surveys) including bats, badger, water vole and GCN.
	Disturbance of protected and/or notable species	Within the Development Site	Protected and/or notable species should they be present (as will be determined by further surveys) including bats, badger, water vole and GCN.
	Introduction or spread of non-native invasive species	Within the Development Site	Priority Habitats (and notable plants)
Contamination of site run-off	Habitat degradation via hydrological pollution	Within watercourses and wet habitats within the Development Site and up to 2km where there is hydrological connectivity	Sites of national importance including; Cwm Du Woodlands SSSI Wildlife Sites/SINCs including Craig Du SINC, Nant-y-Fforest SINC, Blaen-Cwmdu SINC, Disused railway woods SINC, Gelliheblig SINC, Tylacoch North SINC, Tylacoch South SINC, Llwyn-y-brian SINC, Lletty brongu SINC, Garth grassland SINC, Blaen-cwmdu SINC, St John's colliery field SINC, Cemetery fields SINC and Nant cwm-du-bach SINC. AWI parcels Priority Habitats Habitats for protected and/or notable species
Production of aural and visual stimuli and vibration from construction activities such as vehicular movements, piling or site personnel	Noise, vibration and visual disturbance	Within and up to 250m from the Development Site	Protected and/or notable species susceptible to disturbance should they be present (as will be determined by further surveys) including bats, badger, water vole and GCN.

Activity	Effect	Zone of Influence	Ecological Features Impacted
Creation of airborne particles (e.g. dust) during construction activities and vehicle movements	Habitat degradation via air pollution/dust	Within and up to 50m from the Development Site	Wildlife Sites/SINCs including; Craig Du SINC, Nant-y-Fforest SINC, Blaen-Cwmdu SINC and Gelliheblig SINC AWI parcels Priority Habitats Habitats for protected and/or notable species Protected and/or notable species susceptible to disturbance should they be present (as will be determined by further surveys) including bats, badger, water vole and GCN.
Use of temporary lighting for security purposes or to illuminate construction working areas	Changes in light levels creating disturbance to light sensitive protected species	Within and immediately adjacent from the Development Site	Protected and/or notable species susceptible to lighting disturbance should they be present including bats and otter
Working within a conceivable ZOI from International Sites	Disturbance/degradation to Annex I habitats and Annex II species* *subject the results of the proposed HRSA	Within and up to 30km* from the Development Site *within 30km for International Sites designated for bats and within 10km for all other International Sites.	International Sites including; Cefn Cribwr Grasslands SAC; Blackmill Woodlands SAC; and Limestone Coast of South West Wales SAC
Working within a conceivable ZOI from sites of national importance for bats	Disturbance to important populations of bats	Within 2km from the Development Site	Sites of national importance including; Coedymwstwr Woodland SSSI
Operational			

Activity	Effect	Zone of Influence	Ecological Features Impacted
Routine maintenance activities	Noise and visual disturbance from traffic and people	Within and up to 250m from the Development Site	Protected and/or notable species susceptible to disturbance should they be present (as will be determined by further surveys) including bats, badger, water vole and GCN.

ASSESSMENT METHODOLOGY

- 5.4.42. Assessment methods for all potentially significant effects will be based on the methodology described in the CIEEM Guidelines for Ecological Impact Assessment (2024).
- 5.4.43. The importance and sensitivity of ecological features will be evaluated with reference to the quality or extent of designated sites or habitats; to habitat or species rarity; to the extent to which they are threatened throughout their range; or to their rate of decline, and their legal status. This level of importance was then qualified at a relevant geographical scale.
- 5.4.44. Effects are deemed significant if they affect the structure and function of a site, or they impact upon the conservation status of a habitat, species or constituents of a species assemblage.

Identification of Important Ecological Features

- 5.4.45. The value of sites, species and habitats will be evaluated in line with CIEEM guidelines with reference to their importance in terms of conservation value (which relates to the need to conserve representative areas of different habitats and the generic diversity of species populations), and their legal status. For the purposes of this assessment, sites, species populations, species assemblages and habitats will be valued using the following geographical scale:
- International;
 - National (UK or Wales);
 - County;
 - Local;
 - Of value within the context of the project; and
 - Negligible.
- 5.4.46. These are discussed in **Table 5-6**.

Significance criteria

- 5.4.47. This section sets out the methodology that will be followed to assess the potential ecological impacts of the Proposed Development, considering both the construction and operational phases. The construction phase includes enabling works, clearance, earthworks and construction activities.
- 5.4.48. The methodology for this assessment is in accordance with guidance provided by CIEEM (2024) and follows the key stages listed below:
- Establishing the Study Area and Survey Area;
 - Collating information on the baseline studies and evaluation of ecological receptors;
 - Identification of IEFs;
 - Identification and characterisation of potential impacts;
 - Identification and assessment of significant effects from potential impacts upon IEFs; and

- Identification and assessment of residual effects.

Magnitude of Potential Impacts

- 5.4.49. Ecological receptors are usually non-statutory designated sites/nature conservation sites, habitats, species assemblages or communities, or populations or groups of a species. Impacts can be permanent or temporary, direct or indirect, and can be cumulative. These factors are brought together to assess the magnitude of the impact on particular IEFs and, wherever possible, the magnitude of the impact is quantified. Professional judgement is then used to assign the impacts on the IEFs to one of four classes of magnitude, defined in **Table 5-18** below.

Table 5-18 – Magnitude of Potential impacts

Magnitude	Definition
High	A permanent or long-term effect on the extent or size or integrity of a site, habitat, species assemblage or community, population or group. If adverse, this is likely to threaten its sustainability; if beneficial, this is likely to enhance its conservation status.
Medium	A permanent or long-term effect on the extent or size or integrity of a site, habitat, species assemblage or community, population or group. A short-term effect that will adversely affect the integrity of a receptor in a permanent manner. If adverse negative effect, this is unlikely to threaten its overall sustainability, if positive this is likely to be sustainable but is unlikely to significantly enhance its conservation status.
Low	A permanent or temporary, long-term reversible or short-term effect on a site, habitat, species assemblage or community, population or group whose magnitude is detectable but will not threaten/change its conservation status.
Negligible	A short-term reversible effect on the extent, size or integrity of a site, habitat, species assemblage or community, population or group that is within the normal range of natural variation and has no discernible lasting effect.

- 5.4.50. Potential impacts are characterised initially in the absence of any mitigation, except where this is integral to the design of the Proposed Development (embedded mitigation).

Defining Significance of effect

- 5.4.51. The significance of the predicted effects on receptors arising from the identified impacts of the Proposed Development is assessed. Significance is assessed as Adverse, Beneficial or Not Significant on the integrity of an IEF and/or the conservation status of IEFs within a given geographical area.
- 5.4.52. In considering the integrity and conservation status of the receptor, the key considerations are:
- Will any site/ecosystem processes be removed or changed or subject to disturbance?
 - What will be the effect on the nature, extent, structure and function of component habitats?
 - What will be the effect on the average population size and viability of component species?
- 5.4.53. In determining the significance of a potential effect, the above factors including the value of the feature, magnitude of the potential impact, and the duration of the impact are considered.

- 5.4.54. Where possible, the assessment of these parameters needs to be expressed quantitatively and to be based on research and published information. However, it is also recognised that many ecological effects are complex and poorly understood, therefore professional and qualitative judgements are often required to prescribe the significance of the effect.

Source-pathway-receptor approach

- 5.4.55. The source-pathway-receptor approach will be used to understand the mechanisms by which the Proposed Development could result in LSEs on ecological resources. The approach starts by identifying potential sources of effects, defining the Zol, and then mapping the progression of the effect along potential mitigation pathways. Where it was observed that an effect was potentially connected, via a pathway, to an ecological resource, an analysis was undertaken to assess the implications for the resource, including the likely sensitivity of the resource.
- 5.4.56. In order for an effect to occur, all three elements of the concept must be in place. The absence or removal of one of the elements of the concept means there is no likelihood for the effect to occur.
- 5.4.57. Habitats and species which may be impacted by the Proposed Development are considered to be within the Zol. The Zol is specific to the IEF and is defined by the pathways available for the impact, either directly or indirectly, to result in a potential effect to the habitat or species.
- 5.4.58. The Zol is assessed according to the anticipated construction work methods and the extent to which they can affect ecological features within and outside the boundaries of the Proposed Development. The Zol for each ecological feature will vary depending on the nature of the ecological feature being considered and in accordance with published guidance where available.

Assessment of cumulative effects

- 5.4.59. Consideration should also be given as to whether any of the IEFs identified within this scoping chapter are likely to be subject to cumulative effects as a result of the Proposed Development in combination with other nearby developments.
- 5.4.60. Cumulative effects would generally be either:
- Cumulative 'Zol' effects whereby two or more developments affect the same specific receptor (e.g. two developments in the same river catchment); or
 - Cumulative effects on the total resource (or population) of an ecological feature in a region due to two or more developments (e.g. two developments affect the same habitat type in a region, reducing its overall area).
- 5.4.61. Assessment of these is complex and relies on the definition of a reasonable scope for cumulative effects, and the availability of a reasonable baseline for other developments. However, the same principles of assessment apply, i.e. an effect would have to be significant at the 'County' level to be significant in EclA terms. In addition, the assessment focuses on those occasions where two 'not significant' effects might operate cumulatively to result in a significant effect (rather than where the effects of one development on an ecological feature are already, on their own, considered significant).
- 5.4.62. Assessment of cumulative effects are considered likely to be present and have been scoped in at this stage as a precautionary measure. A detailed assessment will be provided within the Environmental Statement (ES) and will be subject to any information available through the Local Planning Authority (LPA) regarding other local projects. Where such information is limited, this may in turn limit the efficacy of the assessment of cumulative effects. Consultation with the LPA will be required to determine a conclusion.

Approach to Mitigation and Compensation

- 5.4.63. The mitigation hierarchy and Step-wise approach will be adopted, following the sequential process of avoidance, minimisation, mitigation and compensation. Inherent in the design of the Proposed Development will be the avoidance of impacts upon potential ecological features as far as possible through the sensitive siting of turbine bases, access tracks and associated infrastructure. Where such impacts cannot be altogether avoided, however, mitigation will be implemented to ensure such impacts are reduced as far as possible so as to minimise harm upon potential ecological features. Where mitigation is unavoidable, compensation will be necessary in respect of residual effects remaining after avoidance and mitigation measures have been taken into account. Additionally, enhancement measures will also be implemented so as to ensure overall net benefit to biodiversity are achieved. Such enhancements would be proposed following consultation with relevant stakeholders to ensure that any measures proposed were compatible with ongoing management of the Site.
- 5.4.64. Avoidance, minimisation, mitigation, compensation and enhancement measures to be implemented as part of the Proposed Development will be informed by those ongoing ecological field surveys of the study area, as detailed previously above, alongside further discussions with relevant stakeholders and consideration of the development proposals as they evolve. Standard measures considered necessary to ensure compliance with relevant legislation, planning policy and best practice guidance will also be implemented, including: the preparation of a Construction Method Statement detailing the practical measures to avoid and reduce potential adverse effects arising; and the production of a habitat management plan detailing those management, maintenance and monitoring measures requiring delivery over the lifetime of the Proposed Development.

5.5 ORNITHOLOGY

- 5.5.1. This section describes the proposed scope of the assessment of effects with respect to ornithology arising from the Proposed Development (terrestrial and freshwater ecology are dealt with separately under **Section 5.4: Biodiversity**).
- 5.5.2. This chapter describes:
- The biodiversity policy and legislative context (with particular focus on ornithology).
 - Baseline conditions, including data sources, the proposed approach for baseline data collection and a summary of data collected to date.
 - Potential ornithological features and likely significant effects of the development on biodiversity.
 - The proposed assessment methodology.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.5.3. The policy and legislation relevant to ornithology of the Site is detailed in **Table 5-19** and **Table 5-20**. Further information on policies relevant to the EIA and their status is set out in **Chapter 3: Legislation and Planning Policy Overview**, which should be read in conjunction with this section.

Table 5-19 - Legislation relevant to the ornithology assessment

Legislation	Description
The Conservation of Habitats and Species Regulations 2017 (as amended) ⁶²	The Habitat Regulations transpose the Habitats Directive ⁶³ into English and Welsh law. The regulations provide for the designation and protection of internationally designated sites, the protection of certain species (referred to as European Protected Species or EPS) and the adaptation of planning and other controls for the protection of international sites
The Environment (Wales) Act 2016 ⁶⁴	The Act makes provisions within Wales for the planning and managing of natural resources at national and local level. Section 6 of the Act introduces the biodiversity and resilience of ecosystems duty whereby public authorities are required to seek to maintain and enhance biodiversity so far as it is consistent with the proper exercise of those functions. Section 7 of the Act introduces a list of living organisms and types of habitat in Wales, known as Species or Habitats of Principal Importance, which are considered of key significance to sustain and improve biodiversity in Wales.
The Wildlife and Countryside Act 1981 (as amended) (WCA) ⁶⁵	All birds and their nests are protected under the Wildlife and Countryside Act 1981 (as amended). Under the Act it is an offence to move, damage or destroy an active nest at any part of the nesting cycle. A subset of species is listed under Schedule 1 of the Wildlife and Countryside Act and are afforded additional levels of protection that include protection from disturbance while it is building a nest or is in, on or near a nest containing eggs or young; or disturb dependent young of such a bird.

Table 5-20 - Planning policy relevant to the ornithology assessment

Policy	Description
<i>National Planning Policy</i>	
Future Wales: The National Plan 2040 ⁶⁶	The Welsh national development framework sets the direction for development in Wales to 2040. Policy 9 – Resilient Ecological Networks and Green Infrastructure outlines measures to ensure the enhancement of biodiversity, the resilience of ecosystems and the provision of green infrastructure.
Planning Policy Wales 12 – Chapter 6	Chapter 6 of Planning Policy Wales (PPW) sets out the Welsh Government's objectives for Distinctive and Natural Places. Planning policy topics covers the historic environment, landscape, biodiversity and habitats, coastal characteristics, air quality, soundscape, water services, flooding and other environmental (surface and sub-surface) risks.

62 UK Government (2017). Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations") has been amended by (inter alia) the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at: <https://www.legislation.gov.uk/uksi/2017/1012/contents> [Accessed 19 January 2026].

63 Council Directive 92/43/EEC on the Conservation of natural habitats and wild flora and fauna, May 1992

64 UK Government (2016). The Environment (Wales) Act 2016. (Online). Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted> [Accessed 19 January 2026].

65 UK Government (1981). The Wildlife and Countryside Act 1981 (as amended). (Online) Available at: <https://www.legislation.gov.uk/ukpga/1981/69/contents> [Accessed 19 January 2026].

66 Welsh Government (2021). Future Wales: The National Plan 2040. (Online). Available at: <https://gov.wales/future-wales-national-plan-2040> [Accessed 19 January 2026].

Policy	Description
Distinctive and Natural Places ⁶⁷	This latest revision (edition 12, 2024) focuses on green infrastructure; net benefit for biodiversity and the step-wise approach; protection for Sites of Special Scientific Interest (SSSI); and trees and woodland. The revision seeks to clarify Wales' intentional, diverging approach to Biodiversity Net Gain in respect of the Environment Act 2021, with a focus instead on ecosystem resilience.
Technical Advice Note 5 (TAN5) Nature Conservation and Planning ⁶⁸	Technical Advice Note 5 (TAN5) supplements PPW and sets out statutory, protection-specific policies in relation to the protection of biodiversity and geological conservation through the planning system. Such policies include those receiving statutory protection under existing legislative provisions (as well as those sites, habitats and species outwith such protection), and aim to ensure that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered
<i>Local Planning Policy</i>	
Bridgend County Borough Local Development Plan (LDP) 2018-2033 ⁶⁹	The LDP identifies where new developments such as housing, employment, community facilities, and roads will go. It provides a framework for local decision making and brings together both development and conservation interests to ensure that any changes in the use of land are coherent and provides maximum benefits to the community.
Bridgend Biodiversity Duty Plan 2022-25 ⁷⁰	This plan sets out the actions the Borough Council will take to meet its legal duty to maintain and enhance biodiversity, and in so doing, promote ecosystem resilience.
Bridgend County Borough Local Biodiversity Action Plan 2014 ⁷¹	The national strategy for biodiversity is delivered at local level via Local Biodiversity Action Plans (LBAP). Bridgend County Borough's LBAP is the driver to protect, enhance and manage the biodiversity resource, by setting out objectives, targets and actions for the conservation of biodiversity within Bridgend County Borough.

5.5.4. The ornithology assessment in the EIA will be based on industry-standard best-practice guidance including:

- CIEEM (2022) Guidelines for Ecological Impact Assessment in the UK and Ireland⁷²;

67 Welsh Government (2024) Planning Policy Wales, Edition 12, February 2024. (Online). Available at: <https://gov.wales/planning-policy-wales> [Accessed 19 January 2026].

68 Welsh Government, (2009). Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning. (Online) Available at: <https://gov.wales/technical-advice-note-tan-5-nature-conservation-and-planning> [Accessed 19 January 2026].

69 Bridgend County Borough (2018-2033). Local Development Plan (LDP): Written Statement Adopted Plan. Available online at <https://www.bridgend.gov.uk/media/pq4nmcd2/ad6-written-statement-final-version.pdf> [Accessed 19 January 2026].

70 Bridgend County Borough (2022-2025). Biodiversity Duty Plan. Available at: <https://www.bridgend.gov.uk/council/plans-and-strategies/biodiversity-duty-plan> [Accessed 19 January 2026].

71 Bridgend County Borough Council (2014) Local Biodiversity Action Plan: Biodiversity and Ecosystem Services Assessment. Available at: <https://www.bridgend.gov.uk/council/plans-and-strategies/local-biodiversity-action-plan> [Accessed 19 January 2026].

72 Chartered Institute of Ecology and Environmental Management (CIEEM) (2022). Guidelines for Ecological Impact Assessment in the UK and Ireland. Version 1.2. Winchester: CIEEM. Available at: <https://cieem.net/resource/guidelines-for-ecological-impact-assessment/> [Accessed 23 January 2026]

- NatureScot (NS) 2025 Recommended bird survey methods to inform impact assessment of onshore wind farms⁷³;
- NatureScot (2024) Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms⁷⁴;
- NatureScot (2025) Guidance note - Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas⁷⁵;
- NatureScot (2025) Guidance - Assessing the cumulative impacts of onshore wind farms on birds⁷⁶;
- Hardy *et al* (2013) Raptors: a field guide to survey and monitoring⁷⁷;
- Gilbert *et al* (1998) Bird monitoring methods⁷⁸;
- Bibby *et al* (2000) Bird census and survey techniques⁷⁹; and
- Goodship *et al.* (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species⁸⁰.

BASELINE

Extent of Study Area

- 5.5.5. Given the mobile nature of birds, the ornithology field surveys undertaken to inform the assessment cover the Site and wider study area as applicable to the potential Zone of Influence (Zol) of the Proposed Development to target species or species-groups, with reference to best practice guidance. For example, in respect of Nightjar *Caprimulgus europaeus* and raptors, the wider study area has included a survey buffer extending circa 500m and 2,000m from the Site respectively.
- 5.5.6. To date, the desk and field study areas have been derived from buffers from the Northern and Southern Array (Development Site).
- 5.5.7. These field study areas, alongside the wider desk study search radius, reflect the sensitivity and value of potential ornithology receptors and are considered to be sufficient to cover the potential Zol of the Proposed Development on these receptors, while providing contextual information to assist with determining and evaluating the baseline.

⁷³ NatureScot (2025). Recommended bird survey methods to inform impact assessment of onshore wind farms. Available at:

<https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms> [Accessed 23 January 2026]

⁷⁴ NatureScot (2024) Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms Available at

<https://www.nature.scot/doc/guidance-using-updated-collision-risk-model-assess-bird-collision-risk-onshore-wind-farms> [Accessed 26 January 2026]

⁷⁵ NatureScot (2025) Guidance note - Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas Available at <https://www.nature.scot/doc/guidance-note-assessing-significance-impacts-bird-populations-onshore-wind-farms-do-not-affect> [Accessed 26 January 2026]

⁷⁶ NatureScot (2025) Guidance - Assessing the cumulative impacts of onshore wind farms on birds Available at <https://www.nature.scot/doc/guidance-assessing-cumulative-impacts-onshore-wind-farms-birds> [Accessed 26 January 2026]

⁷⁷ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013). Raptors: a field guide to survey and monitoring (3rd ed.). Thetford: British Trust for Ornithology.

⁷⁸ Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird monitoring methods: a manual of techniques for key UK species. Sandy: Royal Society for the Protection of Birds.

⁷⁹ Bibby, C., Burgess, N.D., Hill, D., & Mustoe, S. (2000) Bird Census Techniques – Second Edition. Academic Press, London, England.

⁸⁰ Goodship, N.M. and Furness, R.W. (MacArthur Green) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.

Identification of Target Species

- 5.5.8. With reference to best practice guidance⁷³, the surveys and subsequent assessment will focus on Target Species drawn from the following lists:
- Annex I within the Directive 2009/147/EC on the conservation of wild birds, commonly referred to as “the Birds Directive”⁸¹;
 - Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
 - Section 7 of the Environment (Wales) Act 2016
 - Red list of Birds of Conservation Concern UK Version 5⁸²; and
 - Red list of Birds of Conservation Concern Wales Version 4⁸³.
- 5.5.9. Species contained within these lists that by virtue of their breeding, roosting, feeding or migrating behaviour may be sensitive to the Proposed Development have been identified as Target Species for assessment purposes.
- 5.5.10. Target Species for the ornithological assessment are defined as:
- All wildfowl (excluding feral or very common species such as Canada Goose *Branta canadensis*, Greylag Goose *Anser anser* and Mallard *Anas platyrhynchos*);
 - Raptors, owls and waders included in the lists in **paragraph 5.5.8**;
 - Other notable species including: Long-eared Owl *Asio otus* and Nightjar.
- 5.5.11. With reference to best practice guidance⁷³, passerine species have been scoped out as Target Species to be included within the ornithology impact assessment, except where significant habitat loss/disturbance impacts could potentially arise during vegetation clearance, construction and decommissioning. This is because such species are generally not considered to be at risk of impacts from the operational turbines.
- 5.5.12. As per guidance⁷³, consideration will also be given to Secondary Species; those species that do not qualify as Target species but are of regional conservation concern. Recording of Secondary Species is subsidiary to recording of Target Species. Secondary Species will include:
- all species included in the lists in **paragraph 5.5.8**;
 - all raptors;
 - all owls;
 - all waterfowl;
 - all waders;
 - all gulls; and
 - Raven *Corvus corax*.

⁸¹ Directive 2009/147/EC, Article 4(1), Annex I. Available: https://environment.ec.europa.eu/topics/nature-and-biodiversity/birds-directive_en [Accessed 19 January 2026].

⁸² 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. *British Birds* 114:723-747.

⁸³ Johnstone, I. Bladwell, S & Pritchard, R. (2024). Birds of Conservation Concern in Wales 4: the population status of birds in Wales. *Birds in Wales* 13 (1).

Desk Study

- 5.5.13. Given the potential for the Proposed Development to affect ornithological features located outside of as well as within the Development Site, a desk study was undertaken in January 2025 to obtain the following data:
- International protected sites (Special Protected Areas (SPA) and Ramsar Sites) designated for ornithological features within 20km of the Development Site⁸⁴;
 - National statutory sites (SSSIs and National Nature Reserves (NNRs)) designated for ornithological features within 10km of the Development Site;
 - Other statutory and non-statutory sites e.g. Sites of Importance for Nature Conservation (SINCs) designated for ornithological features within 2km of the Development Site; and
 - Records of Target Species (as defined in **Section 5.5.8** of this report) within 2km of the Development Site.
- 5.5.14. The desk study data was sought from the South East Wales Biological Records Centre (SEWBRc), Natural Resources Wales (NRW) Designated Site Search⁸⁵, the Joint Nature Conservation Committee (JNCC), and the Multi-Agency Geographic Information for the Countryside (MAGIC) website⁸⁶.
- 5.5.15. No SPAs or Ramsar sites which are designated for ornithological features were identified within 20km of the Development Site.
- 5.5.16. Two SSSIs which are designated for ornithological features were identified within 10km of the Development Site, as detailed in **Table 5-21** and shown in **Figure 5.3**. No NNRs were identified within 10km of the Development Site.

Table 5-21 - National statutory sites designated for ornithological features within 10km of the Development Site

Site name	Type of designation	Designated features	Approximate distance (m) and direction from the Site
Mynydd Ty-isaf	SSSI	The higher crags within the SSSI provide nesting sites for a Schedule 1 raptor.	5,070 NE
Eglwys Nunydd Reservoir	SSSI	The reservoir attracts large numbers of wintering waterfowl and passage migrants. Notable species including Great Crested Grebe <i>Podiceps</i>	9,630 SW

84 Scottish Natural Heritage (2016). Guidance Note: Assessing Connectivity with Special Protection Areas. Version 3.

20km is considered an appropriate study area as the only bird species listed in this guidance with foraging distances of >20km is Barnacle Goose *Branta leucopsis* and there is an absence of records of this species from the desk study and ongoing field surveys.

85 <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en> [Accessed 19 January 2026].

86 www.magic.gov.uk [Accessed 19 January 2026].

		<i>cristatus</i> , Little Grebe <i>Tachybaptus ruficollis</i> , Mallard <i>Anas platyrhynchos</i> , Gadwall <i>Mareca strepera</i> and Coot <i>Fulica atra</i> now breed.	
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Two SINCs which are designated for ornithological features were identified within 2km of the Development Site, as detailed in **Table 5-22** and shown in **Figure 5.4**.

Table 5-22 - Non-statutory sites designated for ornithological features within 2km of the Development Site

Site name	Type of designation	Designated features	Approximate distance (m) and direction from the Site
Lletty Brongu	SINC	Ancient woodland, wet valley bottom, rare breeding birds	1,190 SW
Tylacoch South	SINC	Rare breeding birds	1,350 S

- 5.5.17. The desk study returned 989 records of Target and Secondary bird species from the last 10 years within 2km of the Development Site, as listed in **Appendix F**.

Field Surveys

Programme

- 5.5.18. The ornithological field survey programme has been designed to provide sufficient information on Target Species to inform the ornithological impact assessment.
- 5.5.19. Initial bird scoping exercises were completed in September 2024 to identify the suitability of the Development Site and a 2km buffer for potential target bird species and to ground-truth Vantage Point (VP) locations following initial desk-based data collation and viewshed analysis. Viewshed analysis is a desk-based task using topographical data the areas visible from any potential VP.
- 5.5.20. The initial bird scoping Site visit, alongside the desk study, were used to identify the potential Target Species and the appropriate scope of survey work.
- 5.5.21. The ornithology surveys commenced in October 2024 and, with reference to best practice⁷³, will continue for two years. Some refinement of the survey work has taken place over time (e.g. two VP locations were moved slightly to better cover turbine locations once their positions had been confirmed) to reflect the ongoing survey findings and small changes to the study area. A summary of the completed and ongoing surveys is provided in **Table 5-23**.

Table 5-23 - Summary of ongoing baseline survey programme for ornithology

Receptor / Survey	Proposed Scope of Survey	Survey Timing
Vantage point (VP) Surveys	VP surveys are in progress and are following NS guidance ⁷³ : 'Recommend bird survey methods to inform impact assessment of onshore wind farms'.	October 2024 – September 2026 (ongoing)

Receptor / Survey	Proposed Scope of Survey	Survey Timing
	Viewshed analysis and Site visits identified that four VPs are sufficient to provide adequate coverage at minimum blade heights of the Development Site. In order to quantify the potential collision risk associated with the Proposed Development, each of the four VPs will receive a total of 144 hours of survey over two years (6 hours each month). All flights of Target Species within a 2km viewshed are recorded (Target Species defined in Section 5.5.7). Surveyors record the approximate route, length and height of each flight to enable analysis using Collision Risk Modelling following Band <i>et al</i> 2007⁸⁷. Target species flight heights were recorded at 15 second intervals. Based on the worst-case turbine specifications, the following core height bands were used, with Bands B and C within the collision risk zone: A: 0-15m; B: 15-100m; C: 100-200m; and D: >200m.	
Breeding Raptor Surveys	Following analysis of the data from the desk study, habitat scoping site visits and the ongoing VP surveys, the following notable raptor species were identified as having potential to breed on the Development Site or in the immediate surrounding area: Goshawk <i>Accipiter gentilis</i>, Red Kite <i>Milvus milvus</i>, Peregrine <i>Falco peregrinus</i>, Kestrel <i>F. tinnunculus</i> and Merlin <i>F. columbarius</i>. During the breeding seasons, dedicated surveys for raptors will continue following Hardey <i>et al</i> (2013)⁷⁷ to identify active nests within a 1km buffer for Goshawk and Kestrel and 2km buffer for Red Kite, Peregrine and Merlin (where access is available). The survey effort comprises four Site visits each breeding season and uses a combination of informal VP watches to identify potential nest locations and dedicated searching and monitoring of any identified nests. All raptor surveys are completed by staff holding a relevant Schedule 1 licence from Natural Resources Wales. The results will be used to estimate the number and distribution of breeding raptors close to the Development Site to enable the production of an accurate baseline for use in the ornithological impact assessment.	March – July 2025, March – July 2026. (ongoing)
Breeding Nightjar Surveys	Following analysis of the data from the desk study and habitat scoping site visits, Nightjar were identified as having potential to breed on the Development Site or in the immediate surrounding area.	June – July 2025, June – July 2026 (ongoing)

⁸⁷ Band, W, Madders, M, & Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In: Janss, G, de Lucas, M & Ferrer, M (eds.) Birds and Wind Farms. Quercus, Madrid. 259-275

Receptor / Survey	Proposed Scope of Survey	Survey Timing
	Nightjar-specific surveys will continue during the breeding seasons, focusing on areas of suitable habitat within the Development Site and within a buffer of 500m. The survey approach follows Gilbert <i>et al</i> (1998)⁷⁸ focusing on the identification of churring males to identify the number of territories present in the survey area. Two transects were identified passing through areas of clear fell and young plantation woodland. Survey visits are undertaken in June and July, shortly after sunset and before sunrise. This data will be used to estimate the number and distribution of Nightjar within the survey area.	
General Breeding Bird Surveys	A breeding bird survey will be carried out following a methodology consistent with the Bird Survey Guidelines⁸⁸ to collect data on the breeding bird assemblage within the Development Site and a 100m buffer. These guidelines were selected instead of the moorland breeding bird survey method⁸⁹ recommended within the NS guidance⁷³, because the survey area of the Development Site includes woodland habitats that are better suited to survey following the Bird Survey Guidelines. Site visits will be undertaken between late March and early July 2026 during which surveyors will complete a full walkover of the Development Site and an additional 100m buffer (where access is available). The survey visits will start at dawn and every bird detected (visually and/or aurally) will be mapped and the species, number of individuals, sex and behaviour recorded. These data will be used to estimate the breeding densities, distribution and overall number of territories of each species within the survey area.	March – July 2026 (ongoing)
Winter Walkover Surveys	Winter walkover surveys will continue to be undertaken following an adapted version of the British Trust for Ornithology Farmland Bird Survey⁹⁰ and other walkover survey methods⁷⁸. These surveys are to collect data on how wintering Target Species and Secondary Species utilise the Development Site, especially wintering waders, that may not be picked up during VP surveys. Monthly Site visits are carried out between October and March to record Target Species and Secondary Species on the Development Site and within a 500m buffer where appropriate.	October 2024 – March 2025, October 2025 – March 2026 (ongoing)

88 Bird Survey & Assessment Steering Group (2021). Breeding Bird Survey Methodology. Available: <https://birdsurguidelines.org/methods/survey-method>

89 A. F. Brown & K. B. Shepherd (1993) A method for censusing upland breeding waders, *Bird Study*, 40:3, 189-195

90 Atkinson, P.W., Fuller, R.J., Gillings, S. & Vickery, J.A. 2006. A detailed assessment of the Pilot Survey: Counting birds on farmland in winter. *Bird Study* 53: 303-309.

Receptor / Survey	Proposed Scope of Survey	Survey Timing
	The data will be used to identify areas important for foraging or roosting by Target Species and Secondary Species within the survey area, especially focusing on wintering waders utilising the survey area.	

Surveys and Species Scoped Out

- 5.5.22. In light of the desk study findings, habitats present, ongoing survey findings and nature of the Proposed Development, certain bird surveys have been scoped out of assessment. These surveys and the justification for scoping them out is summarised in **Table 5-24**.

Table 5-24 - Ornithology surveys scoped out

Receptor/Survey	Reason for Scoping Out
Woodland and waterbody point count surveys	Woodland and waterbody point count surveys have been scoped out given the absence of notable waterbodies within the Development Site and lack of anticipated woodland impacts. It was considered that the winter transects would identify any overwintering/migratory waterfowl or waders using the ponds adjacent to the Development Site. Woodland Target Species, such as raptors, would be identified through specific survey methods covering these species, as outlined in Table 5-23 . In addition, VP surveys will capture any pertinent movements of Target Species across the Development Site from or to such features in the wider landscape. No turbines are proposed in the woodland habitats.
Black Grouse <i>Lyrurus tetrix</i> surveys	There is an absence of records of Black Grouse from the desk study or ongoing Site surveys and there is limited suitable habitat within the Development Site boundary. The BTO Bird Atlas 2007-11 ⁹¹ does not show any records of this species in south Wales.
Barn Owl <i>Tyto alba</i> surveys	No suitable nesting habitat has been identified within or adjacent to the Development Site as there are no buildings present and the adjacent woodland and trees comprise entirely of coniferous plantation.
Targeted Hen Harrier <i>Circus cyaneus</i> or Short-eared Owl <i>Asio flammeus</i> surveys	There is a limited extent of suitable habitat for these species within the Development Site boundary and an absence of records of Short-Eared Owl from the desk study or ongoing Site surveys. There are very limited records of Hen Harrier passing through Site during VP surveys in winter and the BTO Bird Atlas 2007-11 ⁹¹ does not show any records of this species in south Wales.

Field Survey Results

- 5.5.24. This section provides a high-level summary of the bird survey results from the first year of survey (October 2024 – September 2025). However, it should be noted that full analysis of the survey data

⁹¹ Bird Atlas 2007–11 is: Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. & Fuller, R.J. 2013. Bird Atlas 2007–11: the breeding and wintering birds of Britain and Ireland. BTO Books, Thetford.

is yet to be completed. Full reporting, including collision risk analysis, will be provided as part of any final assessment.

VP Surveys

- 5.5.25. A summary of the Target Species recorded during the VP surveys and the number of flights for each species per season is provided in **Table 5-25** and **Table 5-26**. **Table 5-25** shows the flights over and adjacent to the Northern Array of the Development Site and **Table 5-26** shows the flights over and adjacent to the Southern Array of the Development Site.

Table 5-25 - Number of flights of Target Species recorded during VP surveys between October 2024 and September 2025 – Northern Array

Species	Breeding Season (April – July)	Non-breeding Season (August – March)	Total Flights
Red kite	33	56	89
Kestrel	12	41	53
Goshawk	9	5	14
Golden plover <i>Pluvialis apricaria</i>	0	10	10
Peregrine	1	9	10
Hen harrier	0	1	1
Hobby <i>Falco subbuteo</i>	0	1	1

Table 5-26 - Number of flights of Target Species recorded during VP surveys between October 2024 and September 2025 – Southern Array

Species	Breeding Season (April – July)	Migration Season (August – March)	Total Flights
Red kite	94	113	207
Kestrel	0	18	18
Goshawk	5	13	18
Peregrine	3	2	5
Hen harrier	0	2	2
Curlew <i>Numenius arquata</i>	0	1	1

- 5.5.26. Eight Target Species were identified during the first year of survey. The most frequently recorded species was Red Kite with a total of 296 flights recorded throughout the year. Red Kite have been recorded hunting and foraging and across the Development Site, though no breeding activity was recorded. Moderate flight activity was recorded from Kestrel and Goshawk. Kestrel were recorded

hunting outside of the breeding season (including end of July when breeding was likely concluded) and were more frequent in the Northern Array of the Development Site. Goshawk were recorded throughout the year, with the highest activity in the area between the Northern and Southern Arrays of the Development Site. No breeding activity was recorded.

- 5.5.27. Low levels of Peregrine activity were recorded throughout the year and throughout the Development Site, with no breeding activity recorded. Infrequent flights of Golden Plover were recorded during the non-breeding season within the Northern Array. Ten flights were recorded of Golden Plover over two dates (in September and January) and they were recorded roosting in the centre of the Northern array with a maximum flock size of 70.
- 5.5.28. Low numbers of flights were recorded from Hen Harrier, Hobby and Curlew, with Hen Harrier observed during winter and Hobby and Curlew recorded on single occasions during the autumn migration season.
- 5.5.29. Full assessment and analysis of flight line data using collision risk modelling will be completed and presented as part of the final assessment.

Breeding Raptor Surveys

- 5.5.30. The breeding raptor surveys completed between March and July 2025 did not identify any active nest sites of Target Species within 2km of the Development Site.
- 5.5.31. Goshawk were regularly observed hunting and displaying over the woodland within the 1km buffer survey area during the breeding season, suggesting territory occupancy but no breeding. There is potential for breeding attempts in this suitable habitat in future breeding seasons. More detailed information on the potential breeding locations of Goshawk is sensitive and confidential due to the protection and persecution of this species but can be requested as a confidential appendix if required.
- 5.5.32. Suitable breeding habitat for Red Kite was identified within 2km of the Development Site, but no breeding activity was recorded. No suitable nesting habitat for Peregrine was identified within 2km of the Development Site. Kestrel and Merlin were not recorded during the surveys.

Breeding Nightjar Surveys

- 5.5.33. The breeding Nightjar surveys completed in June and July 2025 identified a maximum count of 14 Nightjar within 500m of the Development Site. An estimated eight breeding territories were identified within the clear fell forestry, young plantation and scattered trees adjacent to the north of the Northern Array, to the east of the Southern Array and between the Northern and Southern Arrays.

Winter Walkover Surveys

- 5.5.34. The winter walkover surveys completed between October 2024 and March 2025 identified the Target Species and Secondary Species listed in **Table 5-27**. No large flocks of any species were recorded. Many of the species recorded were restricted to the woodlands adjacent to the Development Site. A flock of two Golden Plover were recorded taking off from the Southern Array on a single occasion in January. Skylark *Alauda arvensis* and Meadow Pipit *Anthus pratensis* were species most frequently recorded. They were associated with grassland habitats within the Development Site.

Table 5-27 - Target Species and Secondary Species identified during the winter walkover surveys (October 2024 - March 2025)

Common Name	Scientific Name
Bullfinch	<i>Pyrrhula pyrrhula</i>
Buzzard	<i>Buteo buteo</i>
Common crossbill	<i>Loxia curvirostra</i>
Dunnock	<i>Prunella modularis</i>
Goldcrest	<i>Regulus regulus</i>
Golden plover	<i>Pluvialis apricaria</i>
Mistle thrush	<i>Turdus viscivorus</i>
Meadow pipit	<i>Anthus pratensis</i>
Raven	<i>Corvus corax</i>
Redwing	<i>Turdus iliacus</i>
Reed bunting	<i>Emberiza schoeniclus</i>
Skylark	<i>Alauda arvensis</i>
Sparrowhawk	<i>Accipiter nisus</i>
Song thrush	<i>Turdus philomelos</i>

THE SCOPE OF THE ASSESSMENT

Potential Ornithological Features

- 5.5.35. The selection of ornithological features to be taken forward to the detailed assessment stage will be informed by baseline data gathered through desk-based review and ongoing field surveys. This information will be used to identify those ornithological features considered to be ‘important’ at the project level. In accordance with CIEEM guidance⁷², the importance of each feature will be defined using an appropriate geographic scale and described in the context of UK and Welsh legislation and policy, with consideration given to the extent of habitat or the size of the population that may be affected by the Proposed Development. Consequently, the importance assigned to an ornithological feature may differ from that implied by legislative protection alone or by its designation as a conservation-notable species.
- 5.5.36. Wherever possible, information regarding the extent and population size, population trends and distribution of the ornithological features will be used to inform their categorisation and determine

their importance at the project level. Where detailed criteria or contextual data are not available, professional judgement will be used to determine importance. Example criteria for determining the importance of ornithological features are provided in **Table 5-28**.

Table 5-28 - Criteria for determining the importance of ornithological features

Geographic context of importance	Description
International	International nature conservation areas including any SPA, proposed SPA or Ramsar. Populations of internationally designated site qualifying species that depend on the Development Site (i.e., functionally linked to the designation). Species present in internationally important numbers (>1% of European populations). Species listed on Annex I of the EC Birds Directive if present in qualifying numbers/proportions of international population.
National (Wales/UK)	National nature conservation areas, including any SSSI or NNR designated for ornithology features. Populations of national nature conservation area qualifying species that depend on the Development Site (i.e., functionally linked to the designation). Breeding or overwintering populations of ecologically sensitive rare bird species (<300 breeding pairs in the UK). Species present in nationally important numbers (>1% Welsh/UK population). Regularly occurring relevant migratory species, which are of rare and/or of significant conservation concern that warrant special consideration on account of the proximity of migration routes, breeding, wintering and staging areas in relation to the Development Site.
County (Bridgend County Borough)	Local nature conservation areas designated for ornithology, including any Local Nature Reserve or SINC. Populations of species that are designated within a local site and depend on the Development Site. County-scale important population/assemblage of bird species listed on Schedule 1 of the WCA or Section 7 of The Environment (Wales) Act 2016 Species present in regionally important numbers (>1% regional population). Significant breeding or overwintering populations of species on the Red List for Birds of Conservation Concern within the county context. Significant species, populations or assemblage that would meet the criteria set for SINC designation.
Local	Breeding or overwintering populations of bird species listed on Schedule 1 of the WCA or Section 7 of The Environment (Wales) Act 2016 where not captured in higher scale categories. Other species of conservation interest where a notable population is present, e.g. reasonable size breeding populations of red- or amber-listed species of Birds of Conservation Concern.

Site only	All other species not included in the above categories, such as populations of green-listed species or smaller populations of certain conservation concern species that are otherwise common and widespread. Such species are normally scoped out of the assessment process.
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- 5.5.37. Where protected bird species are present and there is the potential for a breach of the legislation, those species will be considered as ‘important’ features. Except for species receiving specific legal protection, or those subject to legal control (e.g. invasive species), all ornithological features determined to be important at Site only level will be scoped out of the assessment. Further, ornithological features of greater importance, where justified, will also be scoped out. This is because effects on them would not influence the decision-making about whether consent should be granted for the development (in other words a significant effect in EIA terms could not occur). This approach is consistent with that described in CIEEM guidance²⁶.
- 5.5.38. All bird species that are of sufficient importance will then be taken through to the next stage of the scoping assessment.
- 5.5.39. Based on the preliminary findings of the desk study and initial survey results (full data analysis is still required), the following species are anticipated to be important ornithological features that will be subject to full ornithological impact assessment:
- Red Kite;
 - Goshawk;
 - Peregrine;
 - Kestrel;
 - Golden Plover; and
 - Nightjar.
- 5.5.40. Following completion of the baseline surveys, the full breeding and wintering bird assemblage will be considered with species or species groups taken through to assessment where appropriate and following agreement with relevant consultees.
- 5.5.41. The following designated site is anticipated to be scoped into the full ornithological impact assessment due to species included its citation being recorded within the Development Site:
- Mynydd Ty-isaf SSSI.

Likely Significant Effects

- 5.5.42. In accordance with the EIA Regulations 2017, the EIA for the Proposed Development will consider those impacts where there is a risk of a likely significant effect only. The following section draws on industry experience and expertise to identify those effect-receptor pathways that may potentially lead to a significant effect.
- 5.5.43. The likely significant effects relating to ornithology that will be taken forward for assessment in the EIA are summarised in **Table 5-29**.

Table 5-29 - Likely significant effects relating to ornithology

Activity	Effect	Receptor
<i>Construction</i>		
Change of land use including ground clearance for construction sites (including laydown areas, staff facilities etc.), enabling works and accesses.	Degradation and/or loss of breeding, foraging or refuge habitat. Reduction in suitability of retained breeding, foraging or refuge habitat due to introduction of sub-optimal features nearby. Loss of habitat connectivity or viability through severance of habitats resulting in fragmentation. Killing or injury of birds, particularly nesting birds, through the removal of occupied nests or refuge sites.	Breeding bird assemblage
Production of aural and visual stimuli and vibration from construction activities such as vehicular movements, piling or site personnel.	Disturbance and displacement of species susceptible to noise/visual disturbance resulting in a reduction of energy intake and/or an increase in energy expenditure potentially leading to a reduction in survival and productivity rates.	Goshawk, Red Kite
Use of temporary lighting for security purposes and/or to illuminate construction working areas	Disturbance and displacement of birds sensitive to lighting resulting in indirect loss of foraging and commuting habitat or resting or breeding sites. Disruption of the physiology of species reliant on natural day/night and seasonal light level changes resulting in loss of fitness and reduction in survival rates. Loss of ecological connectivity through severance (due to introduction of artificial light) of habitats resulting in fragmentation.	Nightjar, Goshawk, Red Kite
Construction/alteration of drainage to facilitate construction works.	Direct loss or degradation of breeding, foraging or refuge habitat due to changes in hydrology.	None – scoped out
Use of chemicals (e.g. fuels, solvents etc.) and liberation of pollutants and fine material through excavation, demolition or surface water flows during rainfall events	The introduction of toxic pollutants or sediments into the environment resulting in changes, loss or damage to terrestrial or freshwater environments and the birds they support.	None – scoped out

Activity	Effect	Receptor
Vehicle movements	Potential killing or injury of birds through road traffic collisions.	None – scoped out
<i>Operation</i>		
Turbine operation	Potential killing or injury to birds in flight, through direct collision with moving turbine blades or barotrauma.	Red Kite, Kestrel, Goshawk, Peregrine, Golden Plover, Nightjar
Physical changes to the spatial environment	Displacement of birds from usual foraging and migratory routes.	Red Kite, Kestrel, Goshawk, Peregrine, Golden Plover, Nightjar
Temporary hydrological changes (changes to sub-surface and surface water flows)	Changes to local hydrology resulting in changes or loss of surrounding habitats.	None – scoped out
Use of lighting for security or aviation safety purposes	Disturbance and displacement of species sensitive to lighting resulting in indirect loss of foraging and commuting habitat or resting or breeding sites. Disruption of the physiology of species reliant on natural day/night and seasonal light level changes resulting in loss of fitness and reduction in survival rates. Loss of ecological connectivity through severance (due to introduction of light) of habitats resulting in fragmentation.	Nightjar, Goshawk, Red Kite
Vehicle movements	Potential killing or injury of birds through road traffic collisions.	None – scoped out
<i>Decommissioning – as per construction phase</i>		

Potential Effects not Requiring Further Assessment

- 5.5.44. There are no SPAs or ornithological Ramsar sites within 20km of the Development Site. On this basis, it is considered that a Habitats Regulations Assessment for the Proposed Development will not be required with respect to ornithological features.
- 5.5.45. Eglwys Nunydd Reservoir SSSI will likely be scoped out (dependent on results of ongoing surveys) as none of the species included in its citation have been recorded during the field surveys.
- 5.5.46. Other potential effects may be scoped out once the programme of baseline surveys has been completed and data have been analysed relative to the Proposed Development activities.

ASSESSMENT METHODOLOGY

Overview

- 5.5.47. The generic project-wide approach to the assessment methodology is set out in **Chapter 4: The Environmental Impact Assessment Process**. However, whilst this will inform the approach used in the ornithology assessment, it is necessary to align with the standard industry guidance provided by CIEEM²⁶.
- 5.5.48. The assessment will be based upon not only the results of the desk study and field surveys, but also relevant published information (for example on the status, distribution, sensitivity to environmental changes and ecology of the features scoped into the assessment, where this information is available), and professional knowledge of ecological processes and functions.
- 5.5.49. For each scoped-in ornithological feature, effects will be assessed against the predicted future baseline conditions for that feature during construction, operation and decommissioning.
- 5.5.50. Throughout the assessment process, the initial results of the assessment regarding potentially significant effects will be used to inform whether additional baseline data collection is required, together with the identification of environmental measures that should be embedded into the development proposals to avoid or reduce adverse effects or to deliver enhancements.
- 5.5.51. Where part of a designated site is located within the ecological Zone of Influence (Zol)⁹² relating to a particular biophysical change as a result of the Proposed Development, an assessment will be made of the effects on the designated site as a whole. A similar approach will be taken for areas of notable habitat.
- 5.5.52. For species that occur within the Zol, the assessment will consider the total area that is used by the affected individuals or the local population of the species (e.g. for foraging or as breeding territories).

Significance Evaluation Methodology

Characterising Potential Impacts

- 5.5.53. The CIEEM guidelines⁷² state that the assessment of impacts should be undertaken in relation to the baseline conditions within the Zol that are expected to occur if the development were not to take place. Having identified the activities likely to cause significant impacts, it is then necessary to describe the resultant changes and to assess the impact on valued ornithological features as well as further consideration of impacts to the relevant ecosystem as a whole. The process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts must be assessed in the context of the baseline conditions within the Zol during the lifetime of the Proposed Development.

⁹² The Zol in this context is the area over which an individual ecological feature may be subject to a potentially significant effects resulting from changes in the baseline environment due to the Proposed Development.

5.5.54. When describing changes/activities and impacts on ecosystem structure and function, it is necessary to consider the following parameters:

- Positive or Negative – whether the change is in accordance with the nature conservation objectives and policy (whereby a positive impact is one that improves the quality of the environment, a negative impact being one that reduces it);
- Extent – the spatial or geographical area over which the environmental change may occur;
- Magnitude – the size, amount, intensity or volume of the environmental change;
- Duration – the length of time over which the environmental change may occur;
- Frequency – the number of times the environmental change may occur;
- Timing – the periods of the day/year etc. during which an environmental change may occur; and
- Reversibility – whether the environmental change can be reversed through restoration actions.

Significance Criteria

5.5.55. The guidance defines an ecologically significant impact as ‘an effect that either supports or undermines biodiversity conservation objectives’ for ‘important ecological features’ or for ‘biodiversity in general’. Once a potential significant impact is identified as likely to affect the integrity/favourable conservation status of a potential ornithological feature, the value of the receptor will be used to help determine the geographical scale at which the impact is significant. If an impact is not found to be significant at the level at which the resource or feature has been valued, it may still be significant at a more local level. An impact that is of significance below a local level, or is deemed not to be significant, will be scoped out of the impact assessment.

5.5.56. Although certain species may not constitute potential ornithological features based upon their nature conservation value, they may still warrant consideration during the design and mitigation of the Proposed Development based on their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.

5.5.57. The guidance advocates the use of professional judgement, informed by relevant best practice guidance, in determining significant effects over the use of matrices.

5.5.58. The significance of the potential effects upon potential ornithological features will be assessed considering embedded measures. If significant potential effects remain then additional targeted mitigation will be proposed and a residual effects assessment undertaken considering the additional measures.

Cumulative and In-combination Effects

5.5.59. The ornithological impact assessment will give due consideration to potential in-combination or cumulative effects resulting from other development proposals within the ZoI. In respect of potential ornithological features, consideration will be given to such developments within the same range of mobile bird species. In respect of developments to be included within the cumulative assessment, this will include:

- schemes which are operational or under construction;
- schemes which have been granted planning permission but are not yet constructed/operational; and
- proposals for which consent has been applied but which await determination (including those subject to determination at appeal).

5.5.60. Where appropriate, consideration may also need to be given to other development proposals at the scoping stage where such details are in the public domain, and/or in respect of potential development relating to pre-assessed areas defined within Future Wales: The National Plan 2040.

Approach to Mitigation and Compensation

- 5.5.61. The mitigation hierarchy and stepwise approach will be adopted, following the sequential process of avoidance, minimisation, mitigation and compensation. Inherent in the design of the Proposed Development will be the avoidance of impacts upon potential ornithological features as far as possible through the sensitive siting of turbine bases, access tracks and associated infrastructure and sensitive timing of works. Where such impacts cannot be altogether avoided however, mitigation will be implemented to ensure such impacts are reduced as far as possible to minimise harm upon potential ornithological features. Where mitigation is unavoidable, compensation will be necessary in respect of residual effects remaining after avoidance and mitigation measures have been considered. Additionally, enhancement measures will also be implemented to ensure overall net benefit to biodiversity is achieved. Such enhancements would be proposed following consultation with relevant stakeholders to ensure that any measures proposed were compatible with ongoing management of the Development Site.
- 5.5.62. Avoidance, minimisation, mitigation, compensation and enhancement measures to be implemented as part of the Proposed Development will be informed by the ongoing ornithology field surveys of the study area, alongside further consideration of the development proposals as they evolve. Standard measures considered necessary to ensure compliance with relevant legislation, planning policy and best practice guidance will also be implemented, including: the preparation of a Construction Environmental Method Plan detailing the practical measures to avoid and reduce potential adverse effects arising; and the production of a Habitat Management Plan detailing the management, maintenance and monitoring measures requiring delivery over the lifetime of the Proposed Development.

Assumptions

- 5.5.63. To ensure transparency in the ornithological impact assessment, any assumptions or limitations in the collation of baseline information will be highlighted and a precautionary approach to the consideration of potentially significant effects and mitigation adopted. To date, the following limitations and assumptions have been identified:
- Access to certain areas within 2km of the Development Site, required for some of the baseline surveys, has not been possible in all instances due to health and safety limitations or where access from private landowners cannot be gained. Where possible/necessary, ornithology observations were otherwise made from adjacent public rights of way or accessible land. Any such constraints will be highlighted, and a precautionary approach adopted with regards to the presence/valuation of species and potential for significant effects to arise.
 - The topography and presence of large stands of coniferous woodland presented a challenge to ensuring total coverage of the Site and up to 500m from turbine locations, from the selected VPs. However, the number and locations chosen are considered to provide sufficiently robust coverage to inform the ornithological impact assessment.
 - Inclement weather meant that certain surveys had to be aborted. If this occurred, where possible, surveys were rescheduled during better conditions to ensure the necessary survey effort was completed.
 - Species are mobile and surveys therefore only provide a snapshot of the conditions present across the study area at the time of survey with a precautionary approach adopted based on habitat suitability and records of species locally.

5.6 WATER ENVIRONMENT

INTRODUCTION

- 5.6.1. This section defines the proposed scope of the assessment with regard to the Water Environment. It summarises baseline conditions associated with the Development Sites as well as the Proposed grid connection locations and overhead lines (OHL) required to connect the Proposed Development to the national grid. This document provides a description of potential significant effects, outlines potential mitigation measures and describes assessment methods to be applied.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.6.2. Policy, legislation and guidance used to inform the water environment section are outlined in **Table 5-30** below.

Table 5-30 - Policy relevant to the water environment

Policy	Context
Planning Policy Wales (Edition 12) (2024) ⁹³ ;	Planning Policy Wales (PPW) Edition 12, released in early 2024, embeds the Well-being of Future Generations Act directly into land-use planning, centering development around sustainable placemaking. It prioritizes decarbonization, green infrastructure, and climate-resilient development while strengthening policies on housing, biodiversity, and the Welsh language.
Bridgend County Borough Council (CBC) Local Development Plan (2018 - 2033) ⁹⁴ ;	The Bridgend County Borough Council (CBC) Replacement Local Development Plan (RLDP) 2018–2033 was formally adopted on 13 March 2024 . It serves as the primary blueprint for land use and planning decisions within the borough until 2033.
Bridgend CBC Flood Risk Management Plan (2016) ⁹⁵ ;	The Bridgend County Borough Council (CBC) Flood Risk Management Plan (FRMP), drafted around 2016, outlines the council's approach to managing local flood risks like surface runoff and groundwater in accordance with the Flood and Water Management Act 2010. Key objectives include targeted risk reduction in specific areas, prioritizing investment in communities most at risk, promoting resident and business resilience, collaborating with other authorities, and implementing maintenance like culvert checks to prevent blockages. You can read the full plan at Bridgend.gov.uk .
The National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales, Welsh Government	The National Strategy for FCERM in Wales, as required under the Flood and Water Management Act 2010, set out the management approach for risks associated with flooding and coastal erosion across Wales over a 10-year period. Natural Resource Wales (NRW) are responsible for managing the flood risks from the main rivers and sea across Wales; whilst Local Authorities as Lead Local Flood Authorities (LLFA) are responsible for managing risks associated with surface water, groundwater, and Ordinary Watercourses.

93 Welsh Government (2024). Planning Policy Wales (Edition 12) (January 2026).

94 Bridgend County Borough (2024). Local Development Plan 2018 – 2033 (Adopted March 2024). Available at: <https://www.bridgend.gov.uk/media/izcfp1f/written-statement.pdf>

95 Capita (2016). Bridgend Flood Risk Management Plan: Local Flood Risk Investigation Areas (August 2016). Available at: <https://www.bridgend.gov.uk/media/1yflynyb/bridgend-flood-risk-management-plan.pdf>

Policy	Context
Technical Advice Note 15 (TAN15)	TAN15 provides technical guidance which supplements the policy set out in Planning Policy Wales (Edition 10, December 2018) (Welsh Assembly Government, 2018) in relation to development and flooding, providing a framework within which risks arising from both river and coastal flooding, and from additional run-off from development in any location, can be assessed. Consultation on an updated version of TAN15 has been undertaken. The draft update includes a range of changes to the guidance, in particular it removes reference to the Development Advice Map (DAM) and refers to a “Wales Flood Map” held by NRW. However, the consultation draft clearly states that TAN15 (2004) remains current until such a time that the replacement is confirmed (anticipated to be during 2023). TAN15 (2004) has therefore been used to underpin this assessment. TAN15 is supplemented by the Development Advice Map (DAM) which provides the basis for assessment under TAN15. The DAM was last updated in January 2020. The Justification Test is intended to assess the appropriateness of proposed developments, based upon location in respect of flood zones and the type of development proposed.
National Development Framework (Future Wales: The National Plan 2040) ⁹⁶	This is the national development framework for Wales, which has development plan status. Policy 8 – Flooding The policy sets out the requirement for sustainable development which puts a priority on nature-based flood management solutions, as well as supporting strategic growth and regeneration in National and Regional Growth Areas. Policy 19 – Strategic Policies for Regional Planning. The policy states that environmental consideration when planning developments and managing resources is vital, on a strategic and local scale. Environmental issues identified must be fully assessed and addressed. Policy 33 – Cardiff, Newport and the Valleys. This policy sets out the ambitions for the Cardiff, Newport and Valleys region of Wales, which includes Caerphilly. This is inclusive of development and growth strategies with reference to natural resources, climate change, flooding and biodiversity

Legislation

- Flood and Water Management Act (2010)⁹⁷;
- The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017)⁹⁸; and
- The Environmental Permitting (England and Wales) Regulations (2016)⁹⁹.

Guidance

- National Highways Design Manual for Roads and Bridges (DMRB) LA 113: Road Drainage and the Water Environment (Revision 1) (2020)¹⁰⁰;
- Construction Industry Research and Information Association (CIRIA) guidance documents; and

⁹⁶ Future Wales: the national plan 2040 available online <https://www.gov.wales/future-wales-national-plan-2040> (Accessed Jan 2026)

⁹⁷ UK Government (2010). Flood and Water Management Act 2010.

⁹⁸ UK Government (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

⁹⁹ UK Government (2016). The Environmental Permitting (England and Wales) Regulations 2016.

¹⁰⁰ Highways England (2020). Design Manual for Roads and Bridges LA 113: Road Drainage and the Water Environment (Revision 1). Available at: <https://www.standardsforhighways.co.uk/tse/attachments/d6388f5f-2694-4986-ac46-b17b62c21727?inline=true>

- Planning Guidance Wales¹⁰¹.
- DMRB LA113¹⁰²;
- The Environment (Wales) Act (2016)¹⁰³;
- The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations (2017) – ‘the EIA Regs’¹⁰⁴;
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 – the ‘Water Environment Regs’¹⁰⁵;
- Planning Policy Wales (PPW)¹⁰⁶;
- Construction Industry Research and Information Association (CIRIA) guidance¹⁰⁷ including:
- C753 (The SuDS Manual);
- C532 (Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors); and
- C807 (Managing Construction Pollution: Good Practice Guidance).
- Technical Advice Note 5: Nature conservation and planning (TAN5)¹⁰⁸;
- Technical Advice Note 15: Development, Flooding and Coastal Erosion (TAN15)¹⁰⁹;
- Technical Advice Note: 23: Economic Development (TAN23)¹¹⁰; and
- Natural Resources Wales National Peatland Action Programme¹¹¹

BASELINE

- 5.6.3. This section provides a high-level review of the current baseline environmental characteristics for the Proposed Development and surrounding areas, with particular reference to the water environment. The baseline conditions will be confirmed through review of additional data sources, site visit and consultation with stakeholders during the next stages of the EIA.
- 5.6.4. The baseline text covers the red line boundary for each Development herein referred to as “Development Site”. The proposed OHL infrastructure is also included within this area. Therefore, the baseline will not differentiate and provide baseline conditions over the Development Site as a whole unless a specific receptor exists which would be adversely affected by the OHL.

Study Area

- 5.6.5. The Study Area which has been used to inform scoping consists of a 1km buffer beyond the Northern and Southern Array, as shown on **Figure 5.5**. The Study Area has been extended to 3km for receptors such as water supplies, abstractions and designated sites which have potential to be affected by pollutants transported downstream from construction on the Proposed Development.

101 Welsh Government (2025). Planning Policy and Guidance for Professionals. Available at: <https://www.gov.wales/planning-policy-and-guidance-for-professionals> [Accessed: January 2026].

102 Standards for Highways (2020). DMRB, Road Drainage and the Water Environment. Available: <https://www.standardsforhighways.co.uk> (accessed Jan 2026)

103 Welsh Government (2016). The Environment (Wales) Act 2016. Available: <https://www.legislation.gov.uk> (accessed Jan 2026)

104 Welsh Government (2017). The EIA Regs. Available: <https://www.legislation.gov.uk/wsi/> (accessed Jan 2026)

105 Welsh Government (2017). The Water Environment Regs. Available: <https://www.legislation.gov.uk/wsi/> (accessed Jan 2026)

106 Welsh Government (2024). Planning Policy Wales, Edition 12: Available: <https://www.gov.wales/> (accessed Jan 2026)

107 CIRIA (2025). CIRIA Guidance. Available: <https://www.ciria.org> (accessed Jan 2026)

108 Welsh Government (2009). Technical Advice Note 5, Nature Conservation and Planning. Available: <https://www.gov.wales/> (accessed Jan 2026)

109 Welsh Government (2021). Technical Advice Note 15, Development, Flooding and Coastal Erosion. Available: <https://www.gov.wales/> (accessed Jan 2026)

110 Welsh Government (2014). Technical Advice Note 23: Economic Development. Available: <https://www.gov.wales/> (accessed Jan 2026)

111 Natural Resources Wales (2024). The National Peatland Action Programme. Available: <https://naturalresources.wales> (accessed Jan 2026)

- 5.6.6. At the time of writing this EIA Scoping Report, the extent of upgrades (if required) to the existing access tracks between the Development Site and public highway are not known. Should any upgrades be required then the scope of the Water Environment EIA will be reviewed in liaison with consultees and updated to ensure that potentially impacted receptors are scoped into the assessment.

Land Use

- 5.6.7. From a review of aerial imagery, the current land use within the Northern Array appears to be unmanaged Mooreland possibly used for livestock grazing. This area sits on top of a hill approximately 420m in elevation surrounded by steep slopes and is bordered by planted conifer forestry to the west.
- 5.6.8. The current land use for the Southern Array is managed agricultural fields and improved grassland used for livestock grazing. This site also sits on top of a hill approximately 330m in elevation and has parcels of forestry to the west as well as to the northeast and southeast. Both the Northern and Southern Array sit between the settlements of Maesteg and Pontycymer in South Wales.

Hydrology

Water Framework Directive (WFD) catchments

- 5.6.9. A review of DataMapWales main rivers¹¹² mapping indicates that the Northern and Southern Array fall within six main-river WFD catchments. The watercourses highlighted in bold are ones which intersect the Development Sites. From west-to-east these are:
- Llynfi - headwaters to Lletty Brongu sewage treatment works (STW) (ID: GB110058026331) - Moderate Status;
 - Ffrwd Wyllt - headwaters to tidal limit (ID: GB110058026100) - Moderate Status;
 - Afan - confluence with Corrwg to confluence with Pelenna (ID: GB110058026130) - Moderate Status;
 - Afan - headwaters to confluence with Corrwg (ID: GB110058026120) - Moderate Status;
 - **Llynfi** - Lletty Brongu STW to confluence with Ogmore (ID: GB110058026332) - Moderate Status; and
 - **Garw** - headwaters to confluence with Ogmore (ID: GB110058026320) - Moderate Status.

Watercourses

- 5.6.10. Water Framework Directive classifications for the main rivers and groundwater bodies listed are based on 2021 (Cycle-3) classifications. In addition to the identified main watercourses, OS 1:50,000 scale mapping indicates that there are also several (NRW defined) ordinary watercourses within the Study Areas. A list of the main rivers identified within the Study Areas and their location with reference to the Development Site is shown below. There are no other water features mapped within the Study Areas.

Northern Array

- Nant Gwyn Bach – is within the Northern Array study area, the headwaters of this watercourse intersect the Northern Array northern boundary; and

¹¹² DataMapWales (2022). Main Rivers. Available: <https://datamap.gov.wales> (accessed Jan 2026)

- Nant Cwm-du – is within the northern array Study Area headwaters intersect the southeast boundary of the Northern Array.

Southern Array

- Nant Cwm-du – located approximately 640m west (downslope) of the Southern Array approximately 640m;
- Nant Cedfyw – is within the Study Area, headwaters run through Southern Array from north to south in the eastern side;
- Garw Fechan – is within the Study Area but lies approximately 470m east of the Southern Array; and
- Afon Garw – is within the Study Area and lies approximately 675m to the east of the southern boundary of the Southern Array.

Geology and Soils

5.6.11. In respect of the underlying bedrock geology, BGS Geoindex (Onshore)¹¹³ 1:50,000 scale mapping indicates that the Northern and Southern Array areas are underlain east to west by the following:

- Pennant Sandstone formation; and
- South Wales Middle Coal Measures formation - mudstone, siltstone and sandstone.

Superficial deposits

5.6.12. BGS Geoindex (Onshore)¹¹³ 1:50,000 scale mapping indicates that superficial deposits consist of Devensian till throughout the Study Area.

Soils and Peat

5.6.13. A summary of the Soil and Peat baseline is provided in **Section 5.7 Ground Conditions**.

Hydrogeology

5.6.14. Due to the upland and rural location of the Northern and Southern Array, there is no risk to the sites from sewer flooding. The Development Site lies within the Swansea Carboniferous Coal Measures groundwater body. The BGS data sets¹¹³ indicate that there is no risk from groundwater or artificial flooding within the Study Area.

Groundwater

5.6.15. A review of DataMapWales mapping¹¹⁴ also indicates that the Northern and Southern Array are underlain by the Swansea Carboniferous Coal Measures Water Framework Directive (WFD) groundwater body (ID: GB41002G201000), which was classified as Poor in 2021.

5.6.16. A review of the NRW Water Watch Wales mapping¹¹⁵ shows that the Northern and Southern Array are within the Swansea Carboniferous Measures groundwater DWPA.

¹¹³ British Geological Survey (2025). Geoindex (Onshore). Available: <https://www.bgs.ac.uk> (accessed Jan 2026)

¹¹⁴ DataMapWales (2023). WFD Regulations Cycle 3 Classification. Available: <https://datamap.gov.wales> (accessed Jan 2026)

¹¹⁵ Natural Resources Wales (2025). Water Watch Wales Maps. Available: <https://waterwatchwales> (accessed Jan 2026)

- 5.6.17. BGS geology viewer indicates that the Northern and Southern Array areas are underlain by a carboniferous limestone aquifer that can supply large yields of as much as 175 l/sec from resurgences in the Mendips and South Wales.

Public And Private Water Supplies

- 5.6.18. Data requests have been submitted to Bridgend Council for information in respect of public and private water supplies. However, no response has been received at the time of writing this EIA Scoping Request. Information provided by NRW suggests that there are six licensed abstractions or impoundments within 3 km of the Southern Array and four within 3 km of the Northern Array.

Flood Risk

- 5.6.19. A review of NRW Flood and Coastal Erosion Risk¹¹⁶ mapping suggests that, within the Study Areas, there is a risk of flooding from rivers (main and ordinary) and surface water; though this is limited to immediate floodplains of watercourses and does not intersect the Northern or Southern Array area. There are flood extents within 500m of the Development Site. However, there is a significant increase in elevation as the Development Site lies on top of a hill which further reduces the risk of the Proposed Development impacting, and being impacted by, flooding. NRW flooding data also indicates that the Development Sites are not at risk of flooding from groundwater, Sewers or artificial flooding.

Biodiversity Sites

- 5.6.20. DataMapWales mapping indicates that the Cwm Du Woodlands SSSI (ID: NRW_SSSI.8015) is located approximately 600m west of the Southern Array. The Cwn Cyffog SSSI is also located approximately 2.4km to the east of the Southern Array. Both sites are designated for biological interest. There are no other designated or protected sites including SSSI¹¹⁷, Special Areas of Conservation (SAC)¹¹⁸, Ramsar¹¹⁹, Special protection Zones (SPZ) or Geological Conservation Review (GCR)¹²⁰ sites within the wider 3km Study Area.

Ground Water Dependant Terrestrial Ecosystems (GWDTE)

- 5.6.21. There are no known GWDTE within the Study Areas. However, these may be present and potential for GWDTE within the Development Site will be assessed cognisant of future National Vegetation Classification (NVC) surveys to be carried out by WSP ecologists.

FUTURE BASELINE

- 5.6.22. Hydrological and hydrogeological baseline conditions may change even if the Proposed Development is not built out, for the following reasons:
- Climate change will result in increased rainfall seasonality, with generally wetter winters and drier summers; high-intensity rainfall events will become more common. This will lead to greater variation in river flows (low flows and high flows), and increases in flood risk;

¹¹⁶ Natural Resources Wales (2025). Flood and Coastal Erosion Risk Maps. Available: <https://flood-risk-maps.naturalresources.wales> (accessed Jan 2026)

¹¹⁷ DataMapWales (2025). Sites of Special Scientific Interest. Available: <https://datamap.gov.wales> (accessed Jan 2026)

¹¹⁸ DataMapWales (2022). Special Areas of Conservation. Available: <https://datamap.gov.wales> (accessed Jan 2026)

¹¹⁹ DataMapWales (2022). Ramsar sites. Available: <https://datamap.gov.wales> (accessed Jan 2026)

¹²⁰ DataMapWales (2021). Geological Conservation Review Site Boundaries. Available: <https://datamap.gov.wales> (accessed Jan 2026)

- The location and rate of surface water and groundwater abstractions in the area could vary over time and may result in changes to the WFD surface water and groundwater body status and SPZ designations;
- Improvements to WFD waterbody status associated with improvements to individual quality elements (i.e., phosphate reduction) would result in higher-quality, more sensitive waterbodies; and
- Other new development (e.g., urbanisation settlements) along the valley bottoms may result in changes in hydrological baseline such as surface water runoff (flow and pathways) and increase the number of development receptors.

THE SCOPE OF THE ASSESSMENT

Potential Receptors

5.6.23. There are a number of potential water environment receptors which could be affected by the Proposed Development, which will be confirmed in the next stages of the EIA assessment. These comprise:

- Main River watercourses and WFD surface water bodies within the Development Site;
- Tributaries of main waterbodies and unnamed watercourses within the Development Site;
- Groundwater, the South Wales Upper Coal Measures (Secondary A Aquifers and WFD groundwater body);
- Surface water and groundwater abstractions within the Study Areas (if present);
- Biodiversity sites within the Study Areas that are water-dependent (non-statutory designated sites (SINCs), no statutory designated sites); and
- Humans/properties/infrastructure downslope and adjacent to the Proposed Development including properties at and the surrounding villages.

Likely Significant Effects

5.6.24. The likely significant water environment effects for the construction, operational and decommissioning phases of the Proposed Development that will be taken forward for assessment in the Environment Statement are detailed in **Table 5-31** below. The effects for the decommissioning phase are expected to be similar in nature to the construction phase. Decommissioning effects will typically be temporary, short-term effects that will occur during the break-up and removal of infrastructure.

Table 5-31 – Likely significant water effects

Activity	Effect
Construction and Decommissioning	
Land preparation (earthworks, excavation)	Potential effects on the hydromorphology and flow conveyance as a result of increased sediment inputs or direct watercourse disturbance. Accidental release of pollution into the water environment by leaks/spillages of oil/fuel, leaching from excavated soils and concrete leaching leading to deterioration. Discharge of potentially polluted water generated from construction activities (e.g., dewatering/water ingress activities, concrete batching, surface water runoff) into surface water or groundwater leading to

	deterioration in the water quality of the water environment receptors.
Land preparation (earthworks, excavation)	Temporary increase in sediment-loading of surface water runoff from construction/dismantling areas leading to deterioration in the surface water quality environment and deterioration in the status of WFD surface water bodies
Impermeable land associated with access tracks and construction/dismantling areas	Increase in surface water runoff and therefore increase in flood risk downstream and, increase in potential erosional power of surface overland flow.
Development of temporary infrastructure (e.g., site compound) near watercourses and potential temporary watercourse crossings (to be confirmed within final designs)	Temporary changes to watercourse flow conveyance leading to deterioration in the status of WFD surface water bodies.
Operational Phase	
Impermeable land take (solid concrete foundations for turbines, substation and access tracks)	Increase in surface water runoff and therefore increase in flood risk downstream and, increase in potential erosional power of surface overland flow. Changes to watercourse flow conveyance as a result of new or modified temporary watercourse.
Maintenance activities	Accidental spillage of pollutants (fuel or oil) leading to deterioration in the water quality. Potential change to water quality of a water supply resource which may affect the viability of an abstraction.

5.6.25. A Flood Consequences Assessment (FCA) will be produced in accordance with TAN15 as the Proposed Development area exceeds 1ha and is within Flood Zone 1. The FCA will demonstrate how flood risk to the Proposed Development and any potential to increase flood risk to third parties due to the Proposed Development will be managed over its lifetime. As part of this, the effects of climate change will be given due consideration. The FCA will include an outline surface water drainage strategy, which will ensure that surface water runoff from the Proposed Development is managed and attenuated on site, so that the risk of flooding is not increased off-site. The most suitable surface water drainage strategy for the Proposed Development will be ascertained by undertaking a high-level SuDS Assessment considering the SuDS hierarchy.

5.6.26. No identified potential water receptors or effects have been scoped out of the assessment at this stage.

MITIGATION

5.6.27. Impacts during decommissioning are likely to be like those during the construction phase. However, dependent on the exact nature of the decommissioning activities that take place, it is likely that ground disturbance would be less. Mitigation like that implemented during the construction and operational phases (updated to reflect changes in legislation/guidance) should also help to ensure that the significance of such impacts is minimised. It is therefore proposed that consideration of decommissioning effects is 'scoped out' from detailed assessment in the EIA.

5.6.28. The stability of the ground, in so far as it affects land use, is a material consideration that is taken into consideration in planning application decisions. Land stability in relation to the ground conditions on the Proposed Development Site will be addressed throughout the design and

construction process by compliance with the Construction (Design and Management) Regulations 2015 and will be informed by the coal mining report, the Phase 1 peat depth survey, and any further relevant surveys undertaken. It will not be considered further during the EIA process.

ASSESSMENT METHODOLOGY

- 5.6.29. In respect of potential significant effects on hydrological, geological and hydrogeological receptors, the EIA report will incorporate the following high-level qualitative assessments:
- Surface and groundwater quality;
 - Water supplies (public and private);
 - Soils (inc. Peat); and
 - GWDTE.
- 5.6.30. *Requests have been sent to Bridgend council for information on public and private water supply abstractions however at the time of writing, no information has been supplied. It is thought that there will be public or private water supply abstractions within the Study Areas. due to information on PWS not being available at the time of writing it is possible that a field visit may be required to determine the source location, type and requirements for monitoring of any PWS within the Study Area.*
- 5.6.31. The identification of potentially significant effects on receptors within the Study Area will broadly follow the approach of the Standards for Highways (2020) Design Manual for Roads and Bridges (DMRB) guidance document LA113 – Road Drainage and the Water Environment; although not directly applicable to the nature of the Proposed Development, the assessment principles set out within the DMRB guidance provide an acknowledged and accepted basis for assessing significant effects of developments on the water environment.
- 5.6.32. The proposed approach will be confirmed with the NRW, LLFA and the LPA during the next stages of the EIA. The significance of an effect resulting from the Proposed Development is primarily determined by the value of a given water feature and the magnitude of the effect. In terms of the hydrology, the key determinants of magnitude relate to surface water quantity (level and flow) and water quality. However, depending on the effects of surface water flows, there may also be indirect effects on downstream morphology and sediment dynamics, river water quality and flood risk.

Significance Evaluation Methodology

- 5.6.33. The significance of water-related effects is derived by considering both the value of the feature and the magnitude of change. In this assessment, effects are considered to be significant or not significant according to the matrix in **Table 5-32** with 'Major' and 'Moderate' effects taken to be 'Significant'. Significance can be 'Beneficial', 'Adverse' or 'Neutral'.

Table 5-32 – Significance evaluation matrix relating to the water environment

Magnitude of change						
Sensitivity/ importance/ value		No change	Negligible	Minor	Moderate	Major
	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight or moderate	Slight or moderate	Moderate or large	Large or very large

	Medium	Neutral	Neutral of Slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

- 5.6.34. Note: Significant effects are those identified as 'Very large' or 'large'. 'Moderate' effects have the potential to be significant, and they would normally be deemed to be significant, however in some instances these are deemed to be acceptable based on professional judgment.

Assumptions

- 5.6.35. The scope of the assessment is based on a high-level review of available desk-based information and will be confirmed through further desk-based review and surveys, including a geo-environmental desk study.
- 5.6.36. The assessment approach is therefore broadly presented in three stages:
- Estimating the importance of receptors;
 - Estimating the magnitude of potential impacts on receptors; and
 - Assessing the significance of the potential effects on receptors.
- 5.6.37. The significance of the effect resulting from the Proposed Development will be assessed with reference to the importance (or sensitivity / value) of a given receptor and the magnitude of the impact. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the Project. The residual effects of the Project on receptors will be evaluated assuming that identified mitigation measures are fully implemented.
- 5.6.38. Assessments would be carried out cognisant of national and local planning obligations and policies; as well as established best practice principles as per published industry guidance specific to water quality/pollution, flood risk, water supplies (public and private) and sensitive receptors including carbon-rich peat and GWDTE. A non-exhaustive list of guidance is provided above in the relevant policy legislation and guidance **section 5.6.2**
- 5.6.39. Furthermore, residual effects (i.e. those which remain post-mitigation) would be identified and assessed as either 'significant' or 'not significant'.

5.7 GROUND CONDITIONS

- 5.7.1. This section describes the proposed scope of the assessment of effects, with respect to Ground Conditions, arising from the Proposed Development. It includes consideration of geology, land contamination, minerals, and soil receptors, including peat.
- 5.7.2. The section should be read in conjunction with the description of the Proposed Development presented in **Section 2: Description of the Proposed Development**, and with respect to other relevant sections, such as **Section 5.4 Biodiversity** and **Section 5.6 Water Environment**, where there is an overlap or relationship, e.g., soils interact with the water environment and land contamination can affect groundwater and surface water quality, soils support, and are part of,

terrestrial ecosystems, and designated sites for nature conservation can also be land contamination receptors.

- 5.7.3. The scope of the assessment is based on a review of desk-based baseline information and will be confirmed through review of additional data sources and a site walkover, the findings of which will be reported in the Environmental Statement.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.7.4. This section of the scoping report has been prepared in line with the relevant planning policy documents outlined in **Chapter 3**. In particular, attention has been paid to the documents listed in **Table 5-33**.

Table 5-33 – Legislation and policy relevant to geology, land contamination and soils (including peat)

Legislation/ Planning policy	Description
Legislation	
The Environment (Wales) Act 2016 ¹²¹	The Act makes provisions within Wales for the planning and managing of natural resources at national and local level.
Well-being of Future Generations (Wales) Act (2015) ¹²²	The Act does not refer explicitly to soils or land contamination; however, it requires public bodies in Wales to think about the long-term impact of their decisions. It requires them to act in accordance with sustainable development principles, with the aim of achieving well-being goals, including maintaining and enhancing a biodiverse natural environment with healthy functioning ecosystems that support social, economic, and ecological resilience and the capacity to adapt to change (for example climate change).
Environmental Protection Act (1990) ¹²³	Part 2 of the Act makes provision for the improved control of pollution arising from certain industrial and other processes. Part 2A of the Act provides the regulatory basis for the identification, designation, and remediation of contaminated land. The potential for the Proposed Development to be built on land potentially affected by historical contamination requires assessment to ensure it is suitable for the proposed land-use and that, where necessary, remediation is carried out to ensure the land cannot be determined as Contaminated Land under the Act.
Water Resources Act 1991 ¹²⁴ as amended by the Water Act 2003 ¹²⁵	The Water Resources Act 1991 states that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter controlled waters.

¹²¹ UK Government (2016). Environment (Wales) Act 2016. (Online). Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents>. (Accessed January 2026).

¹²² UK Government (2015). Well-being of Future Generations (Wales) Act 2015. (Online). Available at: <https://www.legislation.gov.uk/anaw/2015/2/contents>. (Accessed January 2026).

¹²³ UK Government (1990). Environmental Protection Act 1990. (Online). Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>. (Accessed June 2022).

¹²⁴ UK Government (1991). Water Resources Act 1991. (Online). Available at: <https://www.legislation.gov.uk/ukpga/1991/57/contents>. (Accessed January 2026).

¹²⁵ UK Government (2003). Water Act 2003. (Online). Available at: <https://www.legislation.gov.uk/ukpga/2003/37/contents>. (Accessed January 2026).

Legislation/ Planning policy	Description
	The Act was revised by the Water Act 2003, which provides the definition of and regulatory controls for the protection of water resources, including the quality standards expected for controlled waters.
Health and Safety at Work etc. Act 1974¹²⁶	The Health and Safety at Work etc. Act and regulations made under the Act place responsibilities upon employers to carry out a risk assessment for every work activity and to document it. Besides carrying out a risk assessment, employers also need to: make arrangements for implementing the health and safety measures identified as necessary by the risk assessment; appoint competent people to help them implement the arrangements; set up emergency procedures; provide clear information and training to employees; and work together with other employers sharing the same workplace. Land contamination (and other ground hazards) pose a risk to groundworkers and potentially others in proximity to the construction work. Appropriate risk assessments must be carried out and arrangements made to protect the health and safety of workers directly involved in groundworks for the Proposed Development and other human receptors who could be affected.
The Construction (Design and Management) Regulations 2015¹²⁷	The Construction (Design and Management) Regulations (CDM) place specific duties on clients, designers, and contractors, so that health and safety is considered throughout the life of a construction project from its inception to its subsequent final demolition and removal. They include the requirement to appoint a Principal Designer and Principal Contractor to co-ordinate health and safety aspects during construction. Under the CDM regulations, designers must avoid foreseeable risks so far as reasonably practicable by: eliminating hazards from the construction, cleaning, maintenance, and proposed use and demolition of a structure; reducing risks from any remaining hazard; and giving collective safety measures priority over individual measures. Construction of the Proposed Development will fall under the requirements of the Regulations requiring consideration of health and safety to be incorporated into the design of the Proposed Development components and at construction stage.
Control of Asbestos Regulations 2012¹²⁸	The Control of Asbestos Regulations 2012 (CAR 2012) apply to employers who carry out work which disturbs, or is likely to disturb, asbestos. This includes groundworks where there is asbestos present or suspected to be present in the ground as loose fibres or as asbestos containing materials (ACMs). To comply with CAR 2012, in respect of asbestos-contaminated soil and construction and demolition materials, employers must consider people other

126 UK Government (1974) health and Safety at Work etc. Act 1974. (Online). Available at: <https://www.legislation.gov.uk/ukpga/1974/37>. (Accessed January 2026).

127 UK Government (2015) The Construction (Design and Management) Regulations 2015. (Online). Available at: <https://www.legislation.gov.uk/uksi/2015/51/contents>. (Accessed January 2026).

128 UK Government (2012) The Control of Asbestos Regulations 2012. (Online). Available at: <https://www.legislation.gov.uk/uksi/2012/632/contents>. (Accessed January 2026).

Legislation/ Planning policy	Description
	than their own employees in the risk assessment required by Regulation 6, and in the action taken to prevent or control exposure required by Regulation 11. The other key regulation relevant to the Proposed Development is the requirement under Regulation 16 to prevent or reduce the spread of asbestos. Every employer must prevent or, where this is not reasonably practicable, reduce to the lowest level reasonably practicable, the spread of asbestos from any place where work under the employer's control is carried out. During construction works for the Proposed Development there is the potential for localised asbestos containing materials or soils to be encountered in the ground. Asbestos can be found on agricultural land or in any made ground e.g., due to historical ad hoc waste disposal to land, incorporation of demolition material into made ground or releases of fibres from Asbestos Containing Materials ('ACM') structures in poor condition, and subsequent spread by vehicle movements.
Policy	
Welsh Government, National Planning Policy Wales, Edition 12, 2024 ¹²⁹	Planning Policy Wales Distinctive and Natural Linkages chapter, page 128, states that decisions on DNS applications must consider the policy topics of the Distinctive and Natural Places theme, including <i>"opportunities in all areas to improve the resilience of ecosystems by addressing building on floodplains, diffuse pollution, soil compaction and sealing, ensuring the protection of peat resources"</i> and <i>"opportunities to improve health and well-being are taken, in particular, to... ensure water sensitive design, address soil carbon management... so as to improve capacity for adaptability to the challenges of climate change, such as flood risk and increased temperatures"</i>. Chapter 6, Section 6.4 Biodiversity and Ecological Networks, paragraph 6.4.3, states that development proposals must consider the need to: <i>"safeguard protected species and species of principal importance and existing biodiversity assets from direct, indirect or cumulative adverse impacts that affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water, air and soil, including peat"</i>. Chapter 6, paragraph 6.9.16 Land Contamination states that <i>"Whenever development or re-development potential exists the planning system will be the preferred means of addressing potential land contamination."</i> 6.9.17 states that <i>where land potentially meets the definition of contaminated land under Part 2A, the onus will remain with the developer to ensure that the land is suitable for its proposed use and would not meet the legal definition of contaminated land under Part 2A. Paragraph 6.9.19 states that "Where land contamination issues arise, the planning authority will require evidence of detailed investigation and risk assessment prior to the determination of the application" as well as "If contamination cannot be overcome satisfactorily, the authority may refuse planning permission."</i>

129 Welsh Government (2024) Planning policy Wales. (online). Available at: <https://www.gov.wales/planning-policy-wales>. (Accessed August 2025).

Legislation/ Planning policy	Description
Bridgend County Borough Council, Local Development Plan (LDP) 2018-2033¹³⁰.	The Council has adopted a Strategic Objective <i>SOBJ4: To Protect and Enhance Distinctive and Natural Places</i>, which is supported by Specific Objectives. <i>SP3: Good Design and Sustainable Placemaking</i> requires that all development must avoid or minimise noise, air, and soils and water pollution, incorporate methods to ensure the site is free from contamination, and safeguard and enhance biodiversity. <i>SP17: Conservation and Enhancement of the Natural Environment</i> states that development proposals will not be permitted where they have an adverse impact upon the quality of the Borough's natural resources, including water, air and soil. <i>DNP9: Natural Resource protection and Public Health</i> seeks to ensure that the County's natural environment is protected from materially harmful development, and this extends to ensuring that potential risks to human health are fully identified and assessed in relation to the redevelopment or remediation of land potentially affected by contamination or ground instability. SP14 relates to mineral resources including development in mineral safeguarding zones. This states that: "<i>In most instances, development may proceed within safeguarding areas as long as developers demonstrate the resource in question is either of poor quality/quantity and would not be economical to exploit, or the nature of the development in question would not prejudice exploitation of the resource.</i>"
Rhondda Cynon Taf County Council, Local Development Plan¹³¹	Policy AW8 Protection and Enhancement of the Natural Environment states that development proposals will only be permitted where there would be no unacceptable impact upon features of importance to landscape or nature conservation, including the quality of natural resources such as water and soil, and the natural drainage of surface water. Policy AW10 Environmental Protection and Public Health states that development proposals will not be permitted where they would cause or result in a risk of unacceptable harm to health and/ or local amenity because of (land) contamination, water pollution, or land instability. Policy CS10 Minerals states that the Council will seek to protect resources and to contribute to the local, regional and national demand for a continuous supply of minerals. Measures to achieve this include defining safeguarding areas.
Neath Port Talbot County Borough Council, Local Development Plan¹³²	Policy EN8 Pollution and Land Stability states that development proposals likely to expose people to unacceptable risk due to land contamination, water (including groundwater) pollution, or land instability, will not be permitted. Policy SP17 Minerals states that a proportionate contribution will be made to meeting national, regional and local demand for a continuous supply of minerals using measures including safeguarding identified resources of coal, hard rock and sand and gravel.

¹³⁰ Bridgend County Borough (2024). Local Development Plan 2018-2033. Available online: [written-statement.pdf](#) (Accessed January 2026).

¹³¹ Rhondda Cynon Taf (2011) Rhondda Cynon Taf Local Development Plan up to 2021, Adopted March 2011. . (Online). Available at: <https://www.rctcbc.gov.uk/EN/Resident/PlanningandBuildingControl/LocalDevelopmentPlans/LocalDevelopmentPlan20062021.aspx> (Accessed January 2026).

¹³² Neath Port Talbot County Borough Council (2016) Local Development Plan, (2011-2026), Adopted January 2016. . (Online). Available at: <https://www.npt.gov.uk/planning-and-building-control/planning-policy/adopted-ldp-2011-2026/>. Accessed January 2026.

BASELINE

Study Area

- 5.7.5. For Scoping, the study area for ground conditions includes a 1km buffer surrounding the Development Site for the consideration of potential land contamination effects. This provides sufficient information on the surrounding area to allow a preliminary site conceptual model to be developed to look at the potential for contaminants to migrate from the Proposed Development site to offsite receptors through the soil or in groundwater, or to migrate onto the Proposed Development site through soil or in groundwater from offsite sources. The conceptual model considers the environmental setting (including geology, hydrogeology, hydrology, sensitive land uses) and the nature and extent of the identified potential contamination sources, potential receptors and available pathways for receptors to be exposed to contaminants.
- 5.7.6. Regarding effects on soil and geology receptors, impacts due to temporary construction activities and permanent development will typically occur within the Proposed Development site boundary, rock and soils are geographically discrete and will generally not be substantially influenced by changes to their surroundings or vice versa. However, there are some possible exceptions to this, e.g., in relation to excavations, where the hydrogeological effects of dewatering excavations could potentially extend beyond the Proposed Development application boundary and affect soils and peat, or the construction of in ground structures which could affect the drainage regime and impact on soils and peat. Based on the ground conditions at the Proposed Development site, an external zone of influence for soil or geology of 250m has been considered beyond the Proposed Development application boundary to ensure that any offsite sensitive features, such as deep peat, are considered in the assessment. Consideration of hydrogeological effects is included in **Section 5.6: Water Environment**.
- 5.7.7. The Development Site (Northern and Southern Array) comprises two separate areas on the hills between the Afon Llynfi (River Llynfi) valley to the west, running through Maesteg, and the Afon Garw valley to the east running through Pontycymer, the north area at Mynydd Pwll-yr-lwrch is referred to in this section below as the Northern Array and the south area at Moel Cynhordy and Mynydd Moelgeila as the Southern Array. Reference to 'the Development Site' is made where the description applies to both areas. The Development Site elevation ranges from around 280m Above Ordnance Datum (AOD) to 425m AOD at the Northern Array, and from around 160m AOD to 345m AOD at the Southern Array.
- 5.7.8. The main land use on the Development Site is agriculture, based on aerial photography this is likely to be limited to grassland and moorland grazing of sheep. The Northern Array comprises mainly marshy grassland, and the Southern Array mainly improved grassland. A livestock pen is shown on OS mapping in the south of the Southern Array.
- 5.7.9. As described in **Section 1.1 Overview of the Proposed Development**, access to the Northern and Southern Array will be achieved via existing access tracks serving operational wind farms in the area. The Proposed Development may require the access tracks to be upgraded, however details of what this would entail and where are not currently known. The baseline will therefore be reviewed as more design information becomes available. Based on the use of existing tracks, no significant effects on Ground Conditions receptors are anticipated as a result of the Proposed Development, and the baseline description below relates only to the Northern and Southern Array.

Soils (including peat)

- 5.7.10. Information reviewed on the LandIS Soilscales map¹³³ indicates the soil type within the Development Site predominantly comprises very acid loamy upland soils with a wet peaty surface, a peaty texture and high carbon content (Soilscale 16). These organic soils are shown across the entirety of the Northern Array. At the Southern Array the map also shows freely draining acid loamy soils over rock, with a loamy texture and medium carbon content (type 13) in south and central areas.
- 5.7.11. The Peatlands of Wales map¹³⁴ shows no deep peat onsite. Deep peat is defined by the Welsh Government as either >40cm thickness organic 'O' horizon material within the upper 80cm, or, >30cm organic 'O' horizon material resting directly on bedrock¹³⁵. Within 250m of the Development Site, one small deep peat area estimated by the Welsh Government as having 40m thickness is shown 50m northwest of the Northern Array by a stream (the Nant y Fforest). The Peatland Evidence map was also consulted, this shows one onsite area of peat with a score of '1'. 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, being captured in the 'Peatlands of Wales' peat distribution map. If the score is '1' this indicates there is one indicator to suggest peat might be present. In the surrounding area within 250m of the Development Site, other areas with a peat evidence score of '1' are present around the Northern Array, the largest being 20m north within an area of plantation woodland. This area is also shown as peat by the British Geological Survey (BGS) on 1:50,000 geology mapping, as outlined below under the geology heading. The geological map shows this as approximately 5.8ha in area. Given the presence of plantation woodland, if deep peat is present in this area it is likely to be damaged/ drained.

Agricultural Land Classification

- 5.7.12. The Welsh Government Predictive Agricultural Land Classification (ALC) Map 2¹³⁶ shows the Northern Array as mainly Grade 5 land (very poor quality agricultural land), with some Grade 4 (poor quality agricultural land). The Southern Array is mainly Grade 4 land, with Grade 5 on steeper slopes. These grades are also present in the wider study area for soils. the Development Site is therefore unlikely to include any 'best and most versatile' (BMV) land (categories 1, 2 or 3a – excellent, good quality, or good to moderate quality agricultural land, respectively). The Welsh Government only requires an agricultural land classification survey where the Predictive ALC Map identifies Grades 1, 2 or 3a.

Geology

- 5.7.13. The following geological descriptions are based upon BGS 1:50,000 scale mapping¹³⁷ unless otherwise stated.

133 Cranfield Environment Centre (CEC) (2026) LandIS Soilscales Viewer. Available at: <https://www.landis.org.uk/soilscales/>. Accessed: 22 January 2026.

134 Welsh Government (2022) Peatlands of Wales Map. (online). Available at: <https://datamap.gov.wales/maps/peatlands-of-wales-maps/>. Accessed: 22 January 2026.

135 Welsh Government (2022) Production of the Peatlands of Wales Map: Soil Policy Evidence Programme 2020-21, March 2022, Report code: SPEP202-21/03. (online). Available at: <https://www.gov.wales/sites/default/files/publications/2022-03/production-peatlands-wales-map-spep2020-21-03.pdf>. Accessed: 22 January 2026.

136 Welsh Government

137 BGS (2026) GeoIndex Onshore. (online) Available at: <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>. Access 22 January 2026.

- 5.7.14. No artificial ground is shown within the Development Site. However, as noted below in the baseline information for Coal mining and other mineral extraction and Land contamination, there is potential for made ground to be present on the Development Site due to legacy coal mining and other mineral extraction.
- 5.7.15. No superficial deposits are shown on the Development Site, indicating thin soils (up to a maximum of a few metres thickness, where present) and potential for near surface or outcropping rock. Bare rock and boulders are shown on OS mapping around the edges of the Northern Array. A linear outcrop of rock is shown on OS mapping and is visible on aerial photography following the line of a fault running northwest to southeast through the southwest and central area of the Northern Array (see further discussion on faults below). As described in the Soils baseline above, an area of peat is shown 20m north of the Northern Array within plantation coniferous woodland, superficial deposits are otherwise shown as absent in the surrounding area within 250m of the Development Site. The maps also show areas of mass movement (mapped landslides) on the Northern Array in its northwest corner and within the study area to the west, south and southeast.
- 5.7.16. Bedrock underlying the Northern Array is mainly the Llynfi Member Sandstone (green-grey and blue-grey, feldspathic, micaceous lithic arenites, aka 'Pennant sandstones', with thin mudstone/siltstone and seatearth interbeds and mainly thin coals). Around the south, west and northwest corner of the Northern Array, bedrock is shown as the South Wales Upper Coal Measures Formation (grey (productive) coal-bearing mudstones/siltstones with seatearths and minor grey, quartz-rich sandstones, coals and ironstones). The Llynfi Member- Mudstone, siltstone and sandstone is also present in the northeast of the Northern Array.
- 5.7.17. Geological faults are shown running generally northwest to southeast through the Northern Array, two in the southwest to central area, and one in the northeast corner, with another at the boundary in this area. An inferred coal seam is also shown around the south, west and northwest corner at the geological boundary between the Llynfi Member Sandstone and South Wales Upper Coal Measures Formation.
- 5.7.18. Beneath the Southern Array the bedrock is mainly the Rhondda Member Sandstone (Green-grey, lithic arenites, aka 'Pennant sandstones', with thin mudstone/siltstone and seatearth interbeds and mainly thin coals). The Rhondda Member Mudstone, siltstone and sandstone is also shown
- 5.7.19. Two inferred faults are shown extending into the west and northwest of the Southern Array. Two observed coal seams and two inferred coal seams are shown, these run generally north to south through the Southern Array, to the east of centre, and west to east and south to east through the southwestern area. A further inferred coal seam is present offsite close to the southeastern edge of the Southern Array.

Geodiversity

- 5.7.20. Information on DataMap Wales confirms that there are no Geological Conservation Review (GCR) sites or geological Sites of Special Scientific Interest (SSSI) on the Development Site or within 250m of it.

Coal mining and other mineral extraction

- 5.7.21. The Development Site and study area (including a buffer of 1km from the Development Site for land contamination) is in an area affected by former coal mining.

- 5.7.22. Information available on the Mining Remediation Authority interactive map viewer¹³⁸ confirms that within the Northern Array there are multiple mine entries including shafts and adits, and development high risk areas associated with coal outcrops (this information has been considered in the design of the Proposed Development, see paragraph 5.7.24). Offsite, an area of past shallow mine workings is immediately south of the northwest corner of the Northern Array. Initial review of other mining datasets available from the Mining Remediation Authority indicates that little is known about the shaft features other than they are unlikely to have been treated (capped) and have the potential to extend to deep (>100m depth) coal workings. There is evidence to suggest shallow coal seams have been worked from an adit mouth at the southern boundary of the Northern Array.
- 5.7.23. Within the Southern Array, there are fewer coal mining features present. The map records several mine entries, all of which are adits, following the recorded coal outcrop running north to south, east of the centre of the Southern Array. Development high risk areas are present associated with recorded coal outcrops. Some past shallow mine workings are recorded in the southwest of the Southern Array, and immediately east of its southwestern area. In relation to the onsite adits, there are no probable workings recorded to the east of this line suggesting that these operations were most likely associated with limited working of the coal at outcrop. There are recorded areas of shallow coal mining encroaching the south-western boundary but there is no evidence of mine shafts within the Southern Array.
- 5.7.24. The above information on historical mining has already been considered in the proposed development layout presented for Scoping. Due to the former mining activity on the Development Site, and the presence of development high risk areas, a Coal Mining Risk Assessment (CMRA) will be produced to support the planning application.
- 5.7.25. The Aggregate Safeguarding Map for South East Wales¹³⁹ shows that the Northern Array and the Southern Array are within Category 1 Aggregates Safeguarding Areas – specifically for High Specification Aggregate – Sandstone and Igneous Rocks. This safeguarding area applies to most of the northern half of the Bridgend county borough. The BGS GeoIndex mines and quarries mapping shows that there are no active quarries within the Development Site or study area.

Land contamination

- 5.7.26. Information on DataMap Wales¹⁴⁰ confirms that there are no historical landfill sites on the Development Site or adjacent to it. One historical landfill 'Cwmcedfyw Farm' is recorded ~450m south of the Southern Array. This is down topographic gradient and it is therefore unlikely to have potential to affect the soil or groundwater quality on the Development Site.
- 5.7.27. No authorised landfill sites are recorded on the Development Site or within 1km of it.

¹³⁸ Mining Remediation Authority (2026) Mining Remediation Authority Map Viewer. (online). Available at: <https://datamine-cauk.hub.arcgis.com/>. Accessed: 22 January 2026.

¹³⁹ British Geological Survey (2012) Aggregates safeguarding map of South-East Wales. OR/12/025. Nottingham, UK, British Geological Survey. (online) Available at: https://nora.nerc.ac.uk/id/eprint/20134/1/SE_Wales_FINAL.pdf. Accessed: 22 January 2026.

¹⁴⁰ NRW (2024) Historic Landfill Sites. (online) Available at: https://datamap.gov.wales/layers/inspire-nrw:NRW_Historic_Landfill_Sites. Accessed: 22 January 2026.

- 5.7.28. Historical mapping available from the National Library of Scotland¹⁴¹ show mining and quarrying activity on and offsite at the Northern Array and to a lesser extent the Southern Array. Features in the area include old trial levels, old coal levels, tramways, air shafts, quarries.
- 5.7.29. Caerau Colliery was just c.1.1km north of the Northern Array, 1947 mapping shows a tramway ran south from this, ending c.750m north of the Northern Array a possible spoil heap and quarries are shown, the spoil heap is shown ending c.500m north of the Northern Array and is visible on present-day aerial photography¹⁴². Coegnant Colliery was c.400m southwest of the Northern Array, and associated old coal levels, tramways, air shafts and trial shafts were present by 1888, also some old quarries.
- 5.7.30. Cwm No 2 Rhondda Colliery was present in the south of the Southern Array in 1948. Immediately south of this (offsite) the West Rhondda Colliery is shown as disused by 1948. Gwar-fechan Colliery was shown as disused by 1914 c.450m northeast of the Southern Array.
- 5.7.31. Former mining activities can result in mine wastes (spoil) being disposed of to ground, in addition to other wastes (e.g., demolition materials). Where voids are present due to historical coal or other mineral extraction, there is potential for these to have been infilled with waste materials.
- 5.7.32. Sheepfolds are also shown at or close to the Development Site on historical mapping. Agricultural activities can include the use of pesticides/ insecticides, and ad hoc waste disposal, however no specific areas of chemical storage or use, or waste disposal, have been identified to date on the Development Site.
- 5.7.33. In its current use, the only human health receptors of any possible land contamination impacts at the Development Site are likely to be occasional agricultural workers, and occasional members of the public.
- 5.7.34. The water environment baseline is described in **Section 5.6**. There are potential controlled waters receptors of land contamination on and off the Development Site. Natural Resources Wales's (NRW's) Interactive Map Viewer¹⁴³ confirms that the bedrock underlying the Development Site is classed as a Secondary A aquifer. Groundwater vulnerability at the Northern Array is classed as medium, and at the Southern Array is medium on the higher ground and high on the lower slopes.
- 5.7.35. Surface watercourses are present on the Development Site. The Nant Gwyn Bach is shown originating (from a small area where surface water collects at a high point c.415m AOD) in the north of the Northern Array, and flowing north then generally east to its confluence with the Afon Llynfi 1km west. A ford is present at the north boundary of the Northern Array where it is intersected by the Nant Gwyn Bach. A tributary of the Nant Cwm-du intersects the northeast corner of the Northern Array and flows south-eastwards, the Nant Cwm-du then flows generally south for over 3km to its confluence with the Afon Llynfi.
- 5.7.36. The Nant Cedfyw is formed from two streams on the steep slopes in the central area of the Southern Array and flows to the confluence of the Nant Cedfyw and Afon Llynfi 2.8km south. The

141 National Library of Scotland (NLS) (2026) (online) Available at: <https://maps.nls.uk/geo/find/marker/#zoom=5&lat=56.0000&lon=-4.0000&f=1&z=1&marker=56.0,-4.0&from=1449&to=2001>. Accessed: 22 January 2026.

142 Google Earth Pro.

143 NRW (2026) Interactive Map Viewer. (online) Available at: <https://naturalresources.wales/evidence-and-data/maps/browse-map-of-data-about-the-natural-environment/?lang=en>. Accessed: 22 January 2026.

Nant y Fforest issues c.80m west of the Southern Array at its northern extent, this flows west to its confluence with the Nant Cwm-du c.715m west of the Southern Array. A tributary of the Garw Fechan rises c.400m north of the Southern Array and flows east to its confluence with the Garw Fechan c.500m northeast of the Southern Array, the Garw Fechan then flows southeast to its confluence with the Afon Garw c.665m east of the Southern Array.

- 5.7.37. In relation to potential ecological receptors of land contamination impacts, there are no statutory nature conservation designations of national or international importance within the Development Site. **Section 5.4 Biodiversity** details other ecological receptors on the Development Site and in the study area. The nearest national designation relates to woodland, including Ancient Woodland Site of Unknown Category and Ancient Semi Natural Woodland (ASNW), adjacent to the Southern Array. There are no Sites of Special Scientific Interest (SSSI) or international designations within the study area..
- 5.7.38. Due to the potential for land contamination to be present on the Development Site and the identified potential receptors, a Phase 1 Geo-environmental Preliminary Risk Assessment (PRA) report will be completed for the project to assess the level of risk to receptors.

THE SCOPE OF THE ASSESSMENT

Potential Receptors

- 5.7.39. The principal Ground Condition receptors that have been identified as being potentially subject to effects are summarised in **Table 5-34**.

Table 5-34 - Ground condition receptors subject to potential effects

Receptor	Reason for consideration
Soils (including peat):	
Soil resources	Land within the Development Site is predominantly in agricultural use and natural soil horizons are expected to be generally present (some made ground associated with former mining and quarrying activity is also possible). The agricultural land on the Development Site is not BMV. Grazing of sheep may take place and the land is a combination of Grade 4 (poor quality agricultural land) and Grade 5 (very poor quality agricultural land). Peat and soil mapping indicates limited potential for deep peat on the Development Site. However, thin peaty soils are likely to be present, particularly on the Northern Array, and more locally on the Southern Array, where mineral soils are also likely to be present. In the study area, peat evidence mapping indicates possible localised deep peat is present. However, the largest area north of the Northern Array, which is also shown as peat on geological mapping, is within coniferous plantation woodland and peat is likely to be drained/ damaged, if present. Key soil functions on the land include supporting crop growth, storage of organic carbon, providing habitat and supporting terrestrial biodiversity and a role in the hydrological cycle.
Land contamination receptors:	
Humans: site users (agricultural workers, public open space users)	Potential for human health impacts on site users receptors has been identified in the Phase 1 geo-environmental desk study due

Receptor	Reason for consideration
Humans – construction/ ground workers Humans - future site users (agricultural workers, maintenance workers/operatives [e.g., wind farm workers], public open space users)	to land contamination. Effects could occur either during construction or operation.
Controlled water: Groundwater – Secondary A aquifer	Groundwater has been identified as a potential receptor due to the presence of a bedrock Secondary A aquifer and the likelihood that rockhead is shallow i.e., the aquifer is not protected by overlying superficial deposits. Effects on the water environment due to land contamination could occur either during construction or operation.
Controlled water: Surface water – tributaries of the Afon Llynfi and Afon Garw rivers	Surface water has been identified as a potential receptor due to the presence of onsite and offsite watercourses. Effects on the water environment due to land contamination could occur either during construction or operation.
Buildings and services	The windfarm will require new structures in ground which may be affected by contaminants in soils or groundwater, or ground gas, which can pose a risk to the built environment, therefore potential for impacts on the built environment (future wind farm development) due to land contamination will be considered. Potential for impacts on the built environment (future wind farm development) due to land instability are possible due to the presence of former mining activity and the presence of Development High Risk Areas within the Proposed Development site.

Likely Significant Effects

- 5.7.40. The potentially significant effects identified for the relevant Ground Condition receptors are summarised in **Table 5-35**.

Table 5-35 – Likely significant ground conditions effects

Activity	Effect	Receptor
Construction: - Use of plant and machinery, vehicle movements, - Excavation including temporary or permanent displacement of soil to construct foundations and tracks or temporary tracks and hardstanding for cranes and compounds. - Temporary storage of soils and dewatering activities.	Permanent loss of soil and associated soil functions due to construction of the wind farm. Compaction of soil by vehicles or during stockpiling during construction leading to damage to soil structure resulting in damage to/loss of soil functions. Erosion of soil during construction, leading to loss of organic matter in runoff. Degradation of soil functions due to cross-contamination of topsoil with contaminated soil/material excavated/disturbed during construction work.	Soils: soils including peaty soils (limited potential for localised deep peat)

Activity	Effect	Receptor
Construction: • Use of plant and machinery, vehicle movements (ground disturbance). • Excavation of soil, reuse of excavated soil within the development. • Temporary storage of soils and dewatering activities.	Mobilisation of contaminants due to ground disturbance and vegetation stripping e.g., dust generation, contaminated run-off, creation of new pollutant migration pathways during excavation, storage, or construction, failure to manage and segregate excavated materials appropriately.	Contaminated land receptors: Human health – future site users and adjacent site users (by direct contact, inhalation or ingestion pathways). Controlled waters – groundwater and surface water.

5.7.41. The effects scoped out from further assessment in the EIA are:

- Potential effects on geology, due to the absence of sensitive geological receptors on the Proposed Development site or in the study area.
- Potential effects on best and most versatile agricultural land, due to the Predictive Agricultural Land Classification (ALC) Map 2 showing the absence of any land above Grade 4.
- Potential effects on land (or water) quality during the construction phase due to accidental release of contaminants (including oils, fuels, chemicals and waste) from construction plant or machinery or waste storage points e.g., accidental spillages or leaks, as these risks can be adequately managed through the Construction Environmental Management Plan (CEMP), and significant effects are, therefore, unlikely.
- Potential effects on construction workers (specifically ground workers), on the basis that risks to these workers will be dealt with under the Health and Safety at Work Act (1974) and regulations made under the Act. This would include desk study and site-specific contamination data obtained from site investigations being included in pre-construction information (this is a requirement of the Construction Design and Management Regulations 2015) for proposed ground disturbance works, enabling any contractors to address potential risks from contamination, as necessary, in their risk assessments and method statements. Using this approach, personal protective equipment (PPE) should always be the last line of defence, with methods selected that avoid or minimise risks to site workers.
- Potential effects on the built environment or other receptors due to ground instability, on the basis that these risks will be managed appropriately throughout the project by compliance with good practice in structural design including compliance with the Eurocodes and relevant British Standards is an embedded measure.
- Potential effects on mineral resources are scoped out on the basis that although the Northern Array and the Southern Array are within Category 1 Aggregates Safeguarding Areas, this safeguarding area applies to approximately 50% of the land in Bridgend County Borough and there are no active quarries within the study area that could potentially be impacted by the development.

5.7.42. Impacts during decommissioning are likely to be like those during the construction phase. However, dependent on the exact nature of the decommissioning activities that take place, it is likely that ground disturbance would be less. Mitigation like that implemented during the

construction and operational phases (updated to reflect changes in legislation/guidance) should also help to ensure that the significance of such impacts is minimised. It is therefore proposed that consideration of decommissioning effects is 'scoped out' from detailed assessment in the EIA.

ASSESSMENT METHODOLOGY

Overview

- 5.7.43. The generic project-wide approach to the assessment methodology is set out in **Chapter 4: The Environmental Impact Assessment Process**. However, whilst this has informed the approach that has been used in this Ground Conditions assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this Ground Conditions assessment.
- 5.7.44. The approach to assessment is set out below for soils, from **paragraph 5.7.45** and for land contamination from **paragraph 5.7.50**. The methodology for land contamination considers the change in risk level to various land contamination receptors because of the Proposed Development, whereas the approach to soil assessment considers the magnitude/consequence of potential effects on soils caused by the Proposed Development.

Soils Approach

- 5.7.45. The magnitude/consequence of the loss or damage to soil receptors will be based upon the:
- Likely nature and scale of soils effects (positive, neutral, or negative) during the construction and operational phases of the Proposed Development, and during decommissioning (which is anticipated to have the potential for similar effects as the construction phase but smaller in scale);
 - Likelihood of the Proposed Development to result in significant effects; and
 - Issues requiring further assessment and the methods to be applied.
- 5.7.46. The classifications in **Table 5-36** are intended to reflect the importance of soils in relation to their soil organic matter content and climate change resilience and mitigation, agricultural (biomass production) function, and biodiversity, as well as the Welsh Government's Peatland Policy¹⁴⁴.

Table 5-36 – Sensitivity classifications for soil resources

Value/ sensitivity	Description example
Very high	Soils (<i>other than peat</i>) directly supporting an EU designated site (e.g., SAC, SPA, Ramsar) <i>Designated peatlands (any statutory designation including SSSI)</i>

144 Welsh Government (2025). The National Peatlands Action Programme. (Online) Available at: <https://naturalresources.wales/evidence-and-data/maps/the-national-peatland-action-programme/?lang=en>. (Online). Accessed: 22 January 2026.

Value/ sensitivity	Description example
	Soils in Grade 1 and 2 agricultural land (and Subgrade 3a in Wales) ¹⁴⁵ according to the Agricultural Land Classification (ALC) system ¹⁴⁶
High	Soils (<i>other than peat</i>) directly supporting a UK designated site (e.g., SSSI) <i>Peat: deep peat¹⁴⁷ with no designation</i>
Medium	Soils (<i>other than peat</i>) supporting non-statutory designated sites (e.g., Local Nature Reserves (LNR), LGSSs, Sites of Importance for Nature Conservation (SINCs)) <i>Peat: peaty soils</i> Soils in Grade 3b agricultural land according to the ALC system
Low	Soils (<i>other than peat</i>) supporting non-designated notable or priority habitats Soils in Grade 4 ¹⁴⁸ and 5 agricultural land according to the ALC system
Very Low	Soils (<i>other than peat</i>) on previously developed land formerly in 'hard uses' with little potential to return to agriculture

5.7.47. The criteria used to define the magnitude of impact on soils is set out in **Table 5-37**.

Table 5-37 – Magnitude classification for soils

Magnitude	Description example
Major	Physical removal or permanent sealing of >20 ha soil resource or agricultural land.
Moderate	Permanent loss / reduction of one or more soil function(s) and restriction to current or approved future use of 1ha to 20ha (e.g., through degradation, compaction, erosion of soil resource.)
Minor	Temporary loss / reduction of one or more soil function(s) and restriction to current or approved future use (e.g., through degradation, compaction, erosion of soil resource.)
Negligible	No discernible loss / reduction of soil function(s) that restrict current or approved future use.
No change	No loss / reduction of soil function(s) that restrict current or approved future use.

145 Grade 1: Excellent quality agricultural land with no or very minor limitations to agricultural use. Grade 2: Very good quality agricultural land with minor limitations which affect crop yield, cultivation or harvesting. Subgrade 3a: Good quality agricultural land capable of producing moderate to high yields of a narrow range of arable crops or moderate yields of a wider range of crops.

146 Welsh Government (2021) Agricultural land classification, frequently asked questions, May 2021. (Online). Available at: <https://gov.wales/sites/default/files/publications/2021-05/agricultural-land-classification-frequently-asked-questions.pdf>. Accessed: 22 January 2026.

147 'Peat' as defined in: Welsh Government (2022) Production of the Peatlands of Wales Map: Soil Policy Evidence Programme 2020-21, March 2022, Report code: SPEP2022-21/03. (online). Available at: <https://www.gov.wales/sites/default/files/publications/2022-03/production-peatlands-wales-map-spep2020-21-03.pdf>. Accessed: 22 January 2026.

148 Grade 4: Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (e.g., cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

5.7.48. The determination of significance combines the sensitivity and magnitude using the matrix presented in **Table 5-38**.

Table 5-38 - Soil effects significance evaluation matrix

		Magnitude of change				
		No change	Negligible	Minor	Moderate	Major
Sensitivity/ importance/ value	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

5.7.49. Based on **Table 5-38**, significant effects are those identified as 'Very large' or 'large'. 'Moderate' effects have the potential to be significant, and they would normally be deemed to be significant, however in some instances these may be deemed to be acceptable based on professional judgment, and the rationale for this explained in the assessment.

Land Contamination Approach

5.7.50. For land contamination receptors, the effect of the Proposed Development will be assessed through desk-based studies to understand the baseline condition land contamination status within the Development Site and the study area. The assessment of the likely land contamination status resulting from the Proposed Development will be informed by a Geoenvironmental PRA Desk Study.

Risk assessment

5.7.51. The process of managing land contamination, as set out in the Environment Agency guidance *Land Contamination: Risk management* (LCRM), which is also adopted by Natural Resources Wales¹⁴⁹, is based on risk assessment. The assessment of risks from land contamination is based upon the identification and subsequent assessment of a contaminant linkage. A contaminant linkage requires the presence of a:

- Source of contamination;
- Receptor that can be adversely affected by the contamination; and

149 Natural Resources Wales (2025) (online) Advice for developers: Land contamination. Available at: <https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/advice-for-developers/land-contamination/?lang=en>. Accessed January 2026.

- Pathway capable of exposing a receptor to the contaminant.

5.7.52. The risk assessment aims to assess the significance of each potential contaminant linkage. The key to the classification is that the designation of risk is based upon the consideration of both of the following.

- The magnitude of the potential consequence (for instance, severity). It considers both the potential severity of the hazard and the sensitivity of the receptor; and
- The magnitude of probability (for instance, likelihood). It considers both the presence of the hazard and receptor and the potential for a pathway to be realised between them.

5.7.53. The definitions for the qualitative risk assessment have been taken from "*Guidance for the Safe Development of Housing on Land Affected by Contamination*" Annex 4 R&D Publication 66: 2008 Volume 2¹⁵⁰.

5.7.54. The likelihood classifications for the contaminant linkages being realised is presented in **Table 5-39**.

Table 5-39 – Likelihood classifications for contaminant linkages

Classification	Definition	Examples
High Likelihood	There is contaminant linkage, and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution	a) Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden. b) Ground/groundwater contamination could be present from chemical works, containing several underground storage tanks (USTs), having been in operation on the same site for over 50 years.
Likely	There is contaminant linkage, and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.	a) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space. b) Ground/ groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.
Low Likelihood	There is contaminant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event	a) Elevated concentrations of toxic contaminants are present in soils at depths >1m in a residential garden, or 0.5-1.0m in public open space. b) Ground/groundwater contamination could be present on a light industrial unit constructed in

150 NHBC, Environment Agency, CIEH (2008). *Guidance for the Safe Development of Housing on Land Affected by Contamination* R&D66: 2008 Volume 1. Available at: <https://webarchive.nationalarchives.gov.uk/ukgwa/20140328111055/http://www.environment-agency.gov.uk/static/documents/Leisure/SR-DPUB66-e-e.pdf>. Accessed January 2026.

Classification	Definition	Examples
	would take place and is less likely in the shorter term.	the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.
Unlikely	There is contaminant linkage, but circumstances are such that it is improbable that an event would occur even in the very long-term.	a) Elevated concentrations of toxic contaminants are present below hardstanding. b) Light industrial unit <10 years old containing a double skinned UST with annual integrity testing results available.

5.7.55. The classification of consequence is presented in **Table 5-40**.



Table 5-40 – Classification of consequence

Classification	Human Health	Controlled Water	Ecology	Property / Structures/ Crops and animals	Examples
Severe	Highly elevated concentrations likely to result in “significant harm” to human health as defined by the EPA 1990, Part 2A, if exposure occurs.	Equivalent to Environment Agency (EA) Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.	Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.	Catastrophic damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated Land Statutory Guidance as death, life threatening diseases (e.g. cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants from site. Highly elevated concentrations of Hazardous or priority substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).
Medium	Elevated concentrations which could result in “significant harm” to human health as defined by the EPA 1990, Part 2A if exposure occurs.	Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.	Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.	Significant damage to crops, buildings or property.	Exposure could lead to acute or chronic health effects which are significant as defined in the Contaminated Land Statutory Guidance. Damage to building rendering it unsafe to occupy e.g., foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes.

Classification	Human Health	Controlled Water	Ecology	Property / Structures/ Crops and animals	Examples
Mild	Exposure to human health unlikely to lead to “significant harm”.	Equivalent to EA Category 3 pollution incident including minimal or short-lived effect on water quality; marginal effect on amenity value, agriculture, or commerce.	Minor or short-lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population.	Minor damage to crops, buildings, or property.	Exposure could lead to slight short-term effects (e.g., mild skin rash). Surface spalling of concrete.
Minor	No measurable effects on humans.	Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.	Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.	Repairable effects of damage to buildings, structures and services.	The loss of plants in a landscaping scheme. Discoloration of concrete.

5.7.56. The risk matrix to link the likelihood and consequence is shown in **Table 5-41**.

Table 5-41 – Risk Matrix

Likelihood \ Potential Consequence	Unlikely	Low	Likely	High
Severe	Moderate/Low Risk	Moderate Risk	High Risk	Very High Risk
Medium	Low Risk	Moderate/Low Risk	Moderate Risk	High Risk
Mild	Very Low Risk	Low Risk	Moderate/Low Risk	Moderate Risk
Minor	Very Low Risk	Very Low Risk	Low Risk	Low Risk

5.7.57. The overall risk definitions are summarised in **Table 5-42**.

Table 5-42 – Risk Definitions

Risk	Definition
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.
High	Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
Very Low	It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

Significance evaluation methodology

- 5.7.58. There is no established guidance on how to use the LCRM risk assessment approach as the basis for the evaluation of the significance of effects within the EIA process. The methodology used in this assessment has, therefore, been developed using professional judgment, evaluating the change in risk from baseline conditions to those during and following the Proposed Development. To define the baseline risk, the initial assessment and classification of risk is carried out for the Study Area in its pre-development state. A separate assessment of risk will then be conducted based on the Proposed Development taking place (including environmental measures inherently embedded in the development) to enable an evaluation of the change in risk due to the Proposed Development.
- 5.7.59. The methodology used in this assessment has, therefore, been developed using professional judgment, evaluating the change in risk from baseline conditions to those during and following the Proposed Development. To define the baseline risk, the initial assessment and classification of risk is carried out for the Study Area in its pre-development state. A separate assessment of risk will then be conducted based on the Proposed Development taking place (including environmental measures inherently embedded in the development) to enable an evaluation of the change in risk due to the Proposed Development.
- 5.7.60. **Table 5-43** uses the risk classification pre- and post-development as the basis for a significance evaluation matrix for the purposes of EIA.
- 5.7.61. In considering the post-development risks, embedded measures will be taken into account.
- 5.7.62. Guidance on the protection of the environment will be used to assist with the development of mitigation e.g. NRW and CIRIA. The assessment will be based on the implementation of those mitigation measures identified, which will feed into the CEMP, method statements and procedures for the Proposed Development. These will cover the control of drainage runoff from excavations and access tracks and the formation of turbine footings. These measures will reflect current best practice in the industry and will serve to prevent increases in pollution and sediment-loading.
- 5.7.63. The Environmental Statement chapter will summarise the findings of the desk study (and any ground investigation), this forming the baseline against which the potential impact of the Proposed Development, alone and cumulatively with other developments, would be assessed. The assessment will be based on both receptor importance and the nature and magnitude of the impact as a result of the Proposed Development with the embedded mitigation measures.

Table 5-43 – Land contamination effects significance evaluation matrix

			Risk Post-development (including embedded environmental measures)					
			Very Low	Low	Moderate / Low	Moderate	High	Very High
Risk Pre-development	Existing receptors	Very High	Major Positive (Significant)	Major Positive (Significant)	Moderate Positive (Potentially significant)	Moderate Positive (Potentially significant)	Minor Positive (Not Significant)	Negligible (Not Significant)
		High	Major Positive (Significant)	Moderate Positive (Potentially significant)	Moderate Positive (Potentially significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)
		Moderate	Moderate Positive (Potentially significant)	Moderate Positive (Potentially significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)
		Moderate / Low	Moderate Positive (Potentially significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)
		Low	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)
		Very Low	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	Major Negative (Significant)
	No Receptor Present Pre-development	N/A	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	Major Negative (Significant)	Major Negative (Significant)

Risks that remain at moderate, high, or very high post-development may require further measures during the construction phase to mitigate those risks depending on the specific circumstances (for example remediation in line with LCRM)..

5.8 TRAFFIC AND TRANSPORT

- 5.8.1. This chapter of the EIA Scoping Report sets out the proposed methodology for the assessment of likely significant traffic and transport effects of the Proposed Development, including identification of the following: key data sources, the determination method for traffic and transport study area and transport receptors. The chapter also provides an overview of the existing baseline transport context.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.8.2. The traffic and transport assessment of the effects of the Proposed Development will be produced with reference to key national, regional and local policy and legislation that is applicable to traffic and transport. This may include, but is not limited to, the following set out in **Table 5-44**.

Table 5-44 – Policy context

Policy	Policy Context
National Planning Policy	
Future Wales: The National Plan 2040 (2021) ¹⁵¹	This document sets out the national development framework for Wales to 2040. One of the 11 desired outcomes is sustainable transport. Policies 11 and 12 cover national and regional transport connectivity and how this feeds into development proposals.
Planning Policy Wales, Edition 12 (2024) ¹⁵²	Section 4.1 - This policy provides guidance on the integration of land use, planning and transport matters to promote more sustainable transport choices for people and freight, thus reducing the need to travel, particularly by private transport.
Llwybr Newydd The Wales Transport Strategy (2021) ¹⁵³	Priority 2 to allow an efficient, sustainable and accessible transport system including safe and efficient use of current infrastructure. Mini Plan 7.4 Roads, streets and parking - This plan outlines priorities and aims for the road network, including ensuring the Strategic Road Network operation has minimal environmental impact and working to make the road network safer, with fewer incidents, for all users. Mini Plan 7.7 Freight and logistics - This plan covers priorities for freight movements including a desire to shift freight movements away from the road network, and to have a network that is safe for all users with reduced impact on the environment.

¹⁵¹ Welsh Government (2021) Future Wales: The National Plan 2040. Available at: <https://www.gov.wales/future-wales-national-plan-2040-0> (Accessed January 2026)

¹⁵² Welsh Government (2024) Planning Policy Wales Edition 12. Available at: <https://www.gov.wales/planning-policy-wales> (Accessed January 2026)

¹⁵³ Welsh Government (2021) Llwybr Newydd: the Wales transport strategy 2021. Available at: <https://www.gov.wales/llwybr-newydd-wales-transport-strategy-2021> (Accessed January 2026)

Policy	Policy Context
The Wales Freight Strategy (2008) ¹⁵⁴	Highlights that there should be a modal shift from road freight to rail/sea transport road to rail/sea where practical and that there needs to be efficient use of the existing suitable road network.
Technical Advice Note 18 Transport (2007) ¹⁵⁵	Paragraph 9.16 - Many proposed developments will require access to the existing highway network. The type of access provided should reflect the type and nature of the road and the volume and character of traffic likely to use the access. Paragraph 9.18 - The extra trips generated by a proposed development may bring forward the need for transportation improvements in the vicinity of the scheme and beyond.
Local and Regional Planning Policy	
Bridgend Replacement Local Development Plan (RLDP) 2018-2033 (2024) ¹⁵⁶	SPA5 – outlines that development that would have an adverse impact on ‘safe and efficient operation of the transport network will not be permitted’. PLA6 – “New development proposals must be located in areas which can be effectively accessed so that the impact of road freight movement on the environment is minimised.” “The following transport corridors are identified as the main routes in the County Borough for the movement of people and goods: PLA6(1) M4, PLA6(2) Lynfi, PLA6(3) Garw, PLA6(4) Ogmores, PLA6(5) Aberkenfig-Brynmenyn, PLA6(6) Pyle-Aberkenfig, PLA6(7) Pencoed-Pyle, PLA6(8) Porthcawl-Cornelly”. Developments must not result in adverse impact on the main transport corridors within the County Borough; where adverse impacts are predicted these must be mitigated. Within Appendix 3 of the document further details are provided on the PLA6 transport corridors. PLA9 – outlines that adverse impacts of developments on Public Rights of Way (PRoWs) must be mitigated.
Bridgend County Borough Council Local	Sets out the vision for Bridgend’s transport network. It includes priority KP4 which is to encourage safer, healthier and more sustainable travel.

154 Welsh Assembly Government (2008) The Wales Freight Strategy. Available at: <https://www.gov.wales/wales-freight-strategy> (Accessed January 2026)

155 Welsh Assembly Government (2007) Technical Advice Note 18: Transport. Available at: <https://www.gov.wales/technical-advice-note-tan-18-transport> (Accessed January 2026)

156 Bridgend County Borough Council (2024) Bridgend County Borough Local Development Plan 2018-2033. Available at: <https://www.bridgend.gov.uk/residents/planning-and-building-control/local-development-plan/> (Accessed January 2026)

Policy	Policy Context
Transport Plan 2015 – 2030 (2015) ¹⁵⁷	
Transport for CCR Regional Transport Plan for South East Wales (2025) ¹⁵⁸	Outlines objectives including providing a transport network which enables modal shift to more sustainable transport for freight and goods movements.
South West Wales Regional Transport Plan 2025-2030 ¹⁵⁹	Outlines policy and ambitions for the transport over the south west Wales region. It includes the promotion of sustainable travel where possible. It includes the need to encourage freight movement by rail and ports.
Neath Port Talbot County Borough Council Local Development Plan (2011-2026) (2016) ¹⁶⁰	Policy SP 20 - This policy states that proposals will be resisted if they are considered to cause unacceptable impact on highway safety. Policy TR2 - This policy states that a proposal will only be permitted if: <i>“The development does not compromise the safe, effective and efficient use of the highway network and does not have an adverse impact on highway safety or create unacceptable levels of traffic generation”</i>. Policy TR 4 - This policy states that proposals that would inhibit the use of certain freight facilities will be resisted <i>“unless it can be demonstrated that the use of the route for movement of freight is not realistic or necessary”</i>. Achieving Sustainable Accessibility objectives - Objective 21: <i>“Increase accessibility, promote active travel and encourage a shift to more sustainable modes of transport for people and freight.”</i> Objective 22: <i>“Reduce impacts of traffic growth and congestion and promote the efficient and effective use of the transport network.”</i>
Rhondda Cynon Taf Local Development Plan up to 2021(2011) ¹⁶¹	Policy AW5 – identifies that new development would have safe highways access and not cause of exacerbate congestion.

5.8.3. The traffic and transport assessment will be produced with reference to the following technical guidance:

¹⁵⁷ Bridgend County Borough Council (2015) Local Transport Plan 2015 – 2030. Available at: <https://www.bridgend.gov.uk/council/plans-and-strategies/local-transport-plan/> (Accessed January 2026)

¹⁵⁸ Cardiff Capital Region (2025) Transport for CCR Regional Transport Plan for South East Wales. Available at: <https://www.cardiffcapitalregion.wales/about-ccr/transport/> (Accessed January 2026)

¹⁵⁹ South West Wales Corporate Joint Committee South West Wales Regional Transport Plan 2025-2030. Available at: <http://www.cjcsouthwest.wales/37375> (Accessed January 2026)

¹⁶⁰ Neath Port Talbot County Borough Council (2016) Neath Port Talbot County Borough Council Local Development Plan (2011-2026). Available at: <https://www.npt.gov.uk/planning-and-building-control/planning-policy/adopted-ldp-2011-2026/> (Accessed January 2026)

¹⁶¹ Rhondda Cynon Taf County Borough Council (2011) Rhondda Cynon Taf Local Development Plan up to 2021. Available at: <https://www.rctcbc.gov.uk/EN/Resident/PlanningandBuildingControl/LocalDevelopmentPlans/LocalDevelopmentPlan20062021.aspx> (Accessed January 2026)

- The Institute of Sustainability & Environmental Professionals (ISEP)'s guidance: Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement (EATM) (IEMA, 2023)¹⁶² which is the current guidance for assessing potentially significant environmental impacts relating to traffic and transport.

BASELINE

- 5.8.4. This section outlines the transport network in the vicinity of the Proposed Development. The details within this section will be expanded within the traffic and transport chapter of the Environmental Statement (ES).

Information sources

- 5.8.5. The sources of information used for this scoping chapter are identified in **Table 5-45**.

Table 5-45 – Information sources summary

Source	Description
Google Maps ¹⁶³ /Streetview/Google Earth	Mapping data and imagery.
National Rail ¹⁶⁴	Rail service information.
First Bus ¹⁶⁵	Bus service information.
Walk Wheel Cycle Trust (formerly Sustrans) ¹⁶⁶	National Cycle Network (NCN) route information.
Bridgend County Borough Council ¹⁶⁷ (BCBC)	PRoW information.
Rhondda Cynon Taff County Borough Council ¹⁶⁸ (RCTCBC)	PRoW information.
Neath Port Talbot County Borough Council ¹⁶⁹ (NPTCBC)	PRoW information.

¹⁶² Davis, S., Hoare, D., Howard, R. and Ross, A., (2023). Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Road Traffic and Movements (EATM).

¹⁶³ Google (2025) Google Maps [online]. Available at: <https://www.google.co.uk/maps>

¹⁶⁴ National Rail (2025) National Rail [online]. Available at: <https://www.nationalrail.co.uk/>

¹⁶⁵ First Bus (2025) Timetables [online]. Available at: <https://www.firstbus.co.uk/south-west-wales>

¹⁶⁶ Walk Wheel Cycle Trust (2025) The National Cycle Network [online]. Available at: <https://www.walkwheelcycletrust.org.uk/national-cycle-network/>

¹⁶⁷ Bridgend County Borough Council (2025) Bridgend County Borough Council: Web Mapping [online]. Available at: <https://maps.bridgend.gov.uk/webmap9/Map.aspx?MapName=OSWMTSBasemap>

¹⁶⁸ Rhondda Cynon Taff County Borough Council (2025) Public Rights of Way Map Available at: <https://www.rctcbc.gov.uk/EN/Resident/PlanningandBuildingControl/Countryside/PublicRightsofWay/PublicRightsofWayMap.aspx>

¹⁶⁹ Neath Port Talbot County Borough Council (2016) Rights of Way [online]. Available at: https://maps.npt.gov.uk/rights_of_way/index.html

5.8.6. In addition to the sources within **Table 5-45**, the traffic and transport assessment within the EIA will likely refer to the sources set out below:

- Department for Transport (DfT) STATS19¹⁷⁰ accident data (accessed via an in-house WSP tool known as Collision Analysis – UK Wide Dashboard);
- DfT¹⁷¹ Average Annual Daily Traffic (AADT) flow data from count point locations on local and strategic roads within the traffic and transport study area. It is proposed that DfT AADT data will be used at survey locations where suitable data is available, subject to agreement with highways officers;
- where a suitable DfT count data set is not available for roads within the traffic and transport study area that are to be assessed, traffic surveys will be undertaken, subject to agreement with highways officers; and
- adoption status of roads on the highway network from Council held information.

Local Road Network

5.8.7. The sections of the local road network (LRN) that form the construction traffic route (between the Proposed Development construction access(es) and the Strategic Road Network (SRN) and/or point of origin on the LRN) will be described within the traffic and transport chapter within the EIA, once these routes are determined.

Strategic Road Network

5.8.8. The nearest roads on the SRN are the M4, (south of the Proposed Development) and the A465 (northwest of the Proposed). The M4 provides connections to the east and west and the A465 to the northeast.

Public Transport

5.8.9. The nearest railway stations to the Proposed Development are: Maesteg, Maesteg Ewenny Road and Garth railway stations. These stations provide services to Ebbw Vale Town and stop at stations including Cardiff Central¹⁶⁴.

5.8.10. The nearest bus stops to the Proposed Development are within Maesteg and south of Pontycymer. The key local buses in the Maesteg area are as follows¹⁶⁵:

- 70 (Firstbus) – operates between Cymmer and Bridgend, with a minimum of 13 services per day per direction Monday to Saturday and ten services per direction on Sunday.
- 71 (Firstbus) – operates between Cymmer and Bridgend, Monday to Saturday with 11 services per day per direction.

5.8.11. The bus stops south of Pontycymer are served by two services as follows¹⁶⁵:

- 72 (Firstbus) – operates between Bridgend and Blaengraw, with approximately two services per hour per direction during operational hours Monday to Saturday.

170 Department for Transport (2025) Road safety statistics [online]. Available at: <https://www.gov.uk/government/collections/road-accidents-and-safety-statistics>

171 Department for Transport (2025) Road traffic statistics [online]. Available at: <https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints>

- 73 (Firstbus) – operates between Bridgend and Blaengraw, with a minimum of: eight services per day per direction Monday to Friday, five services per day per direction on Saturdays and three services per day per direction on Sundays.

5.8.12. The location of the nearest railway stations and bus stops are shown in **Figure 5.6**.

Active Travel

5.8.13. The nearest NCN¹⁶⁶ Routes to the Proposed Development are as follows:

- 884 - which connects Bryngarw Country Park and Blaengarw; the majority of the route is off-carriageway; and
- 885 - which currently routes between Maesteg and Cymmer. The majority of the 885 Route is off-carriageway with some sections of on-carriageway route. Route 885 is planned to connect south to Bridgend; however, this section is still under development.

5.8.14. It should also be noted that the NCN Route 47 routes within the Development Site along the access track leading to the A4601.

5.8.15. The NCNs near the Proposed Development are shown on **Figure 5.6**.

5.8.16. Multiple PRoWs^{167;168;169} cross the Development Site boundary and would therefore interact with the Proposed Development and related traffic. Potentially affected PRoWs are located within BCBC, RCTCBC and NPTCBC areas. The traffic and transport ES chapter would be accompanied by an outline Public Rights of Way Management Plan (PRoWMP). The outline PRoWMP would detail the interactions between the Proposed Development and PRoWs and the proposed mitigation and management measures, for consultation with the relevant PRoW officers. PRoWs in the vicinity of the Development Site are shown in **Figure 5.7**.

THE SCOPE OF THE ASSESSMENT

5.8.17. Based on professional experience and an understanding of the nature of the Proposed Development, it is expected that the majority of traffic movements will be generated during the construction phase.

5.8.18. Once operational, it is envisaged that the amount of traffic movements associated with the Proposed Development would be minimal. Occasional visits may be made to the Site for maintenance checks. The vehicles used for these site visits are likely to be 4x4 or similar and there may be an occasional need for a heavy goods vehicle (HGV) to access the site for maintenance and repairs.

5.8.19. It is considered that the effects of operational traffic would be negligible, and it is therefore proposed that the assessment of the operational phase of the development is 'scoped out' from detailed assessment in the EIA.

5.8.20. The operation life of the Proposed Development is anticipated to be up to 30 years. On the assumption that below ground infrastructure and access tracks will remain in situ, less traffic will be generated during decommissioning than during construction. The traffic baseline is likely to be different (due to the typical trend of annual increases in background traffic) to the current baseline traffic conditions when decommissioning is undertaken after the 30-year operational phase. The effects on the road network are likely to be similar in nature, though of lower magnitude, than that relating to the construction phase as fewer vehicle movements would be required (for example stone for tracks left in situ or turbine bases left in situ create less vehicle movements). Therefore, it is proposed to scope the traffic and transport effects of decommissioning out of the assessment.

- 5.8.21. The main transportation effects will be associated with the movements of construction traffic HGVs travelling to and from the Site during the construction phase of the Proposed Development. This will be subject to detailed assessment in the Environmental Statement. The number of construction traffic movements across the Proposed Development construction programme is not currently known. The anticipated peak daily construction traffic movements for the Proposed Development will be identified within the EIA traffic and transport chapter and will be assessed as the worst-case scenario of traffic impacts.
- 5.8.22. The year in which the peak daily construction traffic movements is anticipated to occur will be the year of assessment. Baseline traffic flows will be increased based on forecasts of future traffic, using growth factors derived from the DfT's Trip End Model Presentation Program (TEMPro), to the future year. The percentage change between the future year baseline traffic flow and future year with the Proposed Development peak construction traffic will be assessed against the EATM Rule 1 and Rule 2 thresholds (identified within Paragraph 5.8.30), to determine which highways sections required detailed assessment.
- 5.8.23. The construction traffic routes are currently unknown but will likely consist of LRN roads, also referred to herein as highway links, that connect the Proposed Development access locations (including the construction compounds and laydown areas) to each other and to the SRN. Highway links within the traffic and transport study area are likely to be located in multiple local highway authority (LHA) areas including BCBC, RCTCBC and NPTCBC. The construction traffic routes will be outlined within the EIA.

Embedded Measures

- 5.8.24. Embedded measures are those that will be incorporated into the Proposed Development to prevent, reduce or offset environmental effects. This will include an Outline Construction Traffic Management Plan (CTMP), Outline PRoWMP and Abnormal Indivisible Loads (AIL) access study. These documents will be appended to the ES Chapter.

Potential Receptors

- 5.8.25. The roads and Public Rights of Way likely to be impacted as a result of traffic movements associated with the Proposed Development will be assessed once the final HGV routing is known. Transport receptors are the users or beneficiaries of the highways network assets and facilities. The EATM guidance identifies the following key user groups: non-motorised users, PRoW users, motorists/freight vehicles, public transport and emergency services.
- 5.8.26. The EATM further identifies sensitive locations or users that may be affected:
- People at home;
 - People at work;
 - Sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors);
 - Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools);
 - Retail areas;
 - Recreational areas;
 - Tourist attractions;
 - Collision clusters and routes with road safety concerns; and
 - Junctions and highway links at (or over) capacity.

Likely Significant Effects

- 5.8.27. The potential likely significant traffic and transport effects of the Proposed Development that are identified within EATM are summarised below.
- severance: the separation of people from places and other people and places or impede pedestrian access to essential facilities;
 - driver delay: traffic delays to non-Proposed Development traffic;
 - non-motorised user amenity: the effect on the relative pleasantness of a pedestrian journey resulting from changes in traffic flow, traffic composition and pavement width/separation from traffic;
 - non-motorised user delay: the ability of people to crossroads as a result of changes in traffic volume, composition and speed, the level of pedestrian activity, visibility and general physical conditions of the Proposed Development;
 - fear and intimidation: the change in fear and intimidation levels experienced by people as a result of an increase in traffic volume and its proximity or the lack of protection caused by such factors as narrow pavement widths;
 - road safety: the risk of accidents occurring where the Proposed Development is expected to produce a change in the character of traffic;
 - impacts of AILs. AILs are long, wide or heavy loads that cannot reasonably be divided into smaller/lighter loads for road transport. In the UK there are set thresholds for these criteria¹⁷²; and
 - impacts of hazardous loads.
- 5.8.28. The above effects will be assessed within the ES traffic and transport chapter for highway sections that are identified as requiring detailed assessment with the exception of:
- Impacts of hazardous load movements. These effects are scoped out of the assessment as no hazardous load movements are anticipated to be required for the Proposed Development.
 - Impact of AIL movements. AIL movements will be required for the Proposed Development, however these are scoped out of the traffic and transport assessment. The movements of AILs along relevant route(s) (likely from the chosen port for turbine delivery to the Site) will be investigated within an AIL access study (as an appendix to the ES traffic and transport chapter). The AIL access study will identify requirements for management and mitigation measures to facilitate safe and efficient AIL deliveries and minimise the impact on the road network as far as reasonably practicable. Additionally, AIL deliveries will be relatively few in number compared to the HGV construction traffic and will be closely managed (including escort vehicles and avoidance of peak and sensitive traffic periods) and the relevant authorities (trunk road agents, councils and police as applicable) will be notified in line with regulations before AIL deliveries, likely via the Electronic Service Delivery for Abnormal Loads (ESDAL) system.

¹⁷² AILs are long, wide or heavy loads that cannot reasonably be divided into smaller/lighter loads for road transport. In the UK there are set thresholds for these criteria. For a summary of criteria see Traffic Wales <https://traffic.wales/swtra-street-works-and-abnormal-loads> and National Highways (2024) Abnormal Loads and the ESDAL system <https://nationalhighways.co.uk/road-safety/abnormal-loads-and-the-esdal-system/>

ASSESSMENT METHODOLOGY

- 5.8.29. EATM outlines that the greatest environmental change will generally be when the Proposed Development traffic is at the largest proportion of the total flow. Therefore, the assessment of traffic and transport effects within the EIA will be undertaken for the construction phase with the largest traffic generation, as this will represent the worst-case scenario of traffic and transport effects. The peak daily construction traffic flow and the construction traffic routes will be identified within the EIA traffic and transport chapter.
- 5.8.30. EATM sets out two rules to establish the need for an environmental assessment of traffic and transport effects on highways receptors, relating to the proportional change in traffic flows on highways with the Proposed Development traffic:
- *“Rule 1: Include highway links where traffic flows will increase by more than 30% (or where the number of heavy goods vehicles will increase by more than 30%).*
 - *Rule 2: Include highway links of high sensitivity where traffic flows have increased by 10% or more”.*
- 5.8.31. Rule 1 and Rule 2 will be used to identify highways within the traffic and transport study area that required detail assessment within the EIA.
- 5.8.32. It should be noted that impacts of construction traffic will be temporary in duration, and therefore effects will be temporary.

Determination of Receptor Sensitivity, Magnitude of Change and Significant of Effect

- 5.8.33. Each highway section that forms part of the construction traffic route will be assigned a receptor sensitivity of high, medium, low or negligible based on the guidance provided within EATM and professional judgement. This includes consideration of proximity of sensitive receptors to the roads to be used by construction traffic and the highway environment, as summarised in **Table 5-46**.

Table 5-46 – Receptor sensitivity

Sensitivity	Description / Reason	Receptor
High	Highway links with a high sensitivity to changes in traffic flows include routes: ■ with highly sensitive receptors alongside them (such as schools, colleges and playgrounds); and/or ■ where there are land uses which result in high volumes of pedestrian/cycle users and the road is narrow and/or footway provision is poor or non-existent and/or existing traffic volumes are high for the type of road resulting in congestion and road safety issues.	Occupants of land uses alongside the highway link and users of the highway link.
Medium	Highway links with a medium sensitivity to changes in traffic flows include routes: ■ with some medium sensitivity receptors alongside them (such as retail areas); and/or ■ where there are land uses which result in some pedestrian/cyclist users, road design and footway provision is adequate/appropriate and/or existing traffic volumes can	Occupants of land uses alongside the highway link and users of the highway link.

	be accommodated for the type of road but are approaching capacity.	
Low	Highway links with low sensitivity to changes in traffic flows include routes: with no high or medium sensitive receptors and some land uses alongside and no/very limited pedestrian/cyclist users and/or road design and footway provision is appropriate and existing traffic volumes can be accommodated for the type of road.	Occupants of land uses alongside the highway link and users of the highway link.
Negligible	Highway links with negligible sensitivity to changes in traffic flows include routes: with no sensitive receptors and very few land uses alongside them, which have no direct access or are sufficiently set back from the carriageway, and no/very limited pedestrian/cyclist users and existing traffic volumes can be accommodated for the type of road.	Users of the highway link.

- 5.8.34. For highways links where the sensitivity is judged as 'High' or 'Medium', Rule 2 is applied (sensitive areas where traffic flows are predicted to increase by 10% or more). For highway links where the sensitivity is judged as 'Low' or 'Negligible', Rule 1 is applied (areas where traffic flows are predicted to increase by more than 30% or where the number of Heavy Goods Vehicles (HGVs) is predicted to increase by more than 30%).
- 5.8.35. For each highway section that forms part of the construction traffic route, the magnitude of change will be determined (high, medium, low or negligible) based on the guidance provided within EATM and professional judgement. The criteria are summarised in **Table 5-47**.

Table 5-47 - Magnitude of change summary

Likely significant effect	High	Medium	Low	Negligible
Severance	Change in total traffic or HGV flows over 91%.	Change in total traffic or HGV flow of 61% to 90%.	Change in total traffic or HGV flows of 31% to 60%.	Change in total traffic or HGV flows of less than 30%.
	Context should, also, be considered including the local population and number of local facilities potentially impacted. EATM states caution should be applied with applying these thresholds to highway links with low baseline flows.			
Driver delay	High increase in queuing at junctions and/or congestion on road links.	Medium increase in queuing at junctions and/or congestion on road links.	Low increase in queueing at junctions and/or congestion on road links.	Low or no increase in queuing at junctions and/or congestion on road links.
Non-motorised user amenity	A halving or doubling of traffic flow (or HGV flow) can be used as a broad threshold when considered in the local context and applied with caution. Assignment of magnitude is based on a variety of factors including general level of pedestrian activity, visibility, and physical conditions such as traffic flow, traffic composition, crossing points and pavement width/separation from traffic.			

Likely significant effect	High	Medium	Low	Negligible
Non-motorised user delay	Generally, increases in traffic may lead to greater delay, though is dependent on the level of non-motorised users' activity in the area. Magnitude is assigned on pedestrian delay experienced when crossing highways links considering a range of factors including crossing type, pedestrian flows, traffic levels, visibility and general highway condition.			
Fear and intimidation	Magnitude is assigned based on the scoring system provided in EATM (which is dependent on an 18-hour average traffic flow; 18-hour average HGV traffic flow and vehicle speed). The scores comprise extreme (71+); great (41 to 70); moderate (21 to 40) and small (0 to 20).			
	Two step change in level score of fear and intimidation.	One step change in level score of fear and intimidation and >400 average 18-hour vehicle increase or >500 HGV 18-hour vehicle increase.	One step change in level score of fear and intimidation and <400 average 18-hour vehicle increase or <500 HGV 18-hour vehicle increase.	No change to step in level score of fear and intimidation.
Road safety	Magnitude is assigned by reviewing existing collision patterns and trends based upon existing personal injury accident records and the forecast increase in traffic that may change the risk of serious and fatal injuries.			

- 5.8.36. Significance of likely traffic and transport effects will be derived by considering the receptor sensitivity and the magnitude of change as defined within **Table 5-48** (shading denotes significant impacts).
- 5.8.37. Major and Moderate effects are considered to be significant, whilst Minor and Negligible effects are considered to be not significant.

Table 5-48 – Traffic and transport significance evaluation matrix

		Receptor Sensitivity			
		High	Medium	Low	Negligible
Magnitude of Change	High	Major (Significant)	Major (Significant)	Moderate (Significant)	Negligible (Not Significant)
	Medium	Major (Significant)	Moderate (Significant)	Minor (Not Significant)	Negligible (Not Significant)
	Low	Moderate (Significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)
	Negligible	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)

Cumulative Effects

- 5.8.38. TEMPro will be used to derive growth factors to increase the baseline traffic flow data to the future year of assessment. The future year will be defined as the year in the construction programme when

daily construction traffic will be highest. DfT's TEMPro forecasts of traffic growth take into account national projections of population, employment, housing, car ownership and trips rates. Therefore, TEMPro should account for all cumulative and anticipated development within the local plans at the time of its production.

- 5.8.39. Consideration would be given as to whether any of the identified receptor locations are likely to be subject to cumulative effects due to traffic and transport effects generated by other proposed developments in the area that are included within the TEMPro growth factor (i.e. recently approved development that was not part of a local plan allocation). If this is likely to be the case, a cumulative assessment would be undertaken.

5.9 NOISE

- 5.9.1. This chapter describes the proposed scope of the assessment of effects with respect to noise arising from the Proposed Development.
- 5.9.2. The proposed scope of the noise assessment would consist of an assessment of the noise effects arising from construction and operation of the Proposed Development, including cumulative noise impacts from proposed, consented and operational wind energy developments in the area

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.9.3. A summary of the relevant policy, legislation and technical guidance with respect to Noise is given in **Table 5-49**.

Table 5-49 – Policy, legislation and guidance relevant to the Noise assessment

Planning Policy document	Context
Future Wales - The National Plan 2040 (2021)	Provides the national development framework up to 2040 and refers to the protection from noise through planning throughout, including renewables. Identifies an area containing the Proposed Development as a pre-assessed area for wind energy development.
Planning Policy Wales - Edition 12 (2024)	Sets out the land use planning policies of the Welsh Government, supplemented by Technical Advice Notes (TANs). Paragraph 5.9.16 states <i>"Wales has an abundant wind resource and, as a result, wind forms a key part of meeting the Welsh Government's vision for future renewable energy production."</i> This policy document sets out the importance of fully considering potential noise impacts from new energy infrastructure when making planning decisions, and refers to use of ETSU-R-97 for the assessment of noise from wind turbines.
Bridgend County Borough adopted Replacement Local Development Plan 2018-2033 (2024)	In the Local Development Plan (LDP) <i>noise</i> is considered as part of a wider framework environmental protection, pollution control, placemaking and public health. Noise is integrated throughout policies that deal with pollution, amenity, transport and development quality. The key strategic policies (SPs) relevant to noise, vibration and this Proposed Development are presented below. <i>SP3: Good Design and Sustainable Placemaking</i> <i>All development must ... Avoid or minimise noise, air, and soil and water pollution.</i>

Planning Policy document	Context
	SP13: <i>Renewable and Low Carbon Energy Development</i> <i>There will be no unacceptable impacts on the natural and historic environmental or local communities (such as noise and air pollution).</i> DNP9: <i>Natural Resource Protection and Public Health</i> <i>Development proposals will only be permitted where it can be demonstrated that they would not cause a new, or exacerbate an existing, unacceptable risk of harm to health, biodiversity and/or local amenity due to: several factors, including:</i> 2) <i>Noise pollution.</i>
Control of Pollution Act 1974	Sets out the legislative approach to construction and demolition noise. Sections 60 and 61 of the Act give the Local Authority special powers for controlling noise arising from construction and demolition works, regardless of whether a statutory nuisance has been caused or is likely to be caused. Works within the scope of these provisions include repair and maintenance work and road works.
Environmental Protection Act 1990 Part III - as amended by the Noise and Statutory Nuisance Act 1993	An Act to make provision for the improved control of pollution (including from noise and vibration) arising from certain industrial and other processes. Section 79 declares several matters to be statutory nuisances, one of which is noise (the term includes vibration). The Act requires local authorities to inspect their area periodically to detect any nuisance and, where a complaint of a statutory nuisance is made by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint.
Technical Advice Note 11 Noise (1997)	TAN 11 provides general advice on noise and refers to TAN 8 for guidance regarding noise from wind turbines. TAN 8 was superseded by national development framework in Future Wales – The National Plan 2040.
Updates to TAN 11 Noise (2015)	The purpose of this document was to update TAN 11 in response to revisions and amendments made to the supporting legislation and British Standards that underpin the guidance. The document endorses “<i>the Institute of Acoustics Good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise.</i>” And states that “<i>Authorities processing wind turbine applications should also note that six supplementary guidance notes have been issued to support this guide</i> (http://www.ioa.org.uk/publications/good-practice-guide)”. It goes on to state that “<i>The Department of Energy and Climate Change have commenced further work on amplitude modulation and any Welsh Government position on this work would be considered at the appropriate time.</i>”
Noise and soundscape plan for Wales 2023 to 2028 (2023)	This document presents the Welsh national strategy on soundscapes. With reference to wind turbines, it highlights that development proposals must seek to minimise their impact to homes and tourism receptors; and that communities should be protected from significant cumulative impacts.

Planning Policy document	Context
	The document confirms that current UK noise assessment guidance, namely ETSU-R-97 and IOA GPG; and references the report for <i>BEIS: A review of noise guidance for onshore wind turbines</i>.
Energy Technology Support Units R-97 - The Assessment and Rating of Noise from Wind Farms (1996)	ETSU-R-97 sets out the UK's methodology for assessing noise from wind turbines. The document provides a method for determining appropriate daytime and night-time noise limits for operational turbine noise. Those limits are derived based on acceptable fixed lower limits (which usually applies at lower wind speeds), and an allowable exceedance over prevailing background noise levels (which usually applies at higher wind speeds). The limits are determined over range of wind speed conditions between turbine cut-in wind speed and 12m/s.
A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (2013)	The IOA GPG represents current good practice in applying the ETSU-R-97 method in the assessment of noise impacts from wind turbine developments. The document provides clarification and guidance on ETSU-R-97 noise assessments, including consultation, background noise survey methodology, noise survey data analysis, derivation of noise limits, noise prediction model input data, algorithms and parameters, cumulative impact assessment procedures, assessment reporting and planning conditions. A set of Supplementary Guidance Notes (SGNs) also form part of the publication and include further specific detail for different technical areas as follows: • SGN 1: Data collection. • SGN 2: Data processing & derivation of ETSU-R-97 background curves. • SGN 3: Sound power level data. • SGN 4: Wind shear. • SGN 5: Post completion measurements. • SGN 6: Noise propagation over water for on-shore wind turbines.
Report for UK Government: A review of noise guidance for onshore wind turbines (2023)	WSP, on behalf of the UK government Department for Business, Energy & Industrial Strategy (BEIS) have completed a review of the onshore commercial wind turbine noise assessment guidance, ETSU-R-97. The review highlights areas within the guidance that warrant consideration for updating, while also recommending where further evidence needed to support any future updates, should they be progressed.
Designing for Renewable Energy in Wales (2023)	This guidance document sets out key design objectives and considerations for the sensitive development of large-scale onshore wind and solar installations in Wales. With reference to wind turbines, it highlights that development proposals must seek to minimise their noise impact to homes and tourism receptors; and that communities should be protected from significant cumulative impacts. The document confirms that current UK noise assessment guidance, namely ETSU-R-97 and the IOA GPG; and references the report for <i>BEIS: A review of noise guidance for onshore wind turbines</i>.
Practice guidance: Planning implications of renewables and low carbon energy development (2011)	This practice guidance is a tool to support Local Planning Authorities (LPAs) in dealing with applications for renewable and low carbon energy development.

Planning Policy document	Context
	With reference to wind turbine development, it states that it is important to ensure that operational noise levels meet ETSU-R-97 established limits. For construction and decommissioning activity it recommends restricting working hours and adopting good practice measures for reducing noise in line with BS 5228-1 and BS 8233.
BS 5228-1: 2009+A1:2014 Code of practice for noise vibration control on construction and open sites – Part 1: Noise	This standard sets out methods for calculating and assessing construction noise. The standard provides the latest recommendations for methods of noise control where there is a need for the protection of persons living and working in the vicinity of, and those working on, construction and open sites. The standard provides a database of information, including previously measured sound pressure level data for a variety of different construction plant undertaking various common activities. The data can be used in noise level calculations following the prediction methods that it presents.
BS 8233:2014 Guidance on sound insulation and noise reduction for buildings	This standard provides guidance on the control of noise in and around buildings. It suggests appropriate criteria for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use.
Calculation of Road Traffic Noise (1988)	The memorandum provides a method to calculate road traffic noise levels. The factors which may influence road traffic noise levels relate to the road (surface and gradient), the traffic (flow, speed and composition) and the propagation (distance and screening). These are accounted for in the presented calculation method. The results of CRTN calculation can be used to determine the noise level changes associated with changes in road traffic flows / composition.
Design Manual for Roads and Bridges, LA 111, Noise and vibration	This document sets out the requirements for noise and vibration assessments from road projects, applying a proportionate and consistent approach using best practice and ensuring compliance with relevant legislation. Whilst this guidance is focussed on the assessment of impact from new road projects, the principles of the assessment method can be used to determine and assess the change in noise level at sensitive receptors from changes road traffic in general or from other proposed developments.
Acoustics — Attenuation of sound during propagation outdoors — Part 2: Engineering method for the prediction of sound pressure levels outdoors, 1996	Defines a method for calculating the attenuation of sound during propagation outdoors to predict the levels of environmental noise at distances from a source or sources. Results are for downwind (conservative) propagation conditions. The calculation method accounts for various factors including ground effects, atmospheric absorption and barrier attenuation.

BASELINE

Study Areas

- 5.9.4. For construction noise and vibration, the adopted Study Area is 300m around noise generating activities and 100m around vibration generating activities. Beyond these distances, construction noise and vibration levels are expected to be sufficiently low that significant effects would not arise.

The construction Study Areas will be applied to proposed turbine locations and across the wider area where relevant.

- 5.9.5. For operational noise, the adopted Study Area is 5km around the Proposed Development wind turbines. Based on experience of similar projects, this distance is considered sufficient to account for all significant cumulative noise effects from the Proposed Development operating together with other acoustically relevant wind farms. The operational noise Study Area and cumulative wind turbine developments are shown on **Figure 5.8**. The potential impact from the Proposed Development alone is expected to be confined to a smaller area.

Desk Study

- 5.9.6. A desk study has been undertaken to assist in determining the baseline conditions. This has included:
- identification of noise-sensitive receptors, including those with the greatest potential to be subject to an impact from the construction and operational of the Proposed Development, in isolation, and/or under the cumulative scenario;
 - identification of cumulative wind turbines in the operational noise Study Area, including their development details (e.g. site layout, hub-height);
 - identification of possible local noise sources in the vicinity of the identified receptors (including local water courses); and
 - identification of information to inform the operational noise level predictions (e.g. ground height contours).
- 5.9.7. A summary of the data sources used to inform the desk study, together with the nature of that data is outlined in **Table 5-50**.

Table 5-50 - Noise assessment data sources

Organisation	Data source	Data provided
Bing	Bing Maps	Publicly available mapping information
BCBC	Local authority planning portal	Identification of applications, including cumulative wind farm developments and potential future sensitive receptors
Esri	ArcGIS Online Basemaps	Open mapping information and satellite imagery
Google	Google Maps	Publicly available mapping information and satellite imagery
Google	Google Street View	Publicly available street scene photography
Ordnance Survey (OS)	AddressBase Plus database	Local authority addresses and four-level classification scheme explaining the function of each property
OS	OS Explorer (1:25,000 scale)	Mapping information
OS	OS Landranger (1:50,000 scale)	Mapping information
OS	OS Terrain 50	Publicly available contour height line dataset

Pennant Walters	Proposed Development information	Turbine locations, red line boundary, access road alignment
UK Government	Check your Council Tax band website	Property information
Welsh Government	'Planning casework' portal	Cumulative development information for DNS applications.

5.9.8. The Proposed Development turbine locations are detailed in **Chapter 2, Table 2-1**.

Current Baseline

5.9.9. No recent surveys have been undertaken to establish baseline conditions. A programme of baseline measurements is proposed, and the results will be used to inform the EIA noise assessment.

Future Baseline

5.9.10. It is unlikely that the future baseline will change significantly in the short to medium term, as conditions around the Proposed Development is expected to remain relatively stable. Relevant wind energy schemes within the study area, including operational, consented or in planning will be considered in the cumulative assessment.

THE SCOPE OF THE ASSESSMENT

Noise Sensitive Receptors

- 5.9.11. The primary data source used to identify noise sensitive receptors is the OS AddressBase Plus database. This database contains geographic, address information and property information, it incorporates a four-level classification scheme that explains the function.
- 5.9.12. The OS AddressBase Plus database has been supplemented based on publicly available satellite/aerial imagery.
- 5.9.13. The nearest noise sensitive receptors to the proposed turbine locations are detailed in **Table 5-51**.
- 5.9.14. All identified sensitive receptors are residential properties, and each residential receptor is classified as having a high level of sensitivity.

Table 5-51 - Noise sensitive receptors and distance to closest turbine

Name	ID	OSBG coordinates		Distance	Closest turbine	Meas. location
		X	Y			
Bryn Llefrith Farm	R1	285943	193543	930m	T1	M1
Blaen-Cwmdu Farm	R2	287727	192128	530m	T8	M2
Brynrhug Farm	R3	286641	191838	860m	T3	M3
Cwrt-Y-Mwnwys Farm	R4	285821	191956	1.1km	T3	-
2 Penybryn Bungalows	R5	285961	194011	1.2km	T1	-
Cwmdu Isaf Farm	R6	287796	190561	950m	T4	M4
18 Garwfechan Road	R7	290265	189981	820m	T5	M5
Cynhordy Farm	R8	288310	188992	580m	T7	M6
Gelliheblig	R9	287693	189603	770m	T4	-
* Distance is calculated between the receptor (OS AddressBase Plus data) and the closest Glanllynfi Garth proposed wind turbine locations.						

- 5.9.15. A sample of the noise sensitive receptors have been selected as proposed baseline noise measurement locations, these are also identified in **Table 5-51** and are shown on **Figure 5.9**. The baseline noise monitoring will be completed in line with recommendations in ETSU-R-97 and IOA GPG.

Likely Significant Effects

Construction

- 5.9.16. There are no sensitive receptors within 300m of proposed turbine locations. The shortest distance between a proposed wind turbine location and a sensitive receptor is approximately 525m (between Glanllynfi Garth wind turbine 08 and Blaen-Cwmdu Farm). Therefore, no significant noise or vibration effects are expected during turbine construction. Onsite noise and vibration assessments of wind turbine construction are therefore scoped-out.
- 5.9.17. The substation and construction compound locations are yet to be finalised. However, as the shortest distance between the red line boundary and a sensitive receptor is more than 300m (approximately 340m between the Southern Array boundary and Cynhordy Farm), no significant noise or vibration effects are expected to occur from construction compounds or substation construction. Onsite construction noise and vibration assessments of substations and compounds are therefore scoped-out.
- 5.9.18. Upgrading of access tracks during construction may be required to facilitate the delivery of turbine components to the Development Site. Where such works are proposed within 300m of noise and vibration sensitive receptors, an assessment of construction noise and vibration will be scoped-in.

5.9.19. Construction related vehicle movements will be necessary for the delivery of plant and materials. These vehicles may result in a temporary increase in road traffic noise. As the construction traffic volumes and access routes have not yet been finalised, a precautionary approach has been taken and construction traffic noise has been scoped-in to the assessment.

5.9.20. Borrow pits will not be used during the construction phase, assessment of noise, groundborne vibration and air overpressure from borrow pit blasting is scoped out.

Operation

5.9.21. Wind turbine noise has the potential to impact noise sensitive receptors. There is flexibility regarding the final number of turbines, their locations and the turbine model to be installed. These factors provide scope to manage operational noise effectively. While the final noise level limits will be determined following a detailed baseline noise survey, it is expected that, with appropriate noise mitigation measures where necessary, compliance with these limits will be achievable. An assessment of operational wind turbine noise is scoped-in.

5.9.22. Current national policy on wind turbine noise assessment is that the guidance in the ETSU-R-97 should be applied in conjunction with the IOA GPG. Assessments of turbine generated vibration, infrasound, low frequency noise and excess amplitude modulation all fall outside the scope of an ETSU-R-97 compliant assessment. Assessments of turbine generated infrasound, low frequency noise, excess amplitude modulation and groundborne vibration are therefore scoped-out.

5.9.23. In relation to infrasound and low frequency noise, The BEIS report confirms that:

“...the weight of evidence appears to indicate that wind turbine infrasound has no adverse effects on human health at typical exposure levels...”

5.9.24. and that:

“...due to the inherent characteristics of wind turbine sound, suitable controls on A-weighted sound levels are expected to also provide sufficient control for the potential impact of low frequency noise”

5.9.25. With respect to amplitude modulation, the ETSU-R-97 assessment method accounts for this to some extent, as it is a component part of typical wind turbine noise. The remaining issue pertains to potential ‘excess’ amplitude modulation, meaning levels beyond those already addressed by ETSU-R-97. At present, there is no reliable or recognised method for predicting the likelihood of amplitude modulation occurrence. While recommendations for its measurement and quantification have been published, none have been formally endorsed by Welsh Government. The current policy position remains that assessments should follow ETSU-R-97 and the IOA GPG.

5.9.26. In relation to groundborne vibration, the proposed separation distances between the turbines and receptors are sufficient to ensure that vibration from the turbines would be imperceptible.

5.9.27. Traffic generated by the development during operational is expected to be minimal, consisting of routine maintenance and service visits. The anticipated traffic volumes would not be sufficient to result in any significant effects. Therefore, an assessment of operational traffic noise has been scoped-out.

5.9.28. Although the substation location(s) have yet to be confirmed, the shortest distance between the red line boundary and a sensitive receptor is approximately 340m (between the Southern Array and Cynhordy Farm). At this separation distance, no significant noise or vibration effects are expected

from substation operation. Therefore, an assessment of operational substation noise and vibration has been scoped-out.

Decommissioning

- 5.9.29. It is anticipated that noise and vibration from decommissioning activities would be no greater than those generated during construction. Therefore, an assessment of decommissioning noise and vibration has been scoped-out.

ASSESSMENT METHODOLOGY

Construction Noise

- 5.9.30. The location of construction works associated with the access road will be reviewed. If noise sensitive receptors are identified within 300m of these areas, noise level predictions will be carried out for a sample of receptors in accordance with BS 5228-1 methodology. These predictions will consider typical construction activities associated with the proposed improvement works and will be based on anticipated construction methodologies.
- 5.9.31. Predicted construction noise levels will be evaluated against criteria established in accordance with BS 5228-1 guidance. The assessment will also take into account the anticipated timing and duration of the works. The results will determine whether the proposed works are likely to result in a significant effect.
- 5.9.32. The assessment of construction phase development generated traffic on the surrounding local road network will be completed based on the CRTN. Noise level calculations will be undertaken for construction access routes to establish the Basic Noise Level (BNL) for scenarios both 'with' and 'without' construction traffic flows. The resulting noise level changes due to construction traffic will be evaluated against the impact magnitude scales set out in DMRB LA 111, and the significance of effects will be determined.
- 5.9.33. In most cases, construction noise (including construction traffic) is controlled through the implementation of mitigation measures (such as limiting hours during which construction can be undertaken via a planning condition), and undertaking construction works in accordance with good practices as described in BS 5228-1:2009 + A1:2014 (such as using well maintained and serviced plant, and the appointment of a Site contact to whom complaints/queries can be directed).

Construction Vibration

- 5.9.34. For construction works to the access tracks, the assessment will be completed based on BS 5228-2. Typical set back distances will be established to indicate where different threshold vibration levels are likely to occur. These distances will then be compared with the actual separation between receptors and working areas to determine whether significant effects may arise. The assessment will also consider the anticipated timing and duration of the works. Where necessary, mitigation measures will be proposed, and residual effects will be determined.

Operational Turbine Noise

- 5.9.35. A detailed assessment of operational turbine noise levels will be undertaken in accordance with ETSU-R-97 and the IOA GPG. Baseline noise survey results, together with concurrent meteorological measurements, will be analysed to establish applicable daytime and night-time noise limits. This process will also take into account relevant local planning policy and guidance. A

detailed noise model will then be developed to reflect the proposed scheme layout design and the candidate turbine for the Proposed Development.

- 5.9.36. The noise model will also incorporate existing and proposed wind turbines within 5km. At this stage it is considered that this will include existing turbines at Llynfi Afan and Pen y Cymoedd wind farms, and proposed turbines at Foel Trawsant, Mynydd Ty-talwyn and Upper Ogmere wind farms.
- 5.9.37. The noise model will calculate operational noise levels at selected noise sensitive receptors, including those listed in Table 5-51 for wind speeds from cut-in up to 12m/s. Calculations will follow apply the prediction method detailed in *ISO 9613-2: 1996: Acoustics — Attenuation of sound during propagation outdoors*, as recommended for use in the IOA GPG, and also applying the adaptations included in that guide (acoustic screening cap and valley corrections).
- 5.9.38. The predicted operational noise levels for the development operating in isolation will be calculated.
- 5.9.39. ETSU-R-97 requires that all wind turbines that contribute to noise are included in a cumulative noise assessment.
- 5.9.40. The noise model will calculate operational noise levels from existing and proposed turbines. Predictions will be based on the installed or proposed turbine types, the assessment will also consider whether development could generate higher noise levels in the future whilst still operating within their planning consent.
- 5.9.41. Where available, the planning consent for existing turbines will be reviewed to identify any applicable noise limits or noise controls. If such limits exist, prediction results will be capped so they do not exceed those limits. In cases where no noise related planning controls apply, an addition margin of conservatism will be incorporated into the predictions; for example, +2dB above the standard uncertainty corrections.
- 5.9.42. The predicted levels will then be used to establish the Remaining Noise Budget (RNB) available for the Proposed Development for the daytime and night-time assessment for each receptor. The RNB will be determined either by subtracting the predicted turbine noise levels from the cumulative noise limits; or set at 10dB below predicted cumulative levels (determined without including the addition prediction conservatism).
- 5.9.43. The predicted operational noise levels for the development operating in isolation will be compared against the RNB. If an exceedance of the noise level limits or the RNB is identified, measures to reduce noise levels from the Proposed Development will be considered to achieve compliance with the cumulative noise limits or RNB. This may include directional corrections and the implementation of a noise management scheme.
- 5.9.44. Residual effects will then be determined. Compliance with the cumulative noise limits or RNB will indicate a not significant effect.

5.10 INFRASTRUCTURE AND OTHER ISSUES

EXISTING INFRASTRUCTURE, TELECOMMUNICATIONS AND BROADCAST SERVICES

- 5.10.1. The ES will consider the potential effects of the proposed wind farm on existing infrastructure, television, aviation, and radar and radio-communication signals.

- 5.10.2. During the preparation of the ES the responses of consultees will be collated and reported to the design team. The consultees will be identified from the contact details referenced within (the now revoked) TAN 8¹⁷³.
- 5.10.3. As part of preliminary site design work to inform the Scoping layout, OFCOM Spectrum Information System¹⁷⁴ data was used to identify telecommunications towers and links in the vicinity of the site with the potential to be affected. Initial discussions with selected operators were undertaken to understand the details of operator assets surrounding the site and a preliminary layout was provided.

Table 5-52 – Summary of consultations and comments received

Consultee	Response Received	Consultee Comment
Vodafone	15/08/2025	No impact on links
Atkins	09/09/2025	Advised Welsh Water may have assets with potential to be affected.
Joint Radio Company	25/08/2025	No impacts predicted on local energy networks radio link systems
Airwave Solutions	13/08/2025	Airwave Solutions could not determine whether any assets have the potential to be affected without undertaking a paid assessment.

- 5.10.4. Should infrastructural constraints be identified, revision to the turbine layout may be necessary to avoid electronic interference or disruption to services. Technical solutions to any infrastructural constraint will be sought during this process to minimise effects upon it.
- 5.10.5. TV interference is now considered to be a low risk due to analogue TV signals no longer being in use and so this aspect is proposed to be **scoped out** of the EIA, while other telecommunication elements (e.g. fixed links) are **scoped in** to the EIA. In the unlikely instance that TV interference occurs it is considered that this can be appropriately covered by a suitably worded planning condition and complaints procedure to implement any necessary mitigation.

AVIATION

- 5.10.6. Wind turbines within radar Line of Sight (LoS), and therefore detectable by radar systems, reflect radio waves that can interfere with the system. Turbine induced radar clutter appearing on radar displays can affect the safe provision of Air Traffic Services as it can mask unidentified aircraft from the air traffic controller and/or prevent the accurate continued identification of aircraft under control. In some cases, radar reflections from the turbines can affect the performance of the radar system itself. Additionally, due to their height, wind turbines will present as additional obstacles within a defined area potentially creating a limit to airspace use.

¹⁷³ Welsh Government (2005) Planning Policy Wales Technical Advice Note 8: Planning for Renewable Energy

¹⁷⁴ OFCOM (2025) Spectrum Information System (SIS). Accessed Online <https://www.ofcom.org.uk/spectrum/frequencies/spectrum-information-system-sis>

- 5.10.7. In the interests of aviation safety, structures of a height greater than 150m require visible aviation lighting.¹⁷⁵
- 5.10.8. Consultations will be undertaken with aviation stakeholders as part of this Scoping Opinion request to identify if the Proposed Development is likely to affect aviation operations. The responses provided will assist in guiding any required aviation assessment. If any issues are identified during the aviation assessment, negotiations would be undertaken to seek and agree appropriate mitigation.
- 5.10.9. Given the potential for significant effects, and further consultation requirements, aviation is **scoped in** to the EIA.

SHADOW FLICKER

- 5.10.10. Shadow Flicker is a phenomenon that can occur in sunny weather when turbines are operating and the rotating blades cause a flickering effect inside a building where sunlight passes through an opening such as a window or door.
- 5.10.11. For shadow flicker to occur, the receptor must be directly in line with the wind turbines when the sun is low in the sky and within 10 rotor diameters of a turbine where they are located within 130 degrees either side of north of any turbine. In these circumstances, the moving turbine blade briefly blocks / reduces the intensity of light entering an opening to a room on each rotation, causing a flickering to be perceived. In the open, shadow flicker is generally not perceived as light outdoors is reflected from all directions. The shadow flicker study area is shown in **Figure 5.10**.
- 5.10.12. If, after design development, any properties were to be located within a 130-degree segment either side of due north, relative to the turbines and within ten rotor diameters of a turbine (as per guidance) they will be assessed for shadow flicker.
- 5.10.13. Where properties meet both criteria for there to be a potential shadow flicker effect, the seasonal duration of this effect will be calculated from the geometry of the turbine and the latitude of the Proposed Development site, to assess potential impacts upon the amenity of local residents. Mitigation measures will be proposed in the ES should they be necessary.
- 5.10.14. The potential for cumulative shadow flicker effects will be assessed. The study will identify residential properties within 10 rotor diameters and a 130-degree arc of both the proposed wind farm and any cumulative wind farm. The seasonal duration of any effect will be calculated and the impact on amenity assessed.
- 5.10.15. Given the potential for significant effects, shadow flicker is **scoped in** to the EIA.

SOCIO-ECONOMICS

- 5.10.16. Wind farms have the potential to have both beneficial and negative effects on socio-economics, tourism and recreation.

¹⁷⁵ Civil Aviation Authority (2016) CAP 764: CAA Policy and Guidelines on Wind Turbines

- 5.10.17. In order to assess the potential socio-economic effects of the Proposed Development, it is necessary to gain a view as to the current position of the local economy. The character of the local economy will therefore be examined as part of the EIA to provide an overview of potential linkages with the Proposed Development. Tourist and recreation attractions along with any core paths or public rights of way (PRoW) within or surrounding the Site and identified within the LVIA and Traffic and Transport baseline will form part of the assessment (while direct effects on existing public access will be considered within the assessment, amenity effects for those using access routes will be considered within the LVIA).
- 5.10.18. The assessment will also examine the level of construction activity and job creation and the potential linkages with the wider local economy. This will include an assessment of potential multiplier effects within the local economy and the degree to which local businesses could benefit from the construction, operation and decommissioning of the Proposed Development. Potential community effects will also be examined and, whilst it is considered unlikely to be significant, the assessment will also qualitatively consider the potential for the Proposed Development to have an effect on other existing business activity.
- 5.10.19. There is no standard approach to this element within an EIA, however the general approach will be to outline the areas of the Proposed Development where there will be the potential for some economic/social effect within the wider area (including tourism, etc.). This will be undertaken with a view to examining the significance of these effects. Where possible (i.e., with quantifiable effects), the significance will be assessed by way of comparison of the factor (e.g., construction jobs) with the variance of related factors within the local economy. Where effects cannot be quantified, the assessment of significance will be undertaken using professional judgement and experience.

POPULATION AND HUMAN HEALTH

- 5.10.20. The potential effects on population and human health arising from the Proposed Development would be considered in the context of the other factors identified in Schedule 4(2) of the 2017 EIA Regulations given that any environmentally related health issues (both beneficial and adverse) are likely to result from, for example, exposure to traffic, changes in living conditions resulting from noise, and increased employment opportunities. It is therefore proposed that population and human health effects of the Proposed Development are incorporated within the relevant technical chapters such as socio-economics, traffic and transport, noise, shadow flicker and landscape & visual (in respect of residential amenity in particular).
- 5.10.21. However, to clearly demonstrate that population and human health effects are included in the ES, and to assist with ease of reference, it is proposed that a summary table that identifies the potential effects and the ES chapter that considers the matter in more detail will be included.

CLIMATE

- 5.10.22. The resilience of the Proposed Development to climate change and extreme climate events will be considered within the detailed design and it is not proposed that a separate ES assessment is prepared. The projected impacts of climate change on the Proposed Development will also be considered in relevant aspect chapters. They will be summarised within the ES under the sub-heading "Climate change resilience".

- 5.10.23. Climate change specialists will work with the engineering design team to scope in or out potential climate change impacts based on climate projections, best practice and expert judgement. This will ensure that the design of the Proposed Development is in-line with local, regional and national policies regarding adaptation to climate change. The design of the Proposed Development will consider the UK Climate Projections 2018 (UKCP18) for a variety of environmental parameters (e.g., extreme rainfall, temperature, drought etc.) to ensure that appropriate mitigation measures are embedded within the design. The climatic conditions at the end of the design life of the Proposed Development will be considered. Any alterations to the design of the Proposed Development to take account of future climate conditions will be outlined in the Design and Access Statement.
- 5.10.24. A carbon balance calculation will be completed using the Scottish Government Carbon Calculator Tool¹⁷⁶, in accordance with advice given by PEDW within Scoping Directions for other Welsh wind farms. This will be reported in a Carbon Balance appendix within the ES. The calculation will include a full lifecycle assessment to determine the carbon benefit of the Proposed Development compared to a reference energy mix within the context of carbon budgets for Wales and the UK. This will include consideration of greenhouse gas (GHG) emissions in the production, transportation, erection, operation and decommissioning phases of the Proposed Development, together with the loss of peat should such areas not be avoided. Given the inherent carbon benefit of wind farms, a standalone GHG ES chapter is not proposed.

SUSTAINABLE RESOURCE USE

- 5.10.25. Although wind turbine developments can encompass large areas of land, the actual built developments cover a relatively small area and, in most circumstances, farming and other land based activities can continue in and around the turbines. As a result of, the Proposed Development would only result in a small land take, which is unlikely to result in significant environmental effects in terms of land use.
- 5.10.26. In terms of soil, the design of tracks, turbine foundations, hardstanding etc. would minimise the amount of soil disturbance. Where soils and peat would be excavated, they would be stored on the development site in accordance with the CEMP, which would be produced prior to construction and then used in the restoration of the development site post construction to minimise the loss of soil resource. An Outline CEMP will be provided as part of the suite of planning application documents.
- 5.10.27. With regards to water, the key environmental effects on this natural resource would be its use during the construction, operational and decommissioning phases, the potential increase in flood risk and the disturbance of surface and groundwater as a result of construction activities. With regards to construction works, the water resource would be managed in accordance with the CEMP.
- 5.10.28. The potential effects of the Proposed Development on biodiversity would be addressed within the Biodiversity and Ornithology assessments within the ES within which appropriate mitigation will be set out in order to minimise the potential damage to habitats and species during the construction,

176 Scottish Environment Protection Agency (2020). Carbon Calculator Tool v1.6.1 [online]. Available at: <https://informatics.sepa.org.uk/CarbonCalculator/index.jsp>

operation and decommissioning. Mitigation measures will also be detailed in an Outline Habitat Management Plan which will be submitted as part of the application and also within the CEMP.

5.10.29. As a result, it is not proposed that sustainable resource use is considered as a discrete assessment in the ES for the Proposed Development.

MAJOR ACCIDENTS AND DISASTERS

5.10.30. Paragraph (8) of Schedule 4 of the EIA Regulations states that an ES should describe “*the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned*”.

5.10.31. The scope for the EIA to consider major accidents and disasters has been initially considered in **Table 5-53**. Major accidents or disasters have been scoped in where they represent a risk to the Proposed Development, either from the proposed location or from the project itself. A high risk is considered to be where there is reasonable likelihood of the accident or disaster occurring, or where the effect of the accident or disaster would lead to the requirement for mitigation which is beyond the usual scope of construction or operational activities. Where an accident or disaster has been scoped in, the ES chapter(s) identified will consider the matter in more detail. This further detail may show that no further assessment is needed, or it may lead onto an appropriate level of assessment and/or identification of appropriate mitigation.

Table 5-53 – Major Accidents and Disasters

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Biological hazards: epidemics	Very low	Very low	Out	The probability of epidemics which would affect the construction or operation of the Proposed Development is considered to be very low.	N/A
Biological hazards: animal and insect infestation	Very low	Very low	Out	The probability of animal and insect infestations which would affect the construction or operation of the Proposed Development is considered to be very low.	N/A
Earthquakes	No	No	Out	Any earthquakes in the vicinity of the Proposed Development would be of a very small magnitude and the design of turbine foundations etc. is adequate to withstand such low magnitude events.	N/A

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Tsunamis / tidal waves / storm surges	No	No	Out	The general location of the Proposed Development and its distance from the coast means there is no risk of these phenomena affecting the Proposed Development.	N/A
Volcanic eruptions	No	No	Out	There are no active volcanos in the vicinity of the Proposed Development.	N/A
Famine / food insecurity	Negligible	Very Low	Out	The probability of famine / food insecurity which would affect the construction or operation of the Proposed Development is considered to be negligible.	N/A
Displaced populations	Negligible	Very Low	Out	The probability of displaced populations affecting the construction or operation of the Proposed Development is considered to be negligible.	N/A
Landslide / subsidence	Low	Low	In	The site of the Proposed Development is located in an area of previous coal mining. An assessment of potential impacts upon the Proposed Development from this previous mining activity, for example from subsidence movements will be undertaken.	Ground Conditions chapter
Severe weather: storms	Medium	No	Out	Turbines are equipped with lightning conductors and automatically shut down when wind speeds are at a level which could damage internal components.	N/A
Severe weather: droughts	Very Low	No	Out	The probability of severe drought occurring in the vicinity of the Proposed Development is considered to be very low. Furthermore, turbines would be unaffected by drought conditions.	N/A

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Severe weather: extreme temperatures	Low	Very Low	In – severe cold weather could lead to ice build-up on blades	Ice build-up could lead to ice throw, or to blade damage and throw.	The Proposed Development chapter.
Floods	Low	Very Low	In – a high level flood risk assessment will be undertaken as part of the EIA	Damage to turbines or infrastructure from flooding or increase in flood risk elsewhere from development in flood zones.	Wind farm site selection and design and Water Environment chapters.
Terrorist incidents	No	No	Out	N/A	N/A
Cyber attacks	No	No	Out	N/A	N/A
Disruptive industrial action	No	No	Out	N/A	N/A
Public disorder	No	No	Out	N/A	N/A
Wildfires	No	No	Out	N/A	N/A
Severe space weather	No	No	Out	N/A	N/A
Poor air quality events	No	No	Out	N/A	N/A
Transport accidents	No	Yes	In - abnormal loads and increase from traffic construction.	Abnormal loads or an increase in traffic could lead to an increased risk of accidents. Road network may be unsuitable for such traffic, further increasing accident risk.	Wind farm site selection and design and Traffic and Transport chapters.
Industrial accidents	No	Yes	In – from construction and maintenance activities.	Manual labour, working at height and use of specialist plant all bring risk of industrial accidents. Relevant UK health and safety legislation will be adhered to; site construction management practices will include, but are not limited to, temporary diversions of	Construction activities are covered by separate H&S legislation and guidelines. Wind farm site selection and design, Water Environment

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
				public rights of way, relevant signage and fencing of potentially hazardous construction areas where appropriate.	and Biodiversity chapters.
Urban fires	No	No	Out	The Proposed Development is not in close proximity to any urban areas.	N/A

6 SUMMARY OF THE PROPOSED SCOPE OF THE EIA

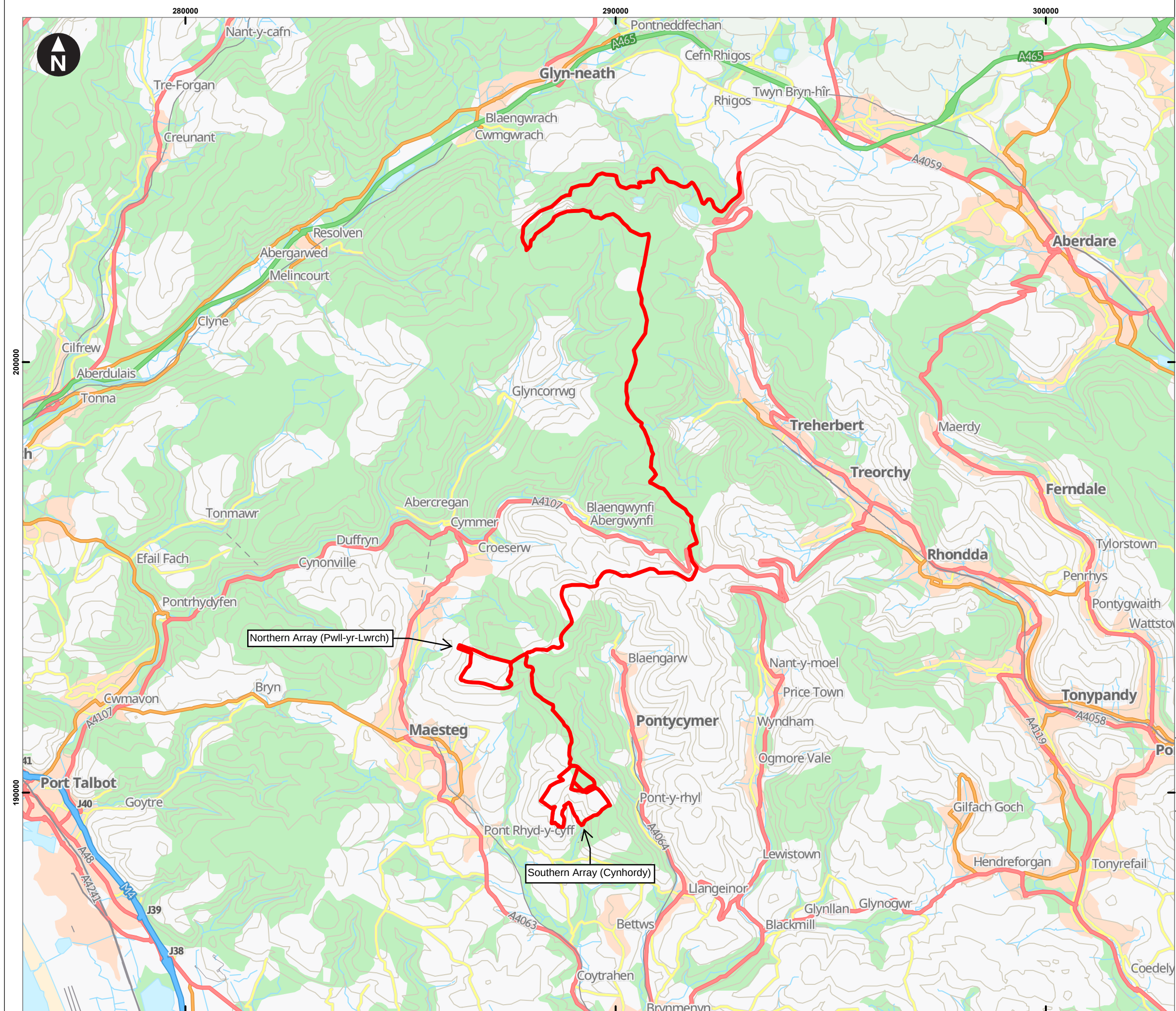
6.1 SUMMARY

- 6.1.1. As set out in **Chapter 5**, the EIA for the Glanllynfi Garth Wind Farm will include detailed assessments on the following topics:
- Landscape and Visual;
 - Historic Environment;
 - Biodiversity;
 - Ornithology;
 - Water Environment;
 - Ground Conditions;
 - Traffic and Transport;
 - Noise;
 - Shadow Flicker;
 - Socio-economics; and
 - Aviation and Telecommunications.
- 6.1.2. Additionally, the following topics will be considered as per approach in **Section 5.10**:
- Population and human health effects of the Proposed Development to be incorporated within relevant technical chapters;
 - The projected climate change on the Proposed Development will be considered in relevant aspect chapters. A carbon balance assessment will be appended to the ES;
 - Sustainable resource use will be considered in individual topic chapters and will not be considered as a discrete assessment in the ES; and
 - Major Accidents and disasters will be scoped in for consideration in individual topic chapters (as per **Table 5-53**).
- 6.1.3. The ES will consider the significant issues in more detail and will report on further investigations in relation to the above.
- 6.1.4. WSP and Pennant Walters Ltd. welcome comments on the proposed scope of the EIA and for any suggestions on potential mitigation and enhancement that can be incorporated into the Proposed Development through the EIA process.

APPENDIX A

FIGURES

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Key

Site boundary

0 1,000 2,000 3,000 4,000 5,000 m

Scale at A3: 1:85,000

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Client

**PENNANT
WALTERS**

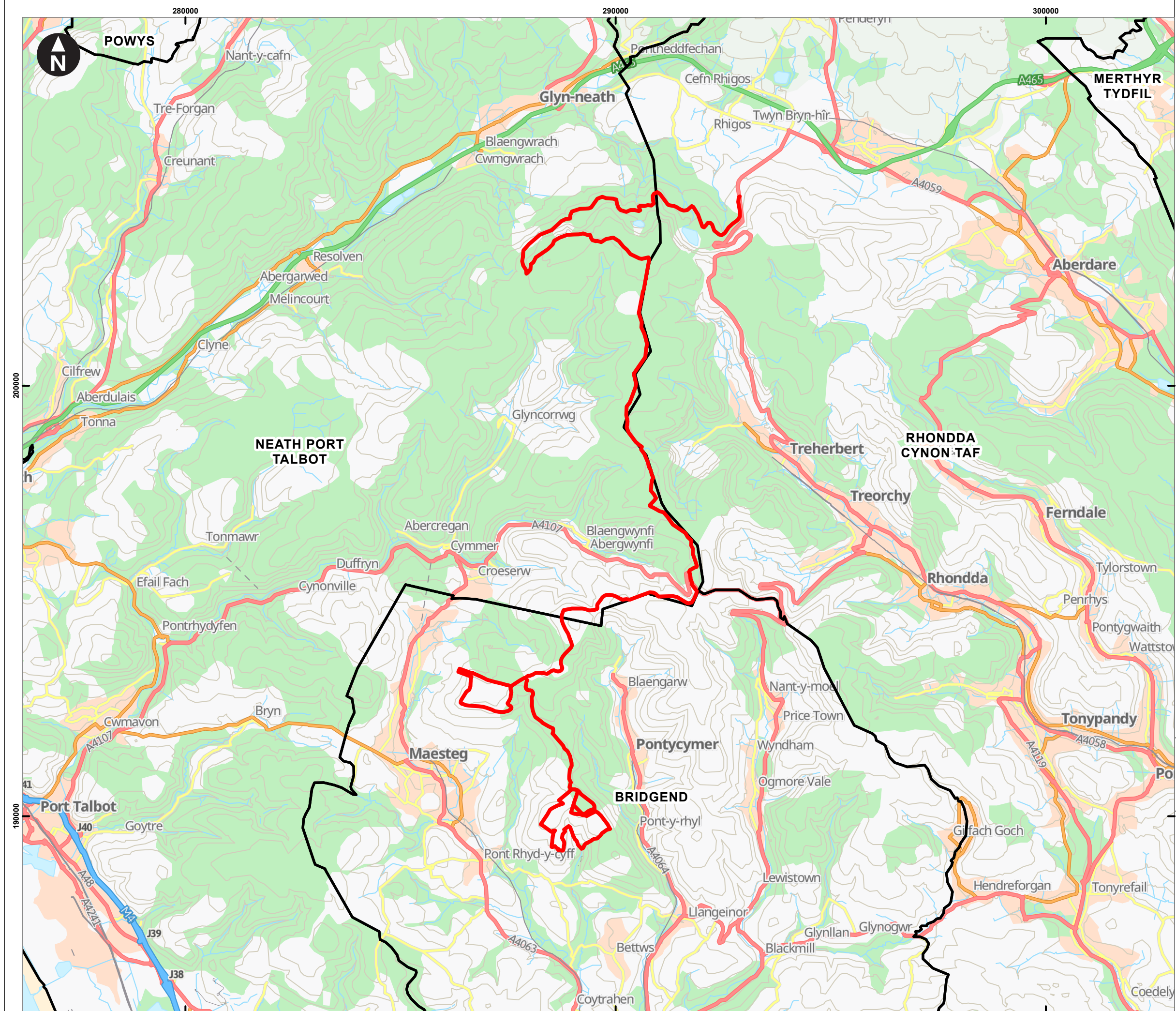
Gllanllyni Garth Wind Farm
Scoping Report

**Figure 1.1
Site location plan**

February 2026

wsp

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Key

- Site boundary
- Local Authority boundary

0 3 km

Scale at A3: 1:85,000

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Client

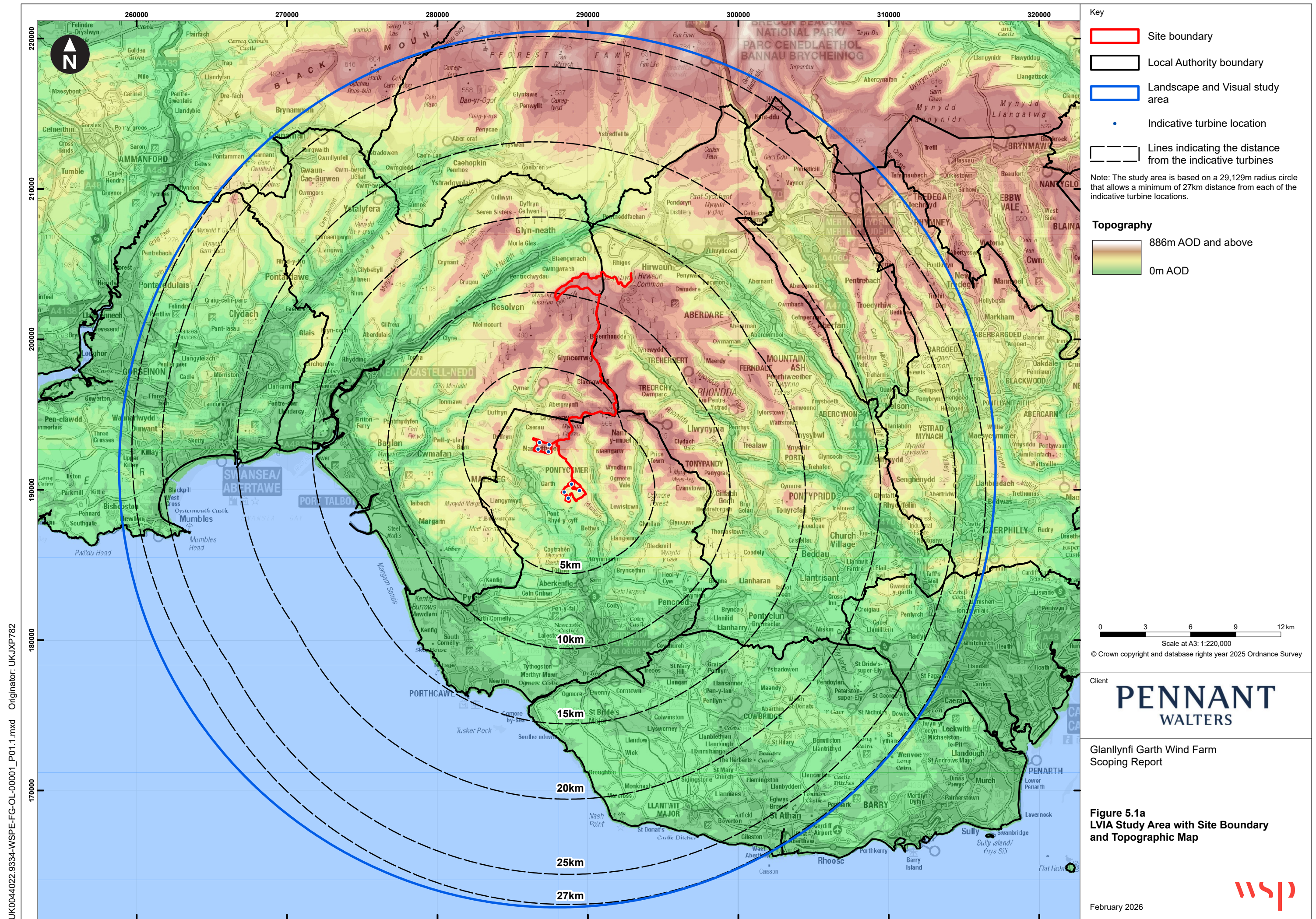
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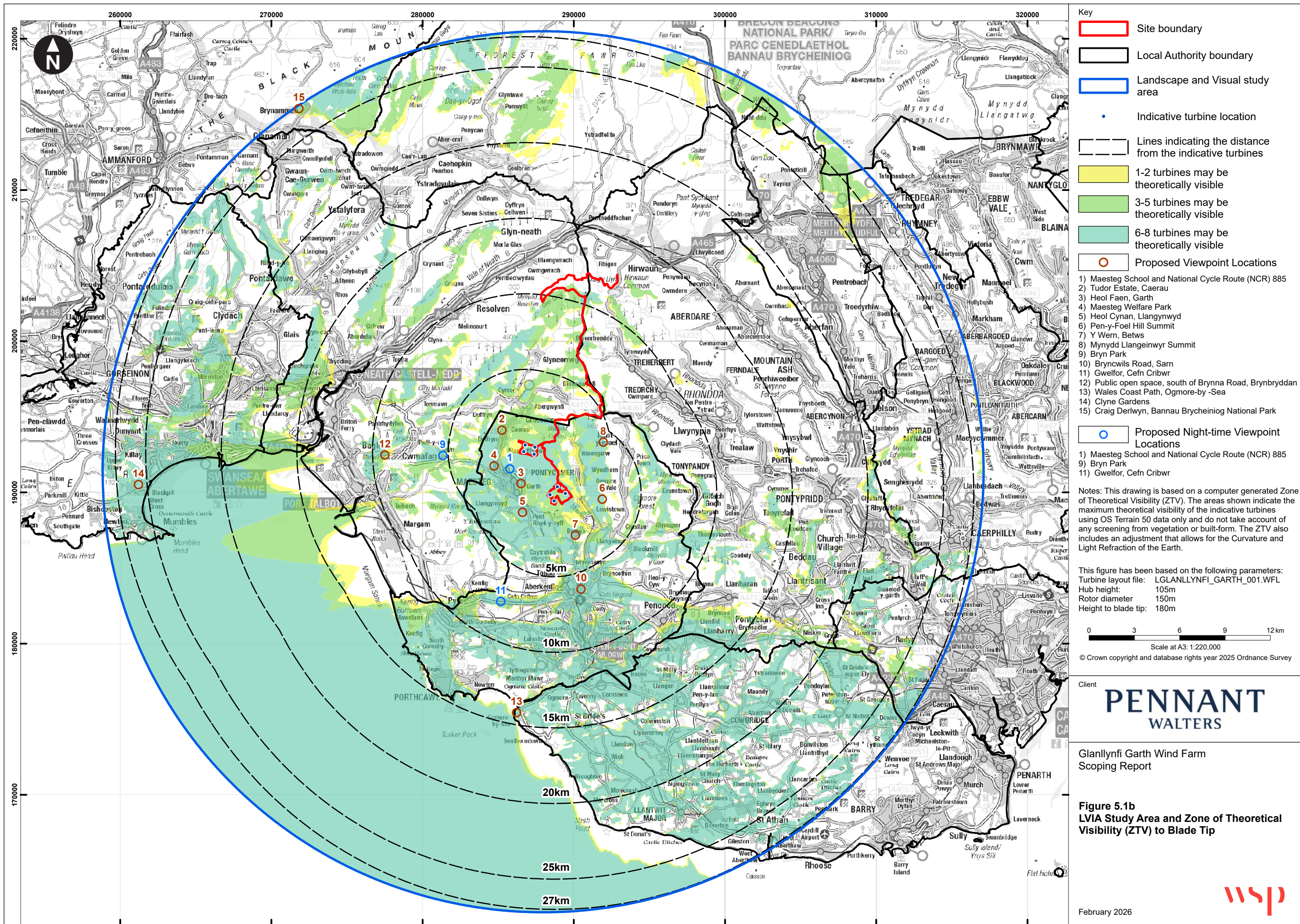
Glanllynfi Garth Wind Farm
Scoping Report

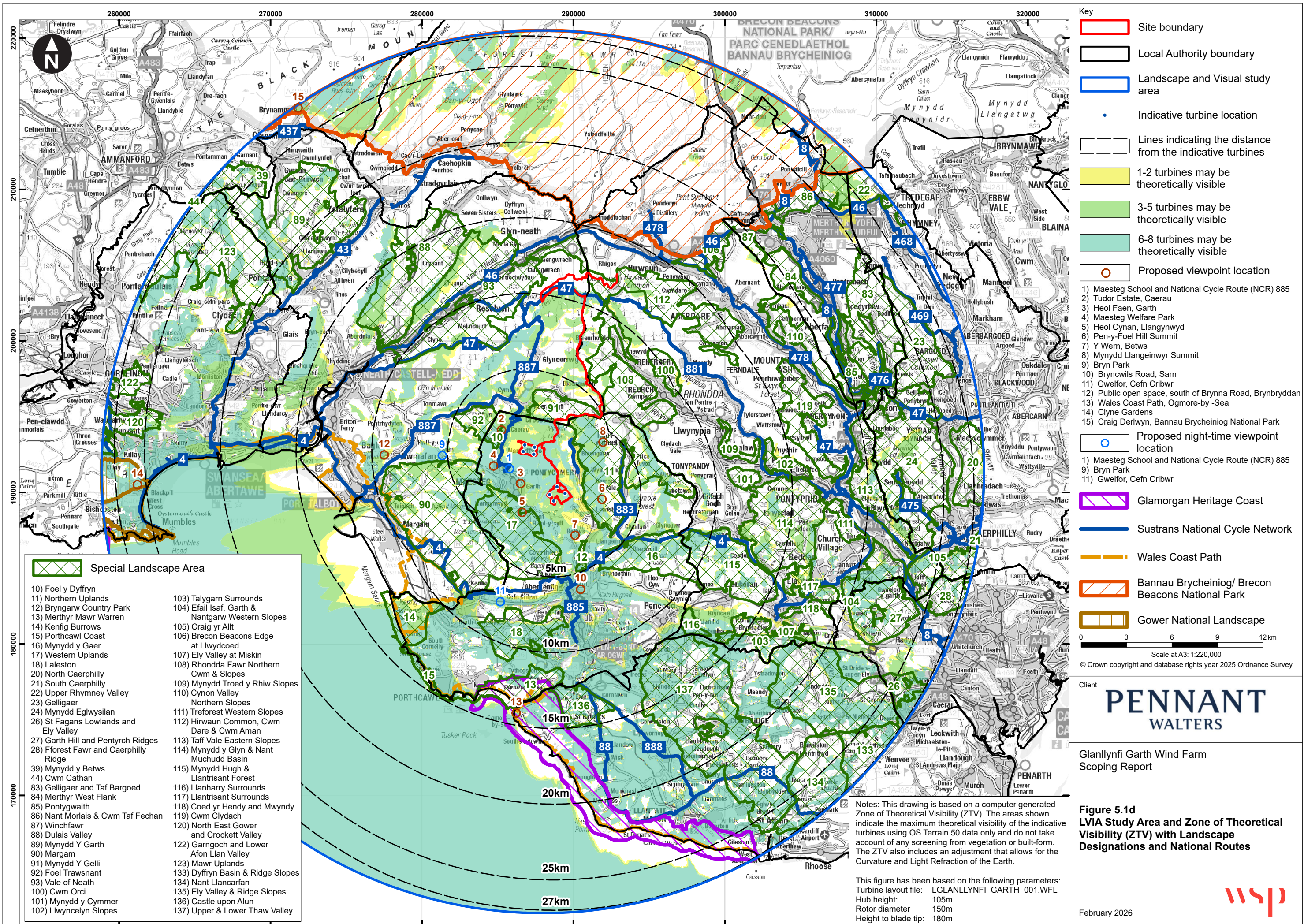
**Figure 1.2
Local Authority Areas**

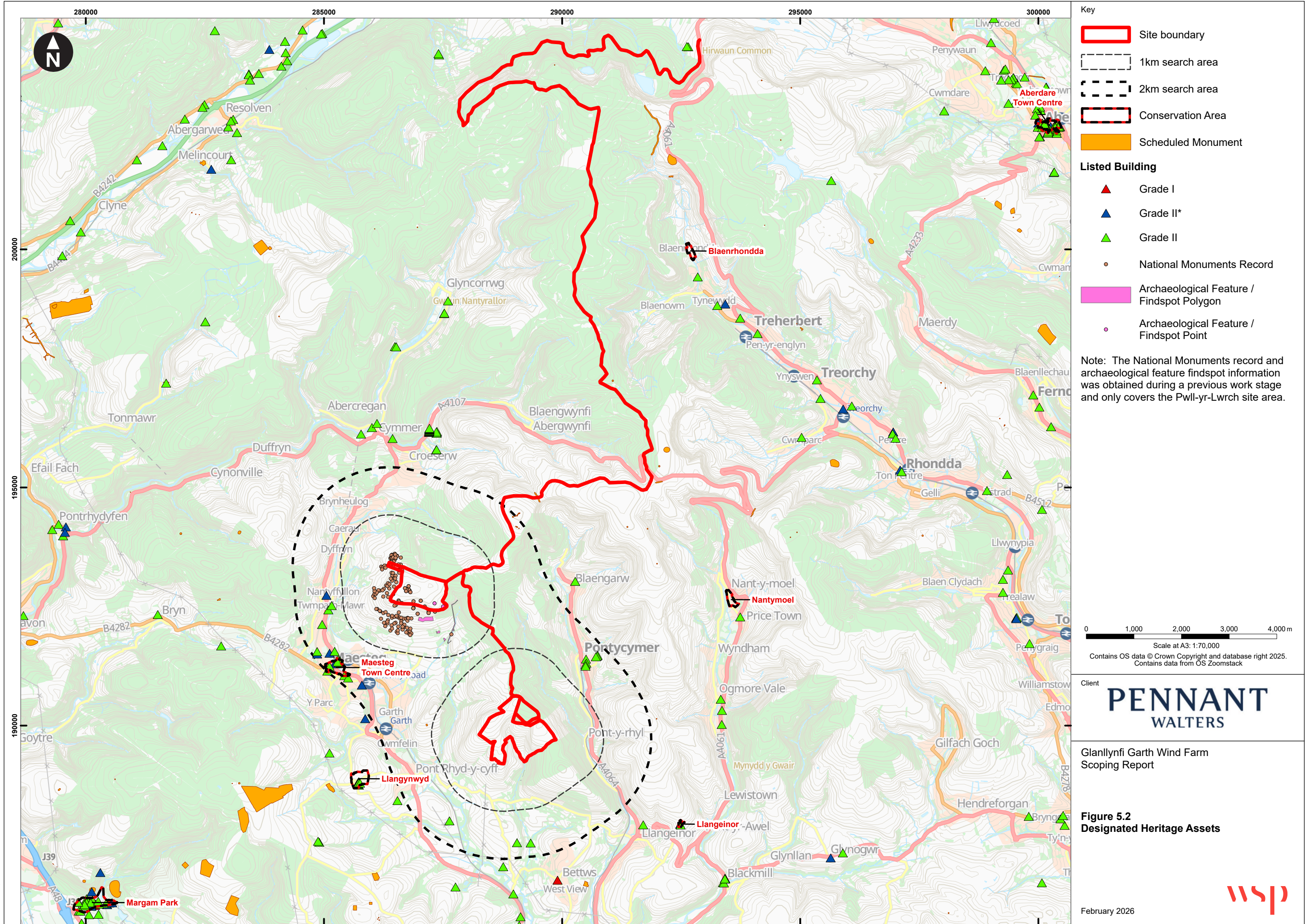
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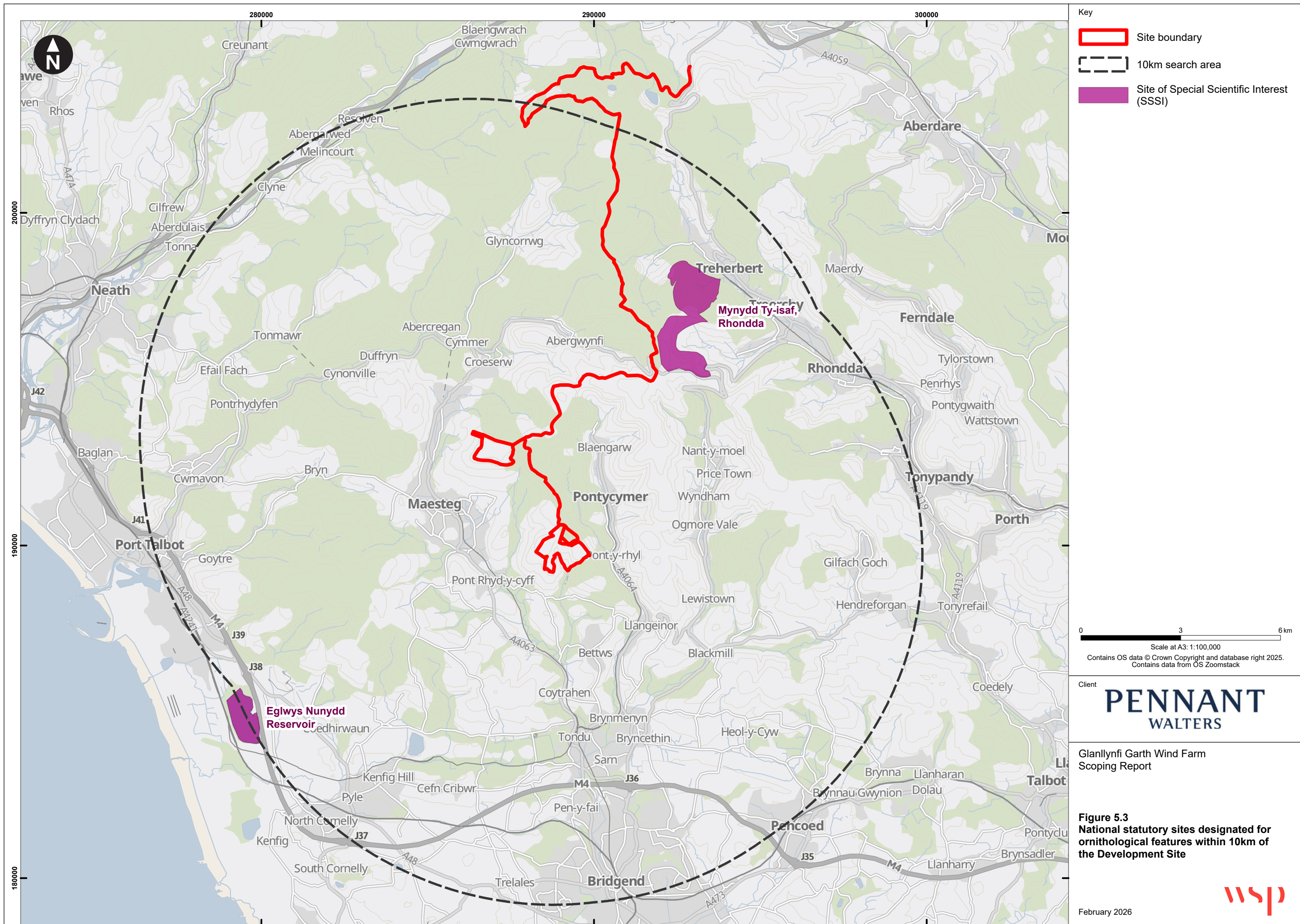


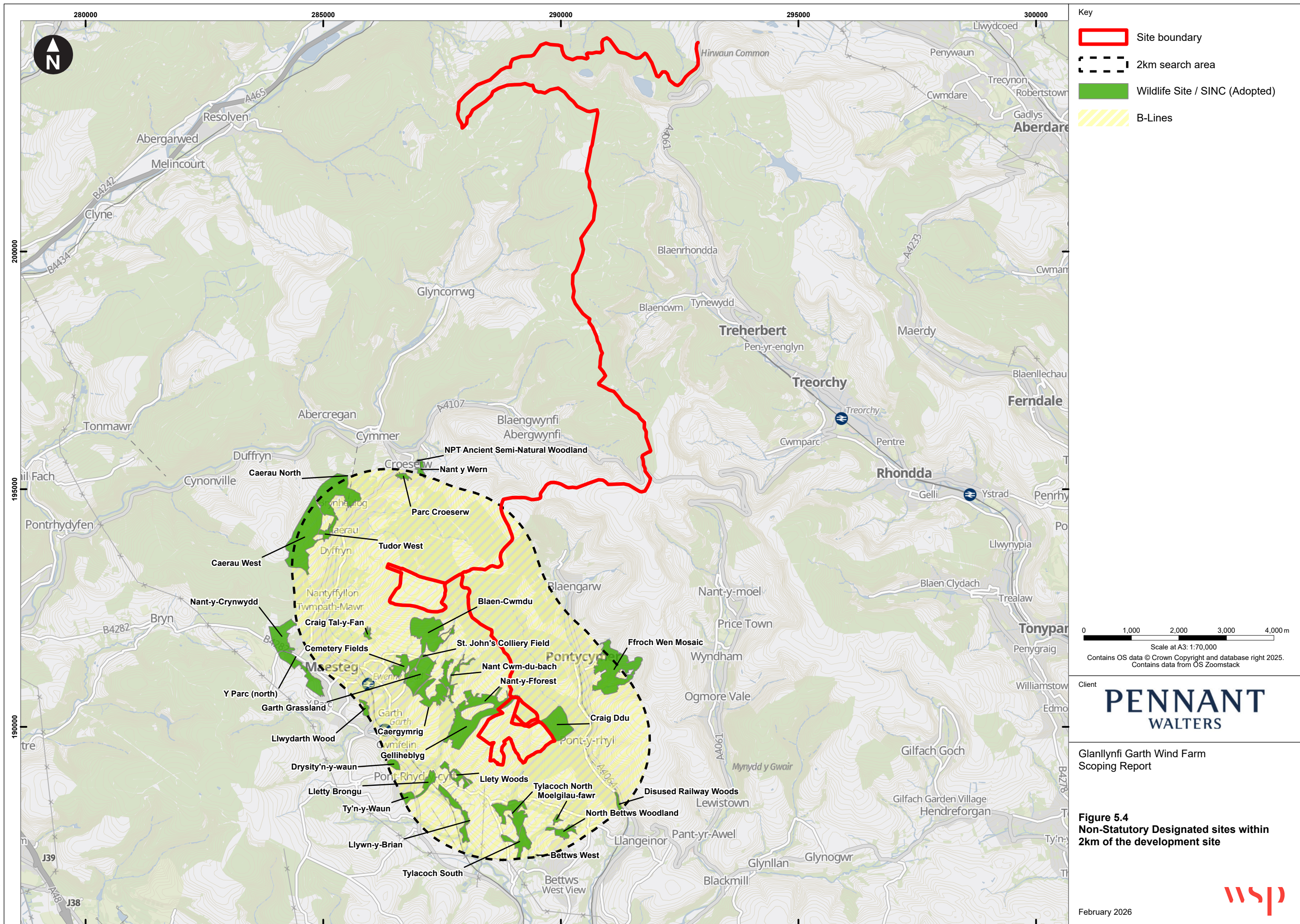




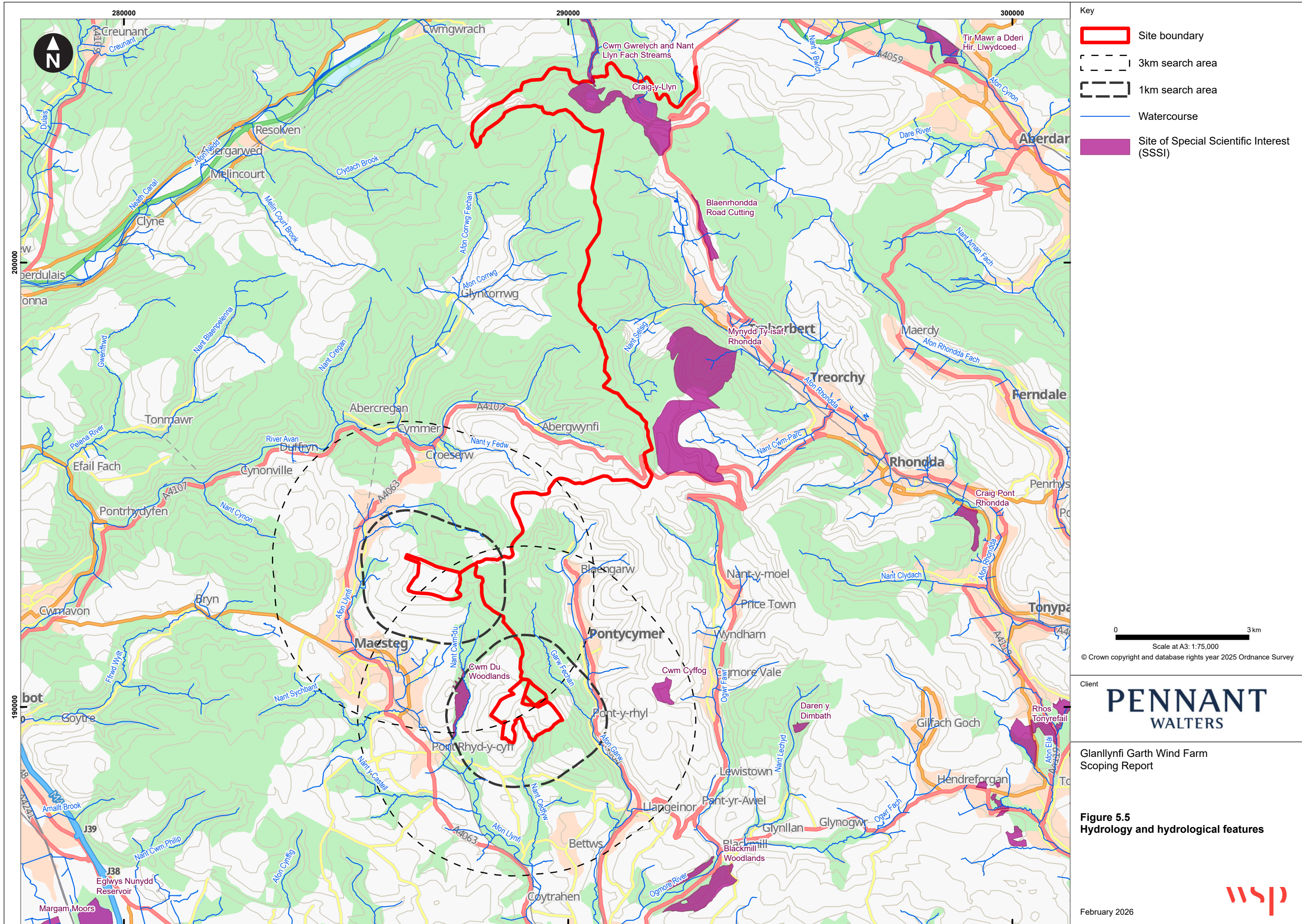


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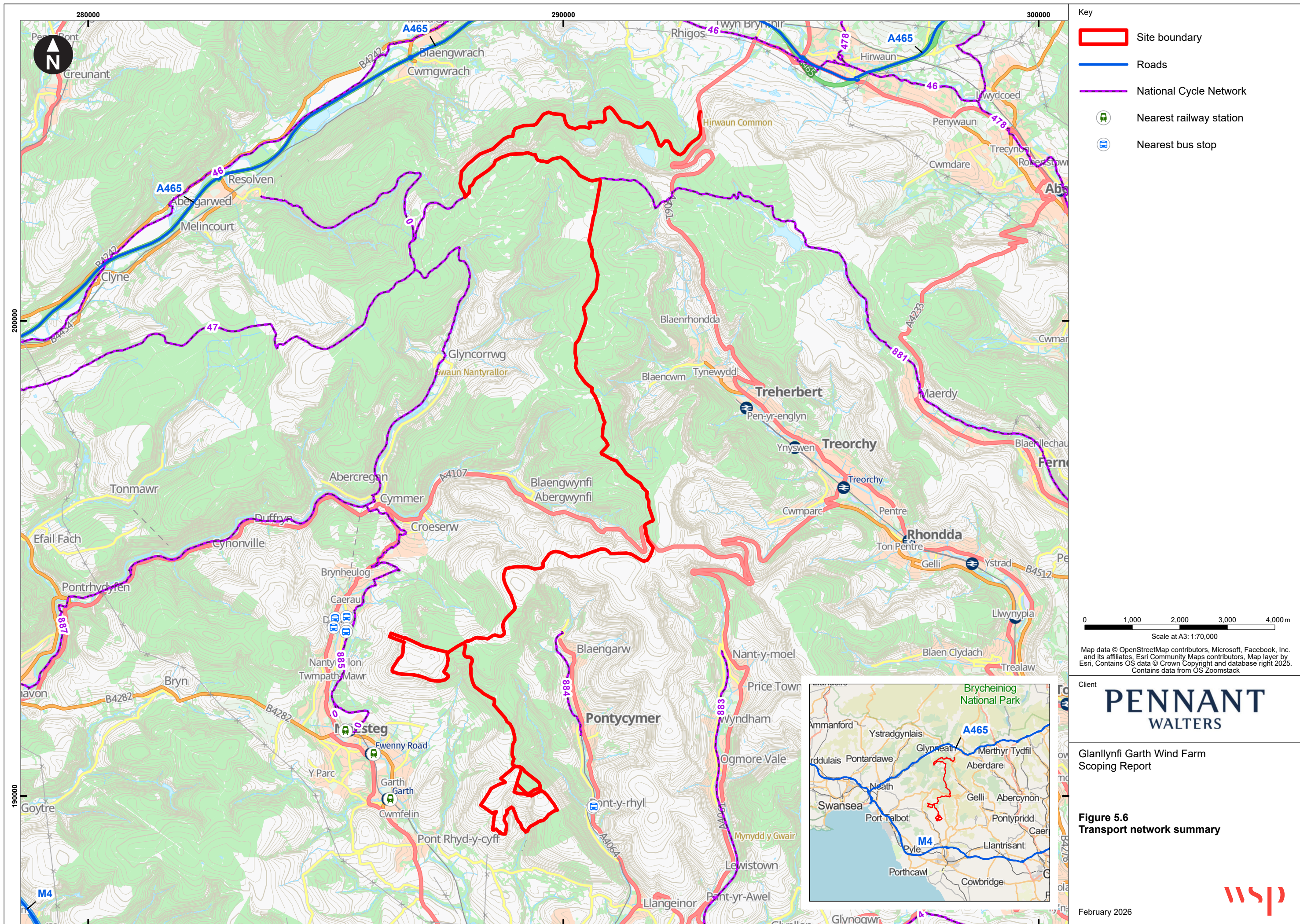


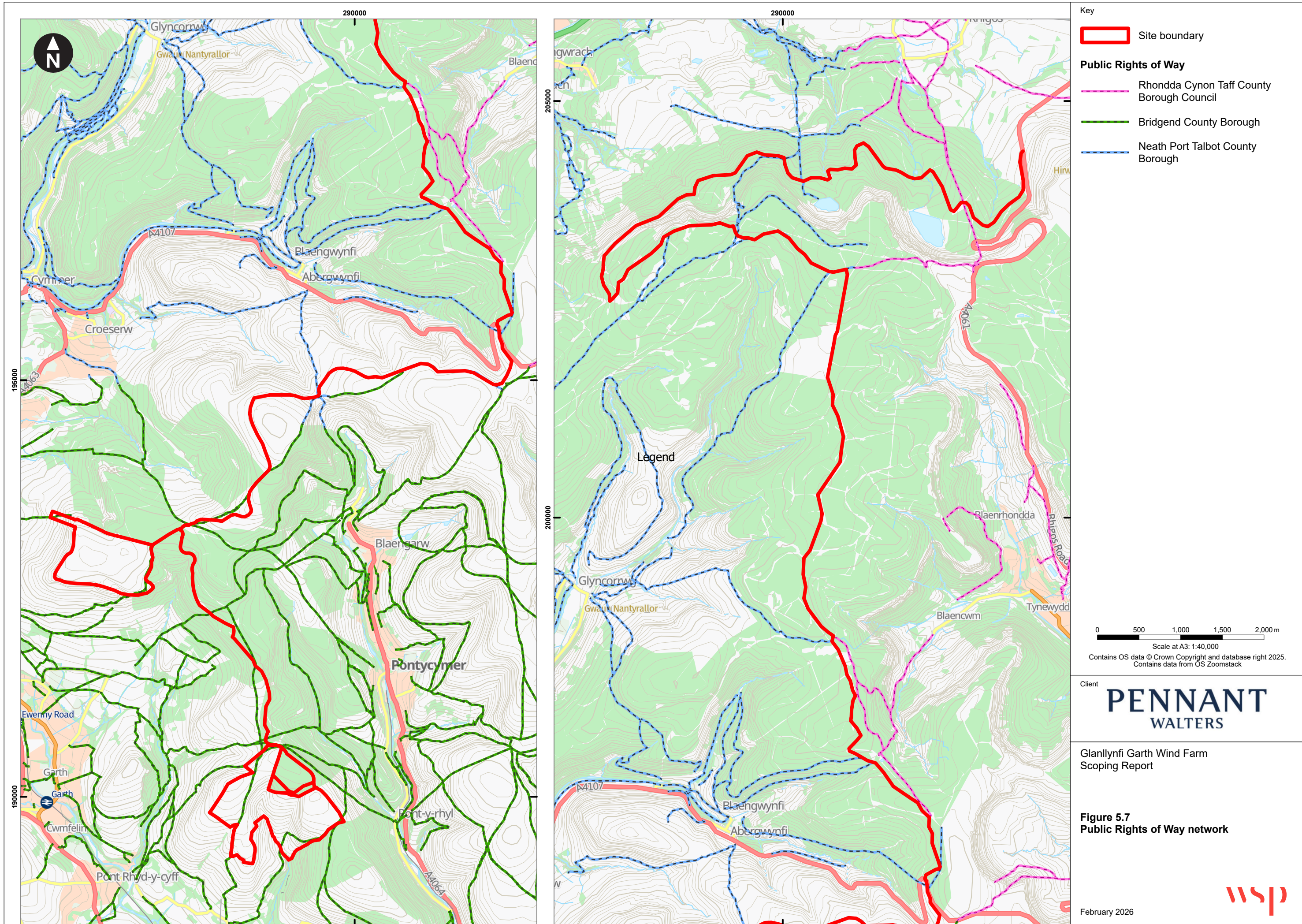


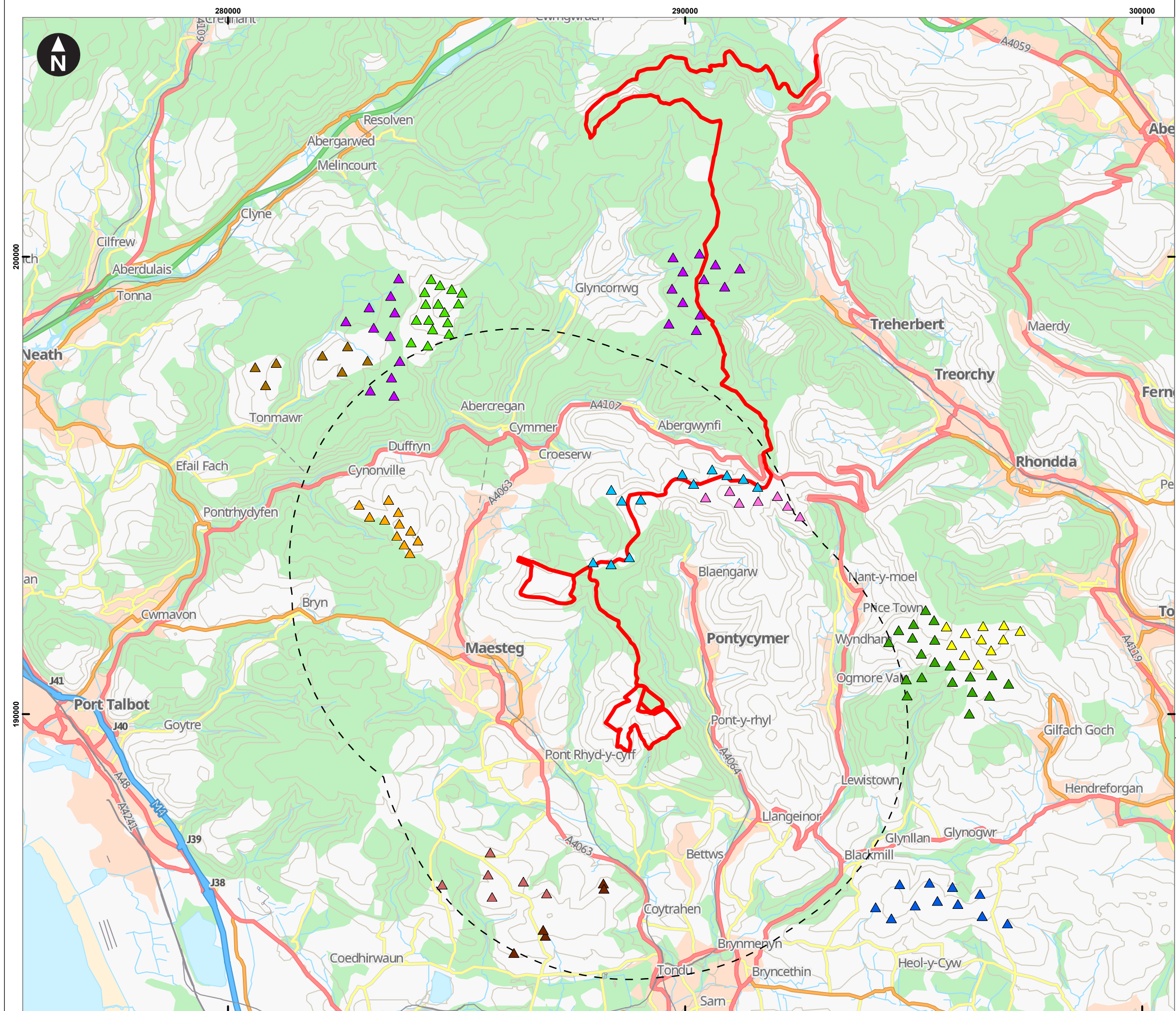
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- Key
- Site boundary
 - 5km search area
 - Pant-y-Wal (operational)
 - Ffynon Oer (operational)
 - Small scale turbines (operational)
 - Llynfi Afan (operational)
 - Pen y Cymoedd (operational)
 - Fforch Nest (operational)
 - Foel Trawsnant (proposed)
 - Mynydd Fforch Dwm (proposed)
 - Mynydd Ty-talwyn (proposed)
 - Mynydd y Gaer (proposed)
 - Upper Ogmre (proposed)

0 1,000 2,000 3,000 4,000m
Scale at A3: 1:80,000
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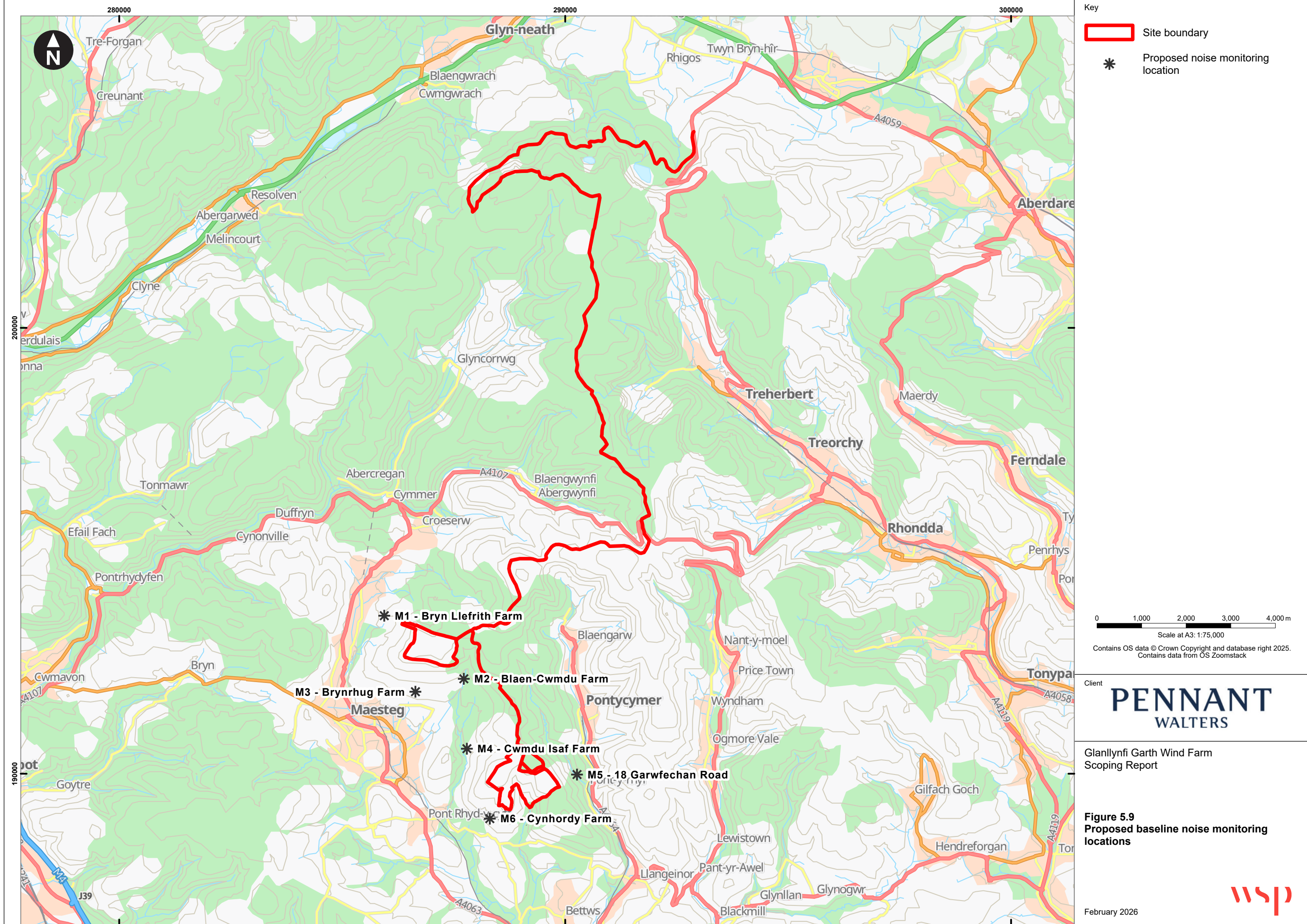
Client
**PENNANT
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Gllanllyfni Garth Wind Farm
Scoping Report

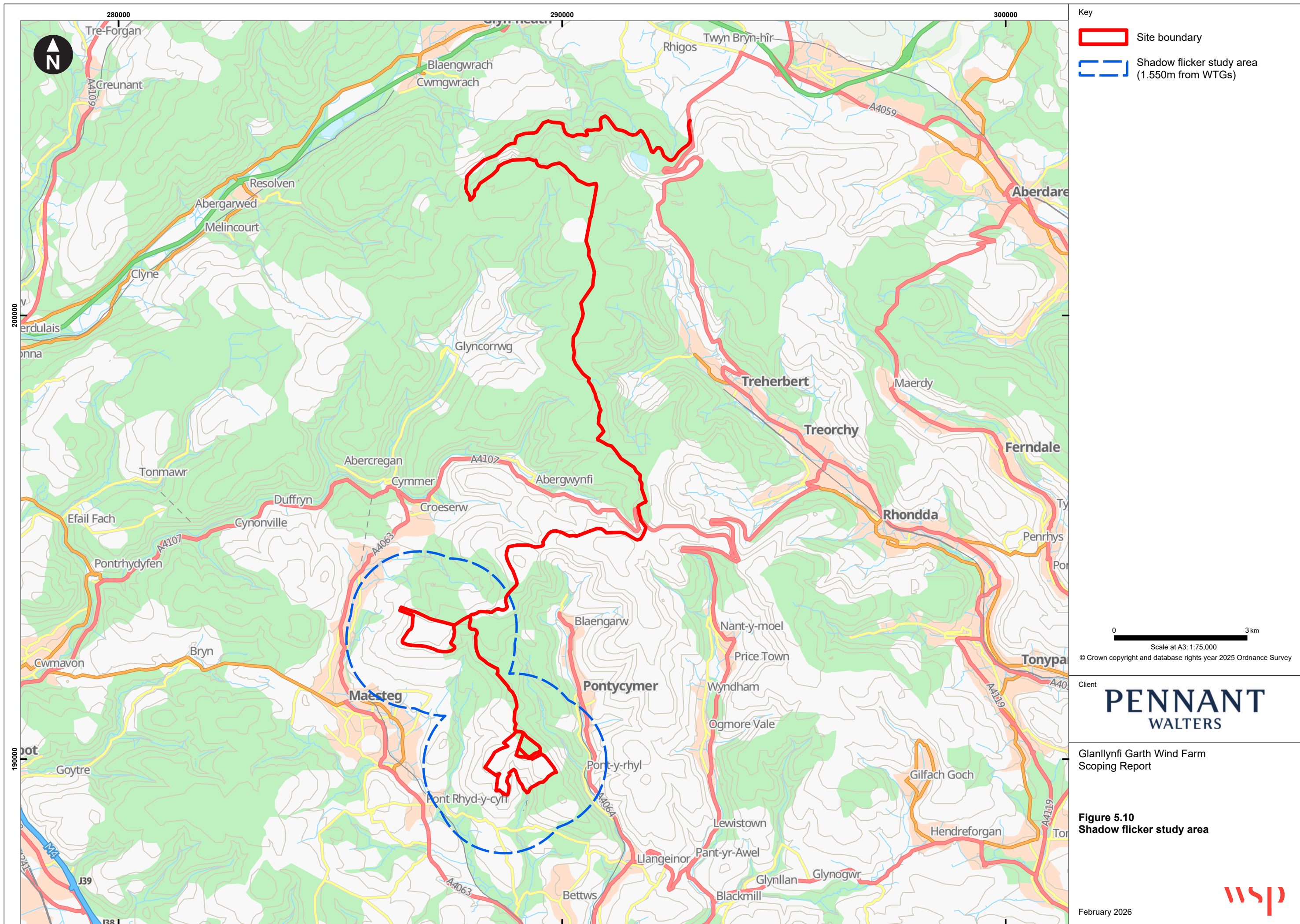
**Figure 5.8
Cumulative wind farms**



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Appendix B

LVIA Methodology and Glossary

1.1 Introduction

- 1.1.1 The Landscape and Visual Impact Assessment (LVIA) and cumulative landscape and visual impact assessment (CLVIA) identifies, predicts, and evaluates the likely significant landscape and visual effects that may result from the Proposed Development.
- 1.1.2 Essentially, the landscape and visual effect (and whether it is significant) is assessed by considering the landscape or visual sensitivity to the Proposed Development, with reference to the susceptibility and value of the receptor, against the magnitude of change in order to identify a level of effect that would be brought about by the Proposed Development, were it to be implemented. The level of effect is also described in terms of its scale, geographical extent, and duration, and subsequently whether the effect would be significant.
- 1.1.3 The type of effect is also considered and may be direct or indirect; temporary or permanent (reversible); cumulative; and beneficial, neutral, or adverse. The assessment has also considered the cumulative effects resulting from the Proposed Development in combination with other existing and consented wind farms, and wind farms at the planning application or scoping stage.
- 1.1.4 The time period for the assessment covers phases of development related to the construction of the Proposed Development and associated infrastructure and its operational period.
- 1.1.5 Landscape and visual assessment unavoidably involve a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.
- 1.1.6 **Appendix 6A** has been structured as follows:
- Overview of the LVIA Methodology;
 - Landscape Assessment;
 - Visual Assessment;
 - Cumulative Landscape and Visual Assessment (CLVIA);
 - Evaluating Landscape and Visual Effects;
 - Residential Visual Amenity Assessment;
 - Night-time Assessment
 - Production of ZTVs and Visualisations; and
 - Glossary of terms and abbreviations.

1.2 Overview of the LVIA Methodology

- 1.2.1 The methodology for the LVIA and CLVIA accords with best practice guidance including, but not limited to, the following:
- *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition*¹ (hereafter referred to as *GLVIA3*);

¹ Landscape Institute and the Institute of Environmental Management and Assessment, (2013). Guidelines for Landscape and Visual Impact Assessment. 3rd edition. London. Routledge

- *Technical Guidance Note LITGN-2024-01 - Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3)*².
- *Using LANDMAP in Landscape and Visual Impact Assessments GN46*³ (hereafter referred to as GN46);
- *Visual Representation of Windfarms, Version 2.2*⁴;
- *Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments*⁵;
- *Technical Guidance Note 06/19: Visual Representation of Development Proposals*⁶;
- *Technical Guidance Note 02/19: Residential Visual Amenity Assessment*⁷;
- *Technical Information Note 04/2020 – Infrastructure*⁸.
- *Technical Guidance Note 02/21 - Assessing landscape value outside national designations*⁹
- *Special Landscape Qualities - Guidance on assessing effects*¹⁰
- *Guidance on Aviation Lighting Impact Assessment*¹¹
- *Nationally Significant Infrastructure: Advice on Cumulative Effects Assessment*¹²

1.2.2 The landscape and visual effects of wind turbines can be directly experienced through the observation of existing wind farms within this area. Noticeably, wind farm development can co-exist with other features of the landscape, rather than replacing or removing them, as in the case of more conventional built development, although they can alter the landscape character of an area. Wind farm development is also visually permeable and although views may be interrupted, they are not blocked or prevented. Generally, wind farms have a 'small' development footprint that preserves much of the physical elements of the landscape, but entails the addition of tall structures, which are unavoidably visible over longer distances, leading to greater visual effects. A further, important difference is

² Landscape Institute (2024) *Technical Guidance Note LITGN-2024-01 Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3)*. (Online). Available at: https://www.landscapeinstitute.org/wp-content/uploads/2024/08/LITGN-2024-01-GLVIA3-NC_Aug-2024.pdf

³ Natural Resources Wales (2024). *Using LANDMAP in Landscape and Visual Impact Assessments GN46*. (Online). Available at: <https://naturalresourceswales.gov.uk/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/using-landmap-in-landscape-and-visual-impact-assessments-gn46/?lang=en> (Accessed September 2023).

⁴ Scottish Natural Heritage (now NatureScot). (2017). *Visual representation of wind farms: Guidance. Version 2.2*. (Online). Available at: <https://www.nature.scot/visual-representation-wind-farms-guidance> (Accessed September 2023).

⁵ NatureScot (2021). *Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments*. (Online). Available at: <https://www.nature.scot/doc/guidance-assessing-cumulative-impact-onshore-wind-energy-developments#Introduction+and+scope+of+this+guidance>

⁶ Landscape Institute. (2019). *Technical Guidance Note 06/19 Visual Representation of Development Proposals*. (online). Available at: <https://www.landscapeinstitute.org/visualisation/>

⁷ Landscape Institute (2019). *Technical Guidance Note 02/19: Residential Visual Amenity Assessment*. (Online). Available at: <https://www.landscapeinstitute.org/technical-resource/rvaa/>

⁸ Landscape Institute (2020) *Technical Information Note 04/2020 – Infrastructure*. (Online). Available at: <https://www.landscapeinstitute.org/news/infrastructure-guidance-updated/>

⁹ Landscape Institute (2021) *Technical Guidance Note 02/21 - Assessing landscape value outside national designations*. (Online). Available at: <https://www.landscapeinstitute.org/publication/tgn-02-21-assessing-landscape-value-outside-national-designations/>

¹⁰ NatureScot (2025) *Special Landscape Qualities - Guidance on assessing effects*. (Online). Available at: <https://www.nature.scot/doc/special-landscape-qualities-guidance-assessing-effects>

¹¹ NatureScot (2024) *Guidance on Aviation Lighting Impact Assessment*. (Online). Available at: <https://www.nature.scot/doc/guidance-aviation-lighting-impact-assessment>

¹² Planning Inspectorate (2025) *Nationally Significant Infrastructure: Advice on Cumulative Effects Assessment* (Online). Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment#stage-1-establishing-the-long-list-of-other-existing-and-or-approved-development>

the reversibility of almost all of the landscape and visual effects as a result of the decommissioning stage.

- 1.2.3 Wind farms give rise to a wide range of opinions, from strongly negative to strongly positive. However, LVIA is not an assessment of public opinion, although a precautionary approach has been taken, which assumes that the nature of the effects would be adverse unless otherwise stated.

Defining the LVIA Study Area

- 1.2.4 Current NRW guidance set out in GN46³ advises that the LVIA Study Area for structures of a height of between 176m to 225m should extend to 26km to 28km distance from each of the proposed turbine locations. For this LVIA, which assesses a maximum turbine height of 180m, a 27km Study Area has been defined.

Integrated Design and Assessment

- 1.2.5 Design is an integrated and iterative part of the LVIA process. In particular, the advice from the relevant local planning authority and the following documents, is relevant to the design in terms of the turbine scale, location / layout and where required aviation warning lights:
- Designing for Renewable Energy in Wales¹³ ; and
 - Siting and Designing Wind Farms in the Landscape Guidance (Version 3a)¹⁴.

1.3 Landscape Assessment

- 1.3.1 Landscape effects are defined by the Landscape Institute in GLVIA3¹, paragraphs 5.1 and 5.2 as follows:

"An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the development may influence in a significant manner."

- 1.3.2 The potential landscape effects, occurring during the construction, operation and decommissioning period may therefore include, but are not restricted to the following:
- Changes to landscape elements: the addition of new elements (wind turbines, met mast(s) and ground level infrastructure elements) or the potential removal of existing elements such as trees, vegetation and buildings and other characteristic elements of the host LANDMAP aspect areas;
 - Changes to landscape qualities: degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of host LANDMAP aspect areas or contribute to the landscape value of adjacent local landscape designations;

¹³ Design Commission for Wales (2023) *Designing for Renewable Energy in Wales*. (Online). Available at: <https://www.gov.wales/sites/default/files/publications/2023-12/designing-for-renewable-energy-in-wales.pdf>

¹⁴ Scottish Natural Heritage (now NatureScot) (2017) *Siting and Designing Wind Farms in the Landscape Guidance (Version 3a)*. (Online). Available at: <https://www.nature.scot/doc/siting-and-designing-wind-farms-landscape-version-3a>

- Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the addition of new features, the magnitude of which is sufficient to alter the overall landscape character within LANDMAP aspect areas;
- Changes to designated landscapes: including nationally and locally designated landscapes that would affect the special landscape qualities underpinning these areas and their integrity; and
- Cumulative landscape effects: where more than one wind farm may lead to a potential landscape effect.

1.3.3 Development may have a direct (physical) effect on the landscape as well as an indirect effect which would be perceived from the wider landscape, or other areas of landscape, outside the host LANDMAP aspect areas. This is usually, but not always exclusively, via a visual effect pathway.

Evaluating Landscape Sensitivity to Change

1.3.4 The sensitivity of the landscape to a particular development considers the susceptibility of the landscape and its value. The overall sensitivity is described as High, Medium, Low or Very Low. Landscape sensitivity often varies in response to both the type of development proposed and the particular site location, such that landscape sensitivity needs to be considered on a case-by-case basis. This should not be confused with 'inherent sensitivity' where areas of the landscape may be referred to as inherently of 'high' or 'low' sensitivity. For example, a National Park may be described as inherently of high sensitivity on account of its designation, although it may prove to be less sensitive to particular development and/or of variable sensitivity across the geographical area of the National Park. Alternatively, an undesignated landscape may be of high sensitivity to a particular development regardless of the lack of local or national designation.

1.3.5 The main factors considered are discussed as follows:

Landscape Susceptibility

1.3.6 Landscape susceptibility according to GLVIA3¹⁵ means "*the ability of the landscape to accommodate the development without undue consequences for maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies*". In the case of wind farm development there may be local or regional spatial strategies and/or landscape studies that can assist in broad scale judgements about the overall landscape capacity or sensitivity to wind farm development¹⁵. Attention, however, must be paid to the purpose, scope and methodology of these documents, as whilst providing assistance for strategic planning, they are not usually suitable for the assessment of specific wind farm proposals and should not be directly applied to individual applications. Rather, they provide broad information that should be considered as part of the more detailed landscape assessment.

1.3.7 Judgements on landscape susceptibility include references to both the physical and aesthetic landscape characteristics, and the potential scope for mitigation. Landscape susceptibility varies according to different areas of landscape character and whilst accepting that wind farm development is likely to lead to high levels of landscape change in most circumstances, factors that commonly indicate lower landscape susceptibility to wind farm development include landscape characteristics of larger scale, uniformity of

¹⁵ A good example is *Heads of the Valleys Smaller Scale Wind Turbine Development Landscape and Sensitivity Study Final Report* (April 2015) prepared by Gillespies.

land cover, simple landform and skylines with limited landscape features. Generally speaking, lower landscape susceptibility together with lower landscape value tends to indicate lower landscape sensitivity to development. Conversely, higher landscape susceptibility and value tend to indicate higher landscape sensitivity to development.

1.3.8 Common indicators of landscape susceptibility¹⁶ to wind farm development are as follows:

- **Landscape Scale:** A large-scale landscape is generally considered to be less susceptible to wind farm development in comparison to a small-scale landscape.
- **Landform and Topography:** A simple landform with smooth, regular, rolling, undulating, or flowing landforms that might include plains, undulating or rolling lowlands, and plateaus that are generally considered to be less susceptible to wind farm development in comparison to more complex landforms which might include narrow glens, valleys, dramatic rugged and/or distinct landform features or pronounced undulations.
- **Openness and Enclosure:** Open landscapes are generally considered to be less susceptible to wind farm development, but could entail wider visibility, conversely enclosed landscapes could offer more screening potential, limiting visibility to a smaller area, but are also likely to be of smaller scale.
- **Land Cover Pattern:** Simple, regular landscapes with extensive areas of uniform ground cover (moorland / grassland, unenclosed land, forestry, large regular field patterns, parliamentary enclosures) are generally considered to be less susceptible to wind farm development in comparison to landscapes with more complex or irregular land cover (smaller fields, medieval enclosures, smaller scale 'patchwork' landscapes of mixed fields with small woodland copses).
- **Presence of Development:** Areas where there are existing large-scale developments including industry, mineral extraction, masts, pylons, other wind turbines (noting these turbines may be decommissioned in the lifetime of the Proposed Development), urban fringe / large settlement and major transport routes are generally considered to be less susceptible to wind farm development in comparison to areas characterised by smaller scale development (smaller, generally historic villages with dense settlement patterns and smaller scale associated buildings such as churches).
- **Landmarks:** Landscapes that contain large scale landmarks which may include other wind farms (noting wind turbines may be decommissioned in the lifetime of the Proposed Development), and infrastructure and large-scale developments are generally less susceptible to wind farm development although development needs to be carefully sited to manage landscape foci and avoid 'visual clutter' or cumulative impacts. Historic landmarks such as important views to distinctive church spires and towers, particular 'landmark' landforms (prominent hills or peaks) or 'land art' generally increase susceptibility.
- **Settlement:** Landscapes which are un-settled or with lower levels of population are generally considered to be less susceptible to wind farm development in comparison to more densely populated areas.
- **Skyline:** Prominent and distinctive skylines, horizons (including indented ridges / peaks, key views and or vistas) or skylines with important landmark features that are identified in LANDMAP commentaries and responses, are generally considered to be

¹⁶ Scottish Natural Heritage (2015). A Guide to Commissioning a Landscape Capacity Study (Online) Available at: <https://www.nature.scot/sites/default/files/2019-10/A%20Guide%20to%20Commissioning%20a%20Landscape%20Capacity%20Study%20Toolkit.pdf> (Accessed April 2022).

more susceptible to wind farm development in comparison to broad, simple skylines which lack landmark features or contain other turbines / tall infrastructure features.

- **Change and Movement:** Landscapes which contain movement (traffic, wind turbines, other moving infrastructure and waves / tides) or are subject to high levels of change (large scale forestry operations, mineral extraction, man-made change and development) are generally considered to be less susceptible to wind farm development in comparison to landscapes that are still or appear to be unchanging and/or notably historic with notable 'time depth'.
- **Remoteness, Naturalness, Wildness / Tranquillity:** Notably wild or tranquil landscapes are generally considered to be more susceptible to wind farm development in comparison to cultivated or farmed / developed landscapes where perceptions of 'wildness' and tranquillity are less tangible. Landscapes which are either remote or natural may vary in their susceptibility to wind farm development.
- **Landscape Context and Adjacent Landscapes:** The location and visual connection to adjacent landscapes may also have a bearing on the overall susceptibility of the landscape to wind farm development. This consideration is pertinent to the ridgeline and valley topography that characterises the parts of south Wales including the defined study area.

Landscape Value

- 1.3.9 This includes the consideration of a range of features which may include the presence or absence of landscape designation, special landscape qualities, rarity / representativeness, conservation interests, recreational value, perceptual qualities such as tranquillity and historical or cultural associations, as set out in the Landscape Institute's *Technical Guidance Note 02/21 - Assessing landscape value outside national designations*⁹. The importance attached to a landscape, often as a basis for designation or recognition, which expresses national or local consensus, because of its quality including cultural associations, scenic or aesthetic qualities. Landscape value may be indicated by the presence or absence of a landscape planning designation such as a National Park, National Landscape or Special Landscape Area (SLA) (higher value) indicating a landscape of national or local value accordingly or an undesignated landscape (lower value).
- 1.3.10 The absence of a landscape planning designation should not assume an area of 'low' landscape value and undesignated areas of landscape are often of some local value. Indications of this are likely to be present in the form of documented, locally valued, cultural / natural heritage and scenic or aesthetic qualities such as 'wildness' or the presence of viewing platforms or benches. The state of repair or condition of the elements of a particular landscape, its integrity and intactness and the extent to which its distinctive character is apparent are also relevant. The value of a landscape element may be influenced by the degree to which it may contribute to the overall landscape character type/area (i.e., its role), its rarity, and its condition. Landscapes of lower value tend to include those under intensive agriculture, forestry or urban fringe situations where the landscape elements and patterns have been eroded, landscapes with man-made development such as infrastructure or other wind farms (noting wind turbines may be decommissioned in the lifetime of the Proposed Development), and areas of derelict or vacant land, areas of mineral extraction and / or land fill.
- 1.3.11 Judgements on value and susceptibility are combined to determine overall landscape sensitivity which is informed by professional judgement and guided by the following matrix shown in **Table 1**. In terms of landscape value, statutory landscape designations are generally accorded the highest assessment value.

Table 1 Evaluation of Landscape Sensitivity

		<u>Susceptibility:</u>			
		High	Medium	Low	Very Low
<u>Value:</u>	High	High	High to Medium	Medium	Medium to Low
	Medium	High to Medium	Medium	Medium to Low	Low
	Low	Medium	Medium to Low	Low	Low to Very Low
	Very Low	Medium to Low	Low	Low to Very Low	Very Low

Evaluating the Magnitude of Landscape Change

1.3.12 The 'magnitude' or 'degree of change' resulting from a particular development is described as Very High, High, Medium, Low, Very Low or Zero. This is assessed by considering the scale, geographical extent and duration of the proposed change, which may include the loss or addition of particular features (primarily wind turbines), changes to landscape quality and changes to landscape character. As such this needs to be considered on a case-by-case basis. It may be possible for some mitigation measures to reduce the magnitude of change and consequently the residual landscape effects, and for these reasons the landscape design of the wind farm should form an iterative part of the assessment process. The main factors to be considered are discussed as follows.

- **Loss, Alteration, or Addition to Landscape Elements:** Development may result in the loss, alteration, or addition of landscape elements such as trees, hedgerows, or development components such as wind turbines anemometry masts and new access tracks. These can be quantified objectively;
- **Loss, Alteration, or Addition to Landscape Characteristics / Quality:** Development may result in the loss, alteration, or addition of physical landscape characteristics, such as wooded areas, landscape patterns, or development components such as wind turbines, which can be quantified objectively. Perceptual characteristics and effects on scenic quality or wildness also need to be considered, albeit subjectively, with reference made to objective and documented opinion; and
- **Change to Landscape Character (as represented by LANDMAP Aspect Areas):** All landscapes change over time and much of that change is managed or planned. Often landscapes will have management objectives for 'protection' or 'accommodation', meaning that they may accommodate wind farm development and 'change' whereby the landscape character could be altered to create new landscapes for the accommodation of wind farm development and / or forestry or to provide areas or development resulting in townscape or peri-urban development. The scale of change may be localised, or occurring over parts of an area, or more widespread affecting whole landscape character areas and their overall integrity.

1.3.13 In addition to the scale or magnitude of the effect, GLVIA3¹ advises that consideration should also be given to the following aspects of a landscape effect:

Geographical Extent

1.3.14 Landscape effects should be described in terms of the geographical extent or physical area that would be affected (described as a linear or area measurement e.g. spatial extent

of the hub height and/or blade tip ZTVs). This should not be confused with the scale of the proposed development or its physical footprint. Landscape effects occurring over a larger geographical extent and over a higher proportion of a landscape designation or LANDMAP aspect area are more likely to be regarded as significant.

Duration and Reversibility

- 1.3.15 Landscape effects should also be described in terms of the duration of the effect and whether this would be permanent, temporary or reversible. Duration can be considered as ranging between temporary (short to long term and time limited) or permanent. Although 'long term' some development such as housing should be regarded as permanent, whilst mineral extraction works usually entail several phases of development, followed by restoration to a 'new' landscape character. Wind farm development usually operates for a long term, time limited operational period, followed by a decommissioning period that would allow the landscape effects to be reversed.
- 1.3.16 Further guidance on the evaluation of landscape sensitivity and magnitude is provided in **Table 2**.

Table 2 Landscape Sensitivity and Magnitude

Examples of Landscape Sensitivity	
High	Landscape character, characteristics, and elements with no or limited landscape capacity or scope for landscape change and higher landscape value and susceptibility to the proposed development. Often includes landscapes which are nationally, internationally or regionally designated and have a high landscape value. In relation to landscape designations, the documented Special Landscape Qualities ¹⁷ are such that there would be no or limited landscape capacity or scope for landscape change of the type posed by the proposed development.
Medium	Landscape character, characteristics, and elements with some landscape capacity or some scope for landscape change. Often includes landscapes of medium landscape value and quality as assessed in the relevant VSAA LANDMAP responses which may be locally designated or undesignated and have a medium landscape value. In relation to landscape designations, the documented Special Landscape Qualities are such that there would be some landscape capacity or scope for change or accommodation.
Low	Landscape character, characteristics and elements which display greater landscape capacity or scope for landscape change to accommodate the proposed development as part of spatial strategy for example. Usually applies to landscapes which are undesignated with indicators of lower landscape susceptibility to development. May also apply to landscapes that may have been subject to intensive agriculture, blanket forestry or other man-made development and have a low landscape value.
Very Low	Landscape character, characteristics and elements where there is a high landscape capacity or a planned desire for landscape change of the type proposed as part of spatial strategy for example. Usually applies to landscapes with a lower landscape susceptibility to development. May also apply to derelict landscapes, or vacant land, areas of mineral extraction and / or land fill for example.

¹⁷ As set out in a National Park Management Plan or the several Special Landscape Area reviews that have been commissioned by individual or consortia of local authorities in south Wales.

Examples of Landscape Magnitude

Very High	Fundamental landscape change that would include the loss of several key landscape characteristics / special qualities or the addition of new highly uncharacteristic features or elements, that would become the dominant characteristics of the landscape, and change the overall landscape quality, and character over an expansive area.
High	A large-scale change and / or extent that may include the loss of key landscape characteristics / special qualities or the addition of uncharacteristic new features or elements, that would become prominent new characteristics of the landscape over a large area.
Medium	A medium-scale change of limited scale and extent including the loss of some key landscape characteristics / special qualities or elements, or the addition of some uncharacteristic new features or elements that would potentially change the landscape quality and character of a localised area or part of a landscape character type/area.
Low	A low-scale change affecting small areas of landscape character / special qualities, including the loss of lower value landscape elements, or the addition of new features or elements of limited characterising influence.
Very Low	A very low change affecting smaller areas of landscape character and quality, including the loss of some landscape elements or the addition of features or elements, which are either of low value or hardly noticeable in terms of their contribution to the landscape character.
Zero	There would be no change to the receptor.

Evaluating landscape effects and significance

- 1.3.17 The level of landscape effect is evaluated through the combination of landscape sensitivity and magnitude of change, a process assisted by the matrix in **Table 5**, which is used to guide the assessment. In those instances where there would be no change to the landscape, the magnitude has been recorded as 'Zero' and the level of effect as 'None'.
- 1.3.18 Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' as required by the relevant EIA Regulations. Further information is also provided about the nature of the effects (whether these would be direct / indirect, temporary / permanent / reversible, cumulative, or beneficial, neutral, or adverse).
- 1.3.19 In describing the level of landscape effect, the assessment text clearly and transparently sets out the professional judgements that have been made in determining sensitivity and how the value and susceptibility of the landscape receptor has been assessed; and in determining magnitude and how the size and scale, geographical extent and duration of the effect has been considered.

Significant Landscape Effects

- 1.3.20 A significant effect would occur where the combination of the variables results in the Proposed Development having a defining effect on the landscape receptor, or where changes of a lower magnitude affect a landscape receptor that is of particularly high sensitivity. A major loss or irreversible effect over an extensive area of landscape character, affecting landscape elements, characteristics and / or perceptual aspects that

are key to a nationally valued landscape are likely to be significant as described in GLVIA3¹ paragraph 5.56.

Non-Significant Landscape Effects

- 1.3.21 A non-significant effect would occur where the effect of the Proposed Development is not defining, and the landscape character of the receptor continues to be characterised principally by its baseline characteristics. Equally a small-scale change experienced by a receptor of high sensitivity may not significantly affect the special landscape quality or integrity of a designation. Reversible effects, on elements, characteristics and character that are of small-scale or affecting lower value receptors are unlikely to be significant as described in GLVIA3¹ paragraph 5.56.

1.4 Visual Assessment

- 1.4.1 Visual Effects are concerned wholly with the effect of the development on views, and the general visual amenity and are defined by the Landscape Institute in GLVIA3¹, paragraph 6.1 as follows:

"An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern ... is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views."

- 1.4.2 Visual effects are identified for different receptors (people) who will experience the view(s) at their places of residence, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:
- Visual effect: a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view(s); and
 - Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.
- 1.4.3 The level of visual effect (and whether this is significant) is determined through consideration of the 'sensitivity' of each visual receptor (or range of sensitivities for receptor groups) and the 'magnitude of change' that would be brought about by the construction and operation proposed development. Visual assessment unavoidably involves a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion is sought through consultation and internal peer review.

Zone of Theoretical Visibility (ZTV)

- 1.4.4 Plans mapping the Zone of Theoretical Visibility (ZTV) are used to analyse the extent of theoretical visibility of development or part of a development, across the defined and detailed LVIA Study Areas and to assist with viewpoint selection. For proposed wind farm developments ZTVs are calculated for the turbines' hub heights and their blade tips. The ZTVs does not take account of the screening effects of buildings, localised landform and vegetation. As a result, there may be views experienced by residents in settlements and users of roads, footpaths, and other receptors within the LVIA study area which, although the receptors are indicated as falling within the ZTV, views in reality would be fully or partially screened or filtered by built form and vegetation.

- 1.4.5 The ZTVs provide a starting point in the assessment process and accordingly tend towards giving a 'worst case' or greatest calculation of the theoretical visibility.

Viewpoint Analysis

- 1.4.6 Viewpoint analysis is used to assist the assessment and is conducted from selected viewpoints identified and agreed upon with consultees within the LVIA Study Area. The purpose of this is to assess both the level of visual impact for particular receptors and to help guide the design process and focus the LVIA. A range of viewpoints are examined in detail and analysed to determine whether a significant visual effect would occur. By arranging the viewpoints in order of distance it is possible to define a threshold or outer geographical limit, beyond which there would be no further significant visual effects.
- 1.4.7 The turbines are always viewed as though facing towards the viewer to provide maximum potential visibility, although during operation, the turbines would face into the wind. The prevailing wind direction, likely to occur during the operational period is therefore also informative to the assessment, particularly if this tends to be variable or directional. In South Wales the prevailing wind direction is from the south-west.

Evaluating Visual Sensitivity to Change

- 1.4.8 In accordance with paragraphs 6.31-6.37 of GLVIA3¹ the sensitivity of visual receptors takes account of the susceptibility of the receptor to visual change and the value of the baseline view available to them. Sensitivity is assessed as High, Medium, Low, or Very Low, although in practice 'Very Low' sensitivity is not used.

Visual Assessment: Susceptibility

- 1.4.9 The main factors to consider are the activity or occupation of the receptor at the viewpoint or receptor location and the extent to which their attention or interest may be focused on the view and visual amenity of the surrounding landscape. Whilst it is accepted that people will undertake a range of different activities, their visual experience of a development will change according to where they are, and what they are doing, and susceptibility is assessed as follows:
- People at nationally recognised viewpoints, people at views/vistas attached to heritage features (such as Registered Parks and Gardens) or other locations recognised nationally in art or literature, are assessed as of high susceptibility. People in their communities including those engaged in outdoor recreation (e.g. users of public open spaces), where the focus of the activity is on enjoyment of the landscape and there is a high frequency of use, are also considered to be of high susceptibility;
 - People on local footpaths routed through undesignated landscapes that may be of lower scenic quality, and people engaged in sport, or travelling / commuting, especially on motorways, trunk roads and other 'A' roads are considered as to be of less susceptibility (medium); and
 - People at their place of work where views are not an important contributor to the quality of working life possess the least (low) susceptibility.

Visual Assessment: Value

- 1.4.10 In relation to value, consideration is given to the value of the view(s) through reference to local or national scenic landscape designation. Other factors to consider include the importance or popularity of the view(s) and/or the likely numbers of viewers and the

location and context of the viewpoint. The visual experience from a tourist destination, for example, could involve either the key views to, or from the main attraction, or those from the car-park / service area, and this context will affect the sensitivity and value of the views. Whilst views from car-parks / service areas may still be experienced by receptors of inherently higher sensitivity; these types of views should not be considered of higher value or sensitivity.

- 1.4.11 Landmarks / tourist attractions and national trails visited and used by large numbers of people are likely to be of higher value and more sensitive than those which are less visited. Occasionally there may be exceptions such as motorways where, although there are higher numbers of receptors these are generally considered to be of lower value. Conversely some less well visited footpaths within remote areas, may be of higher value precisely because of the lower visitor numbers.
- 1.4.12 Judgements on value and susceptibility are combined to determine overall visual sensitivity which is informed by professional judgement and guided by the following matrix shown in **Table 3**.

Table 3 Evaluation of Visual Sensitivity

		<u>Susceptibility:</u>		
		High	Medium	Low
<u>Value:</u>	High	High	High to Medium	Medium
	Medium	High to Medium	Medium	Medium to Low
	Low	Medium	Medium to Low	Low

Evaluating the Magnitude of Change to the View

- 1.4.13 The magnitude of change is described as Very High, High, Medium, Low, Very Low or Zero, and is assessed by consideration of possible changes caused by the Proposed Development, which may affect the view. For visual receptors for whom the Proposed Development would not be visible and there would be no change to their view, the magnitude has been recorded as 'zero' and the level of effect as 'no view'.
- 1.4.14 In assessing the magnitude of change the assessment has focused on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (i.e. as short / medium / long-term and temporary / permanent).

Size or Scale of Change

- 1.4.15 An assessment is made of the size or scale of change in the view that is likely to be experienced as a result of the Proposed Development, based on the following criteria:
- **Distance:** The distance between the visual receptor / viewpoint and the Proposed Development. Generally, the greater the distance, the lower the magnitude of change, as the Proposed Development would constitute a smaller-scale component of the view due to the effects of perspective.
 - **Size:** The amount and size of the Proposed Development that would be seen. Visibility may range from small or partial to whole visibility of the Proposed Development. Generally, the larger and greater number of elements (wind turbines and access

tracks) of the Proposed Development that appear in the view, the higher the magnitude of change.

This is also related to the degree to which development may be wholly or partly screened by landform, vegetation (seasonal) and / or built form. Conversely open views are likely to reveal more of a development, particularly where this is a key characteristic of the landscape.

- **Scale:** The scale of the change in the view, with respect to the loss or addition of features in the view and changes in its composition. The scale of the Proposed Development may appear larger or smaller relative to the scale of the receiving landscape.
- **Field of View** The vertical / horizontal field of view (FoV) and the proportion of view that is affected by the Proposed Development. Generally, the more of the proportion of a view that is affected, the higher the magnitude of change would be. If the Proposed Development extends across the whole of the view, the magnitude of change would generally be higher as the full view would be affected. Conversely, if the Proposed Development extends over a narrow part of an open view, the magnitude of change is likely to be reduced as the Proposed Development would not affect the whole view or outlook. This can in part be described objectively by reference to the horizontal / vertical FoV affected, relative to the extent and proportion of the available view.
- **Contrast:** The character and context within which the Proposed Development would be seen and the degree of contrast or integration of any new features with existing landscape elements, in terms of scale, form, mass, line, height, colour, luminance and motion. Developments which contrast or appear incongruous in terms of colour, scale and form are likely to be more visible and have a higher magnitude of change.
- **Consistency of image:** The consistency of image of the Proposed Development in relation to other developments. The magnitude of change for the Proposed Development is likely to be lower if it appears broadly similar to other developments in the landscape in terms of its scale, form and general appearance. New development is more likely to appear as logical components of the landscape with a strong rationale for their location.
- **Speed of Travel:** The speed at which the Proposed Development may be viewed will affect how long the view is experienced and the likelihood of the Proposed Development being particularly noticed by people travelling in cars compared to those who may be walking and able to stop and 'take in' a view.
- **Angle of View (AoV):** The AoV from the main viewing direction may be considered in terms of whether the Proposed Development is experienced directly or at an oblique angle from the visual receptors' main viewing direction. Road users are generally more aware of the views in the direction of travel, whilst train passengers are more aware of views perpendicular to their direction of travel. Elevated views are likely to reveal more of the Proposed Development, whereas low level views are more likely to be screened by intervening built form and vegetation.
- **Screening:** The Proposed Development may be wholly or partly screened by landform, vegetation (seasonal) and or built form. Conversely open views, particularly from landscapes where LANDMAP identifies their availability as a characteristic, are likely to reveal more of a development.
- **Skyline / Background:** Whether the Proposed Development would be viewed against the skyline or a background landscape may affect the level of contrast and magnitude. For example, skyline developments may appear more noticeable, particularly where they affect open and undeveloped horizons. Conversely, development may also

appear more noticeable when viewed against a darker background landscape, such as forestry. In these cases, the magnitude of change would tend to be higher.

If the Proposed Development adds to an already developed skyline the magnitude of change would tend to be lower.

- **Nature of Visibility:** The nature of visibility, whether this is subject to various phases of development change and the manner in which the development may be viewed such as intermittently or continuously, and / or seasonally, due to periodic management or leaf fall, is a further factor for consideration.

Geographical Extent

- 1.4.16 A visual effect is also considered in terms of the geographical extent, physical area or location over which it would be experienced (described as a linear or area measurement). Visual effects affecting a large geographical area are more likely to be regarded as significant.

Duration and Reversibility

- 1.4.17 A visual effect is also considered in terms of the duration over which the effect would be experienced and whether this would be permanent, temporary or reversible. Duration can be considered as ranging between temporary (short to long term and time limited) or permanent. Although 'long term' some development such as housing should be regarded as permanent, whilst mineral extraction works usually entail several phases of development, followed by restoration. Wind farm development usually operates for a long term, time limited period, followed by a decommissioning period that would allow the visual effects to be reversed. Reversibility is only assessed as part of the decommissioning stage and cannot factor into the assessment of the time limited operational effects. Permanent visual effects (not time limited) are more likely to be regarded as significant.
- 1.4.18 Further guidance on the evaluation of visual sensitivity and magnitude is provided in **Table 4**.

Table 4 Visual Receptor Sensitivity and Magnitude

Examples of Visual Sensitivity	
High	People in their communities and on long distance, strategic footpaths or popular footpaths and tourist destinations, viewing important landscape features, beauty spots and picnic areas, where the activities are focused on the landscape. Receptors include groups of high susceptibility to change such as residents, tourists / visitors, and walkers travelling through the landscape, viewing and experiencing landscapes of high value and quality.
Medium	People within outdoor sports based recreational spaces such as golf courses, using local or less well used recreational routes of viewing landscapes of high or medium value. Receptors include groups of medium susceptibility to change receptors such as some walkers, cyclists, road users, and other recreational receptors travelling through the landscape / seascape. Viewing and experiencing landscapes of medium value and quality.
Low	People working on the land or sea, at their place of work, or taking part in activities such as team sports that do not involving an appreciation of the landscape, including vehicular receptors travelling on motorways and other busy trunk and 'A'

	roads. Often viewing and experiencing landscapes of medium to low value and quality.
Very Low	Not used.
Examples of Visual Magnitude	
Very High	A major change and/or obstruction of a view that is directly visible, appearing as the dominant and contrasting feature appearing in the fore ground and potentially the middle ground of the view.
High	A substantial change that may be directly visible, appearing as a highly prominent and contrasting feature appearing in the fore or middle ground.
Medium	A prominent change or partial view of a new element within the view that may be readily noticeable, directly or obliquely visible including glimpsed, partly screened or intermittent views, appearing as a prominent feature in the middle ground or background landscape.
Low	A noticeable or small level of change, affecting a small part of the view that may be obliquely viewed or partly screened and/or appearing in the background landscape although noticeable. May include views experienced whilst travelling at speed.
Very Low	A small or intermittent change to the view that may be obliquely viewed and mostly screened and/or appearing in the distant background or viewed at high speed over short periods and capable of being missed by the casual observer.
Zero	There would be no change to the view.

Evaluating visual effects and significance

- 1.4.19 The level of visual effect is evaluated through the combination of visual sensitivity and magnitude of change, a process assisted by the matrix in **Table 5**, which is used to guide the assessment. In those instances where there would be no change or no visibility or view of the Proposed Development, the magnitude has been recorded as 'Zero' and the level of effect as 'No View'.
- 1.4.20 Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' as required by the relevant EIA Regulations and is set out at **Section 1.6** of this Appendix. Further information is also provided about the nature of the effects (whether these would be direct / indirect, temporary / permanent / reversible, cumulative, or beneficial, neutral or adverse).

Significant Visual Effects

- 1.4.21 A significant effect is more likely to occur where a combination of the variables results in the Proposed Development having a defining effect on the view or visual amenity or where changes affect a visual receptor that is of high sensitivity as described in GLVIA3¹ paragraph 6.44.

Non-Significant Visual Effects

- 1.4.22 A non-significant effect is more likely to occur where a combination of the variables results in the Proposed Development having a non-defining effect on the view or visual amenity or where changes affect a visual receptor that is of low sensitivity as described in GLVIA3¹ paragraph 6.44.

1.5 Cumulative Landscape and Visual Assessment

- 1.5.1 The assessment of cumulative effects is essentially the same as for the assessment of the primary landscape and visual effects, in that the level of landscape and visual effect is determined by assessing the sensitivity of the landscape or visual receptor and the magnitude of change. The cumulative assessment, however, considers the magnitude of change posed by multiple developments.
- 1.5.2 A cumulative landscape or visual effect simply means that more than one type of development is present or visible within the landscape. Other forms of existing development and land-use such as woodland and forestry, patterns of agriculture, built form, and settlements already have a cumulative effect on the existing landscape that is already accepted or taken for granted. These features often contribute strongly to the existing character, forming a positive or adverse component of the local landscape. Landscapes however, will have a finite capacity for cumulative development, beyond which further new development would result in landscape character change and could result in the creation of a 'wind farm landscape' where wind farms have become the dominant characteristic.
- 1.5.3 Detailed guidance on the cumulative assessment of wind farm development is provided in the NatureScot document '*Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments*'⁵. This assessment distinguishes between 'additional' cumulative effects that would result from adding the Proposed Development to other cumulative wind farm development and 'combined' cumulative effects that assess the total cumulative effect of the Proposed Development and other cumulative wind farm development. In the latter case a significant cumulative effect may result from the Proposed Development or one of more other existing, under-construction or consented wind farms, or other wind farm applications. In those cases, the main contributing wind farm(s) is identified in the assessment.
- 1.5.4 Types of cumulative effect are defined as follows:
- Cumulative Landscape Effects: Where more than one wind development may have an effect on a landscape designation or particular area of landscape character as defined by LANDMAP Aspect Areas;
 - Cumulative Visual Effects: the cumulative or incremental visibility of similar types of development that may combine to have a cumulative visual effect. These can be further defined as follows:
 - ▶ Simultaneous or combined: where two or more developments may be viewed from a single fixed viewpoint simultaneously, within the viewer's field of view and without requiring them to turn their head¹⁸;
 - ▶ Successive or repetitive: where two or more developments may be viewed from a single viewpoint successively as the viewer turns their head or swivels through 360°; and
 - ▶ Sequential: where a number of developments may be viewed sequentially or repeatedly at increased frequency, from a range of locations when travelling along road, Sustrans national or regional cycle route or promoted long distance route within the LVIA Study Area.
- 1.5.5 The SNH document '*Siting and Designing Wind farms in the Landscape*' (Version 3a) explains that the development of multiple wind farms within a particular area may create different types of cumulative effect, such as where:

¹⁸ Note: A person's field of view is variable but is approximately 90° when facing in one direction.

“The wind farms are seen as separate isolated features within the landscape character type, too infrequent and of insufficient significance to be perceived as a characteristic of the area;

The wind farms are seen as a key characteristic of the landscape, but not of sufficient dominance to be a defining characteristic of the area; [a landscape with wind farms] and

The wind farms appear as a dominant characteristic of the area, seeming to define the character type as a ‘wind farm landscape character type.’”

- 1.5.6 Wind farm development that results in the creation of a ‘wind farm landscape’ as opposed to a ‘landscape with wind farms’ or ‘landscape with occasional wind farms’ is likely to be assessed as significant. Equally the ‘additional effect’ of a proposed wind farm development, adding to a scenario where there are already a number of other existing or consented wind farms, may be less than the effect of the Proposed Development either on or primary basis or in an area where there are few or no wind farms existing. This is because wind farm development has already been established as a characterising influence and the additional effect of further development may or may not alter this.
- 1.5.7 Whilst the CLVIA considers other wind farm development, it should not be considered as a substitute for individual LVIA assessment in respect of each of the other cumulative developments included in the CLVIA.

Defining the Cumulative Study Area

- 1.5.8 The cumulative study area will be confirmed during the consultation process. Other existing, consented, planning application and scoping wind energy sites included within this study area are noted and considered in terms of their likely relevance to the CLVIA.
- 1.5.9 Sites within the Cumulative Search Area which are considered likely to contribute to a significant cumulative effect in ‘addition’ or in ‘combination’ with the Proposed Development are included in the CLVIA.

Predicting Cumulative Landscape Effects

- 1.5.10 The CLVIA considers the extent to which the Proposed Development, in combination with other existing, consented or proposed wind farm may change landscape character through either an ‘additional’ or ‘in combination’ effect on characteristic elements, landscape characteristics and quality of the baseline landscape character as defined in LANDMAP. Identified cumulative landscape effects are described in relation to each individual scoped in LANDMAP Aspect Area and for any scoped in designated landscape areas assessed within the LVIA Study Area.

Predicting Cumulative Visual Effects

- 1.5.11 The assessment of cumulative visual effects involves reference to the cumulative visibility ZTV maps and the cumulative viewpoint analysis. The cumulative visibility of other existing and consented wind energy developments and applications is established in the first instance using the computer programme (Resoft Wind Farm© or ArcGIS Pro© software) to identify areas where wind energy developments are theoretically visible. Cumulative visibility maps are analysed to identify the visual receptor locations and routes where cumulative visual effects on the landscape and people may occur as a result of the Proposed Development.
- 1.5.12 With potential receptor locations identified, cumulative effects on individual receptor groups are then explored through viewpoint analysis, which involves site visits informed

by wireline illustrations that include other wind energy developments. The computer programme itself can also be used to 'drive' particular routes to assess the visibility of different wind energy developments and inform the assessment of sequential cumulative effects that may occur along a route or journey, and compared to actual visibility experienced along a route during the site visit.

Evaluation of Cumulative Landscape and Visual Effects

- 1.5.13 The evaluation of cumulative effects is assisted by the matrix in **Table 5**, which is used to guide the assessment.
- 1.5.14 The cumulative assessment will be prepared to ensure that, as well as the primary effect of the Proposed Development (LVIA) the 'additional' cumulative effects and the 'combined' cumulative effect (CLVIA) is also reported to account for two cumulative Scenarios as follows:
- **Proposed Development:** Assessed on an individual basis (the LVIA). This part of the assessment may take account of other operational forms of wind farm development that may be present in the landscape, whilst recognising that their influence on landscape character is likely to be time limited. It does not consider the additional or combined cumulative effects and only reports of the effect of the Proposed Development alone.
 - **Scenario 1: Existing + Consented + the Proposed Development:** The additional and combined cumulative effects of any consented wind energy developments with the Proposed Development are assessed.
 - **Scenario 2: Existing + Consented + Applications + Scoping Schemes + the Proposed Development:** The additional and combined cumulative effects of the existing and consented wind energy developments and any live applications (which would include schemes at scoping if they exhibit high potential to alter the landscape and visual baseline into which the Proposed Development would be introduced or have reached Pre-Application Consultation (PAC) stage with a Draft ES completed), with the Proposed Development are assessed.
- 1.5.15 Due to the numbers of other wind energy developments scoped into the CLVIA, the overall cumulative effects may be greater than for the primary effect or additional effect for the Proposed Development assessed in the main LVIA. The resulting level of cumulative effect may remain at the same level of effect or increase to a higher level of effect. The point at which these effects become significant or not significant in landscape and visual terms is still a matter for professional judgement, although four scenarios or combinations of cumulative effect, taking account of other wind energy development can occur as follows:
- A significant effect from the Proposed Development is predicted in addition or combination with another significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is a greater level of effect than assessed for either development individually;
 - A significant effect from the Proposed Development is predicted in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is attributed to the Proposed Development and is a greater level of effect than for either development assessed individually;
 - A non-significant effect from the Proposed Development is predicted in addition or combination with another significant effect attributed to other wind energy

development(s). The effect is still termed significant and cumulative, but is attributed to the other wind energy development(s) and is a greater level of effect than for either development individually; and

- A non-significant effect from the Proposed Development is assessed in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed cumulative and is a greater level of effect than for either development individually; the combined effect however, may be assessed as either significant or not significant.

1.5.16 The nature of a cumulative effect may also be described as direct / indirect, temporary / permanent, or beneficial / adverse. The probability of a cumulative effect occurring may also be described (certain, likely or uncertain / unknown).

1.6 Evaluating Landscape and Visual Effects

1.6.1 The level of effect relating to landscape and visual effects and / or cumulative landscape and visual effects is determined by the combination of sensitivity (ranging from High to Very Low) and magnitude of change (ranging from Very High to Zero), which is assisted by the matrix illustrated in **Table 5**. In addition to the scale or magnitude of the effect, the GLVIA3¹ advises that consideration should also be given to the geographical extent and duration or reversibility of the effect as described earlier.

Types of Landscape and Visual Effect

1.6.2 The relevant EIA Regulations also require that the level of effect is described in terms of its 'type' or 'nature' of effect (whether the effect is permanent / temporary, direct / indirect, beneficial/neutral/adverse and or cumulative) as well as the scale over which the effect would occur. For example, an effect may be locally significant, or significant with respect to a small number of receptors, but not significant when judged in a wider context. These terms are defined below:

- **Temporary or Short Term / Long term / Permanent:** The time period over which an effect may occur is referred to as temporary / short term, long term, or permanent. Wind farm development is considered 'in perpetuity' due to the long-term periods of operation. However, the Proposed Development is time-limited and the effects would also be reversible upon completion of the Proposed Development's decommissioning.
- **Direct / Indirect effects:** Direct effects relate to the host landscape elements and LANDMAP Aspect Areas and concern both physical and perceptual effects on these receptors. Indirect effects relate to those LANDMAP Aspect Areas, designated landscapes and visual receptors which separated by distance or remote from the Proposed Development. Such receptors can only be impacted via of visual or perceptual effects pathways.
- **Beneficial / Neutral / Adverse:** The landscape and visual effects generated may be beneficial, neutral, or adverse. The LVIA assumes that the nature of the effects would be 'adverse' unless otherwise stated i.e. adopts a worst-case scenario and in the case of wind farm development, the most noticeable effects and changes are likely to be visual. However, GLVIA3¹ cautions against the automatic assumption that all change would result in an adverse effect.
 - ▶ In Landscape Terms: a beneficial effect would require development to add to the landscape quality and character of an area. Neutral landscape effects would include changes that neither add nor detract from the quality and character of an area including development that may be reasonably accommodated within the

scale and capacity of the landscape in the context of landscape management and change as defined in LANDMAP commentaries, and very low magnitudes of change. An adverse effect may include the loss of landscape elements such as mature trees and hedgerows as part of construction or operation that exceeds landscape capacity, leading to a reduction in landscape quality and character of a LANDMAP Aspect Area or a landscape designation;

- ▶ In Visual Terms: beneficial or adverse effects are less easy to define or quantify and require subjective consideration of a number of aesthetic factors affecting the view, which may be beneficial, neutral, or adverse. Not all change, including high levels of change, is necessarily an adverse experience. Public opinions as to the visual effects of wind farms vary widely, however this LVIA is not an assessment of public opinion. Rather, an LVIA considers architectural and aesthetic factors such as the visual composition of the landscape in the view together with the wind farm design, which may or may not be reasonably accommodated within the scale and character of the landscape as perceived from the receptors' location. Neutral visual effects would include changes that are not dominating, overbearing, or oppressive. They include development that appears reasonably well accommodated within the scale and landscape setting or context and also includes very low magnitudes of change. An adverse effect may include poor visual design quality such as overlapping ('stacking') turbines, inappropriate scale of development relative to the underlying landscape, or other visual factors that may reduce scenic quality, such that the wind farm would appear dominating, overbearing, or oppressive.

Probability of Cumulative Effect

- 1.6.3 The probability of cumulative effects is variable. Those effects related to existing wind energy development and those under construction are considered as certain; effects related to development with planning consent are considered as likely. Wind energy development sites for which there is a submitted planning application are considered as uncertain.

Determining the Significance of Effects

- 1.6.4 In accordance with the relevant EIA Regulations it is important to determine whether the effects, assessed as a result of the Proposed Development, are likely to be significant. Significant landscape and visual effects will be highlighted in **bold** in the text and in most cases, relate to all those effects that result in a '**Major**' or '**Major/Moderate**' effect as indicated in **Table 5**.
- 1.6.5 In some circumstances, '**Moderate**' levels of effect also have the potential, subject to the assessor's opinion, to be considered as significant and these exceptions are also highlighted in bold and explained as part of the assessment, where they occur.
- 1.6.6 Wind turbines are tall, visible structures and the existence of what would inevitably be a significant effect does not mean that the proposal should be considered 'unacceptable' and consent refused.
- 1.6.7 In accordance with the overall significance matrix used for the EIA, some moderate, moderate/minor, minor and negligible effects, are determined as 'not significant'. In those instances where there would be no effect, the magnitude has been recorded as 'Zero' and the level of effect as 'None'.

Table 5 Evaluation of Landscape and Visual Effects

		Landscape and Visual Sensitivity			
		High	Medium	Low	Very Low
Magnitude of Change	Very High	Major (Significant)	Major (Significant)	Major/Moderate (Significant)	Moderate (Potentially Significant)
	High	Major (Significant)	Major/Moderate (Significant)	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)
	Medium	Major/Moderate (Significant)	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)
	Low	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)
	Very Low	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)
	Zero	None / No View			

- 1.6.8 In line with the emphasis placed in GLVIA3¹ upon application of professional judgement, the adoption of an overly mechanistic approach through reliance upon a matrix as presented in **Table 5** will be avoided. This will be achieved by the provision of clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape and visual receptor over and above the outline assessment provided by use of the matrix. Matrices for landscape and visual effects are provided as a summary in support of the narrative explanations. Wherever possible cross references will be made to baseline figures and/or to photomontage visualisations to support the rationale.

1.7 Residential Visual Amenity Assessment

- 1.7.1 The assessment of Residential amenity is a planning matter that involves consideration of a number of effects (such as noise and shadow flicker), of which residential visual amenity is a single component. The RVAA is limited to the consideration of visual effects on the residential amenity of residential properties. Visual amenity is defined in GLVIA3¹ as:
- ‘the overall pleasantness of the views they enjoy of their surroundings’*
- 1.7.2 Residential Visual Amenity means: *‘the overall quality, experience and nature of views and outlook available to occupants of residential properties, including views from gardens and domestic curtilage. Residential Visual Amenity is one component of ‘Residential Amenity’⁷.*
- 1.7.3 Planning law contains a widely understood principle that the outlook or view from a private property is a private interest and not therefore protected by either the Scottish or UK planning system. However, the planning system also recognises situations where the effects on residential visual amenity are so serious as to become a matter of public interest. This matter has been examined at a number of public inquiries in the Scotland and the rest of the UK where the key determining issue was not the identification of

significant effects on views, but whether the Proposed Development would have an effect on the residential visual amenity through an ‘overbearing’ and / or ‘dominating’ effect resulting in unsatisfactory living conditions, leading to a property being regarded, objectively, as an unattractive (as opposed to a less attractive) place in which to live. The effects on residential amenity are subsequently considered as part of the planning balance as part of the consent process.

- 1.7.4 Consequently, the RVAA methodology provides for a much more detailed assessment of the closest residential properties to the Proposed Development. This allows the assessor and consequently the determining authority to make a judgement as to whether the residents at these residential properties would be likely to sustain unsatisfactory living conditions which it would not be in the public interest to create. Reviews of decisions demonstrate that significant visual effects or changes to the views available from a residential property and its curtilage are not the decisive consideration, rather it is the residential amenity and, in this case, residential visual amenity that is determinate.
- 1.7.5 The methodology for RVAA accords with the advice in GLVIA3¹, and the Landscape Institute’s Residential Visual Amenity Assessment Technical Note 2/19⁷. It involves a four-step process as follows:
- *“1: Definition of the study area and scope of the assessment.*
 - *2: Evaluation of baseline visual amenity at properties to be included having regard to the landscape and visual context and the development proposed.*
 - *3: Assessment of likely change to visual amenity of included properties in accordance with GLVIA3 principles and processes.*
 - *4: Further assessment of predicted change to visual amenity of properties to be included forming a judgement with respect to the Residential Visual Amenity Threshold.”⁷*
- 1.7.6 Other factors affecting residential amenity such as noise and shadow flicker are not considered as part of the RVAA but will be addressed by other chapters of the EIA Report.

Step 1: Scope of Assessment

- 1.7.7 Based on the Landscape Institute’s guidance, a study area of 2km distance from the proposed turbines has been selected for the RVAA. This study area is then reviewed against the site-specific conditions of the proposed development and the ZTV which may indicate a slightly smaller or larger study area is required.
- 1.7.8 A residential property, for the purposes of RVAA, should be one that was designed and built/converted for that purpose and currently (at the time of the assessment) remains in a habitable condition (is of a safe construction, wind and watertight with appropriate vehicle access, and services such as drinking water, sanitation, and power supply). Other buildings such as barns/ outbuildings, garages, sheds and derelict properties should generally be excluded from the assessment, unless they form part of the curtilage of an existing residence.
- 1.7.9 Planning permissions for new residential properties and conversions which have not been built at the time of the assessment have not been included.

Step 2: Site Survey and Baseline Reporting

- 1.7.10 The assessment of residential properties or clusters of residential properties will be limited to those which appear on the Ordnance Survey 1:25,000 scale map and are overlapped by the blade tip ZTV. The assessment will be informed by site visits, observing the

properties from public locations and through the examination of publicly available aerial and ground level photography as well as map-based data, the production of ZTV plots and visualisations such as wirelines. Some of the properties may be accessed via private or gated roads and due to these access limitations, they will be assessed from the nearest public road or footpath which may be at greater distance from the property. As such the assessment represents an informed judgement of the likely visual effects and the consequential effects on residential visual amenity.

- 1.7.11 Each property included in the RVAA will be described in terms of the type, nature, extent and quality of the views that may be experienced 'in the round' from the dwelling itself and the domestic curtilage which includes the main living areas, usually the ground floor and the main garden and immediate driveway. The relationship of the property with the surrounding landscape and a description of the views in terms of whether they may be considered as primary, secondary or peripheral views.
- 1.7.12 The assessment will allow for the screening effects of vegetation with the following caveats:
- Forestry screening is subject to forestry management and the assessment allows for either no forestry screening or maximum forestry screening, representing the two extremes likely to affect the view during the operational period of the Proposed Development.
 - Woodland and hedgerow screening – Where this includes mature, long standing mixed or broadleaved woodland a degree of permanence will be assumed in the assessment.
 - Individual trees – Where these are mature a degree of permanence will be assumed in the assessment. However, this is subject to the long-term retention of individual trees that would need to be assessed on a case-by-case basis, which is beyond the scope of this assessment.
 - Garden vegetation will be assumed to have a degree of permanence. In the event that it is removed and replanted, most garden shrubs / hedges are reasonably quick to re-establish or are replaced on a piecemeal basis.
- 1.7.13 The assessment will take account of the likely views from the ground floors of properties and main garden areas but excludes upper floors and other land that may relate to the property and is not part of the main living areas.

Cumulative wind farm development

- 1.7.14 The assessment will also take account of cumulative effects likely to result from the visibility of other wind energy development. In order to identify the likely significant effects, and noting that the RVAA study area is 2km, the baseline of other wind energy development considered in the assessment will be limited to those wind farms within 10km of the proposed development.

Step 3: Visual Assessment

- 1.7.15 A visual assessment is undertaken to identify those properties where a significant visual effect on a view from the property is likely to occur. The methodology for this is set out previously under visual assessment and combines an assessment of 'sensitivity' with an assessment of 'magnitude'.
- 1.7.16 The sensitivity of individual residential receptors has been assessed as 'High' in each case due to the high susceptibility of residents in accordance with GLVIA3¹, paragraph

6.33. The value of the view is also likely to be regarded as high by the residents themselves, but the views in this area are not nationally or locally designated for their scenic value and accord a medium value in this respect.

- 1.7.17 The assessment is supported by aerial and ground level photography as well as map-based data, the production of ZTV plots and visualisations such as wirelines and photographs where appropriate, which are illustrated for each property.

Step 4: Residential Visual Amenity Assessment

- 1.7.18 The second stage is to consider the residential visual amenity and whether, in terms of the wider public interest, the visual effects would result in unsatisfactory living conditions, leading to a property being regarded, objectively, as an unattractive (as opposed to a less attractive) place in which to live. Relevant information considered as part of the assessment may include, but is not limited to the following:

- Scale of Wind Farm:
 - Number and height of visible turbines;
 - The horizontal extent or Angle of View (AOV) of the visible turbine array; and
 - Separation distance (closest and furthest visible turbines).
- Description of Property, as far as this can be ascertained:
 - Orientation and size of property and whether views from the property towards the wind farm would be direct or oblique;
 - Location of principal rooms and main living areas such as living/dining rooms, kitchens and conservatories, as opposed to upstairs rooms (bedrooms / bathrooms), working areas such as farm buildings and utility areas;
 - Location of principal garden areas which may include patios and seating areas as opposed to less well used areas such as paddocks or garages; and
 - The effects of any screening by landform, vegetation or nearby built development.
- Location and Context:
 - The aspect of the property in terms of the overall use and relationship to the garden areas and surrounding landscape;
 - The principal direction of main views and visual amenity;
 - The context and nature of any intervening structures e.g. other existing wind farm development, farm buildings or forestry.

- 1.7.19 A final assessment is then made to determine if, in the assessor's opinion, the residential visual amenity threshold would be breached by the proposed development and as such should be considered further as part of the planning balance.

1.8 Night-time Assessment

- 1.8.1 The night-time assessment will be supported by a baseline night-time environment or darkness survey and ZTV plots, baseline photography, wirelines and photomontages from selected viewpoints. These visualisations help to assess both the level of night-time visual impact for particular receptors and focus the assessment.

Night-time Viewpoint Analysis

- 1.8.2 A range of viewpoints are examined in detail and analysed to determine whether a significant visual effect would occur. By arranging the viewpoints in order of distance it is possible to define a threshold or outer limit, beyond which there would be no further significant effects.
- 1.8.3 The night-time viewpoint analysis involves visiting the agreed night-time viewpoint locations during periods between dusk and dawn and viewing wirelines and photomontages prepared for each viewpoint location. The fieldwork is conducted in periods of fine weather with clear skies and considers seasonal changes such as reduced leaf cover or hedgerow maintenance.

Baseline Night-time Environment or Darkness Survey

- 1.8.4 During site visits, a baseline night-time environment survey or 'darkness survey' is carried out at each viewpoint location. The purpose of the darkness survey is to establish the existing light levels perceived by the landscape architects at the viewpoints and determine their sensitivity to change. The following observations are recorded:
- Areas of darkness with no artificial light;
 - Direct artificial lighting (where the light source is directly visible from the viewpoint);
 - Indirect artificial lighting (where the light source is not visible but the light emanating from the light source is visible as in the case of 'sky glow');
 - Static lighting, for example emanating from a residential property or street light; and
 - Mobile or transient lighting, for example associated with moving vehicles, trains or aircraft.
- 1.8.5 Baseline photographs at each of the night-time assessment viewpoints are recorded.

Assessment of Night-time Sensitivity

- 1.8.6 In terms of landscape effects, a key determinant of the value and susceptibility of a landscape is the degree to which the landscape character can be discerned at night and the quality of the baseline 'darkness' – essentially is the area unlit or lit? There is a limited period of the night, during the twilight periods just after sunset or just before dawn when the landscape character maybe partially perceived and during periods when there are clear skies and under conditions such as a full moon. During these limited periods it may be possible to discern sufficient number of the key landscape characteristics, in particular, topography / skyline and some of the perceptual qualities, although other features such as colour, pattern, texture will be muted or not discernible. As darkness progresses these features cease to be visible. The susceptibility of the landscape at night is therefore variable and reduces from its highest or most susceptible during the day, through the twilight period, until the night when susceptibility would be at its lowest, during periods of greatest darkness.
- 1.8.7 The value of the landscape at night is recognised in designations that include National Parks and Dark Sky Parks and more rarely in relation to local landscape designations and particular landscape character types, although the landscape value of non-designated landscapes is usually lower.
- 1.8.8 In terms of visual effects, the susceptibility of the receptor is primarily influenced by the activity of the viewer. A number of tourist locations are likely to be closed to the public during the hours of darkness, residents are most likely to be indoors, and people in

settlements and road users may be influenced by the streetlights and vehicle lights, reducing their sensitivity. Hill walkers and people viewing the landscape from recognised viewpoints are less likely or unlikely to be present at those locations during the night. This small group of receptors however, could be considered as of High sensitivity, particularly in locations such as dark sky park viewpoints.

- 1.8.9 The value of the specific views and visual amenity at night is also recognised in designations that include National Parks and Dark Sky Parks but more rarely documented in local landscape designations, although in all cases the value is likely to be high.

Assessment of Night-time Magnitude

- 1.8.10 The magnitude of change assessment focusses on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (i.e. short / medium / long-term and temporary or permanent).
- 1.8.11 Mitigating factors such as an approved Lighting Design Strategy and the specification of particular aviation warning light attributes will be documented as part of the Project Description within the night-time assessment.
- 1.8.12 The number of lights likely to be visible as well as their intensity can be described in objective terms and ZTVs indicating the theoretical visibility of numbers of lights and their intensity is mapped in order to assist the assessment process. Other objective factors include the FoV and the distance over which the lights may be seen. More subjectively the Proposed Development is considered against the baseline or darkness survey in terms of whether the proposed lighting would contrast with an unlit area or assimilate with other lights in a landscape or view that may already have multiple light sources. In this manner the assessment has to consider the degree to which the Proposed Development would affect the landscape character or designation, as far as that can be perceived at night.
- 1.8.13 In visual terms, a further consideration is the numbers of viewers which are likely to experience the views and visual amenity at night. It is reasonable to assume that the numbers of tourists and hill walkers, viewing the landscape at night for example, will tend to be few in number or rare, with most tourist destinations closed during the hours of darkness for example. Exceptions may include specific viewpoints within a Dark Sky Park. Walkers and road users out at night, will also themselves tend to be sources of light from torches and vehicle headlights and thus affect the baseline or darkness survey.
- 1.8.14 The 'magnitude' or 'degree of change' resulting from the Proposed Development is described as 'Very High', 'High', 'Medium', 'Low', 'Very Low' or 'Zero', in similar terms to the descriptions set out in **Tables 2 and 4**.

Evaluation of Night-time Level of Effects and Significance

- 1.8.15 The level effect is evaluated through the combination of sensitivity and magnitude of change. Once the level of effect has been assessed, and the nature of the effect is determined (whether this is direct / indirect; its duration, temporary / permanent; and whether it is beneficial / neutral / adverse or cumulative) a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations. This process is assisted by the matrix illustrated in **5** which is used to guide the assessment. The factors considered in the evaluation of the sensitivity and the magnitude of the change resulting from the Proposed Development and their conclusion, is presented in a comprehensive, clear and transparent manner.

1.9 Production of ZTVs and Visualisations

- 1.9.1 Zones of Theoretical Visibility (ZTVs) and visualisations (wirelines / wirelines and photomontages) are graphical images produced to assist and illustrate the LVIA and the cumulative assessment. The methodology accords with the SNH guidance Visual Representation of Wind Farms, Version 2.2⁴. Further, additional guidance is provided by the Landscape Institute Technical Guidance Note (TGN) 06/19: Visual Representation of Development Proposals⁶. Paragraph 4.5.14 of TGN 06/19 states that “*The SNH 2017 guidance is endorsed by the LI for windfarms and similar projects which are viewed in expansive landscapes over medium to far distances*”.

Methodology for Production of ZTVs

- 1.6.1 The ZTVs are calculated using ArcGIS Pro© or Resoft Wind Farm© software to generate the zone of theoretical visibility of the Proposed Development. This software creates a 3D computer model of the existing landscape and the development using digital terrain data as follows:
- Ordnance Survey Terrain 50: Used to produce the main or standard ZTV plot and wirelines, these tiles provide a digital record of the existing landform of Great Britain, or Digital Terrain Model (DTM) at 10m elevation intervals based on 50m grid squares and models representing the specified geometry and position of the proposed turbines. The computer model includes the entire LVIA Study Area and takes account of the effects caused by atmospheric refraction and the Earth's curvature; and
 - Ordnance Survey Terrain 5: Used to produce a more detailed ZTV plot or wireline for limited areas, often used where there are small undulations or crags within the landscape. These tiles provide a digital record of the existing landform of Great Britain based on 5m grid squares and models representing the specified geometry and position of the proposed turbines. The computer model includes the central LVIA Study Area and takes account of atmospheric refraction and the Earth's curvature.
- 1.9.2 The resulting ZTV plots are overlaid on Ordnance Survey mapping at an appropriate scale and presented as figures using desktop publishing/graphic design software.
- 1.9.3 The same computer software is also used to calculate cumulative ZTV plots based on the intervisibility of the Proposed Development with other existing, consented and application wind farms included in the CLVIA. In addition to the methods as described above, the layouts and geometries of the surrounding existing, consented and application wind farms are loaded into the same computer programme.

Methodology for Baseline Photography

- 1.9.4 Once a viewpoint has been selected, it is visited, confirmed, and assessed with the aid of a wireline or similar visualisation in the field. A photographic record is taken to record the view and the details of the viewpoint location and associated data are recorded to assist in the production of visualisations and to validate their accuracy. All site photography included in the LVIA is taken in accordance with Visual Representation of Development Proposals. Technical Guidance Note 06/19⁶.
- 1.9.5 The following photographic information is recorded:
- Date and time;
 - GPS recorded 10 figure (British National Grid) grid reference accurate to ~5 m;
 - GPS recorded elevation data; and

- The focal length of lens is confirmed.

- 1.9.6 All photographs included in the assessment will be recorded with a digital SLR camera set to produce photographs equivalent to that of a manual 35 mm SLR camera with a fixed 50mm focal length lens.
- 1.9.7 All the resulting visualisations will be prepared to show other cumulative wind energy development in order that they may assist the cumulative assessment as well as the LVIA.
- 1.9.8 Whilst no two-dimensional image can fully represent the real viewing experience, the visualisation aims to provide a realistic representation of the Proposed Development, based on current information and photomontage methodology.

Weather Conditions

- 1.9.9 GLVIA3 para 8.22 states:

“In preparing photomontages, weather conditions shown in the photographs should (with justification provided for the choice) be either:

- *representative of those generally prevailing in the area; or*
- *taken in good visibility, seeking to represent a maximum visibility scenario when the development may be highly visible”.*¹

- 1.9.10 In preparing photomontages for the LVIA, photographs will be taken in favourable weather conditions that are representative of the weather conditions generally and where possible, will be taken during periods of ‘good’ (between 10-20km¹⁹), very good (between 20-40km¹⁹) or ‘excellent’ (more than 40km¹⁹) visibility conditions.

Methodology for Production of Visualisations

- 1.9.11 Each view will be illustrated with a photograph, a wireline and / or a photomontage indicating the Proposed Development. Definitions of each of these are described as follows:
- Baseline photograph: A photograph of the existing view recorded in fair weather conditions and usually presented as a panorama in line with the relevant SNH guidance.
 - Wireline or Wireframe: A computer generated model of the landscape and the Proposed Development.
 - Photomontage is a visualisation which superimposes an image of a Proposed Development (in this case the wireline or wireframe) upon the baseline photograph, which is then rendered by computer software to produce an image of how the Proposed Development would appear from that viewpoint. Photomontage is a widespread and popular visualisation technique, which allows changes in views and visual amenity to be illustrated and assessed.

Baseline Photograph Production

- 1.9.12 To create the baseline panorama, the photographs from the viewpoint are digitally joined using PTGui software to form a planar or cylindrical projection image or panorama using computer software to remove ‘barrel distortion’ caused by the camera lens. There are practical limitations to shooting viewpoint photographs only in very good or excellent

¹⁹ <https://www.metoffice.gov.uk/services/data/datapoint/code-definitions>

visibility and at particular times of day or from location that avoid foreground clutter or other vertical features such as telegraph poles, particularly where this is a true representation of the view from that viewpoint area.

Wireline or Wireframe Production

- 1.9.13 The wirelines and photomontages are produced using Resoft Wind Farm© software to generate a perspective view of the wind farm. This software creates a 3D computer model of the existing landscape and the Proposed Development using digital terrain data and models representing the specified geometry and position of the proposed turbines. The computer model includes the entire LVIA Study Area, and all visualisations take account of the effects caused by atmospheric refraction and the Earth's curvature. The computer model does not take account of the screening effects of any intervening objects and forestry, unless specified on individual figures.
- 1.9.14 A wireline of the Proposed Development and the existing landform is generated for each viewpoint within the LVIA Study Area. These wirelines are used to assist the assessment on location at each viewpoint, the position of which, if required, is adjusted on site to achieve the most visible vantage-point of the Proposed Development (e.g. to avoid buildings, forestry, other features, potentially interfering with the view).

Photomontage Production

- 1.9.15 Visualisations are produced for the agreed viewpoints identified in the LVIA and photomontages aim to provide a photorealistic image of the appearance of the Proposed Development. 3D model representations are combined with the baseline view photographs to create a photorealistic rendered photomontage image of the development.
- 1.9.16 Visualisations that illustrate the Proposed Development are produced using a range of computer software, most commonly in this case Resoft WindFarm©. Others such as True View and 3D AutoCAD or Studio Max are also used for example.
- 1.9.17 The photomontage is produced by digitally combining or superimposing the wireline / wireframe or computer generation 3D model of the landscape and the Proposed Development onto the baseline photograph and rendering this in order to add colour, texture and lighting effects.
- 1.9.18 To produce the photomontage, the wireline turbines are rendered to appear 'life-like' taking into account the time of the photography and weather conditions occurring on the day.
- 1.9.19 The completed panoramas, wirelines, photomontages and accompanying data are then presented as figures using desktop publishing/graphic design software.

Limitations of Visualisations

- 1.9.20 The photomontage visualisations used in the LVIA are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs. SNH guidance advises that beyond 20km the visibility of turbines in the printed photomontages is difficult to see or reproduce realistically.
- 1.9.21 The photomontage visualisations of the Proposed Development have a number of limitations when using them to form a judgement on visual effect. These include:

- A visualisation can never show exactly what a Proposed Development will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
- The images provided give a reasonable impression of the scale and the distance to the Proposed Development but can never be 100% accurate to the as constructed effect;
- A static image cannot convey movement such as turbine blade rotation or other features such as the movement of water or the reflection from the sun. The assessment however will take account of turbine movement by examining animated versions of the photomontages on screen and / or other examples of operational wind farm development on site;
- The viewpoints illustrated are representative of views in the area but cannot represent visibility at all locations;
- To form the best impression of the effects, these images are best viewed at the viewpoint location shown;
- The visualisations must be printed and viewed at the correct size as indicated on the figures; and
- Images should be held flat at a comfortable arm's length. If viewing these images on a wall or board at an exhibition, stand at arm's length from the image presented to gain the best impression.

1.9.22 It is preferable to view printed images rather than view images on screen. Images on screen should be viewed using a normal PC screen with the image enlarged to the full screen height to give a realistic impression.

1.10 Glossary of Terms and Abbreviations

1.10.1 Note: Those descriptions marked with an asterisk are as per the terminology provided in the GLVIA3¹ glossary.

Term/abbreviation	Definition
AOD	Above Ordnance Datum
AoV	Angle of View
Artificial light	Light produced by electrical means.
BT	Blade Tip
Candela	A unit of measure of luminous intensity, in a given direction.
CLVIA	Cumulative Landscape and Visual Impact Assessment
Constant light	Uninterrupted light source over a given time period.
Cumulative effects*	Additional changes caused by a proposed development in conjunction with other similar developments or as a combined effect of a set of developments, taken together

Term/abbreviation	Definition
Cumulative landscape effects	Effects that 'can change either the physical fabric or character of the landscape, or any special values attached to it' (NatureScot, 2021)
Cumulative visual effects: In combination In succession Sequentially	Effects that can be caused by combined visibility, which 'occurs where the observer is able to see two or more developments from one viewpoint' and/or sequential effects which 'occur when the observer has to move to another viewpoint to see different developments' (NatureScot, 2021) • In combination: Where two or more developments are or would be within the observer's arc of vision at the same time without moving his/her head (GLVIA3¹, Table 7.1). • In succession: Where the observer has to turn his/her head to see the various developments – actual and visualised (GLVIA3¹, Table 7.1). • Sequential cumulative effect. Occurs where the observer has to move to another viewpoint to see the same or different developments. Sequential effects may be assessed for travel along regularly used routes such as major roads or popular paths (GLVIA3¹, Table 7.1).
Darkness survey	Visual survey the night-time environment and the identification of artificial light sources.
Development*	Any proposal that results in change to the landscape and/or visual environment.
Degree of change	A combination of the scale, extent and duration of an effect also defined as 'magnitude'.
Designated Landscape*	Areas of landscape identified as being of importance at international, national or local levels, either defined by statute or identified in development plans or other documents.
Direct light	The artificial light source is visible. Note that light emanating from the window of a building is considered to be a 'direct' light source.
DTM	Digital Terrain Model
EIA	Environmental Impact Assessment
Elements*	Individual parts which make up the landscape, such as, for example, trees, hedges and buildings.
Enhancement*	Proposals that seek to improve the landscape resource of the site and its wider setting beyond its baseline condition.
Environmental fit	The relationship of a development to identified environmental opportunities and constraints in its setting.
Feature*	Particularly prominent or eye-catching elements in the landscape such as tree clumps, church towers or wooded skylines OR a particular aspect of the project proposal.
FoV	Field of View – the horizontal angle of the view illustrated in a visualisation.

Term/abbreviation	Definition
Geographical Information System (GIS)	A system that captures, stores, analyses, manages and presents data linked to location. It links spatial information to a digital database.
GLVIA3	Guidelines for Landscape and Visual Impact Assessment, Third Edition, published jointly by the Landscape Institute and Institute of Environmental Management and Assessment, 2013.
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
HH	Hub Height
Historic Landscape Characterisation (HLC) and Historic Land-use Assessment (HLA)	Historic characterisation is the identification and interpretation of the historic dimension of the present-day landscape or townscape within a given area. HLC is the term used in England and Wales, HLA is the term used in Scotland.
Indirect effects*	Direct effects relate to the host landscape and concern both physical and perceptual effects on the receptor. Indirect effects relate to those landscapes and receptors which separated by distance or remote from the development and therefore are only affected in terms of visual or perceptual effects. The Landscape Institute also defines indirect effects as those which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.
Indirect light	The light source is not visible but the light emanating from the source is apparent.
Infrared light	A type of light not visible to the human eye.
Iterative design process	The process by which project design is amended and improved by successive stages of refinement which respond to growing understanding of environmental issues.
Key characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
LANDMAP	LANDMAP is a whole landscape approach that covers all landscapes, designated and non-designated, it covers the natural, rural, peri-urban and urban areas in Wales, (excluding the Cities of Cardiff and Swansea), it includes inland waters and coastal areas to the low water mark. LANDMAP is an all-Wales GIS (Geographical Information System) based landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated into a nationally consistent data set. In Wales, LANDMAP is the formally adopted methodology for landscape assessment and is advocated by Planning Policy Wales.
Land cover	The surface cover of the land, usually expressed in terms of vegetation cover or lack of it. Related to but not the same as land use.

Term/abbreviation	Definition
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity.
Landscape Character Assessment	The process of identifying and describing variation in the character of the landscape, and using this information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscapes distinctive. The process results in the production of a Landscape Character Assessment.
Landscape character*	A distinct, recognisable, and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape classification	A process of sorting the landscape into different types using selected criteria but without attaching relative values to different sorts of landscape.
Landscape constraints	Components of the landscape resource such as views or mature trees recognised as constraints to development. Often associated with landscape opportunities.
Landscape effects*	Effects on the landscape as a resource in its own right. An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. (GLVIA3¹, Para 5.1).
Landscape fit	The relationship of a development to identified landscape opportunities and constraints in its setting.
Landscape patterns	Spatial distributions of landscape elements combining to form patterns, which may be distinctive, recognisable, and describable e.g. hedgerows and stream patterns.
Landscape quality (condition)*	A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape qualities	A term used to describe the aesthetic or perceptual and intangible characteristics of the landscape such as scenic quality, tranquillity, sense of wildness or remoteness. Cultural and artistic references may also be described here.
Landscape receptors *	Defined aspects of the landscape resource that have the potential to be affected by a proposal
Landscape resource	The combination of elements that contribute to landscape context, character, and value.
Landscape sensitivity	The sensitivity of the landscape to a particular development considers the susceptibility of the landscape and its value.

Term/abbreviation	Definition
Landscape strategy	The overall vision and objectives for what the landscape should be like in the future, and what is thought to be desirable for a particular landscape type or area as a whole, usually expressed in formally adopted plans and programmes or related documents.
Landscape value*	The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons. The value of the landscape units that may be affected, based on review of any designations at both national and local levels, and, where there are no designations, judgements based on criteria that can be used to establish landscape value.
Level of effect	Determined through the combination of sensitivity of the receptor and the proposed magnitude of change brought about by the development.
Lux	A unit of illumination, the amount of light on a surface per unit area.
Magnitude (of effect)*	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration.
Mitigation	Measures which are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible remedy identified effects. (GLVIA3 ¹ , Para 3.37).
NRW	Natural Resources Wales
Natural light	Light supplied by the sun, directly or indirectly, the moon and stars.
Perception	Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).
Perceptual Aspects	A landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity. (GLVIA3 ¹ , Box 5.1)
Photomontage*	A visualisation which superimposes an image of the proposed development upon a photograph or series of photographs.
Beneficial or Adverse Types of Landscape Effect	The landscape effects may be beneficial, neutral, or adverse. In landscape terms – a beneficial effect would require development to add to the landscape quality and character of an area. Neutral landscape effects would include low or negligible changes that may be considered as part of the ‘normal’ landscape processes such as maintenance or harvesting activities. A adverse effect may include the loss of landscape elements such as mature trees and hedgerows as part of construction leading to a reduction in the landscape quality and character of an area.
Beneficial or Adverse Types of Visual Effect	The visual effects may be beneficial, neutral, or adverse. In visual terms – beneficial or adverse effects are less easy to define or quantify and require a subjective consideration of a number of factors affecting

Term/abbreviation	Definition
	the view, which may be beneficial, neutral, or adverse. Opinions as to the visual effects of wind energy developments vary widely, however it is not the assumption of this assessment that all change, including substantial levels of change is a adverse experience. Rather this assessment has considered factors such as the visual composition of the landscape in the view together with the design and composition, which may or may not be reasonably, accommodated within the scale and character of the landscape as perceived from the receptor location.
Probability of Effect	The probability of a landscape and visual effect occurring as a result of this Development should be regarded as certain, subject to the stated project design and the continuance of the existing, baseline landscape resource, including known changes such as other permitted wind farm development. The probability of cumulative effects however is variable. Whereas those effects related to existing wind energy development and those under construction are considered as certain, effects related to development with planning consent are only considered as likely. Wind energy development sites for which there is a submitted planning application are considered as uncertain and other wind energy development for which no planning application has been made are considered as uncertain / unknown, as the level of uncertainty would be greater.
Proximity activated lighting	Lighting which is turned on by the detection of moving objects, such as aircraft detected by radar.
Rarity	The presence of rare elements or features in the landscape or the presence of a rare Landscape Character Type. (GLVIA3 ¹ , Box 5.1)
RD	Rotor Diameter
Receptor	Physical landscape resource, special interest, or viewer group that will experience an effect.
Recreation Value*	Evidence that the landscape is valued for recreational activity where experience of the landscape is important. (GLVIA3 ¹ , Box 5.1)
Representativeness*	Whether the landscape contains a particular character and/or features or elements which are considered particularly important examples.
Residual effects	Likely environmental effects, remaining after mitigation.
Scale Indicators	Landscape elements and features of a known or recognisable scale such as houses, trees, and vehicles that may be compared to other objects, where the scale of height is less familiar, to indicate their true scale.
Scenic quality	Depends upon perception and reflects the particular combination and pattern of elements in the landscape, its aesthetic qualities, its more intangible sense of place or 'genius loci' and other more intangible qualities. (GLVIA3 ¹ , Box 5.1)
Seascape	Landscapes with views of the coast or seas, and coasts and adjacent marine environments with cultural, historical and archaeological links with each other.

Term/abbreviation	Definition
Sense of Place (genius loci)	The essential character and spirit of an area: 'genius loci' literally means 'spirit of the place'.
Sensitivity*	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value associated to that receptor.
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Significant Effects	It is a requirement of the EIA Regulations to determine the likely significant effects of the development on the environment which should relate to the level of an effect and the type of effect. The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and the sensitivity of the receptor) that should be attached to the impact described. Whether or not an effect should be considered significant is not absolute and requires the application of professional judgement. Significant – 'noteworthy, of considerable amount or effect or importance, not insignificant or negligible'. The Concise Oxford Dictionary. Those levels and types of landscape and visual effect likely to have a major or important / noteworthy or special effect of which a decision maker should take particular note.
Sky glow	The brightness of the night sky in a built-up area as a result of light pollution, apparent as a diffuse artificial light in the sky above major towns and cities.
SNH	Scottish Natural Heritage (now NatureScot)
Susceptibility*	The ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences.
Sustainability*	The principle that the environment should be protected in such a condition and to such a degree that ensures new development meets the needs of the present without compromising the ability of future generations to meet their own needs.
Temporary or permanent effects	Effects may be considered as temporary or permanent. In the case of wind energy development the application is for a 30-year period after which the assessment assumes that decommissioning will occur and that the site will be restored. For these reasons the development is referred to as long term and reversible.
Time depth	Historical layering – the idea of landscape as a 'palimpsest', a much written-over asset of landscape.
Townscape	The character and composition of the built environment including the buildings and the relationships between them, the different types of urban open space, including green spaces, and the relationship between buildings and open spaces.

Term/abbreviation	Definition
True View Visuals	A mobile 3D augmented reality (AR) tool used to aid with the assessment. The True View Visuals tool indicates visibility of the Proposed Development to assist in confirming viewpoint positions as well as indicating limited or no visibility of turbines in particular locations. Whilst the images are indicative only, the AR tool provides a comparable image to the accurate wirelines produced.
Type or Nature of effect	Whether an effect is direct or indirect, temporary or permanent, beneficial (positive), neutral or adverse (negative) solus or cumulative.
Viewpoints	Selected for illustration of the visual effects fall broadly into three groups: • Representative Viewpoints: selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example certain points may be chosen to represent the view of users of particular public footpaths and bridleways. • Specific Viewpoints: chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, such as landscapes with statutory landscape designations or viewpoints with particular cultural landscape associations. • Illustrative Viewpoints: chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations. (GLVIA3¹, Para 6.19)
Visual amenity	The overall views and surroundings, which provide a visual setting or backdrop to the activities of people living, working, participating in recreational activities, visiting or travelling through an area.
Visual dominance	A visual effect often referred to in respect of residential properties that in relation to development would be subject to blocking of views, or reduction of light / shadowing, and high levels of visual intrusion.
Visual effect*	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors*	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visual sensitivity	The sensitivity of visual receptors such as residents, relative to their location and context, to visual change proposed by development.
Visualisation	Computer visualisation, photomontage, or other technique to illustrate the appearance of the development from a known location.
Wireline / Wireframe	A computer-generated line drawing of the DTM (digital terrain model) and the proposed development from a known location.
Zone of Theoretical Visibility (ZTV)*	A map, usually digitally produced, showing areas of land within which, a development is theoretical visible.

APPENDIX C: NON-DESIGNATED HISTORIC ASSETS

Appendix C outlines non designated historic assets, in accordance with the Regional Gwent Glamorgan Archaeological Trust (GGAT).

Table C-1: Non-designated historic assets within 1km of Northern Array (Heneb/ GGAT HER 2025)

HER Ref	Asset Name	Period	Type	Easting	Northing
GGAT01491.0m	Llynfi and Ogmore Railway	Post Medieval	Railway	287500	192500
GGAT02503m	Irregular Enclosure, Pantyffold	Unknown	Farmstead Enclosure	287028	192264
GGAT02504m	Platform House, Pantyffold (1 of 2) Maesteg	Medieval	Long Hut	287000	192240
GGAT02505m	Platform House, Pantyffold (2 of 2) Measteg	Medieval	Long Hut	287000	192240
GGAT02506m	Circular Platform, Pantyffold (1 of 2)	Unknown	Earthwork	287000	192240
GGAT02507m	Circular Platform, Pantyffold (2 of 2)	Unknown	Earthwork	287000	192240
GGAT03394m	Bannau Level I	Post Medieval	Colliery	286742	193573
GGAT03395m	Bannau Level II	Post Medieval	Colliery	286823	193534
GGAT03403m	Cwmdu Sheepfold I	Post Medieval	Sheep Fold	288030	192585
GGAT03404m	Cwmdu Sheepfold III	Post Medieval	Sheep Fold	287820	192528
GGAT03405m	Cwmdu Sheepfold IV	Post Medieval	Sheep Fold	287795	192349

HER Ref	Asset Name	Period	Type	Easting	Northing
GGAT03406m	Cwmdu Sheepfold V	Post Medieval	Sheep Fold	287520	192279
GGAT03407m	Cwmdu Structure I	Unknown	Structure	287669	192578
GGAT03408m	Cwmdu Structure II	Unknown	Structure	287850	192445
GGAT03409m	Quarry, Cwmdu	Post Medieval	Quarry	287850	192493
GGAT03410m	Tramway, Blaen Cwmdu	Post Medieval	Tramway	287725	192345
GGAT03465m	Blaen-cwmdu Coal Level I	Post Medieval	Colliery	287914	192364
GGAT03466m	Dunraven Quarry	Modern	Quarry	287004	193206
GGAT03467m	Dunraven Trail Shaft	Post Medieval	Shaft	286968	193383
GGAT03469m	Blaen-cwmdu Coal Level II	Post Medieval	Colliery	287784	192211
GGAT03470m	Blaen-cwmdu Coal Shaft I	Post Medieval	Shaft	287781	192279
GGAT03479m	Dunraven Sheepfold	Post Medieval	Sheep Fold	286718	193356
GGAT03499m	Dunraven Tramway II	Post Medieval	Tramway	286734	193647
GGAT03500m	Dunraven Tramway I	Post Medieval	Tramway	286774	193609
GGAT03503m	Quarry I, Cwmdu	Modern	Quarry	287696	192556
GGAT03515m	Sheepfold, Ogmored Cwmdu	Post Medieval	Sheep Fold	287839	192883
GGAT03516m	Coal Level, Blaen-Cwmdu	Post Medieval	Colliery	287827	192143

HER Ref	Asset Name	Period	Type	Easting	Northing
GGAT03550.0m	Parish boundaries, Maesteg	Medieval	Hedge	287321	192568
GGAT04197m	Mynydd Bach 1	Medieval	Shelter	286350	192803
GGAT04198m	Mynydd Bach 2	Medieval	Shelter	286360	192500
GGAT04205m	Boundary, Maesteg	Medieval	Boundary	286390	192500
GGAT06607m	Old Coal level, Blaen Cwmdu, Maesteg	Post Medieval	Level	287722	192009
GGAT06610m	Tramway, Blaen Cwmdu, Maesteg	Post Medieval	Tramway	287745	192185
GGAT06611m	Cwm-du-cottage, Blaen Cwmdu, Maesteg	Unknown	Cottage	287534	191817
GGAT06612m	Old coal level, Blaen Cwmdu, Maesteg	Post Medieval	Level	287405	191962
GGAT09171m	Tor-cerryg Farmstead	Post Medieval	Farmstead	287203	192269

Table C-2: Non-designated historic assets within 1km of the Northern Array (RCAHMW NMR)

NMR Ref	Asset Name	Period	Type	Easting	Northing
86933	Cwm Du Colliery and Ironstone Quarry	Post Medieval	Coal Workings; Ironstone Workings	287676	191917
86986	Old Coal & Ironstone Mining & Quarrying Features on Mynydd Bach Above Coegnant	Post Medieval	Coal Workings; Ironstone Workings	286221	193280

NMR Ref	Asset Name	Period	Type	Easting	Northing
516208	Pant y Ffald, Sheep Fold I	Post Medieval	Sheep Fold	287032	192622
516209	Pant y Ffald, Sheep Fold II	Post Medieval	Sheep Fold	286875	192464
516211	Cae'r Defaid, Reservoir I	Post Medieval	Reservoir	286688	192118
516212	Cae'r Defaid, Building II	Post Medieval	Building; Building; Building	286814	192037
516213	Cae'r Defaid, Level XI	Post Medieval	Level	286420	192107
516214	Cae'r Defaid, Level XII	Post Medieval	Level	286560	192079
516215	Cae'r Defaid, Level XIII	Post Medieval	Level	286648	192036
516216	Cae'r Defaid, Level XIV	Post Medieval	Level	286623	192186
516217	Cae'r Defaid, Air Shaft	Post Medieval	Ventilation Shaft	286521	192304
516219	Cae'r Defaid, Winding Drum I	Post Medieval	Winding Drum	286306	192157
516220	Cae'r Defaid, Reservoir II	Post Medieval	Reservoir	286351	192322
516221	Mynydd Bach, Level XXI	Post Medieval	Level	286294	192382
516229	Mynydd Bach, Quarry I	Post Medieval	Quarry	286566	192593
516230	Mynydd Bach, Quarry II	Post Medieval	Quarry	286453	192758
516231	Mynydd Bach, Quarry III	Post Medieval	Quarry	286737	192862
516232	Mynydd Bach, Quarry IV	Post Medieval	Quarry	286701	192885
516233	Mynydd Bach, Trial Shaft II	Post Medieval	Trial Mine	286518	193012

NMR Ref	Asset Name	Period	Type	Easting	Northing
516234	Mynydd Bach, Air Shaft	Post Medieval	Ventilation Shaft	286494	193088
516235	Mynydd Bach, Level XXIII	Post Medieval	Level	286580	193212
516331	Cae'r Defaid, Level VII	Post Medieval	Level	286395	191996
516332	Cae'r Defaid, Tramway X	Post Medieval	Tramway	286552	192000
516333	Cae'r Defaid, Tramway XI	Post Medieval	Tramway	286549	191941
516334	Cae'r Defaid, Tramway VIII	Post Medieval	Tramway	286527	191968
516335	Cae'r Defaid, Tramway VII	Post Medieval	Tramway	286727	191958
516336	Cae'r Defaid, Spoil Heap V	Post Medieval	Spoil Heap	286810	191902
516337	Cae'r Defaid, Building I	Post Medieval	Building; Building; Building	286834	191934
516338	Cae'r Defaid, Quarry VI	Post Medieval	Quarry	286808	191980
516339	Cae'r Defaid, Spoil Heap VII	Post Medieval	Spoil Heap	286774	191939
516340	Cae'r Defaid, Spoil Heap X	Post Medieval	Spoil Heap	286751	191971
516341	Cae'r Defaid, Slag Heap	Post Medieval	Slag Heap	286670	192065
516342	Cae'r Defaid, Engine House I	Post Medieval	Engine House	286651	192077
516343	Cae'r Defaid, Winding Drum IV	Post Medieval	Winding Drum	286668	192117
516344	Cae'r Defaid, Spoil Heap VIII	Post Medieval	Spoil Heap	286620	192147

NMR Ref	Asset Name	Period	Type	Easting	Northing
516362	Cae'r Defaid, Quarry I	Post Medieval	Quarry	286197	192244
516366	Cae'r Defaid, Trial Working	Post Medieval	Trial Mine	286099	192449
516367	Cae'r Defaid, Bank I	Post Medieval	Boundary Bank	286118	192447
516368	Cae'r Defaid, Bank II	Post Medieval	Boundary Bank	286171	192410
516369	Cae'r Defaid, Wall	Post Medieval	Wall	286180	192402
516370	Cae'r Defaid, Tramway IX	Post Medieval	Tramway	286247	192364
516371	Cae'r Defaid, Structure I	Post Medieval	Shelter; Structure; Structure; Structure; Structure	286475	192284
516380	Mynydd Bach, Level II	Post Medieval	Level	286066	192677
516382	Mynydd Bach, Spoil Heap XII	Post Medieval	Spoil Heap	286033	192719
516383	Mynydd Bach, Level II	Post Medieval	Ironstone Mine	286085	192760
516384	Mynydd Bach, Spoil Heap XIV	Post Medieval	Spoil Heap	286057	192761
516385	Mynydd Bach, Quarry X	Post Medieval	Quarry	286109	192793
516386	Mynydd Bach, Wall	Post Medieval	Wall	286166	192833
516387	Mynydd Bach, Tramway VI	Post Medieval	Tramway	286061	192825
516388	Mynydd Bach, Level XV	Post Medieval	Level	286229	192842
516389	Mynydd Bach, Quarry VII	Post Medieval	Quarry	286256	192869

NMR Ref	Asset Name	Period	Type	Easting	Northing
516390	Mynydd Bach, Level XVII	Post Medieval	Level	286331	192931
516391	Mynydd Bach, Spoil Heap XV	Post Medieval	Spoil Heap	286306	192943
516392	Mynydd Bach, Spoil Heap XVI	Post Medieval	Spoil Heap	286346	192991
516393	Mynydd Bach, Level XVIII	Post Medieval	Level	286375	192971
516394	Mynydd Bach, Quarry XI	Post Medieval	Quarry	286431	193044
516395	Mynydd Bach, Linear Earthwork	Post Medieval	Trackway; Tramway	286403	193086
516396	Mynydd Bach, Trackway I	Post Medieval	Tramway; Trackway	286434	193155
516397	Mynydd Bach, Spoil Heap XVIII	Post Medieval	Spoil Heap	286419	193209
516398	Mynydd Bach, Level XIII	Post Medieval	Level	286448	193367
516399	Mynydd Bach, Structure IV	Post Medieval	Structure; Structure; Structure; Structure	286466	193373
516400	Mynydd Bach, Structure II	Post Medieval	Shelter	286143	192842
516401	Mynydd Bach, Level XII	Post Medieval	Level	286447	193204
516402	Mynydd Bach, Shelter II	Post Medieval	Shelter	286570	193273
516403	Mynydd Bach, Shelter III	Post Medieval	Shelter	286567	193267
516404	Mynydd Bach, Shelter VII	Post Medieval	Shelter	286504	193147
516405	Mynydd Bach, Level XX	Post Medieval	Level	286470	192918

NMR Ref	Asset Name	Period	Type	Easting	Northing
516406	Mynydd Bach, Level XIX	Post Medieval	Level	286322	192782
516407	Cae'r Defaid, Tramway V	Post Medieval	Tramway	286287	192089
516409	Cae'r Defaid, Level IX	Post Medieval	Level	286262	192160
516410	Cae'r Defaid, Watercourse	Post Medieval	Watercourse	286330	192183
516411	Cae'r Defaid, Tramway IV	Post Medieval	Tramway	286503	192159
516412	Cae'r Defaid, Platform	Post Medieval	Platform	286336	192149
516413	Cae'r Defaid, Linear Earthwork	Post Medieval	Tramway; Trackway	286478	192146
516414	Cae'r Defaid, Tramway I	Post Medieval	Trackway; Tramway	286343	192214
516415	Cae'r Defaid, Hollow III	Post Medieval	Trial Mine	286432	192305
516416	Tor Cerrig, Level	Modern; Post Medieval	Level	287330	192395
516417	Cae'r Defaid, Tramway II	Post Medieval	Tramway	286622	192264
516418	Cae'r Defaid, Spoil Heap XI	Post Medieval	Spoil Heap	286531	192284
516419	Cae'r Defaid, Spoil Heap I	Post Medieval	Spoil Heap	286582	192258
516420	Cae'r Defaid, Spoil Heap II	Post Medieval	Spoil Heap	286673	192247
516421	Cae'r Defaid, Tramway III	Post Medieval	Tramway	286724	192245
516422	Cae'r Defaid, Spoil Heap III	Post Medieval	Spoil Heap	286752	192202
516423	Cae'r Defaid, Level VIII	Post Medieval	Level	286757	192262

NMR Ref	Asset Name	Period	Type	Easting	Northing
516424	Cae'r Defaid, Spoil Heap IV	Post Medieval	Spoil Heap	286771	192255
516425	Cae'r Defaid, Spoil Heap VI	Post Medieval	Spoil Heap	286835	192250
516426	Tor Cerrig, Wall	Post Medieval	Wall	286967	192348
516427	Tor Cerrig, Long Hut	Post Medieval; Medieval	Long Hut	287197	192365
516428	Tor Cerrig, Shelter	Post Medieval	Shelter; Sheep Fold	287200	192397
516429	Pant y Ffald, Wall	Post Medieval	Wall	287115	192498
516430	Pant y Ffald, Long Hut	Post Medieval; Medieval	Long Hut	286880	192609
516431	Mynydd Bach, Quarry XII	Post Medieval	Quarry	286632	192574
516432	Mynydd Bach, Quarry IX	Post Medieval	Quarry	286593	192583
516433	Mynydd Bach, Quarry VI	Modern	Shelter	286574	192603
516435	Mynydd Bach, Shelter I	Post Medieval	Shelter	286567	192627
516436	Mynydd Bach, Structure III	Post Medieval	Shelter	286725	192824
516437	Mynydd Bach, Quarry XIV	Post Medieval	Quarry	286759	192836
516438	Mynydd Bach, Cairn III	Bronze Age	Cairn	286781	192853
516439	Mynydd Bach, Cairn I	Bronze Age	Cairn	286777	192928
516440	Mynydd Bach, Shelter IV	Post Medieval	Shelter	286814	192803
516441	Mynydd Bach, Shelter V	Post Medieval	Shelter	286481	192519

NMR Ref	Asset Name	Period	Type	Easting	Northing
516442	Mynydd Bach, Shelter VI	Post Medieval	Shelter	286511	192534
516445	Mynydd Bach, Tramway V	Post Medieval	Tramway	286202	193338
516446	Mynydd Bach, Spoil Heap XXIII	Post Medieval	Spoil Heap	286231	193321
516447	Mynydd Bach, Ironstone Level	Post Medieval	Ironstone Mine	286291	193315
516448	Mynydd Bach, Tramway I	Post Medieval	Tramway	286273	193359
516449	Mynydd Bach, Building II	Post Medieval	Mine Building	286398	193362
516450	Mynydd Bach, Spoil Heap XXII	Post Medieval	Spoil Heap	286388	193348
516451	Mynydd Bach, Spoil Heap XXI	Post Medieval	Spoil Heap	286380	193376
516453	Mynydd Bach, Spoil Heap XIX	Post Medieval	Spoil Heap	286389	193404
516454	Mynydd Bach, Tramway X	Post Medieval	Tramway	286404	193437
516455	Mynydd Bach, Quarry XIII	Post Medieval	Quarry	286411	193435
516456	Mynydd Bach, Tramway VIII	Post Medieval	Tramway	286504	193524
516457	Mynydd Bach, Level XIV	Post Medieval	Level	286500	193507
516458	Mynydd Bach, Spoil Heap VIII	Post Medieval	Spoil Heap	286477	193518
516459	Mynydd Bach, Quarry VIII	Post Medieval	Quarry	286477	193463
516462	Mynydd Bach, Level XVI	Post Medieval	Level	286413	193525

NMR Ref	Asset Name	Period	Type	Easting	Northing
516463	Mynydd Bach, Spoil Heap IX	Post Medieval	Spoil Heap	286394	193514
516464	Mynydd Bach, Tramway III	Post Medieval	Tramway	286428	193519
516465	Mynydd Bach, Trial Shaft I	Post Medieval	Trial Mine	286371	192879
516466	Mynydd Bach, Spoil Heap I	Post Medieval	Spoil Heap	286483	193541
516467	Mynydd Bach, Spoil Heap II	Post Medieval	Spoil Heap	286480	193558
516468	Mynydd Bach, Spoil Heap III	Post Medieval	Spoil Heap	286453	193535
516469	Mynydd Bach, Shaft	Post Medieval	Mine Shaft	286530	193559
516470	Mynydd Bach, Level X	Post Medieval	Level	286504	193547
516471	Mynydd Bach, Spoil Heap VI	Post Medieval	Spoil Heap	286495	193574
516472	Mynydd Bach, Level IV	Post Medieval	Level	286497	193590
516473	Mynydd Bach, Spoil Heap	Post Medieval	Spoil Heap	286486	193609
516474	Mynydd Bach, Spoil Heap IV	Post Medieval	Spoil Heap	286461	193581
516475	Mynydd Bach, Level VII	Post Medieval	Level	286425	193586
516476	Mynydd Bach, Level I	Post Medieval	Level	286416	193576
516478	Mynydd Bach, Earthwork	Post Medieval	Winding Drum	286612	193380
516479	Mynydd Bach, Tramway II	Post Medieval	Tramway	286565	193384
516480	Mynydd Bach, Quarry V	Post Medieval	Quarry	286613	193528

NMR Ref	Asset Name	Period	Type	Easting	Northing
516481	Mynydd Bach, Structure I	Post Medieval	Sheep Fold	286642	193263
516816	Mynydd Bach, Bank III	Post Medieval	Bank (Earthwork)	286052	192885
516817	Mynydd Bach, Marker Cairn	Modern; Post Medieval	Marker Cairn	286737	192858
516818	Mynydd Bach, Trackway II	Post Medieval	Trackway	286348	192702
516819	Mynydd Bach, Bank II	Post Medieval	Bank (Earthwork)	286245	192710
516826	Mynydd Bach, Tramway IX	Post Medieval	Tramway	286491	193523
516827	Mynydd Bach, Bank I	Post Medieval	Bank (Earthwork)	286532	193566
516828	Cae'r Defaid, Spoil Heaps	Post Medieval	Spoil Heap Complex	286744	192054
516829	Cae'r Defaid, Level X	Post Medieval	Level	286651	192017
516830	Cae'r Defaid, Hollow I	Post Medieval	Trial Mine	286429	192278
516831	Cae'r Defaid, Hollow IV	Post Medieval	Trial Mine	286426	192266
516832	Mynydd Bach, Cairn II	Bronze Age	Cairn	286795	192839
516848	Mynydd Bach, Field System I	Post Medieval	Field System	286572	192377
516849	Mynydd Bach, Field System II	Post Medieval	Field System	286475	193095
516896	Pant y Ffald, Sheep Fold III	Post Medieval	Sheep Fold	286880	192472
516927	Cae'r Defaid, Quarry VIII	Post Medieval	Quarry	286564	192290
516928	Cae'r Defaid, Spoil Heap	Post Medieval	Spoil Heap	286429	192038

NMR Ref	Asset Name	Period	Type	Easting	Northing
705287	Spelter Industrial Estate	20th Century	Industrial Estate	286301	193350

Table C-3: Events recorded within 1km of the Northern Array (Heneb/ GGAT HER 2025)

HER Ref	Asset Name	Type	Organisation	Easting	Northing
GGATE003458	Site Visit to Mynydd Bach deserted rural settlement	Field Visit	Glamorgan-Gwent Archaeological Trust (GGAT)	286717	192523
GGATE006003	Uplands Survey West Glamorgan	Field Survey	Trysor	286980	192670

Table C-4: Non-designated historic assets within 1km of Southern Array (RCAHMW NMR)

NMR Ref	Asset Name	Period	Type	Easting	Northing
9557	St Paul's, Pontycymer	Post Medieval	Chapel	290001	190999
9553	Nazareth Calvinistic Methodist Chapel, Bryn Villa s, Lluest, Pont-y-Rhyl	Post Medieval	Chapel	290731	189359
9540	Carmel Independent Chapel, Pont-yr-Hyl	Post Medieval	Chapel	290471	189639
86990	Moel Cynhordy Mine Workings	Post Medieval	Coal Workings	288101	190099
86989	Pont Rhyd-y-Cyff Mining Remains	Post Medieval	Coal Workings	287601	189200
523346	Lluest Cottages	19th Century; 20th Century; 21st Century; Post Medieval	Settlement	290745	189233

NMR Ref	Asset Name	Period	Type	Easting	Northing
523288	Nant Llwyn Cria	Post Medieval; 19th Century	Quarry	290762	189307
523287	Ty'n y Crier	Post Medieval	House	290729	189296
420756	St Mary's Church, Pontyrhyl	19th Century	Church	290448	189579
408381	Garth Hill House Platforms	Medieval	House Platform	287371	190210
402659	Lluest Colliery [Disused] , Pont-y-Rhyl	Unknown	Coal Mine	290601	189399
34817	Llangynwyd Viaduct	Post Medieval	Viaduct	287451	189320
307408	Croes-y- Bwlchgwyn, Mound	Unknown	Round Barrow	288911	190779
305727	Moel Cynhordy	Medieval; Post Medieval	Platform; House	289101	189769
305726	Craig-yr-Hudol	Post Medieval; Medieval	Platform; House	289681	188599
19755	Pont-y-Cymmer View	Post Medieval	Dwelling	290001	190999
13801	Methodist Church, Pont-y- Rhyl,	Post Medieval	Chapel	290741	189359

APPENDIX D: DESIGNATED HISTORIC ASSETS WITHIN 1 – 5KM

6.1.1. Appendix D outlines the designated historic assets within 1-5km of the Northern and Southern Array.

Table D-1: Designated historic assets within 1 to 5km of the Development Site (Registered Landscapes of Outstanding and of Special Interest)

Registered Landscapes of Outstanding and of Special Interest		
Record/Asset Ref	Name	Register Type
HLW (WGI/MGI) 2	Margam Mountain	Special
HLW (MGI) 5	The Rhondda	Special

Table D-2: Designated historic assets within 1 to 5km of the Development Site (Scheduled Monuments)

Scheduled Monuments				
Record/Asset Ref	SAM No.	Asset Name	Easting	Northing
390	GM418	Maesteg blast furnaces	284856	191594
398	GM243	Carn y Hyrddod & Neighbouring Cairn	291883	193805
625	GM232	Mynydd Caerau Round Cairns	289044	194342
1125	GM589	Plas-y-Betws relict garden	290502	186669
2241	GM086	British Fortified Residence	286090	186827
2262	GM244	Nant Herbert Camp	281994	194031
2264	GM245	Cefn yr Argoed Camp	283225	194056
2285	GM340	Earthwork & Platform Houses N of Nant Fadog	286011	185719
2864	GM085	Llangynwyd Castle	285137	188692
2906	GM231	Clawdd Mawr, Mynydd Caerau	289483	194796

Scheduled Monuments				
Record/Asset Ref	SAM No.	Asset Name	Easting	Northing
2911	GM433	Remains of Tondur Ironworks	289172	184449
3111	GM249	Round Cairn 567m East of Bryn Defaid	288821	191641
3112	GM250	Croes y Bwlchgywyn Round Cairn	288913	190789
3361	GM092	Mynydd Ty Talwyn Ancient Farms	285652	186171
3366	GM093	Mynydd Ty Talwyn Ancient Farms	285981	186266
3438	GM499	Round Barrow on the Werfa	291370	194172
3825	GM238	Cairn Lwyd	291984	190142
3851	GM552	Garth Hill Platform House	287158	190012
3982	GM547	Cae'r Mynydd Ventilation Furnace and Mine	282797	192645
4353	GM059	Y Bwlwarcau	283778	188536
4345	GM557	Twmpath Diwlith Round Barrow	283221	188788

Table D-3: Designated historic assets within 1 to 5km of the Development Site (Listed Buildings)

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
18626	Church of St David, Bettws	I	289903	186765
11243	Church of St Cynwyd	II*	285732	188830

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
11256	Llwydarth farmhouse	II*	285865	190156
11257	Maesteg Sports Centre, The Cornstores	II*	284857	191515
11331	Iron bridge over River Llynfi	II*	285117	191531
18493	Bethania Capel y Bedyddwyr Neillduol	II*	285796	190862
18495	Salem Welsh Baptist Chapel	II*	285051	192746
18499	Maesteg Council Offices, with flanking walls and piers.	II*	285225	191309
18635	Church of St Cein	II*	292478	187941
20763	Former Blast Engine Houses at Tondy Ironworks	II*	289145	184429
20816	Calcining Kilns and attached abutment at Tondy Ironworks	II*	289142	184465
20817	Lift Tower at Tondy Ironworks	II*	289146	184450
11218	Cefn-ydfa farmhouse and adjoining ruins.	II	287761	186622
11329	Gelli-siriol farmhouse	II	287634	188011
11335	Former Truck Shop Tondy Ironworks now Foxtroy Residential Home	II	289008	184578
11352	The Old House Inn PH	II	285732	188762

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
11353	Telephone call box in front of the Old House PH	II	285718	188778
11356	Siloh Independent Chapel	II	285092	192441
11366	Tynton	II	291702	187927
11367	Tabor Eglwys Presbyteriadd Cymru	II	285426	191060
11373	Pentre Farmhouse, with attached farm range.	II	285116	189435
11375	Gilfach-ganol farmhouse	II	284900	187561
14175	Gelli Farm	II	287369	196170
14559	Tyle-coch	II	289052	187552
18492	Blast Furnace at Maesteg Sports Centre	II	284856	191566
18494	Neuadd y Dref (Town Hall)	II	285262	191312
18496	Capel Saron	II	284961	192134
18497	Cenotaph	II	285324	191381
18498	North Company Offices	II	285295	191393
18500	Church of St Michael and All Angels, Llangynwyd with Maesteg, including enclosing graveyard wall.	II	285070	191156
18501	Zoar Chapel	II	285223	191569

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
18502	Church of St David, and surrounding churchyard railed wall.	II	285338	191367
18503	Colonel North Memorial Hall	II	285314	191336
18504	Post Office	II	285320	191356
18505	William Hopkin Thomas memorial Lamp and fountain.	II	285284	191348
18506	The Star Public House	II	285117	191255
18507	Nantffyllon Workmen's Institute	II	285161	192532
18599	Former Co-operative Wholesale Society Building	II	293351	190035
18600	Finger Post at the junction of High Street and Glyn Street	II	293356	190330
18601	Bethlehem Capel Bedyddwyr, with front retaining wall and gates.	II	293331	190566
18603	Paran Capel y Bedyddwr	II	293419	186807
18605	Fox and Hounds PH	II	293377	186713
18606	Blackmill War Memorial	II	293397	186707
18607	Jenkins monument in the graveyard, Paran Chapel	II	293423	186796

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
18608	Evans chest tomb in graveyard of Paran Chapel	II	293423	186790
18609	Edwards monument in the graveyard of Paran Chapel	II	293416	186792
18610	Blaenogwr Farmhouse	II	293739	192293
18627	Bethania Capel y Bedyddwyr (Welsh Baptist Chapel)	II	290274	193040
18628	United Reformed Church including vestry wing	II	290501	191408
18629	Tabernacl Capel yr Annibynwyr (Welsh Independent) including vestry wing	II	290509	191322
18630	Former Cooperative Bakery	II	290491	191294
18631	Ffaldau Workmen's Institute and attached Billiard Hall	II	290492	191258
18632	Mortuary Chapel	II	290745	191487
18633	Monument to Benjamin and Elizabeth Noyle, Pontycymmer Cemetery	II	290734	191469
18634	Pontcymmer Cemetery Entrance	II	290708	191457
18636	Hooped Grave Cover in Llangeinor churchyard	II	292489	187924

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
18637	Ty Isaf	II	288763	187047
18638	Small Tramroad bridge over Nant Cedfyw, Shwt	II	289339	187545
20429	The Hopcyn Cross	II	285701	188786
20430	Two chest tombs on S side of the Church of St Cynwyd	II	285734	188824
20431	Group of five tombs S of the tower of the Church of St Cynwyd	II	285722	188825
20432	Bee boles and stile in garden wall at Gilfach-uchaf farm	II	284875	187583
20433	Ty'n-y-waun farmhouse	II	286542	188436
20434	Group of 4 Hopkin and Jenkins tombs within iron railings on the W side of the path to the S porch	II	285718	188805
20435	Group of nine memorials on the W side of the path to the S porch, Church of St Cynwyd	II	285717	188801
20436	Jenkins Monument in the churchyard, Church of St Cynwyd	II	285724	188801
20437	Churchyard walls around the graveyard, Church of St Cynwyd	II	285756	188802

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
20742	Cildeudy tunnel	II	288967	185371
20743	Pont-y-rhyd-ddu (partly in Garw Valley community)	II	288976	186476
20744	Walls flanking the inclined plane joining the Bettws tramway to the DLP Railway.	II	289127	185997
20745	Nicholls Arms PH	II	289099	185814
20746	Abutments to overbridge/ loading bay on the former Duffryn Llynvi and Porthcawl Railway	II	288803	185245
20747	North portal and wings of the Rock-fawr Bridge on Sir Robert Price's private tramway.	II	289330	184916
20760	Park House	II	288976	184549
20761	Park Cottage	II	288986	184553
20762	23 Derllwyn Road	II	289010	184603
20764	1-26 Park Terrace (consec)	II	288884	184484
20765	1-26 Park Terrace (consec)	II	288879	184483
20766	1-26 Park Terrace (consec)	II	288874	184482
20767	1-26 Park Terrace (consec)	II	288869	184481
20768	1-26 Park Terrace (consec)	II	288863	184480
20769	1-26 Park Terrace (consec)	II	288858	184479

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
20770	1-26 Park Terrace (consec)	II	288853	184478
20771	1-26 Park Terrace (consec)	II	288848	184477
20772	1-26 Park Terrace (consec)	II	288842	184476
20773	1-26 Park Terrace (consec)	II	288836	184476
20774	1-26 Park Terrace (consec)	II	288830	184474
20775	1-26 Park Terrace (consec)	II	288826	184474
20776	1-26 Park Terrace (consec)	II	288820	184472
20777	1-26 Park Terrace (consec)	II	288815	184472
20778	1-26 Park Terrace (consec)	II	288811	184471
20779	1-26 Park Terrace (consec)	II	288805	184470
20780	1-26 Park Terrace (consec)	II	288800	184470
20781	1-26 Park Terrace (consec)	II	288794	184468
20782	1-26 Park Terrace (consec)	II	288790	184468
20783	1-26 Park Terrace (consec)	II	288785	184467
20784	1-26 Park Terrace (consec)	II	288779	184466
20785	1-26 Park Terrace (consec)	II	288774	184465

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
20786	1-26 Park Terrace (consec)	II	288769	184464
20787	1-26 Park Terrace (consec)	II	288764	184463
20788	1-26 Park Terrace (consec)	II	288758	184462
20789	1-26 Park Terrace (consec)	II	288752	184461
20790	27-52 Park Terrace (consec)	II	288749	184480
20791	27-52 Park Terrace (consec)	II	288755	184481
20792	27-52 Park Terrace (consec)	II	288759	184482
20793	27-52 Park Terrace (consec)	II	288765	184482
20794	27-52 Park Terrace (consec)	II	288770	184483
20795	27-52 Park Terrace (consec)	II	288776	184484
20796	27-52 Park Terrace (consec)	II	288781	184486
20797	27-52 Park Terrace (consec)	II	288786	184486
20798	27-52 Park Terrace (consec)	II	288791	184487
20799	27-52 Park Terrace (consec)	II	288797	184488
20800	27-52 Park Terrace (consec)	II	288801	184490
20801	27-52 Park Terrace (consec)	II	288806	184490

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
20802	27-52 Park Terrace (consec)	II	288812	184491
20803	27-52 Park Terrace (consec)	II	288817	184492
20804	27-52 Park Terrace (consec)	II	288826	184495
20805	27-52 Park Terrace (consec)	II	288833	184494
20806	27-52 Park Terrace (consec)	II	288823	184493
20807	27-52 Park Terrace (consec)	II	288838	184496
20808	27-52 Park Terrace (consec)	II	288844	184496
20809	27-52 Park Terrace (consec)	II	288849	184497
20810	27-52 Park Terrace (consec)	II	288852	184499
20811	27-52 Park Terrace (consec)	II	288860	184499
20812	27-52 Park Terrace (consec)	II	288865	184500
20813	27-52 Park Terrace (consec)	II	288869	184501
20814	27-52 Park Terrace (consec)	II	288874	184501
20815	27-52 Park Terrace (consec)	II	288881	184504
22166	Jerusalem Baptist Chapel	II	281510	192343
22167	Kiln block at former Bryn Brickworks	II	282841	191683
23842	Cymmer Bridge	II	286006	196270

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
23843	Cymmer Viaduct	II	285778	196134
23844	Croeserw Viaduct	II	286439	196040
23845	Nantewlath including attached barn and stable	II	286488	197971
23847	Gelli Farm Cottage	II	287371	196188
23848	Old longhouse at Nantfyedw	II	287355	195800
23849	Stable at Nantfyedw	II	287363	195807
23850	Animal House at Nantewlath	II	286517	197965
23852	Bakehouse at Gelli Farm	II	287366	196151
23853	Barn and Cow House at Gelli Farm	II	287357	196177
23854	1 Gelli Houses	II	287206	196169
23855	2 Gelli Houses	II	287208	196176
23856	3 Gelli Houses	II	287209	196183
23857	4 Gelli Houses	II	287210	196191
23858	5 Gelli Houses	II	287211	196198
23859	6 Gelli Houses	II	287212	196206
23860	7 Gelli Houses	II	287213	196218
23861	8 Gelli Houses	II	287213	196225
23862	9 Gelli Houses	II	287213	196232
23863	10 Gelli Houses	II	287213	196240
23864	11 Gelli Houses	II	287214	196248
23865	12 Gelli Houses	II	287214	196256

Listed Buildings				
Record/Asset Ref	Asset Name	Grade	Easting	Northing
23866	Hebron Chapel	II	286112	196357
87889	Catholic Church of Our Lady and St Patrick	II	285506	191012

Table D-4: Designated historic assets within 1 to 5km of the Development Site (Registered Parks and Gardens)

Registered Parks and Gardens			
Record/Asset Ref	Asset Name	Grade	Asset Type
PGW(Gm)65(BRI)	Coytrahen House	II	Landscape Park; garden and walled garden
PGW(Gm)5(BRI)	Bryngarw	II	Formal terraced garden; informal woodland and water garden with Japanese overtones.

Table D-5: Designated historic assets within 1 to 5km of the Development Site (Conservation Areas)

Conservation Area Name	
Local Plan Area	Conservation Area Name
Bridgend	Derllwyn Road, Tondu
Bridgend	Llangeinor
Bridgend	Nantymoel
Bridgend	Llangynwyd
Bridgend	Maesteg Town Centre



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Pennant Walters **Maesteg Windfarms**

Preliminary Ecological Appraisal

2025-05-09

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Pennant Walters

MAESTEG WINDFARMS

PRELIMINARY ECOLOGICAL APPRAISAL

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MAESTEG WINDFARMS

PRELIMINARY ECOLOGICAL APPRAISAL

WSP

1 Capital Quarter

Tyndall Street

Cardiff

CF10 4BZ

Phone: +44 2920 769 200

WSP.com

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EXECUTIVE SUMMARY

It is understood that Pennant Walters is proposing the creation of proposed windfarms at Mynydd Pwll-yr-lwrch and Moel Cynhordy/Mynydd Moelgella (the 'Proposed Development', at the 'Sites'). Pennant Walters commissioned WSP UK Limited (WSP) to undertake a Preliminary Ecological Appraisal (PEA) of the Proposed Development. The aim was to identify habitats and assess their potential to support protected and/or notable species. The following ecological constraints that could be impacted by the Proposed Development were identified during a desk study and a habitat survey:

- Two Special Areas of Conservation (SACs) within 10 km of the Sites, and one SAC within 30 km of the Sites designated for the presence of bats.
- Three Sites of Special Scientific Interest (SSSIs) within 10 km of the Sites, the closest of which (Cwm Du Woodlands) is 0.3 km from the Sites.
- Thirty-five non-statutory designated sites within 2 km of the Site.
- Twenty-five Phase 1 habitat types within the Site, of which seven qualify or may qualify as belonging to one of six Priority Habitats.
- The potential of the Site to support bats, badger *Meles meles*, brown hare *Lepus europaeus*, hedgehog *Erinaceus europaeus*, otter *Lutra lutra*, water vole *Arvicola amphibius*, amphibians including great crested newt *Triturus cristatus*, reptiles, notable plants, and invasive non-native plants (INNS).

For the Proposed Development to comply with relevant legislation and planning policy, the following further surveys, assessments, avoidance and mitigation measures are proposed:

- A Habitats Regulations Assessment (HRA) to determine if the Proposed Development will result in Likely Significant Effects (LSE) on statutory designated sites of international importance.
- Implementation of environmental best practice to avoid impacts to the Cwm Du Woodlands SSSI, laid out in a Construction Environment Management Plan (CEMP).
- Avoidance of Priority Habitats and B-Lines within the Sites. If this is not possible, consultation with Bridgend County Council should be undertaken. For any loss of Priority Habitat, replacement habitat commensurate or greater than that lost should be provided.
- Completion of a National Vegetation Classification (NVC) survey of Priority Habitats.
- Targeted surveys for bats, otter (depending on the construction footprint), water vole, and great crested newt.
- Implementation of preliminary avoidance and/or mitigation measures for badger, reptiles, brown hare, hedgehog, common and widespread amphibian and reptile species, notable plants, and INNS, to include ecological supervision and works under a Precautionary Method of Works (PMoW).
- Implementation of enhancement measures, to include: installation of bat boxes in trees; planting of pollinator-friendly native species of local provenance; and incorporation of Sustainable Drainage (SuDS). This helps deliver biodiversity enhancement in accordance Section 6 of the Environment (Wales) Act 2016. This should be detailed in an NBB report.

The above recommendations should be re-visited following the issue of a preliminary design.

Ornithology surveys, undertaken by WSP in 2025, will be subject to a separate report. Therefore, birds are not mentioned in this report.

1. INTRODUCTION

- 1.1.1. WSP UK Ltd (WSP)¹ was commissioned by Pennant Walters to undertake a Preliminary Ecological Appraisal (PEA) of habitats to support the development of proposed windfarms at Mynydd Pwll-yr-lwrch and Moel Cynhordy/Mynydd Moelgella (hereafter referred to jointly as the 'Proposed Development'). Mynydd Pwll-yr-lwrch (Central Grid Reference SS 87112 92856) and Moel Cynhordy/Mynydd Moelgella (Central Grid Reference SS 88724 90076) are located near the town of Maesteg in Bridgend County Borough. It is anticipated that the Proposed Development will comprise wind turbine generators, access routes, and an on-site substation on each of the Sites, as well as other associated infrastructure, although a design has not yet been finalised. The footprints of the Proposed Development are hereafter referred to as the 'Sites'. The extent of the Sites are shown in Figure 1.
- 1.1.2. The Sites comprise mainly sheep-grazed open upland habitats, with marshy areas extending over large parts of the Sites, and discrete blocks of woodland. The Sites are bordered to the north (Moel Cynhordy/Mynydd Moelgella) and east (Mynydd Pwll-yr-lwrch) by Garw Forest and Caerau Forest, both of which are coniferous plantations. Moel Cynhordy/Mynydd Moelgella is bound on the eastern border by the Garw Fechan, a tributary of the Afon Garw, which eventually flows into the Afon Ogwr. To the north-east of the Sites, the existing Llynfi Afan Wind Farm and associated infrastructure exists within open upland grassland and conifer plantation. The wider landscape of the Sites comprises mostly sheep-grazed open upland, with coniferous plantation. The town of Blaengarw lies to the east, Caerau lies to the west, and Maesteg lies to the south-west.
- 1.1.3. Ecological surveys are required to support the planning process for the Proposed Development. It is important to gather sufficient information to support the design and to identify key ecological considerations relevant to the design. Ornithology surveys, undertaken by WSP in 2025, will be subject to a separate report (WSP, 2025). Therefore, birds are not mentioned further in this report.

1.2. SCOPE OF REPORT

- 1.2.1. Pennant Walters commissioned WSP to complete a PEA of the Sites. The brief was:
- To provide baseline ecological information about the Sites and a surrounding study area with particular reference to whether legally protected and/or notable sites, species or habitats are present or likely to be present;
 - To provide recommendations to enable compliance with relevant nature conservation legislation and planning policy; and

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- if necessary, to identify the need for avoidance, mitigation, compensation or enhancement measures and/or further ecological surveys.

1.3. RELEVANT LEGISLATION AND POLICY

- 1.3.1. The appraisal has been compiled with reference to the following relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in Wales. The context and applicability of each item is explained as appropriate in the relevant sections of the report and additional details are presented in Appendix A.

Legislation

- The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- Countryside Rights of Way Act 2000;
- The Town and Countryside (Environmental Impact Assessment) (Wales) Regulations 2017;
- The Protection of Badgers Act 1992;
- The Wild Mammals (Protection) Act 1996;
- Environment (Wales) Act 2016;
- The Wellbeing of Future Generations (Wales) Act 2015

Policy

- The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012);
- UK Biodiversity Action Plan (UKBAP)²;
- Planning Policy Wales (PPW) (Edition 12) 2024;
- Future Wales: The National Plan 2040;
- Technical Advice Note 5; and
- Bridgend County Borough Local Biodiversity Action Plan (LBAP).

² The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

2. METHODS

2.1. OVERVIEW

- 2.1.1. This appraisal has been prepared with reference to current good practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2017a, 2017b and 2018), and Joint Nature Conservation Committee (JNCC, 2016); and guidance contained in the British Standard - Code of Practice for Biodiversity and Development BS42020:2013 (British Standards Institute, 2013).
- 2.1.2. This PEA is based on the following data sources:
- An ecological desk study;
 - A habitat survey;
 - A Daytime Bat Walkover (DBW);
 - A Great Crested Newt *Triturus cristatus* (GCN) Habitat Suitability Index (HSI) assessment; and,
 - A protected/notable species assessment.

2.2. DESK STUDY

- 2.2.1. The desk study was undertaken in March 2025 to review existing ecological baseline information available in the public domain and to obtain information held by relevant third parties. For the purpose of the desk study exercise, records were collated within various radii around the Sites. This approach is consistent with current good practice guidance published by the CIEEM, 2017a and 2017b. To provide the baseline data for the ecological desk study, the following information was requested from South East Wales Biodiversity Records Centre (SEWBReC):
- Records of non-statutory nature conservation sites within 2 km of the Sites;
 - Records of Ancient Woodland Inventory (AWI) parcels within 2 km of the Sites;
 - Records of Priority Habitats listed on Section 7 of the Environment (Wales) Act 2016 within 2 km of the Sites;
 - Records of legally protected and notable species within 2 km of the Sites; and
 - records of bat roosts within 10 km of the Sites.
- 2.2.2. Freely downloadable datasets (available from Natural Resources Wales (NRW)) were consulted for information regarding the presence of:
- sites of national importance designated under UK³ within 2 km of the Sites;
 - national statutory designated sites which are designated for bats within 10 km of the Sites;
 - sites designated under international directives or conventions⁴ within 10 km of the Sites; and
 - international statutory designated sites for which bats are a qualifying feature within 30 km of the Sites.

³ Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

⁴ Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Ramsar sites

- 2.2.3. In addition, open source 1:25,000 Ordnance Survey mapping was used to identify any mapped water bodies and watercourses within 500 m of the Sites.
- 2.2.4. The findings of the desk study have been incorporated within Section 3 and Appendix B of this report, and are shown on Figure 2 to Figure 7.
- 2.2.5. The ecological desk study was carried out by a qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM) who is experienced in desk studies.

2.3. HABITAT SURVEY

- 2.3.1. Habitats were described and mapped following the standard Phase 1 habitat survey methodology (JNCC, 2016). Phase 1 habitat survey is a standard technique for classifying and mapping British habitats. The dominant plant species are recorded and habitats are classified according to their vegetation types. Where appropriate consideration was given to whether habitats qualify, or could qualify, as a Priority Habitat following habitat descriptions published by the Joint Nature Conservation Committee (JNCC, 2008).
- 2.3.2. A Phase 1 habitat survey of the Site was carried out on the 18 to 19 February and 11 to 12 March 2025. The survey covered the entirety of the Sites including boundary features. The Phase 1 habitat survey was carried out by competent ecologists with CIEEM memberships, and who have experience undertaking habitat surveys of similar habitats. One of the ecologists was also Field Identification Skills Certificate (FISC) accredited to Level 4.
- 2.3.3. A list of plant species was compiled (Appendix C), with relative plant species abundance estimated using the DAFOR scale⁵. The scientific names for plant species follow those in the New Flora of the British Isles (Stace, 2019) and are also listed in Appendix C.
- 2.3.4. Habitats were marked on a mobile mapping computer and were subsequently digitised using a Geographical Information System (GIS).
- 2.3.5. Target notes were made to provide information on specific features of ecological interest or habitat features too small to be mapped. These are included in Appendix D, and photographs are included in Appendix E.
- 2.3.6. Any invasive non-native plant species (INNS) listed on Schedule 9 of the WCA which were evident during the Phase 1 habitat survey were also target noted. Detailed mapping of such species; or a full survey of the Sites for all invasive plant species is beyond the scope of this commission.

⁵ The DAFOR scale has been used to estimate the frequency and cover of the different plant species as follows: Dominant (D) - >75% cover, Abundant (A) – 51-75% cover, Frequent (F) – 26-50% cover, Occasional (O) – 11-25% cover, Rare (R) – 1-10% cover., The term 'Locally' (L) is also used where the frequency and distribution of a species are patchy and 'Edge' (E) is also used where a species only occurs on the edge of a habitat type.

2.4. DAYTIME BAT WALKOVER

- 2.4.1. A DBW of trees, buildings and structures was undertaken within the Sites. The DBW was intended to identify the presence of trees, buildings and structures that could support bat roosts, with the aim to inform any further bat survey requirements. All observations were made from ground level.
- 2.4.2. Following the surveys, buildings and structures were classified as having one of the following categories based on their suitability to support roosting bats (as per Collins (2023) and BSI (2015) guidelines); none, negligible, low, moderate or high suitability. These are described below in Table 1.

Table 1 – Bat roosting suitability categorisation for buildings and structures (as per Collins (2023))

Category	Description
None	No features likely to be used by any roosting bats at any time of the year (i.e., a complete absence of crevice/suitable shelter at all ground/underground levels).
Negligible	No obvious features likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.
Low	A structure with one of more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity and not a classic cool/stable hibernation site but could be used by individual hibernating bats).
Moderate	A structure with one of more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat by unlikely to support a roost of high conservation status.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g., maternity, or classic cool/stable hibernation sites.

- 2.4.3. Trees were categorised as having one of the following categories based on their suitability to support roosting bats (as per Collins (2023)); none, Further Assessment Required (FAR) and Potential Roost Feature (PRF). These are described below in Table 2.

Table 2 – Bat roosting suitability categorisation for trees (as per Collins (2023))

Category	Description
None	Either no Potential Roost Features (PRFs) in the tree or highly unlikely to be any.
Further Assessment Required (FAR)	Further assessment required to establish if PRFs are present in the tree.
PRF	A tree with at least one PRF present.

- 2.4.4. Trees, buildings and structures were considered as requiring further surveys if they were assessed as having suitability to support roosting bats.

2.5. HABITAT SUITABILITY INDEX ASSESSMENT

- 2.5.1. A review of OS and aerial imagery of the Site indicated the presence of waterbodies within 500 m of the Site boundary.
- 2.5.2. A Habitat Suitability Index (HSI) assessment of some of these waterbodies was undertaken in accordance with the standard approach developed by Oldham et al. (2000).
- 2.5.3. The objective of the HSI assessment was to identify the suitability of waterbodies to support great crested newt populations, and to use the HSI scores to scope out locations from further GCN surveys where the results of the HSI assessment indicted a likely absence of breeding GCN.
- 2.5.4. Accessible waterbodies identified (using OS basemaps) within a 500 m search area of the Sites were subjected to a HSI assessment that assessed their suitability to support GCN and informed the need for further surveys. The results of the HSI assessment are presented in Appendix F and discussed in this report.

2.6. PROTECTED SPECIES ASSESSMENT

- 2.6.1. The potential for the Sites to support legally protected and notable species was assessed using the desk study results and combined with field observations during the habitat survey. The assessment of habitat suitability for protected and notable species was based on professional experience and judgement. This was supplemented by standard sources of guidance on habitat suitability assessment for key faunal groups including: GCN (Gent and Gibson, 2003 and English Nature, 2001); reptiles (Froglife, 1999 and Gent and Gibson, 2003); bats (Collins, 2016 and Mitchell-Jones, 2004); badger *Meles meles* (Harris et al, 1991 and Roper, 2010); dormouse *Muscardinus avellanarius* (English Nature, 2006); otter *Lutra lutra* (Chanin, 2003); water vole *Arvicola amphibius* (Dean et al, 2016) and invertebrates (Drake et al, 2007 and Kirby, P, 2001).

2.7. NOTES AND LIMITATIONS

- 2.7.1. Every effort has been made to provide a comprehensive description of the Sites; however, the following specific limitations apply to this assessment:

- Ecological survey data is typically valid for two years unless otherwise specified, for example if conditions are likely to change more quickly due to ecological processes or anticipated changes in management (CIEEM, 2019).
- Records held by local biological record centres and local recording groups are generally collected on a voluntary basis, with some species and taxon such as invertebrates being underreported; therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage.
- The survey was not completed during the optimal survey season for Phase 1 habitat survey, generally accepted to be from April-September (inclusive). However, it is considered that sufficient information was gathered to enable an assessment of the habitat types present, in line with standard Phase 1 habitat categories and the potential for these to support protected or notable species.
- The extended habitat survey was carried out over the period of four days, over a large area; as such only a selection of all species that occur within the Sites will have been recorded. However, through use of desk study information to supplement site survey data, it is considered that an accurate assessment of the potential for the Sites to support protected species or those of conservation concern was possible.
- The extended Phase 1 habitat map (Figures 8 and 9) has been reproduced from field notes and plans. Whilst this provides a sufficient level of detail to fulfil the requirements of a PEA, the maps are not intended to provide exact locations of key habitats for scheme design purposes.

3. RESULTS

3.1. DESK STUDY

STATUTORY DESIGNATED SITES

- 3.1.1. The desk study identified two international statutory designated sites within 10 km of the Sites, and one international statutory designated site for which bats are a qualifying feature within 30 km of the Sites. A description of these sites is detailed in Table 3 below and shown in Figure 2 and Figure 4a.
- 3.1.2. The desk study also identified two national statutory designated sites within 2 km of the Sites. Five further national statutory designated sites for which bats are a qualifying feature were identified within 10 km of the Sites. A description of all of these sites is detailed in Table 4 below and shown in Figures 3 and 4.

Table 3 - Statutory designated sites of international importance

Site Name	Designation	Size (ha)	Approximate Distance and orientation from Pwll-y-lwrch	Approximate Distance and orientation from Cynhordy	Description
Glaswelltiroedd Cefn Cribwr/Cefn Cribwr Grasslands	Special Area of Conservation (SAC)	58.0	8.8km south	6km south west	Designated for the presence of the following Annex I habitat: ▪ <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>). The following Annex II species is also present as a qualifying feature, but not a primary reason for site selection: ▪ Marsh fritillary butterfly <i>Euphydryas aurinia</i>.
Blackmill Woodlands	SAC	70.1	7.7km south-east	4.3 km south east	Designated for the presence of the following Annex I habitat: ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles.
Arfordir Calchfaen de Orllewin Cymru/Limestone	SAC	1583.9	29km west	30.8 km west	Designated for the presence of the following Annex I habitats:

Site Name	Designation	Size (ha)	Approximate Distance and orientation from Pwll-y-lwrch	Approximate Distance and orientation from Cynhordy	Description
Coast of South West Wales					▪ Vegetated sea cliffs of the Atlantic and Baltic Coasts; and ▪ fixed coastal dunes with herbaceous vegetation ("grey dunes"). The following Annex I habitats are also present as a qualifying feature, but not a primary reason for site selection: ▪ European dry heaths; ▪ Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuca-Brometalia</i>) ▪ Caves not open to the public; and ▪ submerged or partially submerged sea caves. Designated for the presence of the following Annex II species: ▪ Greater horseshoe bat <i>Rhinolophus ferrumequinum</i>; and ▪ early gentian <i>Gentianella anglica</i>. The following Annex II species is also present as a qualifying feature, but not a primary reason for site selection: ▪ Petalwort <i>Petalophyllum ralfsii</i>.

Table 4 - Statutory designated sites of national importance

Site Name	Designation	Size (ha)	Approximate Distance and orientation from Pwll-y-lwrch	Approximate Distance and orientation from Cynhordy	Description
Cwm Du Woodlands	Site of Special Scientific Interest (SSSI)	24.0	1.2km south	0.4km west	An ancient sessile valley oakwood growing on the Pennant Sandstone of the South Wales Coalfield. Alder <i>Alnus glutinosa</i> dominates locally, and there is a rich ground flora.
Cwm Cyffog	SSSI	17.9	4.7km south west	1.7km east	An example of upland blanket mire dominated by purple moor-grass <i>Molinia caerulea</i> with a range of bog-mosses <i>Sphagnum spp.</i> White beak-sedge <i>Rhynchosdora alba</i> is locally rare.
Frog Pond Wood	LNR	3.0	10.3 km south-west	8.6km south-east	A mixed oak <i>Quercus sp.</i> and <i>Fraxinus excelsior</i> woodland, with a pond and wetland areas. Pipistrelle bats <i>Pipistrelle sp.</i> are present in the LNR.
Tremains Wood	LNR	3.1	12.79 km south	9.5 km south	A lowland mixed broadleaved woodland. Pipistrelle bats are present in the LNR.
Glyncornel	LNR	29.7	11.6 km east	9.5 km east	Habitats comprise woodland and flower-rich meadows. Foraging bats are present in the LNR.
Coedymwstwr Woodland	SSSI	20.5	12.9km south-east	9.7 km south east	A mixed deciduous woodland on limestone with a rich ground flora. Bats have been recorded

Site Name	Designation	Size (ha)	Approximate Distance and orientation from Pwll-y-lwrch	Approximate Distance and orientation from Cynhordy	Description
					inhabiting the main cave system. ⁶
Craig-y-parciau Woodland	Local Nature Reserve (LNR)	0.6	12.9 km south	9.9 km south east	An oak and ash woodland on a steep slope of the Ogmore River. Daubenton's bat <i>Myotis daubentonii</i> is known to be present within the site.

NON-STATUTORY SITES

- 3.1.3. The desk study identified 34 Wildlife Sites/Sites of Importance for Nature Conservation (SINCs) and 1 B-Line within 2 km of the Sites. The B-Line overlaps the entirety of both Sites. B-lines are locally important insect pollinator dispersal pathways between areas of existing wildflower-rich habitat. B-Lines have been mapped by Buglife to address the problem of the loss of flowers and pollinators. Three of the Wildlife Sites/SINCs are present within the Sites. These are detailed in Table 5, and all of the non-statutory designated sites returned from the desk study are shown in Figure 5.

Table 5 - Non-statutory designated sites within the Sites

Site Name	Which Site it is present within	Description
Craig Du	Moel Cynhordy/Mynydd Moelgella	Comprises the habitats: dense continuous bracken <i>Pteridium aquilinum</i> ; broadleaved semi-natural woodland; semi-improved acid grassland; and acid dry dwarf shrub heath.
Nant-y-Fforest	Moel Cynhordy/Mynydd Moelgella	Comprises the habitats: marsh/marshy grassland; wet dwarf shrub heath; dry heath/acid grassland mosaic; dry modified bog-moss bog; semi-improved acid grassland; broadleaved semi-natural woodland; acid/neutral flush; and acid dry dwarf shrub heath.
Blaen-Cwmdu	Mynydd Pwll-yr-lwrch	Comprises the habitats: marsh/marshy grassland; semi-improved natural grassland; semi-improved acid grassland; dense continuous scrub; broadleaved semi-natural

⁶ Although bats have been recorded in the Coedymwstwr Woodland SSSI, it is not known if the site is designated for the presence of bats. In the absence of this detail, it has been assumed that Coedymwstwr Woodland SSSI is designated for the presence of bats,

Site Name	Which Site it is present within	Description
		woodland; acid/neutral flush; and acid dry dwarf shrub heath.

OTHER HABITATS OF CONSERVATION IMPORTANCE

- 3.1.4. The desk study identified 78 parcels of AWI areas within 2 km of the Sites. These comprised:
- Fifty-nine parcels of Ancient Semi-Natural Woodland (ASNW);
 - Two parcels of Restored Ancient Woodland Site (RAWS);
 - Ten parcels of Plantation on Ancient Woodland Site (PAWS); and
 - Seven Ancient Woodland Sites of Unknown Categories.
- 3.1.5. Of these, none were present within the Sites, although Moel Cynhordy/Mynydd Moelgella was bordered by a PAWS to the east, an Ancient Woodland Site of Unknown Category to the south-east, and a parcel of ASNW to the west.
- 3.1.6. A search on DataMapWales for Priority Habitats identified 564 parcels of habitats that may contain Priority Habitats within 2 km of the Sites. These were:
- Blanket bog;
 - Lowland dry acid grassland;
 - Lowland fens and reedbeds;
 - Lowland heathland;
 - Marsh fritillary habitat;
 - Open mosaic habitat on previously developed land;
 - Purple moor-grass and rush pastures;
 - Raised bog;
 - Traditional orchards;
 - Upland flushes, fens and swamps;
 - Upland heathland; and
 - Wood pasture.
- 3.1.7. The AWI parcels and Priority Habitats are shown in Figure 6.
- 3.1.8. A search for waterbodies identified springs and streams within 500 m of Moel Cynhordy/Mynydd Moelgella, but there were no standing bodies of water within 500 m of this Site identified from the OS mapping. P8 and P10 were not returned from the desk study, but were recorded on Site during the Phase 1 habitat survey.
- 3.1.9. A search for waterbodies within 500 m of Mynydd Pwll-yr-lwrch returned multiple springs and streams. There were also six bodies of standing water identified, three of which (P1, P2, and P3) were within the Site.
- 3.1.10. All waterbodies within the Sites and within 500 m of the Sites are shown on Figure 7.

3.2. HABITAT SURVEY

OVERVIEW

- 3.2.1. The following account summarises the findings of the Phase 1 habitat survey. Twenty-five Phase 1 habitat types were identified in the Sites⁷. They are mapped on Figures 8 and 9 and are listed in Table 5 along with areas in hectares (or length for linear features). A description of the dominant and notable species, the composition and management of each habitat is provided below and an indicative species list is provided in Appendix C. Target Notes (TNs) are provided in Appendix D and shown on Figures 10 and 11, and images (I) are provided in Appendix E. Alpha-numeric codes used in this section cross-refer to the JNCC Phase 1 habitat survey classification (JNCC, 2016). The order of the habitat descriptions below reflects their ordering in the Phase 1 habitat survey manual and does not reflect habitat importance.

Table 6 - Phase 1 habitat areas

Phase 1 Habitat	Moel Cynhordy/Mynydd Moelgella			Mynydd Pwll-yr-lwrch		
	Area (ha)	Length (m)	% of Site Area	Area (ha)	Length (m)	% of Site Area
A1.1.1 Broadleaved woodland	1.80	N/A	0.92	0.12	N/A	0.06
A1.2.2 Coniferous woodland	1.75	N/A	0.90	N/A	N/A	N/A
A1.3.1 Mixed woodland	0.48	N/A	0.25	N/A	N/A	N/A
A2.1 Scrub – dense/continuous	1.56	N/A	0.80	N/A	N/A	N/A
A2.2 Scrub - scattered	0.94	N/A	0.48	0.22	N/A	0.12
A3.1 Broadleaved parkland/scattered trees	N/A	74.86	N/A	N/A	953.15	N/A
B1.2 Acid grassland	22.58	N/A	11.58	25.45	N/A	13.65
B2.2 Neutral grassland	3.38	N/A	1.73	1.30	N/A	0.70
B4 Improved grassland	108.12	N/A	55.44	13.83	N/A	7.42

⁷ Dry dwarf shrub heath/acid grassland and Wet dwarf shrub heath/acid grassland are also included in Table 5. However, these do not represent a different Phase 1 habitat type, and instead demonstrate a complex mosaic of these habitat types.

Phase 1 Habitat	Moel Cynhordy/Mynydd Moelgella			Mynydd Pwll-yr-lwrch		
	Area (ha)	Length (m)	% of Site Area	Area (ha)	Length (m)	% of Site Area
B5 Marsh/marshy grassland	18.84	N/A	9.66	58.50	N/A	31.37
C1.1 Bracken – continuous	27.21	N/A	13.95	15.52	N/A	8.32
C1.2 Bracken – scattered	7.52	N/A	3.86	21.44	N/A	11.50
D1.1 Dry dwarf shrub heath	N/A	N/A	N/A	10.99	N/A	5.89
D2 Wet dwarf shrub heath	N/A	N/A	N/A	0.05	N/A	0.03
D5 Dry heath/acid grassland	N/A	N/A	N/A	31.55	N/A	16.92
D6 Wet heath/acid grassland	N/A	N/A	N/A	4.72	N/A	2.53
G1 Standing water	0.08	N/A	0.04	0.10	N/A	0.05
G2 Running water	N/A	2191.15	N/A	N/A	4278.96	N/A
I1.1.1 Inland cliff – acid/neutral	N/A	N/A	N/A	0.23	185.18	0.12
I1.2.1 Scree – acid/neutral	0.50	N/A	0.26	1.28	N/A	0.69
I2.2 Spoil	N/A	N/A	N/A	0.40	N/A	0.21
J2.5 Wall	N/A	2329.16	N/A	N/A	7106.64	N/A
J2.6 Dry ditch	N/A	2901.80	N/A	N/A	4275.83	N/A
J2.8 Earth bank	N/A	N/A	N/A	N/A	77.89	N/A
J4 Bare ground	0.27	N/A	0.14	0.76	N/A	0.41
TOTAL⁸	195.03	7496.97	100.01	186.46	16877.65	99.99

⁸ The habitat percentage totals do not equal exactly 100% due to rounding differences.

A1.1.1 BROADLEAVED WOODLAND

- 3.2.2. A parcel of broadleaved woodland was recorded in the east of the Moel Cynhordy/Mynydd Moelgella Site. This was broadly divided into a northern section, which bordered the bank of the Garw Fechan, and a southern section, which extended westwards up a steep slope.
- 3.2.3. The northern section comprised mostly semi-mature and dense elder *Sambucus nigra*, sessile oak *Quercus petraea*, silver birch *Betula pendula*, and ash *Fraxinus excelsior*, with locally abundant alder *Alnus glutinosa* along the bank of the river. The understory was as per the surrounding bracken *Pteridium aquilinum*, although heath species indicative of acidic conditions, including bilberry *Vaccinium myrtillus* and heather *Calluna vulgaris* were also recorded. This habitat was assessed as being the Priority Habitat 'Lowland Mixed Deciduous Woodland' in accordance with the Environment (Wales) Act 2016.
- 3.2.4. The southern block of broadleaved woodland comprised predominantly mature sessile oak and silver birch. This woodland was very open, with large spaces between trees, but a connecting canopy. Here, the understorey was as for the surrounding sheep-grazed habitats, with sheep's fescue *Festuca ovina*, creeping bent *Agrostis stolonifera*, and occasional soft rush *Juncus effusus*. Sheep's paths were present throughout the woodland, but there was no evidence of management. Dead and dying trees had been left in situ. This habitat was assessed as being the Priority Habitat 'Upland oakwood' in accordance with the Environment (Wales) Act 2016.
- 3.2.5. A small parcel of broadleaved woodland was recorded in the south of the Mynydd Pwll-yr-lwrch Site (I1). This was a mature sessile oak woodland, again with a very open, sheep-grazed grassland understorey. There were no saplings or young trees present within the woodland. This habitat was assessed as potentially belonging to the Priority Habitat 'Upland oakwood' in accordance with the Environment (Wales) Act 2016.

A1.2.2 CONIFEROUS WOODLAND

- 3.2.6. Immediately to the south of the broadleaved woodland in the Moel Cynhordy/Mynydd Moelgella Site was a larch *Larix decidua* plantation, with the invasive non-native Schedule 9 species rhododendron *Rhododendron ponticum* recorded on the edges of this habitat parcel (I2). The coniferous woodland was steeply sloping to the east and was separated by a fence from the sheep-grazed habitats to the north and west. Bracken was abundant in the understorey, with occasional bilberry and hard fern *Blechnum spicant*.

A1.3.2 MIXED WOODLAND

- 3.2.7. Two parcels of mixed woodland were present in the south of the Moel Cynhordy/Mynydd Moelgella Site. The western-most of these was a Sitka spruce *Picea sitchensis* plantation, with young scattered sessile oak, hawthorn *Crataegus monogyna*, willow *Salix sp.*, and ash. The understory comprised bramble *Rubus fruticosus agg.*
- 3.2.8. The eastern mixed woodland parcel comprised similar species, with abundant soft rush and bracken.

A2.1 SCRUB – DENSE/CONTINUOUS

- 3.2.9. There were parcels of dense/continuous scrub recorded throughout the Moel Cynhordy/Mynydd Moelgella Site, although most of these were too small to be mapped. These mostly comprised gorse *Ulex europaeus* or bramble scrub, and were found at the edges of woodland parcels and field boundaries (I3). One parcel of scrub, in the centre of the Moel Cynhordy/Mynydd Moelgella Site comprised grey willow *Salix cinerea* up to 6 m tall on either side of a stream, with an understorey of soft rush. Owing to the grazed nature of this parcel, there were no saplings.

A2.2 SCRUB – SCATTERED

- 3.2.10. Scattered scrub was present in several areas of the Moel Cynhordy/Mynydd Moelgella Site, overlying grassland habitats. It comprised very sparse gorse and western gorse *Ulex gallii*, and plants were generally small and isolated.
- 3.2.11. Scattered gorse and scattered bramble were identified in the north of the Mynydd Pwll-yr-lwrch Site, again overlying grassland habitats. These were isolated areas.

A3.1 BROADLEAVED PARKLAND/SCATTERED TREES

- 3.2.12. A line of mature trees was recorded either side of a stream in the northern section of the Moel Cynhordy/Mynydd Moelgella Site. The species comprised dominant sessile oak, with rare ash, alder, and downy birch *Betula pubescens*.
- 3.2.13. Lines of trees were also recorded in the south-east of the Mynydd Pwll-yr-lwrch Site, with dominant sessile oak and rare hawthorn and downy birch (I4). These were mostly adjacent to running water and dry ditches, and formed the boundary of the edge of the Site.

A3.2 CONIFEROUS PARKLAND/SCATTERED TREES

- 3.2.14. Scattered Sitka spruce saplings were recorded within acid grassland in the north of the Mynydd Pwll-yr-lwrch Site. These were sparsely scattered, and considered likely to have self-seeded from the conifer plantation to the north and east of the Mynydd Pwll-yr-lwrch Site.

A3.3 MIXED PARKLAND/SCATTERED TREES

- 3.2.15. One area of mixed parkland/scattered trees was recorded in the Moel Cynhordy/Mynydd Moelgella Site, which extended from a parcel of woodland to the south of the Site north-east across the bracken and adjacent to a stream. Most of the trees were immature, and the species composition was 30% coniferous trees and 70% broadleaved. The following species were all occasional within the area of scattered trees: Sitka spruce; hawthorn; sessile oak and goat willow *Salix caprea*.

B1.2 ACID GRASSLAND

- 3.2.16. Much of the grassland in the north-west of the Moel Cynhordy/Mynydd Moelgella Site and the north of the Mynydd Pwll-yr-lwrch Site was sheep-grazed acid grassland, with a sward height of up to 20 cm and anthills abundant throughout (I5). These grasslands were unenclosed, with defunct dry stone walls throughout, and were bordered by encroaching bracken. Species recorded within these parcels included dominant sheep's fescue, abundant common bent *Agrostis capillaris*, and rare heath bedstraw *Galium saxatile*, heather *Calluna vulgaris*, foxglove *Digitalis purpurea* and bilberry. Lichens and mosses were observed throughout. Perennial rye-grass *Lolium perenne* and soft rush were indicative of improved conditions owing to nutrient enrichment as a result of grazing.

B2.2 NEUTRAL GRASSLAND

- 3.2.17. Linear strips of neutral grassland were recorded on both sites adjacent to watercourses and improved grasslands, where wet areas were subject to sheep-grazing and were dominated by soft rush (I6). Some areas of this were too small to map, and so were recorded as TNs (TN2, TN5, TN6, TN10, I22). Locally, the sward height reached up to 1.5 m tall, and some of the neutral grassland areas were wet underfoot.

B4 IMPROVED GRASSLAND

- 3.2.18. Most of the grassland in the Moel Cynhordy/Mynydd Moelgella Site and isolated parcels in the Mynydd Pwll-yr-lwrch Site were assessed as being improved grassland, on account of the dominance of perennial rye-grass (I7). The improved grasslands were considered likely to have derived from acid grassland, with species such as heath bedstraw rare within the parcels, although these parcels have been improved through nutrient enrichment and grazing. The sward height was between 3 and 10 cm.
- 3.2.19. Creeping buttercup *Ranunculus repens*, cock's foot *Dactylis glomerata*, creeping thistle *Cirsium arvense* and common chickweed *Stellaria media*, all of which are indicative of improved grasslands, were all rare. Soft rush was locally occasional where ground conditions were wet, and some areas formed a mosaic with neutral grassland.

B5 MARSH/MARSHY GRASSLAND

- 3.2.20. Much of the northern section of the Moel Cynhordy/Mynydd Moelgella Site comprised marsh/marshy grassland, dominated by purple moor-grass, with rare soft rush and tufted hair-grass *Deschampsia caespitosa*. The sward height was up to 70 cm, and the purple-moor grass formed dense tufts with dead leaf litter. A similar habitat type was found across much of the central and southern sections of the Mynydd Pwll-yr-lwrch Site (I8).
- 3.2.21. Locally, species indicative of acid conditions were recorded, including bell heather *Erica cinerea*, bilberry, foxglove, heath milkwort *Polygala serpyllifolia* and heath bedstraw.
- 3.2.22. Encroaching scattered bracken was recorded on some edges of the marsh/marshy grassland habitat, and rhododendron was also recorded in the Moel Cynhordy/Mynydd Moelgella Site.
- 3.2.23. The marsh/marshy grassland habitats were considered likely to qualify as the Priority Habitat 'Purple moor-grass and rush pastures' in accordance with the Environment (Wales) Act 2016. Some areas of marsh/marshy grassland may also qualify as 'Upland Flushes, Fens and Swamps'.

C1.1 BRACKEN – CONTINUOUS

- 3.2.24. There were large areas of continuous bracken across much of the Moel Cynhordy/Mynydd Moelgella Site and the south of the Mynydd Pwll-yr-lwrch Site, with rare foxglove and purple moor-grass, and scattered trees including holly *Ilex aquifolium*, Sitka spruce, elder, sessile oak, silver birch and ash (I9).
- 3.2.25. Within the Mynydd Pwll-yr-lwrch Site, some of these areas displayed evidence of recent burning (such as TN21), most likely as a management technique. These burnt areas were all in the south of the Mynydd Pwll-yr-lwrch Site, adjacent to areas of improved grassland.

C1.2 BRACKEN – SCATTERED

- 3.2.26. Parcels of scattered bracken encroached onto grassland habitats throughout both Sites, with rare bilberry and sheep's sorrel *Rumex acetosella* in the sward.

D1.1 DRY DWARF SHRUB HEATH

- 3.2.27. Dry dwarf shrub heath was present within much of the Mynydd Pwll-yr-lwrch Site, forming a mosaic with acid grassland and grading into wet dwarf shrub heath locally. This habitat showed evidence of grazing outside of sloping areas, which could not be grazed by sheep (I10). The dry dwarf shrub heath was tussocky, and had a sward height of approximately 30cm. Bilberry, western gorse and heather were all locally abundant, although most of the parcels comprised constant bilberry shrub. Bryophytes (excepting bog-mosses) were frequent throughout, and sheep's fescue and heath bedstraw were occasional.
- 3.2.28. These parcels were considered to qualify as the Priority Habitat 'Upland heathland' in accordance with the Environment (Wales) Act 2016.

D2 WET DWARF SHRUB HEATH

- 3.2.29. Wet dwarf shrub heath was also recorded within the Mynydd Pwll-yr-lwrch Site, again forming a mosaic with acid grassland. Here, although the shrub species were the same as for dry dwarf shrub heath, purple moor-grass was abundant (I11). The habitats were still sheep-grazed, but to a lesser extent than the dry dwarf shrub heath.
- 3.2.30. These parcels were considered to qualify as the Priority Habitat 'Upland heathland' in accordance with the Environment (Wales) Act 2016.

G1 STANDING WATER

- 3.2.31. Two parcels of standing water were present in the Moel Cynhordy/Mynydd Moelgella Site. The eastern most of these (P8) comprised standing water up to 10 cm deep, fed by a culvert passing beneath the bare ground track to the west. There was an outflow to the east leading into a dry ditch, although at the time of the survey this was not being fed due to dry conditions. The standing water was vegetated with bulrush *Typha latifolia* and soft rush, and was slightly poached by grazing sheep.
- 3.2.32. The westernmost parcel of standing water in the Moel Cynhordy/Mynydd Moelgella Site (P9) had steep banks on its north, east and south banks, but graded over the path on the western bank. It was not possible to determine the depth of the standing water from the bank. There was no shade or macrophyte cover. The edges were vegetated with rush and grassland species. It was considered unlikely to support fish or wildfowl.
- 3.2.33. There was also an area of standing water that was too small to map in the Moel Cynhordy/Mynydd Moelgella Site, marked as TN8 (P10). It was not possible to determine its depth, as it was vegetated with soft rush and purple moor-grass. It was heavily shaded by immature goat willow scrub.
- 3.2.34. Four parcels of standing water were recorded within the northern section of the Mynydd Pwll-yr-lwrch Site, although only three of these were large enough to map on the Phase 1 habitat figure.
- 3.2.35. Of these, the northernmost standing water habitat, identified during the desk study as P1, was heavily vegetated with dense willow scrub and bulrush, making it difficult to determine its depth (I18). It was poached by horses, and had shallow gradual banks.

- 3.2.36. To the south of the Mynydd Pwll-yr-lwrch Site, within an area of acid grassland and dry heath mosaic, a standing water habitat was identified (I20) on the Site boundary. Again, willow scrub was growing within the standing water, making it difficult to determine the depth. The banks were vegetated with soft rush, and the waterbody was approximately 25% shaded. Macroalgae covered approximately 10% of the water surface. This was identified during the desk study as P6.
- 3.2.37. To the west of this, a third parcel of standing water was recorded. This was returned from the desk study as P3, and was almost completely dry during the survey (I19). It was heavily shaded, and was densely vegetated with soft rush, purple moor-grass and willow scrub.
- 3.2.38. Finally, a pool of standing water too small to be mapped was identified in the north of the Mynydd Pwll-yr-lwrch Site (I21). This measured approximately 4m x 2m, and had shallow banks shaded by willow scrub. It is marked as TN13 (P7).

G2 RUNNING WATER

- 3.2.39. There were several areas of running water recorded within the Moel Cynhordy/Mynydd Moelgella Site. Bordering the east of the Moel Cynhordy/Mynydd Moelgella Site, the Garw Fechan was a meandering river with steep vertical banks up to 1 m high on the outside of bends, and shallow stoney banks on the inside of bends (I12). The water was up to 30 cm deep and 1.5 m wide, and flowed south-east with a moderate flow. Although there was no vegetation within the watercourse, the banks were vegetated with bracken and grasses, and semi-mature alders lined much of the banks. There was some minor poaching by sheep. A stream flowed into this from the west.
- 3.2.40. The Garw Fechan was considered to qualify as the Priority Habitat 'Rivers' in accordance with the Environment (Wales) Act 2016.
- 3.2.41. A further stream was recorded flowing through the Site from the north. It had a very slow flow at the time of the survey, and was 50 cm wide. Towards the north, the banks were steep but low, although further south the banks were up to 60 cm deep. The substrate was stony and silty, and the stream was densely shaded by soft rush.
- 3.2.42. Along the south of the Moel Cynhordy/Mynydd Moelgella Site, a stream with grassy banks flowed west. The stream had a maximum depth of 20 cm. At the Site boundary, this joins another shallow stream that flows south.
- 3.2.43. In the northern section of the Moel Cynhordy/Mynydd Moelgella Site, a stream was present within marshy grassland. Further upstream, the stream was very shallow, with a very low flow in a ditch 10 cm wide and 15 cm deep. It was choked with purple moor-grass and soft rush. As it flowed westwards, the stream became more open, up to 80 cm wide, and had some pools of water. The substrate became stoney, and towards the western end the stream was shaded by grey willow *Salix cinerea* on the banks.
- 3.2.44. The northernmost stream in the Moel Cynhordy/Mynydd Moelgella Site could be heard beneath very dense tussocky purple moor-grass, and flowed from a source within a deep depression on the slope. Around the stream, there was increased soft rush, with some bog-mosses.
- 3.2.45. These streams were considered to be near-natural, and are within 2.5 km of their source, and so are considered to qualify as the Priority Habitat 'Rivers' in accordance with the Environment (Wales) Act 2016.

- 3.2.46. Within the Mynydd Pwll-yr-lwrch Site, there were multiple areas of running water, most of which formed a network of interconnected streams and wet ditches in the south and north of the Site.
- 3.2.47. In the south east of the Mynydd Pwll-yr-lwrch Site, the streams showed evidence of being straightened and deepened, with recently excavated earth on their banks. These had a low to moderate flow, and were up to 30 cm wide and 10 cm deep. Many of them were lined with sessile oak trees. Due to the improvement of these streams through straightening, they are not considered to qualify as Priority Habitats.
- 3.2.48. Further west within the Mynydd Pwll-yr-lwrch Site, a stream with moderate flow flowed south-west from P3 (I13). It was heavily shaded due to dense vegetation smothering the stream, with soft rush lining the banks. This stream was considered to be near-natural, and is within 2.5 km of their source, and so is considered to qualify as the Priority Habitat 'Rivers' in accordance with the Environment (Wales) Act 2016.
- 3.2.49. Streams were also identified in the north of the Mynydd Pwll-yr-lwrch. Again, these were heavily shaded by dense vegetation, and were poached by horses. One of these, flowing west, had steep banks up to 3 m high, which were vegetated with western gorse. Again, these streams were considered to be near-natural, and are within 2.5 km of their source, and so are considered to qualify as the Priority Habitat 'Rivers' in accordance with the Environment (Wales) Act 2016.

I1.1.1 INLAND CLIFF – ACID/NEUTRAL

- 3.2.50. A southwards facing inland cliff was recorded in the centre of the Mynydd Pwll-yr-lwrch Site. It was steeply sloping and was sparsely vegetated with dry dwarf shrub heath species, with a scree pile at the base of the cliff (I14).
- 3.2.51. A second inland cliff was recorded to the south of this, but was too small to map, and so was recorded as TN23. It was approximately 15 m high, and was vertical, comprising blocks of rocks. Again, a scree pile was recorded at its base.
- 3.2.52. These habitats are considered to qualify as the Priority Habitat 'Inland rock outcrop and scree habitats' in accordance with the Environment (Wales) Act 2016.

I1.2.1 SCREE – ACID/NEUTRAL

- 3.2.53. A scree pile was present in the east of the Moel Cynhordy/Mynydd Moelgella Site. This was a large, unvegetated scree pile, with particles ranging from silt size to 30 cm.
- 3.2.54. A second scree pile was present to the west, on a slope up to 5 m high, with mostly gravel-sized particles, but some ranging up to 40 cm. Again, this scree was unvegetated, but mosses and lichens were prevalent around the scree pile.
- 3.2.55. Numerous scree piles were recorded across the Mynydd Pwll-yr-lwrch Site, mostly in the north, around exposed rock faces. These were all unvegetated, and particles were larger, ranging from 10 cm to 50 cm across. Where not mapped owing to their small size, these were recorded as TN24, TN25 and TN31.
- 3.2.56. These habitats are considered to qualify as the Priority Habitat 'Inland rock outcrop and scree habitats' in accordance with the Environment (Wales) Act 2016.

I2.2 SPOIL

- 3.2.57. Two spoil piles were recorded in the south of the Mynydd Pwll-yr-lwrch Site (I15). These were approximately 4 m tall, and were vegetated as per the surrounding habitats, with dense bracken and acid grassland species recorded.

J2.5 WALL

- 3.2.58. A network of defunct dry stone walls were present in both of the Sites (I16). Most of these were covered in mosses and lichen, and were up to 1.5 m high, where not collapsed.

J2.6 DRY DITCH

- 3.2.59. There was a network of dry ditches within the Moel Cynhordy/Mynydd Moelgella Site (I17). These were up to 2 m deep, although most were approximately 1 m deep. Although none of them were wet at the time of survey, some of them had increased levels of soft rush, and were therefore likely wet during periods of high rainfall. Within the north-west of the Moel Cynhordy/Mynydd Moelgella Site, the dry ditches were vegetated with purple moor-grass, as per the surrounding marshy grassland habitats. A dry ditch in the south of the Moel Cynhordy/Mynydd Moelgella Site had a stand of the INNS Indian balsam *Impatiens glandulifera* on its southern bank (TN1).
- 3.2.60. Within the Mynydd Pwll-yr-lwrch Site, the dry ditches formed a network in the north of the Site, and were up to 3 m deep. The substrate was stony, and the banks were either exposed rocks or vegetated with dry heath. The banks varied between 45° and vertical. These ditches were considered likely to be natural geological formations.
- 3.2.61. However, in the south-east of the Mynydd Pwll-yr-lwrch Site, the dry ditches were evidently managed, with piles of excavated earth alongside them. These were likely used to divert water from the improved sheep-grazed fields.

J2.8 EARTH BANK

- 3.2.62. An earth bank was recorded in the south-west of the Mynydd Pwll-yr-lwrch Site, vegetated with dense bracken. It was likely a dry stone wall, that had collapsed and become vegetated.

J4 BARE GROUND

- 3.2.63. Bare ground tracks within both Sites were recorded, constructed to allow for vehicular access between fields. These were unvegetated.

3.3. DAYTIME BAT WALKOVER

- 3.3.1. Eighteen trees were assessed as having PRFs for bats within the Moel Cynhordy/Mynydd Moelgella Site (Labelled BT1-18 on Figure 10). No structures were identified within this Site that may have the potential to support roosting bat species.
- 3.3.2. A further 18 trees were assessed as having PRFs for bats within the Mynydd Pwll-yr-lwrch Site (Labelled BT19-36 on Figure 11).
- 3.3.3. A rocky outcrop (TN16, I24) was identified within the Mynydd Pwll-yr-lwrch Site which was considered to have low potential to support roosting bats. It was west facing, with crevices between rocks on the face which were considered likely to extend backwards into the hillside. However, the face of the features was very exposed, and there was a lack of connecting trees or hedgerows

which would provide flight lines around the feature. Therefore, it was considered likely to be used only opportunistically by individual crevice roosting bats.

3.4. HABITAT SUITABILITY INDEX ASSESSMENT

- 3.4.1. No ponds were identified within 500 m of the Moel Cynhordy/Mynydd Moelgella Site during the desk study, but three bodies of standing water were recorded during the Phase 1 habitat survey (one of which was too small to map and is marked as TN8).
- 3.4.2. Six ponds were identified within 500 m of the Mynydd Pwll-yr-lwrch Site during the desk study. Of these, three were present within the Site: P1, P2, and P3. P6 was on the Site boundary. P4 and P5 were to the south of the Site boundary. P2 was not recorded during the Phase 1 habitat survey, and is considered absent from the Mynydd Pwll-yr-lwrch Site. A further pond was identified within the Mynydd Pwll-yr-lwrch Site during the Phase 1 habitat survey, marked as TN13 (P7).
- 3.4.3. All of these bodies of water, with the exception of P2, which was absent, and P5, which was beyond the survey boundary, were subject to an HSI assessment, the results of which are shown in Table 7.

Table 7 – HSI Assessment Results

Waterbody reference	HSI Result
Mynydd Pwll-yr-lwrch	
P1	Below Average
P3	Below Average
P4	Below Average
P6	Average
P7	Poor
Moel Cynhordy/Mynydd Moelgella Site	
P8	Poor
P9	Average
P10	Poor

- 3.4.4. Full results are shown in Appendix F.
- 3.4.5. Therefore, P9 in the Moel Cynhordy/Mynydd Moelgella Site, and P1, P3, P4 and P6 in the Mynydd Pwll-yr-lwrch Site provide habitat that is suitable to support GCN, and the Sites could support populations of GCN. A paper quantifying the status of GCN in Wales (French et al., 2014) indicates that there is suitable habitat for GCN within the Sites, as the Sites fall within the known distribution of GCN in Wales. P8 and P10 in the Moel Cynhordy/Mynydd Moelgella Site, and P7 in the Mynydd

Pwll-yr-lwrch Site, returned a 'poor' suitability to support GCN, and therefore the presence of breeding GCN within these waterbodies is considered unlikely.

3.5. PROTECTED AND NOTABLE SPECIES ASSESSMENT

3.5.1. The potential for the Sites to support legally protected species and notable species has been assessed using the results of the desk study and observations made during the site survey of habitats within and immediately surrounding the Sites. A summary of desk study information is included within Appendix B. Desk study records have only been considered below if they are recent (from the last 10 years) and/or if they relate to species that may be supported by habitats at the Sites. Habitats present within the Sites are suitable for the following species; further consideration is given below to the likelihood for these species to be present within the Sites:

- Bats;
- Badger;
- Dormice;
- Brown hare *Lepus europaeus*;
- Hedgehog *Erinaceus europaeus*;
- Otter;
- Water vole;
- Amphibians;
- Reptiles;
- Invertebrates; and
- INNS.

3.5.2. The Sites do not provide suitable habitat for other protected or notable species and other species, beyond those listed above, will not be considered further in this PEA.

BATS

- 3.5.3. Twenty-four records of bats were returned from the desk study within 2 km of Mynydd Pwll-yr-lwrch. The closest to the Mynydd Pwll-yr-lwrch Site was a record of pipistrelle bat species located 420m west of the Site. This is also the species for which most of the records were returned.
- 3.5.4. Seven records of bats were returned from the desk study within 2 km of the Moel Cynhordy/Mynydd Moelgella Site. The closest to the Moel Cynhordy/Mynydd Moelgella Site was a record of common pipistrelle *Pipistrellus pipistrellus* located 36 m west of the Site.
- 3.5.5. There were also 31 records of bat roosts within 10 km of the Sites. The closest bat roost record to the Mynydd Pwll-yr-lwrch Site was located 3 km north-east of the Site.
- 3.5.6. The closest bat roost record to the Moel Cynhordy/Mynydd Moelgella Site was located 1.5km south-east of the Site.
- 3.5.7. Of these bat roosts, all were recorded within buildings. There were multiple confirmed maternity roosts, the closest of which was for soprano pipistrelle *Pipistrellus pygmaeus*. It was located 2.9 km north of the Mynydd Pwll-yr-lwrch Site and 5.9 km north of Moel Cynhordy/Mynydd Moelgella Site.
- 3.5.8. The closest record to the Mynydd Pwll-yr-lwrch Site was a record for pipistrelle bat species which was located 3km north-west of the Site.

- 3.5.9. The closest record to the Moel Cynhordy/Mynydd Moelgella Site was a record of soprano pipistrelle which was located 1.4 km south-west of the Site.
- 3.5.10. The species returned as part of the desk study, including all bat records within 2 km of the Sites, and records of roosts within 10 km of the Sites, comprised common pipistrelle, brown long-eared bat *Plecotus auritus*, Natterer's bat *Myotis nattereri*, noctule bat *Nyctalus noctula*, soprano pipistrelle, and lesser horseshoe *Rhinolophus hipposideros*, along with other records of undetermined bat species.
- 3.5.11. Suitable habitat to support roosting bats was recorded within the Sites in the form of broadleaved woodland and scattered trees. Within the Moel Cynhordy/Mynydd Moelgella Site, 18 trees were assessed as having PRFs suitable to support roosting bats. Within the Mynydd Pwll-yr-lwrch Site, 18 trees and one structure (TN16, I24) were assessed as having PRFs suitable to support roosting bats. These are shown on Figure 10 and Figure 11. Linear habitats such as running water provide suitable commuting corridors, and marshy grassland and woodland provide suitable foraging opportunities for bats.

BADGER

- 3.5.12. No records of badger were returned from the desk study.
- 3.5.13. No signs or evidence of badger were identified during the Phase 1 habitat survey.
- 3.5.14. The bracken, dry heath, and acid and improved grassland habitats within the Sites were considered to provide suitable foraging and commuting habitat for badger. Sett-building potential was considered to be limited to the woodlands within the Sites.

DORMICE

- 3.5.15. One record of dormice was returned from the desk study.
- 3.5.16. This record was located at 2566 m south of the Mynydd Pwll-yr-lwrch Site and 1745 m west of the Moel Cynhordy/Mynydd Moelgella Site.
- 3.5.17. No signs or evidence of dormice were identified during the Phase 1 habitat survey.
- 3.5.18. The broadleaved woodland habitat and dense scrub have the potential to support nesting dormice. However, the scrub within the Sites is generally limited and isolated and there was relatively poor connectivity to suitable habitat outside of the Sites. The broadleaved woodland habitats had an open understorey, and therefore had limited foraging and nesting opportunities. Similarly, the proximity of these woodlands to coniferous plantations reduces the suitability of the Sites to support dormice; the plantation woodland which border the Sites (Garw Forest to the north of Moel Cynhordy/Mynydd Moelgella, and Caerau Forest to the east of Mynydd Pwll-yr-lwrch) have low species diversity, a high canopy, and poor understorey. This limits off-Site connectivity. Dormice can be found within conifer plantation, but typically only where it forms a mosaic with other optimal habitats such as hedgerow, scrub and broadleaved woodland.
- 3.5.19. Therefore, dormice are considered to be likely absent from the Sites and are not discussed further in this report.

BROWN HARE

- 3.5.20. Three records of brown hare were returned from the desk study. The closest record to the Mynydd Pwll-y-Lwrch Site was located 1556 m to the east; the closest record to the Moel Cynhordy/Mynydd Moelgella Site was located 842 m to the south.
- 3.5.21. No brown hares were recorded during the Phase 1 habitat survey.
- 3.5.22. Diverse open habitats, notably grasslands with encroaching bracken recorded within the Sites, were considered suitable to support brown hares. This species prefers areas of short vegetation for feeding at night, but uses areas of denser vegetation cover for resting and occasional feeding during daylight hours.

HEDGEHOG

- 3.5.23. Fifteen records of hedgehog were returned from the desk study.
- 3.5.24. The closest record of hedgehog was located 933 m south-west of the Mynydd Pwll-y-Lwrch Site.
- 3.5.25. The closest record to the Moel Cynhordy/Mynydd Moelgella Site was located 352 m west of the Site.
- 3.5.26. No hedgehogs were recorded during the Phase 1 habitat survey.
- 3.5.27. Areas of habitat suitable to support foraging, resting and breeding hedgehog were identified within the Sites (scrub, woodland, and scattered trees).

OTTER

- 3.5.28. Three records of otter were returned from the desk study
- 3.5.29. The closest record to the Mynydd Pwll-y-Lwrch Site was located 984 m to the south.
- 3.5.30. The closest record to the Moel Cynhordy/Mynydd Moelgella Site was located 1189 m to the west.
- 3.5.31. The ditches and streams present within the Sites had low potential for commuting and foraging otters, there was no evidence of otter holts or rocks/tree roots suitable for resting identified during the extended habitat survey. The stream banks within the Site are considered unsuitable for building holts/couches and there are limited foraging opportunities due to the size of the streams and the low capacity to support large populations of fish or other prey such as amphibians and small mammals.
- 3.5.32. It is considered that the Site is of low to negligible value to the local otter population, and it is unlikely that otters use the Site. Any use is likely to be infrequent. .

WATER VOLE

- 3.5.33. No records of water vole were returned from the desk study.
- 3.5.34. No evidence of water vole was recorded during the Phase 1 habitat survey.
- 3.5.35. Suitable habitat for water vole existed within the ditches and marshy grasslands across the northern section of the Moel Cynhordy/Mynydd Moelgella Site, and across the majority of the Mynydd Pwll-y-Lwrch Site. Water voles inhabit wet heathland, marshes and rivers/streams with steep vegetated banks.

AMPHIBIANS

- 3.5.36. Records of common frog *Rana temporaria*, common toad *Bufo bufo*, palmate newt *Lissotriton helveticus*, and smooth newt *Lissotriton vulgaris* were returned from the desk study.

- 3.5.37. The closest record to the Mynydd Pwll-y-lwrch Site was for common frog located at a distance of 383 m northeast of the Site.
- 3.5.38. The closest record to the Moel Cynhordy/Mynydd Moelgella Site was also for common frog, which was located 145 m east of the Site.
- 3.5.39. There were no records of GCN returned from the desk study.
- 3.5.40. Frogspawn (TN14) was recorded within the pond identified as P7 in the Mynydd Pwll-yr-lwrch Site. The waterbodies and watercourses within the Sites were suitable to support common amphibians during their aquatic stage, including common frogs and common toads. The surrounding grassland may also provide suitable terrestrial habitat for amphibians, and the dry stone walls would provide suitable refugia and hibernacula.
- 3.5.41. There was no evidence of GCN during the Phase 1 habitat survey. The suitability of the Sites to support GCN is discussed further in Section 3.4.

REPTILES

- 3.5.42. Records of common lizard *Zootoca*, slow worm *Anguis fragilis* and grass snake *Natrix helvetica* were returned from the desk study.
- 3.5.43. The closest record of common lizard to the Mynydd Pwll-y-lwrch Site was located 455 m to the south and closest common lizard record to the Moel Cynhordy/Mynydd Moelgella Site was located 385 m to the east.
- 3.5.44. The closest record of grass snake to the Mynydd Pwll-y-lwrch Site was located 677 m to the south and the closest grass snake record to the Moel Cynhordy/Mynydd Moelgella Site was located 992 m to the east.
- 3.5.45. The closest slow worm record to the Mynydd Pwll-y-lwrch Site was located 460 m to the south and the closest slow worm record to the Moel Cynhordy/Mynydd Moelgella Site was located 653 m to the east.
- 3.5.46. No reptiles were observed during the Phase 1 habitat survey of the Sites; however, suitable habitat for supporting reptiles was recorded within the Site.
- 3.5.47. Bracken, scrub, heath, and grasslands including marshy grassland and acid grassland were considered to be suitable for common lizard, slow worm, grass snake and adder *Vipera berus*.
- 3.5.48. Parcels of scree habitats were considered to provide suitable basking opportunities for reptiles, and the dry stone walls and rock piles (TN11, TN12, TN15, TN16, TN17, TN18, TN19, TN24, TN25, TN27, TN31, I23, I25) would provide suitable refugia and hibernacula.

INVERTEBRATES

- 3.5.49. Ninety-seven records of protected and/or notable invertebrates were returned from the desk study.
- 3.5.50. Three records of invertebrates were returned from the desk study which were located within the Site boundary of the Mynydd Pwll-y-lwrch Site. These records were for knot grass (moth) *Acrionicta rumicis*, beautiful yellow underwing (moth) *Anarta myrtili* and green hairstreak (butterfly) *Callophrys rubi*.
- 3.5.51. The closest invertebrate record to the Moel Cynhordy/Mynydd Moelgella Site was for dingy skipper (butterfly) *Erynnis tages* and was located 12 m east of the Site.

- 3.5.52. It was considered that the mosaic of grassland, heath, bracken and woodland within the Sites was suitable to support large numbers of mainly common terrestrial invertebrate species.
- 3.5.53. The watercourses and waterbodies within the Sites were also considered likely to support mainly common and widespread aquatic invertebrate species.
- 3.5.54. Due to the widespread nature of the habitats present within the Sites, and the fact that the Proposed Development is unlikely to lead to isolation of habitats, impacts on invertebrates as a result of the Proposed Development are likely to be minor. Therefore, although ecological enhancement opportunities will consider invertebrates, no specific invertebrate surveys or ecological enhancements are considered necessary, and invertebrates are not discussed further in this report.

NOTABLE PLANTS

- 3.5.55. Twenty-four notable plant species were identified within 2 km of the Sites in the desk study. Of these, two species are listed on Section 7 of the Environment (Wales) Act 2016 (chamomile *Chamaemelum nobile* and pennyroyal *Mentha pulegium*), and two are listed on Schedule 8 of the WCA (bluebell *Hyacinthoides non-scripta* and pennyroyal).
- 3.5.56. Woodland and bracken habitats within the Site were considered suitable to support bluebell. The acid grassland habitats within the Sites were considered suitable to support chamomile, and marshy grassland parcels were considered suitable to support pennyroyal.

INVASIVE NON-NATIVE PLANT SPECIES

- 3.5.57. Certain plant species are listed on Schedule 9 of the WCA. It is an offence to plant or otherwise cause these species to grow in the wild.
- 3.5.58. No INNS were returned from the desk study. Two species of INNS were identified during the Phase 1 habitat survey: rhododendron and Himalayan balsam *Impatiens glandulifera*. All habitats within the Site were considered suitable to support various species of INNS.
- 3.5.59. It should be noted that an exhaustive INNS survey was beyond the scope of this assessment, and therefore further INNS may be present within the Site, but undetected.

4. DISCUSSION AND RECOMMENDATIONS

- 4.1.1. This section considers the potential for effects on designated sites, legally protected species, notable species and notable habitats as a consequence of the Proposed Development. Where further surveys or detailed assessment of potential effects are required in order to design suitable mitigation this is identified.

4.2. STATUTORY DESIGNATED SITES

- 4.2.1. The Habitats Regulations provide strict protection to sites of international importance. This includes requiring projects or plans to be screened for Likely Significant Effects (LSEs) upon SPA, SAC and candidate SACs (cSACs). Guidance also requires potential SPAs (pSPAs) and Ramsars are subject to the same assessment. Therefore, due to the presence of Glaswelltiroedd Cefn Cribwr/Cefn Cribwr Grasslands SAC, Blackmill Woodlands SAC, and Arfordir Calchfaen de Orllewin Cymru/Limestone Coast of South West Wales SAC within the conceivable zones of influence from the Proposed Development, it must be screened by the competent authority to determine whether LSE are likely to result. If the competent authority is unable to conclude that significant effects are not likely, the Proposed Development must be subject to additional assessment in accordance with the Habitats Regulations.
- 4.2.2. SSSIs are subject to strict protection under the WCA. This requires landowners to maintain these sites in favourable condition and works within these sites are managed by the appropriate national statutory body via the consent process. Certain operations within SSSIs require consent; these are specific to each SSSI. Cwm Du Woodlands SSSI is 0.3 km west of the Sites, and is of interest as an ancient sessile valley oakwood growing on the Pennant Sandstone. No working within the SSSI will occur. However, indirect effects on the SSSI may result from the Proposed Development through pollution. It is therefore recommended that environmental best practice is followed. This environmental best practice should be laid out in a Construction Environmental Management Plan (CEMP).
- 4.2.3. Cwm Cyffog SSSI is considered to be of a sufficient distance from the Sites, and without impact pathways such as watercourses, so that it, or its features, will not be impacted by the Proposed Development. No further recommendations are therefore made in relation to this SSSI.
- 4.2.4. Coedymwstwr SSSI is partially designated due to the presence of bats roosting within the cave systems. This PEA will recommend bat activity surveys of the Sites (Section 4.5). The results of these surveys will allow for a better understanding of how bats use the Sites, and therefore if any impacts to the bats recorded within the Coedymwstwr Woodland SSSI are likely to be result from the Proposed Development. Any further recommendations in relation to bats using the Coedymwstwr SSSI should be set out in a bat survey report.

4.3. NON-STATUTORY DESIGNATED SITES

- 4.3.1. The Proposed Development should seek to avoid direct and indirect impacts to all B-lines, Wildlife Sites and Wildlife Sites (Candidate) that lie within the Site, as listed in Section 3.2. If this is not feasible, the local authority should be consulted before a design is developed.

4.4. OTHER HABITATS OF CONSERVATION IMPORTANCE

- 4.4.1. The desk study identified the following Priority Habitats within the Sites: 'Lowland dry acid grassland', 'Lowland fens and reedbeds', 'Lowland heathland', 'Open mosaic on previously developed land', 'Purple moor-grass and rush pastures', 'Upland flushes, fens and swamps', 'Upland heathland', and 'Wood pasture'.
- 4.4.2. Seven habitat types across the Site were identified as Priority Habitats (or possible Priority Habitats) in accordance with Section 7 of the Environment (Wales) Act 2016 during the Phase 1 habitat survey: 'Upland heathland', 'Rivers', 'Upland oakwood', 'Lowland mixed deciduous woodland', 'Inland rock outcrop and scree habitats', 'Upland flushes, fens and swamps', and 'Purple moor-grass and rush pastures'.
- 4.4.3. The Priority Habitats (or possible Priority Habitats) identified during the Phase 1 habitat survey are considered to be accurate and true to the habitats recorded within the Sites. Priority Habitats returned from the desk study have been used as a guide for our assessment of the Sites, but are not considered to be representative of the Sites. For example, an area in the north of the Moel Cynhordy/Mynydd Moelgella Site was returned from the desk study as belonging to the Priority Habitat 'Lowland heath'. However, during the field survey, this habitat was found to comprise continuous bracken and acid grassland, and therefore would not qualify as Lowland Heath.
- 4.4.4. Another example of this is that areas of both Sites were returned from the desk study as being 'Lowland Dry Acid Grassland'. However, as the Sites comprise old, non-functional enclosures (as opposed to grassland managed in functional enclosures), these were not considered to qualify as Priority Habitats. Where enclosures were functional, here the habitats had degraded into improved grassland, and so did not qualify as a Priority Habitat.
- 4.4.5. Under Section 7 of this legislation all public bodies (including local planning authorities) must 'take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section and encourage others to take such steps'.
- 4.4.6. To comply with planning policy, the Proposed Development would need to demonstrate that there would be no significant loss of these Priority Habitats as a result of the works. If it is not feasible to avoid Priority Habitats, consultation with the local authority should be completed as the design is developed. For any loss of Priority Habitat, replacement habitat commensurate with that lost should be provided within the design. This should ideally be at a higher biodiversity value than the habitat removed.
- 4.4.7. National Vegetation Classification (NVC) surveys may be required on habitats which will be impacted by the Proposed Works and have been assessed as qualifying, or potentially qualifying as Priority Habitats during the Phase 1 habitat survey
- 4.4.8. Multiple parcels of ancient woodland occur within 2km of the Sites, although none were within the Sites; therefore no further recommendations in relation to AWI parcels are provided.

4.5. PROTECTED AND NOTABLE SPECIES

- 4.5.1. The results of the desk study, Phase 1 habitat survey and protected species assessment highlighted the potential presence of several protected species or species of conservation concern within the Sites, or within the immediate surroundings of the Sites. These were bats, badger, brown hare, hedgehog, otter, water vole, amphibians, reptiles, common and widespread invertebrates, notable

plants, and INNS. The legal protection afforded to these species is outlined below and, where appropriate, the requirement for further survey and/ or mitigation measures is identified.

BATS

- 4.5.2. All species of bats recorded within the UK are protected from killing, injury and disturbance⁹ and their roosts protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the WCA with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.
- 4.5.3. Certain species of bats, including the Bechstein's bat *Myotis bechsteinii*, greater *Rhinolophus ferrumequinum* and lesser *Rhinolophus hipposideros* horseshoe bats, noctule bat, brown long-eared bat and soprano pipistrelle bat are also listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation to maintain and enhance for these species when carrying out their functions.
- 4.5.4. Suitable habitat for commuting bats was recorded within the Sites in the form of linear habitats such as lines of trees, dry-stone walls and streams, and the habitats throughout the Sites provide suitable foraging habitats for bats.
- 4.5.5. A total of 36 trees (18 in each of the Sites) were assessed as being suitable to support roosting bats. A rocky outcrop within the Mynydd Pwll-yr-lwrch Site was also assessed as having low suitability to support roosting bats.
- 4.5.6. The Proposed Development has been identified to present the following risks to bats:
- Disturbance/killing/injury to commuting and foraging bats caused by wind turbine collisions;
 - Disturbance/killing/injury of roosting bats through site clearance activities; and
 - Loss of suitable roosting, commuting and foraging habitat through site clearance activities.
- 4.5.7. It is recommended that the Proposed Development seeks to minimise loss of roosting, foraging and commuting habitat for bats through sensitive scheme design where practicable. Retained habitat shall be protected during the clearance and construction phases.
- 4.5.8. Further surveys are recommended to determine the bat species assemblage within the Sites, and if they are at risk of loss to the Proposed Development, to determine if the trees and structure with suitability to support roosting bats are used by roosting bats. These surveys are detailed within Section 4.6.

BADGER

- 4.5.9. The Protection of Badgers Act 1992 makes it illegal to wilfully kill, injure or take any badger, or attempt to do so. It also makes it an offence to intentionally or recklessly damage, destroy or

⁹ Disturbance is defined within the Habitats Regulations as that which is likely to impair a species ability to survive, breed or reproduce, hibernate or migrate or to significantly affect the local distribution or abundance of the species.

obstruct access to any part of a badger sett. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.

- 4.5.10. The Sites had suitability for badgers to excavate setts, although this was restricted to the woodland and dense bracken. The Sites had suitability to support foraging badgers across the entirety of the Sites. No setts or signs of badgers were identified during the Phase 1 habitat survey. However, badgers are able to quickly excavate setts in new locations.
- 4.5.11. Owing to the limited amount of suitable habitat for sett-building badgers within the Site, the absence of evidence of badgers during the Phase 1 habitat survey, and the lack of badger records returned from the desk study, it is considered the badger are likely to be absent from the Sites. Ecological avoidance, mitigation and compensation requirements to minimise effects on badgers are described in Section 4.7.
- 4.5.12. NRW will typically only issue licenses for the closure and destruction of badger setts between 1 July and 30 November under a registered licence. As badgers are able to build setts quickly, it is recommended that a pre-works check for badgers is undertaken two to three months prior to the commencement of construction if it is within this window. Should construct fall within December-June surveys should be completed in September to allow sufficient time for the setts to be closed in advance of the closure window shutting.

BROWN HARE

- 4.5.13. Brown hare are offered protection under Section 10A of the WCA, which protects brown hare from killing at certain times of year. The species is also listed as a Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation to maintain and enhance for this species when carrying out their functions.
- 4.5.14. The Proposed Development has the potential to lead to the killing/injury of brown hares, particularly young, through vegetation clearance and other intrusive works, and removal of their habitats.
- 4.5.15. It is likely that potential impacts on brown hare could be avoided through design and implementation of standard mitigation measures during construction works. For this reason, it is recommended that works are conducted under a Precautionary Method of Works (PMoW).

HEDGEHOG

- 4.5.16. The hedgehog is listed on Schedule 6 of the WCA ,which makes it illegal to kill or capture wild hedgehogs, and is listed under the Wild Mammals Protection Act (1996), which prohibits cruel treatment of hedgehogs. The species is also listed as a Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation to maintain and enhance for this species when carrying out their functions.
- 4.5.17. The Sites had suitable habitat for foraging, commuting and nesting hedgehog in woodland and scrub. Therefore, the Proposed Development presents the risk of killing/injury through vegetation clearance to hedgehog. To prevent this, any removal of suitable habitat should be carried out under a PMoW, as detailed in a CEMP.

OTTER

- 4.5.18. Otters are protected from killing, injury and disturbance and their places of rest or shelter (holts and other resting sites) are protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the WCA with respect to disturbance of individuals occupying

places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.

- 4.5.19. Otters are also listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation to maintain and enhance for this species when carrying out their functions.
- 4.5.20. Although no potential holts or resting places for otter were recorded within the Site, there were watercourses suitable to support commuting otter within the Sites. Therefore, measures to avoid impacts to commuting otters should be detailed in a CEMP.
- 4.5.21. The Garw Fechan to the east of the Moel Cynhordy/Mynydd Moelgella Site may provide suitable resting places for otter, including natal holts, beyond the Site boundary. If works to facilitate the Proposed Development are required within 200 m of the Garw Fechan, it is recommended that an otter survey of the extent of the Garw Fechan within 200 m of the Moel Cynhordy/Mynydd Moelgella Site is carried out. This is described in Section 4.6.

WATER VOLE

- 4.5.22. The water vole is protected from killing and injury and its place of rest or shelter (burrow) is protected from damage, destruction or obstruction under the WCA. Additional protection from disturbance is extended to individuals occupying places of rest or shelter. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.
- 4.5.23. The water vole is also listed as a Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation to maintain and enhance for this species when carrying out their functions.
- 4.5.24. The steep sided banks present within the ditches and above ground dense marshy grassland vegetation in the Sites may provide suitable shelter or protection for water vole. Therefore, the Proposed Development has the potential to injure/kill or disturb water vole, as well as destroy their places of rest.
- 4.5.25. A follow-up riparian mammal survey to fully understand the extent to which water vole may be using these stretches of streams is recommended, as detailed in Section 4.6. Ecological avoidance, mitigation and compensation requirements to minimise effects on water vole are described in Section 4.7.

AMPHIBIANS

Common and widespread amphibians

- 4.5.26. Common frog and common toad are protected under Schedule 5 of the WCA. This includes protection from killing and injury. Common toads are also listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation to maintain and enhance for this species when carrying out their functions.
- 4.5.27. The Mynydd Pwll-yr-Iwrch Site is known to support frogs, with frogspawn recorded in P7 during the Phase 1 habitat survey. The ditches, streams and terrestrial habitat in the Site was considered suitable to support all common and widespread amphibians.
- 4.5.28. Therefore, the Proposed Development presents the risk of killing/injury of common and widespread amphibians through vegetation clearance, and removal of their habitats.

- 4.5.29. Impact to all habitat suitable for amphibians (including terrestrial habitat) should be avoided as far as possible. Where this is not practicable, it is recommended that an ECoW is present on site prior to works commencing to deliver a toolbox talk to all site personnel to advise on the possibility of amphibians being present during the works and what to do should they be identified. The ECoW should perform a fingertip search of all vegetation to be cleared immediately prior to clearance, and potential hibernacula should be removed, where required, during the active season under supervision of an ECoW. Works should be conducted under a PMoW, as detailed in a CEMP.

GCN

- 4.5.30. GCN are protected from deliberate killing, capturing or disturbing; deliberate taking or destroying of the eggs; and damaging or destroying of a breeding site/resting place under the Habitats Directive. GCN are also listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation to maintain and enhance for this species when carrying out their functions.
- 4.5.31. P9 in the Moel Cynhordy/Mynydd Moelgella Site, and P1, P3, P4 and P6 in the Mynydd Pwll-yr-lwrch Site underwent a HSI assessment and returned a result of above 0.5, and were therefore considered suitable to support GCN. One other pond, P5, within 500 m of the Mynydd Pwll-yr-lwrch Site, was not subject to an HSI assessment, and may also be suitable to support GCN.
- 4.5.32. The terrestrial habitats within the Sites were considered suitable to support GCN in their terrestrial phase.
- 4.5.33. If GCN are present within the Site, the Proposed Development risks the killing/injury and/or disturbance to GCN and their place of rest/shelter. Therefore, further surveys are required to confirm GCN presence/likely absence.
- 4.5.34. P5, within 500m of the Mynydd Pwll-yr-lwrch Site, should be subject to an HSI assessment. This may lead to the requirement of further surveys, depending on the results.
- 4.5.35. P9 in the Moel Cynhordy/Mynydd Moelgella Site, and P1, P3, P4 and P6 in the Mynydd Pwll-yr-lwrch Site would require further surveys, which could include environmental DNA (eDNA) surveys, or four presence/likely absence surveys per pond. These further surveys are restricted to mid-March – June, which is the optimal period for GCN surveys. Presence/likely absence surveys would comprise four to six surveys.
- 4.5.36. These surveys are detailed in Section 4.6.
- 4.5.37. If GCN are identified within the Site and impacts to GCN or GCN habitat cannot be avoided, activities that would otherwise constitute an offence under legislation may be licensed by NRW for certain purposes.

REPTILES

- 4.5.38. Native widespread reptile species (common or viviparous lizard, adder, grass snake and slow worm) are partially protected under Schedule 5 of the WCA. This includes protection from killing and injury.
- 4.5.39. All reptile species are also listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation to maintain and enhance for these species when carrying out their functions.

- 4.5.40. No evidence of reptiles was identified during the Phase 1 habitat survey, although the habitats, specifically marshy grassland, bracken, acid grassland, heath and scrub, were considered to be suitable to support common and widespread reptile species, with basking opportunities on the spoil and scree. Due to the widespread nature of reptile species, and the suitability of the habitats within both Sites to support common and widespread reptile species, it can be assumed that reptile species are present in suitable habitats within both Sites. Therefore, the Proposed Development risks killing/injury of reptiles through vegetation clearance or other intrusive works. Therefore, no further surveys are required, but mitigation measures should be implemented to prevent killing and injury to reptile species, and enhancement measures should consider reptile species.
- 4.5.41. Any refugia and hibernacula, such as the stone piles and dry stone walls, should be retained and protected where possible. If this is not possible, they should be dismantled under supervision of an ECoW during the active season.
- 4.5.42. Any removal of vegetation suitable to support hibernating reptiles should be carried out in the active season (March to October) to avoid impacts to hibernating reptiles.
- 4.5.43. Vegetation clearance and refugia/hibernacula dismantling should be carried out under a PMoW.

NOTABLE PLANTS

- 4.5.44. Although no notable plant species have been recorded during the Phase 1 habitat survey, habitats within the Site were considered suitable to support bluebell (woodland and bracken), chamomile (acid grassland) and pennyroyal (marshy grassland). It should be assumed that chamomile is present within the Sites, owing to the proximity of the record of chamomile and the suitability of the habitats within the Sites. Public bodies have an obligation to maintain and enhance for these species when carrying out their functions.
- 4.5.45. In the first instance, removal of the habitats on the Sites suitable to support notable plant species should be avoided where possible. Where it is not possible to avoid, habitat suitable for supporting notable plant species should be replaced at a minimum ratio of 1:1. Surveys to confirm the presence or likely absence of these species may also be necessary to inform appropriate mitigation measures.

INVASIVE NON-NATIVE PLANT SPECIES

- 4.5.46. Certain plants are listed on Schedule 9 of the WCA. It is an offence to plant or otherwise cause these species to grow in the wild.
- 4.5.47. Rhododendron and Himalayan balsam were identified during the field survey. Presence of INNS elsewhere within the Site, and presence of other INNS, cannot be ruled out.
- 4.5.48. There is, therefore, a possibility that the Proposed Development may risk the spread of Schedule 9 WCA plant species, resulting in an offence under the WCA. To avoid this, any habitat removal should be subject to a pre-works check by an ECoW to determine the presence of INNS, and under a PMoW. No additional surveys are considered necessary.

4.6. FURTHER SURVEY REQUIREMENTS

- 4.6.1. Potential ecological constraints for which further surveys are required to ensure legal and planning policy compliance are listed in Table 6.

Table 8 - Key ecological constraints and further survey requirements

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
Priority Habitats	Loss of habitats.	If identified Priority Habitats cannot be avoided then NVC surveys should be completed to inform mitigation measures and inform further Ground Water Dependant Terrestrial Ecosystems.	The optimal period for NVC surveys on habitats identified within the Sites is May – August.
Bats	Risk of disturbance to bats roosting in suitable trees via direct effect and/or artificial lighting. Risk of loss and/or severance of suitable commuting and foraging habitat.	PRF inspection surveys – Should trees be directly impacted by the development a more detailed assessment of the likely suitability of the trees for bats, and to look for more conclusive evidence of bats may be required. This may involve the use of tree climbing. Depending on the results of these surveys, further surveys may be required. Preliminary Roost Assessment (PRA) surveys – To allow for a more detailed assessment of the likely suitability of any structures impacted which have been identified as having suitability for bats, an internal inspection may be required. This would look for more conclusive evidence of bats. Depending on the results of this survey, further surveys may be required. Where accessibility prevents close inspection, a dusk emergence survey may be required. Bat Activity Surveys – To assess the bat species assemblage and activity levels within	PRF inspection surveys and PRA surveys are not seasonally constrained. Bat Activity Surveys comprising both static detector deployment and NBWs should be undertaken in each of spring (April-May), summer (June-mid-August) and autumn (mid-August-October).

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
		the Sites. At this stage of the project, there is not yet a fixed design and therefore the number of the turbines is not known. Once this is known automated detectors should be located at turbine locations to collect data for 10 consecutive nights in each of spring (April-May), summer (June-mid-August) and autumn (mid-August-October). Nighttime Bat Walkover (NBW) – Static detectors provide an overview of how bat activity is broadly distributed over the site and which species are present, but are less suited to identifying flight lines and understanding the numbers of bats present. NBW surveys can be used to identify connections between nearby roosts, linear features (or other potential flight paths and potential key foraging areas. These surveys are recommended should additional information on flight paths be required once turbine locations are known.	
Otter	Risk of disturbance to otters and/or their resting places. Risk of loss of suitable habitat for commuting otter. Risk of indirect effects to river habitat such as pollution run-off.	Should habitats within 200m of the Garw Fechan be affected during the construction of the Proposed Development: Otter survey – To assess the use of the Garw Fechan and associated habitats by otter. This will involve a full survey of 200m upstream and downstream of the Moel Cynhordy/Mynydd Moelgella Site boundary extent.	Otter surveys are not seasonally constrained.

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
		This may lead to the requirement for further surveys, including the deployment of trail cameras. If places of rest or shelter for otters are damaged/destroyed during the Proposed Development, further surveys/inspections may be required and an EPS licence from NRW will need to be obtained to allow the work to proceed lawfully. A precautionary approach would be followed in accordance with licence methodology. This would likely include a pre-works check to identify any resting places/holts in proximity to the Proposed Development prior to works commencing.	
Water vole	Risk of disturbance to water voles and their resting places. Killing/injury of water voles during construction works. Loss of suitable habitat. Risk of indirect impacts to river habitat such as pollution run-off.	Riparian mammal survey – To assess the use of the streams within the Sites and associated habitats by water vole. This will involve a full survey of all of the watercourses within the Sites.	Two water vole surveys should be undertaken. One of these should be in mid-April to June, and one should be in July to September inclusive. The visits should be at least two months apart.
Great crested newts	Killing/injury of GCN through construction works.	Development within 500m of waterbodies that may support GCN poses a risk of causing harm, including injury, disturbance, or killing.	HSI assessments are not seasonally constrained.

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
		Should P9 in the Moel Cynhordy/Mynydd Moelgella Site, and P1, P3, P4 and P6 in the Mynydd Pwll-yr-lwrch Site fall within 500m of the development they should be subject to further surveys, which could include environmental DNA (eDNA) surveys, or four presence/likely absence surveys per pond. P5, within 500m of the Mynydd Pwll-yr-lwrch Site, should be subject to an HSI assessment. This may lead to the requirement of further surveys, depending on the results.	Further GCN surveys (eDNA and presence/likely absence surveys) are restricted to the optimal times of mid-March – June.

4.7. PRELIMINARY AVOIDANCE, MITIGATION AND COMPENSATION MEASURES

4.7.1. To enable compliance with relevant legislation and planning policy, as described above within Sections 4.1-4.4, the following avoidance, mitigation and compensation measures should be designed into the Proposed Development. These will be refined following completion of further survey work recommended above. It should be noted that targeted mitigation measures including but not limited to habitat retention and/or restoration could be required. It is not possible to provide prescriptive measures in the absence of design information for the Proposed Development. Any such measures will need to be developed in parallel with further surveys and as the design for the Proposed Development is developed.

- Any vegetation clearance required as part of the Proposed Development should be carried out under a PMoW with an ECoW present. Information to prevent impacts on the protected species discussed in this report should be documented in a PMoW document.
- Works should be carried out as per environmental best practice to avoid indirect impacts to Wildlife Sites and Priority Habitats, including river habitat.
- Avoidance of vegetation clearance within Priority Habitats, where practicable. Where this is not possible, provision of replacement habitat, over and above that which is lost, would be required.
- Avoidance of working in areas where INNS are present.

ENVIRONMENTAL BEST PRACTICE

4.7.2. In addition, general environmental protection measures must be implemented during the construction phase of the proposed scheme. Such measures include best environmental practice guidance outlined in the NRW Guidance for Pollution Prevention (NRW, 2018) and those outlined by the Construction Industry Research and Information Association guidance (CIRIA, 2015). The following minimum standards must be adhered to prevent ecological impacts beyond the Site boundaries:

- Measures must be taken to prevent dust and other emissions from construction affecting land beyond the Sites.
- Chemicals and fuels must be stored in secure containers located away from watercourses or water bodies. Spill kits must be available.
- Excavations must be covered or securely fenced (with no potential access points beneath fencing) when the Sites are closed (e.g. overnight) to prevent entrapment of animals.
- Retained trees must be protected in accordance with BS5837 (British Standards Institute, 2012).
- Noise and vibration must be controlled and kept to the minimum necessary.
- Lighting used for construction must be switched-off when not in use and positioned so as not to spill on to adjacent land or retained vegetation within the Site.

4.8. ECOLOGICAL ENHANCEMENT OPPORTUNITIES

4.8.1. PPW (Edition 12, 2024) states *‘By protecting and enhancing biodiversity, and our natural environment more generally, it will be possible to future proof economic assets in response to the challenges presented by climate change, to promote low carbon and appropriate resource choices which address the causes of climate change and to provide cost effective ecosystems services such as clean air and water.’*

- 4.8.2. Net Benefit for Biodiversity (NBB) in association with development is encouraged by PPW (2021) and under Section 6 of Part 1 of the Environment (Wales) Act 2016. The below recommendations aim to comply with a NBB approach, by way of delivering an overall improvement in biodiversity without use of a metric. Engaging with these recommendations in the early stages of the Proposed Development would facilitate ecosystem resilience and wider ecosystem benefits being achieved. This approach will support local authorities in achieving their Section 6 duty to “*promote the resilience of ecosystems*” when determining planning applications.
- 4.8.3. To encourage compliance with planning policy the following measures are recommended for inclusion within the Proposed Development; where possible:
- Installation of bird and bat boxes in trees to provide additional refuge sites;
 - If planting is required, no planting of INNS within the Site;
 - Planting of pollinator friendly native species of local provenance for any habitat lost which is suitable for invertebrates.
 - Enhancing connectivity through the planting of shrubs and trees where appropriate; and
 - Sustainable drainage systems (SuDS) to be incorporated into the design of the Proposed Development to reduce the effects of water runoff and provide ecological benefits. To facilitate this, ecological and landscape design input would be required in the design of SuDS features to ensure that the relevant standards are met and to ensure benefits for biodiversity are achieved.
- 4.8.4. These measures should be detailed in an NBB report.

5. CONCLUSIONS

- 5.1.1. The Proposed Development is likely to impact upon protected and/or notable species and habitats due to the removal of habitats within the Sites during the construction phase, and continuing through the operational phase. During the operational phase of the Proposed Development, there may be impacts to species such as commuting/foraging bats.
- 5.1.2. The Sites lie 4.3 km from the closest statutory designated site of international importance, and 30.0km from the closest statutory designated site of international importance designated for the presence of bats. Therefore, an HRA assessment will be required once further details on the Proposed Development are available.
- 5.1.3. Cwm Du Woodlands SSSI is located 0.3 km west of the Site. To prevent indirect effects on Cwm Du Woodlands SSSI, environmental best practice should be followed, laid out in a CEMP.
- 5.1.4. Habitats recorded within the Site comprise: woodland; scrub; parkland/scattered trees; grassland (comprising acid, neutral, improved, and marsh/marshy); bracken; heath; standing water; running water; inland cliff; scree; spoil; wall; dry ditch; earth bank; and bare ground. The following Priority Habitats were identified (or potentially present) within the Site: Upland heathland; Rivers; Upland oakwood; Lowland mixed deciduous woodland; Inland rock outcrop and scree habitats; Upland Flushes, Fens and Swamps; and Purple moor-grass and rush pastures.
- 5.1.1. If it is not feasible to avoid Priority Habitats within or adjacent to the Site, consultation with Bridgend County Council should be completed as part of design development and NVC surveys may be required at those locations. For any loss of Priority Habitat, replacement habitat commensurate or greater than that lost should be provided within the design.
- 5.1.2. The Proposed Development has the potential to impact upon protected and/or notable species including bats, badger, brown hare, hedgehog, otter, water vole, amphibians, reptiles, notable plants and INNS. Further targeted surveys for bats, otter (should habitats within 200 m of the Garw Fechan be impacted), water vole, and GCN are recommended, based on the current understanding of the Proposed Development.
- 5.1.3. Preliminary avoidance and/or mitigation measures are recommended for badger, brown hare, hedgehog, common and widespread amphibians, reptiles, notable plants and INNS in the form of protection/retention of habitats, ecological supervision and/or PMoW.
- 5.1.4. Results of the surveys recommended as part of this assessment will inform the need for any further licensing and/or mitigation requirements and help inform the detailed design of the proposals in line with national and local planning policy and legislation, including the delivery of biodiversity enhancements in accordance with duties under Section 6, which should be detailed in an NBB report. The recommendations detailed above should be re-visited following the issue of a preliminary design.

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Key
— Mynydd Pwll-yr-Iwrch
— Moel Cynhordy/Mynydd Moelgella

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012

Kilometers

Client:

Pennant Walters

Project:

Maesteg Windfarms Preliminary Ecological Appraisal

Title

Mynydd Pwll-yr-Iwrch and Moel Cynhordy/Mynydd Moelgella Site Location

Drawing No:

Figure 1

Date:

11/03/2025

Scale:

40,000 @ A3

Drawn:

LT

Checked:

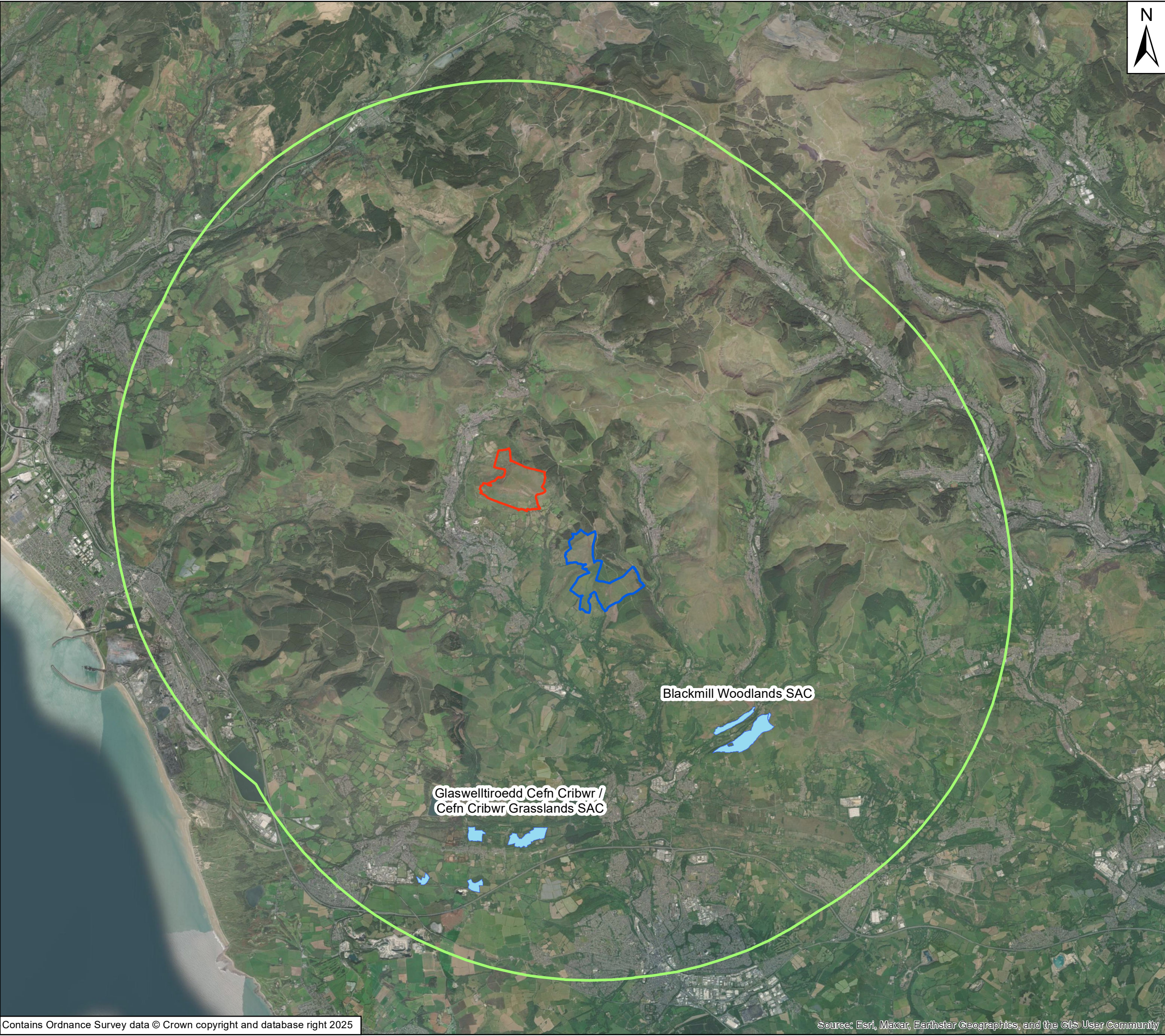
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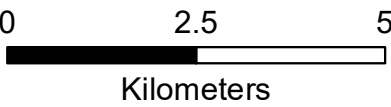
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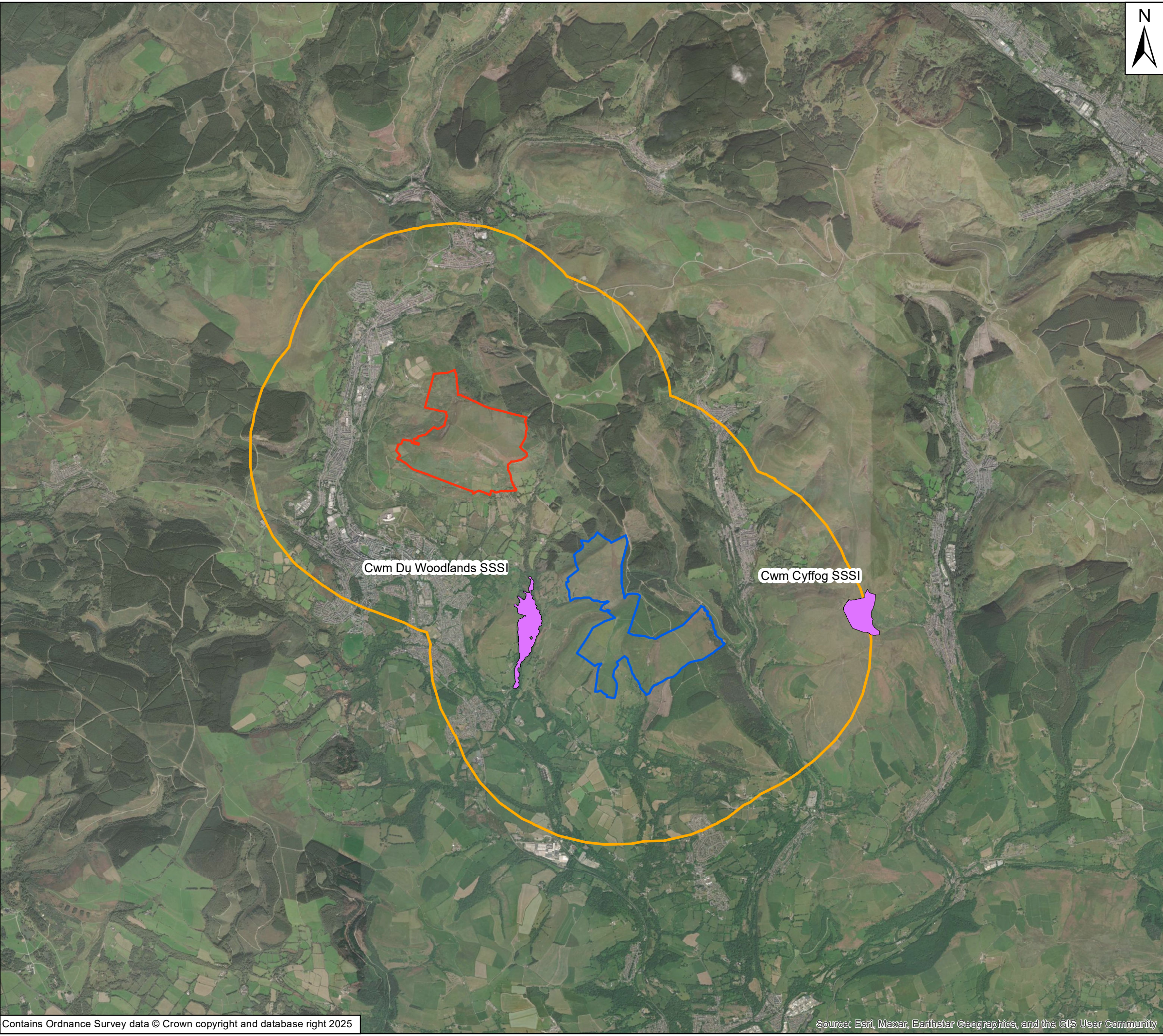
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



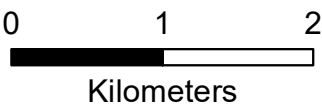
- Key**
- Mynydd Pwll-yr-Iwrch
 - Moel Cynhordy/Mynydd Moelgella
 - 10 km buffer
 - Special Area of Conservation (SAC)



Client:	Pennant Walters		
Project:	Maesteg Windfarms Preliminary Ecological Appraisal		
Title	International Statutory Designated Sites within 10km of the Sites		
Drawing No:	Figure 1	Drawn:	LT
Date:	11/03/2025	Checked:	MB
Scale:	100,000 @ A3	Approved:	GL



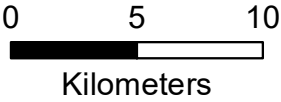
- Key**
- Mynydd Pwll-yr-Iwrch
 - Moel Cynhordy/Mynydd Moelgella
 - 2 km buffer
 - Site of Special Scientific Interest (SSSI)



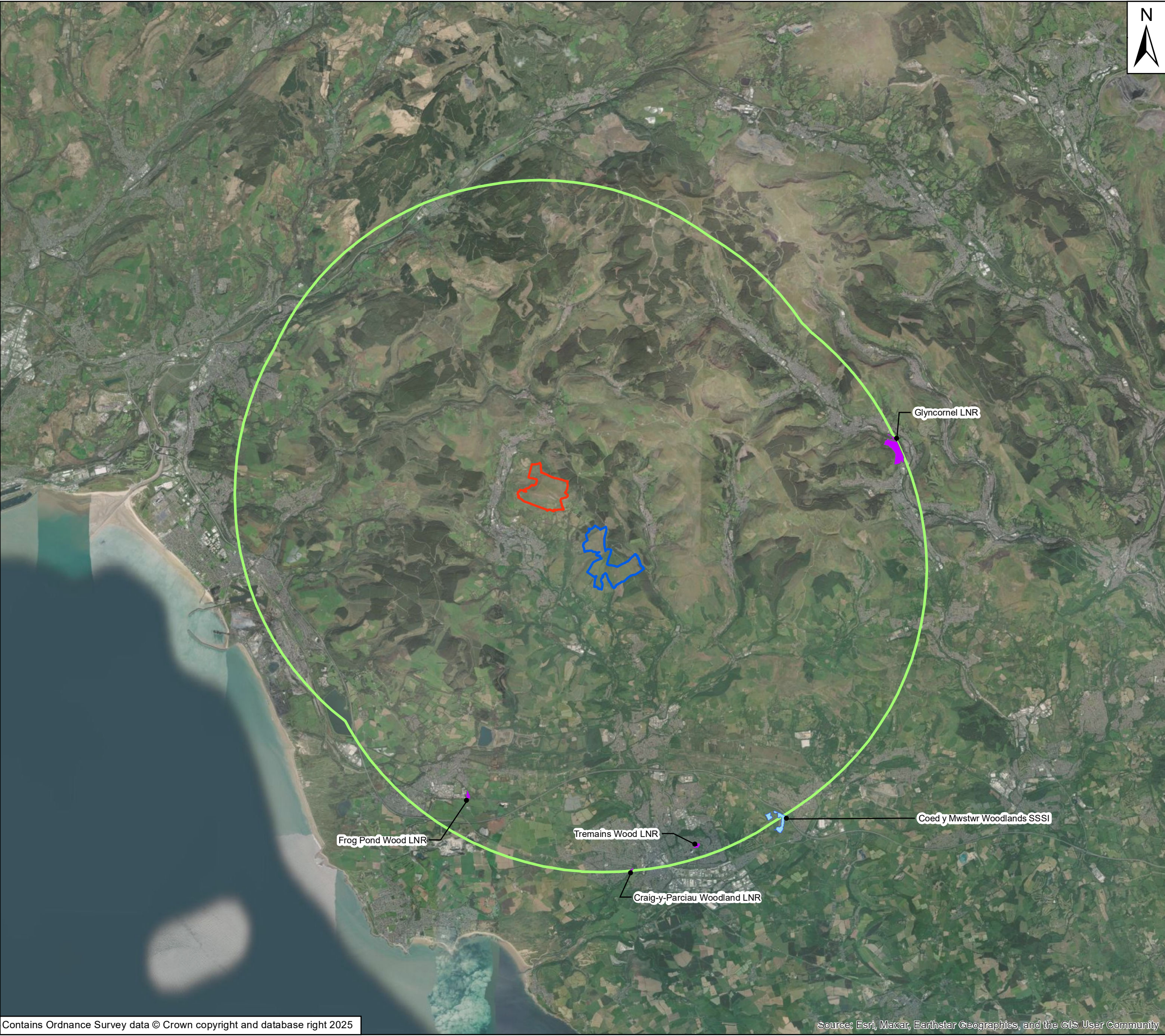
Client:	Pennant Walters		
Project:	Maesteg Windfarms Preliminary Ecological Appraisal		
Title	National Statutory Designated Sites within 2 km of the Sites		
Drawing No:	Figure 3	Drawn:	LT
Date:	11/03/2025	Checked:	MB
Scale:	50,000 @ A3	Approved:	GL



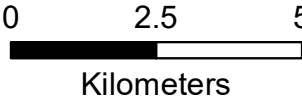
- Key**
- Mynydd Pwll-yr-lwrch
 - Moel Cynhordy/Mynydd Moelgella
 - 10km Buffer
 - 30km Buffer
 - Local Nature Reserve (LNR)
 - Site of Special Scientific Interest (SSSI)



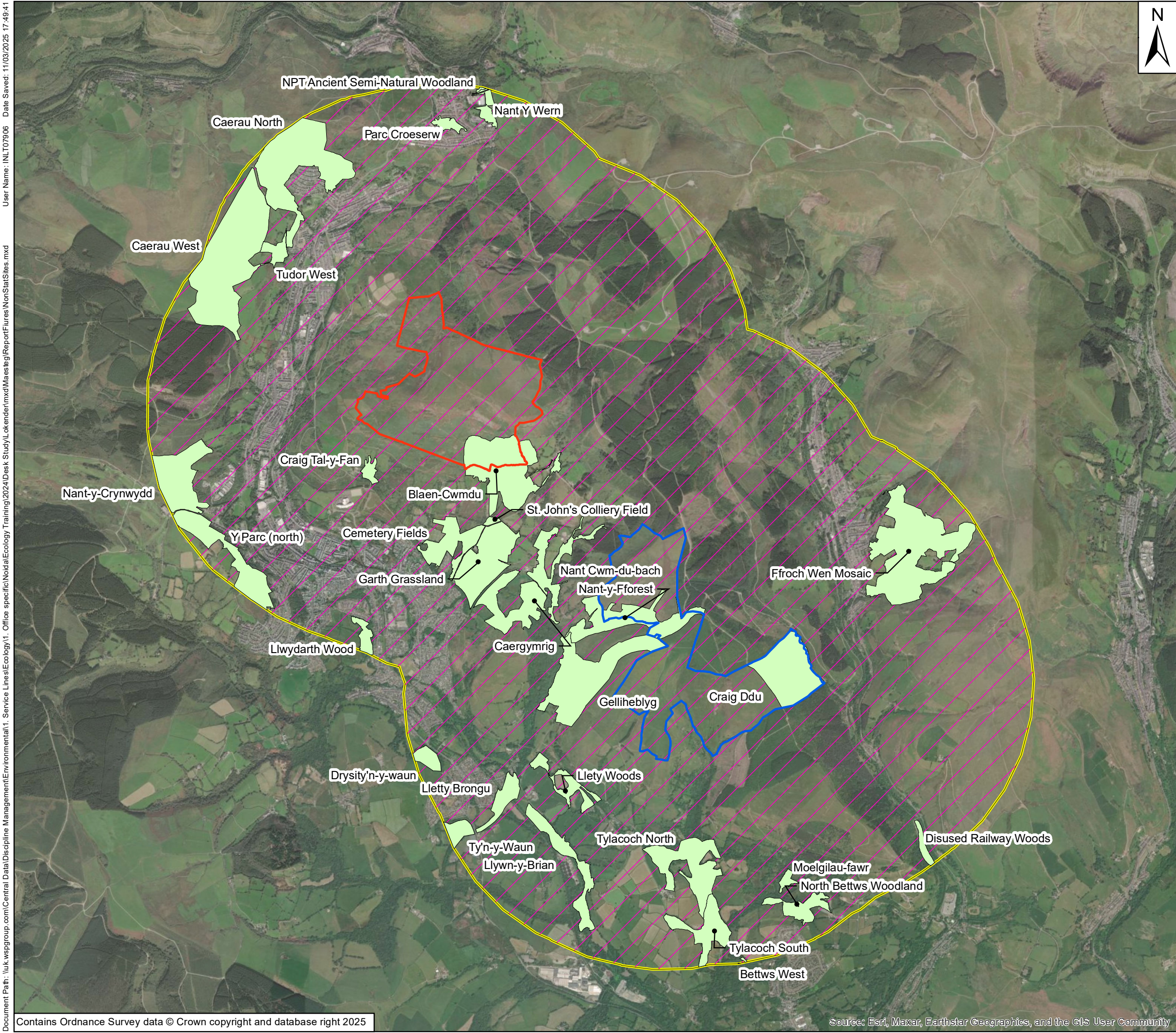
Client:	Pennant Walters		
Project:	Maesteg Windfarms Preliminary Ecological Appraisal		
Title	Statutory Designated Sites for which Bats are a Qualifying Feature		
Drawing No:	Figure 4a	Drawn:	LT
Date:	17/04/2025	Checked:	MB
Scale:	300,000 @ A3	Approved:	GL



- Key**
- Mynydd Pwll-yr-lwrch
 - Moel Cynhordy/Mynydd Moelgella
 - 10km Buffer
 - Local Nature Reserve (LNR)
 - Site of Special Scientific Interest (SSSI)



Client:	Pennant Walters		
Project:	Maesteg Windfarms Preliminary Ecological Appraisal		
Title	Statutory Designated Sites for which Bats are a Qualifying Feature		
Drawing No:	Figure 4b	Drawn:	LT
Date:	01/04/2025	Checked:	MB
Scale:	130,000 @ A3	Approved:	GL



Key

- Mynydd Pwll-yr-Iwrch
- Moel Cynhordy/Mynydd Moelgella
- 2 km buffer
- Wildlife Site/SINC (Adopted)
- B-Lines

0 1 2
Kilometers

wsp

Client:

Pennant Walters

Project:

Maesteg Windfarms Preliminary Ecological Appraisal

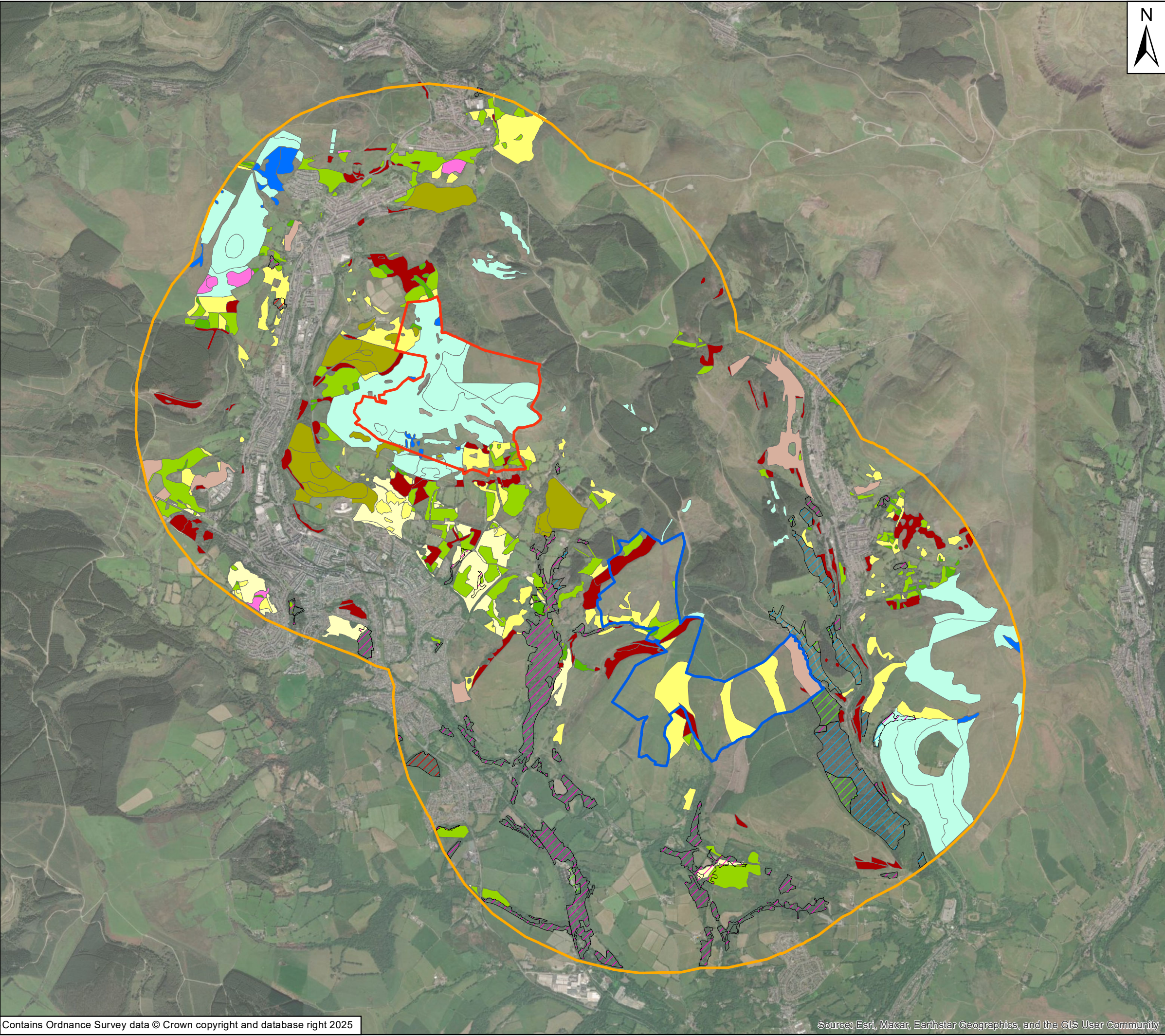
Title:

Non-Statutory Designated Sites within 2km of the Sites

Drawing No:	Figure 5	Drawn:	LT
Date:	12/03/2025	Checked:	MB
Scale:	35,000 @ A3	Approved:	GL

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N

0

0.5

1

Kilometers

Mynydd Pwll-yr-Iwrch

Moel Cynhordy/Mynydd Moelgella

2 km buffer

Ancient Semi-Natural Woodland

Ancient Woodland Site of Unknown Category

Plantation on Ancient Woodland Site

Restored Ancient Woodland Site

Blanket Bog

Lowland Dry Acid Grassland

Lowland Fens and Reedbeds

Lowland Heathland

Marsh Fritillary Habitat

Open Mosaic Habitat on Previously Developed Land

Purple Moor Grass and Rush Pastures

Raised Bog

Traditional Orchards

Upland Flushes, Fens and Swamps

Upland Heathland

Wood Pasture

Client:

Pennant Walters

Project:

Maesteg Windfarms Preliminary Ecological Appraisal

Title

Priority Habitats and AWI Areas within 2 km of the Sites as Returned from the Desk Study

Drawing No:

Figure 6

Date:

12/03/2025

Scale:

35,000 @ A3

Drawn:

LT

Checked:

MB

Approved:

GL

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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Key

Mynydd Pwll-yr-Iwrch

500m Buffer

Bodies of standing water

0400800

Meters

Client:

Pennant Walters

Project:

Maesteg Windfarms Preliminary Ecological Appraisal

Title

Standing water within 500m of the Mynydd Pwll-yr-Iwrch Site

Drawing No:

Figure 7

Date:

17/04/2025

Scale:

12,000 @ A3

Drawn:

LT

Checked:

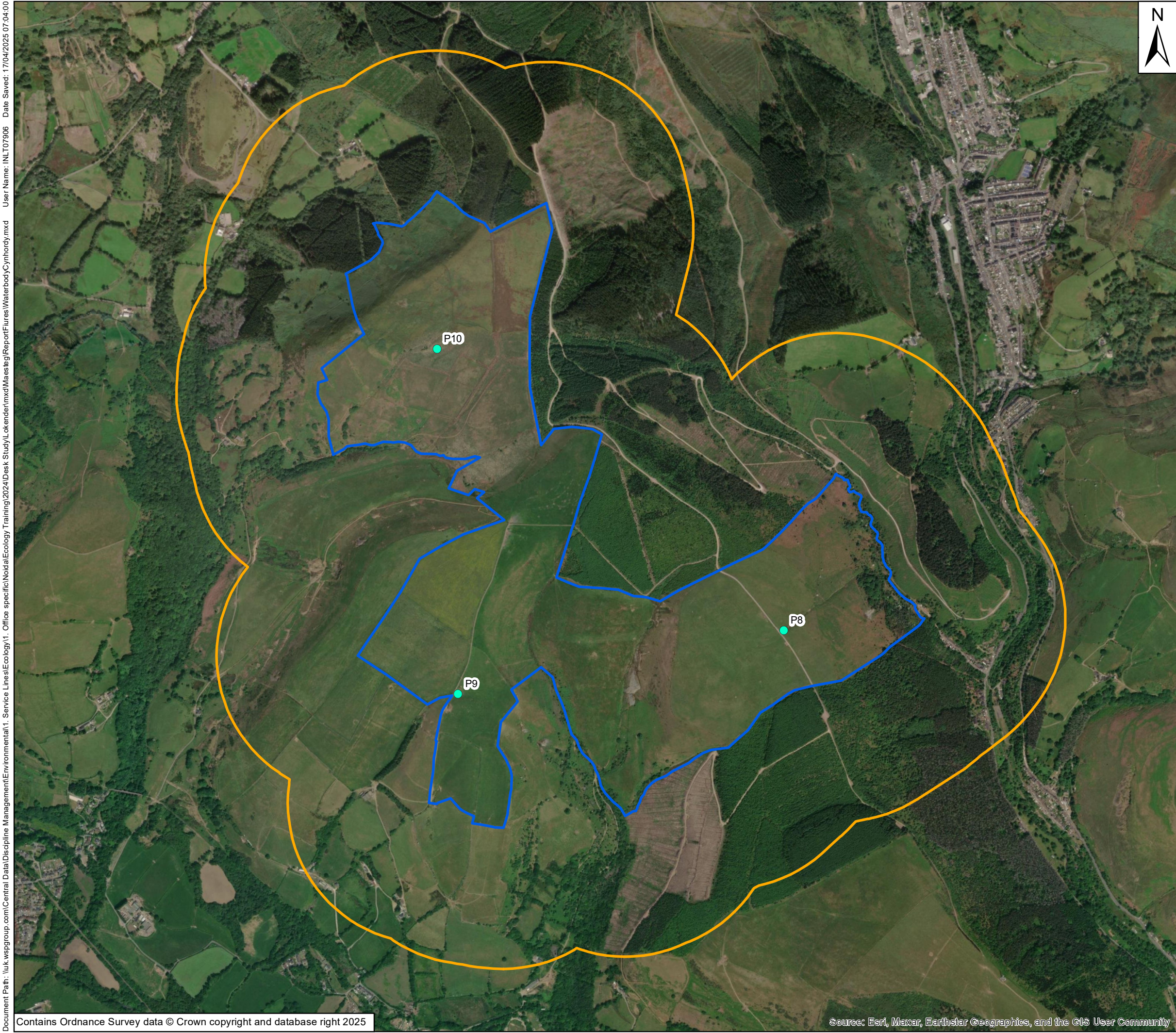
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Approved:

GL

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Key

- Moel Cynhordy/Mynydd Moelgella
- 500m Buffer
- Bodies of standing water

0400800

Meters

Client:

Pennant Walters

Project:

Maesteg Windfarms Preliminary Ecological Appraisal

Title

Standing water within 500m of the Moel Cynhordy/Mynydd Moelgella Site

Drawing No:

Figure 7b

Date:

17/04/2025

Scale:

13,000 @ A3

Drawn:

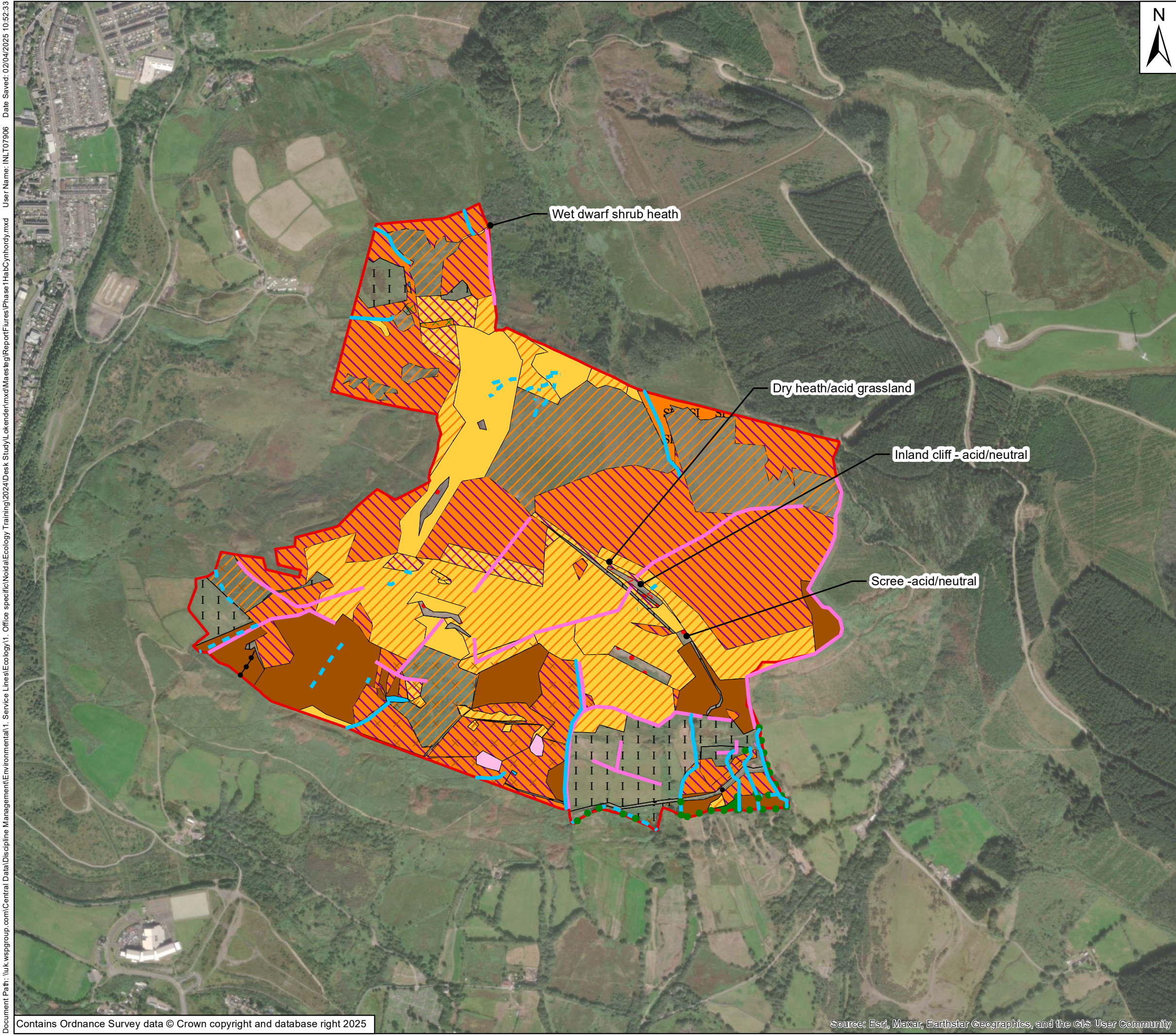
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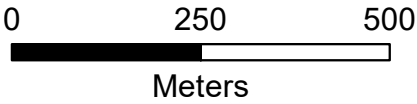
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Approved:

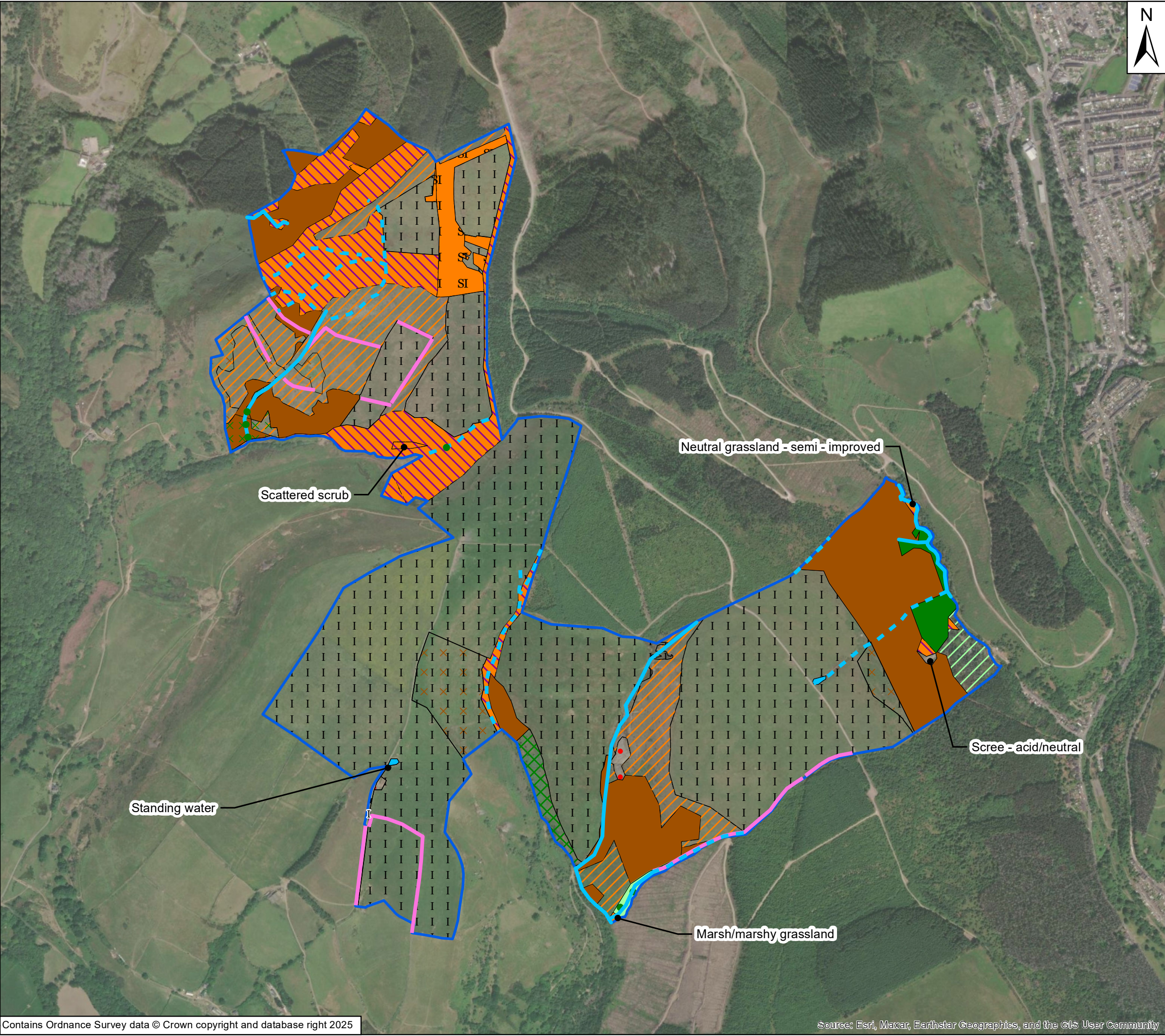
GL



- Key**
- Mynydd Pwll-yr-Iwrch Site
 - Phase 1 Habitat**
 - Broadleaved woodland - semi-natural
 - Scrub - scattered
 - Acid grassland - semi-improved
 - Neutral grassland - semi-improved
 - Improved grassland
 - Marsh/marshy grassland
 - Bracken - continuous
 - Bracken - scattered
 - Dry dwarf shrub heath - acid
 - Wet dwarf shrub heath
 - Dry heath/acid grassland
 - Wet heath/acid grassland
 - Standing water
 - Inland cliff - acid/neutral
 - Scree - acid/neutral
 - Spoil
 - Bare ground
 - Broadleaved parkland/scattered trees
 - Dry ditch
 - Earth bank
 - Running water
 - Wall



Client:	Pennant Walters		
Project:	Maesteg Windfarms Preliminary Ecological Appraisal		
Title	Mynydd Pwll-yr-Iwrch Site Phase 1 Habitat Survey Results		
Drawing No:	Figure 8	Drawn:	LT
Date:	17/04/2025	Checked:	MB
Scale:	10,000 @ A3	Approved:	GL



N

0250500

Meters

Client:

Pennant Walters

Project:

Maesteg Windfarms Preliminary Ecological Appraisal

Title

Moel Cynhordy/Mynydd Moelgella Site Phase 1 Habitat Survey Results

Drawing No:

Figure 9

Date:

17/04/2025

Scale:

10,000 @ A3

Drawn:

LT

Checked:

MB

Approved:

GL

Key

Moel Cynhordy/Mynydd Moelgella Site

Phase 1 Habitat

Acid grassland - semi-improved

Bare ground

Bracken - continuous

Bracken - scattered

Broadleaved woodland - semi-natural

Coniferous woodland - plantation

Improved grassland

Marsh/marshy grassland

Mixed woodland - semi-natural

Neutral grassland - semi-improved

Scree - acid/neutral

Scrub - dense/continuous

Scrub - scattered

Standing water

Broadleaved Parkland/scattered trees

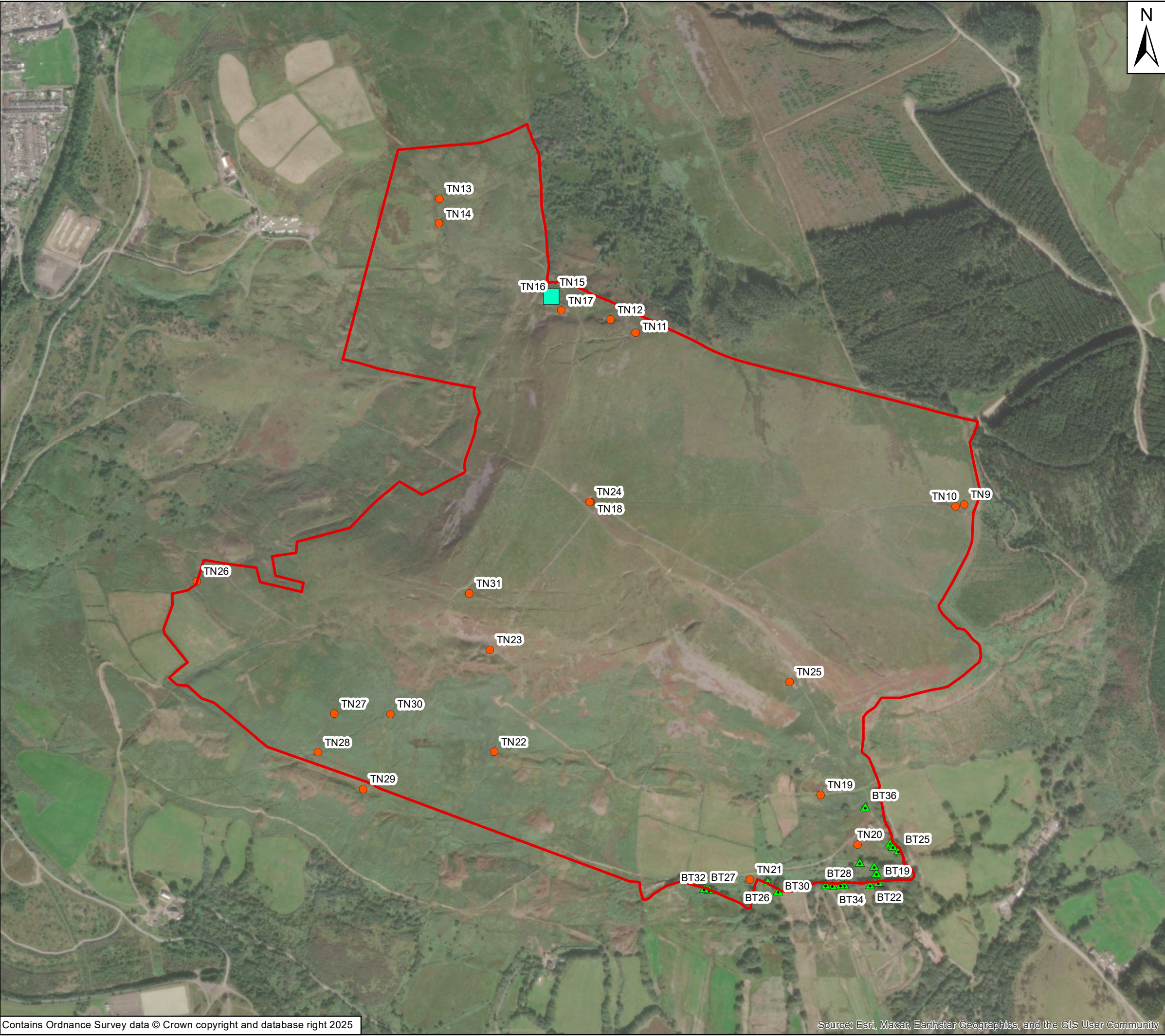
Dry ditch

Running water

Wall

Broad-Leaved parkland/scattered trees

Improved grassland



Key

Mynydd Pwll-yr-Iwrch Site

Target Notes

PBRA Trees
Suitability

PRF

PBRA Structures
Suitability

Low

0250500

Meters

Client:

Pennant Walters

Project:

Maesteg Windfarms Preliminary Ecological Appraisal

Title

Mynydd Pwl-yr-Iwrch Site
Target Notes and Daytime Bat Walkover Results

Drawing No:

Figure 10

Date:

17/04/2025

Scale:

8,000 @ A3

Drawn:

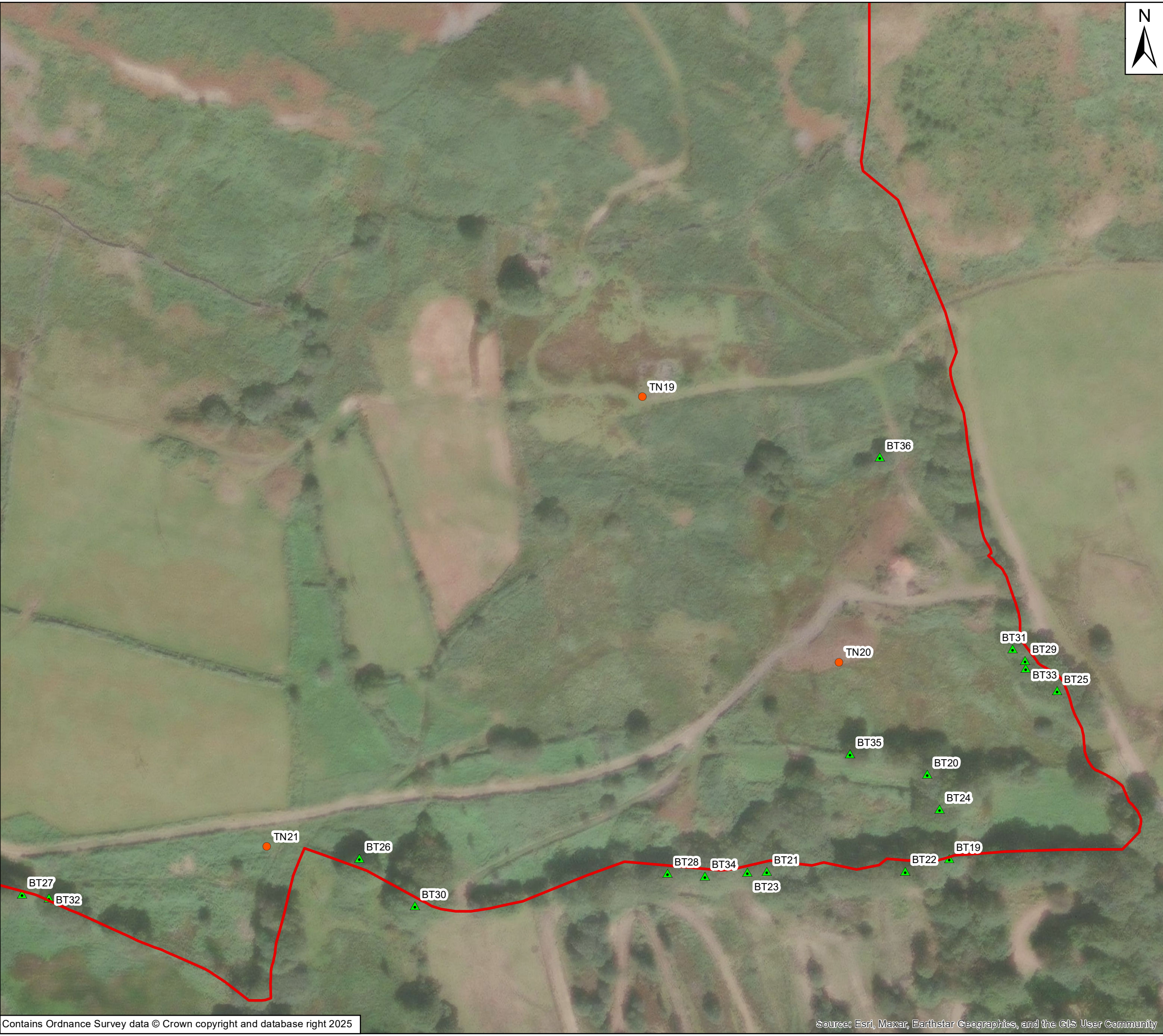
LT

Checked:

MB

Approved:

GL



N

Key

Mynydd Pwll-yr-lwrch Site

Target Notes

PBRA Trees

Suitability

PRF

050100

Meters

Client:

Pennant Walters

Project:

Maesteg Windfarms Preliminary Ecological Appraisal

Title

Mynydd Pwll-yr-lwrch Site
Target Notes and Daytime Bat Walkover Results

Drawing No:

Figure 10

Date:

17/04/2025

Scale:

1,500 @ A3

Drawn:

LT

Checked:

MB

Approved:

GL

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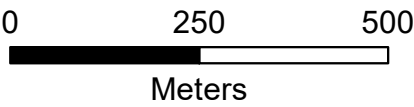
Key

- Moel Cynhordy/Mynydd Moelgella Site
- Target notes

PBRA Trees

Suitability

- PRF



Client:	Pennant Walters		
Project:	Maesteg Windfarms Preliminary Ecological Appraisal		
Title	Moel Cynhordy/Mynydd Moelgella Site Target Notes and Daytime Bat Walkover Results		
Drawing No:	Figure 11	Drawn:	LT
Date:	17/04/2025	Checked:	MB
Scale:	10,000 @ A3	Approved:	GL



Key

Moel Cynhordy/Mynydd Moelgella Site

Target notes

PBRA Trees
Suitability

PRF

050100

Meters

Client:

Pennant Walters

Project:

Maesteg Windfarms Preliminary Ecological Appraisal

Title

Moel Cynhordy/Mynydd Moelgella Site Target Notes and Daytime Bat Walkover Results

Drawing No:

Figure 11

Date:

17/04/2025

Scale:

1,500 @ A3

Drawn:

LT

Checked:

MB

Approved:

GL

Appendix A

**RELEVANT LEGISLATION AND
PLANNING POLICY**

wsp

ENGLAND & WALES LEGISLATION AND POLICY CONTEXT

This report has been compiled with reference to relevant wildlife legislation, planning policy and the UK Biodiversity Framework. An overview and context of relevant legislation is provided, with the relevant protection each species groups or species receives summarised in Table 1.

The Wildlife and Countryside Act 1981, (as amended) (WCA)

Protected birds, animals and plants are listed under Schedules 1, 5, 8 respectively of the WCA, while Schedule 9 lists non-native and/or invasive species the spread of which in the wild is prohibited by the WCA. A description of these Schedules and their meaning is provided below.

Under the WCA (England and Wales) all birds, their nests and eggs (with exception of species listed under Schedule 2) are protected by the WCA. It is an offence to:

- Intentionally kill, injure, or take any wild bird,
- Take or destroy an egg of any wild bird.
- Damage or destroy the nest of any wild bird (whilst being built, or in use). Under the WCA the clearance of vegetation within the survey area boundary, or immediately adjacent to the survey area during the bird nesting season could result in an offence occurring by the disruption or destruction of nest sites. The bird breeding season can be taken to occur between March - August inclusive, although is subject to variations based on species, geographical and seasonal factors.

Schedule 1

Birds listed under Schedule 1 of the WCA¹⁰ are afforded additional protection with regard to intentional or reckless disturbance whilst nest-building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Schedule 5

Species listed in Schedule 5 can either be fully protected or be partially protected under Section 9, which makes it unlawful to intentionally:

- Part 1: kill, injure or take;
- Part 2: possess or control (live or dead animal, part or derivative);
- Part 4 (a): damage or destruct any structure used for shelter or protection;
- Part 4 (b): disturb them in a place of shelter or protection;
- Part 4 (c): obstruct access to place of shelter or protection;
- Part 5 (a): sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative);
- Part 5 (b): advertise for buying or selling.

Schedule 8

The Act makes it an offence (subject to exceptions) to pick, uproot, trade in, or possess (for the purposes of trade) any wild plant listed in Schedule 8, and prohibits the unauthorised intentional uprooting of such plants.

Schedule 9

Invasive species listed under Schedule 9 are prohibited from release into the wild and the Act prohibits planting or “causing to grow” in the wild of any plant species listed in Schedule 9. It should be noted that certain bird species listed on Schedule 1 of the WCA are also listed on Schedule 9 to prevent release of non-native and captive individuals, this includes barn owl, red kite, goshawk and corncrake.

Countryside Rights of Way Act 2000 (CRoW Act)

The CRoW Act has amended the WCA in England and Wales strengthening the protection afforded to Sites of Special Scientific Interest (SSSI) and the legal protection for threatened species. It adds the word ‘reckless’ to the wording of the offences listed under Section 9(4) of the WCA. This alteration makes it an offence to recklessly commit an offence, where previously an offence had to be intentional to result in a breach of legislation.

¹⁰ To view the current list of Schedule 1 listed birds visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/1> [Accessed 20.03.25].

Natural Environment and Rural Communities (NERC) Act 2006

Species and Habitats of Principal Importance in England and Wales are listed under Section 41 and Section 42 respectively of the NERC Act. The Section 41 and 42 lists detail species that are of principal importance for the conservation of biodiversity in England and Wales, and should be used to guide decision-makers such as local and regional authorities when implementing their duty to have regard for the conservation of biodiversity in the exercise of their normal functions – as required under Section 40 of the NERC Act 2006.

The Environment (Wales) Act 2016

The Environment (Wales) Act 2016 (<http://www.legislation.gov.uk/anaw/2016/3/contents/enacted>) puts in place the legislation needed to plan and manage Wales' natural resources in a more proactive, sustainable and cohesive way. Section 7 replaces the duty in Section 42 of the NERC Act 2006 and it places a duty on the Welsh Ministers to publish, review and revise lists of living organisms and types of habitats which they consider are of key significance to sustain and improve biodiversity in Wales. The species and habitat lists are identical to those in Section 42 but it should be noted it is currently under review (23.03.2017).

The Protection of Badgers Act (1992)

It is an offence to wilfully take, kill, injure, possess or ill-treat a badger. Under the Act their setts are protected against intentional or reckless interference. Sett interference includes damaging or destroying a sett, obstructing access to any part of the sett, or disturbance of a badger whilst it is occupying a sett. The Act defines a badger sett as 'any structure or place, which displays signs indicating the current use by a badger' and Natural England (NE) takes this definition to include seasonally used setts that are not occupied but that show sign of recent use by badgers (Natural England, 2009¹¹).

If impacts to badgers or their setts are unavoidable then authorised sett disturbance requires a licence.

The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012)

This Framework lists the UK's most threatened species and habitats and sets out targets and objectives for their management and recovery. The UK Biodiversity Action Plan (BAP) process is delivered nationally, regionally and locally and should be used as a guide for decision-makers to have regards for the targets set by the framework and the goals they aim to achieve. The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant (UK Post-2010 Biodiversity Framework, 2012¹²).

The Conservation of Habitats and Species Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2017 (as amended) consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales. The Regulations came into force on 30th November 2017, and extend to England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters). In Scotland, the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the Conservation (Natural Habitats &c.) Regulations 1994. The Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) transpose the Habitats Directive in relation to Northern Ireland.

All species listed under Annex IV of the Habitats Directive require strict protection and are known as European Protected Species (EPS). Under Regulation 42 of the Habitats Regulations it is unlawful to:

- Deliberately kill, capture or disturb;
- Deliberately take or destroy the eggs of; and
- Damage or destroy the breeding site/resting place of any species protected under this legislation.

If the Ecologist determines that impacts to an EPS are unavoidable then the works may need to be carried out under a site specific mitigation licence from Natural England (NE) or Natural Resources Wales (NRW). Low Impact Class licences are also available in both England and Wales for bats and great crested newts. This enables Registered Low Impact Consultants to undertake certain low impact activities reducing the EPS application paperwork and process length.

¹¹ Natural England, June 2009, Protection of Badgers Act 1992 (as amended), Guidance on 'Current Use' in the definition of a Badger Sett WMLG17, Natural England, Peterborough.

¹² JNCC and Defra (on behalf of the Four Countries' Biodiversity Group), July 2012, UK Post-2010 Biodiversity Framework, Available from: http://jncc.defra.gov.uk/pdf/UK_Post2010_Bio-Fwork.pdf [Accessed 20.03.25].

Certain EPS are also listed under Annex II of the Habitats Directive and are afforded protection by the establishment of core areas of habitat known as Special Areas of Conservation. This means these species are a relevant consideration in a Habitats Regulations Assessment (HRA).

The Birds Directive seeks to maintain populations of all wild bird species across their natural range (Article 2). All bird species listed under Annex I¹³ of the Birds Directive are rare or vulnerable and afforded protection by the classification of Special Protection Areas (SPAs), these are also designated under all regularly occurring migratory species, with regard to the protection of wetlands of international importance (Article 4). This means these bird species and communities are a relevant consideration in HRA.

¹³ To view birds listed under Annex I visit: http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm [accessed 20.03.25]

Table A-1 - Key Species and National Wildlife Legislation, Policy and Biodiversity Framework Applicable in England & Wales

Table A:1: Key Species and National Wildlife Legislation, Policy and Biodiversity Framework Applicable in England & Wales								
Species	Legislation, Planning Policy and UK Biodiversity Framework							
	Wildlife and Countryside Act 1981 (as amended), (WCA)				The Conservation of /Habitats and Species Regulations 2010 (as amended) (Habitats Regulations) - Regulation 41	Natural Environment and Rural Communities (NERC) Act 2006 / The Environment(Wales) Act (2016)	The Protection of Badgers Act 1992	The UK Post-2010 Biodiversity Framework 2011-2020 (JNCC and DEFRA, 2012)
	Schedule1	Schedule 5	Schedule 8	Schedule 9	European Protected Species (Annex IV of the EC Habitats Directive),			
Badger							✓	
Bats		✓ ¹⁴ (part)			✓ ¹⁵	✓ ¹⁶		✓ ¹⁷
Hazel Dormouse		✓ 5(part)			✓	✓		✓
Otter		✓ 5(part)			✓	✓		✓
Water vole		✓ ¹⁸ (full)				✓		✓
Birds	✓			✓ ¹⁹		✓ ²⁰		✓ ²¹

¹⁴ These species are partially protected under section 9(4)(b), (4)(c) and (5).

¹⁵ Only Barbastelle (*Barbastella barbastellus*), Bechstein’s bat (*Myotis bechsteinii*), greater horseshoe bat (*Rhinolophus ferrumequinum*) and lesser horseshoe bat (*Rhinolophus hipposideros*) are listed on Annex II of the Habitats Directive.

¹⁶ Greater horseshoe bat, lesser horseshoe bat, Bechstein’s bat, noctule (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat (*Plecotus auritus*) and barbastelle are listed as Species of Principal Importance in England with the addition of common pipistrelle (*Pipistrellus pipistrellus*) in Wales listed under Section 7 of the Environment (Wales) Act (2016) <http://www.legislation.gov.uk/ukpga/2006/16/contents>.

¹⁷ Barbastelle bat, Bechstein’s bat, noctule, soprano pipistrelle, brown long-eared bat, greater horseshoe bat, lesser horseshoe bat are listed as UK BAP species of bat.

¹⁸ Class Licences are available to Registered Consultants to intentionally disturb, damage or destroy water vole burrows or to displace water voles from their burrows in relation to a development proposal where the licensed action provides a conservation benefit for water voles. Certain displacement operations may be carried out under a Class licence by a registered person in England, however in Wales all displacement operations must be carried out under a site specific licence.

¹⁹ To view plants and animals listed on Schedule 9 Part 1 visit <http://www.legislation.gov.uk/ukpga/1981/69/schedule/9> [accessed 6 April 2017]

²⁰ There are 49 species of birds listed as Species of Principal Importance in England in Section 41 of the NERC Act 2006 and 51 species in Wales under Section 7 of the Environment (Wales) Act (2016) <http://www.legislation.gov.uk/ukpga/2006/16/contents>.

²¹ To view the current list of UK BAP priority birds visit: <http://jncc.defra.gov.uk/page-5163> [Accessed 20.03.25].

Reptiles		✓ ²² (part)		✓ ⁹	✓ ²³	✓ ²⁴		✓ ²⁵
Amphibians		✓ ²⁶ (part)		✓ ²⁷	✓ ^{28, 29}	✓ ³⁰		
White-clawed Crayfish		✓ ³¹ (partial)			✓ ³²	✓		✓
Invertebrates		✓ ³³ (full/part)		✓	✓ ^{34, 35}	✓ ³⁶		✓ ³⁷

²² The four common reptile species, Adder (*Vipera berus*), Grass snake (*Natrix natrix*), Common lizard (*Zootoca vivipara*) and Slow worm (*Anguis fragilis*) are offered partial protection under section 9(5). The rarer UK reptile species (Smooth snake (*Coronella austriaca*) and Sand lizard (*Lacerta agilis*)) are partially protected under section 9(4)(b) and (c) and (5).

²³ Smooth snake (*Coronella austriaca*) and Sand lizard (*Lacerta agilis*) are the only reptiles to be designated as European Protected Species.

²⁴ All 6 reptile species are listed as Species of Principal Importance in England listed under Section 41 of the NERC Act 2006 and 5 species, excluding smooth snake, listed under Section 7 of the Environment (Wales) Act (2016) <http://www.legislation.gov.uk/ukpga/2006/16/contents>.

²⁵ To view the current list of UK BAP priority herptile species visit: <http://jncc.defra.gov.uk/page-5166> [Accessed 20.03.25].

²⁶ The four common reptile species, Adder (*Vipera berus*), Grass snake (*Natrix natrix*), Common lizard (*Zootoca vivipara*) and Slow worm (*Anguis fragilis*) are offered partial protection under section 9(5). The rarer UK reptile species (Smooth snake (*Coronella austriaca*) and Sand lizard (*Lacerta agilis*)) are partially protected under section 9(4)(b) and (c) and (5).

²⁷ Common frog (*Rana temporaria*), Common toad (*Bufo bufo*), Smooth newt (*Lissotriton vulgaris*) and Palmate newt (*Lissotriton helveticus*) are offered partial protection under section 9(5). Great crested newt (*Triturus cristatus*) and Natterjack toad (*Epidalea calamita*) are offered partial protection under section 9(4)(b) and (c) and (5). Pool frog (*Pelophylax lessonae*) is offered partial protection under section 9(4)(b) and (c)(1) only and with respect to England only.

²⁸ Great crested newt, Natterjack toad and Pool frog are the only amphibians to be designated European Protected Species.

²⁹ Great crested newt is the only amphibian listed on Annex II of the Habitats Directive.

³⁰ Great crested newt, Natterjack toad and Common toad are listed as Species of Principal Importance in England in Section 41 of the NERC Act 2006 and under Section 7 of the Environment (Wales) Act (2016) <http://www.legislation.gov.uk/ukpga/2006/16/contents>.

³¹ Under the Wildlife and Countryside Act it is illegal to take or sell white clawed crayfish under the WCA. A licence is required to survey (hand net or trap) for the species. To undertake work within WCC inhabited rivers a Class Licence maybe issued by the relevant authority to move WCC away from harm prior to works. Although WCC are not protected from killing or injury Natural England state in their Class licence that due to declining numbers all efforts should be made to conserve the species.

³² White clawed crayfish are listed under Annex II and V of the Habitats Directive.

³³ To view the current list of invertebrates that are protected under this Act either in part or full visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/5> [Accessed 20.03.25].

³⁴ The Large blue butterfly (*Maculinea arion*), Fisher’s estuarine moth (*Gortyna borelii lunata*) and Lesser whirlpool ram’s-horn snail (*Anisus vorticulus*) are the only invertebrates to be designated European Protected Species.

³⁵ There are currently twelve invertebrates listed in Annex II of the Habitats Directive; White-clawed crayfish (*Austroptamobius pallipes*), Southern damselfly (*Coenagrion mercuriale*), Marsh fritillary butterfly (*Eurodryas aurinia*), Violet click beetle (*Limonicus violaceus*), Stag beetle (*Lucanus cervus*), Freshwater pearl mussel (*Margaritifera margaritifera*), Narrow-mouthed whorl snail (*Vertigo angustior*), Round-mouthed whorl snail (*Vertigo genesii*), Geyer’s whorl snail (*Vertigo geyeri*), Desmoulin’s whorl snail (*Vertigo moulinsiana*), Lesser whirlpool ram’s-horn snail (*Anisus vorticulus*) and Fisher’s estuarine moth (*Gortyna borelii lunata*).

³⁶ There are currently 379 invertebrate species (not including marine species) listed as Species of Principal Importance in England http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0ahUKEwivvu7J9trSAhXiCsAKHX4TBGcQFggvMAM&url=http%3A%2F%2Fpublications.naturalengland.org.uk%2Ffile%2F6518755878240256&usg=AFQjCNEpiUWYuOghVcfSDvi_3iK2TJytfQ and 188 species in Wales http://www.eryri-npa.gov.uk/data/assets/pdf_file/0003/486156/SpeciesList.pdf listed under Section 41 of the NERC Act 2006 and listed under Section 7 of the of the Environment (Wales) Act 2016. [Accessed 20.03.25]

³⁷ To view the current list of UK BAP priority invertebrates visit: <http://jncc.defra.gov.uk/page-5169> [Accessed 20.03.25].

Fish		✓ ³⁸ (full/part)		✓ ⁹	✓ ^{39, 40}	✓ ⁴¹		✓ ⁴²
Plants			✓ ⁴³	✓ ⁹	✓ ^{44, 45}	✓ ⁴⁶		✓ ⁴⁷

³⁸ To view the current list of fish either part or fully protected under the Act visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/5> [Accessed 20.03.25].

³⁹ Sturgeon (*Acipenser sturio*) is the only fish to be designated a European Protected Species.

⁴⁰ There are eight fish species listed on Annex II of the Habitats Directive. To view the current list visit: <http://jncc.defra.gov.uk/page-1523> [Accessed 20.03.25].

⁴¹ There are 35 species of fish listed as Species of Principal Importance in England listed under Section 41 of the NERC Act 2006 and 10 species in Wales listed under Section 7 of the Environment (Wales) Act 2016.

⁴² To view the current list of UK BAP priority fish visit: <http://jncc.defra.gov.uk/page-5164> [Accessed 20.03.25].

⁴³ To view the current list of Schedule 8 listed plants visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/8> [Accessed 20.03.25].

⁴⁴ There are nine plant species designated as European Protected Species. To view the current list visit: <http://www.legislation.gov.uk/ukpga/2010/490/schedule/5/made> [Accessed 20.03.25].

⁴⁵ To view the current list of plant species on Annex II of the Habitats Directive visit: <http://jncc.defra.gov.uk/page-1523> [Accessed 20.03.25].

⁴⁶ There are currently 152 vascular plants listed as Species of Principal Importance in England listed under Section 41 of the NERC Act 2006 and 77 species in Wales listed under Section 7 of the Environment (Wales) Act 2016.³¹ To view the current list of UK BAP priority plants visit: <http://jncc.defra.gov.uk/page-5171> and <http://jncc.defra.gov.uk/page-5168> [Accessed 20.03.25].

⁴⁷ To view the current list of UK BAP priority plants visit: <http://jncc.defra.gov.uk/page-5171> and <http://jncc.defra.gov.uk/page-5168> [Accessed 20.03.25].

Appendix B

**SUMMARY OF ECOLOGICAL DESK
STUDY DATA**



Table 2 - Protected and notable mammals (excluding bats) for which records have been identified within 2km of the Sites

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁴⁸
Hare	<i>Lepus europaeus</i>	3	842	S7
Hazel dormouse	<i>Muscardinus avellanarius</i>	1	1745	EPS, WCA5, S7, RDB2 (UK)
Hedgehog	<i>Erinaceus europaeus</i>	15	352	S7
Otter	<i>Lutra lutra</i>	3	1032	EPS, WCA5, S7, RDB2 (UK)

Table 3 - Protected and notable bats for which records have been identified within 2km of the Sites, or bat roosts within 10km of the Sites

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁴⁹
A bat species	-	19	662	EPS, WCA5
Brown long-eared bat	<i>Plecotus auritus</i>	1	1811	EPS, WCA5, S7, RDB2(UK)
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	35	36	EPS, WCA5, S7, RDB2(UK)
Natterer's bat	<i>Myotis nattereri</i>	1	1479	EPS, WCA5, S7, RDB2(UK)
Noctule	<i>Nyctalus noctula</i>	7	124	EPS, WCA5, S7, RDB2(UK)

⁴⁸ WCA = Wildlife and Countryside Act (1981), RDB1 (UK) = UK Red Data Book listing based on IUCN guidelines, RDB2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce), EPS = European Protected Species, S7 = Section 7 of the Environment (Wales) Act 2016.

⁴⁹ WCA = Wildlife and Countryside Act (1981), RDB1 (UK) = UK Red Data Book listing based on IUCN guidelines, RDB2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce), EPS = European Protected Species, S7 = Section 7 of the Environment (Wales) Act 2016.

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁴⁹
A pipistrelle species	<i>Pipistrellus sp.</i>	11	459	EPS, WCA5
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	13	280	EPS, WCA5, S7, RDB2(UK)

Table 4 – Bat roosts which have been identified within 10 km of the Sites

Species common name	Species Latin name	Notes	Distance from Site	Legal / Conservation Status ⁵⁰
A bat species	-	Minimum of night feeding perch in building	2292	EPS, WCA5
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	17 bats emerged from roost in cottage.	4162	EPS, WCA5, S7, RDB2(UK)
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Maternity roost in building. 50 counted in 2015.	4183	EPS, WCA5, S7, RDB2(UK)
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	53 bats seen exiting roost	4185	EPS, WCA5, S7, RDB2(UK)
Pipistrelle bat species	<i>Pipistrellus</i>	Entered roost behind facias in front of house	4662	EPS, WCA5
Pipistrelle bat species	<i>Pipistrellus</i>	Adult. Roost in corner of 1 Greenfield Terrace: bats use the row of 3 houses.	4674	EPS, WCA5
Pipistrelle bat species	<i>Pipistrellus</i>	Maternity roost in building.	5771	EPS, WCA5

⁵⁰ WCA = Wildlife and Countryside Act (1981), RDB1 (UK) = UK Re1536d Data Book listing based on IUCN guidelines, RDB2 (UK) = UK Red Data Book listing not based on IUCN guideline1538s (Nationally Rare and Scarce), EPS = European Protected Species, S7 = Section 7 of the Environment (Wales) 1540Act 2016.

Species common name	Species Latin name	Notes	Distance from Site	Legal / Conservation Status ⁵⁰
Pipistrelle bat species	<i>Pipistrellus</i>	Maternity roost in building as pup could not fly.	5771	EPS, WCA5
Myotis bat species	<i>Myotis</i>	Roost 1 individual	6542	EPS, WCA5,
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Emerging from roost	7111	EPS, WCA5, S7, RDB2(UK)
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Maternity colony; individual roosts	7143	EPS, WCA5, S7, RDB2(UK)
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	Day and night roost	7143	EPS, WCA5, S7, RDB2(UK)
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	Day and night roost	7143	EPS, WCA5, S7, RDB2(UK)
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Roost. Observed emerging during survey	7707	EPS, WCA5, RDB2(UK)
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Maternity Roost	7727	EPS, WCA5, RDB2(UK)
Greater horseshoe bat	<i>Rhinolophus ferrumequinum</i>	Seen in cellars while on routine roost visit	9028	EPS, AnII, WCA5, S7, RDB2(UK)
Brown long-eared bat	<i>Plecotus auritus</i>	Maternity roost	9042	EPS, HDir, WCA5, S7, RDB2(UK)
Greater horseshoe bat	<i>Rhinolophus ferrumequinum</i>	Hibernation and small summer roost	9042	EPS, AnII, WCA5, S7, RDB2(UK)
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	Hibernation and small summer roost	9042	EPS, AnII, WCA5, S7, RDB2(UK)
Daubenton's bat	<i>Myotis daubentonii</i>	Known roost	9071	EPS, WCA5, RDB2(UK)
Pipistrelle bat species	<i>Pipistrellus</i>	Roost in building: lots of droppings outside	9094	EPS, WCA5
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Multiple roosts under coping stones around roof	9342	EPS, WCA5, RDB2(UK)

Species common name	Species Latin name	Notes	Distance from Site	Legal / Conservation Status ⁵⁰
Pipistrelle	<i>Pipistrellus pipistrellus</i>	Day roost in western gable end of church: plus active around site.	9356	EPS, WCA5
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Adult. Roost at western eaves of St Paul's Church.	9578	EPS, WCA5, RDB2(UK)
Whiskered bat	<i>Myotis mystacinus</i>	Single animal Day roost from side elevation fascia	9633	EPS, WCA5, RDB2(UK)
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Possible Nursery Roost; mixed in swarming soprano pipistrelle	9633	EPS, WCA5, RDB2(UK)
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Re-entry Nursery roost	9633	EPS, WCA5, S7, RDB2(UK)
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Confirmed nursery roost	9633	EPS, WCA5, S7, RDB2(UK)
Brown long-eared bat	<i>Plecotus auritus</i>	Single animal Day roost from side elevation fascia or possibly part of building behind	9633	EPS, HDir, WCA5, S7, RDB2(UK)
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Confirmed nursery roost	9634	EPS, WCA5, S7, RDB2(UK)
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Non-breeding day roost	9840	EPS, WCA5, S7, RDB2(UK)

Table 5 - Protected and notable reptiles for which records have been identified within 2 km of the Sites

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵¹
Common lizard	<i>Zootoca vivipara</i>	50	290	WCA5, S7
Grass snake	<i>Natrix helvetica</i>	3	692	WCA5, S7
Slow worm	<i>Anguis fragilis</i>	18	382	WCA5, S7

Table 6 - Protected and notable amphibians for which records have been identified within 2 km of the Sites

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵²
Common frog	<i>Rana temporaria</i>	10	141	WCA5
Common toad	<i>Bufo bufo</i>	5	452	WCA5, S7
Palmate newt	<i>Lissotriton helveticus</i>	4	384	WCA5
Smooth newt	<i>Lissotriton vulgaris</i>	4	374	WCA5

⁵¹ WCA = Wildlife and Countryside Act (1981), S7 = Section 7 of the Environment (Wales) Act 2016.

⁵² WCA = Wildlife and Countryside Act (1981), S7 = Section 7 of the Environment (Wales) Act 2016.

Table 7 - Protected and notable invertebrates for which records have been identified within 2km of the Sites

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵³
Black oil-beetle	<i>Meloe proscarabaeus</i>	7	267	S7
Anoscopus albifrons	<i>Anoscopus albifrons</i>	3	1303	RDB2 (UK) - NB
Anomalous	<i>Stilbia anomala</i>	7	174	S7
August thorn	<i>Ennomos quercinaria</i>	2	1000	S7
Autumnal rustic	<i>Eugnorisma glareosa</i>	8	174	S7
Banded demoiselle	<i>Calopteryx splendens</i>	1	847	LI(SEWBRcC)
Banded general	<i>Stratiomys potamida</i>	1	1587	RDB2 (UK) - N
Beautiful demoiselle	<i>Calopteryx virgo</i>	1	629	LI(SEWBRcC)
Black darter	<i>Sympetrum danae</i>	5	191	LI(SEWBRcC)
Black-tailed skimmer	<i>Orthetrum cancellatum</i>	1	763	LI(SEWBRcC)
Blood vein	<i>Timandra comae</i>	10	358	S7
Bramble bronze	<i>Argolamprotes micella</i>	8	408	RDB2 (UK) - N
Brindled beauty	<i>Lycia hirtaria</i>	12	614	S7

⁵³ RBD1 (UK) = UK Red Data Book listing based on IUCN guidelines, RDB2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce), LI(SEWBRcC) = Locally Important (SEWBRcC), S7 = Section 7 of the Environment (Wales) Act 2016, WCA = Wildlife and Countryside Act (1981).

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵³
Broom moss	<i>Ceramica pisi</i>	9	308	S7
Brown banded carder bee	<i>Bombus humilis</i>	2	282	S7
Buff ermine	<i>Spilosoma lutea</i>	17	308	S7
Buff-tailed mining bee	<i>Andrena humilis</i>	2	792	RDB2 (UK) - NB
Bulrush veneer	<i>Calamotropha paludella</i>	1	408	RDB2 (UK) - NB
Centre-barred sallow	<i>Atethmia centrigo</i>	5	1000	S7
Cheilosia chrysocoma	<i>Cheilosia chrysocoma</i>	1	1652	RDB2 (UK) - S
Cinnabar moth	<i>Tyria jacobaeae</i>	15	452	S7
Conops vesicularis	<i>Conops vesicularis</i>	1	1090	RDB2 (UK) - N
Dark-barred twin-spot carpet	<i>Xanthorhoe ferrugata</i>	13	487	S7
Dark brocade	<i>Mniotype adusta</i>	1	497	S7
Dark green fritillary	<i>Speyeria aglaja</i>	11	308	LI(SEWBRc)
Deleaster dichrous	<i>Deleaster dichrous</i>	1	1000	RDB2 (UK) - NB
<i>Dictya umbrarum</i>	<i>Dictya umbrarum</i>	2	1119	RDB2 (UK) - N
Dingy skipper	<i>Erynnis tages</i>	24	12	S7, RDB1(UK) - VU, LI(SEWBRc)
Diogma glabrata	<i>Diogma glabrata</i>	1	1000	RDB2 (UK) - N
Dot moth	<i>Melanchra persicariae</i>	19	478	S7
Dusky brocade	<i>Apamea remissa</i>	11	408	S7

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵³
Dusky thorn	<i>Ennomos fuscantaria</i>	4	1000	S7
Ear moth	<i>Amphipoea oculatea</i>	1	581	S7
Emerald demoiselle	<i>Lestes sponsa</i>	6	133	LI(SEWBRcC)
Feathered gothic	<i>Tholera decimalis</i>	1	741	S7
Flounced chestnut	<i>Anchoscelis helvola</i>	2	1648	S7
Forester	<i>Adscita statice</i>	4	308	S7
Galium carpet	<i>Epirrhoe galiata</i>	2	325	S7
Garden tiger	<i>Arctia caja</i>	9	408	S7
Ghost moth	<i>Hepialus humuli</i>	1	352	S7
Golden horsefly	<i>Atylotus fulvus</i>	1	957	RDB2 (UK) - N
Golden-ringed dragonfly	<i>Cordulegaster boltonii</i>	16	191	LI(SEWBRcC)
<i>Grammoptera abdominalis</i>	<i>Grammoptera abdominalis</i>	1	1154	RDB2 (UK) - NA
Grayling	<i>Hipparchia semele</i>	12	87	S7, RDB1(UK) - VU, LI(SEWBRcC)
Green brindled crescent	<i>Allophyas oxyacanthae</i>	2	932	S7
Hedge rustic	<i>Tholera cespitis</i>	3	431	S7
<i>Larinus carlinae</i>	<i>Larinus carlinae</i>	2	1374	RDB2 (UK) - NB
<i>Lithobius (Lithobius) pilicornis</i>	<i>Lithobius (Lithobius) pilicornis</i>	1	362	RDB2 (UK)
Keeled skipper	<i>Orthetrum coerulescens</i>	8	191	LI(SEWBRcC)

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵³
Knot grass	<i>Acronicta rumicis</i>	15	124	S7
Large wainscot	<i>Rhizedra lutosa</i>	1	1000	S7
Latticed heath	<i>Chiasmia clathrate</i>	5	408	S7
Long-winged cone-head	<i>Conocephalus fuscus</i>	3	592	LI(SEWBRc)
<i>Lophosia fasciata</i>	<i>Lophosia fasciata</i>	1	689	RDB2 (UK) - N
Marsh fritillary	<i>Euphydryas aurinia</i>	1	738	WCA5, S7, RDB1(UK) - VU, LI(SEWBRc)
Moss carder bee	<i>Bombus muscorum</i>	1	679	S7
Mottled rustic	<i>Caradrina Morpheus</i>	4	533	S7
Neglected rustic	<i>Xestia castanea</i>	5	174	S7
Oak hook-tip	<i>Watsonalla binaria</i>	1	1708	S7
Oblique carpet	<i>Orthonama vittata</i>	3	1197	S7
<i>Oedemera virescens</i>	<i>Oedemera virescens</i>	1	1252	RDB2 (UK) - R
Orange-footed furrow bee	<i>Lasioglossum xanthopus</i>	1	1086	RDB2 (UK) - NB
Pearl-bordered fritillary	<i>Boloria euphrosyne</i>	1	16	WCA5, S7, RDB1(UK) - EN, LI(SEWBRc)
Pied grey	<i>Eudonia delunella</i>	2	1000	RDB2 (UK) - NB
<i>Polydrusus formosus</i>	<i>Polydrusus Formosus</i>	2	1119	RDB2 (UK) - NA
Powdered quaker	<i>Orthosia gracilis</i>	5	706	S7
<i>Psammotettix albomarginatus</i>	<i>Psammotettix albomarginatus</i>	1	1119	RDB2 (UK) - NB

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵³
Pygmy soldier	<i>Oxycera pygmaea</i>	7	849	RDB2 (UK) - N
River skater	<i>Aquarius najas</i>	1	1235	RDB2 (UK) - S
Rosy knot-horn	<i>Oncocera semirubella</i>	1	645	RDB2 (UK) - NB
Rosy minor	<i>Litologia literosa</i>	4	359	S7
Rosy rustic	<i>Hydraecia micacea</i>	5	741	S7
Rustic	<i>Hoplodrina blanda</i>	7	478	S7
Sallow	<i>Cirrhia icteritia</i>	8	174	S7
Scarce blue-tailed damselfly	<i>Ischnura pumilio</i>	3	233	RDB1(UK) - NT, LI(SEWBRcC)
Scarce grass-moth	<i>Crambus pratella</i>	3	492	RDB2 (UK) - NB
Short-winged cone-head	<i>Conocephalus dorsalis</i>	4	645	LI(SEWBRcC)
Shoulder-striped wainscot	<i>Leucania comma</i>	17	174	S7
Slender ground-hopper	<i>Tetrix subulate</i>	2	1119	LI(SEWBRcC)
Small blue	<i>Cupido minimus</i>	1	833	WCA5, S7, RDB1(UK) - NT, LI(SEWBRcC)
Small emerald	<i>Hemistola chrysoprasaria</i>	1	1714	S7
Small heath	<i>Coenonympha pamphilus</i>	44	339	S7, RDB1(UK) - NT
Small pearl-bordered fritillary	<i>Boloria selene</i>	6	237	S7, RDB1(UK) - NT, LI(SEWBRcC)
Small phoenix	<i>Ecliptopera silaceata</i>	19	408	S7
Small scabious mining bee	<i>Andrena marginata</i>	2	798	RDB2 (UK) - NA
Small square-spot	<i>Diarsia rubi</i>	5	478	S7

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵³
Speckled bush-cricket	<i>Leptophyes punctatissima</i>	1	851	LI(SEWBRcC)
Spindle knot-horn	<i>Nephopterix angustella</i>	1	1000	RDB2 (UK) - NB
<i>Temnocerus coeruleus</i>	<i>Temnocerus coeruleus</i>	2	1401	RDB2 (UK) - NB
<i>Tetanocera punctifrons</i>	<i>Tetanocera punctifrons</i>	3	940	RDB2 (UK) - N
Tormentil mining bee	<i>Andrena tarsata</i>	4	963	S7
Violet oil-beetle	<i>Meloe violaceus</i>	2	188	S7, RDB2(UK)
Wall	<i>Lasiommata megera</i>	1	1126	S7, RDB1(UK) - NT
White ermine	<i>Spilosoma lubricipeda</i>	15	575	S7
<i>Xylota xanthocnema</i>	<i>Xylota xanthocnema</i>	1	1785	RDB2 (UK) - N
<i>Zodion cinereum</i>	<i>Zodion cinereum</i>	1	1401	RDB2 (UK) - N
<i>Zophomyia temula</i>	<i>Zophomyia temula</i>	1	836	RDB2 (UK) - N

Table 8 - Protected and notable fish for which records have been identified within 2km of the Sites

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵⁴
Atlantic salmon	<i>Salmo salar</i>	1	619	S7
Brown trout	<i>Salmo trutta</i>	3	619	S7

⁵⁴ S7 = Section 7 of the Environment (Wales) Act 2016.

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵⁴
Eel	<i>Anguilla anguilla</i>	2	619	S7

Table 9 - Protected and notable plants for which records have been identified within 2km of the Sites

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵⁵
Royal fern	<i>Osmunda regalis</i>	2	194	LI(SEWBRcC)
Bee orchid	<i>Ophrys apifera</i>	5	672	CITES, LBAP(CLY, GWY, TRA, TRF), LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LS), WS_C
Bird cherry	<i>Prunus padus</i>	4	458	LBAP(GWY), LI(SEWBRcC), LI(VC47), LI(VC49, LS), WS_C
Bluebell	<i>Hyacinthoides non-scripta</i>	12	512	WCA8, LBAP(ANG, CLY, CON, SNP, TRA, TRF)
Bristle bent	<i>Agrostis curtisii</i>	9	16	LI(SEWBRcC), WS_P
Brown sedge	<i>Carex disticha</i>	1	755	LBAP(BRG, CON, GWY), LI(SEWBRcC), LI(VC43), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR), LI(VC51, LS), WS_C
Chamomile	<i>Chamaemelum nobile</i>	2	458	S7, RDB1(Wales) - EN, LBAP(CON, GWY, PEM, VOG), LI(VC49, LR), LI(VC52, LR)

⁵⁵ RDB2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce), LI(SEWBRcC) = Locally Important (SEWBRcC).

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵⁵
Corn mint	<i>Mentha arvensis</i>	1	525	RDB1(Wales) - VU, LI(VC50, LR)
Dwarf thistle	<i>Cirsium acaule</i>	1	517	LBAP(DEN), LI(SEWBRcC), LI(VC47), LI(VC50, LR), LI(VC51, LR), WS_C
Fragrant agrimony	<i>Agrimonia procera</i>	2	308	LBAP(BRG, GWY), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC48, LS), LI(VC49, LR), LI(VC50, LR), LI(VC51, LS), WS_C
Grass vetchling	<i>Lathyrus nissolia</i>	4	478	LI(SEWBRcC), LI(VC43), LI(VC49, LR), LI(VC50, LS), WS_C
Greater knapweed	<i>Centaurea scabiosa</i>	1	505	LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC50, LS), WS_C
Hawkweed oxtongue	<i>Picris hieracioides</i>	1	1330	LI(SEWBRcC), LI(VC43), LI(VC49, LR), LI(VC50, LR), LI(VC51, LR), WS_C
Knotted pearlwort	<i>Sagina nodosa</i>	1	1303	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC50, LS), LI(VC51, LS), WS_C
Mare's tail	<i>Hippuris vulgaris</i>	2	1566	RDB1(Wales) - NT, LBAP(BGW, BRG), LI(SEWBRcC), LI(VC48, LS), LI(VC49, LR), LI(VC50, LR), LI(VC52, LS), WS_C
Meadow thistle	<i>Cirsium dissectum</i>	1	1861	LBAP(BRG, GWY, VOG), LI(VC43), LI(VC47), LI(VC48, LR), LI(VC49, LR)
Pennyroyal	<i>Mentha pulegium</i>	1	598	WCA8, S7, RDB1(Wales) - CR, RDB2(UK) - S, LBAP(ANG, CON, CRM, POW, TRF), LI(VC50, LR), LI(VC52, LR)

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵⁵
Scots pine	<i>Pinus sylvestris</i>	1	309	RDB2 (UK)
Spiked sedge	<i>Carex spicata</i>	1	970	LBAP(BRG, GWY), LI(VC43), LI(VC48, LR), LI(VC49, LS)
Stinking chamomile	<i>Anthemis cotula</i>	1	640	RDB1(UK) - VU, LBAP(VOG), LI(SEWBRc), LI(VC47), LI(VC49, LR), LI(VC51, LR), WS_C
Viper's bugloss	<i>Echium vulgare</i>	1	836	LBAP(BGW, GWY), LI(SEWBRc), LI(VC47), LI(VC48, LS), LI(VC49, LS), LI(VC50, LS), LI(VC51, LS), LI(VC52, LS), WS_C
Welsh poppy	<i>Meconopsis cambrica</i>	6	798	RDB2 (UK) - S, LBAP(CON, DEN, NPT), LI(VC43), LI(VC48, LS), LI(VC49, LS), WS_P
Whorled caraway	<i>Carum verticillatum</i>	1	587	LBAP(BGW, BRG, GWY), LI(VC43), LI(VC47), LI(VC48, LS), LI(VC49, LR)
Wood small-reed	<i>Calamagrostis epigejos</i>	1	970	LBAP(BRG, GWY), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR), LI(VC51, LR)

Table 10 - Protected and notable lichens for which records have been identified within 2km of the Sites

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵⁶
Greater whipwort	<i>Bazzania trilobata</i>	1	588	RDB1(Wales) – LC, LI(VC41, LR)

Table 11 - Protected and notable mosses for which records have been identified within 2km of the Sites

Species common name	Species Latin name	No. of records	Distance between closest record and Sites (m)	Legal / Conservation Status ⁵⁷
Heath star moss	<i>Campylopus introflexus</i>	17	308	RDB1(Wales) - NA, INNS

⁵⁶ RBD1 (UK) = UK Red Data Book listing based on IUCN guidelines, LI(VC41) = Locally Important (Vice County 41).

⁵⁷ RBD1 (UK) = UK Red Data Book listing based on IUCN guidelines, INNS = Invasive Non-Native Species.

Appendix C



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PLANT SPECIES RECORDED

Table 12 - Plant species recorded

Common name	Botanical name	DAFOR
A1.1.1 Broadleaved woodland		
Alder	<i>Alnus glutinosa</i>	LF
Bilberry	<i>Vaccinium myrtillus</i>	O
Bracken	<i>Pteridium aquilinum</i>	O
Bramble	<i>Rubus fruticosus</i> agg.	R
Creeping bent	<i>Agrostis stolonifera</i>	F
Hard fern	<i>Blechnum spicant</i>	R
Heather	<i>Calluna vulgaris</i>	O
Sessile oak	<i>Quercus petraea</i>	A
Sheep's fescue	<i>Festuca ovina</i> agg.	F
Silver birch	<i>Betula pendula</i>	A
Soft rush	<i>Juncus effusus</i>	O
A1.1.2 Coniferous woodland		
Bilberry	<i>Vaccinium myrtillus</i>	O
Bracken	<i>Pteridium aquilinum</i>	A
Hard fern	<i>Blechnum spicant</i>	O
Larch	<i>Larix decidua</i>	D
Rhododendron	<i>Rhododendron ponticum</i>	E
Sessile oak	<i>Quercus petraea</i>	R
A1.1.3 Mixed woodland		
Bracken	<i>Pteridium aquilinum</i>	A
Hawthorn	<i>Crataegus monogyna</i>	R
Sessile oak	<i>Quercus petraea</i>	F
Sitka spruce	<i>Picea sitchensis</i>	D
Soft rush	<i>Juncus effusus</i>	A
Willow	<i>Salix</i> sp.	R

Common name	Botanical name	DAFOR
Bracken	<i>Pteridium aquilinum</i>	A
Hawthorn	<i>Crataegus monogyna</i>	R
A2.1 Scrub – dense/continuous		
Ash	<i>Fraxinus excelsior</i>	O
Bracken	<i>Pteridium aquilinum</i>	O
Bramble	<i>Rubus fruticosus</i> agg.	D
Gorse	<i>Ulex europaeus</i>	LD
Grey willow	<i>Salix cinerea</i>	LD
Soft rush	<i>Juncus effusus</i>	F
A2.1 Scrub – scattered		
Gorse	<i>Ulex europaeus</i>	R
Western gorse	<i>Ulex gallii</i>	R
A3.1 Broadleaved parkland/scattered trees		
Alder	<i>Alnus glutinosa</i>	R
Ash	<i>Fraxinus excelsior</i>	R
Downy birch	<i>Betula pubescens</i>	R
Sessile oak	<i>Quercus petraea</i>	D
A3.3 Mixed parkland/scattered trees		
Goat willow	<i>Salix caprea</i>	O
Hawthorn	<i>Crataegus monogyna</i>	O
Sessile oak	<i>Quercus petraea</i>	R
Sitka spruce	<i>Picea sitchensis</i>	O
B1.2 Acid grassland		
Bilberry	<i>Vaccinium myrtillus</i>	O
Common sorrel	<i>Rumex acetosa</i>	R
Creeping bent	<i>Agrostis stolonifera</i>	A
Field wood-rush	<i>Luzula palustris</i>	R
Foxglove	<i>Digitalis purpurea</i>	R

Common name	Botanical name	DAFOR
Heath bedstraw	<i>Galium saxatile</i>	R
Heather	<i>Calluna vulgaris</i>	O
Mat-grass	<i>Nardus stricta</i>	O
Perennial rye-grass	<i>Lolium perenne</i>	O
Purple moor-grass	<i>Molinia caerulea</i>	R
Sheep's fescue	<i>Festuca ovina agg.</i>	D
Soft rush	<i>Juncus effusus</i>	O
Springy turf-moss	<i>Rhytidiadelphus squarrosus</i>	F
Western gorse	<i>Ulex gallii</i>	R
B2.2 Neutral grassland		
Field wood-rush	<i>Luzula palustris</i>	R
Heath bedstraw	<i>Galium saxatile</i>	R
Perennial rye-grass	<i>Lolium perenne</i>	O
Round-leaved crowfoot	<i>Ranunculus omiophyllus</i>	R
Sheep's fescue	<i>Festuca ovina agg.</i>	R
Soft rush	<i>Juncus effusus</i>	D
B4 Improved grassland		
Cock's-foot	<i>Dactylis glomerata</i>	R
Common bent	<i>Agrostis capillaris</i>	O
Common chickweed	<i>Stellaria media</i>	R
Compact rush	<i>Juncus conglomeratus</i>	R
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping buttercup	<i>Ranunculus repens</i>	R
Creeping thistle	<i>Cirsium arvense</i>	R
Crested dog's-tail	<i>Cynosurus cristatus</i>	F
Heath bedstraw	<i>Galium saxatile</i>	R
Perennial rye-grass	<i>Lolium perenne</i>	D
Sheep's fescue	<i>Festuca ovina agg.</i>	O

Common name	Botanical name	DAFOR
Soft rush	<i>Juncus effusus</i>	LO
Springy turf-moss	<i>Rhytidiadelphus squarrosus</i>	R
Thyme-leaved speedwell	<i>Veronica serpyllifolia</i>	R
White clover	<i>Trifolium repens</i>	O
B5 Marsh/marshy grassland		
Bell heather	<i>Erica cinerea</i>	R
Bog-mosses	<i>Sphagnum spp.</i>	LF
Bracken	<i>Pteridium aquilinum</i>	O
Bramble	<i>Rubus fruticosus agg.</i>	R
Common sedge	<i>Carex nigra</i>	R
Hard fern	<i>Blechnum spicant</i>	R
Hemlock water dropwort	<i>Oenanthe crocata</i>	R
Purple moor-grass	<i>Molinia caerulea</i>	D
Rhododendron	<i>Rhododendron ponticum</i>	R
Sessile oak	<i>Quercus petraea</i>	R
Sheep's fescue	<i>Festuca ovina agg.</i>	O
Silver birch	<i>Betula pendula</i>	R
Soft rush	<i>Juncus effusus</i>	O
Tufted hair-grass	<i>Deschampsia caespitosa</i>	O
Wood sage	<i>Teucrium scorodonia</i>	R
C1.1 Bracken – continuous		
Ash	<i>Fraxinus excelsior</i>	R
Bracken	<i>Pteridium aquilinum</i>	D
Elder	<i>Sambucus nigra</i>	R
Foxglove	<i>Digitalis purpurea</i>	R
Gorse	<i>Ulex europaeus</i>	R
Holly	<i>Ilex aquifolium</i>	R
Purple moor-grass	<i>Molinia caerulea</i>	R

Common name	Botanical name	DAFOR
Sessile oak	<i>Quercus petraea</i>	R
Silver birch	<i>Betula pendula</i>	R
Sitka spruce	<i>Picea sitchensis</i>	R
Soft rush	<i>Juncus effusus</i>	R
C1.2 Bracken – scattered		
Bilberry	<i>Vaccinium myrtillus</i>	R
Bracken	<i>Pteridium aquilinum</i>	R
Sheep's sorrel	<i>Rumex acetosella</i>	R
D1.1 Dry dwarf shrub heath		
Bilberry	<i>Vaccinium myrtillus</i>	A
Heath bedstraw	<i>Galium saxatile</i>	O
Heather	<i>Calluna vulgaris</i>	A
Sheep's fescue	<i>Festuca ovina</i> agg.	F
Western gorse	<i>Ulex gallii</i>	A
D2 Wet dwarf shrub heath		
Bilberry	<i>Vaccinium myrtillus</i>	A
Heather	<i>Calluna vulgaris</i>	A
Purple moor-grass	<i>Molinia caerulea</i>	A
G2 Running water		
Bog-mosses	<i>Sphagnum</i> spp.	R
Bracken	<i>Pteridium aquilinum</i>	R
Bramble	<i>Rubus fruticosus</i> agg.	R
Marsh thistle	<i>Cirsium palustre</i>	R
Purple moor-grass	<i>Molinia caerulea</i>	LF
Sharp-flowered rush	<i>Juncus acutiflorus</i>	R
Soft rush	<i>Juncus effusus</i>	LF
J2.5 – Wall		
Hard fern	<i>Blechnum spicant</i>	R

Common name	Botanical name	DAFOR
J2.6 Dry ditch		
Soft rush	<i>Juncus effusus</i>	LD
Perennial rye-grass	<i>Lolium perenne</i>	R
Foxglove	<i>Digitalis purpurea</i>	R
Purple moor-grass	<i>Molinia caerulea</i>	LD

Appendix D

TARGET NOTES **wsp**

Table 13 – Target notes

Target Note	Description
Moel Cynhordy/Mynydd Moelgella	
TN1	Stand of Indian balsam <i>Impatiens glandulifera</i>
TN2	Area of increased soft rush <i>Juncus effusus</i> , indicative of wetter conditions
TN3	Raptor pellets within grassland
TN4	A 1 m high rock face which does not extend inwards, which is surrounded by an area of increased soft rush
TN5	Area of increased soft rush and bog-mosses <i>Sphagnum spp.</i> , indicative of wetter conditions. Extends northwards
TN6	Area of increased soft rush, indicative of wetter conditions
TN7	Earth bank 1 m high and 1.5 m wide, extending along field boundary
TN8	Small pool of standing water, which was too small to map. It was not possible to determine its depth. Heavily shaded by goat willow <i>Salix caprea</i>
Mynydd Pwll-yr-lwrch	
TN9	Mossy mounds over acid grassland habitat. Increase of acid species including bilberry <i>Vaccinium myrtillus</i> , heath bedstraw <i>Galium saxatile</i> and heather <i>Calluna vulgaris</i>
TN10	Area of dense soft rush along fence line, indicative of wetter conditions
TN11	Exposed rocks. Up to 30 cm diameter. Several areas of rock piles, no more than three rocks deep. Up to 20m long, 2m wide. Provides suitable refugia for amphibians and reptiles
TN12	Large pile of rocks. From 10cm to 1m diameter. Not vegetated. Likely from collapsing cliff, which is 4m high. Provides suitable refugia for amphibians and reptiles
TN13	Pool of standing water 4m x 2m, too small to be mapped. Unable to tell depth. Willow <i>Salix sp.</i> scrub growing in it. Shallow sided
TN14	Frogspawn in standing water
TN15	Pile of boulders and stones, likely collapsed from rocky outcrop to east. Provides suitable refugia for amphibians and reptiles
TN16	Rocky outcrop. Collapsed rubble at base. Facing west. Low potential to support bats. Although crevices between rocks likely extend back, the face is very exposed and lack of flight lines around outcrop. Collapsed rubble provides suitable refugia for amphibians and reptiles
TN17	Stone pile, no more than 3 stones deep. 10m wide and 3m across. Provides suitable refugia for amphibians and reptiles
TN18	Stone pile, 6m x 3m. Provides suitable refugia for amphibians and reptiles
TN19	Remains of stone building with remnants of walls which are 1m high and rubble piles around collapsed walls. Provides suitable refugia for amphibians and reptiles
TN20	Large spoil pile vegetated with mosses and gorse <i>Ulex europaeus</i> .

Target Note	Description
TN21	Bare ground, likely as a result of burning, potentially to clear bracken <i>Aquilinum pteridium</i>
TN22	Open fronted stone building with missing roof, stone construction. Negligible potential to support roosting bats as very exposed, with no flight lines. Cracks between stones do not extend inwards
TN23	15m tall inland vertical cliff. Blocks of rocks, with no large crevices seem from ground suitable for large numbers of bats
TN24	Scree pile. Provides suitable refugia for amphibians and reptiles
TN25	Scree pile. Provides suitable refugia for amphibians and reptiles
TN26	Deep depressions in ground
TN27	Remains of dry stone wall. Provides suitable refugia for amphibians and reptiles
TN28	Network of steep ditches to east and west
TN29	Pond outside of the boundary. Likely ephemeral, with shallow banks, and a gradual slope to dry land. Densely choked with aquatic plants. 5×15m
TN30	Hole at the top of the ditch connecting to underground spring with running water inside
TN31	Small pile of scree at base of exposed rocks. Provides suitable refugia for amphibians and reptiles

Appendix E

PHOTOGRAPHS **wsp**



I1 - A1.1.1. A representative example of broadleaved woodland.



I2 - A1.1.2. A representative example of coniferous woodland.



I3 – A2.1. A representative example of dense/continuous scrub.



I4 – A3.1. A representative example of broadleaved parkland/scattered trees.



I5 – B1.2. A representative example of acid grassland.



I6 – B2.2. A representative example of neutral grassland.



I7 – B4. A representative example of improved grassland.



I8 – B5. A representative example of marsh/marshy grassland.



I9 – C1.2. A representative example of continuous bracken.



I10 – D1.1. A representative example of dry dwarf shrub heath.



I11 – D2. A representative example of wet dwarf shrub heath.



I12 – G2. The Garw Fechan.



I13 – G2. An example of running water.



I14 – I1.1.1 and I1.2.1. A representative example of inland cliff and scree.



I15 – I2.2. A representative example of spoil.



I16 – J2.5. A representative example of a wall.



I17 – J2.6. An example of a dry ditch.



I18 – P1.



I19 – P3.



I20 – P6.



I21 – TN13, P7. A pool of standing water.



I22 – TN5. An area of increased soft rush *Juncus effusus* and bog-mosses *Sphagnum* spp.



I23 – TN11. Large pile of rocks providing suitable refugia for reptiles and amphibians.



I24 – TN16. Rocky outcrop identified as having low suitability to support roosting bats.



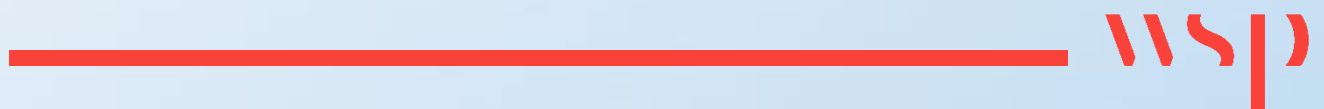
I25 – TN19. Remains of stone building with rubble piles around base of walls.



I26 – TN29. Pond outside of the Site boundary (P4).

Appendix F

HSI ASSESSMENT RESULTS



Habitat Suitability Index (HSI)	Moel Cynhordy/Mynydd Moelgella Site			Mynydd Pwll-yr-lwrch Site				
	P8	P9	P10	P1	P3	P4	P6	P7
Notes	Standing water up to 10 cm deep, fed by a culvert passing beneath the bare ground track to the west. Outflow to east leading to dry ditch. Vegetated with bulrush and soft rush, and poached by grazing sheep.	Pond with steep banks on its north, east and south banks, but gradated over the path on the western bank. Indeterminable depth. No shade of macrophyte cover. Vegetated banks.	Of indeterminate depth, vegetated with soft rush and purple moor-grass. It was heavily shaded by immature goat willow scrub.	Heavily vegetated with dense willow scrub and bulrush, making it difficult to determine its depth. Poached by horses, with shallow gradual banks.	Almost completely dry. Heavily shaded, and densely vegetated with soft rush, purple moor-grass and willow scrub.	Pond to the south of the Site. Likely ephemeral. Very gradual banks. Densely vegetated with aquatic plants. 5x15m.	Willow scrub growing within standing water, making it difficult to determine the depth. Banks vegetated with soft rush, and approximately 25% shaded. Macroalgae coverage approximately 10%.	Measured approximately 4m x 2m, and had shallow banks shaded by willow scrub.
Location	Zone B	Zone B	Zone B	Zone B	Zone B	Zone B	Zone B	Zone B
Pond area (m²)	<50m ²	375m ²	<50m ²	50-100m ²	900m ²	50-100m ²	100m ²	<50m ²
Pond drying	Sometimes dries	Never dries	Sometimes dries	Rarely dries	Dries annually	Dries annually	Rarely dries	Sometimes dries
Water quality	Moderate	Good	Good	Moderate	Good	Good	Good	Moderate
Shade	66-70%	0-60%	91-95%	91-95%	91-95%	0-60%	0-60%	86-90%
Fowl	Absent	Minor	Absent	Absent	Absent	Absent	Absent	Absent



Habitat Suitability Index (HSI)	Moel Cynhordy/Mynydd Moelgella Site			Mynydd Pwll-yr-lwrch Site				
	P8	P9	P10	P1	P3	P4	P6	P7
Fish	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
Ponds within a 1 km radius	1	2	0	3	8	8	8	3
Terrestrial habitat	Moderate	Poor	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Macrophytes	1-5%	<1%	<1%	<1%	<1%	96-100%	6-10%	<1%
HSI score	0.484	0.650	0.387	0.515	0.552	0.547	0.688	0.4614
Habitat suitability	Poor	Average	Poor	Below average	Below average	Below average	Average	Poor

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Appendix F: Records of Bird Species

Table F-1 - Records of Target Species and Secondary Species within 2km of the Development Site

Common Name	Scientific Name	Status	Number of records	Date of most recent record	Distance (m) and direction of nearest record from Development Site
Barn Owl	<i>Tyto alba</i>	WCA1	7	2022	741 NW
Black Redstart	<i>Phoenicurus ochruros</i>	WCA1	1	2021	1886 S
Brambling	<i>Fringilla montifringilla</i>	WCA1	4	2021	943 SW
Bullfinch	<i>Pyrrhula pyrrhula</i>	S7	47	2024	308 W
Common Scoter	<i>Melanitta nigra</i>	WCA1, S7, UKBR.	1	2022	1785 W
Crossbill	<i>Loxia curvirostra</i>	WCA1	18	2022	12 N
Cuckoo	<i>Cuculus canorus</i>	S7, WBR, UKBR.	37	2024	Within Development Site
Curlew	<i>Numenius arquata</i>	S7, WBR, UKBR.	1	2021	1785 W
Dartford Warbler	<i>Sylvia undata</i>	BDir1, WCA1.	1	2015	593 SW
Dunnock	<i>Prunella modularis</i>	S7	44	2024	Within Development Site
Fieldfare	<i>Turdus pilaris</i>	WCA1, UKBR.	6	2023	593 SW
Firecrest	<i>Regulus ignicapilla</i>	WCA1	2	2020	593 SW
Goldcrest	<i>Regulus regulus</i>	WBR	43	2023	124 NW
Golden Plover	<i>Pluvialis apricaria</i>	BDir1, S7, WBR.	5	2023	Within Development Site
Goshawk	<i>Accipiter gentilis</i>	WCA1	25	2024	309 W
Grasshopper Warbler	<i>Locustella naevia</i>	S7, WBR, UKBR.	18	2024	Within Development Site

Common Name	Scientific Name	Status	Number of records	Date of most recent record	Distance (m) and direction of nearest record from Development Site
Greenfinch	<i>Chloris chloris</i>	WBR, UKBR.	19	2024	Within Development Site
Herring Gull	<i>Larus argentatus</i>	S7, WBR, UKBR.	21	2023	Within Development Site
Hobby	<i>Falco subbuteo</i>	WCA1	1	2018	1403 SW
House Martin	<i>Delichon urbicum</i>	UKBR	43	2024	309 W
House Sparrow	<i>Passer domesticus</i>	S7, UKBR.	36	2023	552 W
Kestrel	<i>Falco tinnunculus</i>	S7	14	2022	79 SE
Kingfisher	<i>Alcedo atthis</i>	BDir1, WCA1.	3	2017	309 W
Lesser Redpoll	<i>Acanthis flammea cabaret</i>	S7, UKBR.	12	2022	Within Development Site
Lesser Spotted Woodpecker	<i>Dryobates minor</i>	S7, WBR, UKBR.	3	2022	659 W
Linnet	<i>Linaria cannabina</i>	S7, WBR, UKBR.	22	2024	59 NW
Marsh Harrier	<i>Circus aeruginosus</i>	BDir1, WCA1.	1	2021	Within Development Site
Marsh Tit	<i>Poecile palustris</i>	S7, WBR, UKBR.	1	2015	734 S
Meadow Pipit	<i>Anthus pratensis</i>	WBR	36	2023	Within Development Site
Merlin	<i>Falco columbarius</i>	BDir1, WCA1, WBR, UKBR,	4	2021	Within Development Site
Mistle Thrush	<i>Turdus viscivorus</i>	UKBR	45	2024	Within Development Site
Nightjar	<i>Caprimulgus europaeus</i>	BDir1, S7.	23	2024	Within Development Site
Osprey	<i>Pandion haliaetus</i>	BDir1, WCA1.	2	2020	Within Development Site

Common Name	Scientific Name	Status	Number of records	Date of most recent record	Distance (m) and direction of nearest record from Development Site
Peregrine	<i>Falco peregrinus</i>	BDir1, WCA1.	8	2022	593 SW
Pied Flycatcher	<i>Ficedula hypoleuca</i>	S7	3	2022	59 NW
Red Kite	<i>Milvus milvus</i>	BDir1, WCA1.	50	2024	Within Development Site
Redwing	<i>Turdus iliacus</i>	WCA1	24	2023	Within Development Site
Reed Bunting	<i>Emberiza schoeniclus</i>	S7	25	2023	Within Development Site
Ring Ouzel	<i>Turdus torquatus</i>	S7, WBR, UKBR.	4	2021	Within Development Site
Ringed Plover	<i>Charadrius hiaticula</i>	S7, WBR, UKBR.	1	2021	1785 W
Sandwich Tern	<i>Thalasseus sandvicensis</i>	BDir1	3	2021	621 SW
Skylark	<i>Alauda arvensis</i>	S7, UKBR.	29	2024	Within Development Site
Snow Bunting	<i>Plectrophenax nivalis</i>	WCA1	1	2023	Within Development Site
Song Thrush	<i>Turdus philomelos</i>	S7	67	2024	Within Development Site
Spotted Flycatcher	<i>Muscicapa striata</i>	S7, WBR, UKBR.	10	2022	Within Development Site
Starling	<i>Sturnus vulgaris</i>	S7, WBR, UKBR.	24	2023	Within Development Site
Swift	<i>Apus apus</i>	WBR	45	2024	Within Development Site
Tree Pipit	<i>Anthus trivialis</i>	S7, WBR, UKBR.	25	2023	Within Development Site
Whimbrel	<i>Numenius phaeopus</i>	WCA1, UKBR.	1	2021	1785 W
Whinchat	<i>Saxicola rubetra</i>	WBR, UKBR.	4	2020	Within Development Site
Whitethroat	<i>Sylvia communis</i>	WBR	27	2024	Within Development Site
Willow Tit	<i>Poecile montanus</i>	S7, WBR, UKBR.	11	2023	Within Development Site

Common Name	Scientific Name	Status	Number of records	Date of most recent record	Distance (m) and direction of nearest record from Development Site
Willow Warbler	<i>Phylloscopus trochilus</i>	WBR	59	2024	Within Development Site
Wood Warbler	<i>Phylloscopus sibilatrix</i>	S7, WBR, UKBR.	6	2023	641 SW
Woodcock	<i>Scolopax rusticola</i>	WBR, UKBR.	13	2024	280 E
Woodlark	<i>Lullula arborea</i>	BDir1, WCA1, S7.	1	2017	309 W
Wryneck	<i>Jynx torquilla</i>	WCA1	1	2018	1973 NW
Yellow Wagtail	<i>Motacilla flava</i>	S7, WBR, UKBR.	1	2021	1892 SE
BDir1 = Annex I within the Directive 2009/147/EC on the conservation of wild birds, commonly referred to as "the Birds Directive" S7 = Section 7 of the Environment (Wales) Act 2016 UKBR = Red list of Birds of Conservation Concern UK Version 5 WBR = Red list of Birds of Conservation Concern Wales Version 4 WCA1 = Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)					



The Mailbox
Level 2
100 Wharfside Street
Birmingham
B1 1RT

wsp.com