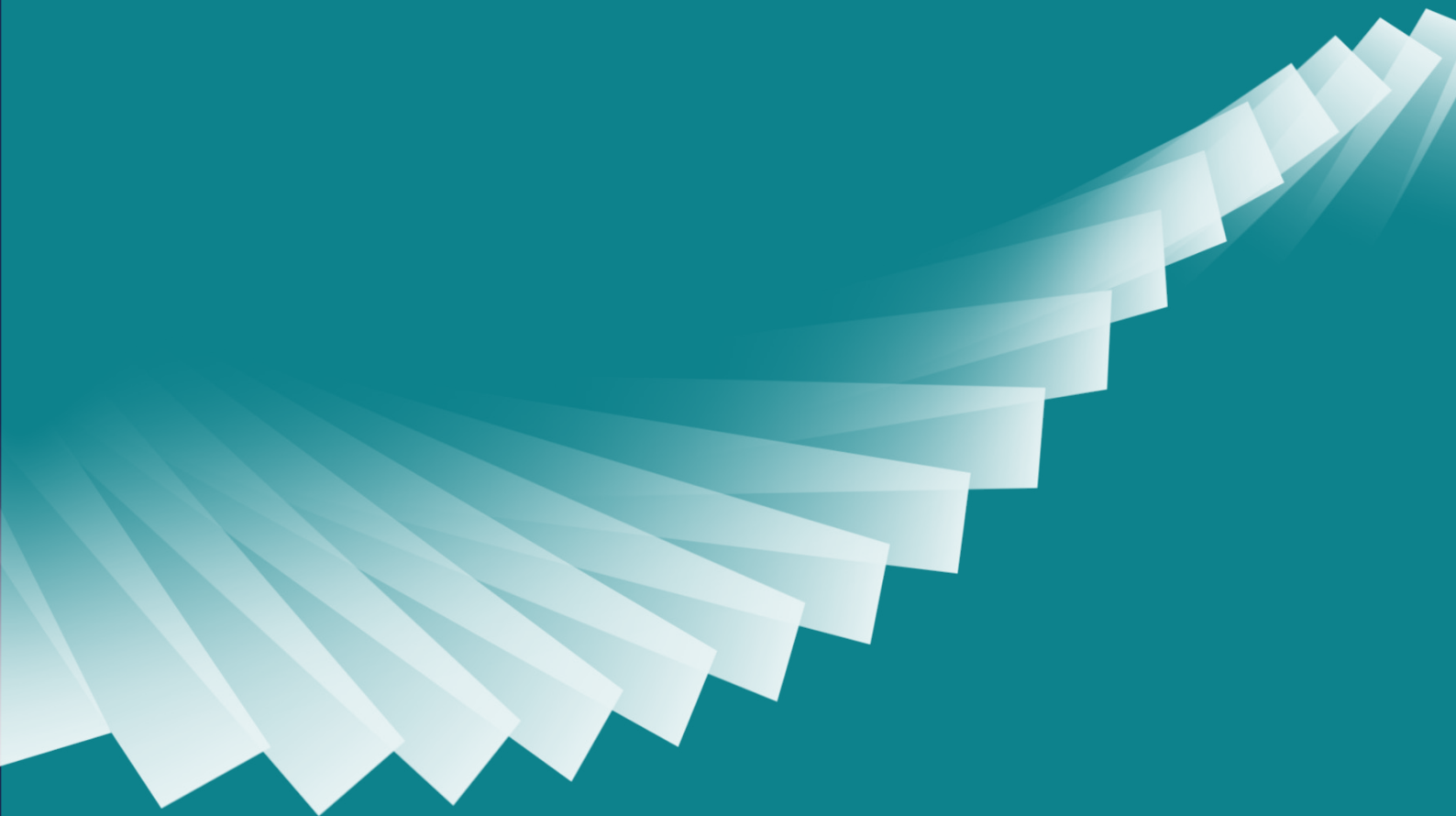




Bute Energy
Aberedw Energy Park

Appendix 2.1:

Scoping Report



Bute Energy

Aberedw Energy Park Scoping Report

Final report

Prepared by LUC

December 2023



Bute Energy

Aberedw Energy Park Scoping Report

Project Number
12522

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Ecology
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Chapter 1

Introduction

Introduction

1.1 Aberedw Energy Park Limited ('the Applicant') intends to apply to the Welsh Ministers for permission to construct, operate and decommission Aberedw Energy Park ('the Proposed Development'). The Proposed Development will be situated on elevated land at Aberedw Hill and Wylfre, approximately 3 km east of Builth Wells as shown on **Figure 1.1** (the land within the red line boundary hereby referred to as the 'Site'). The Site is located within the local planning authority area of Powys County Council (PCC) and further details on the Site and description of the Proposed Development are provided in **Chapter 3**.

Purpose of this Report

1.2 Land Use Consultants Ltd (LUC) has been commissioned by the Applicant to prepare a Scoping Report as defined within the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (the EIA Regulations).

1.3 The EIA Regulations require that, prior to planning permission being granted, for certain types of development, an Environmental Impact Assessment (EIA) must be undertaken. The EIA Regulations set out the types of development which require an EIA (referred to as 'Schedule 1 development') and other developments which may require EIA should they give rise to potentially significant effects (referred to as 'Schedule 2 development').

1.4 The Proposed Development does not fall under any of the types of development set out in Schedule 1 of the EIA Regulations, but it does fall under Schedule 2 of the EIA Regulations, 3(i) 'Installations for the harnessing of wind power for energy production (wind farms)' and exceeds the threshold of the installation of more than two wind turbines, as well as the wind turbine height exceeding 15 metres. Therefore, the Proposed Development qualifies as EIA development and an Environmental Statement (ES) is required.

1.5 The EIA Regulations make provision for obtaining a Scoping Direction from Planning and Environment Decisions Wales (PEDW) on behalf of the Welsh Ministers, on the information to be included in the ES. The Scoping Report accompanies the Applicant's written request to PEDW for a

‘Scoping Direction’ as to which environmental effects are to be considered in the EIA. It provides details of:

- The Proposed Development;
- The Site and the surrounding area;
- The environmental desk-based and field survey work undertaken to date;
- The potential significant environmental effects to be considered within the EIA and ES; and
- The proposed EIA survey and assessment methods.

Project Background

1.6 The Proposed Development comprises of 18 wind turbines with a maximum blade tip height of up to 200 m and associated infrastructure, including access tracks and cabling. The Proposed Development will be a ‘Development of National Significance’ (DNS) as the wind turbines will have a combined installed capacity greater than 10 megawatts (MW)¹. The proposed wind turbine layout is shown in **Figure 1.2** and the detailed locations of the wind turbines and associated infrastructure will be subject to iterative design through the Environmental Impact Assessment (EIA) process.

1.7 The majority of the Proposed Development is located on common land; therefore, the DNS application will be accompanied by the requisite secondary consent applications to authorise the proposed works on common land and for consent to deregister and exchange common land (i.e., Sections 16 and 38 of the Commons Act 2006²). Impacts of the Proposed Development on common land will be addressed in the relevant environmental chapters, with impacts on graziers assessed in the Other Issues chapter.

Scoping

1.8 At this early stage in the design process, it is necessary to consider the maximum parameters that the Proposed Development may represent in terms of Site area, and in relation to the wind farm, wind turbine numbers and tip heights, to identify a robust scope for the EIA. These aspects will be refined as the EIA and design progress.

1.9 Scoping is an early step in the EIA process, ensuring the assessment focuses on the likely significant effects associated with a project. Scoping also provides an opportunity for consultees to comment on the

¹ Developments of National Significance (Specified Criteria and Prescribed Secondary Consents) (Wales) Regulations 2016 (as amended)

² Commons Act 2006. Available at: <https://www.legislation.gov.uk/ukpga/2006/26/contents> (accessed 27.09.2023).

proposed methodologies, identify sources of baseline information and raise any specific issues that they consider require assessment.

1.10 In accordance with established guidance and good practice, the ES will focus only on potentially significant effects, partially or fully ‘scoping out’ topics from the EIA where significant effects are not likely. Proposals in this regard are set out in this Scoping Report. Further details of the proposed approach to the EIA are discussed in **Chapter 2**.

The Applicant

1.11 Aberedw Energy Park is being developed by Aberedw Energy Park Limited, a subsidiary of Bute Energy Limited (‘Bute Energy’).

1.12 Bute Energy is an independent renewable energy company combining experience with innovation. Headquartered in Wales, Bute Energy is seeking to deliver a portfolio of energy parks, with suitable infrastructure, using the latest proven technology to deliver onshore renewable power generation in Wales. Bute Energy is also in the process of preparing DNS applications for the Nant Mithil and Bryn Gilwern Energy Parks which are the two closest wind farms to the Proposed Development in the Bute portfolio, and also in the PCC administrative area.

1.13 Bute Energy’s mission is to help address the climate crisis by unlocking Wales’ potential for onshore renewable power generation and bring benefits to local communities where energy parks are created.

Document Structure

1.14 Various EIA topic specialists have contributed to this Scoping Report, as detailed in **Table 1.1** below.

Table 1.1: The EIA Scoping Team

Topic	Team
Landscape and Visual Amenity	LUC
Ecology (Non-Avian)	LUC
Ornithology	LUC
Archaeology and Cultural Heritage	LUC
Water and Soil Resources	Yellow Sub Geo

Topic	Team
Peat	East Point Geo
Transport and Access	Pell Frischmann
Noise and Vibration	Hoare Lea
Aviation	WPAC
Telecommunication and Utilities	LUC
Shadow Flicker	LUC
Forestry	McKay Forestry
Common Land	LUC
Climate Change	LUC
Socio-economics, Tourism and Recreation	LUC
Major Accidents and Disasters	LUC
Human Health	LUC

1.15 The remainder of the report is structured as follows:

- **Chapter 2** provides information on the EIA process;
- **Chapter 3** provides a brief description of the nature and purpose of the Proposed Development;
- **Chapters 4-12** outline the topic areas to be considered in the EIA and the elements that are proposed to be scoped out of the EIA;
- **Appendix A** sets out a glossary of terms;
- **Appendix B** provides a consolidated list of the questions put forward to the consultees to focus the response to the Scoping Report and which are also included at the end of each chapter; and
- **Appendix C** provides an outline of the proposed structure of the ES.

Chapter 2

The EIA Process and Assessment Methodology

What is EIA?

2.1 EIA is the process of systematically evaluating and presenting the likely significant effects, both positive and negative, of a development on the environment, to assist the determining authority in making an informed decision on an application for consent. It enables the significance of effects to be clearly understood, incorporating consideration of mitigation (for negative effects) and enhancement (for positive effects) measures. The findings of the EIA process are presented within an ES which accompanies an application for consent.

2.2 EIA is an iterative process which takes place alongside, and informs, project design. As potential effects are identified, the design of the Proposed Development will be modified to avoid or reduce adverse effects and enhance positive effects where possible.

Scoping

2.3 The purpose of scoping is to focus the EIA on the likely significant environmental effects of a proposal. Therefore, on the basis of the Site work undertaken to date, desktop studies, the professional judgement of the assessment team and experience from other similar projects, as well as policy, guidance and relevant good practice, each topic-based section within this Scoping Report outlines:

- Potentially significant effects upon the environment associated with the construction and/or operation of the Proposed Development that will be subject to detailed consideration within the ES. Decommissioning is addressed in paragraph 2.12 of this report;
- Mitigation measures likely to be required to ameliorate significant effects, or anticipated to be implemented through the design process; and
- Effects considered unlikely to be significant and therefore scoped out of the EIA.

2.4 Additional purposes of this Scoping Report are:

- To establish the availability of baseline environmental data and their sources;
- To define a survey and assessment framework from which an appropriately comprehensive assessment can be produced;

- To invite comments on the proposed survey and assessment methodologies;
- To invite responses to specific topic-based questions;
- To put forward proposals and receive comments concerning the way in which the EIA findings are to be presented in the ES;
- To invite PEDW, on behalf of the Welsh Ministers, and consultees to draw the Applicant's attention to any matters that are likely to be key to any decision on the forthcoming DNS application; and
- To provide and receive additional information relevant to the Proposed Development.

2.5 As mentioned above, key questions are included throughout the Scoping Report to help structure the feedback from PEDW and consultees and realise the maximum value of the scoping process for all parties. A consolidated list of these questions is included in **Appendix B**.

2.6 Paragraphs 3.14 and 3.15 of Appendix 3 of the DNS Guidance³ list what should be provided with the Scoping Report (drawing on Regulation 14 of the EIA Regulations). **Table 2.1** sets out these requirements and signposts where this information is contained.

Table 2.1: DNS Guidance Scoping Report requirements

DNS Guidance Requirement	Relevant Chapter in this Report
A plan, a brief description of the nature and purpose of the Proposed Development, a description of its possible effects on the environment, and a statement that the request is made in relation to a DNS.	Chapters 1 and 3 to 12
■ Characteristics of the Proposed Development; ■ Location of the Proposed Development; ■ Characteristics of the potential impacts; and ■ Ensure that all aspects of the environment likely to be significantly affected by the Proposed Development are addressed.	Figure 1.1 and Chapters 4 to 12

³ The Planning Inspectorate/ YR Arolygiaeth Gynllunio (no date) Developments of National Significance - Appendix 3: Environmental Impact Assessment. Available at: <https://gov.wales/sites/default/files/publications/2019-07/developments-of-national-significance-guidance-environmentalimpact-assessment.pdf> (accessed 28.09.2023)

DNS Guidance Requirement	Relevant Chapter in this Report
An outline of the main alternatives considered and the reasons for selecting a preferred option.	Chapter 3
Results of desktop and baseline studies where available.	Chapters 4 to 12
A record of consultation undertaken with relevant bodies (including any public engagement) to date.	Chapters 4 to 12
Referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the proposal.	All figures
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.	Chapters 4 to 12
Methods used or proposed to be used to assess impacts and the significance criteria framework used.	Chapters 4 to 12
Any mitigation proposed and the extent to which these are likely to reduce impacts.	Chapters 4 to 12
Where impacts from consequential or cumulative development have been identified, how applicants intend to assess these impacts in the ES (for example, a high-level assessment of the grid connection where this does not form part of the Proposed Development for a power station).	Chapters 2 and 4 to 12
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.	Chapters 5, 6 and 8
Key topics covered as part of applicants' scoping exercise.	Chapters 4 to 12
An outline of the structure of the proposed ES.	Appendix C

Baseline Conditions

2.7 The EIA Regulations require that aspects of the environment which are likely to be significantly affected by the Proposed Development are clearly defined within the ES. To achieve this, it is necessary to gather environmental information on the current and existing status of each topic proposed for consideration as part of the EIA, i.e., 'baseline conditions'.

2.8 Baseline conditions are not static, and it is often necessary to update them with further baseline surveys to ensure that the data upon which the EIA is based is up to date and reasonably reflects the nature of the receiving environment. For the purposes of the assessment, the baseline is considered to be the existing Site which is currently undeveloped. Details on the existing conditions of the Site, and the surveys which have been, or are proposed to be, undertaken for each topic are detailed in **Chapters 4 to 12**.

2.9 In accordance with the EIA Regulations, climate change will also be considered in the context of understanding how baseline conditions for each topic area could change during the lifetime of the Proposed Development.

Assessment of Effects

2.10 For each topic that is identified as requiring further study, a detailed technical assessment will be carried out in line with the scope and methodology proposed and, where relevant, agreed upon with statutory consultees. Individual technical assessments will be undertaken by a competent and appropriately qualified expert in which technical standards and relevant guidance will be adhered to.

2.11 The assessment of potential significant effects, using a range of appropriate methodologies, will take into account the construction and operation of the Proposed Development in relation to the Site and the surrounding area.

2.12 At the end of the operational phase, the Proposed Development will either be decommissioned, or an application made for consent to extend its operational life or replace the wind turbines and other electricity infrastructure. Access tracks are likely to be left in-situ, but this would be discussed with the landowners at that time. Decommissioning activities are in effect a reversal of the construction process; relevant effects are generally similar and decommissioning effects would be expected to be no greater than those associated with construction. The decommissioning effects will therefore be scoped out except where it is deemed appropriate on an individual topic basis to include it within the scope of the EIA (**Chapters 4 to 12**).

2.13 The methods for predicting the nature and magnitude of any potential effects vary according to the topic assessed. Quantitative methods of assessment can predict values that can be compared against published thresholds and criteria in Government guidance and standards. However, it is not always possible to ascribe values to environmental assessments and thus qualitative assessments are also undertaken with such assessments relying on previous experience and professional judgement. The methodologies used for assessing each topic area will be described within the individual chapters of the ES.

2.14 The following criteria will be used to evaluate the significance of potential effects of the Proposed Development:

- Sensitivity, importance or value of the resource or receptor;
- Extent and magnitude of the effect;
- Duration of the effect;
- Nature of the effect; and
- Performance against environmental quality standards.

2.15 The ES topic chapters will each provide a detailed assessment of potential effects (direct and indirect, positive and negative, short term or long term), identify mitigation measures, and determine the significance of the residual effects (those remaining after the mitigation measures have been implemented). Chapters will be accompanied by technical appendices and figures where relevant. All relevant policy, guidance and data sources used will be fully referenced, as required by Part 10 of Schedule 4 of the EIA Regulations.

2.16 A consolidated list of all significant effects before and after mitigation will be included in the final chapter of the ES for ease of reference.

2.17 A standalone Non-Technical Summary (NTS) of the findings of the ES will also be produced as required by Part 9 of Schedule 4 of the EIA Regulations.

Cumulative Assessment

2.18 An assessment will be made of the likely significant cumulative effects of the Proposed Development in combination with other wind farms and other developments where relevant, broadly following guidance within Advice Note 17 published by the Planning Inspectorate (PINS)⁴ as shown in **Table 2.2**.

Table 2.2: Cumulative assessment process

Stage	Main activities
Stage 1 – Establishing a zone of influence for the Proposed Development and identifying a ‘long list’.	Identifying a long list of developments that are proposed in the vicinity of the Proposed Development. This is sourced from the PEDW and PINS websites as well as any consented developments available from PCC.
Stage 2 – Identify a ‘short list’	Identifying the nature of the developments and assessing whether there is the potential for significant cumulative effects with the Proposed Development
Stage 3 – Information gathering	Collation of the information on the developments on the ‘short list’
Stage 4 – Assessment	The cumulative assessment and presenting the findings in the ES.

2.19 The schemes that have been sourced (and will be updated within the ES) will include:

- Schemes which are operational (although to be excluded from the cumulative assessment when incorporated within the baseline);
- Schemes which are under construction;
- Schemes which have been consented; and

⁴ Planning Inspectorate Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects. (2019). Available online at: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/> (accessed 28.10.2023).

- Schemes which have been subject to a Scoping Opinion or where a planning application has been submitted but not yet determined (which will be collated at a later stage with the relevant authorities).

2.20 As the cumulative baseline is constantly evolving and the relevant cumulative schemes will vary by topic, the schedule of cumulative schemes to be included in the assessment will be finalised in the ES following consultation with relevant consultees, and the long list should therefore not be considered to be the final list of schemes to be assessed and it will be refined and supplemented as further information on these schemes becomes available.

2.21 A list of wind farm developments known to lie within 33 km of the Site is presented in **Table 2.3** below and shown in **Figure 2.1**. The 33 km search area is based on guidance from Natural Resources Wales (NRW)⁵, which suggests that the search areas for structures 176 m to 225 m tall should be 26 km to 33 km.

2.22 The PINS website has also been reviewed to identify any Nationally Significant Infrastructure Projects (NSIPs) that are suitable for inclusion, but as none are included within the 33km search area, they have not been included in the long list.

2.23 Information available on the website of PCC suggests that no planning applications for major developments subject to EIA have been received by the Local Planning Authority in the previous five years and therefore the long list will be refined through further liaison with PCC during the preparation of the ES to ensure that any proposed schemes that they consider appropriate for inclusion is assessed accordingly.

2.24 Using the information within **Table 2.3**, a short list (i.e., those schemes that are scoped into the cumulative assessment) has been collated. Individual study areas (including cumulative study areas) will be defined separately for each EIA topic to reflect the likely extent of potential significant effects. This will allow proportionate assessment that only considers likely significant effects from other proposed schemes where it is relevant to do so.

⁵ Natural Resources Wales Guidance Note 46 'Using LANDMAP in Landscape and Visual Impact Assessments'

Table 2.3: Wind farm developments within approximately 33 km of the Site

Wind Farm	No. of Wind Turbines	Status	Distance from Proposed Wind Turbines (km) ⁶	Tip Height (m)	Scoped In/Out (according to the filtering process set out in Chapter 4)
Operational/Under Construction					
Tremaen	1	Operational	2.71	27.13	Scoped In
Hendy	7	Under Construction	9.18	110	Scoped In
Pen Y Rhiw	1	Operational	19.18	17.8	Scoped Out
Bailey Bog	1	Operational	24.45	20.4	Scoped Out
BDCR II Community Turbine	1	Operational	25.4	N/A	Scoped Out
Brynddu	2	Operational	25.6	20.4	Scoped Out
Aberffrydlan	1	Operational	25.83	N/A	Scoped Out
Garreg Lywd Hill	17	Operational	28.43	126.5	Scoped In
Bryn Titli	22	Operational	28.83	53.5	Scoped In
Garth Fawr	1	Operational	29.39	20.9	Scoped Out
Hafod Fraith	2	Operational	30.73	17.7	Scoped Out

⁶ Distance between the wind turbine developable area of the proposed wind farm and the center of the cumulative scheme

Wind Farm	No. of Wind Turbines	Status	Distance from Proposed Wind Turbines (km) ⁶	Tip Height (m)	Scoped In/Out (according to the filtering process set out in Chapter 4)
Esgairdraenllwyn	2	Operational	31.15	34.6	Scoped Out
Bryn Garw	2	Under Construction	31.87	39.6	Scoped Out
Llandinam	102	Operational	32.27	45.5	Scoped In
Bryn Cwmrhiewdre	1	Operational	32.37	34.4	Scoped Out
Dugwm	1	Operational	33.95	34.4	Scoped Out
Consented					
Ddulley Bank	1	Consented	29.67	20	Scoped Out
Brynmawr Cottage	1	Consented	30.17	17.7	Scoped Out
Llandinam Repowering	34	Consented	32.4	121.2	Scoped In
Bryn Dadlau	1	Consented	32.72	19.5	Scoped Out
In Planning					
Bryngydfa	12	Application Submitted	28.45	126.5	Scoped In
Garn Fach	17	Application Submitted	29.93	149.9	Scoped In

Wind Farm	No. of Wind Turbines	Status	Distance from Proposed Wind Turbines (km) ⁶	Tip Height (m)	Scoped In/Out (according to the filtering process set out in Chapter 4)
Other					
Nant Mithil	36	Pre – Scoping	13.8	220	Scoped In
Rhiwlas Energy Park	15	Scoping	30.71	200	Scoped In
Bryn Cadwgan	25	Pre - Scoping	30	230	Scoped In
Bryn Gilwern	15	Pre – Scoping	7.05	200	Scoped In

2.25 In addition to the wind farms listed in **Table 2.3**, the Towy Usk grid connection project being developed by Green Gen Cymru, is also listed as a DNS project currently being considered by PEDW. This is the only non-wind farm development that is on the long list at present.

2.26 One of the key aspects of the cumulative assessment is to consider the effects of the Proposed Development alongside the Bryn Gilwern Energy Park. The two projects are separate and do not collectively constitute a ‘project’ as defined in the EIA Regulations, as they can be delivered in isolation. The cumulative effects of these projects on the baseline conditions and the significance of the likely impacts will be assessed.

2.27 The ES will include a section that details how the cumulative effects assessment has been carried out. This section will also highlight the specific aspects of each project that are relevant for the cumulative assessment, such as the design, construction schedule and mitigation measures. For the visual impact assessment where elements of the Proposed Development will be visible in some views of the wind turbines at the Bryn Gilwern and Nant Mithil Energy Parks, it is proposed that photomontages for the Proposed Development will be prepared that show all developments where a viewpoint includes all projects. However, for the purposes of the ES, the Proposed Development will be fully appraised in isolation before the cumulative effects (alongside other developments) are assessed.

Mitigation and Monitoring

2.28 Part 7 of Schedule 4 of the EIA Regulations states that the ES should include ‘a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases’. These measures will be termed ‘mitigation measures’ and will be included for each topic area, where appropriate.

2.29 The ES will identify and assess likely significant effects prior to mitigation and, where mitigation measures are proposed, their effectiveness will be evaluated, and the significance of the ‘residual’ effect assessed and presented.

2.30 It is important to note that, given both the commitment of the Applicant to implement accepted good practice during the construction and operation of the Proposed Development, and the regulatory context, there are a number of relevant measures which are more appropriately considered to be an integral part of the design/construction process rather than ‘mitigation’ per se. For example, mitigation such as ‘standard’ practices and procedures will be secured via a Construction Environmental Management Plan (CEMP) which would stipulate good practice construction techniques to reduce, as far as reasonably practicable, environmental effects - thereby reducing, as far as reasonably practicable, the need for additional mitigation measures or environmental controls.

2.31 It is, therefore, appropriate to scope out some assessments from an ES on the basis that these will be avoided by standard good practice measures that would be secured through an appropriately worded planning condition. Where this is the case, it has been addressed on a topic specific basis.

2.32 Where it is appropriate to do so, mitigation measures will be monitored for their effectiveness, as provided for in Regulation 25(3) of the EIA Regulations. Proposed monitoring measures will be set out in the relevant ES chapters.

2.33 A Schedule of Mitigation will be included in the ES and will provide a consolidated list of all proposed mitigation and monitoring measures identified in the ES.

Uncertainty

2.34 The EIA process is designed to enable good decision-making based on the best available information about the environmental effects of a project. There will, however, be some situations where

uncertainty as to the exact scale and nature of effects occurs. This may arise through shortcomings in available information or due to the necessary limitations of the professional judgement process. As required in Schedule 4, Part 6 of the EIA Regulations, it is important that such uncertainty is explicitly recognised and that the ES includes ‘*a description of the forecasting methods or evidence used to identify and assess the effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved*’.

2.35 Each topic chapter of the ES will include details of the assumptions made and limitations identified before assessing the significance of effects.

Competent Experts

2.36 As per Regulation 17(4)(a) of the EIA Regulations, the ES must be prepared by ‘*persons who in the opinion of the relevant planning authority or the Welsh Ministers, as appropriate, have sufficient expertise to ensure the completeness and quality of the statement*’. The ES will include a statement of expertise for each of the principal individuals who have contributed to its preparation.

ES Introductory Chapters

2.37 In addition to the topic-specific chapters, the ES will contain introductory chapters as identified in **Appendix C**. The ES will include a Project Description chapter which will describe the main components of the Proposed Development and a Site Selection and Design Strategy chapter which will describe the evolution of the Proposed Development specification and design. In particular, it will set out how and where design choices have been made in order to avoid potentially significant effects, thereby removing the requirement for further detailed assessment of such effects. This is discussed further in relation to the particular topic chapters below.

2.38 The Site Selection and Design Strategy chapter will also fulfil the requirements of the EIA Regulations with regard to the consideration of reasonable alternatives. This would include the reasons for selecting the Site along with an explanation of the design iterations made during the EIA process to respond to the relevant environmental and technical constraints on the Site and surrounding area, before arriving at the final design.

2.39 Further to the information above the ES introductory chapters are identified below with a brief description of their contents:

- **Chapter 1: Introduction** – This chapter will provide a brief introduction to the Proposed Development and the legislative requirements for the EIA, as well as an outline of the structure of the ES;
- **Chapter 2: Approach to the EIA** – This chapter will provide more detail on the EIA process including consultation;
- **Chapter 3: Site Selection and Design Strategy** – This chapter will provide reasons for the Site selection and will detail the approach to the design strategy and layout modifications, including details about the main alternatives; and
- **Chapter 4: Project Description** – This chapter will provide a detailed description of the Proposed Development and explain the context of the Site.

Energy and Planning Policy

2.40 The DNS application for the Proposed Development will be supported by a Planning Statement which will contain an assessment of how it accords with the energy, climate change and planning legislative and policy framework. The Planning Statement will make reference to relevant provisions at the international, UK and Welsh Government levels, as well as the policy framework at the local planning authority level.

2.41 The ES will contain a summary description of the relevant energy, climate change and planning legislative and policy framework. In the interests of a proportionate ES, it is not proposed to include a separate planning policy context chapter within the ES as this will have been provided already within the Planning Statement. The relevant policies/guidance for each topic area will be outlined within the topic chapters, where relevant.

Energy & Climate Change, Legislative and Policy Provisions

2.42 The framework of international agreements, binding targets and climate change global advisory reports is the foundation upon which national energy policy is based. International and national policy demonstrates the need case for renewable energy.

2.43 The ES will set out the framework and legislative energy and climate change policy provisions which will include but not be limited to:

International Level

- The Paris Agreement (2016); and

- The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report.

UK Level

- The UK Clean Growth Strategy (2017);
- Committee on Climate Change (CCC), Net Zero, the UK's Contribution to Stopping Global Warming (May 2019);
- National Audit Office, Achieving Net Zero (2020);
- UK Government, The UK Energy White Paper: Powering our Net Zero Future (2020);
- UK Government, The Ten Point Plan for a Green Industrial Revolution (2020);
- CCC, Sixth Carbon Budget (2021);
- The UK Net Zero Strategy (2021); and
- The British Energy Security Strategy (2022).

Welsh Government Level

- Welsh Government, A Low carbon Transition (2012);
- The Wellbeing of Future Generations (Wales) Act 2015;
- The Environment (Wales) Act 2016;
- Welsh Government, Prosperity for All: A Low Carbon Wales (2019); and
- Net Zero Wales, Carbon Budget 2 (2021-2025).

2.44 The Climate Change Act 2008 (the 2008 Act) provides a system of carbon budgeting. Under the 2008 Act, the UK committed to a net reduction in GHG emissions by 2050 of 80% against the 1990 baseline. In June 2019, secondary legislation was passed that extended that target to at least 100% against the 1990 baseline by 2050, The Sixth Carbon Budget (CB6) requires a reduction in UK greenhouse gas emissions of 78% by 2035 relative to 1990 levels.

2.45 In 2019, the Welsh Government declared a Climate Emergency. Defining the issue as an emergency is a reflection of both the seriousness of climate change and its potential effects and the need for urgent action to cut carbon dioxide and other greenhouse gas emissions.

Planning Policy Provisions

Welsh Government Level

2.46 At the Welsh Government level reference will be made in the ES to:

- The National Development Framework (NDF), Future Wales – the National Plan 2040 (2021); and
- Planning Policy Wales Edition 11, 2021 (as amended) (PPW11) - including any updates to this, such as those made to Chapter six, which were published in a Heads of Planning Letter on the 18 October 2023⁷.

2.47 Future Wales seeks to influence all levels of the planning system and helps to shape the Strategic and Local Development Plans. The document addresses key national priorities through the planning system including achieving de-carbonisation and climate resilience.

2.48 All planning decisions in Wales must be taken in accordance with the Development Plan. Future Wales⁸ is the highest tier of the 'development plan' and focuses on solutions to issues and challenges nationally.

2.49 Future Wales sets out that '*...in determining planning applications for renewable and low carbon energy development, decision makers must give significant weight to the need to meet Wales' international commitments and our target to generate 70% of consumed electricity by renewable means by 2030 in order to combat the climate emergency*'. In January 2023, the Welsh Government started consulting on proposals to set a new target of 100% of Welsh annual electricity consumption from renewable electricity sources by 2035.

2.50 Policies 17 'Renewable and Low Carbon Energy and associated Infrastructure'; and 18 'Renewable and Low Carbon Energy Developments of National Significance' of Future Wales will be directly relevant and will be addressed in detail in the Planning Statement.

2.51 The policies are clear about the Welsh Government's intentions for the planning system to help contribute to renewable energy provision.

2.52 Policy in Future Wales and PPW11 set out that the Welsh Government strongly supports the principle of developing renewable and low carbon energy from all technologies and at all scales to meet

⁷ Welsh Government (2023) Local Authorities – Heads of Planning [online]. Available at: <https://www.gov.wales/addressing-nature-emergency-through-planning-system-update-chapter-6-planning-policy-wales>.

⁸ Welsh Government (2021) Future Wales: The National Plan 2040. Available at: <https://www.gov.wales/future-wales-national-plan-2040-0>

our future energy needs and that the planning system should maximise renewable and low carbon energy generation.

2.53 PPW11 details the land use planning policies of the Welsh Government, with the objective to ensure the delivery of sustainable development. PPW11 notes that energy demand is expected to grow due to the growing electrification of transport and heat, and that significant investment will be needed in energy generation, transmission and distribution infrastructure.

2.54 PPW11 identifies that low carbon electricity must become the main source of energy in Wales. Renewable and low carbon energy are seen as part of the overall commitment to tackle the climate emergency and increase energy security. PPW11 also recognises that wind energy forms a key part of meeting renewable energy production due to Wales' considerable wind resource.

2.55 PPW11 is supplemented by a number of Technical Advice Notes which will be referred to and considered as appropriate on a topic specific basis.

Local Authority Level

2.56 The Site is located within the administrative boundary of PCC. The Local Development Plan (LDP) for PCC was adopted in April 2018. The relevant policies in the extant PCC LDP include:

- Policy DM2 – The Natural Environment;
- Policy DM3 – Public Open Space;
- Policy DM4 – Landscape;
- Policy DM5 – Development and Flood Risk;
- Policy DM6 – Flood Prevention Measures and Land Drainage;
- Policy DM7 – Dark Skies and External Lighting; and
- Policy RE1 – Renewable Energy.

2.57 The adopted LDP is undergoing review and a replacement LDP (RLDP) is intended to be operative by March 2026. Pre-Deposit consultation on the RLDP took place between May and June 2023. The public consultations on the Deposit Plan are expected to take place between February and March 2024⁹.

2.58 Supplementary Planning Guidance (SPG) is also in place, including the following of relevance:

⁹ Powys Replacement Local Development Plan 2022-2037. Delivery Agreement June 2022. Available at: https://en.powys.gov.uk/media/15759/Powys-Replacement-Local-Development-Plan-2022-37-Delivery-Agreement-June-2022/pdf/aiPowys_Replacement_Local_Development_Plan_2022-37_Delivery_Agreement_June_2022_1luhlzwtuouuf.pdf?m=1657005640003.

- SPG – Renewable Energy; and
- SPG – Landscape.

2.59 The ES chapters will provide a description of the policy provisions from the LDP and any applicable SPG where they are relevant to the assessment. The Planning Statement will include a more detailed appraisal of the Proposed Development against relevant local planning considerations.

Alternatives Considered

2.60 DNS guidance for EIA¹⁰, states that an outline of the main alternatives considered and the reason for selecting a preferred option is to be provided in the Scoping Report. The following key parameters are pertinent to the development and ongoing refinement of the Proposed Development.

Site Boundary

2.61 The topography has informed the general boundary of the Site; with the location chosen to reflect discussions between the Applicant, relevant landowners and the environmental impacts. The ES will include a review of the reasonable alternatives that have been considered along with detail on how ongoing development of the proposals for the Site have informed the final boundary. In accordance with the EIA Regulations this will include environmental and non-environmental reasons for the Applicant's choice.

Wind Turbine Layout

2.62 The EIA process is an iterative process and the wind turbine layout shown in **Figure 1.2** has been informed by initial consideration of the Site constraints.

2.63 As the EIA progresses and further information is available from the surveys and assessments, the wind turbine and infrastructure layout may be amended and refined as appropriate, taking into account the advice of the EIA team and the emerging assessments.

Associated Infrastructure

2.64 This will be informed by the wind turbine layout and the Site's topography. Access track routes will be designed to reflect Site surveys and feedback from the environmental topic specialists.

¹⁰ Developments of National Significance. Appendix 3: Environmental Impact Assessment. Available at: <https://www.gov.wales/sites/default/files/publications/2019-07/developments-of-national-significance-guidance-environmental-impact-assessment.pdf>.

Questions

Questions for Consultees

Question 2.1: Are there other wind farm proposals or other developments that should be considered in the cumulative assessment?

Question 2.2: Do the consultees agree that the approach to the consideration of various standard good practice measures as 'pre-mitigation' is appropriate?

Question 2.3: Are there other national or local planning policies or guidance that are relevant to the assessment of potential significant environmental effects?

Chapter 3

Project Description

The Site and Surrounding Area

3.1 The Proposed Development is located approximately 3 km east of Builth Wells. The entirety of the Site lies within Powys (**Figure 1.1**).

3.2 The Site is located between the A481 (to the north of the Site boundary) and the B4567 (to the west of the Site boundary). The Site is not located within a Pre-Assessed Area for Wind Energy as defined by Future Wales.

3.3 The Site is located on high terrain, with the highest point being approximately 451 m Above Ordnance Datum (AOD). It is generally defined by Aberedw Hill which is a broad hill, with steep escarpments/slopes and valleys on all sides. The deepest valley is to the west of the Site is the River Wye Valley. The majority of the Site is made up of undulating upland which is managed as open moor common land, with a small number of access tracks and small areas of scrub woodland.

3.4 Bannau Brycheiniog National Park is located approximately 15 km south-east of the Site. The Shropshire Hills National Landscape is approximately 26 km to the north-east of the Site boundary. The Middle Wye Valley Registered Historic Landscape (RHL) is located approximately 10.5 km south-east of the Site, the Middle Usk Valley- Brecon and Llangorse RHL is located approximately 17 km south of the Site and the Elan Valley RHL is approximately 17 km north-west of the Site. There are no Nationally Designated Landscapes, Registered Historic Landscapes, or Local Landscape Designations within the Site boundary.

3.5 The River Wye Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) is located approximately 50 m west of the Site at its closest point to the Site boundary and approximately 750 m to the nearest infrastructure. Various watercourses within the Site drain into the SAC. The Upper Wye SSSI is also designated for the presence of Daubenton and Lesser Horsehoe Bats. Additionally, the Llandeilo, Rhulen and Llanbedr Hills SSSI is located approximately 1.5 km south of the Site. This is designated for ecological purposes mainly due to the presence of a range of moorland vegetation but also is an area of high ornithological interest.

3.6 Scheduled Monuments are present within and in the vicinity of the Site. These include but are not limited to Colwyn Castle, a medieval castle located to the north of the Site boundary, which was built

over the remains of a Roman Fort, and the Aberedw Hill Deserted Rural Settlement, located within the Site, which is from the medieval/post-medieval period. Around the vicinity of the Site there are isolated Grade II Listed Buildings (the majority are located to the north, south and west of the Site).

3.7 There are no long-distance, National Trails or National Cycle Network (NCN) routes within the Site. The closest Long-Distance Trail (the Wye Valley Walk) is approximately 1 km west of the Site. A variety of Public Rights of Way (PRoW) cross into and within the vicinity of the Site (**Figure 3.2**).

3.8 Around the Site there are areas of ancient woodland, with the majority being classed as ancient semi natural woodland. There are no areas of peatland located within the Site but there are small pockets to the north and north-west of the Site boundary.

3.9 The Site is surrounded by countryside with a few isolated settlements. Besides Builth Wells, other smaller settlements such as Hundred House (to the north of the Site), Cregina (to the east of the north-eastern edge of the Site) and Aberedw (to the south of the Site) are also located nearby. In addition, there are other roadside clusters and farmsteads, as well as more isolated properties on the surrounding hills and valley slopes.

Proposed Development Description

3.10 The Proposed Development will include the following components:

- 18 wind turbines, each with external transformers, wind turbine foundations, crane hardstanding and laydown/storage areas;
- An electrical substation and control building;
- Underground power cables linking the wind turbines and the onsite substation, laid in trenches alongside access tracks;
- New site access and onsite access tracks and watercourse crossings (if/where required);
- A steel tower anemometer mast(s) for monitoring wind speed and wind turbine performance;
- Borrow pit(s) (if required);
- Temporary construction and storage compounds; and
- Habitat management area(s).

Wind Turbines

3.11 The proposed wind turbines would be three bladed horizontal axis wind turbines. The wind turbine towers will be of tapering tubular steel construction, likely to be finished in a light grey semi-matt colour. This Scoping Report is based upon a maximum tip height for wind turbines of up to 200 m, although turbine specifications in other respects will be considered further through the EIA process. The worst-case candidate wind turbine can differ across the EIA disciplines (for example noise, ornithology, transport etc.). Therefore, different candidate wind turbines may be specified in the ES, where necessary, to inform assessments of effects. The worst-case parameters used for assessment within relevant topic areas will be clearly identified in the ES.

3.12 A transformer would be required for each wind turbine. Depending upon the type of wind turbine selected, the wind turbine's electrical transformers may be located within or adjacent to the wind turbines. For the purposes of the ES, it will be assumed that the transformers will be located adjacent to each wind turbine within the hardstanding areas rather than within the wind turbine, as this reflects a greater hardstanding requirement.

3.13 The wind turbines will be installed on foundations comprising of steel-reinforced concrete. The detailed design, sizing and specification for each foundation will depend on the final wind turbine type and the specific ground conditions encountered at each wind turbine location, which will be confirmed during pre-construction surveys.

3.14 Adjacent to each wind turbine, an area of hardstanding would be constructed for use as a crane pad. The exact geometry and position of the crane pads will depend on the wind turbine supplier's specifications, the crane selected for erection and the results of the detailed ground investigations, prior to construction. In accordance with the wind turbine specification, additional laydown and storage areas may be required adjacent to the crane hardstanding. The EIA will be based on maximum crane pad dimensions together with an appropriate micro-siting allowance.

3.15 **Figure 1.2** shows the proposed wind turbine layout and **Table 3.1** presents the corresponding wind turbine coordinates for this layout. This layout may be subject to change as part of the iterative EIA process.

Table 3.1: Wind Turbine Co-ordinates

Wind Turbine Number	X	Y
1	308846	250156
2	308401	250401
3	308150	308150
4	308814	251167
5	308325	251350
6	308430	251852
7	310065	250097
8	310130	250630
9	310053	251093
10	310100	251608
11	309624	251831
12	309090	252195
13	309749	252329
14	310439	252304
15	310766	251987
16	311099	252672
17	311488	252407
18	311519	251935

Control Building and Electrical Substation

3.16 The proposed wind turbines will produce electricity at typically up to 1,000 Volts. The electricity will then be transformed to 33,000 Volts (33kV) via a transformer which is for the purpose of the assessment presumed to be located immediately adjacent to the tower of each wind turbine, and subject to change as stated above. The transformers would be linked to an onsite substation via high voltage underground cables placed in trenches which would generally follow the route of the onsite tracks. In addition, the transformers would connect to the substation via underground cables across open ground with electrical marker posts used to identify their locations.

3.17 A control building would serve as an operational hub. Its compound would provide for services including waste storage and car parking. A substation would step up the electricity generated onsite to 132kV for connection to the distribution network.

3.18 The location of the onsite control building/substation is yet to be determined and would be influenced by several factors such as distribution network operator requirements, the location of the wind turbines, access during the operation of the Proposed Development and environmental constraints, all of which would be considered further throughout the iterative design of the Proposed Development and the EIA process.

Grid Connection

3.19 Connection from the onsite substation to the wider electricity network is likely to be at 132kV and involve either underground cables, an overhead line on wooden poles, or a combination of the two.

3.20 The ES will include an assessment of the proposed grid connection routeing options (to the extent known at the time of submission) within the cumulative assessment. An assessment of the likely significant effects associated with the grid connection routing options will be undertaken for each relevant topic within the ES.

3.21 It should be noted that the grid connection is not a part of the proposal for the Proposed Development and will be subject to a separate consent.

Access and Vehicle Movements

Construction Traffic Route

3.22 The size and weight of the wind turbine components and transformers require specialist lorries to carry them to the Site; some of these will be classed as abnormal loads. It is anticipated that abnormal load vehicles carrying wind turbine components will travel to the Site from the port of entry. The route from the port to Site is likely to be via the A44, but this will be identified as part of the EIA process and assessed accordingly within the ES and an abnormal load assessment will accompany the application.

Onsite Access Tracks and Cable Runs

3.23 The Proposed Development will include a new network of access tracks to enable construction and maintenance once operational. These tracks are anticipated to have a maximum running width of 5 m, widening at bends, as necessary.

3.24 It is anticipated that cabling connecting wind turbines, the control building and the substation will be laid in trenches running alongside the access tracks. These will be excavated to a maximum depth of 1 m and backfilled. The layout of the tracks will be determined by the final wind turbine positions and informed by consideration of relevant environmental receptors and effects, such as onsite ecology identified through the EIA process.

Anemometer Mast

3.25 Prior to the construction of the wind turbines, wind speed will be monitored on the Site with steel masts. A single mast will remain after construction for monitoring ongoing wind speed and wind turbine performance.

Borrow Pits

3.26 The stone required for the tracks, wind turbine bases and hardstandings for the operation of cranes will either be sourced from a suitable quarry, from onsite borrow pit(s), or a combination of both. Following surveys on the suitability of onsite material, a decision will be made on the most appropriate source of material which will then be assessed in the ES accordingly.

Temporary Construction Compound

3.27 Temporary construction compound(s) will be required at the Site, though precise locations are yet to be identified.

3.28 One of the temporary construction compounds would be located as close as possible to the Site entrance to manage access to the Site. A typical compound would be in the region of 100 m x 100 m and include staff facilities, dedicated storage and parking areas.

3.29 Any construction disturbance associated with the construction compounds will be managed/mitigated to ensure that any potential disruption will be reduced as much as reasonably practicable. Typically, surface soils would be stripped and stockpiled, and the surface then capped with geofabric and aggregate. Once construction is complete the stone would be lifted, geofabric removed and the surface soils re-spread, re-seeded/re-planted allowing the area to regenerate. Best practice soil handling techniques will be followed as will be agreed with Land Quality Advice Service (LQAS) of the Welsh Government.

Aviation Lighting

3.30 A wind farm with tip heights in excess of 150 m will need to be illuminated at the hub of selected wind turbines with medium intensity red aviation obstruction lighting. A lighting layout will be designed and agreed with the Civil Aviation Authority (CAA) which minimises the number of lit wind turbines whilst fulfilling flight safety requirements. An infra-red lighting layout to fulfil Ministry of Defence (MOD) requirements will also be designed and approval obtained from the MOD prior to construction.

Micrositing

3.31 Micrositing of the wind turbines and associated crane hardstandings is likely to be required with a proposed allowance of at least 50 m. Each chapter of the ES will consider the validity of the micrositing allowance relative to the topic area.

Operational Phase

3.32 Planning permission will be requested to allow for an operational period of up to 40 years. Maintenance work would involve visiting the Site on a weekly basis, to undertake scheduled maintenance and operational checks. Annual servicing would involve the undertaking of non-essential repairs on blades, gearboxes and generators.

Decommissioning Phase

3.33 At the end of the operational period, the Proposed Development will be decommissioned, and the infrastructure removed. Access tracks will either be left for use by the landowner or covered in topsoil. Alternatively, a new application may be made to extend its life or replace the wind turbines.

3.34 The ES will include high level information on the likely process that will be undertaken to decommission the Proposed Development at the end of its lifespan. However, it is not proposed to undertake a detailed assessment of the decommissioning effects associated with the Proposed Development as the future baseline conditions (environmental and other developments) cannot be predicted accurately at this stage; the detailed proposals for refurbishment/decommissioning are not currently known; and as decommissioning is in essence a reversal of the construction process, for a shorter period, the effects of decommissioning can in general be anticipated to be no greater than those arising from construction and which will be considered in the ES. An Outline Decommissioning Plan will be submitted with the application.

Questions

Questions for Consultees

Question 3.1: Confirmation is requested on the proposed approach to the assessment of decommissioning.

Chapter 4

Landscape and Visual Amenity

Introduction

4.1 This chapter presents the proposed scope of work for the assessment of likely significant effects of the Aberedw Energy Park upon landscape and visual amenity. It presents the scope of the Landscape and Visual Impact Assessment (LVIA) that will be undertaken for the Proposed Development.

4.2 The primary guidance for undertaking LVIAs is the Guidelines for Landscape and Visual Impact Assessment 3rd Edition (GLVIA3)¹¹. In accordance with GLVIA3, the landscape and visual effects of the Proposed Development will be considered separately, with the landscape assessment considering the effects of the Proposed Development on the constituent elements of the landscape and its character (including aesthetic or perceptual qualities) and the visual assessment considering the change to views and visual amenity as experienced by people.

4.3 The assessment will also cover effects on the residential visual amenity of nearby private properties through a Residential Visual Amenity Assessment (RVAA), which will form an appendix to the LVIA. The LVIA will focus on receptors which are likely to experience significant effects.

4.4 The 'Search Area' for the LVIA will initially cover a radius of up to 33 km from the outermost turbine of the Proposed Development, as shown on **Figure 4.1**. This area is based on the guidance from NRW¹² which suggests that the 'Search Area' for structures 176 m to 225 m tall should be 26 to 33 km. The NRW recommended study area is also shown on this Figure – this is up to 28km, in accordance with NRW's guidance for structures 176 m to 225 m tall. The assessment in the ES will identify all wind turbines within 33 km (see **Table 2.3**) and consider in the assessment all receptors likely to experience significant effects within the 28 km study area.

4.5 This chapter has been prepared by LUC.

¹¹ Landscape Institute and the Institute of Environmental Assessment (2013). Guidelines for Landscape and Visual Impact Assessment. 3rd Edition.

¹² Natural Resource Wales Guidance Note 46 'Using LANDMAP in Landscape and Visual Impact Assessments'

Existing Conditions

Information Sources

4.6 The following sources of information have been reviewed during the desk-based research for this Scoping Report and will be considered in the assessment in the ES:

- Natural Resources Wales (NRW) National Landscape Character Areas (NLCAs);
- NRW's LANDMAP maps and surveys (and associated guidance notes);
- Powys County Council Local Landscape Character Assessment¹³ and Bannau Brycheiniog National Park Authority's Landscape Character Assessment¹⁴;
- National landscape designations and associated management plans, including the adopted Brecon Beacons Management Plan¹⁵ and the emerging Bannau Brycheiniog Management Plan¹⁶;
- NRW's Dark Skies, Light Pollution and Visual Tranquillity in Wales mapping;
- NRW's Visible settings of Designated Landscapes and Key Views¹⁷; and
- Ordnance Survey Maps and readily available aerial photographs.

The Site and its Immediate Surroundings

4.7 The location of the Site and Proposed Development are shown in **Figure 1.1** and **Figure 1.2**. The Proposed Development is also shown on an aerial base in **Figure 4.2**.

4.8 A description of the Site and surroundings is provided in **Chapter 3**, and an overview of the Site and surroundings in relation to LVIA is presented in paragraphs 4.9 to 4.12 below.

4.9 The Site comprises the upland area of Aberedw Hill. This is a broad hill, edged by steep escarpments/slopes and valleys on all sides, particularly the northern and western flanks. The deepest and broadest of these valleys, to the west of the Site, is that of the River Wye, above which Aberedw Hill occupies a prominent position and forms a distinguishable landform feature when viewed from the valley. The valley of the River Edw, a tributary of the River Wye flowing south-west, is located to the east and south of the Site. Several smaller, incised valleys contain water courses that drain south from Aberedw Hill and feed into the River Edw. A triangulation point marks the summit of Aberedw Hill at 451 m Above

¹³ Powys County Council (2022). Local Landscape Character Assessment for the Powys Local Development Plan Area

¹⁴ Brecon Beacons National Park Authority (2012) Brecon Beacons National Park Landscape Character Assessment

¹⁵ A Management Plan for the Brecon Beacons National Park 2015-2020

¹⁶ Future Beacons: The Management Plan for the Bannau Brycheiniog National Park 2022-2027 (Consultation Draft)

¹⁷ https://landmap-portal.naturalresources.wales/visual_settings_and_key_views_list.php (accessed November 2023)

Ordnance Datum (AOD), but there are several outlying summits of Aberedw Hill to the north, east and south.

4.10 The majority of the Site is managed as open bracken moorland with acid dry heath/grassland and pasture and limited scrub woodland upon incised valley slopes. The Site is crossed by a small number of access tracks. In contrast, the adjacent valleys and containing slopes are areas of wooded pasture, transportation corridors and settlement. The landscape has a sense of relative remoteness from settlement, and experiences dark night skies as indicated by the Natural Resources Wales (NRW) map of Dark Skies and Light Pollution in Wales (see **Figure 4.11**).

4.11 The Site is almost entirely open access land (common land), providing public access along with several public rights of way (PRoWs) which cross it.

4.12 A list of wind farms within a 33 km search area is presented in **Table 2.3** and presented on **Figure 2.1**. The nearest existing wind farm to the Site is Hendy wind farm, located 7.2 km north-east of the Site.

Landscape Character

National Landscape Character Areas (NLCAs) and National Character Areas (NCAs)

4.13 A series of NLCAs have been published by NRW which form a broad landscape character assessment across Wales. Most of the Site (and all of the proposed wind turbines) are located within **NLCA 20: Bryniau Sir Faesyfed / Radnorshire Hills**. This NLCA is described as ‘an area of gentle, smooth, upland hills’¹⁸. The summary description continues:

‘Radnorshire’s topography is breathtaking and varied, with smooth, rolling, open moors, dissected by steep sided valleys with hedgerow-enclosed pastures by small rivers and streams, and ancient woodlands. Unfenced moorland roads reinforce the sense of openness and being away from the confines and pressures of other, more urbanised landscapes. The varying topography straddles the upland-lowland divide in many places, giving rise to marginal agriculture.

Radnorshire, the old county name that included this area, historically had the lowest population of any of the Welsh counties. Offa’s Dyke runs through part of the area and there are a mix of English and Welsh influences to the east in this Marches landscape. It is a very rural, and in the main it is a quiet area, away from the focus of tourism, despite promotion as ‘Kilvert Country’.

4.14 The key characteristics, as stated in the profile of NLCA 20, are:

¹⁸ Natural Resources Wales (2014). National Landscape Character, Radnorshire Hills.

- **‘Smooth rounded moorland hills and glacially modified valleys** – Bedrock geology is that of Silurian rock, including sandstones, shales, and mudstones.
- **An undulating upland landscape** – with sinuous skylines and distant views from moor to moor.
- **Extensive sheep and cattle rearing.**
- **Minor river valleys** – such as the Ithon and Marteg, dissect the area. A lateral network of minor tributaries drains the hillsides.
- **Enclosed pasture in the valleys and lower hillsides** – with seasonally wet, deep peat soils and loams.
- **Heather dominated moorland** – occurs in the most elevated parts of the area, some recognised for red grouse.
- **A network of geometric fields of small to large scale** – defined by mixed native hedgerows interspersed with broadleaf woodland. Few extensive blocks of coniferous forestry.
- **Shelter belts** – in exposed upland and hillside locations in a few locations, at times incongruous in location and geometric shape, often coniferous.
- **Offa’s Dyke** – illustrates the historic, strategic importance of this Marches landscape. Other historic elements included remnants of Medieval and post Medieval settlement, including motte and bailey castles, earthworks and moated sites.
- **Very little settlement, which is confined to the lower valleys** – the pattern is defined by compact linear villages, together with a small number of larger nucleated, valley towns at river crossing points. A comparatively low population in this former county.’

4.15 The Site displays several of the key characteristics of the NLCA, notably the undulating upland landscape of smooth rounded moorland hills, glacially modified valleys, heather dominated moorland, pasture on valley slopes, and settlement confined to valleys.

4.16 The south-western part of the Site comprises a steep valley slope of the River Wye and forms part of **NLCA 29: Dyffrynnoedd Gwy ac Wysg / Wye and Usk Vales.**

4.17 There are several other NLCAs located within the 28 km study area, as shown in **Figure 4.3**, including:

- NLCA 21: Bryniau'r Canolbarth / Cambrian Mountains
- NLCA 26: Blaenau Gwy / Upper Wye Valley;

- NLCA 27: Dyffrynnoedd Irfon ac Ieithon / The Vales of Irfon and Ithon;
- NLCA 28: Epynt; and
- NLCA 30: Bannau Brycheiniog a'r Mynyddoedd Du / Bannau Brycheiniog (Brecon Beacons) and Black Mountains

4.18 There are also NCAs (published by Natural England) within the 28 km study area, shown in **Figure 4.3**, including:

- NCA 58: Clun and North West Herefordshire Hills;
- NCA 59: Herefordshire Lowlands; and
- NCA 60: Black Mountains and Golden Valley.

Local Landscape Character

4.19 Published in 2022, a Landscape Character Assessment was prepared for the Powys Local Development Plan (LDP) area, excluding the area within the Bannau Brycheiniog National Park. A total of 61 landscape character areas (LCAs) were derived with the baseline information informed by existing LANDMAP assessments.

4.20 Most of the Site (and all of the proposed wind turbines) lie within **LCA 50: Aberedw Uplands** (see **Figure 4.4**), characterised by the '*distinctive open upland landscape, situated in the south-east of the Powys Local Development Plan (LDP) area*'. The key characteristics of this LCA are:

- *'A series of upland hills, plateaus and ridges with a smooth and rounded profile, incised by upland brooks.*
- *At its lowest point where the LCA meets the Wye Valley, the elevation is around 200 m AOD, whereas the upland hills frequently exceed 400 m AOD in elevation, with the tallest, Gwaunceste Hill reaching 542 m AOD.*
- *The upland area is dominated by late Silurian siltstones and sandstones. These rocks have a general dip to the south-east and are often dissected by glacial and river valleys.*
- *The landscape contains several distinctive rock outcrops including Aberedw Rocks in the south-west of the LCA. There is a clear historic relationship to quarrying in the LCA, with frequent disused quarries present on the lower slopes.*

- *An area largely devoid of woodland, with a small number of broadleaved shelterbelts scattered across the landscape as well as small, isolated conifer blocks. Woodland is more common in the north of the area near New Radnor.*
- *Some of the broadleaved woodlands within the landscape are of ancient semi-natural origin. Part of Coed Aberedw SSSI designated woodland is in the west of the LCA.*
- *The majority of this landscape comprises unenclosed, sheep-grazed, common land running along the upland ridges.*
- *In the north of the area, there is a greater presence of improved pasture fields, these tend to be large in scale and enclosed by post and wire fencing.*
- *Expansive areas of dry heathland heather moorland are found at Glaschwmm and Gladestry Hills SSSI, comprising an upland area in the east of the LCA. The area also supports upland bird populations of conservation interest, with a notably large red grouse population.*
- *Llandeilo, Rhulen and Llanbedr Hills SSSI is an expansive area of sub-montane upland situated in the south-west of the character area, of ecological interest for its unusual moorland vegetation types.*
- *Important non-designated habitats include areas of dry heathland, acid grassland and numerous upland mawn pools which support species of national interest.*
- *Early activity of likely Bronze Age origin within this area is reflected in the numerous funerary and ritual monuments including round and long barrows, cairns, a number of stone circles and standing stones (all designated as Scheduled Monuments).*
- *Part of the Cross Ridge Dyke Scheduled Monument crosses this area, interpreted to be an indicator of past territorial boundaries and likely to have been built in the Bronze or Iron Age. Wern Camp Hillfort is also identified as a Scheduled Monument of likely Iron Age origin.*
- *Medieval and late medieval features include the remains of three deserted rural medieval settlements, two platform houses and Crug Eryr Mound and Bailey Castle (designated as Scheduled Monuments).*
- *Post medieval to modern features designated as Scheduled Monuments include platform houses, an enclosed long hut and a deserted rural settlement.*
- *Settlement is limited to the church settlement of Llanfihangel-nant-Melan and a small number of isolated farmsteads on the lower reaches of the area.*

- *Buildings are mixed with vernacular materials including stone, painted stone and rendered buildings, usually nestled within lower-lying parts of the landscape.*
- *Very few roads cross this uplands area, with vast swathes only publicly accessible on foot. Where roads do occur they usually compromise minor lanes without boundary features crossing commons.*
- *The area is traversed by Public Rights of Way (PRoW) and a small part of National Cycle Route (NCN) Route 825 crosses the landscape near Glascwm.*
- *The majority of the landscape is open access land with only small areas on the lower slopes and in the north overlain with enclosed improved grazing.*
- *The area has a strong visual relationship with the Aberedw Valley which it encircles, as well providing dramatic and long-reaching views over the adjacent lower lying areas of the Painscastle Uplands to the south and the Wye Valley to the west.*
- *Dramatic views to neighbouring elevated areas including the distinctive Painscastle Uplands LCA to the south-east, Radnor Forest LCA to the north and more distant views to summits within the Brecon Beacons National Park to the south-west.*
- *The area has a distinctly rural and exposed character with a sense of wildness.'*

4.21 Effects on the landscape character of the Powys LCAs within 10 km of the proposed wind turbines will be assessed in the LVIA in the ES.

LANDMAP

4.22 Published by NRW, LANDMAP provides an all-Wales landscape resource where landscape characteristics, qualities and influences are recorded and evaluated. LANDMAP data was used as the basis for the identification of LCA boundaries as part of the Brecon Beacons Landscape Character Assessment, informed by the geographic extents of the Visual and Sensory aspect layer. This approach was also followed for the development of the Powys Landscape Character Assessment with boundaries being further refined with field work.

4.23 Although LANDMAP information has already been used to inform published landscape character assessments for Powys and the Bannau Brycheiniog National Park, descriptive and evaluative LANDMAP information will be used in the assessment presented in the ES to supplement the published landscape character information.

4.24 **Figures 4.6- 4.10** show the LANDMAP aspect areas within 10 km from the outermost wind turbine of the Proposed Development.

Landscape Designations

National Landscape Designations

4.25 Nationally designated landscapes are shown in **Figure 4.1**. The nearest part of the Bannau Brycheiniog National Park is situated approximately 14 km from the outermost wind turbine of the Proposed Development. Special qualities of the nationally important landscape are highlighted within the emerging Bannau Brycheiniog Management Plan (Consultation Draft) and those relevant to this assessment are as follows:

- *'A National Park offering peace and tranquillity with opportunities for quiet enjoyment, inspiration, relaxation and spiritual renewal.*
- *The Park's sweeping grandeur and outstanding natural beauty observed across a variety of harmoniously connected landscapes, ... and prominent hilltops with extensive views in all directions.*
- *A working, living 'patchwork' of contrasting patterns, colours and textures comprising well-maintained farmed landscapes, open uplands, lakes and meandering rivers, punctuated by small-scale woodlands, country lanes, hedgerows and stone walls and scattered settlements.*
- *Enjoyable and accessible countryside with extensive, widespread and varied opportunities to pursue walking, cycling, fishing, water-based activities and other forms of sustainable recreation or relaxation.*
- *A National Park offering dark night time skies, peace and tranquillity with opportunities for quiet enjoyment, inspiration, relaxation and spiritual renewal.'*

4.26 The National Park is also designated as an International Dark Sky Reserve. **Figure 4.11** shows dark skies information across the 28 km study area.

4.27 The Brecon Beacons National Park Landscape Character Assessment also includes information about the special qualities of the National Park and this would be used to inform the assessment of effects on special qualities. The landscape of the National Park is classified into five broad Landscape Character Types (LCTs) and further subdivided into 15 LCAs, six of which fall within the 28 km study area (see **Figure 4.5**) as follows:

- LCA 5: Western Usk Tributaries;
- LCA 6: Middle Usk Valleys;
- LCA 7: Central Beacons;

- LCA 11: Eastern Usk Valley;
- LCA 13: The Black Mountains; and
- LCA 14: Wye Valley Foothills.

4.28 The Shropshire Hills National Landscape occupies land at the north-eastern edge of the 28 km study area (see **Figure 4.1**), approximately 26 km from the outermost wind turbine of the Proposed Development. However, it is not being considered further as there will be no visibility of the Proposed Development from the part of the Shropshire Hills National Landscape that falls within the 28 km study area, as indicated by the Zone of Theoretical Visibility (ZTV) in **Figure 4.12**.

Local Landscape Designations

4.29 Powys County Council used to designate Special Landscape Areas (SLAs)¹⁹ but now recommends the use of LANDMAP to identify valued characteristics and qualities of the Powys landscape. The Landscape Supplementary Planning Guidance²⁰ recommends analysing the survey reports undertaken for each LANDMAP aspect area and these survey reports will inform the judgement concerning landscape value as part of the landscape assessment.

4.30 Within the 28 km study area only a very small part of the North Eastern Upland SLA in Carmarthenshire occurs at the south-western edge of the study area. At this distance, there will be no significant effects on this landscape and so will be scoped out of the LVIA.

4.31 There are no local landscape designations in the Herefordshire Adopted Core Strategy²¹ or the Shropshire Adopted Core Strategy²².

Registered Historic Landscapes

4.32 Registered historic landscapes are shown on **Figure 7.2** and effects on these landscapes will be addressed within the Cultural Heritage assessment (see **Chapter 7**).

Visual Receptors

4.33 Visual receptors are the people who would be affected by changes in views, and they are usually grouped by what they are doing at those places, for example:

¹⁹ Special Landscape Areas (SLAs) are a non-statutory designation which are generated by local planning authorities to enable landscapes that are unique, exceptional, or distinctive in the local authority context to be defined

²⁰ Powys County Council (Adopted 2019) Supplementary Planning Guidance: Landscape

²¹ Herefordshire Council (Adopted 2015) Core Strategy 2011-2031

²² Shropshire Council (Adopted 2011) Shropshire Local Development Framework: Adopted Core Strategy

- people within settlements (local communities) surrounding the Site;
- people travelling on roads and railways around and through the Site;
- people using open access land, walking routes and cycle routes in and around the Site for recreational purposes;
- people visiting particular attractions, promoted viewpoints (such as those depicted with a blue viewpoint symbol on the 1:50,000 OS map base) or popular hill summits; and
- people visiting and using the Bannau Brycheiniog National Park for recreational purposes.

4.34 The wind turbines would have the most widespread visual impact, but ancillary features (including tracks between wind turbines) could also affect views and will be assessed in the ES.

4.35 **Figures 4.12 and 4.13** indicate the ZTV for the Proposed Development with a maximum turbine blade tip height of 200 m. **Figures 4.14 and 4.15** show the ZTV for the turbines with a maximum hub height of 122.5 m. These show theoretical visibility of the proposed turbines from areas of high ground in the Radnorshire Hills, Cambrian Mountains, the Epynt Plateau, and Black Mountains (with more limited visibility from the Clun and North West Herefordshire Hills).

4.36 There will also be theoretical visibility of turbines from the Wye and Usk Vales, the Upper Wye Valley, the Vales of Irfon and Ithon and the Herefordshire Lowlands.

4.37 The ZTVs indicate theoretical visibility from the Bannau Brycheiniog National Park, located approximately 14 km south from the southernmost wind turbine of the Proposed Development at its nearest point, affecting the north-facing slopes of the Black Mountains and Fforest Fawr,

People within Settlements (Local Communities)

4.38 Settlements in the study area are typically located in the valleys. The LVIA will consider visual effects on the following settlements (that fall wholly or partially within the ZTV of the wind turbines):

- Llansantffraed-in-Elwel;
- Hundred House;
- Frank's Bridge;
- Cregrina;
- Builth Wells;
- Llanelwedd.

- Cilmeri;
- Caerwnon Park;
- Newbridge-on-Wye;
- Llandrindod Wells; and
- Llanyre.

4.39 Aberedw, Crossgates, Llandegley, Llanfihangel Rhydithon, New Radnor, Gladestry, Newchurch, Rhos-goch, Painscastle, Clyro, Hay-on-Wye, Llowes, Llanigon, Glasbury, Ffynnon Gynydd, Erwood, Gwenddwr and Llangammarch Wells are not in the ZTV and so will be scoped out of the LVIA. In addition, although the ZTV indicates theoretical visibility from some parts of Fron, Penybont, Glaswm, Boughrood, Alltmawr, Garth and Builth Road, the limited extent of the Proposed Development likely to be visible combined with the layout of the settlements and presence of screening means wind turbines are extremely unlikely to significantly affect the visual amenity of these local communities, and therefore they are also scoped out.

People Travelling on Roads and Railways

4.40 The assessment in the ES will consider the effects on sequential views experienced by road users on the key roads where theoretical visibility is indicated. Many of the roads follow valleys where visibility is less, but the following roads will be assessed as they fall within the ZTV:

- A481;
- A44;
- A470;
- A483; and
- A4081.

4.41 Consideration will also be given to the pattern of visibility and how this will affect views from minor roads. An assessment of views from the B4567 and B4520 will be undertaken.

4.42 The Heart of Wales Railway Line passes through Garth, Cilmeri, Builth Road, Llandrindod Wells and Penybont. However, the railway line is in a cutting and contained by mature vegetation along the length of this route which means turbines are extremely unlikely to be visible, and therefore this receptor will be scoped out of the LVIA.

People Using Open Access Land, PRowS, Promoted Walking Routes and Cycle Routes

4.43 The assessment will consider the visibility of turbines from:

- open access land that falls within the ZTV, including:
 - Perthi Common;
 - Hundred House Common;
 - Little Hill;
 - Glaschw Hill;
 - Red Hill;
 - Rhulen Hill;
 - Llandeilo Hill;
 - Banc y Celyn and Carneddau;
 - Gilwern Hill;
 - Llanfihangel/ Colva Hill;
 - The Begwns Roundabout National Trust open access land;
 - Moelfre; and
 - Llandegley Rocks.
- Local PRowS - these will be considered and those that will experience visual effects will be identified and assessed in the LVIA;
- The following promoted routes:
 - the Wye Valley Walk (a long-distance footpath);
 - the Elan Valley Way (a long-distance footpath);
 - The Heart of Wales Line Trail (a long-distance footpath); and
 - National Cycle Network Routes 8 and 825.

4.44 Note that the Offa's Dyke Path (a National Trail) is mostly outside of the ZTV for the turbines. There are short sections of the route that fall within the ZTV (at Disgwylfa Hill and Hergest Ridge) but views will be limited to the very tips of the proposed wind turbines, seen at distances of 11 km and 14 km. Given

this context, effects on the visual amenity experienced by recreational users of the national trail are unlikely to be significant, so will be scoped out of the LVIA.

People Visiting Attractions and Promoted Viewpoints

4.45 The assessment will also consider effects on people visiting areas of interest, such as heritage features, and promoted viewpoints (such as those depicted with a blue viewpoint symbol on the 1:50,000 OS map base). These will be:

- the Royal Welsh Showground;
- Builth Castle;
- Fforest Fields, Mid Wales Caravan & Camping Site;
- Bryn-crach Caravan and Camping Site; and
- Promoted viewpoint south of Cwm Graig-ddu.

4.46 Although the ZTV indicates theoretical visibility from Cefnlllys Castle, views would be limited to the very tips of the proposed wind turbines, seen at a distance of 9 km. At this distance, effects on the visual amenity experienced by visitors to the castle are unlikely to be significant, so will be scoped out of the LVIA.

People Visiting the Bannau Brycheiniog National Park

4.47 The assessment will also consider effects on people visiting hill summits in the Bannau Brycheiniog National Park (up to 28 km), including at Hay Bluff and Twyn y Gaer.

Assessment Viewpoints

4.48 Assessment viewpoints that provide a representation of the range of receptors who will experience changes to views, including views from settlements, points of interest and sequential views along routes are set out below in **Table 4.1**. The viewpoints are all publicly accessible and have been chosen to cover the following:

- locations selected to represent the experience of different types of receptors;
- locations at different distances to provide a representative range of viewing angles and distances (i.e. short, medium and long distance views);
- locations which represent a range of viewing experiences (i.e. static views and points along routes);

- specific viewpoints selected because they represent promoted views or viewpoints within the landscape; and
- illustrative viewpoints chosen specifically to demonstrate a particular visual effect or specific issue (which could include restricted visibility in particular locations).

4.49 The proposed assessment viewpoint locations are set out below in **Table 4.1** and are mapped on **Figures 4.12 to 4.15**. Potential visual receptors of the Proposed Development, and which viewpoints these are represented by, are shown in **Table 4.2**. Where no specific viewpoint exists, wirelines will be used to indicate the extent of potential visibility.

Table 4.1: Provisional LVIA Viewpoint Locations

VP no.	Viewpoint Location	X	Y	Approximate Distance from nearest wind turbine (km)	Receptor / Reason for Selection
1	St. David's Church, Cregrina	312340	252117	0.8	Represents views experienced by the local community at Cregrina.
2	A481 at Hundred House	311275	254460	1.8	Represents views experienced by the local community at Hundred House, road users of the A481, recreational users of NCN 825, Hundred House Common and PRowS to the north-east, and visitors to Brynchrach Caravan and Camping Site.
3	NCN 825 near Cregrina	313425	252198	1.9	Represents views experienced by recreational users of NCN 825 and PRowS to the east.
4	Perthi Common	309493	254586	2.3	Represents views experienced by the local community at

VP no.	Viewpoint Location	X	Y	Approximate Distance from nearest wind turbine (km)	Receptor / Reason for Selection
					Llansantffraed-in-Elwel and recreational users of Perthi Common and PRoWs to the north.
5	Wye Bridge, Builth Wells	304226	251236	4.0	Represents views experienced by the local communities at Builth Wells and Llanelwedd, road users of the A470 and A483, recreational users of NCN 8 and the Wye Valley Walk) and visitors to the Royal Welsh Showground and Builth Castle.
6	Wye Valley Walk near Banc y Celyn	305975	246198	4.8	Represents views experienced by recreational users of the Wye Valley Walk, PRoWs to the south-west and open access land at Banc y Celyn.
7	Gilwern Hills Common Land	307908	256764	4.8	Represents views experienced by recreational users of open access land at Gilwern Hills and PRoWs to the north-west.
8	NCN 8 near Cilmeri	301786	252384	6.6	Represents views experienced by the local communities at Cilmeri and Caerwnon Park and recreational users of NCN 8 and PRoWs to the west.

VP no.	Viewpoint Location	X	Y	Approximate Distance from nearest wind turbine (km)	Receptor / Reason for Selection
9	The Begwns Roundabout	315477	244378	7.9	Represents views experienced by recreational users of open access land at The Begwns and PRoWs to the south-east.
10	Bridleway off A44 near Castell Crugerydd	315875	259359	8.2	Represents views experienced by road users of the A44 and recreational users of PRoWs to the north-east.
11	Heart of Wales Line Trail at Moelfre	299909	248720	8.5	Represents views experienced by recreational users of the Heart of Wales Line Trail, open access land at Moelfre and PRoWs to the west.
12	Llandegley Rocks	313118	261802	9.4	Represents views experienced by recreational users of the open access land at Llandegley Rocks and PRoWs to the north-east.
13	A4081 at Llanyre	304475	262305	11.1	Represents views experienced by the local community at Llanyre and road users of the A4081.
14	Promoted viewpoint south of Cwm Graig-ddu	296264	246769	12.5	Represents views experienced by visitors to the promoted viewpoint and recreational users of PRoWs to the south-west.

VP no.	Viewpoint Location	X	Y	Approximate Distance from nearest wind turbine (km)	Receptor / Reason for Selection
15	Elan Valley Way near Cwmwrach	312125	267075	14.4	Represents views experienced by recreational users of the Elan Valley Way and PRoWs to the north.
16	Path to Hay Bluff, Bannau Brycheiniog National Park	324319	236824	19.5	Represents views experienced by visitors to the Bannau Brycheiniog National Park. This viewpoint is the equivalent of key view 'BB25' in the Bannau Brycheiniog National Park's Visible settings and Key Views dataset.
17	Twyn y Gaer	298981	228072	24.2	Represents views experienced by visitors to the Bannau Brycheiniog National Park. This viewpoint is the equivalent of key view 'BB14' in the Bannau Brycheiniog National Park's Visible settings and Key Views dataset.

Table 4.2: Relationship between visual receptors and representative viewpoints

Visual Receptor Group	Visual Receptor	Representative Viewpoint(s)
Local Communities		
Local Communities	Llansantffraed-in-Elwel	VP4 Perthi Common is close by and is representative.
	Hundred House	VP2 A481 at Hundred House
	Frank's Bridge	No specific viewpoint proposed (due to lack of opportunities for clear views from the settlement) - wirelines/ models will be used to assess effect on receptor
	Cregrina	VP1 St. David's Church, Cregrina
	Builth Wells	VP5 Wye Bridge, Builth Wells
	Llanelwedd	VP5 Wye Bridge, Builth Wells is close by and is representative
	Cilmery	VP8 NCN 8 near Cilmery can be used as a proxy (the view from NCN 8 is clearer than from Cilmery)
	Caerwnon Park	VP8 NCN 8 near Cilmery can be used as a proxy.
	Newbridge-on-Wye	No specific viewpoint proposed (due to lack of opportunities for clear views from the settlement) - wirelines/ models can be used to assess effect on receptor

Visual Receptor Group	Visual Receptor	Representative Viewpoint(s)
	Llandrindod Wells	VP12 A4081 at Llanyre can be used as a proxy (the view from Llanyre is clearer than from Llandrindod Wells)
	Llanyre	VP12 A4081 at Llanyre
Road users		
Road users on main roads	A481	VP2 A481 at Hundred House
	A44	VP10 Bridleway off A44 near Castell Crugerydd
	A470	VP5 Wye Bridge, Builth Wells is close by and is representative.
	A483	VP5 Wye Bridge, Builth Wells
	A4081	VP13 A4081 at Llanyre
Road users of minor roads	B4567	No specific viewpoint proposed – wirelines/ models can be used to assess effect on sequential views
	B4520	No specific viewpoint proposed – wirelines/ models can be used to assess effect on sequential views
Recreational users		
Users of Open Access Land	Open access land including the summits at Perthi Common, Hundred House Common, Little Hill, Glascwm Hill, Red Hill, Rhulen Hill, Llandeilo Hill, Banc y Celyn and Carneddau,	VP2 A481 at Hundred House is close to Hundred House Common and representative VP4 Perthi Common

Visual Receptor Group	Visual Receptor	Representative Viewpoint(s)
	Gilwern Hill, Llanfihangel/ Colva Hill, The Begwns Roundabout National Trust open access land, Moelfre and Llandegley Rocks)	VP6 Wye Valley Walk near Banc y Celyn VP7 Gilwern Hills Common Land VP 9 The Begwns Roundabout VP11 Heart of Wales Line Trail at Moelfre VP12 Llandegley Rocks VP15 Elan Valley Way near Cwmwrach
Local PRowS	Local PRowS that fall within the ZTV will be considered in the assessment and those that will experience visual effects will be identified.	VP2 A481 at Hundred House (representing PRowS to the north-east) VP3 NCN 825 near Cregrina (representing PRowS to the east) VP4 Perthi Common (representing PRowS to the north) VP6 Wye Valley Walk near Banc y Celyn (representing PRowS to the south-west) VP7 Gilwern Hills Common Land (representing PRowS to the north-west) VP8 NCN 8 near Cilmeri (representing PRowS to the west) VP 9 The Begwns Roundabout (representing PRowS to the south-east) VP10 Bridleway off A44 near Castell Crugerydd (representing PRowS to the north-east)

Visual Receptor Group	Visual Receptor	Representative Viewpoint(s)
		VP11 Heart of Wales Line Trail at Moelfre (representing PRowS to the west) VP12 Llandegley Rocks (representing PRowS to the north-west) VP14 Promoted viewpoint south of Cwm Graig-ddu (representing PRowS to the south-west) VP15 Elan Valley Way near Cwmwrach (representing PRowS to the north)
Promoted Walking Routes and Cycle Routes	Wye Valley Walk	VP5 Wye Bridge, Builth Wells VP6 Wye Valley Walk near Banc y Celyn
	Elan Valley Way	VP15 Elan Valley Way near Cwmwrach
	Heart of Wales Line Trail	VP11 Heart of Wales Line Trail at Moelfre
	National Cycle Network Route 8	VP8 NCN 8 near Cilmeri
	National Cycle Network Route 825	VP3 NCN 825 near Cregina
Visitor Attractions		
Visitors to attractions	Royal Welsh Showground	VP5 Wye Bridge, Builth Wells is close by and is representative
	Builth Castle	VP5 Wye Bridge, Builth Wells is close by and is representative

Visual Receptor Group	Visual Receptor	Representative Viewpoint(s)
	Fforest Fields, Mid Wales Caravan & Camping Site	No specific viewpoint proposed – wirelines/ models will be used to assess effect on views
	Bryncrach Caravan and Camping Site	VP2 A481 at Hundred House is close by and is representative
	Promoted viewpoint south of Cwm Graig-ddu	VP14 Promoted viewpoint south of Cwm Graig-ddu
Visitor to the Bannau Brycheiniog National Park		
Visitors to Hill Summits in the Bannau Brycheiniog National Park (up to 28 km)	Visitors to hill summits in the Bannau Brycheiniog National Park	VP16 Path to Hay Bluff, Bannau Brycheiniog National Park VP17 Twyn y Gaer

Residential Receptors

4.50 There are 26 residential properties contained in the OS residential property data within 1 km of the wind turbines and another 126 within 1-2 km of the turbines, as shown in **Figure 4.16**. Those closest to the wind turbines are typically 0.6 to 0.8km. Other residential receptors within 2 km comprise scattered properties in all directions from the Site and clusters of properties within small settlements such as Llansantffraed-in-Elwel, Hundred House, Frank's Bridge and Cregrina, roadside clusters and farmsteads, as well as more isolated properties on nearby hill slopes. The outlook from properties varies, owing to their individual orientation, adjacent landform and intervening features (such as vegetation).

Proposed Surveys and Assessment Methodology

Legislation, Policy and Guidance

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

Legislation

4.52 Nationally important landscapes (such as the Bannau Brycheiniog National Park) have protection through the law under the National Parks and Access to the Countryside Act 1949 and the CROW Act 2000.

4.53 The European Landscape Convention (ELC)²³, although not legislation, is a Convention of the Council of Europe and a treaty between states that seeks to influence governments. It sets out the importance of protecting, managing and planning Europe's landscapes for their future prosperity. The UK Government became a signatory to the ELC in 2006.

4.54 The ELC advocates the importance of landscapes, not just for their visual quality but the range of ecosystem services they provide both culturally, socially and environmentally. The ELC defines landscape as *'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.'* Wales' LANDMAP Information System was developed as a direct response to the ELC, providing an integrated resource across Wales where landscape character, qualities and influences can be recorded and evaluated.

Policy

4.55 The following policy documents will be reviewed as part of the LVIA:

- Future Wales: The National Plan 2040 (2021);
- Planning Policy Wales Edition 11 (PPW) including recent updates to Chapter 6 - or its update;
- Powys Local Development Plan (2011-2026);
- Powys Supplementary Planning Guidance: Landscape; and
- Powys Supplementary Planning Guidance: Renewable Energy.

Guidance

4.56 The following guidance documents will inform the design and assessment of the Proposed Development:

- The current Design Commission for Wales (2014) Designing Wind Farms in Wales and the emerging Design Commission for Wales (2023) Designing for Renewable Energy in Wales (Consultation Draft);

²³ Council of Europe (2000) European Landscape Convention - European Treaty Series - No. 176

- Landscape Institute and the Institute of Environmental Assessment (2013) Guidelines for Landscape and Visual Impact Assessment. 3rd Edition;
- Landscape Institute (2019) Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19;
- Landscape Institute (2019) Visual Representation of Development Proposals Technical Guidance Note 06/19;
- Natural Resources Wales (updated March 2023) Using LANDMAP in Landscape and Visual Impact Assessments GN46;
- NatureScot (2021) Assessing the cumulative landscape and visual impact of onshore wind energy developments;
- The Planning Inspectorate (2019) Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects;
- Scottish Natural Heritage (2017) Siting and Designing Windfarms in the Landscape. Version 3a; and
- Scottish Natural Heritage (2017) Visual Representation of Wind Farms Guidance. Version 2.2.

Proposed Study Area

4.57 It is proposed that the study area for effects on landscape character is 10 km from the outermost turbines and the study area for effects on the special qualities of nationally designated landscapes is 28 km. The study area for effects on visual receptors is 28 km.

Proposed Desk Study

4.58 Baseline studies will be undertaken, supported by GIS mapping and 3D visualisation tools including Google Earth Pro and Resoft Windfarm.

Proposed Field Surveys

4.59 Field survey work has already started and will continue to be undertaken to gather information about existing character of the landscape, to visit receptors and to record views from representative viewpoints.

LVIA Assessment Methodology

4.60 The assessment in the ES will determine the significance of landscape and visual effects with reference to the nature of the receptor, which is commonly referred to as the sensitivity of the receptor, and the nature of the effect, which is commonly referred to as magnitude.

Landscape Sensitivity

4.61 The sensitivity of a landscape receptor to change will combine professional judgements on susceptibility and value, using the principles set out in **Table 4.3**.

Table 4.3: The principle of judging landscape sensitivity

	Higher	↔	Lower
Susceptibility	The landscape is less able to accommodate wind energy development without undue negative consequences to the baseline situation. Attributes that make up the character of the landscape offer very limited opportunities for the accommodation of change without key characteristics being fundamentally altered by wind energy development, leading to a different landscape character.	↔	The landscape is more able to accommodate wind energy development without undue negative consequences to the baseline situation. Attributes that make up the character of the landscape are more resilient to being changed by wind energy development.
Value	Landscapes with higher scenic quality, conservation interests, recreational value, cultural associations or rarity or uniqueness. Areas designated at a national level e.g. National Parks or National Landscapes with national policy level protection. LANDMAP aspect areas with higher overall evaluation scores.	↔	Landscapes of limited aesthetic qualities, low conservation interest, little recreational value, few cultural associations or of character that is frequent/ widespread. Areas or features that are not formally designated. LANDMAP aspect areas with lower overall evaluation scores.

Landscape Susceptibility

4.62 Susceptibility means ‘the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue

consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies' (GLVIA3 paragraph 5.40).

4.63 For wind energy development, a series of criteria are used to evaluate susceptibility of landscape character types or areas to wind energy development as set out in **Table 4.4**. These criteria are drawn from a range of published sources relating to wind farm development, including Siting and Designing Windfarms in the Landscape (SNH, 2017) and GLVIA3.

Table 4.4: Criteria to determine susceptibility to wind energy development

Characteristic/Attribute	Aspects Indicating Lower Susceptibility to Wind Energy Development	↔	Aspects Indicating Higher Susceptibility to Wind Energy Development
Scale	Large scale.	↔	Small scale.
Landform	Absence of strong topographical variety, featureless, convex or flat.	↔	Presence of strong topographical variety or distinctive landform features.
Land Cover and Landscape Pattern/Complexity	Simple. Regular or uniform.	↔	Complex. Rugged and irregular.
Historic Landscape/Time Depth	Absence of time depth and historic features.	↔	Presence of historic landscapes with great time depth with a high density of historic landscape features.
Settlement and Manmade Influences	Presence of contemporary structures e.g. utility, infrastructure or industrial elements.	↔	Absence of modern development. Presence of small scale, historic or vernacular settlement.

Characteristic/Attribute	Aspects Indicating Lower Susceptibility to Wind Energy Development	↔	Aspects Indicating Higher Susceptibility to Wind Energy Development
Skylines	Non-prominent/screened skylines or skylines that are less important in views. Presence of existing modern man-made features.	↔	Distinctive, undeveloped skylines. Skylines that are highly visible over large areas or exert a large influence on landscape character. Skylines with important historic landmarks.
Visibility from Adjacent Landscapes	Little visibility from adjacent designated landscape or promoted viewpoints.	↔	Visible from nationally designated landscapes. Forms an important part of a view from promoted viewpoints.
Perceptual Aspects	Presence of visible or audible signs of human activity and development. Lacking in naturalness. Threatening; unattractive; noisy. High levels of light pollution/doesn't experience dark skies.	↔	Remote from visible or audible signs of human activity and development. High levels of naturalness evident. Particularly tranquil; wild; spiritual; attractive; peaceful. Low levels of light pollution/experiences dark skies.

4.64 Information contained within the landscape character assessment and in LANDMAP will be used, alongside field survey, to inform susceptibility. Landscape susceptibility will be defined as **high**, **medium** or **low**, as set out in **Table 4.5**.

Table 4.5: Definition of landscape susceptibility

Landscape Susceptibility	Description
High	The landscape is less able to accommodate the type of development proposed without undue negative consequences to the baseline situation, e.g. this may include: ■ Landscapes that are smaller in scale or exhibiting some complexity, perhaps with some distinctive topographical features; ■ General absence of modern development and/or presence of historic landscape with a degree of time depth; ■ Relatively undeveloped skylines and/or skylines that are visible and exert an influence on landscape character (which may include some historic landmarks); ■ May be inter-visible with sensitive landscapes or forms an important part of a view; and ■ Has a sense of remoteness/tranquillity with few visible or audible signs of human activity and development, and experiences dark skies.
Medium	The landscape is able to accommodate the type of development proposed to some extent without undue negative consequences to the baseline situation, e.g. this may include: ■ Medium scale landscapes which may have some topographical variety or features present; ■ May be some man-made features and/or contemporary structures present; ■ Skylines may be present but not likely to be the most important skylines in a region – there could be some visibility of the skyline from sensitive landscapes or views; ■ Some visible or audible signs of human activity and development, but may also be some sense of tranquillity and experiences some dark skies; and ■ Medium can also be a balance of indicators associated with high and low susceptibility.

Landscape Susceptibility	Description
Low	The landscape is more able to accommodate the type of development proposed without undue negative consequences to the baseline situation, e.g. this may include: ■ Large scale landscapes with absence of strong topographical variety and a simple form; ■ Regular or uniform landcover patterns; ■ Presence of man-made features and/ or contemporary structures e.g. utility, infrastructure or industrial elements; ■ Skylines that are not prominent or less important in views; ■ Less visible from sensitive landscapes or views; ■ Presence of visible or audible signs of human activity and development, and doesn't experience dark skies; and ■ Lack of tranquillity.

Value of the Landscape Receptor

4.65 Landscape value, for the purposes of the LVIA, will be determined with reference to:

- A review of designations and the level of policy importance that they signify (such as landscapes designated at international or national level²⁴);
- The application of criteria that indicate value (such as condition/ intactness, scenic quality, rarity, recreational value, representativeness, conservation interests, perceptual aspects and artistic associations) as described in GLVIA3, paragraphs 5.44 – 5.47; and
- A review of the relevant LANDMAP evaluation information for the Visual and Sensory aspect layer (predominantly relating to the 'overall' evaluation score but also a consideration of 'scenic quality' and 'character' which influence the 'overall evaluation' score.

4.66 Landscape value will be recorded as **high**, **medium** or **low**.

²⁴ Powys County Council does not designate landscapes at the local level.

Table 4.6: Definition of landscape value

Landscape Value	Description
High	This may include: ■ Landscapes designated at national level (e.g. National Parks, National Landscapes) or Registered Landscapes of Special Historic Interest; ■ Landscapes that are in good condition, have high scenic quality, are rare, have high recreational value, high conservation interest, are remote/tranquil and/or have high/nationally recognised associations with artists, writers or events in history that contribute to perceptions of the natural beauty of the area; and ■ Landscapes that have an ‘outstanding’ or ‘high’ LANDMAP overall evaluation for the Visual & Sensory aspect layer where the reason provided is relevant to this assessment. NB Not all landscapes with a ‘high’ LANDMAP score would automatically fall into this category, but when combined with the other indicators above may do so.
Medium	This may include: ■ Landscapes that are in a moderate condition, that have a moderate scenic quality, may have some rarity value at a local level, have some recreational value, some conservation interest, have a degree of rurality (but not a great sense of tranquillity/remoteness) and/or have locally recognised associations with artists, writers or events in history that contribute to perceptions of the natural beauty of the area; and ■ Landscapes that have a ‘moderate’ LANDMAP overall evaluation for the Visual & Sensory aspect layer where the reason provided is relevant to this assessment. NB This category may include landscapes with higher or lower LANDMAP scores where other indicators indicate a ‘medium’ value overall.
Low	This may include: ■ Landscapes that are in less good condition, have a low scenic quality, are not rare, lacking recreational value or conservation interest, unlikely to exhibit a sense of

Landscape Value	Description
	tranquillity/remoteness and have no notable associations with artists, writers or events in history that contribute to perceptions of the natural beauty of the area; and ■ Landscapes that have a 'low' LANDMAP overall evaluation for the Visual & Sensory aspect layer where the reason provided is relevant to this assessment.

Combining Landscape Susceptibility and Value Judgements

4.67 An overall judgement of landscape sensitivity will be derived by combining the separate judgements on landscape susceptibility and landscape value, as per the 'sequential combination' approach referred to in GLVIA 3 (para 5.55). The process of combining the judgements of susceptibility and value is one of professional judgement. The starting point is an even weighting given to susceptibility and value, but each situation is different and there may be instances where susceptibility or value has more influence. In each case the judgement will be clearly explained.

4.68 Landscape sensitivity of a landscape receptor to change will be expressed as **high**, **medium** or **low** (or the intermediate levels of **low-medium** and **medium-high**).

Visual Sensitivity

4.69 Visual sensitivity will combine professional judgements on susceptibility and value using the principles set out in **Table 4.7**.

Table 4.7: The principle of judging visual sensitivity

	Higher	↔	Lower
Susceptibility	Viewers whose attention or interest is focused on their surroundings including communities/ individual residential receptors/ people engaged in outdoor recreation/ visitors to heritage assets or other attractions where views of the surrounding area are an important contributor to experience.	↔	People whose attention is not on their surroundings (and where setting is not important to the quality of working life) such as commuters/ people engaged in outdoor sports/ people at their place of work.

Value	Views recorded in management plans or guidebooks. Views associated with nationally designated landscapes; notable views from a National Trail or promoted route; or designed views (vistas) recorded in citations for historic parks, gardens/scheduled monuments etc.	↔	Views which are not documented or protected. Views which are more incidental, and less likely to be associated with somewhere people travel to or stop.
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Susceptibility of the Visual Receptor

4.70 The susceptibility of visual receptors to changes in views/visual amenity is a function of the occupation or activity of people experiencing the view and the extent to which their attention is focused on views (GLVIA3, paragraph 6.32).

4.71 The susceptibility of visual receptors will be defined as **high**, **medium** or **low**, as set out in **Table 4.8**.

Table 4.8: Definition of visual susceptibility

Susceptibility	Receptor Group
High	Viewers whose attention or interest is focused on their surroundings, including: ■ Communities where views contribute to the landscape setting enjoyed by residents; ■ People engaged in outdoor recreation (for example users of rights of way including national trails and promoted routes, whose interest is likely to be focused on the landscape, views from promoted viewpoints, or views from nationally/locally designated landscapes); ■ Visitors to heritage assets or other attractions where views of surrounding are an important contributor to experience; and

Susceptibility	Receptor Group
	■ People travelling on scenic routes and tourist routes, where attention is focused on the surrounding landscape.
Medium	Viewers whose attention or interest is focused on their surroundings to some extent, including: ■ People travelling on local road routes, where attention may be focused on the surrounding landscape, but is transitory; and ■ People at their place of work whose attention is focused on the surroundings and where setting is important to the quality of working life.
Low	Viewers whose attention or interest is less focused on their surroundings, including: ■ People travelling more rapidly on major road, rail or transport routes (not recognised as scenic routes); ■ People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape; and ■ People at their place of work whose attention is not on their surroundings (and where setting is not important to the quality of working life).

Value of the Views Experienced by the Visual Receptor

4.72 Recognition of the value of views experienced from the visual receptor will be determined with reference to:

- Planning designations specific to views;
- Whether views are recorded as an important part of designated landscapes, for example views being specifically mentioned within the special qualities of a National Park or a National Landscape;
- Whether they are notable views from a National Trail;
- Whether views are recognised as important within citations, for example designed views within Registered Parks and Gardens, or views recorded as important within Conservation Area appraisals;

- The value attached to views by visitors, for example as indicated by designated viewpoints advertised on OS maps and in tourist information, or significant destinations such as popular hill summits, or viewpoints which have facilities for enjoyment of the view, or views made famous by photographs or paintings; and
- The ‘attractiveness’ of views, as referenced in existing information, such as LANDMAP/judged on site.

4.73 The value of views experienced from the visual receptor will be recorded as **high**, **medium** or **low** in accordance with **Table 4.9** below.

Table 4.9: Definitions of value attached to views

Value of Views Experienced from the Visual Receptor	Description
High	This may include: ■ High quality views associated with nationally/locally designated landscapes (perhaps identified in management plans), or high-quality views from National Trails; ■ Designed views recorded in citations for historic parks and gardens; ■ Valued views from heritage assets (conservation areas, scheduled monuments or listed buildings) that are highlighted in the citation for the designation or, in the case of conservation area, in the conservation area appraisal; and ■ High quality views that have facilities provided for the enjoyment of the view by visitors (such as parking places, sign boards and interpretative material for the views).
Medium	This may include:

Value of Views Experienced from the Visual Receptor	Description
	■ Non-designated views, which may be noted as attractive in landscape character assessments or within LANDMAP evaluative information (i.e. if views/visual qualities are mentioned in the overall evaluation); and ■ Views that are 'attractive'/scenic (as judged on site).
Low	This may include: ■ Other non-designated views that are not noted as attractive in landscape character assessments or within LANDMAP evaluative information (i.e. if views/visual qualities are not mentioned in the overall evaluation), and are not notably scenic (they may nevertheless be valued by the local community who experience them).

Combining Visual Susceptibility and Value Judgements

4.74 An overall judgement of visual sensitivity will be derived by combining the separate judgements on visual susceptibility and the value of views experienced from the visual receptor, as per the 'sequential combination' approach referred to in GLVIA 3 (para 6.43). The starting point for combining the judgements of susceptibility and value is an even weighting given to susceptibility and value, but each situation is different and there may be instances where susceptibility or value has more influence. If an even weighting is not applied, the reason for this will be explained.

4.75 Visual sensitivity of a visual receptor to change will be expressed as **high**, **medium** and **low** (or the intermediate levels of **low-medium** and **medium-high**).

Magnitude

4.76 The nature of the effect is commonly referred to as magnitude and is driven by the size and scale of change with, duration, reversibility and geographical extent also reported.

4.77 In GLVIA3 geographical extent is considered as forming part of the magnitude (when combined with the size/scale of effect, duration and reversibility). However, the inclusion of geographical extent can distort the aim of identifying significant effects. For example, a high magnitude of change based on size or scale may be reduced to a lower rating if it occurs in a localised geographical area. This might mean that a potentially significant effect would be overlooked if effects are diluted down due to their limited geographical extents. Therefore, the geographic extent of effects will be reported alongside the effect. The key objective is to communicate the location of effects.

Size and Scale of Landscape Effect

4.78 For landscape elements/features this depends on the extent of existing landscape elements that will be lost or changed, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape.

4.79 In terms of landscape character, this reflects the degree to which the character of the landscape will change by removal or addition of landscape components, and how the changes will affect key characteristics.

4.80 The assessment of size/scale will be described as being **large**, **medium**, **small** or **barely perceptible** according to **Table 4.10**.

Table 4.10: Size/scale of landscape change

Size/Scale	Definition
Large	Loss or modification of landscape elements and features, or addition of new elements and features, which result in a large change to the key characteristics and character of the landscape (including perceptual character).
Medium	Loss of landscape elements and features, or addition of new ones, which result in discernible changes to landscape characteristics and character (including perceptual character).
Small	A perceptible but small change to landscape characteristics and character (including perceptual character) as a result of the loss of landscape elements and features or addition of new ones.
Barely Perceptible	A barely perceptible change to landscape characteristics and character.

Duration of Landscape Effect

4.81 GLVIA3 (paragraph 5.51) states that duration of effect ‘can usually be simply judged on a scale such as short term, medium term or long term’. For the purposes of the LVIA, duration will be determined in relation to the length of phases of the development, as follows:

- **Short-term** with effects generally lasting 0-5 years e.g. resulting from construction activities or presence of temporary structures;
- **Medium-term** with effects generally lasting 5-10 years e.g. resulting from longer construction periods or operational effects that may cease on growth of planting mitigation; and
- **Long-term** with effects generally lasting over 10 years e.g. resulting from the presence of turbines or other operational structures lasting more than 10 years.

Reversibility of Landscape Effect

4.82 In accordance with the principles contained within GLVIA3, reversibility will be reported as **reversible, partially reversible** or **not reversible**, and is related to whether the change can be reversed at the end of the phase of development under consideration (i.e. at the end of the construction or at the end of the operational lifespan of the development).

Combining the Magnitude of Landscape Change Judgements

4.83 An overall judgement for the magnitude of landscape change will be derived by combining the judgements on size/scale and duration. In most cases, size/scale of change tends to have the largest influence on overall magnitude. Reversibility does not tend to influence the magnitude, but is recorded for clarity. Geographical extent is also recorded separately i.e. the area over which the effect on landscape character will be felt is recorded for each assessment unit.

4.84 The magnitude of landscape change will be expressed as **high, medium, low** or **barely perceptible**.

Table 4.11: Definitions of magnitude of landscape change

Magnitude of Landscape Change	Definition
High	This may include:

Magnitude of Landscape Change	Definition
	■ An obvious (large scale) change in landscape features, characteristics and character potentially resulting in the creation of a new landscape character type; and ■ Likely to apply to obvious changes over the long or medium term, but could apply to very large changes over a short term.
Medium	This may include: ■ Discernible (medium scale) changes to landscape features, characteristics and character; and ■ Likely to apply to discernible changes over a long or medium term, but could include obvious changes for a short term.
Low	This may include: ■ A perceptible but small change to landscape features, characteristics and character; and ■ Likely to apply to small changes over the long or medium term, but could apply to discernible (medium scale) changes over a short term.
Barely Perceptible	This may include: ■ An imperceptible/barely perceptible change to landscape features, characteristics and character for any duration.

Size and Scale of Visual Effect

4.85 The size/scale of visual effect depends on:

- 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, including the proportion of the view occupied by the development;

- The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and texture; and
- The nature of the view of the development, in terms of whether views will be fully open, partially open, glimpsed or oblique.

4.86 The assessment of size and scale will be described as being **large**, **medium**, **small** or **barely perceptible**, as set out in **Table 4.12** below.

Table 4.12: Size/scale of visual change

Size/Scale	Description
Large	Large change in the available view, perhaps where the development is in relatively close proximity in a direct line of vision, or affecting a substantial part of the view, or providing contrast with the existing view.
Medium	Clearly perceptible change in the available view, perhaps where the development is relatively close but at an oblique angle or further away in the direct line of vision, creating a distinct new element in the view.
Small	Small change in the available view, perhaps where the development is at a distance or oblique angle, or where the scale of the landscape absorbs the development well.
Barely Perceptible	Change in the available view which is barely perceptible, or the change may go unnoticed.

4.87 Effects will be judged to be during winter when a ‘worst case’ situation is present due to minimal screening by vegetation.

Duration of Visual Effect

4.88 Duration will be reported as **short term**, **medium term** or **long term**, as defined for landscape.

Reversibility of Visual Effect

4.89 Reversibility will be reported as **reversible**, **partially reversible** or **not reversible** (i.e. permanent) and is related to whether the change can be reversed at the end of the phase of development under

consideration (i.e. at the end of the construction or at the end of the operational lifespan of the development).

Combining Magnitude of Visual Change Judgements

4.90 An overall judgement for the magnitude of visual change will be derived by combining the judgements on size/scale and duration. In most cases, size/scale of change tends to have the largest influence on overall magnitude. Reversibility does not tend to influence the magnitude but will be recorded for clarity. The geographical extent over which the visual effect will occur will be recorded for each visual receptor, focussing on the largest scale of visual change experienced by the receptor. The magnitude of visual change will be expressed as **high**, **medium**, **low** or **barely perceptible**.

Table 4.13: Definitions of magnitude of visual change

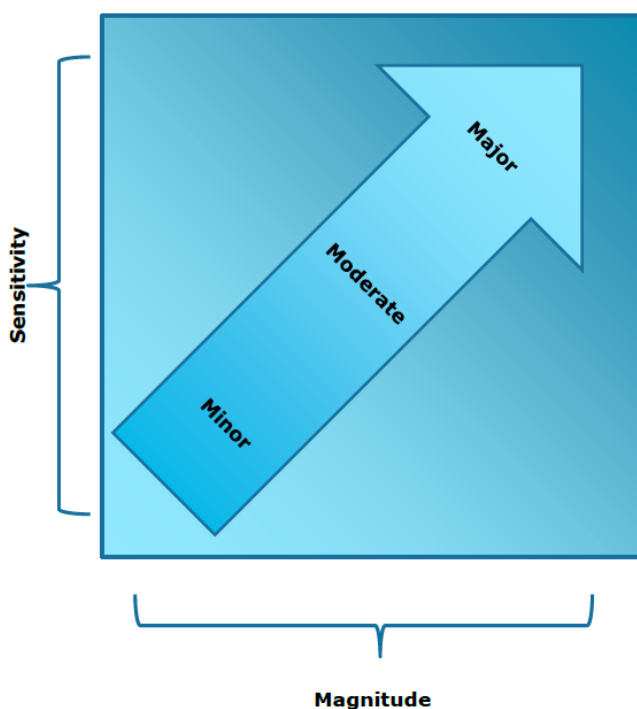
Magnitude of Change	Definition
High	This may include: ■ A large change in available views, perhaps where the development is in close proximity in a direct line of vision, or affecting a substantial part of the view, or providing contrast with the existing view; and ■ Likely to apply to large changes over the long or medium term but could apply to very large changes over a short term.
Medium	This may include: ■ A clearly perceptible change in view, perhaps where the development is relatively close but at an oblique angle or further away in the direct line of vision, creating a distinct new element in the view; and ■ Likely to apply to clearly perceptible changes over a long or medium term but could include large changes for a short term.
Low	This may include: ■ A small change in view, perhaps where the development is at a distance or oblique angle, or where the scale of the landscape absorbs the development well; and

Magnitude of Change	Definition
	■ Likely to apply to small changes over the long or medium term but could apply to clearly perceptible changes over a short term.
Barely Perceptible	A change in view which is barely perceptible or may go unnoticed.

Significance

4.91 Sensitivity and magnitude will be considered together, to form a judgement regarding the overall significance of effects, guided by the principles set out in the diagram below:

Diagram 1: Principal of judging levels of effect using sensitivity and magnitude



4.92 Sensitivity and magnitude are typically weighted evenly so that a medium sensitivity and medium magnitude will result in a moderate overall effect, while a high sensitivity combined with a high magnitude will result in a major effect and a low sensitivity combined with a low magnitude will result in a minor effect. However, there are many possible combinations and in some cases a weighting to either

sensitivity or magnitude may be required to come to an overall level of effect e.g. a medium-high sensitivity combined with a medium magnitude could result in either a moderate or a moderate-major effect. In these finely balanced cases magnitude tends to influence the overall level of effect slightly more than sensitivity.

4.93 Levels of effect will be identified as **negligible**, **minor**, **moderate** or **major** (or the intermediate levels of **minor-moderate** and **moderate-major**) where effects of 'moderate' and above are considered significant in the context of the EIA Regulations.

Proposed Approach to Cumulative LVIA

4.94 Existing wind energy developments and those under construction will form part of the LVIA as they already form part of the baseline landscape.

4.95 The criteria for which wind turbines and wind farms will be included in the cumulative LVIA are as follows:

- Start with all operational, under construction, consented schemes and schemes for which planning applications have been submitted within 33 km (these are those on the 'long list' as defined in Advice Note 17²⁵;

4.96 The 'short list' will then be refined from the long list as follows:

- Scope out all turbines that are less than 20 m to blade tip in height across the whole study area;
- Scope out any single turbines of any size beyond 10 km;
- Scope out any turbines that are less than 50 m to blade tip height beyond 10 km unless they are in groups of 10 or more.

4.97 All operational wind energy developments under construction, consented, undergoing determination and those in the pre-application process, within the 33 km search area, filtered as per the criteria above, are shown on **Figure 2.1** and set out in **Table 2.3**. Other wind energy projects on the Welsh Government's register of DNS that have not yet been submitted (i.e. 'Tier 2' projects) but are likely to be submitted before the Proposed Development will also be reviewed for inclusion.

²⁵ Planning Inspectorate (2019) Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects

Assessing Additional Cumulative Effect Across Two Scenarios

4.98 In accordance with NatureScot guidance²⁶ the LVIA cumulative assessment will consider two scenarios:

- Scenario A is a more certain scenario (which also adds consented schemes to those included in the LVIA baseline); and
- Scenario B is a less certain scenario (which also adds undetermined planning applications and consented schemes to those included in the LVIA baseline).

4.99 The susceptibility and value of the landscape and visual receptors in the cumulative assessment will remain the same as for the LVIA. The magnitude of change will be judged using the same criteria as for the LVIA. The cumulative landscape assessment will consider the following for the proposed wind farms cumulatively with the Proposed Development:

- The position of the wind farms within the landscape, e.g. in similar landscape or topographical context;
- The relationship between the scale and layout of the wind farms, including turbine size/proportion/number of turbines;
- The distances between wind farms, and their distance and direction from the receptor; and
- The cumulative effect of ancillary development, e.g. access tracks.

4.100 The cumulative visual assessment will consider the following for the proposed wind farms cumulatively with the Proposed Development:

- The arrangement of wind farms in the landscape or view e.g. developments seen in one direction or part of the view (combined views), or seen in different directions (successive views in which the viewer must turn) or developments seen sequentially along a route;
- The relationship between the scale and layout of the wind farms, including turbine size/proportion/number of turbines;
- The position of the wind farms within the landscape, e.g. in similar landscape or topographical context; or within the view, e.g. on the skyline, against the backdrop of land;
- The distances between wind farms, and their distance and direction from the viewer; and

²⁶ NatureScot (2021) Assessing the cumulative landscape and visual impact of onshore wind energy developments.

- In the case of routes, the relative duration of views of wind farms from routes.

4.101 Intervisibility of the Proposed Development and other existing and future wind farms, as well as other types of development (if relevant), within the 28 km study area will be illustrated through combined ZTV (CZTV) maps demonstrating the key relationships with existing or proposed wind farms close to the Site. The CZTVs will then be used to assess the cumulative visual effects, alongside computer-generated wirelines.

4.102 Judging the significance of cumulative landscape and visual effects requires consideration of the sensitivity (nature of the receptor) and the magnitude of effect on those receptors (nature of the effect), guided by the same principles as set out in the LVIA methodology.

4.103 Cumulative landscape and visual effects will be described as **negligible, minor, moderate** or **major** (or the intermediate levels of **minor-moderate** and **moderate-major**) where cumulative landscape or visual effects of 'moderate' and above are typically considered significant in the context of the EIA Regulations.

Total (Combined) Cumulative Effect

4.104 The assessment of total (also referred to as combined) cumulative effect (i.e. the effect on landscape and views if all current, and future proposals, including the Proposed Development, are implemented when compared to the existing baseline) will be addressed through a commentary. It is not up to one developer to assess all other developers' projects (this is recognised in paragraph 7.13 of GLVIA3: *'the assessor will not have assessed the other schemes and cannot therefore make a fully informed judgement'*), but the total effect will be judged in broad terms for both landscape and visual amenity.

Proposed Approach to the Visualisations to Accompany the LVIA and Cumulative LVIA

4.105 Wirelines and photomontages (collectively known as 'visualisations') will illustrate the predicted change to views.

4.106 Photomontages from 17 representative viewpoints will be produced by overlaying computer-generated perspectives of the Proposed Development on photographs of the existing baseline. Viewpoint photography will be undertaken in accordance with Landscape Institute (2019) guidance²⁷. All visualisations will also be prepared in accordance with the 2019 LI guidance as well as SNH (2017)

²⁷ Landscape Institute Technical Guidance Note 06/19 (2019) Visual Representation of Development Proposals

visualisation guidance²⁸. Wirelines will include existing and proposed wind farms identified within the cumulative LVIA to provide a representation of the cumulative effects of wind energy development within the 28 km study area.

Proposed Approach to Residential Visual Amenity Assessment

4.107 Views from houses and individual properties are a matter of private amenity. However, the effects on residential visual amenity become a public rather than a private matter when properties become regarded as unattractive places to live because of a development.

4.108 A RVAA will be undertaken for all properties within a 2 km radius from the proposed wind turbine locations (grouping properties where views are similar) in accordance with the Landscape Institute's Technical Guidance Note²⁹ to determine whether visual effects on the property are considered to breach the 'residential visual amenity threshold'.

4.109 For each property or group of properties, the RVAA will be informed by ZTVs, aerial photography, wirelines and field work undertaken from publicly accessible locations within the vicinity to determine the scale of visual effects.

4.110 The methodology can be summarised as follows:

- Step 1: Identification of properties to be considered (defining the study area and scope);
- Step 2: Evaluation of baseline visual amenity from each property/ property group;
- Step 3: Assessment of likely change to visual amenity of properties; and
- Step 4: Forming the RVAA judgement (the Residential Visual Amenity Threshold).

Proposed Approach to the Aviation Lighting Assessment

4.111 Structures, including wind turbines, that are greater than 150 m require visible aviation lighting³⁰. This typically consists of 2000 candela red lights mounted onto the wind turbine's nacelle and intermediate 32 candela lights mounted on the wind turbine tower. As the proposed wind turbine model for the Proposed Development is a 200 m to tip height model, a night-time visual assessment of visible turbine lighting will be undertaken. This will be carried out in accordance with the approach advocated by NatureScot³¹. It will include preparation of a lighting ZTV and two night-time visualisations. For these,

²⁸ Scottish Natural Heritage (2017) Visual Representation of Wind Farms Guidance. Version 2.2

²⁹ Landscape Institute (2019) Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19

³⁰ Civil Aviation Authority (2016) CAA Policy and Guidelines on Wind Turbines – CAP 764

³¹ NatureScot (2020) General pre-application and scoping advice for onshore wind farms: Guidance, Annex 2

photographs will be taken in low light conditions from two viewpoints. The location of the viewpoints will be subject to the final lighting design and will be informed by the lighting ZTV. One of the viewpoints will be from Bannau Brycheiniog National Park, an International Dark Sky Reserve (e.g. from Hay Bluff or a suitable location accessible after dark) and will be agreed with the relevant consultees.

4.112 Night-time photomontages including wind turbine lighting from the two viewpoints will be presented in the ES in accordance with the industry standard guidance prescribed in SNH (now NatureScot)³² and Landscape Institute guidance.

Assessment of Effects

4.113 Effects of the wind turbines' lighting on landscape character and visual amenity will be assessed using professional judgement of what the naked human eye can reasonably perceive in the context of the baseline situation with regard to existing sources of artificial lighting, supported by the lighting ZTV and visualisations, drawing on the lighting Technical Appendix that will be produced by as part of the assessment of effects on aviation (see **Chapter 12**).

Proposed Approach to Assessing Implications for Landscape Designations

4.114 Any implications for the published special qualities of the nationally designated Bannau Brycheiniog National Park will be considered and presented in the ES. The Bannau Brycheiniog National Park is also designated as an International Dark Sky Reserve and so impact of lighting on the dark skies of the Park will also be a consideration in the assessment.

Likely Significant Effects

Construction

4.115 At this stage in the design of the Proposed Development the requirements of the construction contractor are not yet known. However, it is likely that operational visual impacts will be greater or similar to those during construction. The assessment of the operational phase of the Proposed Development therefore constitutes a worst case scenario and construction phase impacts are unlikely to be any greater.

4.116 The exception to this is where more localised impacts are experienced as a result of temporary construction related activities such as the construction compounds, access arrangements, borrow pits,

³² Visual Representation of Wind Farms Guidance - Version 2.2. (February 2017) Scottish Natural Heritage

and storage areas. At this stage in the design of the Proposed Development, the location, and the need for these is uncertain and therefore, until their location is understood, it is assumed that they may be required in locations where they will have significant landscape and visual effects.

4.117 The ES will include greater detail on the location and requirement for such temporary facilities, and should their location give rise to likely significant effects, then the ES will include an assessment following the same methodology as the assessment for the operational phase.

Operation

Landscape Effects

4.118 The following list summarises the potential landscape effects that will be scoped into the assessment:

- Direct effects on the landscape features and character of the Site;
- Indirect effects on the landscape character within 10 km radius; and
- Indirect effects on the special qualities of the Bannau Brycheiniog National Park and Dark Sky Reserve up to 28 km.

Visual Effects

4.119 The following list summarises the potential visual effects that will be scoped into the assessment:

- Visual effects on people in individual properties / groups of properties within 2 km of the wind turbines (through the RVAA);
- Visual effects on local communities;
- Visual effects on road users;
- Visual effects on recreational receptors;
- Visual effects on visitors to attractions and popular hill summits; and
- Visual effects on visitors to the Bannau Brycheiniog National Park up to 28 km of the turbines.

Decommissioning

4.120 At the end of the operational phase, the Proposed Development would either be decommissioned, its operational lifetime extended, or the wind turbines would be replaced. Decommissioning would involve the removal of all above ground infrastructure, including the wind turbines. Access tracks would

likely remain in place; however, this will be subject to agreement with the landowners. Therefore, as decommissioning effects are unlikely to be greater than those considered in the operational assessment, this element is scoped out of the ES.

Topics Scoped Out

4.121 On the basis of the assessment undertaken to date and presented in this Scoping Report, the professional judgement of the assessment team and experience from similar projects, it is proposed that the following effects are scoped out:

- Effects on landscape character beyond a 10 km radius from the proposed wind turbines (the LCAs within 10 km shown in **Figure 4.4** are the proposed landscape reporting units);
- Effects on visual receptors beyond 28 km from the nearest turbine;
- Effects on receptors outside the visual envelope as indicated by the ZTV (see **Figures 4.12 to 4.15**) of the Proposed Development;
- Effects of decommissioning the Proposed Development at the end of its operational life;
- Cumulative effects arising from wind turbines excluded from the assessment (pursuant to paragraphs 4.95 and 4.96); and
- Cumulative landscape and visual effects during construction.

Table 4.14: Proposed Scope of the ES

Topic	Scoped In/Out	Justification
Landscape Effects		
Direct effects on the landscape features and character of the Site	Scoped In	Potential for significant effects arising from the Proposed Development.
Indirect effects on the landscape character within 10 km radius	Scoped In	Potential for significant effects arising from the Proposed Development.

Topic	Scoped In/Out	Justification
Indirect effects on the special qualities of the Bannau Brycheiniog National Park and Dark Sky Reserve up to 28 km.	Scoped In	This is a nationally designated landscape that falls within the 28 km study area, and where the Proposed Development is likely to be visible.
Effects on landscape character beyond a 10 km radius from the proposed wind turbines	Scoped Out	Indirect significant effects arising from the Proposed Development are unlikely to occur on the landscape beyond 10 km.
Visual Effects		
Visual effects on people in individual properties / groups of properties within 2 km of the wind turbines within the ZTV of the scoping layout (through the RVAA).	Scoped In	A RVAA is one component of 'Residential Amenity' which is an important consideration in the planning balance. The Landscape Institute's Technical Guidance Note 2/19 considers a 2 km study area to be appropriate for a RVAA that is assessing wind turbines.
Visual effects on local communities within the ZTV of the scoping layout.	Scoped In	Potential for significant effects arising from the Proposed Development, and in accordance with GLVIA3 to assess this receptor group.
Visual effects on road users within the ZTV of the scoping layout.	Scoped In	Potential for significant effects arising from the Proposed Development, and in

Topic	Scoped In/Out	Justification
		accordance with GLVIA3 to assess this receptor group.
Visual effects on recreational receptors within the ZTV of the scoping layout.	Scoped In	Potential for significant effects arising from the Proposed Development, and in accordance with GLVIA3 to assess this receptor group.
Visual effects on visitors to attractions and popular hill summits within the ZTV of the scoping layout.	Scoped In	Potential for significant effects arising from the Proposed Development, and in accordance with GLVIA3 to assess this receptor group.
Visual effects on visitors to the Bannau Brycheiniog National Park up to 28 km of the turbines within the ZTV of the scoping layout.	Scoped In	This is a nationally designated landscape that falls within the 28 km study area, and where the Proposed Development is likely to be visible. In accordance with GLVIA3 to assess this receptor group.
Effects on visual receptors beyond 28 km from the nearest turbine.	Scoped Out	Significant visual effects arising from the Proposed Development are unlikely to occur beyond 28 km.
Effects on receptors outside the visual envelope as indicated by the ZTV of the Proposed Development.	Scoped Out	The Proposed Development will not be visible and therefore will not result in any significant visual effects.

Topic	Scoped In/Out	Justification
Effects of decommissioning the Proposed Development at the end of its operational life.	Scoped Out	Decommissioning effects are unlikely to be very different from those at construction
Cumulative effects arising from wind turbines excluded from the assessment (pursuant to paragraphs 4.95 and 4.96).	Scoped Out	Significant cumulative effects are unlikely to occur.
Cumulative effects during construction.	Scoped Out	The timescales for construction of the various schemes are too uncertain and the operational phase is considered to be the main source of in combination effects.

Approach to Mitigation

4.122 The key principle for the mitigation of landscape and visual effects of the Proposed Development will be the iterative design of the wind turbine layout and associated infrastructure. The Proposed Development's design will draw on guidance provided in:

- The current Design Commission for Wales (2014) Designing Wind Farms in Wales and the emerging Design Commission for Wales (2023) Designing for Renewable Energy in Wales (Consultation Draft); and
- Scottish Natural Heritage (2017) Siting and Designing Windfarms in the Landscape. Version 3a.

4.123 The aim of the mitigation, from a landscape and visual perspective, will be to consider the following:

- Locate wind turbines in the large-scale open areas as far as possible where landscape scale is larger, avoiding the smaller scale valleys.
- Locate turbines back from the distinctive profile of the northern escarpment and slopes of Aberedw Hill which occupies a prominent position and forms a distinguishable feature above the Wye Valley

- Achieve as consistent a height and spacing as feasible (in light of other constraints), to achieve a well-balanced composition overall;
- Ensure no wind turbine is too dominant or overwhelming in the main view from a property, such that it could result in unacceptable living conditions;
- Utilise existing tracks where possible, minimising the necessity for new excavation, and keeping tracks and other ancillary features (including borrow pits and the substation) away from the most visible slopes, as far as reasonably possible (including the need for cut and fill operations);
- Minimise the visibility of ancillary features, such as buildings, walls and fences, and use materials characteristic of the locality where possible;
- Seek to utilise a 'smart' transponder-based demand-controlled aviation lighting system that only switches on when aircraft are detected within a particular airspace around the wind farm (known as an Aircraft Detection Lighting System, or ADLS), to minimise the occurrence of impacts from lighting. If this is not possible, seek to control nacelle lights by visibility sensors to reduce the intensity of the lights to approximately 10% of the minimum peak intensity in times of clear meteorological conditions (where visibility exceeds 5 km), which will substantially reduce the perceptibility of the proposed nacelle lights.
- Follow an agreed 'Construction Method Statement' and 'Construction Environmental Management Plan' which will include arrangements for implementation of various aspects of the works such as turf and soil removal, storage and replacement. The statement will also set out restoration of landscape earthworks, soils and surface vegetation e.g. alongside tracks, around turbine bases, around borrow pits, and along cable routes once the construction phase is complete.

Questions

Questions for Consultees

Question 4.1: Is the proposed approach and scope for the assessment of effects on landscape character considered to be appropriate?

Question 4.2: Is the proposed approach and scope for the assessment of effects on designated landscapes considered to be appropriate?

Question 4.3: Is the proposed approach and scope for the assessment of visual effects appropriate?

Question 4.4: Do consultees consider that the proposed viewpoints are appropriate to inform the visual assessment, and that the suggested presentation of visualisations is appropriate?

Question 4.5: Is the approach to inclusion of schemes within the cumulative assessment appropriate?

Question 4.6: Is the approach to the assessment of effects on residential visual amenity appropriate?

Question 4.7: Do consultees consider the effects to be scoped in and out appropriate?

Question 4.8: Is the approach to the aviation lighting assessment and night-time photography appropriate and proportionate, and are the suggested night-time viewpoints appropriate?

Question 4.9: Are there any other relevant parties who should be included within the post-scoping consultation process for the LVIA?

Chapter 5

Ecology (Non-Avian)

Introduction

5.1 This chapter presents the proposed scope of work for the assessment of likely significant effects of the Aberedw Energy Park upon non-avian ecology. This chapter has been prepared by LUC. Ornithology is considered in **Chapter 6**.

5.2 Key terrestrial species and habitats of relevance to the Proposed Development are identified with respect to a framework of international and national habitat and species legislation as follows:

- Annex I Habitat and Annex II Species: Habitats listed in Annex I and Annex II of the European Commission (EC) Habitats Directive are those most in need of protection at a European level and for which Special Areas of Conservation (SAC) are designated. A sub-set identifies those which are considered to be ‘priority’ because they are particularly vulnerable;
- Annex IV Species: Species listed in Annex IV of the EC Habitats Directive afforded strict protection independently of their designation under a SAC. These species are referred to as European Protected Species (EPS);
- Schedule 5 Species: Species listed in Schedule 5 of the Wildlife and Countryside Act 1981 (WCA) are notified as receiving protection under Section 9 of the WCA;
- Schedule 7 Habitats and Species: Habitats or species listed under Section 7 of the Environment (Wales) Act 2016 as being of principal importance in Wales; and
- Schedule 8 Species: Plant species listed in Schedule 8 are protected from picking, uprooting or destruction, and from sale.

Existing Conditions

Information Sources

5.3 An ecological desk study was undertaken in 2021 using data from the following sources and has been used to inform this section of the Scoping Report:

- Biodiversity Information Service (BIS) for Powys and Bannau Brycheiniog National Park³³;
- MAGIC: Nature on the Map³⁴;
- Natural Resources Wales (NRW): Designated Sites Search³⁵;
- National Biodiversity Network Atlas³⁶; and
- Natural Resources Wales Ancient Woodland Inventory³⁷.

5.4 International designations focusing on non-avian ecology features, i.e. any Sites of Special Scientific Interest (SSSIs), National Parks, and National Nature Reserves (NNRs), have been identified within 5 km of the Site (up to 10 km for SACs with bat features). Local Nature Reserves (LNRs) as well as non-statutory nature conservation designations, such as Local Wildlife Sites (LWSs), Sites of Interest for Nature Conservation (SINCs) Section 7 Priority Habitats, or woodland areas included on the Ancient Woodland Inventory (AWI), have been identified within 2 km of the Site. Only designations with ecological and qualifying features were considered relevant in the study.

5.5 Existing records for protected or otherwise notable species (e.g. Environment (Wales) Act 2016 / Local Biodiversity Action Plan priority species) have been identified within 5 km of the Site. The search buffer was extended to 10 km for bat roost records. In keeping with established practice, only records from within the last 10 years were considered relevant in the study.

Study Area

5.6 The proposed non-avian ecology study areas vary between features, as follows:

- Nature conservation designations: Statutory international and national designations, i.e. any Sites of Special Scientific Interest (SSSIs), and National Nature Reserves (NNRs), within 5 km of the Site boundary but extended to 10 km for areas designated for roosting bats (**Figure 5.1**). Local Nature Reserves (LNRs) and non-statutory nature conservation designations, such as Local Wildlife Sites (LWSs), Sites of Interest for Nature Conservation (SINCs) or woodland areas included on the Ancient Woodland Inventory (AWI), Section 7 habitats of principal importance, within 2 km of the Site boundary (**Figure 5.2**);

³³ BIS (2021). Data Request for ITP Energised. Jan 2021

³⁴ MAGIC: Nature on the Map (Accessed Jan 2021). Interactive Map. Available online at: <https://magic.defra.gov.uk/magicmap.aspx>

³⁵ Natural Resources Wales (Accessed Jan 2021). Designated Sites Search. Available online at: <https://naturalresources.wales/guidance-andadvice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en>

³⁶ National Biodiversity Network (NBN) Atlas (Accessed Jan 2021). NBN Atlas. Available online at: <https://nbnatlas.org/>

³⁷ Natural Resources Wales. Ancient Woodland Inventory. Accessed Jan 2021. Available on line https://datamap.gov.wales/layers/inspire-nrw:NRW_ANCIENT_WOODLAND_INVENTORY_2021

- Habitats: Covering the Proposed Development plus a 100 m buffer, reduced to 50 m for highway works;
- Bats: Potential roosts in structures and trees within 250 m of potential wind turbine locations or within 30 m of potential track, cable or substation infrastructure and construction works areas. Commuting and foraging bats within the proposed wind turbine area; and
- Other protected species: Within potential works areas and a 50 m buffer but extended to 200 m for otter *Lutra lutra*.

The Site and Environs

5.7 The Site is located on an area of upland farmland with small areas of open access land around the summit. The Site is located approximately 3 km east of Builth Wells (central Ordnance Survey Grid Reference (OSGR) SO098512). The surrounding area comprises predominantly farmland with occasional blocks of broadleaved and plantation woodland, and some areas of open access land.

5.8 The Site is located on high terrain, with the highest point being approximately 445 m Above Ordnance Datum (AOD).

5.9 Existing habitats comprise acid dry heath, dense bracken, grazed acid and neutral grassland, marshy grassland, blanket bog, mire, flushes, hedgerows, tree lines, areas of woodland and ffridd³⁸. Areas of standing water are present on the main upland area.

5.10 There are 20 nature conservation designations, covering 19 geographical areas of international or national importance within 5 km of the Site boundary, or up to 10 km for those with bats as a feature of importance (see **Figure 5.1**). One of these designations is of international importance (an SAC) and three of local importance, as presented below in **Table 5.1**.

³⁸ Ffridd is described as a mosaic of fragmented and diverse habitats found at the interface of upland and lowland habitats. It is often comprised of a diverse mixture of grass and heathland with bracken, scrub (often hawthorn and gorse) or rock exposures and may also include flushes, mires, streams and standing water.

Table 5.1: Nature Conservation Designations

Name	Distance and Direction from Site	Designation	Non-avian Biological Reasons for Designation
Statutory designations within 10 km			
Colwyn Brook Marshes (North and South)	230 m to north of Site	SSSI	Designated for the following: ■ Flood plain fen; ■ Marshy grassland; ■ Unimproved neutral grassland; ■ Otter; ■ Atlantic salmon (<i>Salmo salar</i>); ■ Bullhead (<i>Cottus gobio</i>); and ■ Atlantic stream crayfish (<i>Austropotamobius pallipes</i>).
River Wye /Afon Gwy	54 m W of the western Site boundary, 215 m E of the eastern Site boundary and 670 m south of southern Site boundary	SAC	Annex I habitats that are a primary reason for selection of this site: ■ Watercourses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation. Annex II species that are a primary reason for selection of this site: ■ White-clawed (or Atlantic stream) crayfish; ■ Sea lamprey (<i>Petromyzon marinus</i>); ■ Brook lamprey (<i>Lampetra planeri</i>); ■ River lamprey (<i>Lampetra fluviatilis</i>); ■ Twaite shad (<i>Alosa fallax</i>); ■ Atlantic salmon;

Name	Distance and Direction from Site	Designation	Non-avian Biological Reasons for Designation
			■ Bullhead; and ■ Otter. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: ■ Transition mires and quaking bogs. Annex II species present as a qualifying feature, but not a primary reason for site selection. ■ Allis shad (<i>Alosa alosa</i>); and ■ Riverine site known to support the foraging activity of Daubenton's bats (<i>Myotis daubentonii</i>).
		SSSI	Designated for the following habitats and species: ■ Moderate nutrient status river communities; ■ Otter; ■ Fish (Atlantic salmon, bullhead, river lamprey and brook lamprey); and ■ Riverine site known to support the foraging activity of Daubenton's bats.
River Wye (Upper Wye) / Afon Gwy (Gwy Uchaf)	54 m W	SSSI	Designated for the following: ■ River with moderate nutrient status, including stands of vegetation dominated by water crowfoot (<i>Ranunculus aquatilis</i>) with acidic, nutrient-poor headwaters upstream; ■ River with higher nutrient status, including stands of vegetation dominated by water crowfoot;

Name	Distance and Direction from Site	Designation	Non-avian Biological Reasons for Designation
			■ A variety of rare and scarce plants including: rock cinquefoil (<i>Potentilla rupestris</i>), wild chives (<i>Allium schoenoprasum</i>) and whorled water-milfoil (<i>Myriophyllum verticillatum</i>); ■ A variety of rare and scarce mosses and liverworts including: gravel grimmia (<i>Grimmia lisae</i>) and Spruce's bristle moss (<i>Orthotrichum sprucei</i>); ■ A variety of rare and scarce aquatic and riverside lichens, including: river-jelly lichen (<i>Collema dichotomum</i>), <i>Porocyphus kenmorensis</i> and <i>Pterigiopsis lacustris</i>; ■ Otter; ■ Goosander (<i>Mergus merganser</i>); ■ Atlantic salmon; ■ Twaite; ■ Sea lamprey; ■ Brook lamprey; ■ River lamprey; ■ Bullhead; ■ Aquatic invertebrates including <i>Potamanthus luteus</i> and shingle dwelling invertebrates; and ■ Riverine site known to support the foraging activity of Daubenton and lesser horseshoe bats (<i>Rhinolophus hipposideros</i>).

Name	Distance and Direction from Site	Designation	Non-avian Biological Reasons for Designation
River Wye (Tributaries) / Afon Gwy (Isafonydd)	215 m E	SSSI	Designated for the following: - Streams with moderate nutrient status; - Otter; - Atlantic salmon; - Brook lamprey; - River lamprey; - Bullhead; - Atlantic stream crayfish; - Silurian rocks of the Wenlock series; and - Riverine site known to support the foraging activity of Daubenton's bats.
Llandeilo, Rhulen and Llanbedr Hills	1.18 km S	SSSI	Designated for the following: Upland habitats and species – including dry and wet heath (one of the largest remaining areas of heather moorland on the Welsh borders), moorland pools, pillwort (<i>Pilularia globulifera</i>) and fairy shrimp (<i>Chirocephalus diaphanus</i>).
Duhonw	1.19 km W	SSSI	Designated for the following: - Otter; - Atlantic salmon; - Bullhead; and - Riverine site known to support the foraging activity of Daubenton's bats.

Name	Distance and Direction from Site	Designation	Non-avian Biological Reasons for Designation
Coed Aberedw	1.3 km S	SSSI	Designated for the following: ■ Semi-natural broadleaved woodland; ■ Calcareous cliffs and scree; ■ Welsh poppy (<i>Papaver cambricum</i>); ■ Whitebeam (<i>Sorbus porrigentiformis</i>); ■ Ancient woodland lichens; ■ The lichen <i>Porina roseii</i>; ■ Lichens on calcareous rocks; ■ Otter; and ■ Atlantic salmon.
Glascwm and Gladestry Hills	1.32km E	SSSI	Designated for the following: ■ Upland Habitats – including dry and wet heath (one of the largest remaining areas of heather moorland on the Welsh borders) and a strong breeding population of red grouse (<i>Lagopus lagopus</i>).
Llanelwedd Rocks	1.77 km W	SSSI	Designated for the following: ■ Unimproved dry acid grassland; ■ Unimproved calcareous grassland; ■ Spear-leaved willowherb (<i>Epilobium lanceolatum</i>); ■ An assemblage of rare lichens;

Name	Distance and Direction from Site	Designation	Non-avian Biological Reasons for Designation
			■ Pearl-bordered fritillary butterfly (<i>Boloria euphrosyne</i>); ■ Exposures of Ordovician Volcanic rocks; and ■ Exposures of Caledonian structures.
Banc Hirllwyn	1.93 km N	SSSI	Designated for the following: ■ Unimproved acid grassland; and ■ Maiden pink (<i>Dianthus deltoides</i>).
New Castle Meadows	2.91 km N	SSSI	Designated for the following: ■ Unimproved neutral grassland.
Llan Bwch-Llyn Lake	3.32 km S	SSSI	Designated for the following: ■ Mesotrophic standing water; ■ Broad-leaved semi-natural woodland; ■ Marshy grassland; ■ Floodplain fen; and ■ Long-stalked pondweed (<i>Potamogeton praelongus</i>) and hairlike pondweed (<i>P. trichoides</i>).
Pen-Common, Llanbedr	3.48 km SE	SSSI	Designated for the following: ■ Basic flush.
Caeau Coed Mawr (Coedmawr Fields)	3.58 km N	SSSI	Designated for the following: ■ Unimproved neutral grassland; ■ Unimproved acid grassland;

Name	Distance and Direction from Site	Designation	Non-avian Biological Reasons for Designation
			■ Otter; ■ Atlantic salmon; ■ Bullhead; and ■ Atlantic stream crayfish.
Afon Irfon	4 km W	SSSI	Designated for the following: ■ Exposures of Silurian rocks; ■ Moderate nutrient status river communities, including those supporting water crowfoot; ■ Assemblage of aquatic lichens including river jelly lichen; ■ Otter; ■ Fish species (Atlantic salmon, bullhead, river lamprey and brook lamprey); and ■ Riverine site known to support the foraging activity of Daubenton's bats.
Allt Cynhelyg	4.28 km W	SSSI	Designated for the following: ■ Broad-leaved semi-natural woodland; and ■ Welsh poppy.
Neuadd and Tylelo Mires	4.34 km NW	SSSI	Designated for the following: ■ Marshy grassland; and ■ Northern marsh-orchid (<i>Dactylorhiza purpurella</i>).
River Ithon	4.97 km N	SSSI	Designated for the following: ■ Moderate nutrient status river communities;

Name	Distance and Direction from Site	Designation	Non-avian Biological Reasons for Designation
			■ Otter; ■ Fish (Atlantic salmon, bullhead, river lamprey and brook lamprey); and ■ Riverine site known to support the foraging activity of Daubenton's bats.
Ciliau	6.55 km S	SSSI	Designated for the following: ■ Lesser horseshoe bat.
Nature Conservation Designations of Local Importance within 2km			
Llanelwedd	0.98 km W	Road Verge Nature Reserve	Huge diversity of species, including early purple orchids
Hendre	1.31 km S	Road Verge Nature Reserve	Unknown
Old Bedw	1.36 km S	SINC	Unknown

5.11 There are parcels of scattered and unconnected Ancient Woodland around the Site including some small parcels within the Site Boundary as shown on **Figure 5.2**.

5.12 There are multiple records for roosting bats within 10 km of the Site, including lesser horseshoe bat, a Habitats Directive Annex II species.

5.13 The 2020 habitat and National Vegetation Classification (NVC) survey found the Site to be largely covered by grasslands and dense bracken (895ha or 67.2% of the Site), with localised mire, upland heathland and rush pasture habitats. In total 12 NVC communities were recorded. The Site contains minor coverage of mire plant communities (around 10ha or 8.8% of the total Site area in total). Blanket

mire is present in NVC communities M1 and M17, with soligenous mire communities M6 and M25 present in small discrete areas. Rush pasture accounts for 5.58ha across the Site. Heathland vegetation accounts for 131.5ha of the Site (dry dwarf shrub heath of NVC communities H8, H12 and H18 present).

5.14 Six NVC communities were identified with potential for moderate or high groundwater dependency in accordance with SEPA guidance³⁹: M23 (*Juncus effusus/acutiflorus* – *Galium palustre* rush pasture); M25 (*Molinia caerulea* – *Potentilla erecta* mire); and M6 (*Carex echinata* – *Sphagnum recurvum/denticulatum* mire). Potential Groundwater Dependent Terrestrial Ecosystems (GWDTE) are assessed under water and soil resources (see **Chapter 8**).

5.15 Bat surveys undertaken between May and September 2020 included a desk study, Site walkover Preliminary Bat Roost Assessment and automated (temporal) surveys at ground level in spring (May/early June), summer (July/early August) and autumn (September) using 17 static detectors. Across the survey period the following bat species were recorded; common pipistrelle, soprano pipistrelle, noctule, Leisler's Bat, serotine, barbastelle, brown long-eared bat, lesser horseshoe and unidentified Myotis bat species. Of these species, common pipistrelle, soprano pipistrelle and noctule are considered at high risk of wind turbine collision, while Leisler's Bat and serotine are at medium risk of collision, whilst barbastelle, brown long-eared bat and all Myotis species are considered to be at low risk⁴⁰.

5.16 In addition, Preliminary Ground Level Inspections (PGLI) of all trees and Preliminary Roost Assessment (PRA) of all buildings within 250 m of proposed wind turbine locations were undertaken in 2020. Results comprised 19 features with potential to support bats. However, since all the features are over 300 m from a proposed wind turbine location, impacts were considered to be negligible and no further survey effort, including preliminary roost assessments, was considered necessary.

5.17 Great crested newt (GCN) surveys were conducted in 2023 on 53 ponds within the Site to identify GCN potential and presence. All ponds were subject to Habitat Suitability Index (HSI) assessment and 14 waterbodies found to have below average suitability or above were subject to eDNA survey. A population assessment was also conducted on two waterbodies confirmed as supporting GCN within the Site within 250 m of proposed wind turbine locations.

5.18 From the data search, the local area of the Site is known to support a range of other protected or otherwise notable species, such as badger (*Meles meles*) and otter. Given the habitats present and likely to be impacted, no specific aquatic surveys have been undertaken or are being proposed.

³⁹ SEPA 2017 Guidance Note 31. Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and GWDTEs

⁴⁰ Scottish Natural Heritage (2019) Bats and Onshore Wind Turbines: Survey Assessment and Mitigation. SNH, Natural England, NRW, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, University of Exeter and the Bat Conservation Trust

Proposed Surveys and Assessment Methodology

Legislation, Policy and Guidance

5.19 The following will inform the approach to the design and assessment of the Proposed Development:

- The Wildlife and Countryside Act 1981 (as amended);
- The Environment (Wales) Act 2016;
- Future Wales: The National Plan 2040;
- The Conservation of Habitats and Species Regulations 2017 (as amended) (i.e., the ‘Habitats Regulations’);
- The Nature Recovery Plan 2020⁴¹;
- Planning Policy Wales: Technical Advice Note 5: Nature Conservation and Planning⁴²;
- Planning Policy Wales, including the new Chapter 6 updated Oct 2023 (‘Addressing the Nature Emergency through the Planning System’)⁴³;
- The Powys County Council Local Biodiversity Action Plan (LBAP) 2002⁴⁴; and
- NatureScot *et al.* (2021) guidance on bats and onshore wind turbines⁴⁵.

Proposed Study Area

Desk studies

5.20 Desk studies will be updated in 2023, This will update any more recent protected species data and protected site information.

⁴¹ Welsh Government (2020) The Nature Recovery Action Plan for Wales. Available online at:

<https://gov.wales/sites/default/files/publications/2020-10/nature-recovery-action-plan-wales-2020-2021.pdf> (accessed Oct 2023)

⁴² Welsh Government (2022) Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning. Available online at:

<https://gov.wales/sites/default/files/publications/2018-09/tan5-nature-conservation.pdf> (accessed Oct 2023)

⁴³ <https://www.gov.wales/addressing-nature-emergency-through-planning-system-update-chapter-6-planning-policy-wales>

⁴⁴ Powys Biodiversity Partnership (2002). Our Partnership with Nature: A Local Biodiversity Action Plan for Powys. Available online at: <https://en.powys.gov.uk/article/2553/Local-Biodiversity-Action-Plan> (accessed Oct 2023).

⁴⁵ NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (2021). Bats and onshore wind turbines, survey, assessment and mitigation, August 2021 update. NatureScot, Inverness.

Field Studies

Habitat Survey

5.21 As stated above, a Phase 1 Habitat Survey and National Vegetation Classification (NVC) survey was undertaken in Sept/Oct 2020⁴⁶ providing detailed information on plant communities and identifying areas of potential GWDTE. An updated extended Phase 1 Habitat Survey and walkover NVC update will be undertaken in Spring/Summer 2024.

Bat survey

5.22 As stated above, bat surveys were undertaken in 2020. Updated bat surveys to assess bat activity within the Site will be undertaken during three monitoring periods (autumn 2023, spring, summer 2024) and the collected data analysed to determine species assemblage and levels of activity. In line with NatureScot Guidance¹³ (adopted by NRW), 13 static bat detectors will be deployed located to record bat activity within 250 m of each proposed turbine location.

Other Protected Species Surveys

5.23 An extended Phase 1 Habitat Survey, and updated NVC walkover survey confirming habitat data and identifying potential for specially protected species will be undertaken in Spring 2024. Otter and badger surveys will be carried out in 2024 within suitable habitat in the potentially developable area and within a suitable buffer previously stated in paragraph 5.6. The surveys will follow the standard survey methodologies for otter⁴⁷ and badger⁴⁸, as endorsed by the Chartered Institute of Ecology, Environmental Management (CIEEM) and NRW. Depending on the nature of any evidence recorded and the location relative to the infrastructure layout of the Proposed Development, if potential otter holts or badger sets are recorded, further targeted survey work would be undertaken as appropriate, e.g. camera trapping.

Assessment Method

5.24 The impact assessment will be undertaken following the CIEEM guidelines. Only ecological receptors which are considered to be important at the local or higher level (denoted Important Ecological Features, IEFs), and/or which are subject to legal protection, will be assessed if they are considered

⁴⁶ Rodwell JS (2006). NVC Users' Handbook. JNCC, Peterborough

⁴⁷ Chanin P (2003). Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No.10, English Nature, Peterborough

⁴⁸ Harris S, Cresswell P and Jeffries D (1989). Surveying Badgers (Volume 9, Occasional Publication). Mammal Society

potentially vulnerable to effects. Both negative effects and positive (from habitat management) will be assessed. Ecological receptors will be assessed according to their geographic context as follows:

- International;
- National (Wales);
- Regional (Powys County area);
- Local (The Site and appropriate buffers as per survey methods); and
- Less than local.

5.25 The impact assessment will incorporate the following:

- Identifying and characterising impacts;
- Including mitigation measures to avoid and reduce impacts;
- Assessing the significance of any residual effects (after mitigation);
- Detailing appropriate compensation to offset residual effects as required; and
- Incorporating opportunities for ecological enhancement and biodiversity gain.

5.26 The following will be considered when describing potential impacts:

- Positive impacts and negative impacts;
- Extent;
- Magnitude;
- Timing;
- Duration;
- Frequency; and
- Reversibility.

5.27 According to the CIEEM guidelines, a 'significant effect' is an effect that either supports or undermines conservation objectives for 'important ecological features'. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy). Effects can be considered significant at a wide range of scales from international to local. For example, a significant effect on a regionally important population of a species is likely to be of regional significance.

Cumulative Effects

5.28 As discussed in **Chapter 2**, an assessment will be made in the ES of the likely significant cumulative effects of the Proposed Development in combination with other developments. The ecological cumulative effects will be assessed in line with methods described in the CIEEM guidelines.

5.29 Cumulative effects may be experienced through a variety of pathways, e.g. schemes sharing hydrological connectivity with an aquatic feature or through populations of mobile species, such as bats, experiencing impacts from more than one development site. Other wind farm developments within the catchment of the Proposed Development will be identified during hydrological assessments. For protected species, the radius will vary between IEFs in line with the typical extent of range, up to 10 km for bats.

Habitat Regulations Assessment

5.30 Any proposal which could result in Likely Significant Effects (LSE) to a Natura 2000 site (SACs and Special Protection Areas, as well as Ramsar sites) will require a Habitat Regulations Assessment (HRA). HRA is formally the responsibility of the Competent Authority, but in line with standard practice the planning submission will be accompanied by an informative HRA report for the project.

Likely Significant Effects

Potential Effects Scoped into the Assessment

Construction

5.31 The following potential significant effects will be assessed:

- Damage/modification and loss of habitat IEFs, such as wet heath, and important plant species unless these can be avoided altogether. Note that potential effects on Groundwater Dependant Terrestrial Ecosystems (GWDTEs) will be assessed under water and soil resources (see **Chapter 8**);
- Habitat fragmentation and disturbance/displacement of faunal species IEFs;
- Pollution events and sedimentation, including on the River Wye SAC and SSSI; and
- Death, injury and/or disturbance to species IEFs, such as bats, including destruction/removal of habitat.

Operation

5.32 The following potential significant effect will be assessed:

- Injury or death to bat species due to turbine collision and/or barotrauma (damage to tissues from air pressure changes around turbines).

Decommissioning

5.33 Decommissioning is considered to result in similar potential significant effects to construction, although the magnitude of the impact is likely to be lower. This is based on the access tracks and hard standings likely remaining *in situ* so there will be no impacts associated with their removal (such as sedimentation, further disruption to habitats etc). Decommissioning is therefore scoped out of the assessment.

Topics Scoped Out

5.34 Due to most of the designated sites in proximity to the Site being designated for habitats and floral species, it is considered unlikely there will be any significant negative effects on such sites as a result of the construction, operation or decommissioning of the Proposed Development. Therefore, with the exception of the Colwyn Brook Marshes SSSI (which is close to the Site's northern boundary) and the River Wye/Afon Gwy SAC and SSSI (which overlaps the Site's boundary), designated sites will be scoped out of the assessment (see **Figure 5.1**). It is noted that Ciliau SSSI designated for lesser horseshoe bats lies 6.55 km to the south: this is also scoped out as lesser horseshoe bats generally do not forage greater than 4 km from roosts and prefer feeding along broad-leaved woodland, not uplands. The Ciliau SSSI is surrounded by predominately pastoral habitats, with cattle grazing on lowlands and sheep grazing on higher areas. There are high densities of broadleaved woodland, between the Site and the SSSI along watercourses, and some conifer plantations. Lesser horseshoe bats were found to forage predominately in broadleaved woodland along the banks of the River Wye and its tributary streams⁴⁹. For these reasons it is considered unlikely that lesser horseshoe bats associated with Ciliau SSSI will use the Site.

5.35 In line with common practice for wind farm assessments, due to the size of the Site and small footprint of the infrastructure a targeted survey for reptiles is not considered proportionate. However, any incidental observations of reptiles made during other surveys will be recorded, and mitigation for reptiles

⁴⁹ Schofield, H., Messenger, J., Birks, J. & Jermyn, D. 2003. Foraging and Roosting Behaviour of Lesser Horseshoe bats at Ciliau, Radnor. Ledbury: The Vincent Wildlife Trust; Barataud, M., Faggio, G., Pinasseau, E. & Roué, S. G. 2000. Protection et restauration des habitats de chasse du Petit rhinolophe. Paris : Société Française pour l'Etude et la Protection des Mammifères

will be included within the Outline CEMP (Outline Construction Environmental Management Plan) where suitable habitat is present.

Table 5.2: Proposed Scope of the ES

Topic	Scope In/Out	Justification
Potential effect on Designated Sites	Construction - Scoped out, apart from Colwyn Brook Marshes SSSI and River Wye SAC/SSSI which are scoped in. Operation – Scoped Out	Due to most of the designated sites in proximity to the Site being designated for habitats and floral species, it is considered unlikely there will be any significant negative effects on such sites as a result of the construction, operation or decommissioning of the Proposed Development. Therefore, with the exception of the Colwyn Brook Marshes SSSI (which is close to the Site's northern boundary) and the River Wye/Afon Gwy SAC and SSSI (which overlaps the Site's boundary), designated sites will be scoped out of the assessment (see Figure 5.1).
Potential effect on Priority habitats/ habitats of principal importance ⁵⁰ including ancient woodlands	Construction – Scoped In Operation – Scoped Out	Key part of Welsh Step Wise approach

⁵⁰ Section 7 Habitats Environment (Wales) Act 2016

Topic	Scope In/Out	Justification
Potential effects on Protected Species: bats; birds; great crested newt; badger; otter.	Construction – Scoped In Operation – Scoped Out (apart from bats and birds – Scoped In)	Key part of Welsh Step Wise approach.
Potential effects on Protected Species: water vole; reptiles; red squirrel; pine marten; fish and aquatic species	Construction and Operation – Scoped Out	Either species not present, not impacted or impacts not significant due to nature of works and established Outline CEMP approaches and techniques
Non-statutory sites	Construction and Operation – Scoped Out	Lie outside the Site and not structurally or functionally connected to the Site

Approach to Mitigation

5.36 The location and design of the Proposed Development will follow the Welsh Government Step Wise approach, damage to biodiversity and ecosystem functioning are avoided (Step 1), and impacts are minimised (Step 2) and mitigated (Step 3). Specifically for bats, impacts will be mitigated and mitigated by avoiding siting turbines (rotors) within 50 m of linear habitat features (watercourses, woodland edges and hedges). For great crested newts, any ground disturbance will avoid areas within 250 m of breeding ponds.

5.37 A Green Infrastructure Assessment will be produced, accompanied by an outline Habitat Management Plan (HMP) which will identify measures to secure a net benefit for biodiversity. The HMP will set out the immediate and on-going management of the Site, future monitoring arrangements for all secured measures and identify funding mechanisms to meet management plan objectives.

5.38 Habitat loss as a result of infrastructure construction will be compensated. This may include, but is not limited to, restoration of native habitats within the Site that are currently of limited ecological value, compensatory planting and consultation with local and/or regional stakeholders on land use and appropriate management for biodiversity.

During Construction

5.39 The assessment in the ES will identify and set out mitigation required in relation to IEFs and/or protected habitats and species, where the assessment concludes likely significant effects could occur. These are likely to include, but are not limited to the following:

- Retain habitat IEFs wherever possible and protect trees according to BS 5837: 2012 – Trees in relation to design, demolition and construction;
- Pre-works checks for protected and/or notable species ahead of activities such as ground and vegetation clearance;
- Temporary lights used during construction should be fitted with shades to prevent light spillage outside the working area.
- Temporary lights should not illuminate habitats favoured by nocturnal or crepuscular species such as bats and otter; and
- The capping of ends of any pipeline when unattended, to prevent animal access.

5.40 As set out in **Chapter 2**, an Outline CEMP will be submitted with the ES which will cover standard best practice construction techniques and compliance with relevant regulations. If the assessment in the ES identifies that additional protection and mitigation measures, as well as monitoring programmes, are required to mitigate a significant effect, these will be clearly identified in the ecology ES chapter. The mitigation measures will be audited by a suitably qualified ecologist or Ecological Clerk of Works (ECOW).

5.41 The risk of pollution from surface runoff to watercourses and aquatic habitats will be managed by ensuring that runoff control measures, such as appropriate buffers as determined within the Outline CEMP, and that interceptor drains and silt traps to assist in maintaining water quality, are in place.

During Operation

5.42 Areas of temporary infrastructure required during construction of the Proposed Development will be reinstated during operation to allow the natural recolonisation of habitats.

5.43 The results of the bat surveys described in Paragraph 5.22 will determine the mitigation requirements, if any, of the Proposed Development's wind turbines. Habitat management described in the outline HMP will form the basis of a more detailed HMP, which will be in place during the operational phase of the Proposed Development.

Questions

Questions for Consultees

Question 5.1: Is the scope considered appropriate?

Question 5.2: Do you agree that, with the exception of Colwyn Brook Marsh North and South SSSI, River Ithon SSSI and the River Wye SAC and SSSI, designated sites can be scoped out?

Question 5.3: Do you agree that the HRA should focus on the River Wye/Afon Gwy SAC only?

Chapter 6

Ornithology

Introduction

6.1 This chapter presents the proposed scope of work for the assessment of likely significant effects of Aberedw Energy Park upon ornithology. This chapter has been prepared by LUC.

6.2 Key populations of bird species, including their supporting habitats, which may be affected by the Proposed Development are identified with reference to international and national legislation and conservation frameworks, as follows:

- Annex 1 birds and migratory populations of Annex 2 birds: species defined and listed in the EU Birds Directive, as those in most need of protection at a European level, and whose breeding and/or wintering populations underpin the designation and ongoing management of Special Protection Areas (SPAs);
- Schedule 1 birds: species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) (WCA) which receive special protection on account of their rarity and sensitivity; and
- Red-listed birds: species listed on the most recent Red List of UK Birds of Conservation Concern (BoCC) or the most recent Red List of Welsh Birds of Conservation Concern (WBoCC) which identify species whose populations have undergone substantial historic declines or where their geographic range has substantially contracted.

Existing Conditions

Study Area

6.3 The study area for ornithology field surveys is defined with reference to the boundary of the Proposed Development and comprises a series of buffers around this, extending up to 2 km, with the size of buffer dependent on the sensitivity of different species to potential effects arising from the Proposed Development.

6.4 In respect of statutory designated sites, the ornithology study area extends to 10 km from the Proposed Development for internationally designated sites (Special Protection Areas (SPAs) and

Ramsar Sites) and 2 km for nationally designated sites (Sites of Special Scientific Interest (SSSIs)) which cite ornithological features, which is consistent with relevant guidance⁵¹.

6.5 A comprehensive ornithological baseline to inform the design and assessment of the Proposed Development will be established through desk-based study and field surveys. Full details will be presented within the ES.

Ornithological Receptors

6.6 The ornithological receptors that will be considered for assessment will comprise:

- Statutory designated sites, namely SPAs and SSSIs where the qualifying features of the site include ornithological interests;
- The avian species listed as qualifying features of the above sites; and,
- Other species deemed to be of High or Moderate Nature Conservation Importance, due to their inclusion on Annex I of the EC Birds Directive (Annex 1 species), Schedule 1 of the Wildlife and Countryside Act (1981), as amended (Schedule 1 species) and their occurrence on the Red List of UK Birds of Conservation Concern (BoCC)⁵² or the Red List of Welsh Birds of Conservation Concern (WBoCC)⁵³ (Red-list species).

Statutory Designated Sites for Ornithology

6.7 There are no sites designated for ornithology within the Site. The nearest internationally designated site is the Elenydd-Mallaen SPA, approximately 16 km from the Site and outside the ornithology study area. The nearest SSSI citing ornithological features is the River Wye (Tributaries) SSSI which is within 1 km of the Site and designated in part for its breeding bird assemblage, including common sandpiper, grey wagtail, dipper and kingfisher. The Glascwm and Gladestry Hills SSSI lies approximately 1.4 km from the Site and is designated in part for its moorland bird population, which has included red grouse, merlin and ring ouzel in its citation. Further information on these designated sites is included in **Table 6.1**.

⁵¹ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester. Available at: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1.pdf> (accessed 15/09/2023).

⁵² Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (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.

⁵³ Johnstone, I.G., Hughes, J., Balmer, D.E., Brenchley, A., Facey, R.J. Lindley, P.J., Noble, D.G. & Taylor, R.C. (2022). Birds of Conservation Concern Wales 4: the population status of birds in Wales. *Milvus*, 2: 1-34.

Table 6.1: Designated Sites Potentially Impacted

Designated Site	Notes
Site of Special Scientific Interest within 1 km	
River Wye (Tributaries)	A linear SSSI comprising the River Wye and key tributaries. The site qualifies as a SSSI on account of several biological and geological criteria, including breeding riverine birds.
Glascwm and Gladestry Hills	An upland moorland, mainly comprising dry heath but with other key upland habitats present including mires and blanket bog. Supports moorland bird populations of high conservation interest.

Survey findings

6.8 Desk and field studies undertaken to date show that several breeding bird species of nature conservation importance occur within and adjacent to the Site, including birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 and birds from the UK and Welsh Red Lists of Birds of Conservation Concern.

6.9 The Schedule 1 raptors goshawk, red kite and peregrine breed within 2 km of the Site with barn owl possibly breeding in the area. Other raptors present were osprey, hen harrier, merlin and hobby although there were no breeding attempts recorded.

6.10 No waders have been recorded breeding within the relevant study area. Golden plover were present on the Site in the non-breeding season and a small number of flights by a number of wader species including lapwing and snipe have been recorded.

6.11 Among the other species recorded during surveys were buzzard, kestrel, raven, black-headed gull, herring gull, lesser black-backed gull and a number of Red Listed passerines.

Proposed Surveys and Assessment Methodology

Legislation and Policy

6.12 The following will inform the approach to the design and assessment of the Proposed Development:

- The Wildlife and Countryside Act 1981 (as amended);
- The Environment (Wales) Act 2016;
- The Conservation of Habitats and Species Regulations 2017 (as amended) (i.e. the 'Habitats Regulations');
- The Nature Recovery Plan 2020⁵⁴;
- Planning Policy Wales: Technical Advice Note 5: Nature Conservation and Planning⁵⁵;
- Planning Policy Wales, including the new Chapter 6 updated Oct 2023 ('Addressing the Nature Emergency through the Planning System')⁵⁶; and
- The Powys County Council Local Biodiversity Action Plan (LBAP) 2002⁵⁷.

Desk Studies

6.13 Desk studies will continue to inform the collation of baseline information. To date, data requests have been made to the Biodiversity Information Service for Powys & Brecon Beacons National Park.

6.14 The following key guidance and information resources have been accessed:

- National Biodiversity Network (NBN) Atlas;
- Natural Resources Wales: Designated Sites Search (Natural Resources Wales, 2018a);
- MAGIC: Nature on the Map (MAGIC, 2020);
- NatureScot guidance (SNH 2017)⁵⁸ on bird survey methods at onshore wind farms; and

⁵⁴ Welsh Government (2020) The Nature Recovery Action Plan for Wales. Available online at:

<https://gov.wales/sites/default/files/publications/2020-10/nature-recovery-action-plan-wales-2020-2021.pdf> (accessed Oct 2023).

⁵⁵ Welsh Government (2002) Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning. Available online at: <https://gov.wales/sites/default/files/publications/2018-09/tan5-nature-conservation.pdf> (accessed Oct 2023)

⁵⁶ <https://www.gov.wales/addressing-nature-emergency-through-planning-system-update-chapter-6-planning-policy-wales>

⁵⁷ Powys Biodiversity Partnership (2002). Our Partnership with Nature: A Local Biodiversity Action Plan for Powys. Available online at: <https://en.powys.gov.uk/article/2553/Local-Biodiversity-Action-Plan> (accessed Oct 2023).

⁵⁸ SNH (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms. March 2017, Version 2.

- NatureScot guidance (SNH, 2018)⁵⁹ assessing significance of impacts from onshore wind farms outwith designated areas.

Field Surveys

6.15 In accordance with NatureScot guidance (SNH, 2017)³, which has been adopted by Natural Resources Wales (NRW), two years of ornithological surveys have been completed. The following field surveys were undertaken:

- Flight Activity Surveys totalling 144 hours⁶⁰ from each of five vantage points (VPs) from October 2019 to September 2021;
- Breeding Bird Surveys comprising three (2020) or four (2021) visits to open ground habitats within the Site plus (in 2021) a buffer of up to 500 m from the Site;
- Breeding Raptor and Owl Surveys within 2 km of the Site in 2020 and 2021;
- Nightjar Survey in suitable habitat within 2 km of the Site in 2021; and
- Winter Walkover Surveys over the entire Site in 2019-20 and in 2020-21.

6.16 Field surveys used species-specific survey methodologies include those described by Brown and Shepherd (1993)⁶¹ (for breeding bird surveys), a range of survey methods given in Hardey et al. (2013)⁶² (for breeding raptor and owl searches) and methods specified by Gilbert et al. (1998)⁶³ (for nightjar and winter walkovers). Flight activity surveys comprise timed watches from VPs using methods described by Band et al. (2007)⁶⁴.

6.17 Targeted field surveys to inform the baseline for assessment were undertaken between October 2019 and August 2021. Further surveys are scheduled for March to June 2024 with the aim of verifying the presence, distribution and status of key species within and adjacent to the Site, particularly raptor species of High Nature Conservation Importance.

⁵⁹ SNH (2018) Assessing significance of impacts from onshore wind farm outwith designated areas. Guidance. Version 2- February 2018.

⁶⁰ Thirty-six hours of watches were undertaken from all VPs in both breeding seasons and both non-breeding seasons.

⁶¹ Brown, A.F. and Shepherd, K.B. (1993) A method for censusing upland breeding waders. *Bird Study* 40: 3 pp189 -195.

⁶² Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) *Raptors: a field guide to survey and monitoring*. Third Edition. The Stationary Office, Edinburgh.

⁶³ Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird monitoring methods. A manual of techniques for key UK species*. RSPB, Sandy, Bedfordshire.

⁶⁴ Band, W., Madders, M. & Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In de Lucas, M, Janss, G.F.E. and Ferrer, M. (Eds.) *Birds and Wind Farms: Risk assessment and Mitigation*, pp. 259 - 275. Quercus, Madrid.

Assessment methodology

6.18 The ES will provide a detailed description of the existing baseline ornithological receptors, along with an assessment of the potential effects of the Proposed Development on the important ornithological receptors present, taking account of mitigation measures that avoid and reduce significant effects where appropriate and where feasible.

6.19 Impact assessments presented within the ES will be undertaken in accordance with CIEEM guidance (CIEEM 2018¹) which presents an accepted approach to determining the significance of an effect upon ecological receptors (see also **Chapter 5: Ecology (non-avian)**). The approach to assessment will take account of a range of existing guidance (e.g. SNH 2017⁴ and SNH 2018⁵) and published scientific literature in relation to avian ecology and bird-wind farm interactions, alongside professional judgement and experience of wind farm EIA.

6.20 Effects will be considered during both the construction and operational phases and will be assessed on the basis that a clearly defined range of appropriate avoidance buffers and standard good practice measures are implemented (see section below). Effects on birds could arise because of habitat loss, disturbance, displacement and collision mortality.

Determining Importance

6.21 Relevant international and national legislation, policy and guidance will be referenced to determine the Nature Conservation Importance (NCI) of relevant ornithological receptors. In addition, species' sensitivity to potential effects from wind farm developments will be taken into account by considering aspects such as their behaviour and capacity for habituating to the presence of wind farm infrastructure.

Identification and Characterisation of Effects

6.22 The identification and characterisation of effects on important ornithological receptors will be undertaken in accordance with the CIEEM guidelines (CIEEM 2018¹) with reference to effect magnitude (e.g. proportion of a population affected), extent, duration and reversibility as appropriate. The CIEEM guidelines require that effect magnitude will be considered alongside the likelihood of its occurrence to help make a judgement on the significance of effects. Where appropriate and where supporting information is available (e.g. population-specific demographic parameters), this approach will be supported by population models which will explore a range of scenarios to help understand the likely response of populations to potential effects arising from the Proposed Development.

6.23 Following the characterisation of effects, professional judgement will aid the consideration of effect significance on each ornithological receptor, with effects on species' populations evaluated with reference to appropriate regional or national spatial units.

Significant Effects

6.24 The evaluation of effects will consider how the conservation status of each species may be affected by the predicted magnitude and direction of effects arising from the Proposed Development. The maintenance of existing favourable conservation status for affected species, at the appropriate geographic scale, will be a key judgement for evaluating effect significance.

Presentation of Sensitive Information

6.25 Sensitive information as it relates to ornithology, including the location of the nesting sites of Schedule 1 birds, will be presented within a confidential appendix to the ES.

Likely Significant Effects

Embedded and standard mitigation measures

6.26 The adoption of embedded mitigation measures to avoid or reduce adverse effects upon ornithological receptors resulting from the Proposed Development will continue to form part of the iterative design process.

6.27 Where required, suitable species-specific buffers around sensitive ornithological sites will be incorporated in the design process. Full details of Proposed Development design and embedded mitigation measures in relation to ornithology will be detailed within the ES.

6.28 A Bird Protection Plan (BPP) will be prepared to ensure legislative compliance and accordance with current good practice guidance. This will be incorporated into any Construction Environmental Management Plan (CEMP) and its delivery will be overseen by an Ecological Clerk of Works (ECoW).

6.29 It has been assumed that the clearance of vegetation likely to support breeding birds will be avoided during the bird breeding season (March to August inclusive). Where this is not possible, an ECoW will undertake a disturbance risk-assessment as part of the BPP and will supervise the work to ensure that disturbance is avoided or reduced. Where active nests are discovered, suitable 'no disturbance buffers' will be maintained until chicks have fledged. Where possible, scheduling construction and maintenance activities outside certain periods will be proposed should significant effects upon species that are particularly vulnerable during certain seasons be identified.

Potential Effects Scoped into Assessment

6.30 The construction and operation of the Proposed Development has the potential to cause significant effects on birds (See **Table 6.2**). These may arise due to:

- Direct loss of habitat arising from temporary land take during construction and permanent habitat losses to accommodate the infrastructure of the Proposed Development;
- Indirect habitat loss if birds are displaced from nesting, foraging or roosting habitats during the construction and operational phases of the Proposed Development;
- Mortality from collision with the wind turbines of the Proposed Development; and
- Cumulative effects arising from any of the above combined with effects from other proposed or existing developments in the same geographic area which act on the same bird population units.

6.31 The potential for each effect varies between species and species-groups and, therefore, a species-specific assessment will take place using information from baseline studies and knowledge of how different species may be affected. For example, the risk of collision varies for different species due to their biometrics and flight behaviour and some species are more tolerant of disturbance associated with wind farm development than others.

6.32 The assessment will only assess in detail effects upon important ornithological receptors, where these receptors, principally species, are known to be susceptible to the effects likely to arise from the construction and operation of the Proposed Development. This will include species defined as having high or moderate nature conservation interest, where individuals of these species make substantial use of airspace and habitats surrounding the Proposed Development for breeding, roosting, or foraging.

Topics Scoped Out

6.33 The following potential effects are proposed to be scoped out of the full assessment (See **Table 6.2**):

- Effects on non-sensitive bird populations defined as of low Nature Conservation Importance - a detailed assessment of bird populations that are present but sufficiently widespread, unthreatened and resilient to the potential effects arising from the Proposed Development will not be undertaken.

Table 6.2: Proposed Scope of the ES

Topic	Scope In/Out	Justification
Direct habitat loss arising from construction and operation	In	Potential for significant effects on populations due to loss of nesting and foraging habitat
Indirect habitat loss arising from disturbance and/or displacement during construction and operation	In	Potential for significant effects on populations due to loss of nesting and foraging habitat
Collision mortality during operation	In	Potential for significant effects on populations arising from collision with wind turbine blades
Effects on populations defined as being of low conservation concern	Out	Some species recorded during baseline surveys are so widespread and common within the region that significant effects on their populations can be ruled out
Effects on non-sensitive populations	Out	Some species recorded during baseline surveys occurred very infrequently or their populations are not considered susceptible to effects associated with wind farm developments.
Cumulative effects on ornithological features	In	Potential for significant effects arising from the Proposed Development alongside other developments that could impact

Topic	Scope In/Out	Justification
		on the same species populations or sites.

Approach to Mitigation

6.34 Mitigation measures will be proposed to off-set any predicted significant effects.

6.35 Mitigation measures may include: Further location- or species-specific buffers or timing restrictions to avoid disturbance to sensitive bird species; habitat enhancement to mitigate for potential loss of key habitat; provision/safeguarding of alternative nesting sites should some existing locations become less favourable; the use of visual cues/deterrents to reduce collision risk including 'painted-blade' techniques.

Questions

Questions for Consultees

Question 6.1: Do consultees agree that the desk and field surveys already undertaken, plus those proposed in 2024, provide a sufficient baseline to allow the assessment of effects on ornithology?

Question 6.2: Do consultees agree with the assessment method (including scoped in/scoped out effects)?

Question 6.3 Do consultees hold any data sets that could be made available to inform the assessment?

Question 6.4: Do consultees agree that the proposed mitigation options provide suitable methods to offset any identified significant effects?

Chapter 7

Archaeology and Cultural Heritage

Introduction

7.1 This chapter presents the proposed scope of work for the assessment of likely significant effects of the Aberedw Energy Park upon archaeology and cultural heritage (collectively termed the 'historic environment'). This chapter has been prepared by LUC.

7.2 *'The historic environment comprises all the surviving physical elements of previous human activity and illustrates how past generations have shaped the world around us...The historic environment is made up of individual historic features which are collectively known as historic assets'⁶⁵. A historic asset can be a building, monument, site, place, archaeological remains, townscape or landscape. Some historic assets are designated as World Heritage Sites, scheduled monuments, listed buildings, conservation areas, registered historic parks and gardens, inventory battlefields, registered historic landscapes, or locally designated through policies in the Local Plan. Non-designated assets may be recorded in Historic Environment Records (HER), while many other assets are currently unrecorded. Historic assets may also derive some, or all, of that interest from their 'setting'.*

7.3 In Welsh planning policy the setting of a historic asset is defined as *'the surroundings in which it is understood, experienced and appreciated, embracing present and past relationships to the surrounding landscape'⁶⁶.*

7.4 The purpose of the assessment in the ES would be to identify the potential significant effects of the Proposed Development on the historic environment and cultural significance of the area in which the Site is located.

⁶⁵ Planning Policy Wales 11 available at https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf

⁶⁶ Welsh Government (2017) Technical advice note (TAN) 24: the historic environment Cadw (2011) Conservation Principles for the sustainable management of the historic environment in Wales available at <https://www.gov.wales/technical-advice-note-tan-24-historic-environmenthttp://cadw.gov.wales/historicenvironment/conservation/conservationprinciples/?lang=en>

Existing Conditions

Information Sources

7.5 The following sources of information have been reviewed during desk-based research to inform this scoping report:

- Data on designated historic assets⁶⁷ comprising:
 - World Heritage Sites;
 - Scheduled monuments;
 - Listed buildings;
 - Conservation areas;
 - Registered historic parks and gardens;
 - Historic battlefields recorded on the Inventory of Historic Battlefields in Wales; and
 - Registered historic landscapes.
- Clwyd Powys Archaeological Trust (CPAT) HER data (received 27 September 2023);
- Historic and current Ordnance Survey (OS) mapping;
- Recent digital aerial photography from online sources; and
- Initial findings of other topics (e.g. Landscape and Visual Amenity, Hydrology, Hydrogeology and Geology).

Scoping Study Areas

7.6 The following study areas were used for data gathering to inform scoping:

- **The Site** – the potential for direct and indirect physical effects and effects related to setting change in all historic assets (i.e. designated and non-designated) would be considered;
- **Core Study Area** – land within 5 km from the Site over which the potential for significant effects related to setting change to all historic assets would be considered; and

⁶⁷ Spatial data for designated historic assets sourced from MapDataWales, Available at: <https://datamap.gov.wales/search/?limit=20&offset=0> . (accessed 04/10/2023).

- **Wider Study Area** – land beyond 5 km but within 10 km from the Site over which the potential for significant effects related to setting change to designated historic assets would be considered.

7.7 The extent of the Site and study areas are shown on **Figures 7.1** and **7.2**.

Preliminary Environmental Baseline

7.8 There are four scheduled monuments within the Site. These comprise:

- Aberedw Hill Round Barrows (SM Ref. RD074), the remains of four Bronze Age round barrows;
- Cwmblaenerw House Platforms (SM Ref. RD170), the earthwork remains of two prehistoric / medieval house platforms built on sloping ground overlooking Cwmblaenerw Brook; and
- Aberedw Hill Deserted Rural Settlement (SM Ref. RD166), the above-ground remains of a group of medieval or post-medieval buildings, enclosures and fields; and
- Cwmblaenerw Enclosed Long Hut (SM Ref. RD169), a medieval or post-medieval building combining a domestic dwelling and barn under one roof.

7.9 The CPAT HER has 347 entries for the Site in its core database.

7.10 The majority of the Site has been subject to detailed archaeological survey undertaken on behalf of the Royal Commission on the Ancient and Historic Monument Wales (RCAHMW) in 2008⁶⁸ and 2012⁶⁹. The purpose of these surveys was to identify and record all historic assets with visible above-ground features (e.g. earthworks, structural remains) located within the unenclosed land forming Aberedw Hill and commons. The methodology for these surveys comprised a systematic walkover survey using 30 m transects. This level of archaeological survey accounts for the large number of entries for the Site in the CPAT HER core database. A number of these records appear to relate to the scheduled monuments identified above.

7.11 Activity is recorded at the Site from the Bronze Age onwards (c. 2300 BC - 800 BC), and is characterised by prehistoric funerary monuments, evidence of medieval occupation and farming practices, including the archaeological remains of long houses, cultivation, field systems, farmsteads and rabbit warrens, and later assets related to post-medieval agriculture including the sites of buildings recorded on historic OS mapping and quarries.

⁶⁸ Hall J. and Sambrook P. (2008) Upland Initiative Aberedw Hill Archaeological Survey available at <http://www.walesher1974.org/herumd.php?group=CPAT&level=3&docid=301373332>

⁶⁹ Hall J. and Sambrook P. (2012) Upland Initiative Radnorshire Small Commons Archaeological Survey available at <http://www.walesher1974.org/herumd.php?group=CPAT&level=3&docid=301373363>

7.12 While there is a CPAT HER entry relating to the recovery of Mesolithic (9200 BC – 4000 BC) flint artifacts from within the Site (CPAT HER Ref. PRN4272), the earliest recorded above-ground historic assets date from the Bronze Age. As noted above these are funerary monuments, such as the group of barrows on Aberedw Hill (SM Ref. RD074; CPAT HER Refs. PRN81289 and PRN167237) and a number of possible barrows, including those at Cwmblaenerw (CPAT HER Ref. PRN344) and Pen-waun Pool (CPAT HER Ref. PRN5195). There are several similar, possibly contemporary, funerary and ritual monuments in the Core and Wider Study Areas, including Hundred House round barrow to the north (SM Ref. RD132) in the Core Study Area, the stone circle and barrow at Cefn Wylfre (SM Ref. RD177) to the east in the Wider Study Area and the barrows and cairns on Gilwern Hill to the north. As is common throughout Wales, these assets have been placed on high points in the landscape, often at the ends of ridges. Despite the number of hillforts in the study areas, including the examples in the Core Study Area at Castle Bank (SM Ref. RD149) to the north and Caer Einon Camp (SM Ref. RD014) to the west in the Wider Study Area, there is no evidence of Iron Age (c. 800 BC - AD 74) activity within the Site.

7.13 The Roman occupation of Wales (AD 74 – 410) is characterised by a series of military campaigns and ‘Romanisation’ of native populations (adopting the lifestyles, material culture and values of the Roman colonists), which establish a long Roman presence and influence well beyond the network of military installations and associated settlement. While there is no evidence of Roman activity within the Site, to its west the projected alignment of the Roman road between Cardiff and the fort at Castell Collen (CPAT HER Ref. PRN14011 and PRN14019; SM Ref. RD001). Further to the west, in the Wider Study Area, are the remains of a Roman fortlet at Diserth (SM Ref. RD137). Dated to the AD 70s, this fort may represent one of the earliest Roman incursions into what became Wales.

7.14 The reorganisation of society and transfer of political and military control following the collapse of the Roman administration resulted in the establishment of a number of competing independent kingdoms. While there is no evidence for this period within the Site evidence for early medieval (AD 410 – 1100) activity and settlement of this period is indicated by placenames with the prefix ‘Llan’ which indicates the presence of a post-Roman / early medieval Christian church site and associated settlement, that has continued as the focus of later settlement. Those in the study areas include Llanfaredd, Llanelwedd and Llanbadarn-Y-Garreg. Physical evidence for this period includes the moated site at Cwrt Llechrhyd (SM Ref. RD140) in the Core Study Area, which was built between AD 750 and AD 1040, and a stone with a carved cross probably dating to the AD 700 – AD 900 embedded into the floor of a church at Painscastle (SM Ref. RD101) located in the Wider Study Area.

7.15 Located within the Site, the medieval or post-medieval deserted settlement at Aberedw Hill (SM Ref. RD166) includes a long house and building platforms. There is similar evidence of medieval and post-

medieval habitation, land-use and agricultural practices within the Site including the deserted settlement at Cwm-blaen-erw (CPAT HER Ref. PRN167241) and Meilwn Brook (CPAT HER Ref. PRN167239). These abandoned settlements are found in sheltered locations off the higher ground on the lower slopes and in the sheltered valleys with the Site. Similarly, evidence of post-medieval agricultural activity and associated occupation is largely focused on the more fertile and easier to cultivate lower slopes of Aberedw Hill. At the centre of the Site, at the top of the narrow valley which runs north-west from Blaenmilo-uchaf, is Pen-Blaen-Meilwn rabbit warren (CPAT HER Ref. PRN130170). The warren comprises at least eight pillow mounds, rectangular or circular earthworks with a shallow ditch and internal stone tunnels and chambers forming an artificial rabbit warren. These evidence the 'farming' of rabbits during the medieval and post-medieval period for their fur and meat.

7.16 The charged political environment resulting from the wrestling for control of the Welsh Marches following the Norman conquest and Welsh Wars of Independence is evidenced in the number of mottes, earthwork and timber castles, recorded in the study areas. Many of the surviving mottes are scheduled monuments and evidence this time of military control over the contested marches. They are strategically located to enable the occupants to exert a level of control over the local environs as well as the movement of people through the landscape. There are eight examples of earthwork and timber castles within the Core Study Area, including Fforest Wood Mound & Bailey Castle (SM Ref. RD075), Colwyn Castle (SM Ref. RD035) and Penarth Mount Castle Mound (SM Ref. RD076) to the north. To the south at Aberedw village, overlooking the floodplain of the River Wye, is the remains of a stone castle (SM Ref. RD029) almost certainly built between c.1284-5, for Walter Hakelutel, following the defeat of the Welsh under Llywelyn ap Gruffudd.

7.17 Within the Site to south above the Wye Valley is evidence of post-medieval quarrying with a number of quarry pits (CPAT HER Ref. PRN166558) entered on the CPAT HER. Similar evidence of localised small-scale stone extraction, probably for local use, is recorded elsewhere within the Site. The majority of the historic assets dating to be post-medieval period are buildings and features, such as trackways, which have been recorded on historic OS mapping but have since been abandoned. Following abandonment of the medieval and post-medieval farmsteads and small agricultural settlements, the 20th century has made little impact on the landscape of on Aberedw Hill. Although a commemorative stone of green volcanic tuff (CPAT HER Ref. PRN167224) erected to mark the millennium has been constructed on top of one of the scheduled prehistoric round barrows on Aberedw Hill (SM Ref. RD074).

7.18 Listed buildings are present throughout the study areas with clusters in historic settlements (towns, villages and hamlets), including those within the conservation areas at Builth Wells and Llandrindod Wells. Most of the listed buildings are of post-medieval date and range between domestic structures,

those associated with an agricultural or commercial function, milestones and bridges. Listed buildings with surviving architectural elements of medieval interest are ecclesiastical buildings and are Grade I or II*, such the Church of St David, Glaschw (LB Ref. 8780) in the Core Study Area. These buildings represent relatively discrete assets whose settings are related to their function or the settlements they are located within.

7.19 The location of historic assets identified within the Site are shown on **Figure 7.1**.

7.20 The Core Study Area contains numerous historic assets, these comprise:

- 56 scheduled monuments;
- 128 listed buildings (one Grade I; eight Grade II*; 119 Grade II);
- Builth Wells Conservation Area;
- Pencerrig Registered Historic Park and Garden (PGW(Po)19(POW); and
- 3335 CPAT HER entries.

7.21 The location of designated historic assets within the Core Study Area are shown on **Figure 7.2**.

7.22 The following further designated historic assets are located within the Wider Study Area, as shown in **Figure 7.2**:

- 65 scheduled monuments;
- 179 listed buildings (two Grade I; 11 Grade II*; 166 Grade II);
- Llandrindod Wells Conservation Area; and
- Llangoed Hall and Llandrindod Wells Public Parks registered historic parks and gardens (PGW(Po)12(POW); PGW(Po)20(POW)).

Proposed Surveys and Assessment Methodology

Legislation, Policy and Guidance

7.23 The assessment of likely significant effects of the Proposed Development will be carried out in accordance with the principles contained within the following documents:

- Welsh Government (2021) Planning Policy Wales (PPW)⁷⁰;

⁷⁰ Welsh Government (2021) Planning Policy Wales available at <https://www.gov.wales/planning-policy-wales>

- Welsh Government (2017) Technical advice note (TAN) 24: the historic environment⁷¹;
- Cadw (2011) Conservation Principles for the sustainable management of the historic environment in Wales (the 'Conservation Principles')⁷²;
- Cadw (2017) Setting of Historic Assets in Wales ('Cadw's setting guidance')⁷³;
- Cadw (2017) Heritage Impact Assessment in Wales⁷⁴;
- Chartered Institute for Archaeologists (CIfA) (2017) Standard and guidance for historic environment desk-based assessment⁷⁵; and
- Institute of Environmental Management and Assessment, CIfA and Institute of Historic Building Conservation (IHBC) (2021) Principles of Cultural Heritage Impact Assessment in the UK⁷⁶.

Proposed Study Area

7.24 The following study areas are proposed:

- **The Site** – the potential for direct and indirect physical effects and effects related setting change in all historic assets (i.e. designated and non-designated) would be considered;
- **Core Study Area** – land within 5 km from the Site over which the potential for effects related to setting change to all historic assets would be considered; and
- **Wider Study Area** – land beyond 5 km but within 10 km from the Site over which the potential for effects related setting change to designated historic assets would be considered.

7.25 In addition, designated historic assets beyond 10 km would be screened, and any asset with the potential to experience significant effects due to setting change would be included in the baseline for the assessment.

⁷¹ Welsh Government (2017) Technical advice note (TAN) 24: the historic environment available at <https://www.gov.wales/technical-advice-note-tan-24-historic-environment>

⁷² Cadw (2011) Conservation Principles for the sustainable management of the historic environment in Wales available at <https://cadw.gov.wales/advice-support/historic-assets/conservation-principles>

⁷³ Cadw (2017) Setting of Historic Assets in Wales available at <https://cadw.gov.wales/sites/default/files/2019-05/Setting%20of%20Historic%20Assets%20in%20Wales%20EN.pdf>

⁷⁴ Cadw (2017) Heritage Impact Assessment in Wales available at <https://cadw.gov.wales/sites/default/files/2019-05/20170531Heritage%20Impact%20Assessment%20in%20Wales%2026917%20EN.pdf>

⁷⁵ CIfA (2017) Standard and guidance for historic environment desk-based assessment available at https://www.archaeologists.net/sites/default/files/CIfA%26GDBA_4.pdf

⁷⁶ Institute of Environmental Management and Assessment, CIfA and Institute of Historic Building Conservation (IHBC) (2021) Principles of Cultural Heritage Impact Assessment in the UK available at https://www.archaeologists.net/sites/default/files/i30361_iema_principlesofchia_v8.pdf

Desk-based study

7.26 A desk-based study would identify the key characteristics of the Site and surrounding environment and would collate baseline information from available sources to inform the subsequent field survey. The desk-based study would involve review of but would not be restricted to:

- Updated data on designated historic assets identified in the Information Sources section above;
- Updated CPAT HER data;
- Published sources on the archaeological and historical background of the area;
- Historic mapping, including archival sources such as tithe maps;
- Aerial photography – both recent digital and historic coverage (historic aerial coverage is held by RCAHMW and Welsh Government);
- Publicly accessible LiDAR data;
- ZTVs and visualisations; and
- Findings of other relevant topics (Landscape and Visual Amenity, Hydrology, Hydrogeology and Geology).

Field Studies

7.27 Given the extent of previous detailed archaeological survey within the Site, field survey would comprise a targeted walkover survey to inform the assessment. This would focus on areas of the Site not previously the subject of RCAHMW archaeological survey, infrastructure locations and site visits to historic assets with the potential to experience significant effects related to setting change (where access is permitted). Should any previously unknown historic assets be identified during the walkover survey, an appropriate record (i.e. location, extent, apparent form of and significance of asset) would be made. A photographic record would be made of the walkover survey and site visits and a selection of images utilised in the baseline reporting.

7.28 The results of the assessment process would be reported as a Historic Environment Desk-based Assessment (HEDBA). The ES chapter will include an appropriate summary of the conclusions of the HEDBA, plus any other supporting surveys / studies, and detail the likely significant effects of the Proposed Development upon Archaeology and Cultural Heritage.

7.29 Consultation would be undertaken with Cadw and CPAT as appropriate, post-scoping to establish the requirement for and scope of any archaeological field survey, such as targeted geophysical survey,

that may be required to aid the design evolution and to provide appropriate baseline information in the ES.

Assessment Method

7.30 In historic environment policy and guidance, the significance, hereafter referred to as ‘heritage significance’ to disambiguate from the EIA concept of ‘significance’, of a historic asset comprises a series of qualities, known as ‘heritage values’. The heritage significance of assets would be articulated using Conservation Principles. Informed by Cadw’s setting guidance, this would include assessment and discussion of how an historic asset’s setting contributes to its heritage significance.

Importance

7.31 Whilst heritage values help describe the heritage significance of historic assets, they do not articulate the relative importance of assets. For the purposes of the ES, the ‘importance’ of assets would be ascribed using the following criteria, informed by the designation criteria and the Research Framework for the Archaeology of Wales⁷⁷:

- **High** – historic assets of national significance. This would comprise designated historic assets and non-designated assets of demonstrably equivalent importance;
- **Medium** – historic assets of regional importance. Identified with reference to regional priorities from the Research Framework for the Archaeology of Wales; and
- **Low** – historic assets of local importance.

7.32 All effects would be assessed in terms of the way in which the Proposed Development would, either physically or through setting change, affect the significance of the historic asset. This would be articulated with reference to Conservation Principles. In articulating effects, a judgement would be made on the level of harm or benefit a historic asset would experience as a result of the Proposed Development, supported by an appropriate narrative linking this to how the asset would have its significance changed. Assessment of effects related to setting change would be undertaken using the staged approach laid out in the Cadw’s setting guidance. In articulating effects, a clear statement would be made as to whether the effect is considered to be significant in EIA terms.

7.33 There is currently no relevant professional guidance covering what constitutes an effect which is significant in EIA terms. In the absence of such guidance, this judgment would be made based on the level of direct physical, and / or other effects, to each asset. Although this would be evaluated on an

⁷⁷ A Research Framework for the Archaeology of Wales, available at: <https://archaeoleg.org.uk> (accessed 04/10/2023)

asset-by-asset basis it is expected that an effect to an asset of at least regional significance, and results in either its total removal or very much reduces its heritage significance, would be significant. This does not rule out significant effects arising as a result of other levels of effect to assets of lower levels of importance. The potential for such effects to be significant in EIA terms would be kept under review during the course of the EIA.

7.34 There is no industry-wide accepted methodology for the assessment of cumulative effects to historic assets within EIA. The assessment of cumulative effects would review the agreed list of cumulative schemes for the Proposed Development and identify whether any further effects (i.e. effects that would not be caused solely by the Proposed Development itself) would arise. This assessment would be undertaken and articulated in the same terms as the assessment of the effects of the Proposed Development in its own right.

7.35 Where relevant, asset-based ZTVs and visualisations would be prepared to support the assessment and articulation of effects. This may include visualisations to support the cumulative assessment. The need for asset-based ZTVs and visualisations would be agreed in consultation with relevant consultees.

Likely Significant Effects

7.36 At this stage, likely significant effects scoped into the ES (See **Table 7.1**), including cumulative effects, associated with the construction and / or operation of the Proposed Development include:

- Direct physical effects to historic assets arising from construction; and
- Effects related to change in the setting of assets during operation.

Likely Effects Scoped Out

7.37 On the basis of the work undertaken to date, the professional judgement of the assessment team and experience from other similar projects and consultation responses, it is proposed that the following effects can be scoped out due to the design evolution process and implementation of standard good practice construction measures (See **Table 7.1**):

- Direct physical effects to historic assets during operation and maintenance (since direct physical effects would only occur during construction);
- Direct physical effects to assets beyond the land required for construction;
- Effects resulting from change in the setting of assets during construction due to the temporary nature of construction activities;

- Indirect physical effects resulting from construction; and
- Effects during decommissioning.

Decommissioning

7.38 At the end of the operational phase, the Proposed Development would either be decommissioned, or its operational lifetime extended through an application. Decommissioning would involve the removal of all above ground infrastructure such as the wind turbines. Effects are not expected to be significant and would therefore be scoped out.

Table 7.1: Proposed Scope of ES Chapter

Topic	Scope In/Out	Justification
Direct physical effects to historic assets arising from construction	Scoped In	Potential for Likely Significant Effects
Effects related to change in the setting of assets during operation	Scoped In	Potential for Likely Significant Effects
Cumulative effects	Scoped In	Potential for Likely Significant Effects
Direct physical effects to historic assets during operation and maintenance	Scoped Out	Direct physical effects will only occur during construction
Direct physical effects to assets beyond the land required for construction	Scoped Out	There will be no direct physical effects to historic assets beyond the land required for construction as direct physical effects can only occur within the areas where construction will take place.
Effects resulting from setting change during construction	Scoped Out	Direct effects resulting from setting change during

Topic	Scope In/Out	Justification
		construction due to the temporary nature of construction activities.
Indirect physical effects resulting from construction	Scoped Out	Given the nature of the receiving environment and the Proposed Development indirect physical effects are not predicted to occur to historic assets beyond the land required for construction.
Effects during decommissioning	Scoped Out	Decommissioning of the Proposed Development will be carried out in line with the legislation and guidance current at the time of decommissioning.

Approach to Mitigation

7.39 In the first instance the Proposed Development would seek to avoid and minimise as far as reasonably practicable effects through design. Where interaction cannot be completely avoided, good practice and additional mitigation measures to prevent, reduce, and / or where possible offset these effects would be proposed. This is likely to include control measures within the outline CEMP.

7.40 Owing to the nature of the Proposed Development, it is envisaged that mitigation is likely to focus on addressing direct physical effects to historic assets, particularly those to below-ground assets (archaeological remains). The approach to mitigation would be guided by industry common practice and appropriate procedures as laid out in the relevant ClfA standards and guidance documents.

Questions

Questions for Consultees

Question 7.1: Do consultees consider the study areas appropriate?

Question 7.2: Are there any other relevant consultees who should be consulted about this topic?

Question 7.3: Are consultees aware of any other supplementary guidance of relevance to assessment of effects to historic assets?

Question 7.4: Is the approach to the assessment of effects, including those effects scoped in and out and the cumulative assessment, appropriate?

Question 7.5: Is the approach to field survey considered appropriate?

Question 7.6: Are consultees content with the proposed approach to scope out 'Likely Effects Scoped Out' from the ES?

Question 7.7: Are consultees aware of any non-statutory stakeholders that should be consulted?

Chapter 8

Water and Soil Resources

Introduction

8.1 This chapter presents the proposed scope of work for the assessment of likely significant effects of the Aberedw Energy Park upon the hydrology, hydrogeology and geology (referred to as Water and Soil Resources) of the Site. The Water and Soil Resources chapter of the ES will include an assessment of flooding, water quality and water resources, including consideration of spring lines, flushes and groundwater dependent terrestrial ecosystems (GWDTEs). The geological assessment includes soils, geoconservation and geodiversity. Peat is addressed separately within **Chapter 9**.

8.2 This chapter has been prepared by Yellow Sub Geo Ltd.

8.3 There are interrelationships related to the potential effects on Water and Soil Resources. Therefore, please also refer to the following chapters:

- **Chapter 5: Non-Avian Ecology;** and
- **Chapter 9: Peat.**

Study Area

8.4 The study area comprises the area that could be directly affected by the Proposed Development with a 250 m buffer within which potential effects may occur. Specific features of interest that lie outside of the buffer zone may be included where required for example, if there is a particular hydraulic catchment of interest. The study area is shown on **Figure 8.1**.

Existing Conditions

Information Source

8.5 The following sources of information have been reviewed during the desk-based research for this Scoping Report and will be considered in the assessment in the ES:

- Topographical information at the Site is provided by OS mapping and LiDAR data⁷⁸;
- Designated nature and conservation sites have been identified using information from NRW's mapping database⁷⁹;
- Solid and superficial geological information is provided by British Geological Survey (BGS) mapping, the UK Soil Observatory Map viewer⁸⁰ and Cranfield Soilscales⁸¹;
- Information relating to aquifers is provided by BGS Geoindex⁸²;
- Flood risk at the Site is indicated by the Natural Resources Wales (NRW) online flood maps,⁸³ and
- Information pertaining to water resources and water quality at and near the Site is given by NRW river basin management plans⁸⁴, NRW Water Watch Wales map gallery and Cycle 3 rivers and waterbodies mapping⁸⁵.

Geology and Soils

8.6 The Site spans across 1:50k scale BGS Sheets 197 (Hay-on-Wye) and 196 (Builth Wells). The two sheets have differing levels of mapping detail, resulting in more detailed mapping being available for the west of the Site than the east. The east of the Site is simply mapped as Silurian Rocks (undifferentiated), whereas the west of the Site is mapped (from north to south) as the Builth Mudstone Formation, the Irfon Formation (mudstone and siltstone), the Irfon Formation (slumped mudstone and slumped siltstone, and the Cwm Graig Ddu Formation (mudstone, siltstone and sandstone). All of these are of Silurian age.

8.7 Superficial Deposits onsite mainly comprise glacial till which typically outcrops across lower elevations, and is present across the agricultural fields at the northern most point of Site and within the two valleys which extend southwards between Aberedw Hill and Llan-fraith Hill. There is also a small linear deposit of Head associated with Milo Brook in the south of the Site, a small outcrop of Alluvium in the north of the Site near the A481 and two small deposits of peat towards the centre of the Site. Peat is discussed further in **Chapter 9**.

⁷⁸ LLE Geo-Portal. Available at: <http://lle.gov.wales/GridProducts#data=LidarCompositeDataset>

⁷⁹ Geocortex Viewer for HTML5. Available at: cyfoethnaturiolcymru.gov.uk.

⁸⁰ UKSO. Available at: <https://mapapps2.bgs.ac.uk/ukso/home.html>

⁸¹ Soilscales Viewer. Available at: <https://www.landis.org.uk/soilscales/>

⁸² BGS GeoIndex Onshore. Available at: <https://mapapps2.bgs.ac.uk/geoindex/home.html>

⁸³ Check your flood risk on a map (Flood Risk Assessment Wales Map). Available at: <https://naturalresources.wales/flooding/check-your-flood-risk-on-a-map-flood-risk-assessment-wales-map/?lang=en>

⁸⁴ River basin management plans. Available at: <https://naturalresourceswales.gov.uk/evidence-and-data/research-and-reports/water-reports/river-basin-management-plans/?lang=en>

⁸⁵ DataMapWales. Available at: https://datamap.gov.wales/maps/new?layer=geonode:nrw_wfd_cycle_3_classifications#

8.8 BGS mineral resource maps for Wales⁸⁶ indicate the Alluvium deposit in the north of Site is designated as a mineral resource for sand and gravel; this covers an area of approximately 360 m².

8.9 Cranfield Soilscales categorises the majority of soils onsite as Soilscale 13, described as freely draining acid loamy soils over rock. The southern portion of the valley associated with Cwmblaenerw Brook is classified as Soilscale 6, defined as freely draining slightly acid loamy soils. As both these soil types are freely draining, they are anticipated to drain to local groundwater and the river network. The peak of Aberedw Hill is classified as Soilscale 16, very acid loamy upland soils with a wet peaty surface. Drainage within Soilscales is described as surface wetness and anticipated to drain to the local stream network. The northern portion of the valley where Milo Brook runs, is classified as Soilscale 19 and the southern portion of the valley as Soilscale 17. These are described as slowly permeable wet very acid upland soils with a peaty surface and as slowly permeable seasonally wet acid loamy and clayey soils respectively. These both are defined as having impeded drainage and draining to the stream network. Peat soils are discussed further in **Chapter 9**.

8.10 NRW mapping does not show any Geological Conservation Review Sites, geological SSSIs or Regionally Important Geological Sites (RIGS) on or within 250 m of the Site.

8.11 The geological landscape of the Site is classified as high in the LANDMAP landscape and visual impact assessment tool⁸⁷.

8.12 There are steep slopes present across the Site typically associated with the gullies and valleys which lie between Aberedw Hill and Llan-fraith Hill. However, the BGS does not map any areas of slope instability onsite, and no visual signs were recorded during a walkover survey by Yellow Sub Geo Ltd in September 2023.

8.13 According to BGS mapping⁸⁸ there are 24 quarries onsite, none of which are operational.

Hydrology

8.14 The Site lies across the catchments of the Camnant Brook, River Edw and River Wye. All three catchments have a 'Good' overall status as defined by the Water Framework Directive (WFD). The River Edw headwaters drain the majority of the Site, the Camnant Brook catchment covers a small area at the north of the Site and the River Wye catchment the western edge of the Site. The Camnant Brook and River Edw are both tributaries of the River Wye, with the River Edw joining the River Wye 1.35 km south of the Site in Aberedw. Cwmblaenerw Brook and the tributaries of Milo Brook which follow the two

⁸⁶ Minerals. Available at: <https://en.powys.gov.uk/article/5444/Minerals?ccp=true#cookie-consent-prompt>

⁸⁷ LandMap Geological Landscape. Available at: https://datamap.gov.wales/layers/inspire-nrw:NRW_LANDMAP_Geological_Landscape

⁸⁸ BGS Mapping. Available at: https://map.bgs.ac.uk/arcgis/services/GeolIndex_Onshore/minerals_wms/MapServer/WmsServer

valleys extending southwards between Aberedw Hill and Llan-fraith Hill drain into the River Edw and ultimately the River Wye.

8.15 The River Wye and its tributaries are designated as a SSSI and SAC. This includes the Colwyn Brook, which lies adjacent to the north of the Site, near the A481 and the River Edw, which lies 200 m east of the Site at its closest point near Cregina. The River Wye is located approximately 50 m west of the Site at its closest point. The Colwyn Brook Marshes are also designated as an additional SSSI, which extends onto the north of the Site. Further details are provided in **Chapter 5**.

8.16 In addition to these watercourses, the Site has several small discrete pools and ponds many of which, based on the walkover survey by Yellow Sub Geo Ltd in September 2023, are considered likely to be manmade as they typically comprise livestock watering holes. These are typically located within topographical hollows within the upland landscape. The largest being Llyn Cawr, approximately 70 m in length on Aberedw Hill.

Flooding

8.17 Data available from NRW indicates that the majority of the Site is within Flood Zone 1 (low risk). Small areas of the Site are within medium and high-risk flood zones (Flood Zones 2 or 3). However, these are all within well-defined valley/ channel systems which drain upland areas. There is also a medium risk of flooding (Flood Zone 2) associated with the River Wye adjacent to the south-west of the Site (**Figure 8.1**).

Hydrogeology

8.18 The bedrock across the Site is classified by NRW as a Secondary B aquifer. These are defined as a 'predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. The aquifer underlying the Site is rated as being 'low productivity'⁸⁹.

8.19 The superficial Glacial Till which covers the very northern extent of the Site and the two valleys which extend southwards between Aberedw Hill and Llan-fraith Hill, and the Head Deposit associated with Milo Brook, are both classified as Secondary (undifferentiated) Aquifers. These are aquifers where it is not possible to apply either a Secondary A or B definition and, because of the variable characteristics of the rock type, they have only a minor value.

⁸⁹ Groundwater Productivity- UK. Available at: <https://mangomap.com/land-information/maps/54498/groundwater-productivity-uk#>.

8.20 The Alluvium deposit which outcrops in the north of the Site is classified as a 'Secondary A Aquifer'. These comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers.

8.21 According to the BGS, groundwater vulnerability across the majority of the Site is medium to high.

8.22 There are numerous springs present onsite, forming headwaters to the streams that drain the upland areas. These springs are likely formed via a combination of groundwater seepage and soil throughflow.

8.23 Powys County Council (PCC) has provided information relating to private water supplies on and near to the Site. As a result of this request, there are 16 recorded private water supplies (PWS). At present, in the absence of a hydrogeological assessment, the closest (on and within 50 m of the Site) and therefore most critical receptors include:

Onsite:

- Upper Blaenmilo, Aberedw, Builth Wells, Powys, LD2 3UP; and
- Edw Country Wines, Glyn Farm, Aberedw, Builth Wells, Powys, LD2 3UH.

Within 50 m of the Site there are a further two private water supplies at the following addresses:

- Ffynnonau, Hundred House, Llandrindod Wells, Powys, LD1 5RU (10 m from Site); and,
- Fforest Farm, Hundred House, Llandrindod Wells, Powys, LD1 5RT (49 m from Site).

8.24 As part of the assessment process, all PWS will be mapped and considered based on their source (e.g. surface or groundwater) and in the context of the Proposed Development and potential pathways whereby impacts may occur.

Future Baseline

8.25 The future baseline relates to known or anticipated changes to the current baseline in the future which should be assessed in the ES.

8.26 With regard to flood risk and drainage, future baseline conditions would be forecast by NRW, drawing on current best practice guidelines taking into account the likely impacts of climate change on rainfall intensities and where applicable peak river flows.

8.27 The assessment in the ES will consider the future scenario with respect to climate change resilience in regard to flood risk and managing surface water runoff.

8.28 The implementation of future cycles of WFD management plans driving future improvements in the ecological and chemical quality of water bodies would also be considered. However, under the 'do

nothing scenario' based on current and future predicted agricultural practices together with future development, there is a likelihood that water quality in the identified watercourses will deteriorate due to the influx of nutrients (phosphate) from farming activities.

8.29 In relation to geology and soils, there are no foreseeable notable changes anticipated either prior to, or during, the construction and operational phases.

Proposed Surveys and Assessment Methodology

Legislation, Policy and Guidance

8.30 The following will inform the approach to the design and assessment of the Proposed Development:

Legislation

- Control of Pollution Act 1974⁹⁰;
- Environmental Protection Act 1990⁹¹;
- Environment Act 1995⁹²;
- Flood and Water Management Act (2010)⁹³;
- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017⁹⁴;
- The Groundwater (England and Wales) Regulations (2009)⁹⁵;
- UK Water Quality (Water Supply) Regulations 2010⁹⁶;
- The Water Framework Directive⁹⁷; and
- The Contaminated Land (Wales) (Amendment) Regulations 2012 and associated Contaminated Land Statutory Guidance for Wales (2012)⁹⁸.

⁹⁰ Control of Pollution Act 1974. Available at: <https://www.legislation.gov.uk/ukpga/1974/40>.

⁹¹ Environmental Protection Act 1990. Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>.

⁹² Environment Act 1995. Available at: <https://www.legislation.gov.uk/ukpga/1995/25/contents>.

⁹³ Flood and Water Management Act 2010. Available at: <https://www.legislation.gov.uk/ukpga/2010/29/contents>.

⁹⁴ The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Available at: <https://www.legislation.gov.uk/uksi/2017/407/contents/made>.

⁹⁵ The Groundwater (England and Wales) Regulations 2009. Available at: <https://www.legislation.gov.uk/uksi/2009/2902/contents/made>.

⁹⁶ The Water Supply (Water Quality) Regulations 2010. Available at: <https://www.legislation.gov.uk/wsi/2010/994/contents/made>.

⁹⁷ The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Available at:

<https://www.legislation.gov.uk/uksi/2017/407/contents/made>.

⁹⁸ The Contaminated Lands (Wales) (Amendment) Regulations 2012. Available at: <https://www.legislation.gov.uk/wsi/2012/283/made>.

Policy

- Planning Policy Wales, Technical Advice Note (TAN)15 Development and Flood Risk (2004)⁹⁹; and
- Powys County Council, Local Development Plan (2011 – 2026)¹⁰⁰.

Guidance

- PCC Strategic Flood Consequence Assessment (2012)¹⁰¹;
- Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems (DEFRA, March 2015)¹⁰²;
- PCC Preliminary Flood Risk Assessment (2017 addendum)¹⁰³;
- Land Use Planning System SEPA Guidance Note 31 Version 3 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (2017)¹⁰⁴;
- Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems (Welsh Government 2018)¹⁰⁵;
- PCC Guidance for Pre-Application Approval and Full Application Approval of SuDS on new developments (2018)¹⁰⁶;
- Sustainable Drainage Systems (SuDS) Statutory Guidance (Welsh Government 2019)¹⁰⁷;
- Land Contamination Risk Management Guidance pages, the Land Contamination Technical Guidance pages and on the Land Affected by Contamination Pages of gov.uk¹⁰⁸; and
- Contaminated land risk assessment. A guide to good practice. CIRIA C552, 2001.

⁹⁹ Technical advice note (TAN) 15: development and flood risk (2004). Available at: <https://www.gov.wales/technical-advice-note-tan-15-development-and-flood-risk-2004>.

¹⁰⁰ Adopted LDP (2011-2026). Available at: <https://en.powys.gov.uk/article/4898/Adopted-LDP-2011---2026>.

¹⁰¹ Powys County Council: Strategic Flood Consequence Assessment Stage 1. Available at: https://en.powys.gov.uk/media/5851/Strategic-Flood-Consequence-Assessment---Stage-1-2012/pdf/ngStrategic_Flood_Consequence_Assessment_-_Stage_1_2012.pdf?m=1538146037010.

¹⁰² Sustainable Drainage Systems. Non-statutory technical standards for sustainable drainage systems March 2015. Available at: <https://assets.publishing.service.gov.uk/media/5a815646ed915d74e6231b43/sustainable-drainage-technical-standards.pdf>

¹⁰³ Flood Risk Management. Available at: <https://en.powys.gov.uk/article/5575/Flood-Risk-Management>.

¹⁰⁴ Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Available at: <https://www.sepa.org.uk/media/144266/lups-qu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf>.

¹⁰⁵ Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems. Available at: <https://www.gov.wales/sites/default/files/publications/2019-06/statutory-national-standards-for-sustainable-drainage-systems.pdf>.

¹⁰⁶ Flood & Water Management Act 2010 Schedule 3 Sustainable Drainage SuDS Scheme Application for SuDS Approving Body (SAB) Approval – Wales. Available at https://en.powys.gov.uk/media/9045/Powys-CC-Pre-App-Form-FINAL-Version-05-11-18-eng/pdf/s0Powys_CC_Pre-App_Form_FINAL_Version_05_11_18_eng.pdf?m=1646060234673.

¹⁰⁷ Sustainable Drainage (SuDS) Statutory Guidance. Available at: <https://www.gov.wales/sites/default/files/publications/2019-06/statutory-guidance.pdf>.

¹⁰⁸ Land affected by contamination. Available at: <https://www.gov.uk/guidance/land-affected-by-contamination>.

Assessing Significance

8.31 The following criteria have been defined for use in assessing the sensitivity of receptors, the magnitude of anticipated change to receptors caused by the Proposed Development and the resulting magnitude of effect that is created. The assessment will be based on experience and professional judgement, guided by criteria which will be set out in the ES. Likely significant effects, in the context of the EIA Regulations would be effects of moderate or major significance.

Sensitivity

8.32 Table 8.1 below provides the framework for defining the sensitivity of receptors. There is no negligible sensitivity classification as this is not considered appropriate in the context of hydrological, geological and hydrogeological receptors.

Table 8.1: Classification of sensitivity

Classification	Definition	Receptors
High	The receptor has little ability to absorb change without fundamentally altering its character, is of high environmental value, or of international importance.	■ River Wye SSSI and SAC; ■ Colwyn Brook and River Edw SSSI; ■ Colwyn Brook Marshes SSSI; ■ GWDTEs that are highly dependent on groundwater and local infiltration; ■ Public water supplies or private abstractions that supply more than 25 people or 100 livestock; ■ Principal aquifers; and ■ Active floodplain that protects residential properties.
Medium	The receptor has moderate capacity to absorb change without significantly altering its character, has some environmental value, or is of regional or national importance.	■ Active floodplain protecting industrial properties; ■ Construction workers;

Classification	Definition	Receptors
		■ GWDTes which are moderately dependent on groundwater and local infiltration; ■ Private water abstractions supplying less than 25 people or 100 livestock; ■ Secondary aquifers; and ■ Wider catchment area of a SSSI or SAC.
Low	The receptor has high capacity to absorb change without significantly altering its character, has low environmental value, or is of local importance.	■ Active floodplain in a low risk flood zone; ■ GWDTes that are moderately dependent on groundwater but independent of local infiltration; ■ Soils which are suitable only for grazing; and ■ Groundwater that is of low quality or permeability and unexploited.

Magnitude of Change

8.33 The potential changes brought about by the Proposed Development are identified and classified according to their magnitude of change. These changes are adverse unless specifically labelled as being beneficial. The categories of the magnitude of change are defined below with example definitions provided (**Table 8.2**).

Table 8.2: Classification of magnitude of change

Classification	Example definitions
Large	Construction phase: Activities result in a major pollution release (Category 1) or create / remove a pollutant linkage with a substantial pollutant source. Serious risk / improvement to human health / life. Fundamental changes to hydrology e.g. loss of regionally important public water supply. Operational Phase: The Proposed Development introduces or removes a large-scale source of potential contamination or a pollutant linkage for the same.
Medium	Construction phase: Activities result in a moderate pollution release (Category 2) or create / remove a pollutant linkage with moderate pollutant source. Moderate risk / improvement to human health / life. Material but non-fundamental changes to the hydrology e.g. partial loss or change to an aquifer. Operation phase: The Proposed Development introduces or removes a relatively small-scale source of potential contamination or a pollutant linkage for the same.
Small	Construction phase: Activities result in a minor pollution release (Category 3) or create / remove a pollutant linkage with a minor pollutant source. Temporary pathway or receptor is introduced or removed during construction phase. Minor risk / improvement to human health. Detectable but non-material changes to hydrology e.g. minor effects on aquifers or abstractions. Operational phase: The Proposed Development introduces or removes a minor source of potential contamination or a pollutant linkage for the same.
Negligible	There would be no perceptible changes.

Significance

8.34 The predicted significance of the effect was determined through a standard method of assessment based on professional judgement, considering both sensitivity and magnitude of change as detailed in **8.35** below. Major and moderate effects are considered significant in the context of the EIA Regulations.

Table 8.3: Matrix for assessment of significance of effects

		Magnitude of change			
		Large	Medium	Small	Negligible
Sensitivity	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Negligible	Negligible

Desk-based Surveys

8.36 A desk-based assessment (the findings of which are summarised in this Scoping Report) has been undertaken to establish the baseline hydrological, hydrogeological and geological conditions of the Site. The desk-based review of baseline information will comprise:

- The determination of Site hydrogeology and geology from maps published by the BGS, Datamap Wales, SoilScapes and NRW (already progressed and findings summarised in this Scoping Report), which will inform a Soil Management Plan (SMP);
- A review of existing sources of data, including NRW water quality and flood risk, abstraction licences and identification of other water uses;
- Review of data from PCC and NRW on private water supplies, consultation with NRW with respect to water resource issues within the catchments and, a private water supply assessment; and
- A review of the Proposed Development and reports from other technical studies being undertaken, including ecological surveys which may identify areas of GWDTEs.
- A Flood Consequence Assessment (FCA) which will include:
 - Obtaining NRW flood risk and model data for the Site which will include information on the risks associated with surface water run-off and groundwater flood risk;

- Review all data in the context of the Site topography and Proposed Development;
- Consider the effects of Climate Change in accordance with current guidance; and,
- Undertake a review of the local Strategic Flood Risk Assessment (SFRA) to understand any local flooding issues, including evidence of flooding from sewers.

8.37 The FCA will consider potential risks to the Proposed Development arising from all sources of flooding. Advice will be given on the impact of flooding on the Proposed Development, where relevant. The main focus of the FCA will be demonstrating lack of detrimental impact to the catchment however, it is not envisaged that flooding will be a constraint to the Proposed Development's infrastructure itself due to the location of the flood risk zones in relation to the Proposed Development. Therefore, it is not intended to undertake any detailed modelling to inform the FCA.

8.38 An Outline Sustainable Drainage Strategy will be prepared which will consider the Proposed Development's layout and recommend suitable sustainable urban drainage systems (SuDS) in line with the SuDS hierarchy. The strategy will provide an assessment of the following aspects:

- Collation of details of the Proposed Development and Site layout in the context of the local water environment;
- Consider infiltration potential (desk based);
- Access and feasibility of connection to local surface water features and, if required, sewers;
- A review of the hydrological and hydrogeological context of the Site including proximity to SSSIs, SPA and Source Protection Zones (SPZs);
- Analysis of rainfall intensity data using the latest UK environmental datasets;
- Surface water runoff calculations undertaken using Institute of Hydrology (IH) 124¹⁰⁹ and rational methods in-line with guidance, including the effects of climate change; and
- A watercourse crossing schedule will be included along with potential impacts, benefits and, where required, mitigation to prevent the increase of flood risk up and down stream.

8.39 The outline sustainable drainage strategy will present a plan of measures to be employed across the Proposed Development. The assessment will take into account the design storm period and intensity; methods to delay and control the surface water discharged from the Site; and measures to prevent pollution of the receiving groundwater and/ or surface waters. Clear recommendations for a drainage

¹⁰⁹ Report No. 124 Flood estimation for small catchments. Available at: https://nora.nerc.ac.uk/id/eprint/7367/1/IH_124.pdf.

strategy specific to the Proposed Development's layout and topography will be incorporated into the drainage assessment detailing the mitigation measures for the attenuation of storm water runoff through the use of sustainable drainage techniques, following national guidance. Whilst not part of the planning or EIA process, the above shall be presented to the SuDS Advisory Board (SAB) to ensure it meets with current best practice and policy.

8.40 A screening phase Water Framework Directive (WFD) assessment will be undertaken and included within the ES to present the potential impacts on the affected River Basin Management Plans and, if required, how these will be mitigated.

8.41 A Preliminary Risk Assessment (Desk Study) will be undertaken for the Site including consideration of all topics covered in this chapter including:

- Geology (including RIGS/GCR sites);
- Mineral reserves, mining and landfills;
- Contaminated land; and
- Land instability.

8.42 The Desk Study will utilise all existing and proposed available data and consider potential risks to sensitive receptors in accordance with the methodology outline in CIRIA C552. The report will be appended to the ES.

8.43 An outline Soil Management Plan (SMP) will be prepared for all surficial soils including peat (see **Chapter 9**), organic topsoil and organo-mineral soils. The outline SMP will be written following consultation with the Welsh Government's Soils, Peatland and Agricultural Land Use Planning Unit and will be appended to the ES.

Field Surveys

8.44 To inform the baseline surveys, a programme of field surveys will be undertaken. These include:

- Mapping the Site for slope instability / geomorphological features;
- A preliminary assessment of near surface soils including organic and organo-mineral soils;
- Undertaking a water features survey, mapping springs, flushes, watercourses, potential GWDTEs and other relevant salient water features; and
- Preliminary estimations of stream water flows based on visual inspection only (no stream gauging).

8.45 If required following baseline surveys, the following detailed assessments will be undertaken:

- An assessment of the hydrological regime at the Site including the use of groundwater monitoring wells to assess potential impacts on GWDTEs.

Cumulative Effects

8.46 An assessment will be made of the likely significant cumulative effects of the Proposed Development in combination with other developments. The geological, hydrological and hydrogeological cumulative effects on the sensitive receptors summarised below will be assessed. This will include developments that are located on land in hydraulic connectivity with the Site e.g., within the same catchment, have the potential to cause a pollution release or create a pathway for pollutants to reach the Site or potential damage a sensitive site e.g. Colwyn Marshes SSSI.

Potential Sensitive Receptors

8.47 The following sensitive receptors have been identified and will be considered within the ES:

The Site

- Demolition, construction and maintenance workers;
- Controlled waters namely Secondary B Aquifer (bedrock), Secondary A Aquifer (Alluvium), Secondary (Undifferentiated) Aquifer (Head and Glacial Till);
- Surface water bodies including the tributaries of Cwmblaenerw Brook and Milo Brook;
- Alluvium mineral resource at north of the Site;
- Existing onsite properties;
- Private water supplies at Upper Blaenmilo and Edw Country Wine; and
- Future structures

Additional Offsite Receptors

- Controlled waters namely River Wye SSSI and SAC;
- Colwyn Brook Marshes SSSI;
- Offsite residential properties; and
- Private Water Supplies.

Likely Significant Effects

8.48 Reflecting IEMA guidance on delivering proportionate EIA (IEMA 2017), the scope and assessment assumes that relevant embedded and standard good practice applied measures will be in place. The overriding design principle for the Proposed Development will be to seek to avoid or minimise impacts on sensitive soil and water resources receptors.

Embedded and Standard Mitigation Measures

8.49 Embedded and standard mitigation measures will include:

- The FCA and Outline Sustainable Drainage Strategy;
- The Outline SMP;
- As part of the detailed pre-construction design, the findings of the Desk Study will inform a suitable environmental and geotechnical site investigation will be undertaken in accordance with current best practice including BS5930¹¹⁰, BS10175¹¹¹ and Eurocode 7¹¹² which will inform, if required, a Site remediation strategy, slope stability assessments and piling risk assessments where appropriate;
- If required, a Foundation Works Risk Assessment will be undertaken for permanent ground-based infrastructure to understand potential impacts on hydrogeology including GWDTEs and PWSs (where it has not been possible to avoid these through design). Where required, this will include suitable mitigation measures to minimise potential effects;
- The construction of the Proposed Development will be managed by use of the CEMP. This document will set out the requirements of all contractors working on the Proposed Development in adhering to environmental statutory requirements, guidance and best practice. The requirements of the CEMP will be assumed as applied mitigation within the assessment of effects during the construction phase. The Outline CEMP will include the following measures:
 - Management of surface water during the construction phase, including attenuation and settlement of surface water to reduce silt loads entering waterbodies;
 - Proper storage and use of oils, fuels and construction chemicals;
 - Provision of Site-worker accommodation and sanitation facilities;

¹¹⁰ BS 5930:2015+A1:2020

¹¹¹ BS 10175:2011+A2:2017

¹¹² Eurocodes: Building the future. Available at: <https://eurocodes.jrc.ec.europa.eu/EN-Eurocodes/eurocode-7-geotechnical-design> (accessed 28.08.2023).

- A construction phase surface water management plan; and,
 - Management and removal of waste materials.
- Works within or in close proximity to watercourses will be undertaken in accordance with relevant consents/ permits including Ordinary Watercourse Consent/ Flood Risk Activity Permit.

Construction Effects

Watercourse Pollution

8.50 Good practice standard mitigation measures within the Outline CEMP will minimise as far as reasonably practical the risk of pollution to hydrology, hydrogeology (including PWSs) and land drainage receptors during construction by removing the pathway between the source and the receptors for most of the working environment.

8.51 The most sensitive sites regarding pollution risk are where works involve watercourse crossings and/or where ground-based infrastructure are located in close proximity to watercourses. Works within watercourses and the construction of access tracks across watercourses, will be undertaken with the conditions set out within the consents and permits from the relevant authorities (e.g. Flood Risk Activity Permit or Ordinary Watercourse Consent). With the implementation of standard mitigation measures, no likely significant effects are anticipated and therefore it is proposed to scope drainage and water quality out of the ES during the construction phase.

Hydrology and Flood Risk

8.52 Based on the nature of the Proposed Development, during its construction there would be no large-scale consumptive water uses and no effects on the downstream continuity of flow in watercourses. The potential for likely significant effects on existing water interests including PWSs is therefore considered to be negligible and no significant effects on hydrology are anticipated. Therefore, it is proposed to scope this aspect out of the ES.

Drainage and Flood Risk

8.53 During the construction phase there is the potential for the Proposed Development to increase flood risk through the formation of compounds, storage of materials and other temporary works e.g. construction of access tracks and temporary watercourse crossings.

8.54 The Proposed Development will be accompanied by a FCA which is considered to be standard mitigation and best practice on a project of this scale. The FCA will assess potential flood risk from all

sources and provide suitable mitigation where required. In addition, the Proposed Development shall consider the presence of flood zones in relation to the siting of infrastructure and will be undertaken with the conditions set out within consents and permits from the relevant authorities (e.g. Flood Risk Activity Permit or Ordinary Watercourse Consent), where required. Notwithstanding the above, at present, with the potential for a temporary loss of floodplain storage and/or impediment to flood flows, flood risk from all sources during construction is proposed to be scoped into the assessment.

Hydrogeology Including GWDTEs and PWS

8.55 During the construction phase there is the potential for the alteration of groundwater flows and aquifer properties including from the introduction of foundations including piles. This may impact sensitive receptors including GWDTEs and water abstractions including PWSs. Therefore, it is proposed to scope construction effects upon hydrogeology and water abstractions into the ES.

Land Instability and Mining

8.56 Ground stability in relation to site specific ground conditions and geohazards including mining will be considered within the engineering design of the Proposed Development. The design of all infrastructure will include (in accordance with best practice and industry guidance) suitable consideration of site-specific ground conditions, potential ground instability and geohazard risks such that new infrastructure would not be adversely affected and would not generate any significant effects. Therefore, Land Instability and Mining is proposed to be scoped out of the ES.

Mineral Reserves

8.57 The Site includes a number of historic quarries and a small area of possible mineral reserves for sand and gravel in the north. This will be covered in further detail within the desk study for the Site. However, based on the limited extent of possible mineral reserves (based on the geology) it is proposed to scope mineral reserves out of the ES.

Geo-conservation

8.58 There are no RIGS/ GCR sites either on or within 250 m of the Site. Therefore, it is proposed to scope this out of the ES.

8.59 The Landscape and Visual Impact Assessment including for the geological landscape character will be considered in **Chapter 4**.

Soil Resource

8.60 The outline SMP will consider the presence of all sensitive surficial soils onsite including peat (see **Chapter 9**). Where possible, infrastructure will be designed to avoid such areas. However, where this is not possible, suitable mitigation will be recommended. Potential impacts to sensitive soils as a resource may be recognised, therefore, it is proposed to scope construction effects upon soils into the ES.

Contaminated Land Including Landfills

8.61 There are no recorded landfills present onsite or within the study area and the Site has remained in greenfield/ agricultural use throughout its history. This will be considered in further detail within the desk study but is proposed to be scoped out of the ES.

Operational effects

Watercourse Pollution

8.62 During operation of the Proposed Development, pollution impact pathways to surface watercourses will not be present as land will be reinstated following completion of the construction phase and there will be no operational discharges. Physico-chemical elements supporting WFD water body status will therefore be safeguarded.

8.63 All maintenance activities will be undertaken in accordance with best practice and manufacturer's requirements. Therefore, no likely significant effects on water quality including groundwater and, where present, PWSs are anticipated, and it is proposed that this aspect is scoped out of the ES.

Hydrology, Drainage and Flood Risk

8.64 With the implementation of recommended flood risk and drainage controls during the construction phase, there will be no significant effects on existing water receptors including PWSs when the project is operational. Therefore, it is proposed to scope out this aspect from the ES.

Hydrogeology including GWDTEs and PWS

8.65 Based on the nature of the Proposed Development, permanent infrastructure will be relatively limited e.g., wind turbines, a substation, access tracks and cable runs. However, the placement of foundations and other below ground requirements may have a permanent effect on groundwater flows and/or levels. Therefore, in the absence of further data and assessment, the potential effects on hydrogeology and water abstractions including associated sensitive receptors as identified above is proposed to be scoped in during operation.

8.66 Based on the standard/ embedded mitigation measures outlined and the Proposed Development there are no other potential operational effects proposed to be scoped into the ES.

Other Topics

8.67 No other topics are proposed to be scoped into the ES as identified in **Table 8.4**.

Decommissioning

8.68 Without mitigation, decommissioning of the Proposed Development would result in the following likely significant effects:

- If hardstanding and access trackways are to be removed, likely effects would be expected to be similar to the those associated with the construction phase, such as damage to soil resource, sedimentation, reduced water quality etc; and
- If hardstanding and access trackways are to remain in situ, likely effects would be expected not to differ from those associated with the operational phase.

8.69 At this stage, it is considered that standard/ embedded mitigation including a decommissioning phase CEMP would be implemented in a similar manner to the construction phase. Therefore, there would be no significant effects and it is proposed to scope decommissioning out of the ES.

Approach to Additional Mitigation

8.70 No additional mitigation is proposed at this stage. Where significant effects on Water and Soil have not been avoided during design and the implementation of standard good practice measures, additional geographic/receptor specific measures will be identified to avoid/reduce likely significant effects.

Proposed scope of the ES

8.71 Table 8.4 provides a summary of the proposed scope of the ES.

Table 8.4 Proposed Scope of the ES

Matter	Scoped in/out	Justification
Watercourse pollution	Construction – Out Operation – Out	Embedded mitigation and design will likely avoid significant effects to sensitive receptors.

Matter	Scoped in/out	Justification
Hydrology	Construction – Out Operation – Out	No works are proposed to Main Rivers. Where works are required within or in close proximity to ordinary watercourses (e.g. track crossings) additional surveys will be undertaken to obtain the necessary consents/ permits.
Flood risk and drainage	Construction – In Operation – Out	Significant effects covered by mitigation measures set out in the FCA and Outline Drainage Strategy for the Proposed Development and ground-based infrastructure. However potential significant effects may be identified during the construction phase including increased run off from temporary compounds and interaction with flood zones where present which may increase flood risk offsite.
Hydrogeology and water abstractions	Construction – In Operation – In	Potential temporary and permanent significant effects to sensitive receptors including secondary aquifers, private water supplies, River Wye SSSI and SAC, Colwyn Brook Marshes SSSI and GWDTEs.
Land instability and mining	Construction – Out Operation – Out	Significant effects covered by standard / embedded mitigation including desk-based surveys and geomorphological Site walkover. Post consent, all ground-based infrastructure will be investigated to confirm the ground conditions present and allow the foundation design to proceed in accordance with best practice. Project is outside of Coal Mining Development High Risk Areas.
Mineral reserves	Construction – Out Operation – Out	Mapped resource covers a very limited area (approximately 360 m ²) which is considered unlikely to be economically viable.
Geo-conservation	Construction – Out Operation – Out	None present onsite or within 250 m

Matter	Scoped in/out	Justification
including RIGS		
Soil resource	Construction – In Operation - Out	Embedded mitigation in the form of general good practice and an appropriate SMP will largely prevent significant effects. However potential significant effects may remain with loss of organic and mineral soils as a result of construction. Therefore, the ES will consider potential impacts on soils as a resource and how these may be managed throughout the construction phase to ensure that they remain suitable for reinstatement during the decommissioning phase.
Contaminated land including landfills	Construction – Out Operation – Out	There is no evidence of recorded landfills onsite, and it has remained greenfield throughout its history.

Questions

Questions for Consultees

Question 8.1: Whilst potential mineral resources are present in part of the Site, please can confirmation be sought as to if these are safeguarded and under what policy/ plan.

Question 8.2: Please can all data held on private water supplies on or near (within 250 m) the Site be provided?

Question 8.3: Please can NRW comment on the Proposed Development in relation to potential interaction with the Colwyn Brook Marshes SSSI. Particularly in relation to its geo-morphological habitats including quaking bogs, transition mires and flood plains. In addition, what actions are required to maintain a favourable condition?

Chapter 9

Peat

Introduction

9.1 This topic will include assessment of peat soils, including assessment of excavation and reuse volumes and assessment of peat landslide risk. The definition of peat will follow the Soil Survey of England & Wales (SSEW, 1980)¹¹³. Assessment of peat hydrology in relation to its relevance to peat reuse and its stability will be included, however, assessment of the overall hydrological function of the Site will form part of the assessment in **Chapter 8 (Water and Soil Resources)**. The assessment of the effects of the Proposed Development upon non-peat soils, also defined in SSEW (1980), will also be presented in **Chapter 8**.

9.2 The study area for this topic will be the Site, however, the spatial extent of assessment may be limited if peat is proven to be absent from large areas of the Site.

9.3 This chapter has been prepared by East Point Geo Ltd in conjunction with ecological and hydrological assessments delivered in other **Chapter 5 (Non-avian Ecology)** and **Chapter 8** respectively.

Existing Conditions

9.4 The Site lies on a series of steep sided hills running from Llwyn-y-wrach (398 m above Ordnance Datum) in the south to Aberedw Hill (451 m) in the north to Wylfre (410 m) and Llan-fraith Hill (386 m) in the east. British Geological Survey (BGS) superficial geology data indicate glacial till on the sideslopes and in the valley floors with small pockets of peat on Aberedw Hill and in the centre of the Site. While the Unified Peat Map of Wales replicates these peat extents, the later Data Map Wales 'Peatlands of Wales Thickness' layer (Welsh Government, 2022)¹¹⁴ shows no peat on the Site (**Figure 9.1**).

9.5 A Phase 1 peat depth survey was undertaken in summer 2023 to support scoping and initial site layout design, collecting data on a 100 m grid over the full extent of the Site (**Figure 9.2**). No peat was recorded during the survey and soil depths were recorded to be thin over the entire Site. No peat was found in probes located within the Aberedw Hill deposit shown on the Unified Peat Map of Wales,

¹¹³ Soil Survey of England and Wales (1980). Soil Survey Technical Monograph No. 14: Soil Classification for England and Wales [Higher Categories]. B.W.Avery. 1980.

¹¹⁴ Welsh Government (2022) Accessible at: https://datamap.gov.wales/layers/geonode:peatlands_of_wales_thickness (accessed Nov 23)

however, probes in the centre of the Site were positioned at the margins of the central peat deposit and further probing would be needed to verify the presence / absence of peat at this location.

9.6 Review of satellite imagery shows grassland and likely heath over most of the Site. There are no geomorphological features typical of peatlands evident on this imagery, which is in agreement with the peat depth map shown on **Figure 9.2**.

Legislation, Policy and Guidance

9.7 The following guidance documents will inform the approach to design and assessment of the Proposed Development:

- Planning Policy Wales, Edition 11 (Welsh Government, 2021);
- Planning Policy Wales, Annex to Heads of Planning Letter Dated 11 October 2023: Addressing the Nature Emergency through the Planning System: Updated National Planning Policy for Chapter 6 of Planning Policy Wales (Welsh Government, 2023);
- Guidance Note: Assessing the impact of windfarm developments on peatlands in Wales (CCW, 2010)¹¹⁵;
- Guidance on Developments on Peat – Peatland Survey (SG, SNH & SEPA, 2017)¹¹⁶;
- Developments on Peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste (Scottish Renewables & SEPA, 2012)¹¹⁷;
- Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments (2nd Edition) (Scottish Government, 2017)¹¹⁸.

Proposed Surveys and Assessment Methodology

9.8 While Phase 2 peat depth surveys will be undertaken to prove the presence or absence of peat at all final turbine locations and along track alignments, there may also be a need for interim peat depth surveys to inform layout adjustments ahead of a design freeze. These surveys will be undertaken in

¹¹⁵ Countryside Council for Wales (2010) Guidance Note: Assessing the impact of windfarm developments on peatlands in Wales. 26p.

¹¹⁶ Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only. 18p.

¹¹⁷ Scottish Renewables & SEPA (2012) Developments on Peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste. 23p.

¹¹⁸ Scottish Government (2017) Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments (2nd Edition). 84p.

accordance with industry good practice and will include recordings of soil depth as well as peat depth in order to inform a Soil Management Plan (if soil dominates over peat).

9.9 If peat is present, a geomorphological walkover survey will be undertaken to inform the peat landslide risk assessment, contribute to characterisation of peatland hydrology and aid in identification of peatland restoration and enhancement opportunities where it is appropriate and feasible to do so. Any associated habitat management measures will be detailed in the Habitat Management Plan (HMP).

9.10 If peat cannot be avoided by infrastructure, the volume of peat excavation will be calculated using the Phase 2 peat survey data and infrastructure footprints. This will include an assessment of excavations associated with earthworks and will identify appropriate reuse opportunities for excavated materials. Good practice handling and storage methodologies will also be identified and documented alongside excavation and reuse calculations in a Peat Management Plan (PMP). The assessment of excavation and reuse of non-peat soils will be undertaken by Yellow Sub Geo Ltd and will be documented as an appendix to **Chapter 8**.

Likely Significant Effects

9.11 Likely significant effects will be assessed in relation to the extent, quality and function of peat soils (if present), including both direct and indirect effects. Direct effects include removal, storage and reinstatement of excavated peat and the assessment will consider the continued viability of these soils as carbon stores, as substrates for peatland habitats and as hydrological elements of the wider landscape. Indirect effects include knock-on effects on adjacent peat soils where proposed infrastructure has the potential to disrupt hydrology, and in turn, habitats. Assessment of hydrological impacts will be undertaken in **Chapter 8** and effects on peatland habitats will be assessed as part of **Chapter 5**.

9.12 Table 9.1 provides a framework for defining the sensitivity of peat as a receptor.

Table 9.1: Criteria for Identifying Sensitivity of Receptors

Sensitivity	Criteria
High	Where peatland is identified as a qualifying feature of a site of national or international value (i.e. SSSI, SAC, NNR and Ramsar). Where peat supports mire NVC communities associated with active bog formation or is unmodified peat indicating resilience under current environmental conditions.

Sensitivity	Criteria
	Peatland that is very sensitive to hydrological change or displacement such that fundamental changes in ecosystem services (biodiversity, hydrology, carbon sequestration) would be expected following disturbance. Peat is unmodified and typically >1.0 m deep, likely to have a well-developed acrotelm / catotelm system and is likely to be actively sequestering carbon.
Medium	Where peatland is identified as a qualifying feature of a site of regional or local value (e.g. Sites of Interest for Nature Conservation (SINC), Local Nature Reserves, Local Wildlife Sites, Regionally Important Geodiversity Sites). Where peat supports mire NVC communities that are not associated with active bog formation but where there is the potential for recovery to habitats associated with active bog formation. Peatland that is likely to be sensitive to hydrological change or displacement such that measurable changes in ecosystem services (biodiversity, hydrology, carbon storage) might occur following disturbance. Peat that is unmodified and typically between 0.5 m and 1.0 m deep, or modified and typically >1.0m deep, may have an acrotelm / catotelm system and is a stable carbon store.
Low	Where peatland is not identified as a qualifying feature on a designated site but has attributes that may, particularly with active management, support future regional or local designation. Where peat supports non-mire NVC communities with some potential for recovery to mire communities with proactive restoration, or is afforested, or has been afforested with no subsequent restoration. Peatland that is unlikely to be sensitive to hydrological change or displacement (i.e. the effects of disturbance cannot be readily measured).

Sensitivity	Criteria
	Peat that is typically <0.5 m or if deeper may have a disrupted or absent acrotelm / catotelm system due to, for example forestry, and is only a locally stable carbon store or is degrading and therefore emitting carbon.
Negligible	Peatland that supports non-mire NVC communities with no potential for recovery to mire communities, even with proactive restoration. Peat is very isolated and discrete, or no peat is present (i.e. <0.3 m deep).

9.13 The potential changes associated with the proposed development will be considered in terms of their magnitude, which may be positive, in line with the categories shown on **Table 9.2** below.

Table 9.2: Criteria for Estimating Magnitude of Potential Effect

Classification	Definition
High	Substantial loss or gain of function of the peatland and its ecosystem services.
Medium	Partial loss or gain of resource and short to medium term change to ecosystem services.
Low	Minor but detectable change in quality or extent of resource, measurable but non-substantial or temporary effect on ecosystem services.
Negligible	No perceptible change to the quality or quantity of resource and no associated effects on ecosystem services.

9.14 Likely significant effects will be determined using a standard matrix approach that combines magnitude and sensitivity, is informed by detailed site survey and reflects expert judgement given experience from other similar sites in UK settings. Major and Moderate effects are considered significant in terms of the EIA Regulations.

Table 9.3: Criteria for Assessment of Significant Effects

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

Topics Scoped Out

9.15 Given the likely absence of peat identified by the Phase 1 peat survey, it is likely that there will be no significant effects on peat soils resulting from the Proposed Development. Should further peat probing identify that both direct and indirect effects on peat soils can be avoided, and by implication effects on peatland habitats and peat hydrology, the assessment of effects upon peat will be scoped out of the EIA with supporting justification provided in the ES. Otherwise, **Table 9.4** shows the scope of peatland assessment in this chapter (noting that potential significant effects on peatland habitats will be assessed in **Chapter 5**).

Table 9.4: Proposed Scope of the ES Chapter

Topic	Scope In/Out	Justification
Peatland hydrology	Construction – In Operation – In	Peatland hydrology may be affected both during and after construction depending on infrastructure placement relative to peatland resource, potentially significant effects may be mitigated by layout design and construction methodology.

Topic	Scope In/Out	Justification
Peat mass balance	Construction – In Operation – In	Peat soil carbon (displaced or affected volume being used as a proxy) may be displaced by construction or indirectly affected by changes to hydrology. Changes are most likely to occur during the construction period but may occur during operation.
Peat stability	Construction – In Construction – Out	Peat stability may be affected by construction but is unlikely to be affected in the long term once construction has ceased.
Peatland hydrology	Construction – In Operation – In	Peatland hydrology may be affected both during and after construction depending on infrastructure placement relative to peatland resource, potentially significant effects may be mitigated by layout design and construction methodology.

Approach to Mitigation

9.16 9.14 The layout of access tracks and the siting of the turbines will follow the mitigation hierarchy, avoiding peat soils and, where this is not possible, minimising overlap with peat by careful track routing and alignment of infrastructure footprints. Where overlap of infrastructure with peat is unavoidable, design and construction methodologies will be identified to minimise impacts, e.g. through the use of floating track. Opportunities to compensate for any significant effects will be explored through restoration and enhancement of peatland habitats, if present, on other parts of the Site.

Questions

Questions for Consultees

Question 9.1: NRW – in the event that interim peat depth probing (e.g. on a 25m grid) confirms the absence of peat across the Site, and that this absence is supported by both a lack of peatland habitats and a lack of geomorphological / hydrological indicators of peat, would NRW and LQAS (Land Quality Advice Service) accept that a Phase 2 peat survey is not required?

Question 9.2: NRW / LQAS – in the event that direct and indirect effects on peat soils can be demonstrably avoided, would NRW / LQAS support scoping out of a peat landslide risk assessment and peat management plan as part of the EIA (noting that a Soil Management Plan would still be delivered as part of the ES).

Chapter 10

Transport and Access

Introduction

10.1 This chapter sets out the proposed approach to the assessment of potential effects of transport and access during construction and operation of the Proposed Development.

10.2 This chapter has been prepared by Pell Frischmann Consultants Limited.

Existing Conditions

10.3 A detailed access review will be prepared to confirm the design of the junction for the Site and consultation with Powys County Council (PCC) will be held once the final access solution has been determined. Access to the site will be taken from the A481 corridor via new or existing roads or tracks.

10.4 The access junction will provide the sole access to the Site for abnormal loads associated with the turbine equipment as well as access for construction materials and the ongoing site operation traffic.

10.5 The proposed study area network is predominantly comprised of A class roads maintained by Powys County Council (PCC). These provide local access to the surrounding villages as well as links to the wider trunk road network, including the A470 and A483 to the south and west of the Site. The trunk road network is maintained by the North & Mid Wales Trunk Road Agent (NMWTRA) on behalf of Welsh Ministers.

Proposed Surveys and Assessment Methodology

10.6 A detailed site access review will be provided to support the application and will be appended to a Transport Assessment (TA). This will detail the finalised access option in detail and will outline the reasoning for the selected access option.

10.7 The finalised access option would then be used to determine the traffic impact associated with the Proposed Development. This will be assessed in the TA. The impact assessment will be summarised in the ES which will also examine the impact upon affected receptors.

10.8 The following policy and guidance documents will be used to inform the Traffic and Access Chapter:

- Future Wales – The National Plan 2040 (2021);

- Planning Policy Wales (PPW);
- Technical Advice Note (TAN) 18 Transport;
- Welsh Transport Appraisal Guidance (WelTAG) (2017);
- Strategic Traffic Management Plan (STMP); and
- Pulling Together, Best Practice for Transporting Abnormal Loads in Wales (Welsh Government, 2020).

10.9 The Environmental Assessment of Traffic and Movement (IEMA 2023) (the IEMA guidance) sets out a methodology for assessing potentially significant environmental effects. In accordance with this guidance, the scope of assessment will focus on:

- Potential impacts (of changes in traffic flows) on study area roads and the users of those roads; and
- Potential impacts (of changes in traffic flows) on land uses and environmental receptors fronting these roads, including the relevant occupiers and users.

10.10 The following rules taken from the IEMA guidance would be used as a screening process to define the scale and extent of the assessment:

- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
- Rule 2: Include highway links of high sensitivity (as defined in the IEMA guidance) where traffic flows have increased by 10% or more.

10.11 Increases below these thresholds are considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level predicted as a consequence of the Proposed Development will therefore be assumed to result in no discernible or significant environmental impact and as such no further consideration will be given to the associated environment effects.

10.12 The estimated traffic generation of the Proposed Development will be compared with baseline traffic flows, obtained from existing traffic survey data, in order to determine the percentage increase in traffic.

10.13 Potentially significant environmental effects will be assessed where the thresholds in Rule 1 or Rule 2 are exceeded. Suitable mitigation measures will be proposed, where it is appropriate and feasible to do so.

Proposed Study Area

10.14 The study area for the assessment has considered likely access routes for the delivery of raw materials. For the purposes of the assessment, it is assumed that bulk materials will be sourced from quarry and readymix sites located on the A44 corridor to the north-east of the Site.

10.15 The suggested study area is therefore defined by the following road links:

- The A44 between Kington and Crossgates;
- The A470 between Builth Wells and Bronllys;
- The A481 between Llanellwedd and Fforest Mill; and
- The A483 between Builth Wells and Crossgates.

Desk Studies

10.16 Traffic survey data would be obtained for the trunk road network from the UK Department of Transport (DfT) count database. In addition, traffic accident statistics would be obtained from Crashmap for a five-year period for the A481 corridor.

Field Studies

10.17 Automatic Traffic Count (ATC) sites will be established for one week at the following locations to provide baseline traffic data in the study.

- At the location of the site access junction;
- The A44 at Fforest Mill; and
- The A481 at Hundred House.

10.18 Traffic survey data will be factored to future year conditions using National Road Traffic Forecast Low Growth assumptions.

10.19 The Route Survey for abnormal loads will be informed via a site visit of the access route to identify the likely constraints along the access route.

Cumulative Effects

10.20 Cumulative traffic impacts will only be considered where an adjoining or neighbouring site has planning consent in place, is of a significant scale in traffic terms (i.e. has associated traffic impact of over 10%) and is therefore considered as 'committed development'. Schemes without consent cannot be

considered as being committed and would therefore be excluded. A list of significant traffic generating schemes will be agreed with the local planning authority to determine what schemes, if any, should be included in the future baseline traffic flows.

Likely Significant Effects

10.21 The key issues for consideration as part of the assessment for the construction phase will be:

- The temporary change in traffic flows and the resultant, temporary effects on the study network during the construction phase for residents and users of the study network roads;
- The physical mitigation associated with the delivery of abnormal loads;
- The design of new access infrastructure; and
- The consideration of appropriate and practical mitigation measures to offset any temporary effects.

10.22 The potential effects of these will be examined in detail.

10.23 The main transport impacts will be associated with the movement of construction traffic travelling to and from the site during the construction phase of the Proposed Development.

10.24 Each wind turbine is likely to require between 12 and 14 abnormal loads to deliver the components to the Site. The components will be delivered on extendable trailers which will then be retracted to the size of a standard HGV for the return journey.

10.25 Detailed swept path analysis will be undertaken for the main constraint points on the route from the port of entry through to the access junction to demonstrate that the turbine components can be delivered to site and to identify any necessary temporary road works. This will be presented in a Route Survey Report to be appended to the ES.

Topics Scoped Out

10.26 Once operational, it is envisaged that the level of traffic associated with the proposed energy park would be minimal. Regular weekly visits will be made to the energy park for maintenance checks. The vehicles used for these visits are likely to be 4x4 vehicles, and there may also be the occasional need for an HGV to access the energy park for specific maintenance and/or repairs. It is considered that there will be no significant effects resulting from operational traffic and therefore assessment of the operational phase will be scoped out of the ES.

10.27 The traffic generation levels associated with the decommissioning phase will be less than those associated with the construction phase. Some elements such as access roads will be left in place on the Site, where their retention is agreed with all relevant parties and as such, decommissioning traffic flows will be reduced from those encountered at the construction phase.

10.28 As such, the construction phase is considered the worst-case scenario for the assessment of the impact of construction traffic on the study area. An assessment of the impacts of the decommissioning phase would therefore not be undertaken, although a commitment to reviewing the impact of this phase would be made immediately prior to decommissioning works proceeding.

Approach to Mitigation

10.29 Standard mitigation measures that are likely to be included in the assessment are:

- Production of a Construction Traffic Management Plan (CTMP);
- The design of suitable access arrangements with full consideration given to the road safety of all road users;
- A Staff Sustainable Access Plan for the construction phase; and
- A Framework Abnormal Load Transport Management Plan.

Table 10.1: Proposed Scope of the ES

Topic	Scoped In/Out	Justification
Potential impacts for users of the road and residents along delivery routes.	Construction: Scoped In Operation: Scoped Out	Maximum impacts will occur during the peak construction period due to the change in traffic flows and effects of abnormal load delivery. This assessment will be based on percentage increase in traffic flow and reviewed against impacts on users.

Topic	Scoped In/Out	Justification
		Once operational, it is envisaged that the level of traffic associated with the Proposed Development will be negligible and therefore no detailed assessment of the operational phase of the development is proposed.
Decommissioning	Scoped Out	The traffic generation levels associated with the decommissioning phase will be less than those associated with the construction phase.

Questions

Questions for Consultees

Question 11.1: Is the proposed methodology acceptable, including what is proposed to be scoped out and the approach to the cumulative assessment?

Question 11.2: Are the proposed traffic survey locations acceptable?

Question 11.3: Is the use of National Road Traffic Forecasts (NRTF) Low Growth acceptable for the whole of the study to determine future year traffic flows?

Question 11.4: What committed development traffic flows should be included in the baseline traffic flows?

Question 11.5: Is a Framework Abnormal Load Transport Management Plan sufficient for the planning application stage?

Chapter 11

Noise and Vibration

Introduction

11.1 This chapter presents the proposed scope of work for the assessment of likely significant effects of the Aberedw Energy Park upon noise and vibration on nearby noise-sensitive receptors. This chapter has been prepared by Hoare Lea.

11.2 During construction, noise and vibration could arise from both onsite activities, such as the construction of access tracks, wind turbine foundations, the control building (substation), and from the movement of construction related traffic both onsite and travelling on public roads to and from the Site.

11.3 During their operation, wind turbines have the potential to create noise effects through both aerodynamic noise and mechanical noise. Aerodynamic noise would be caused by the interaction of the wind turbine blades with the air. Mechanically generated noise would be caused by the operation of internal components, such as, the gearbox and generator, which are housed within the nacelle of the wind turbine. However, modern wind turbines models are generally engineered to minimise the level of this mechanical noise. Other infrastructure, such as electrical or mechanical plant associated with the substation, would also represent a potential source of operational noise.

11.4 The assessment of effects of noise and vibration on sensitive receptors will be undertaken by Hoare Lea.

Existing Conditions

11.5 The Site is in a rural area, with several individual farmhouses or other noise-sensitive dwellings located within 1 to 2 km from the Site boundary. The nearest large settlement, Builth Wells, is located approximately 3 km away (see **Figure 1.1** for context) and the village of Aberedw is situated approximately 2 km to the south.

11.6 The noise environment in the surrounding area is likely to be mostly characterised by 'natural' sources, such as wind disturbed vegetation, birds, farm animals and (in some cases) watercourses. Other sources of noise will include road traffic, particularly in proximity to 'A' roads such as the A481 or A470, as well as agricultural vehicle movements and activities.

Proposed Surveys and Assessment Methodology

Legislation, Policy and Guidance

11.7 The following legislation, policy and guidance documents are pertinent to the assessment of the effects of the Proposed Development upon noise and vibration.

Legislation

- Environmental Protection Act 1990 (EPA); and
- Control of Pollution Act 1974, Part III, HMSO (CoPA).

Policy

- Planning Policy Wales (PPW, edition 11, February 2021);
- Future Wales; the National Plan 2040;
- Technical Advice Note (TAN) 11: Noise (1997)¹¹⁹;
- Noise and soundscape action plan 2018 to 2023 (2018)¹²⁰;
- Revised planning guidance in relation to air quality, noise and soundscape, draft for consultation (2022)¹²¹; and
- Draft Noise and Soundscape Plan for Wales 2023-2028 (2023)¹²².

Guidance

- ETSU-R-97¹²³;
- the IOA Good Practice Guide (IOA GPG¹²⁴);
- British Standard (BS) 5228¹²⁵;

¹¹⁹ Welsh Government (1997), Technical advice note (TAN) 11: Noise.

¹²⁰ Welsh Government, Noise and soundscape action plan 2018 to 2023, December 2018.

¹²¹ Welsh Government, Revised planning guidance in relation to air quality, noise and soundscape, "Technical Advice Note 11: Air Quality, Noise and Soundscape", draft for consultation (2022).

¹²² Welsh Government, Draft Noise and Soundscape Plan for Wales 2023-2028, draft for consultation, June 2023.

¹²³ The Working Group on Noise from Wind Turbines (1997), the Assessment and Rating of Noise from Wind Farms (ETSU-R-97), Final Report for the Department of Trade & Industry.

¹²⁴ Institute of Acoustics (2013), M. Cand, R. Davis, C. Jordan, M. Hayes, R. Perkins, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise, May 2013 (IOA GPG).

¹²⁵ British Standard Institute (BSI, 2014): BS 5228: 2009 + A1:2014, Code of practice for noise and vibration control on construction and open sites, Parts 1 & 2.

- Calculation of Road Traffic Noise (CRTN)¹²⁶; and
- Design Manual for Roads and Bridges (DMRB)¹²⁷.

11.8 PPW and Future Wales require consideration of potential noise and vibration impacts for wind farms such as the Proposed Development, including cumulative impacts where relevant. PPW refers to the recommendations of ETSU-R-97 as the relevant guidance for assessing operational wind farm noise.

11.9 PPW also references good practice in the application of the ETSU-R-97 methodology, as set out in Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97 (IOA GPG). This includes guidance on the assessment of cumulative operational noise impacts from wind farms, and on this point, further guidance set out in an article in the Institute of Acoustics Noise Bulletin¹²⁸ will also be considered.

11.10 Operational noise from fixed plant other than wind turbines, such as that associated with the substation, will be assessed using BS 4142¹²⁹ which is also referenced in TAN 11.

11.11 To assess construction noise and vibration, Annex B of TAN 11 refers to BS 5228. Part one of the standard (BS 5228-1) provides guidance on a range of considerations relating to construction noise including the legislative framework, general control measures, example methods for estimating construction noise levels and example criteria which may be considered when assessing the significance of any effects. Similarly, Part two (BS 5228-2) provides general guidance on legislation, prediction, control and assessment criteria for construction vibration.

11.12 TAN11 does not deal specifically with noise from stone extraction (for example from borrow pits). However, Welsh planning guidance on surface mineral extraction provides guidance that is relevant to the types of mineral extraction activity associated with site construction works. Specifically, Minerals Technical Advice Note (Wales) 1: Aggregates (MTAN 1)¹³⁰ can be referenced in addition to general guidance in BS 5228-1 and BS 5228-2.

Proposed Study Area

11.13 The assessment will consider noise-sensitive residential locations in the vicinity of the Site. Specifically, ETSU-R-97 states that noise levels will be considered acceptable, even in the absence of measured baseline data, if predicted noise levels (including cumulative contributions from all wind farms) do not exceed 35 dB LA90.

¹²⁶ Department of Transport (1988), Calculation of Road Traffic Noise.

¹²⁷ Welsh Government (2020), Design Manual for Roads and Bridges, LA 111 Noise and vibration, revision 2.

¹²⁸ Bowdler et. al., Wind farms cumulative impact assessments, Jan/Feb 2016 Acoustics Bulletin, Institute of Acoustics.

¹²⁹ BSI (2019). BS 4142: 2014 + A1:2019: Methods for rating and assessing industrial and commercial sound.

¹³⁰ Minerals Planning Policy (Wales), Minerals Technical Advice Note (Wales) 1: Aggregates, National Assembly for Wales, 2004.

11.14 Therefore, the study area for noise will encompass dwellings where predicted levels are above the threshold of 35 dB L_{A90} , or are close to this threshold (and therefore could potentially be above the threshold as the design evolves), which will be determined by modelling. This will comprise dwellings located in the Powys County Council area. However, some receptors will be discounted if the specific contribution of the Proposed Development is negligible relative to that of the other schemes considered (see 11.32).

11.15 It is likely that the identification of the properties likely to be affected in the operational phase of the Proposed Development will also include most dwellings potentially affected by noise or vibration effects from the construction of the Proposed Development. The exception will be dwellings located along the onsite access track or route who will also be considered in relation to construction traffic noise (see paragraphs 11.24 and 11.25).

Desk Studies

11.16 The latest available information on cumulative wind farms in the area (see **Table 2.3**) will be reviewed to inform the cumulative operational noise assessment.

11.17 Mapping and other data (including the Ordnance Survey address database) will also be reviewed to consider noise-sensitive receptors potentially affected by the Proposed Development.

Field Studies

11.18 ETSU-R-97 requires the baseline environment within the study area to be characterised by measuring background noise levels as a function of site wind speed at the nearest neighbours (or, at a representative sample of the nearest neighbours). ETSU-R-97 also requires that any such measurements are not significantly influenced by existing operational wind turbines, to prevent unreasonable cumulative increases.

11.19 The potential implication of wind shear effects due to the heights of the wind turbines considered for the Proposed Development would be taken into account in the assessment in line with best practice. This would consist of referencing a sufficiently high wind speed reference for the background noise measurements proposed as part of the assessment.

11.20 The survey methods, the assessment methodology and selection of noise-sensitive receptors would be discussed and, if possible, agreed with the Environmental Health Department of PCC. Representatives of the Council will be invited to attend the setup of the equipment for these surveys to agree measurement positions.

11.21 The baseline data acquired for the assessment of operational wind turbine noise would also be suitable for consideration of noise from other fixed plant associated with the Proposed Development using BS 4142.

Assessment Method

Construction noise and vibration

11.22 In assessing the impact of noise and vibration from the construction activities, it is usual to accept that the associated works are of a temporary nature (i.e. will last no longer than the construction phase). The assessment of potential impacts due to noise emissions during construction will be undertaken in accordance with the BS 5228 British Standard guidance. Predictions of construction noise will be made referencing typical activity emission levels and likely variations in noise levels at surrounding receiver locations, using the methodology set out in BS 5228 Part one. This standard is referenced in TAN 11. This standard can be used to predict noise levels associated with the different construction activities used throughout the construction programme. Part two of the BS 5228 standard considers construction vibration, and this guidance will also be applied in the assessment.

11.23 Any blasting, if used for rock extraction at borrow pits, may also create vibration and air overpressure which may require assessment. Reference will be made to relevant guidance on the topic in MTAN1, BS 5228-1 and BS 5228-2.

11.24 Consideration will also be given to the potential impact of construction traffic on sensitive receptors. Depending upon the outcome of the assessment of traffic (see **Chapter 10: Transport and Access**), the impact of traffic along the access route will be assessed based on the methodology within BS 5228-1, and CRTN where appropriate.

11.25 The assessment of construction noise and vibration will identify if and when predicted noise or vibration levels may be above standard guideline limits, taking into account the rural character of the area. For construction traffic, the criteria for temporary increases in traffic noise set out in Table 3.54a of the DMRB will be referenced. This will be used to determine the magnitude of impact, which will directly identify their significance. All residential receptors considered will be of high sensitivity and major and moderate effects will be considered to be significant in the context of the EIA Regulations.

11.26 Construction noise management procedures will also be determined.

Operational noise

11.27 The methodology for the assessment of operational noise from wind farms in Wales recommended in PPW is that documented in ETSU-R-97. In summary, the assessment will:

- Identify the noise-sensitive receptors within the study area;
- Determine the quiet day-time and night-time noise limits from measured background noise levels at the nearest neighbours (see Field Studies section above);
- Specify the type and noise emission characteristics of the proposed wind turbines;
- Calculate noise emission levels attributable to the operation of the wind turbines as a function of site wind speed at the nearest neighbours, including the cumulative effect of all wind turbines (see Cumulative section below); and
- Compare the calculated wind farm noise levels with the derived noise limits.

11.28 The IOA GPG will be considered in the preparation of the assessment, including its advice on baseline survey, wind shear assessment and noise prediction methodology.

11.29 Operational noise levels below the ETSU-R-97 criteria will be considered 'not significant' in the context of the EIA Regulations. If modelled noise levels are above the ETSU-R-97 criteria, effects will be considered to be Significant in the context of the EIA Regulations.

11.30 If the proposed substation is located at a substantial distance from the nearest noise-sensitive receptors, e.g. 1 km or more, it may be possible to conclude that the associated noise effects are likely to be negligible based on experience of similar developments. If not, a more detailed study in line with BS 4142 would be undertaken, based on representative noise data for the electrical/mechanical plant units which may be installed, on a worst-case basis. The predicted levels at neighbouring receptors would be assessed relative to the existing baseline background noise levels at the relevant receptors, accounting for the potential character of the noise, in accordance with BS 4142. The greater the difference between predicted operational noise levels and baseline levels, the greater the impact, subject to accounting for several contextual factors. As part of the contextual analysis, it is relevant to consider the absolute noise levels which, if sufficiently low, may be considered acceptable regardless of background levels.

Cumulative Assessment

11.31 When considering neighbouring cumulative wind farm noise, the noise emissions from neighbouring wind farm sites will be considered by examining the potential level of noise emission permitted under the respective consent for each of the sites, in line with the IOA GPG guidance.

11.32 The ETSU-R-97 limits for each noise-sensitive receptor apply to the total noise produced by all wind farms. Therefore, potential cumulative operational noise levels, including existing, consented and planned wind turbines in the area, must be assessed relative to these limits where sufficient information is available to do so. This is the case unless it is considered that these effects are likely to be negligible: the IOA GPG suggests that cumulative noise effects need not be considered where differences between the noise level contribution of two wind farms are 10 dB or more.

11.33 The other wind farm sites considered will include as a minimum the proposed Bryn Gilwern Energy Park. Based on previous experience, wind farm proposals located more than 5 km from the Proposed Development are generally likely to represent a negligible cumulative noise contribution. It is proposed to discount the cumulative impacts of smaller single wind turbine schemes in the area, with a capacity of less than 50 kW, as their impact tends to be localised and unlikely to result in significant cumulative noise impacts.

11.34 Cumulative operational noise impacts from other non-wind farm schemes are unlikely to be significant but consultation with PEDW and PCC will identify whether other consented schemes are appropriate to consider.

11.35 If relevant, the effect of noise from cumulative construction traffic from different consented wind farms and other developments as considered appropriate, should the schemes construction phases overlap, will also be considered. In accordance with the EIA Regulations schemes without consent cannot be considered as being committed and would therefore be excluded.

Likely Significant Effects

11.36 Potential noise and vibration effects scoped into the ES (see **Table 11.1**), including cumulative, associated with the construction and/or operation of the Proposed Development include:

- Noise during operation of the Proposed Development;
- Cumulative noise impacts during operation with other nearby wind farms; and
- Noise and vibration associated with the onsite construction activities and associated traffic (including cumulative with other nearby relevant developments) and blasting activities.

Topics Scoped Out

11.37 It is proposed that the following effects are scoped out (see **Table 11.1**):

- It is recognised that vibration resulting from the operation of wind farms is imperceptible at typical separation distances. It is therefore proposed to scope out the assessment of vibration produced during the operation of the Proposed Development;
- Traffic during the operational phase of the Proposed Development is likely to be very low and is considered unlikely to have any noise effects and is therefore also proposed to be scoped out;
- The consensus from research in the UK and elsewhere (which will be set out in the ES) is that infrasound and low frequency noise from wind turbines at typical separation distance (such as for the Proposed Development) will be at low or imperceptible levels and that this is therefore not a source of significant noise impacts. The current recommendation from PPW is that ETSU-R-97 should continue to be used for the assessment and rating of operational noise from wind farms. Therefore, it is not proposed to undertake specific assessments of infrasound and low frequency noise, but the noise chapter in the ES will consider the latest supporting information on these subjects and the topic of wind turbine blade swish or Amplitude Modulation (or AM); and
- Decommissioning is likely to result in less noise than during construction of the Proposed Development and similar management measures can be employed and therefore this can be scoped out.

Table 11.1: Proposed Scope of the ES

Topic	Scope In/Out	Justification
Construction noise and vibration, including construction traffic (including cumulative).	Scoped in	Potential for some significant adverse effects.
Operational noise	Scoped in	Potential for some significant adverse effects.
Cumulative operational noise	Scoped in	Potential for some significant adverse effects.

Topic	Scope In/Out	Justification
Operational vibration	Scoped out	Unlikely to be perceptible by receptors.
Operational traffic noise and vibration	Scoped out	Very low volume and sporadic traffic.
Decommissioning noise and vibration	Scoped out	Similar or lower effects than during construction phase.

Approach to Mitigation

11.38 The assessment of the effects of construction noise is primarily aimed at understanding the need for dedicated management measures and, if so, the types of measures that are required. In this respect, relevant working practices, traffic routes, and proposed working hours will be considered in the assessment in the ES.

11.39 The following standard construction mitigation measures are assumed to be in place for the purposes of the assessment:

- Restriction of construction hours; and
- Good practice management measures relating to control of construction noise and vibration.

11.40 The above measures will be implemented through the CEMP. The CEMP will also implement any additional site-specific management measures, which are not part of standard good practice, and these will be highlighted as part of the assessment and clearly presented in the noise and vibration ES chapter.

11.41 Mitigation of wind turbine operational noise will be achieved through the design of the Proposed Development, such that the relevant ETSU-R-97 noise limits can be achieved at the surrounding properties with commercially available wind turbines, taking into account the noise emissions from other wind farms in the area.

11.42 If there is a potential for significant noise from non-wind turbine components associated with the Proposed Development, engineering and design control measures will be outlined.

Questions

Questions for Consultees

Question 11.1: Are the consultees in agreement with the suggested approach for the noise assessment?

Question 11.2: Do the consultees have any comments on the elements proposed to be scoped out?

Chapter 12

Other Issues

Introduction

12.1 This chapter of the Scoping Report considers other issues that have been considered for inclusion within the ES.

12.2 It is proposed that an ES chapter will be prepared to draw together the assessments of the Proposed Development on those topics that are pertinent for consideration but are not addressed in other environmental factor chapters and in the interests of producing a proportionate ES, are not included as their own separate chapter. Alternatively, it is identified why these topics have been scoped out of the assessment in the ES.

12.3 This chapter therefore presents a discussion of the following issues:

- Aviation;
- Telecommunications and Utilities;
- Shadow Flicker;
- Forestry;
- Climate Change;
- Socio-economics;
- Common Land
- Population and Human Health; and
- Major Accidents and Disasters.

Aviation

12.4 Wind turbines have the potential to affect civil and military aviation. This section covers the methodology, which is proposed to undertake the aviation safeguarding assessment, lists the aviation references used and describes the aviation baseline condition, consultation requirements and mitigation to be applied, should it be required.

12.5 This section has been prepared by Wind Power Aviation Consultants Ltd (WPAC).

Legislation, Policy and Guidance

12.6 There are a number of aviation publications relevant to the interaction of wind turbines with aviation assets containing guidance and legislation, which cover the complete spectrum of aviation activity in the UK as shown below:

- Civil Aviation Authority (2016) Policy and Guidance on Wind Turbines Version 6 CAP 764;
- Civil Aviation Authority (2019) Licensing of Aerodromes, Version 11 CAP 168;
- Civil Aviation Authority (2019) ATS Safety Requirements Version 3 CAP 670;
- Civil Aviation Authority (2017) UK Flight Information Services, Ed 3 CAP 774;
- Civil Aviation Authority (2006) Safeguarding of Aerodromes Version 2 CAP774;
- Civil Aviation Authority (2010) Safe Operating Practices at Unlicensed Aerodromes Ed 1 CAP 783;
- Civil Aviation Authority (2017) Manual of Air Traffic Services Part 1 Ed 7.0 CAP 493;
- Civil Aviation Authority (2020) Parachuting Ed 5 CAP660;
- Ministry of Defence (2022) Military Aviation Authority Regulatory Article 2330 (Low Flying) MOD;
- Civil Aviation Authority (2017) CAA Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level CAA; and
- Future Wales – The National Plan 2040 Policy 18.8.

Scope of the Assessment

12.7 The assessment of effects in the ES will consider the following:

Non-military Airfields and Aerodromes

12.8 The assessment of effects of the Proposed Development will be informed by the guidance laid down in CAA Publication CAP 764 Policy and Guidelines on Wind Turbines Version 6 dated February 2016. Consultation criteria for aviation stakeholders is defined in **Chapter 4**. The following distances inform the size of the study area and include:

- Airfield with a surveillance radar – 30 km;
- Non radar licensed aerodrome with a runway of more than 1.1 – 17 km;

- Non radar licensed aerodrome with a runway of less than 1.1 – 5 km;
- Licensed aerodromes where the wind turbines would lie within airspace coincidental with any published Instrument Flight Procedure (IFP);
- Unlicensed aerodromes with runways of more than 800 m – 4 km;
- Unlicensed aerodromes with runways of less than 800 m – 3 km;
- Gliding sites – 10km; and
- Other aviation activity such as parachute sites and microlight sites within 3 km – in such instances developers are referred to appropriate organisations.

12.9 CAP 764 goes on to state that these distances are for guidance purposes only and do not represent ranges beyond which all wind turbine developments will be approved or within which they will always be objected to. These ranges are intended as a prompt for further discussion between developers and aviation stakeholders.

Military Receptors

12.10 It is necessary to consider the aviation and air defence activities of the Ministry of Defence (MOD) as safeguarded by the Defence Infrastructure Organisation (DIO). The types of issues and receptors that will be addressed in the ES include:

- Ministry of Defence Airfields, both radar and non-radar equipped;
- Ministry of Defence Air Defence Radars;
- Meteorological Radars; and
- Military Low Flying.

Aviation Radar

12.11 It is necessary to consider the possible effects of wind turbines upon the National Air Traffic Services En Route Ltd (NERL) communications, navigation and surveillance (CNS) systems – a network of primary and secondary radars and navigation facilities around the country.

12.12 As well as examining the technical impact of wind turbines on Air Traffic Control (ATC) facilities, it is also necessary to consider the physical safeguarding of ATC operations using the criteria laid down in CAP 168 Licensing of Aerodromes to determine whether a proposed development will breach obstacle

clearance criteria. This would also be reported on in the ES, but initial surveys show there are no physical safeguarding issues associated with the Proposed Development.

12.13 The following data sources were consulted to inform the assessment:

- UK Military Aeronautical Information Publication (MIL AIP);
- UK Aeronautical Information Publications (AIP);
- CAA 1:250,000 VFR and 1:500,000 Charts;
- UK Military Low Flying Charts; and
- WPAC in-house databases.

Assessing Significance

12.14 There is no agreed definition of significance for assessing effects on aviation. This is because, whilst technical effects on communications, navigation and surveillance (CNS) systems are simple to identify and evaluate, operational and flight safety effects can be subjective and are often challenged by third parties. It is enough in this context to identify any technical effects and then, taking into account the statements in CAP 764 regarding the status of aviation stakeholders, in general to accept the judgement of those stakeholders in assessing the significance of the effects. For example, CAP 764 states: *‘Where an ANSP determines that it is likely that a planned wind turbine development would result in any of the above effects on their CNS infrastructure, this may not, in itself, be sufficient reason to justify grounds for rejection of the planning application. The ANSP must determine whether the effect on the CNS infrastructure has a negative impact on the provision of the ATS. The developer should pay for an assessment of appropriate mitigating actions that could be taken by the ANSP and/or wind energy developer to deal with the negative impact. The position of an ANSP at inquiry would be significantly degraded if they had not considered all potentially appropriate mitigations.’*

12.15 Therefore, taking the above into account, it is not considered to be appropriate for a wind farm developer to be making an assessment of significance of an effect in relation to aviation interests. It is also often the case that different Air Navigation Service Providers (ANSP) can take a different view of the same scenario and may disagree with the assessment findings leading to the need for further consultation to confirm the findings of the assessment and/or agree to the need for and extent of mitigation.

Radar Modelling Methodology

12.16 The radar calculation results discussed in this report (see paragraphs 12.17 to 12.22) have been produced using specialist propagation prediction software (RView Version 5). Developed over several years, it has been designed and refined specifically for the task. RView will be used to identify potential aviation effects of the Proposed Development with the results to be used as a basis for consultation and liaison with relevant aviation bodies, as detailed further below.

Existing Conditions and Proposed Scope of Assessment

12.17 The Proposed Development located 3 km to the east of Builth Wells, in a location devoid of significant aviation features; RAF Shawbury is over 80 km to the north-east and RAF Valley is over 100 km to the north-west with Aberporth range radar over 80 km to the south-west. The Site is also located to the north-east of Danger Area D203, Sennybridge Range which is used for high level mortar firings and UAV trials. The Proposed Development is also located under Class A controlled airspace designated Niton CTA (Control Area) and used mainly for civil air traffic flying from Scotland and Manchester to Spain and France.

Licensed Aerodromes

12.18 There is no radar equipped licensed aerodrome within or close to the standard consultation distance of 30 km. Additionally, radar modelling shows that wind turbines will be screened by terrain from the radars at Cardiff Airport and Bristol Airport, both over 80 km to the south. Radar line of sight for both radars is in excess of 600 m above ground level (AGL) demonstrating that the wind turbines will not be visible to the radars. There is no licensed non-radar equipped aerodrome within or close to consultation distance. The closest is at Shobdon, over 32 km to the north-east. The Proposed Development will not affect Shobdon, and further consultation and assessment is therefore not required.

Ministry of Defence

12.19 Military ATC Radars - The closest military ATC radar is at RAF Shawbury, 82 km to the north-east. The unit is currently being re-equipped with a new Thales Star 2000NG radar. Radar modelling results show that radar line of sight for the new radar is in excess of 700 m AGL across the development and as the maximum tip height of the wind turbines is well below this height there is no possibility of the radar being affected. The results are similar for the existing and shortly to be removed Watchman radar as well. This will be reassessed once the layout of the Proposed Development has been finalised and the results reported in the ES.

12.20 The next closest military ATC radar is at Aberporth Range, over 85 km to the south-west. Radar modelling confirms that there is no possibility of the wind turbines being visible to the radar. Line of sight is in excess of 850 m AGL. Again, these results will be reassessed once the final Proposed Development layout has been designed and reported in the ES.

12.21 MOD Air Defence Radars – the closest air defence radar is located at Portreath in North Cornwall. Radar modelling shows that there is no possibility of the Proposed Development being detected by the radar and there will be no MOD objection in relation to air defence radar. The Applicant will consult with the MOD and report the outcome in the ES Chapter.

12.22 MOD Low Flying – the Proposed Development is located within an area designated as ‘Blue’ in relation to military low flying. This is defined as a ‘*low priority military low flying area less likely to raise concerns*’. A substantive low flying objection is therefore unlikely although the MOD may raise concerns about wind turbines creating an obstruction to low flying aircraft. To mitigate this effect, the MOD will require Infra-Red (IR) lighting which will be in addition to any Civil Aviation Authority (CAA) lighting requirements. The MOD position will be confirmed through the MOD response to the Scoping Report and will be reported in the ES.

12.23 Met Office Radars – The Met Office safeguards its network of radars using a European methodology known as OPERA. In general, they will object to any wind turbine within 5 km in line of sight and will examine the impact of any wind turbines within 20 km. Where a site is within 20 km, the Met Office will undertake an operational assessment based on three main criteria, having determined if there is a technical effect on the radar. The factors they will consider include the following:

- Proximity to Airports;
- River catchment response times; and
- Population density.

12.24 The closest Met Office radar to the Site is at Clee Hill, approximately 55 km to the north-east. There will be no effect on the Met Office radar network.

NATS En Route Ltd (NERL)

12.25 The closest NERL long range ‘*en route*’ radar is also at Clee Hill in Shropshire, approximately 55 km to the north-east. Initial radar modelling has been undertaken which shows that the wind turbines will all be partially visible to the radar and may create ‘radar clutter’ and obscuration effects. These results will be re-assessed and reported in the ES Chapter. The Applicant is in discussions with NERL in

relation to mitigation options for this and other wind farm developments in the region and any mitigation measures will be reported in the ES.

Aviation Obstruction Lighting

12.26 A wind farm with tip heights in excess of 150 m will need to be illuminated at the hub of selected wind turbines with medium intensity red aviation obstruction lighting. WPAC will design a lighting layout which minimises the number of lit wind turbines whilst fulfilling flight safety requirements and gain approval for the lighting layout from the CAA. This will be reported in the ES within a technical appendix to describe the effect of aviation lighting on the environment and to inform the LVIA. It will also articulate the mitigation techniques available, taking into account extant legislation and guidance. An IR lighting layout to fulfil MOD requirements will also be designed and approval obtained from the MOD and reported in the ES.

Telecommunications and Utilities

12.27 Wind farm developments have the potential to impact telecommunication operations and infrastructure. There are many forms of telecommunications infrastructure in the UK. The most relevant aspect in the context of potential restrictions/mitigation requirements for wind farm developments is the presence of wireless fixed links between radio antennae and masts. Links broadly fall into two categories. The first is 'microwave links', which provide high-frequency data transfer between antennae and is utilised by mobile phone operators and the emergency services to support their communications network. The second is 'Ultra High Frequency' (UHF) links, which is utilised by operators including utility companies. The technical assessment approach varies for these two link technologies. There are overall two types of impact:

- Blocking or diffracting existing link paths; and
- Interacting with antennas masts if a wind turbine is located too close.

12.28 Consultation with link operators and assessment will be necessary to determine the status of the network in the area and establish if an impact on the existing infrastructure (microwave and UHF wireless links and masts) is possible. Only telecommunication infrastructure and wireless links in the area of the Proposed Development will be assessed. There are several stakeholders that might be affected. These include Telefonica (O2), Vodafone, Atkins global, MBNL, Arqiva, BT, Spectrum Licensing, Joint Radio Company (JRC), Dŵr Cymru Welsh Water, and Airwave.

12.29 It is common practice for wind developers to assess these potential impacts and, where necessary, mitigate them. Such mitigation can take the form of technical solutions associated with the links themselves and/or amendments to the wind turbine layout.

12.30 The issue of wireless telecommunication fixed links and infrastructure is one of industry best-practice more than it is one of legislation and policy. The following are the most relevant sources of best-practice guidance:

- International Telecommunications Union (1992) Assessment of impairment caused to television reception by a wind turbine, Recommendation ITU-R BT805;
- International Telecommunications Union (2010) ITU-R BT.2142-1;
- Bacon (2002)., A proposed method for establishing an exclusion zone around a terrestrial fixed radio link outside of which a wind turbine will cause negligible degradation of the radio link performance; and
- Joint Radio Company (2014)., Calculation of Wind Turbine clearance zones for JRC ultra-high frequency (UHF) (460MHz) Telemetry Systems when turbine sizes and locations are accurately known – Issue 4.2.

Assessment Methodology

12.31 If a stakeholder raises concerns, an assessment of the link or infrastructure will be carried out to determine whether there is an impact and its magnitude of effect. Technical link data will be used to model 2-D exclusion zones of each link and to calculate the clearance/infringement of the proposed wind development. If it cannot be established whether the Proposed Development is affecting the link using a 2-D model, a 3-D analysis can be carried out. If the outcome of the analysis confirms the infringement, mitigation will be necessary and would be presented in the ES.

12.32 If wind turbines are located close to UHF telemetry links, an assessment of reflection effects will be carried out. Reflection effects occur when the transmitted signal from one link end is reflected by the wind turbine towards the other link end. This causes interference to the signal. As such, reflection calculations will be undertaken to quantify the carrier to interference ratio in accordance with the JRC's published methodology¹³¹.

12.33 In the first instance the location of any wind turbines affecting links will be reviewed to ascertain whether the wind turbine can be relocated to remove the interference. Failing this, re-networking the

¹³¹ JRC report, "Calculation of Wind Turbine Clearance Zones used by JRC when turbine sizes and locations are accurately known", June 2006

links via existing telecommunications sites or replacing the wireless link with a leased line may need to be investigated. These options will be discussed with the relevant stakeholders and mitigation agreed.

12.34 Given that there is potential for significant effects prior to mitigation, an assessment of effects on telecommunication infrastructure has been scoped into the EIA and will be undertaken by Pager Power and the results reported in a technical appendix to the ES following the methodology outlined here in the Scoping Report.

Utilities

12.35 Utilities infrastructure (water, gas and electricity) may potentially be affected by wind turbines either due to disturbance during construction, or in the very unlikely event of wind turbines components falling onto this infrastructure when the Proposed Development is in its operational stage. Utilities operators impose appropriate separation distances between wind turbines and infrastructure to mitigate the latter risk in particular.

12.36 A gas pipeline operated by National Gas lies approximately 10 km south of the Site and does not intersect with the Site boundary¹³². Further investigation is required as to whether private gas mains and utilities are present onsite. If this infrastructure is present then these will also be considered during the design evolution, to avoid direct contact and hence ensuring that significant effects are not likely to occur. As such, it is proposed that an assessment of potential effects buried utilities can be scoped out of the ES.

12.37 A 66kV overhead line crosses the south-east of the Site although no direct impact or interaction with any aspects of the Proposed Development are envisaged. Given this, it is considered that significant effects are not likely to occur and as such, an assessment of potential effects on overhead lines can be scoped out of the ES.

Shadow Flicker

12.38 Shadow flicker occurs when a certain combination of conditions prevail at a certain geographical location, time of day and year. It firstly requires the sun to be at a certain level in the sky. The sun then shines onto a window of a building from behind the wind turbine rotor. As the wind turbine blades rotate, this causes the shadow of the wind turbine to flick on and off. This may have a negative effect on the amenity of residents and occupants of affected properties. If shadow flicker cannot be avoided through

¹³² National Grid (2023) Network route maps. Available at: <https://www.nationalgrid.com/uk/gas-transmission/land-andassets/network-route-maps> (accessed 20.10.2023)

design, technical mitigation solutions are available, such as shutting down wind turbines when the relevant conditions prevail.

12.39 In the UK, shadow flicker is only likely to occur in a building located within a distance of ten times the rotor diameter of a wind turbine and within 130 degrees either side of north. Any residential properties within this criteria will be subject to potential shadow flicker effects in the ES and consideration given to suitable mitigation measures, if required. Should there be several properties near each other, such as in a village or hamlet, then a number of properties at these locations will be selected and assessed as representative of the shadow flicker effects that could be experienced at these locations.

12.40 If no properties are located within the shadow flicker range, it is proposed to scope out a shadow flicker assessment from the ES, with a justification for scoping it out presented accordingly.

Forestry and Woodland

12.41 This section considers the assessment of forestry and woodland within the Site.

12.42 The following sources of information have been reviewed during the desk-based research to inform the preparation of this Scoping Report and will inform the assessment presented in the ES:

- DataMap Wales¹³³;
- Woodlands for Wales, the Welsh Government's Strategy for Woodlands and Trees¹³⁴;
- Ancient Woodland Inventory (AWI); National Resources Wales (NRW)¹³⁵;
- National Forest Inventory Woodlands Wales (NFIWW) 2020 ¹³⁶; and
- Recent digital aerial photography (available via Google Earth).

12.43 The assessment of effects on forestry and woodland will be undertaken by Neil McKay MICFor.

¹³³ DataMap Wales, data and maps from the Welsh public sector. Available at: <https://datamap.gov.wales/> (accessed 13.10.2023)

¹³⁴ Welsh Government (2018) Woodlands for Wales, The Welsh Government's Strategy for Woodlands and Trees. Available at: https://gov.wales/sites/default/files/publications/2018-06/woodlands-for-wales-strategy_0.pdf (accessed 13.10.2023)

¹³⁵ Natural Resources Wales Ancient Woodland Inventory. Available at: <https://naturalresources.wales/evidence-and-data/research-and-reports/ancient-woodland-inventory> (accessed 21.07.2023)

¹³⁶ Forestry Commission Open Data, The National Forest Inventory Woodland Wales (NFIWW) (2020). Available at: <https://data-forestry.opendata.arcgis.com/datasets/c2a20eabb5934622a4fd19646451c129/explore> (accessed 13.10.2023)

Existing Conditions

The Site

12.44 The Site is not extensively wooded nor contains any sizeable coniferous plantations. There are however 13 parcels of woodland identified through NFIWW. The average size of these woodlands is between two and three hectares. Of these 13 woodlands, 11 are broadleaved with two areas identified as coniferous woodland. Within this count of woodlands four are classified within AWI as ancient semi-natural woodland. The woodlands tend to be on steeper valley sides or associated with watercourses. All woodlands within the Site are illustrated in **Figure 12.1**.

12.45 There are several larger broadleaved woodlands adjacent to the Site which are classed within AWI as ancient semi-natural woodland. Typically, these are valley side woodlands, and the wider landscape includes numerous small woodlands often adjacent to streams and rivers.

Design Considerations

12.46 The Welsh Government's Strategy for Woodland and Trees states that there is a strong presumption against the permanent removal of woodland except for the restoration of high priority open habitats and to meet the requirements of the Environment (Wales) Act.¹³⁷ When permanent removal of woodland is permitted for development, the losses in public benefit should be offset by compensatory planting and this is reflected in planning policy. Furthermore, Planning Policy Wales Chapter 6¹³⁸ states that the permanent removal of trees, woodland and hedgerows will only be permitted where it would achieve significant and clearly defined public benefits. The annex to Heads of Planning letter dated 11 October 2023 describes where loss is unavoidable developers will be required to provide compensatory planting. The following will be considered and applied for the Proposed Development:

- The design criteria will include the avoidance of woodland where possible. The location of the wind turbines (shown in **Figure 1.2**) will not have a direct impact upon woodlands, but the associated infrastructure and any clearance required during construction will be considered to ensure that woodland loss is minimised as far as reasonably practicable;

¹³⁷Welsh Government, Environment (Wales) Act 2016: Available at: <https://www.gov.wales/environment-wales-act-2016> (accessed 07.11.2023)

¹³⁸Welsh Government, Addressing the nature emergency through the planning system: update to Chapter 6 of Planning Policy Wales (2023). Available at: <https://www.gov.wales/addressing-nature-emergency-through-planning-system-update-chapter-6-planning-policy-wales> (accessed on 23.11.2023)

- Although reducing the permanent woodland loss is a key design consideration, should some limited felling be required for the Proposed Development, it may be necessary to fell a wider area to a wind firm boundary¹³⁹ within the woodland to avoid predictable wind blow;
- Felling and replanting for the Proposed Development will be integrated into a felling and replanting plan;
- Where woodland is lost to the permanent infrastructure this will be mitigated with compensatory planting within the Site or offsite where this is not possible;
- A Forestry Assessment would detail the area of permanent woodland loss and the requirement for compensatory planting as mitigation. The Forestry Assessment will be included as a technical appendix to the ES;
- Replacement planting will be at a ratio equivalent to the quality, environmental and ecological importance of the tree(s) lost and shall be at a minimum ratio of at least three trees of a similar type and compensatory size planted for everyone lost;
- Where a woodland or shelterbelt is lost as part of the Proposed Development, the compensation planting must be at a scale, design and species mix reflective of that area lost. The planting standards in this case is a minimum of 1600 trees per hectare for broadleaves and 2500 trees per hectare for conifers; and
- Replanting designs will follow the requirements of UK Forestry Standard¹⁴⁰ (UKFS).

Proposed Surveys and Assessment Methodology

12.47 The woodlands onsite will be visited to ensure a full woodland picture is available for input into the design process.

12.48 A forestry assessment will detail the area of permanent woodland loss and the requirement for compensatory planting as mitigation. The Forestry Assessment will be included as a technical appendix to the ES.

¹³⁹ Wind firm boundary: area where the trees are less likely to be blown away by wind.

¹⁴⁰ Forestry Commission, The UK Forestry Standard (2017) updated October 2023. Available at: <https://www.gov.uk/government/publications/the-uk-forestry-standard> (accessed 07.11.2023).

Potential Significant Effects

Potential Effects Scoped into Assessment

12.49 At this stage, potential forestry and woodland effects, associated with the construction and/or operation of the Proposed Development include:

- The potential permanent woodland loss.

Potential Effects Scoped out of Assessment

12.50 Potential significant effects relating to forestry from other topics will be assessed in the relevant chapters i.e., landscape and visual amenity, ecology, ornithology, water and soil resources ES chapters.

Approach to Mitigation

12.51 The following embedded mitigation measures are assumed to be in place for the purposes of the assessment:

- The keyhole design approach to felling will minimise the permanent woodland / forestry loss;
- Felling design will be integrated within the whole Site felling and replanting plans;
- Access track design should follow existing open ground, forest tracks or rides where appropriate;
- Detailed design will prioritise the avoidance of AWI and the small woodlands where possible;
- Compensatory planting is a recognised mitigation for permanent woodland loss within approved development sites;
- Good practice will be followed during any tree felling and replanting in compliance with the Guidelines on General Forestry Practice contained within UKFS; and

12.52 The Outline CEMP will include forestry best practice timber harvesting operations to prevent diffuse pollution of watercourses by the formation and maintenance of brash mats and log bridges where necessary.

Climate Change, including Carbon Balance

12.53 The key means by which an Energy Park may have effects relating to climate change is in its generation of low-carbon energy. The generation of electricity from an Energy Park such as the Proposed Development results in reduced carbon emissions from other generation sources. However, emissions reductions of this nature also need to be understood in the context of the carbon emissions

associated with the construction of the Proposed Development. The ES will therefore include a calculation of net carbon savings from the Energy Park. This calculation will employ the latest version of the Scottish Government Carbon Calculator Tool, which remains the suitable standardised tool for use in relation to net carbon saving calculations. The impacts of climate change on the Proposed Development will be addressed in relevant chapters of the ES.

Common Land

12.54 As discussed in **Chapters 1** and **3**, the majority of the Site comprises of common land that is open moorland, with grazing fields. Applications under the Commons Act 2006 will be submitted alongside the DNS application for the Proposed Development. The ES will assess the impacts of the Proposed Development on common land where relevant although as the land is likely to be deregistered and replaced on a like for like basis, there are not expected to be significant effects upon users of common land as there will be no reduction in scale or quality of the land over which the commoners have rights.

Socio-Economics

12.55 The Applicant considers that the most appropriate way to present all relevant socio-economic aspects for consideration within the DNS process is to submit a separate 'Socio-economic Information' document that accompanies the application. This information will present as a minimum the following, and the Applicant will engage with stakeholders to draw upon any relevant information and data that they have:

- Construction investment;
- Construction employment demands;
- Temporary impact upon farming operations;
- Temporary accommodation requirements; and
- The Bute Energy Community Benefit Fund.

12.56 This is considered the most appropriate approach as the EIA Regulations state in Schedule 4 the 'environmental factors' that are to be considered within the EIA process if they are likely to be significantly affected by a development. These are listed in paragraph 4 of the Schedule as '*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’.

12.57 Paragraph 5 then continues to clarify that the ES needs to consider the likely significant effects upon the environment resulting from aspects of a development and its parameters and characteristics.

12.58 The Applicant will therefore, consistent with the approach that PEDW has agreed to in other recent Scoping Opinions, present socio-economic information in a separate document, to be submitted as part of the DNS application.

12.59 The ES will, however, by the nature of other factors that are scoped into the assessment, consider aspects relevant to potential socio-economic impacts on people as follows:

- Traffic and Transport: The effects upon road users and delays (including tourist visitors and local residents);
- Landscape and Visual: The view from footpaths, tourist attractions and effects on residential visual amenity; and
- Noise: The impacts upon sensitive receptors may include tourist accommodation as well as residential dwellings.

Population and Human Health

12.60 It is not considered necessary to include a standalone Human Health Impact Assessment chapter within the ES and therefore this will be scoped out.

12.61 Potential effects of the Proposed Development with respect to human health will instead be considered via other relevant topics, such as noise, shadow flicker (where potential for this is identified), access, traffic and transport.

12.62 As described below in relation to major accidents and disasters, relevant safety considerations informing the final Site design will instead be described in the Project Description ES chapter.

Major Accidents and Disasters

12.63 The Site is not located in an area with a history of natural disasters such as extreme weather events, and its design, construction, operation and decommissioning will be managed within the requirements of a number of health and safety related Regulations, including the Construction (Design and Management) Regulations 2015 and the Health and Safety at Work Act 1974. Consideration of flood

risk and peat landslide risk will be fully covered and reported in the ES, as described in **Chapter 8** and **Chapter 9**, respectively.

12.64 It is not therefore considered necessary to undertake an assessment of the Proposed Development with respect to major accidents and disasters within the ES. Relevant safety considerations informing the final Energy Park design will instead be described in the Development Description ES chapter. As such, it is proposed that an assessment of major accidents and disasters be scoped out of the ES.

Questions

Questions for Consultees

Question 12.1: Do consultees agree with the approach to how these factors have been scoped in and scoped out of the ES?

Question 12.2: Do consultees agree with the assessment of which topics are to be scoped in or scoped out of the ES?

Question 12.3: Does the provision of a forestry assessment in the form of a technical appendix to the ES meet with NRW requirements?

Question 12.4: Are there any other relevant consultees who should be consulted about the other EIA topic assessments?

Appendix A

Glossary

Table A.1: Glossary of terms

Term	Definition
Anemometer Mast	A device that measures wind speed and direction.
Ancient Woodland Inventory (AWI)	Map based tool that shows the location of many of the most valuable woodlands.
Areas of Outstanding Natural Beauty (AONB)	A designated exceptional landscape with distinctive character and natural beauty that is precious enough to be safeguarded in the national interest.
Air Traffic Control Radar (ATC)	System used in air traffic control to enhance surveillance radar monitoring and separation of air traffic.
Bird Protection Plan (BPP)	Prepared to ensure legislative compliance and accordance with current good practice guidance
Borrow Pits	Pits that are dug to provide fill materials like gravel and sand for construction projects.
Chartered Institute of Ecology and Environmental Management (CIEEM)	Leading professional membership body representing and supporting ecologists and environmental managers in the UK, Ireland and Abroad.
Construction Compound	A compound including central offices, welfare facilities, accommodation facilities, and storage for construction of the Proposed Development.
Construction Environmental Management Plan (CEMP)	A document that addresses how potentially significant effects associated with the Proposed Development will be managed.

Term	Definition
Construction Traffic Management Plan (CTMP)	This establishes vehicle routeing and tests that vehicles can access the site safely during construction.
Common Land	Owned by a person or collectively by a number of people, over which other people have certain common rights, such as to allow their livestock to graze upon it etc.
Communications, Navigation and Surveillance Systems (CNS)	Essential technological systems, procedures and programmes for pilots in the air and air traffic controllers on the ground.
Cumulative Assessment	To identify the magnitude of additional cumulative change which would be brought about by the Proposed Development when considered in conjunction with other wind farms/projects.
Development of National Significance (DNS)	A type of planning application for large infrastructure projects in Wales.
Decommissioning	The strategic approach to deactivate a project or facility from service.
Ecological Clerk of Works (ECoW)	Oversees the management of risks on the construction sites associated with managing biodiversity.
EIA Regulations	Regulations that cover certain types of development which have potential to give rise to significant effects on the environment.
Energy Parks	Areas used and planned for the purpose of clean energy development like wind.
Environmental Impact Assessment (EIA)	EIA is the process of systematically evaluating and presenting the likely significant effects, both positive and negative, of a development on the environment, to assist the determining authority in making an informed decision on an application for consent.

Term	Definition
Environmental Statement	This sets out the assessment of the likely environmental effects of the Proposed Development.
Flood Consequence Assessment (FCA)	This is a flood assessment that is specific to Wales and is required if any part the site is located within a flood zone.
Future Wales	A 20-year national development plan that covers the whole of Wales.
Geoconservation	The practice of recognising, protecting and managing sites and landscapes which have value for their geology or geomorphology.
Geological Conservation Review Sites	These are sites that contain geological and geomorphological features that are of national and international importance.
Geodiversity	The variety of nature elements, such as minerals, rocks, fossils, landforms and their landscapes, soils, and active geological/geomorphological processes.
Groundwater Dependant Terrestrial Ecosystems (GWDTEs)	Ecosystems that rely upon groundwater.
Habitat Regulation Assessment (HRA)	A process that determines whether or not development plans could negatively impact local plans on a site that is protected by Habitat Regulations.
Hardstanding	Area that accommodates the cranes required for the construction of the wind turbine.
Heavy Goods Vehicle (HGV)	Any vehicles that over 3.5 tonnes gross combination mass.
kV	Kilovolt (one thousand volts)
Listed Building	A listed building is a structure of particular architectural and/or historic interest deserving of special protection.

Term	Definition
Local Nature Reserves (LNRs)	A protected area of land designated by a local authority because of its local special natural interest and educational/community value where possible.
Local Wildlife Sites (LWS)	Wildlife rich sites selected for their local nature conservation value.
National Forestry Inventory (NFI)	A collection of data on the forestry resources in a given area.
National Landscape Character Areas (NLCAs)	These are defined at a broad landscape scale throughout Wales. There are 48 individual character areas which highlights what distinguishes one landscape from another.
National Nature Reserves (NNRs)	Established to conserve most important habitats, species and geology, and to provide 'outdoor laboratories' for research.
Nationally Significant Infrastructure Project (NSIP)	A project of a type and size required to go through the consenting process as defined by the Planning Act 2008. The Act includes thresholds to defined relevant projects and these can be located wholly in Wales, wholly in England or be "cross border".
National Vegetation Classification (NVC)	A system classifying natural habitat types in the UK according to the vegetation they contain.
Micrositing	A design and planning process where the specific locations for each wind turbine is determined.
Mitigation	Measures that are identified to avoid, minimise or remedy any impacts.
Overhead Line	A structure used in electric power transmission and distribution to transmit electrical energy along large distances.
Planning and Environment Decisions Wales (PEDW)	They manage the casework relating to the development and use of the land in the public interest.

Term	Definition
Planning Policy Wales	This sets out the land use planning policies of the Welsh Government and is supplemented by a series of Technical Advice Notes (TANs).
Private Water Supplies	Any water supply that is not provided by a water company where the water is consumed for a domestic purpose or as part of a public/commercial activity.
Proposed Development	The development being assessment and proposed to be built.
Public Rights of Way (PRoW)	A right by which the public can pass along linear routes over land at all times.
Registered Historic Landscape (RHL)	Drainage solutions that provide an alternative to the direct channelling of surface water through networks of pipes and sewers to nearby watercourses.
Residential Visual Amenity Assessment (RVAA)	An assessment used to inform decision-makers about the effect a development proposal may have on views experienced in and around the home.
Scheduled Monument	A scheduled monument is a nationally important archaeological site or historic building, given protection against unauthorised change.
Scoping	An early step in the EIA process, to help define how to approach the assessment and what information might be needed to identify the likely significant effects from the Proposed Development.
Shadow Flicker	The flickering effect caused when rotating wind turbine blades periodically cast shadows over neighbouring properties as they turn, through constrained openings such as windows.
Site	An area of ground on which the Project is located/constructed.
Sites of Interest for Nature Conservation (SINCs)	Locally designated areas which are recognised as being of particular importance to wildlife and biodiversity.

Term	Definition
Sites of Special Scientific Interest (SSSI)	A formal conservation designation where the areas of land and water best represent natural heritage in the terms of flora, fauna, animals and geology.
Soil Management Plan (SMP)	The application of operations, practices, and treatments to protect soil and enhance its performance (such as soil fertility or soil mechanics).
Special Areas of Conservation (SAC)	Sites that have been adopted by the European Commission and formally designated, protecting one or more special habitats and/or species.
Special Protection Areas (SPAs)	Protected areas for birds in the UK.
Substation	A high voltage electricity system facility.
Sustainable Urban Drainage System (SuDS)	A collection of water management practices that aim to align modern drainage systems with natural water processes and are part of a larger green infrastructure strategy.
Superficial Deposits	These are geological deposits typically of Quaternary age.
Transformer	A device that transfers electric energy from one alternating current circuit to one or more other circuits, either increasing or reducing the voltage.
Underground Cable	Cables that are designed to be placed/buried beneath the surface of the earth.
Water Framework Directive (WFD)	This is an EU directive which commits European Union member states to achieve good qualitative and quantitative statuses of all water bodies by 2015.
Wind Turbine	A machine that converts kinetic energy from the wind into electricity.

Term	Definition
World Heritage Site (WHS)	A landmark or an area with legal protection by an international convention administered by the United Nations Educational, Scientific and Cultural Organization. World Heritage Sites are designated by UNESCO for having cultural, historical, scientific or other forms of significance.
Zone of Theoretical Visibility (ZTV)	A computer generated tool to identify the likely/ theoretical extent of visibility of a Proposed Development.

Appendix B

List of Scoping Questions

Table B.1: List of scoping questions

Scoping Report Chapter	Questions
Chapter 2: The EIA Process and Assessment Methodology	Question 2.1: Are there other wind farm proposals or other developments that should be considered in the cumulative assessment?
	Question 2.2: Do the consultees agree the approach to consideration of various standard good practice measures as 'pre-mitigation' is appropriate?
	Question 2.3: Are there other national or local planning policies or guidance that are relevant to the assessment of potential significant environmental effects?
Chapter 3: Project Description	Question 3.1: Confirmation is requested on the proposed approach to the assessment of decommissioning.
Chapter 4: Landscape and Visual Amenity	Question 4.1: Is the proposed approach and scope for the assessment of effects on landscape character considered to be appropriate?
	Question 4.2: Is the proposed approach and scope for the assessment of effects on designated landscapes considered to be appropriate?
	Question 4.3: Is the proposed approach and scope for the assessment of visual effects appropriate?
	Question 4.4: Do consultees consider that the proposed viewpoints are appropriate to inform the visual assessment, and that the suggested presentation of visualisations is appropriate?
	Question 4.5: Is the approach to inclusion of schemes within the cumulative assessment appropriate?

Scoping Report Chapter	Questions
	Question 4.6: Is the approach to the assessment of effects on residential visual amenity appropriate?
	Question 4.7: Do consultees consider the effects to be scoped in and out appropriate?
	Question 4.8: Is the approach to the aviation lighting assessment and night-time photography appropriate and proportionate, and are the suggested night-time viewpoints appropriate?
	Question 4.9: Are there any other relevant parties who should be included within the post-scoping consultation process for the LVIA?
Chapter 5: Ecology (Non-Avian)	Question 5.1: Is the scope considered appropriate?
	Question 5.2: Do you agree that, with the exception of Colwyn Brook Marsh North and South SSSI, River Ithon SSSI and the River Wye SAC and SSSI, designated sites can be scoped out?
	Question 5.3: Do you agree that the HRA should focus on the River Wye/Afon Gwy SAC only?
Chapter 6: Ornithology	Question 6.1: Do consultees agree that the desk and field surveys already undertaken, plus those proposed in 2024, provide a sufficient baseline to allow the assessment of effects on ornithology?
	Question 6.2: Do consultees agree with the assessment method (including scoped in/scoped out effects)?
	Question 6.3: Do consultees hold any data sets that could be made available to inform the assessment?
	Question 6.4: Do consultees agree that the proposed mitigation options provide suitable methods to offset any identified significant effects?
	Question 7.1: Do consultees consider the study areas appropriate?

Scoping Report Chapter	Questions
Chapter 7: Archaeology and Cultural Heritage	Question 7.2: Are there any other relevant consultees who should be consulted about this topic?
	Question 7.3: Are consultees aware of any other supplementary guidance of relevance to assessment of effects to historic assets?
	Question 7.4: Is the approach to the assessment of effects, including those effects scoped in and out and the cumulative assessment, appropriate?
	Question 7.5: Is the approach to field survey considered appropriate?
	Question 7.6: Are consultees content with the proposed approach to scope out 'Likely Effects Scoped Out' from the ES?
	Question 7.7: Are consultees aware of any non-statutory stakeholders that should be consulted?
Chapter 8: Water and Soil Resources	Question 8.1: Whilst potential mineral resources are present in part of the Site, please can confirmation be sought as to if these are safeguarded and under what policy/plan.
	Question 8.2: Please can all data held on private water supplies on or near (within 250 m) the Site be provided?
	Question 8.3: Please can NRW comment on the Proposed Development in relation to potential interaction with the Colwyn Brook Marshes SSSI. Particularly in relation to its geo-morphological habitats including quaking bogs, transition mires and flood plains. In addition, what actions are required to maintain a favourable condition?
Chapter 9: Peat	Question 9.1: NRW – in the event that interim peat depth probing (e.g. on a 25m grid) confirms the absence of peat across the Site, and that this absence is supported by both a lack of peatland habitats and a lack of geomorphological/hydrological indicators of peat, would NRW and LQAS

Scoping Report Chapter	Questions
	(Land Quality Advice Service) accept that a Phase 2 peat survey is not required? Question 9.2: NRW/LQAS – in the event that direct and indirect effects on peat soils can be demonstrably avoided, would NRW/LQAS support scoping out of a peat landslide risk assessment and peat management plan as part of the EIA (noting that a Soil Management Plan would still be delivered as part of the ES).
Chapter 10: Transport and Access	Question 10.1: Is the proposed methodology acceptable, including what is proposed to be scoped out and the approach to the cumulative assessment? Question 10.2: Are the proposed traffic survey locations acceptable? Question 10.3: Is the use of National Road Traffic Forecasts (NRTF) Low Growth acceptable for the whole of the study to determine future year traffic flows? Question 10.4: What committed development traffic flows should be included in the baseline traffic flows? Question 10.5: Is a Framework Abnormal Load Transport Management Plan sufficient for the planning application stage?
Chapter 11: Noise and Vibration	Question 11.1: Are the consultees in agreement with the suggested approach for the noise assessment? Question 11.2: Do the consultees have any comments on the elements proposed to be scoped out?
Chapter 12: Other Issues	Question 12.1: Do consultees agree with the approach to how these factors have been scoped in and scoped out of the ES? Question 12.2: Do consultees agree with the assessment of which topics are to be scoped in or scoped out of the ES?

Scoping Report Chapter	Questions
	Question 12.3: Does the provision of a forestry assessment in the form of a technical appendix to the ES meet with NRW requirements?
	Question 12.4: Are there any other relevant consultees who should be consulted about the other EIA topic assessments?

Appendix C

Outline Structure of the ES

c.1 The following section presents the proposed Aberedw Energy Park ES Structure:

Volume 1: Non-Technical Summary

Volume 2: Main Report

Chapter 1: Introduction

- Introduction to the Project
- Legislative Requirements for EIA
- Other Application Documents
- The EIA Process
- The Project Team
- Structure of the ES
- Availability of the ES and how to comment on it

Chapter 2: Proposed Development Description

- Site Location
- Proposed Development Description
- Construction Activities
- Operational Management and Maintenance
- Residues and Emissions
- Decommissioning

Chapter 3: Design Evolution and Alternatives

- Site Selection Considerations
- Current Land Use and Site Context

- Policy Considerations
- Design Strategy (Key Issues and Constraints)
- Design Evolution and Alternatives (including the do-nothing scenario)

Chapters 4 to 12: Landscape and Visual Amenity; Ecology; Ornithology; Cultural Heritage; Hydrology and Ground Conditions; Peat; Traffic, Transport and Access; Noise and Vibration; and Other Issues

c.2 Each chapter will include:

- Introduction
- Assessment Methodology
 - Scope of the Assessment (setting out effects scoped in, and effects scoped out)
 - Consultation Summary
 - Committed Design (e.g. good practice measures and project design assumptions)
 - Method of Baseline Characterisation
 - Criteria for the Assessment of Effects
 - Limitations and Assumptions
- Baseline Conditions (derived from desk studies and surveys undertaken)
 - Existing Baseline
 - Future Baseline
- Identification of Likely Significant Effects
- Mitigation (and monitoring as appropriate)
- Assessment of Residual Effects (assessment of effect significance once mitigation has been incorporated)
- Summary

Chapter 13: Schedule of Mitigation

Volume 3a: Figures

Volume 3b: Visualisations

Volume 4: Appendices

- E.g. Consultation Summary, Outline Construction Environmental Management Plan (CEMP), Abnormal Loads Assessment (ALA), topic relevant survey information.

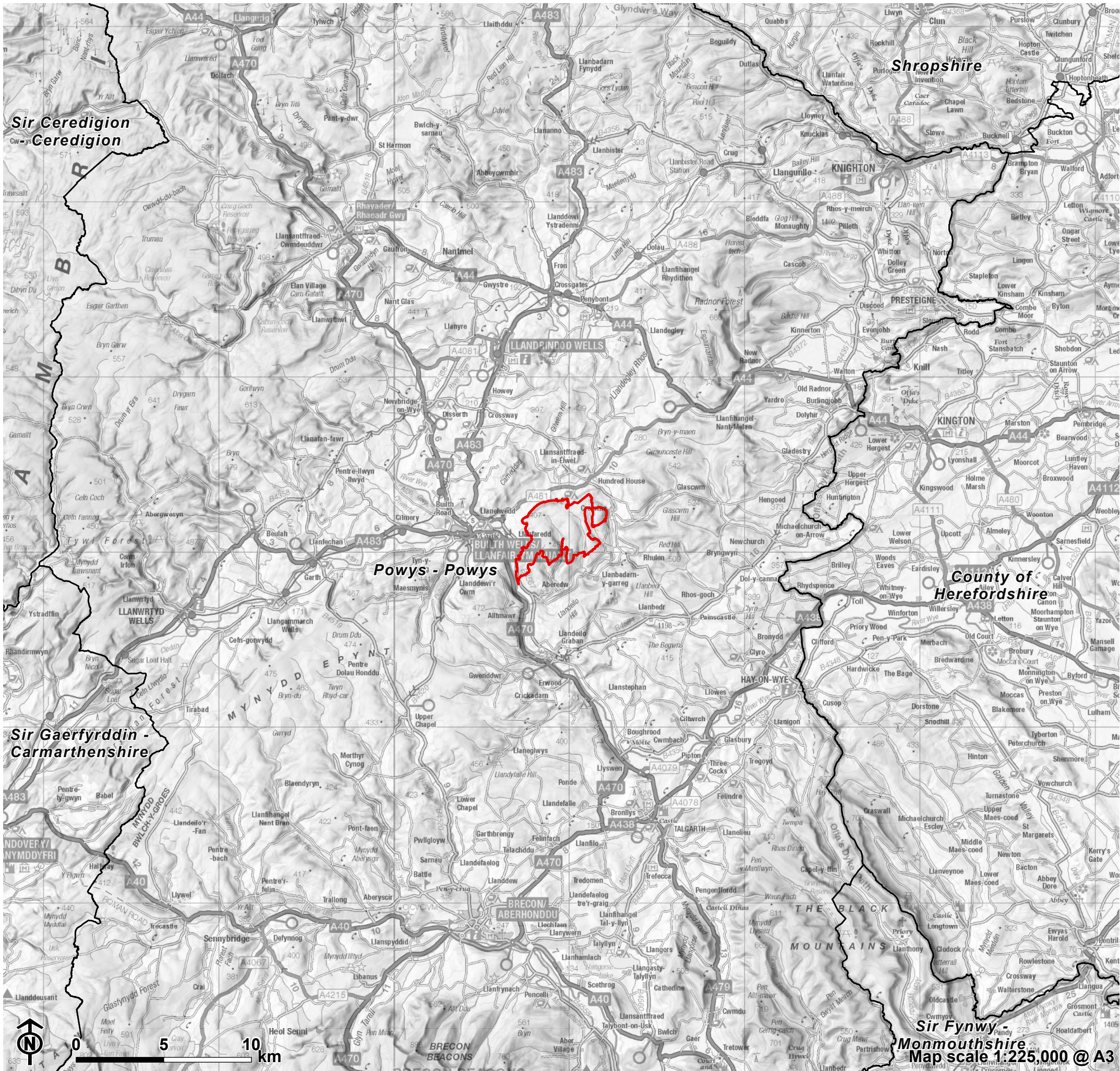


Figure 1.1: Site Location

- Site boundary
- Local authority boundary

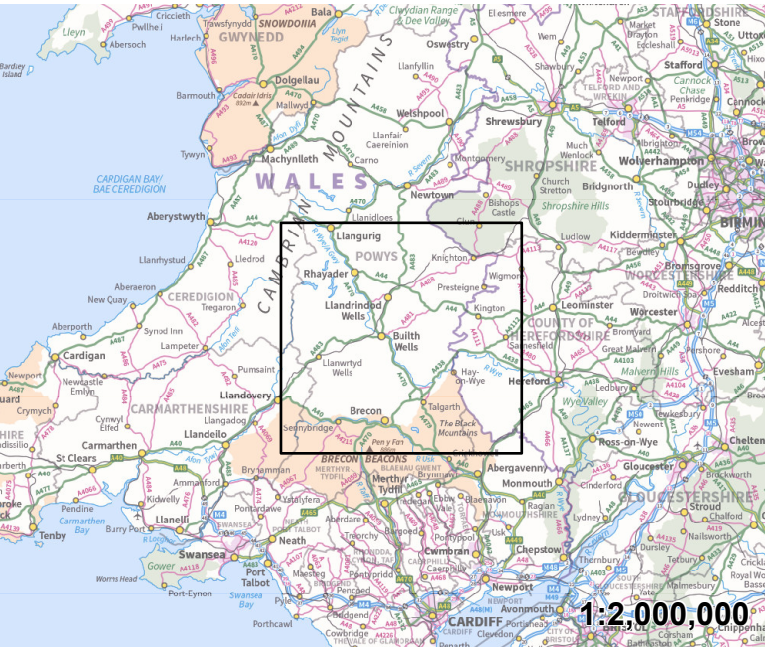
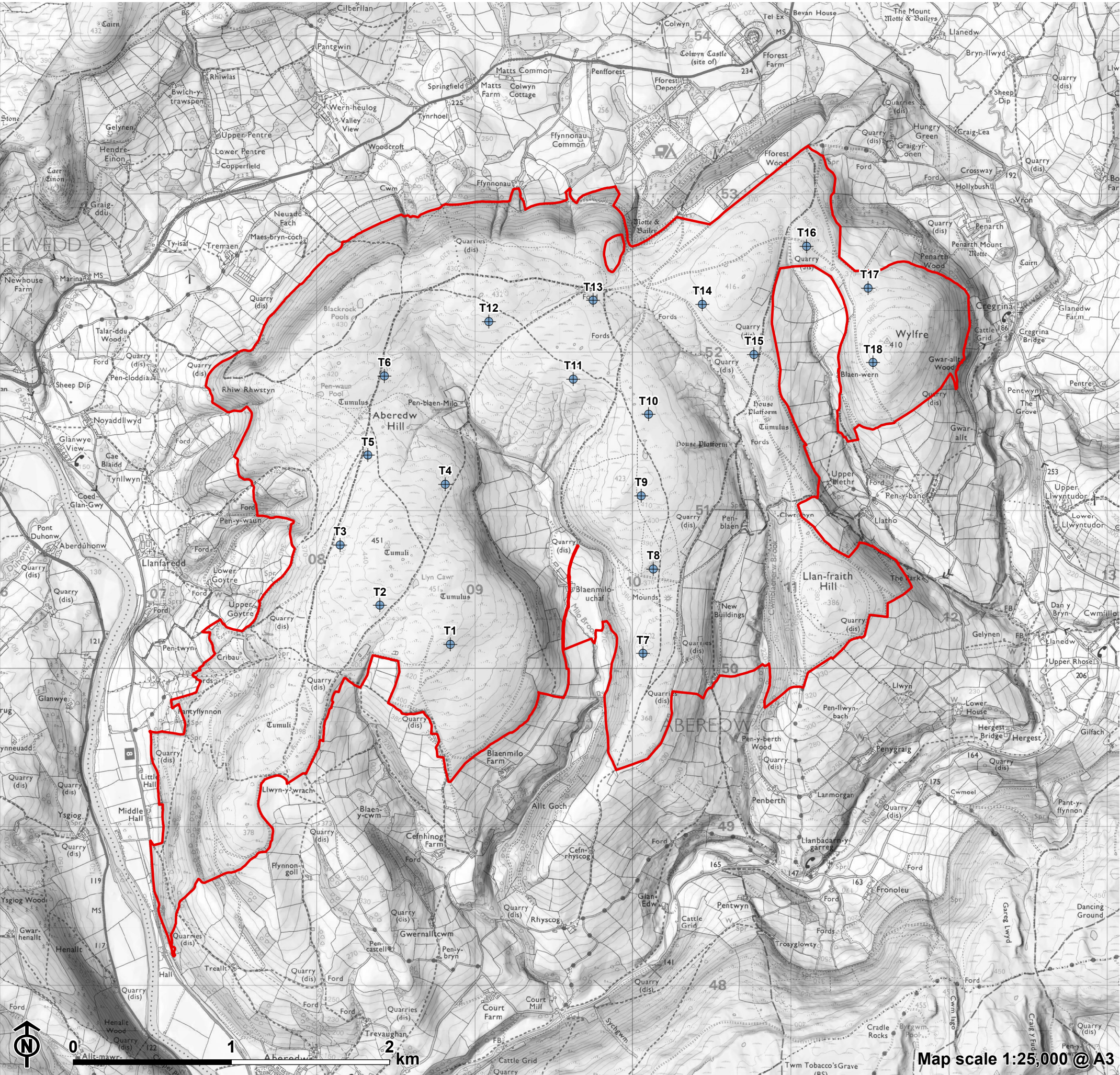
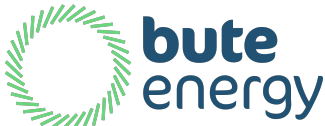




Figure 1.2: Site Layout



- Site boundary
- Turbine



- Site boundary
- Turbine
- Buffer intervals from the turbine layout
- 33km from outermost turbine

Wind Farm Status

- Operational
- Under Construction
- Consented
- Application Submitted
- Design/Scoping

Under Construction

- ## Design/Scoping

Cumulative data correct as of 27/11/2023



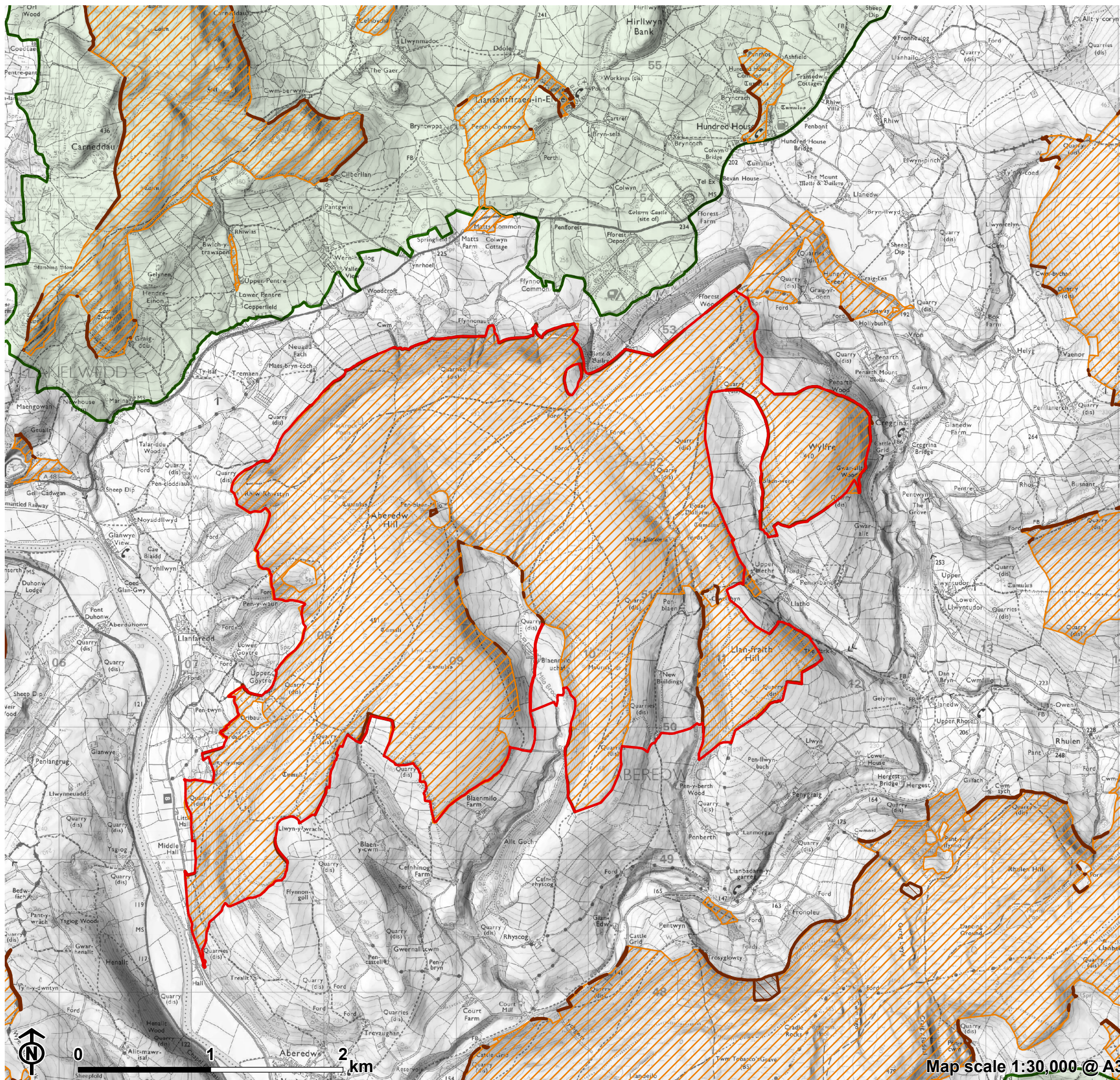


Figure 3.1: Open Access Land and Pre-Assessed Wind Priority Areas

- Site boundary
- Pre-assessed Wind Priority Areas
- Open Access Land**
 - Common Land
 - Open Country

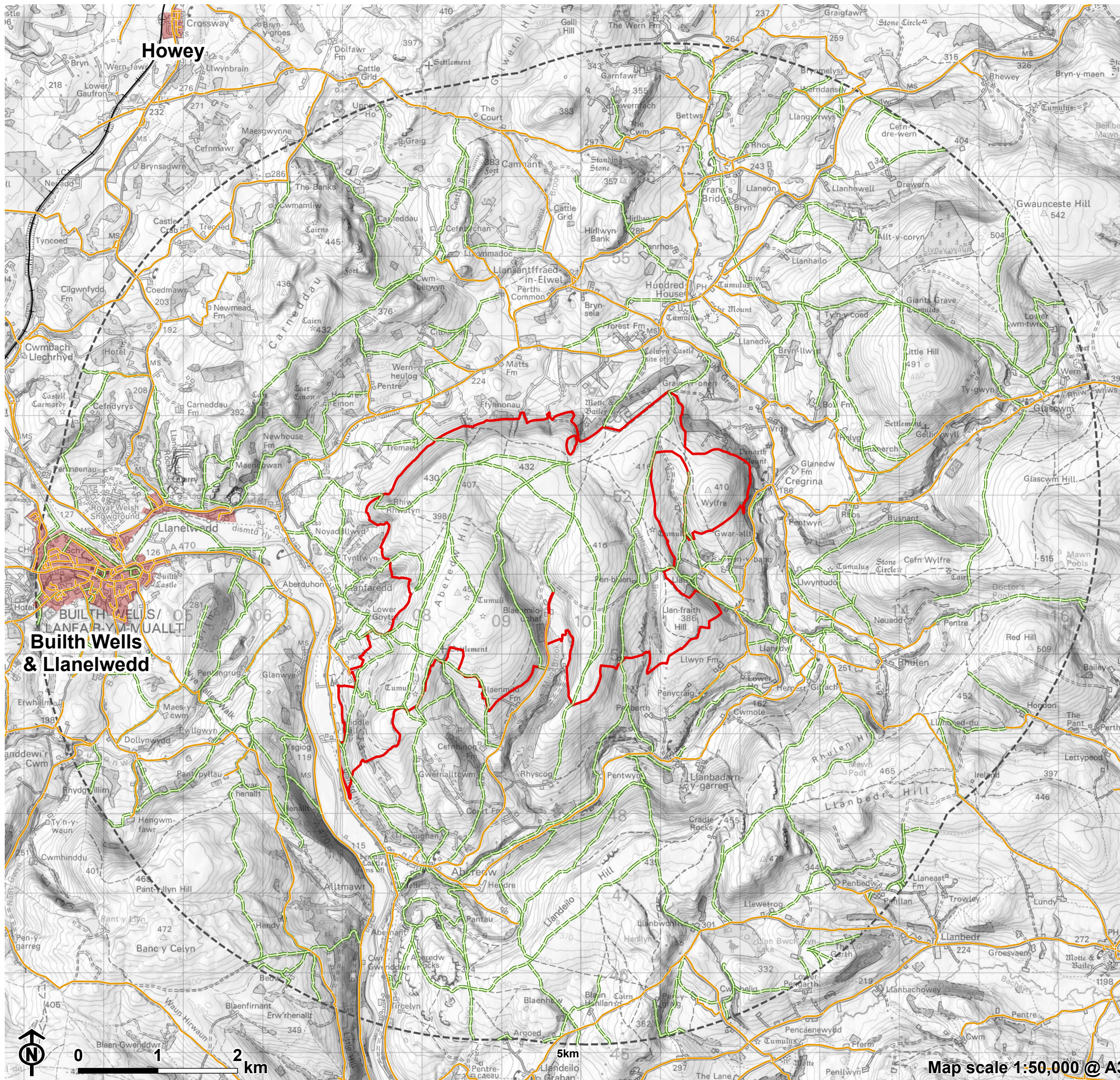
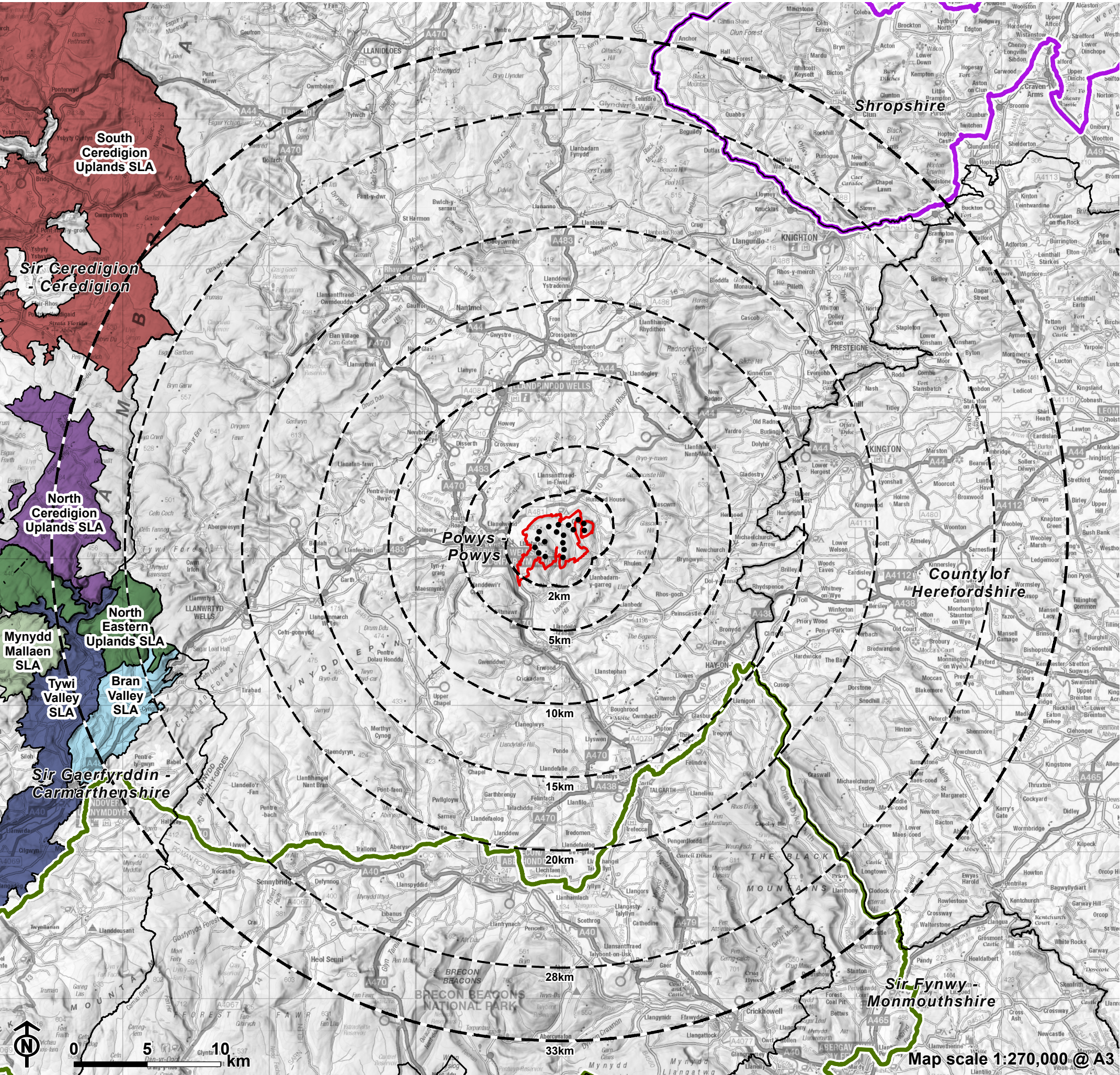


Figure 3.2: Existing Settlements, Public Rights of Way, Road, Rail and PROW Infrastructure

- Site boundary
- 5km from outermost turbine
- Road
- Railway
- Public Rights of Way
- Settlement for Towns and Large Villages designated in the Adopted Powys LDP (2011 to 2026)

Figure 4.1: Search Area and Designated Landscapes



- Site boundary
- Turbine
- Buffer intervals from the turbine layout
- 33km from outermost turbine
- Local authority boundary
- Bannau Brycheiniog National Park and International Dark Sky Reserve
- Shropshire Hills National Landscape
- Special Landscape Area (SLA)**
 - Bran Valley SLA
 - Mynydd Mallaen SLA
 - Tywi Valley SLA
 - North Eastern Uplands SLA
 - South Ceredigion Uplands SLA
 - North Ceredigion Uplands SLA

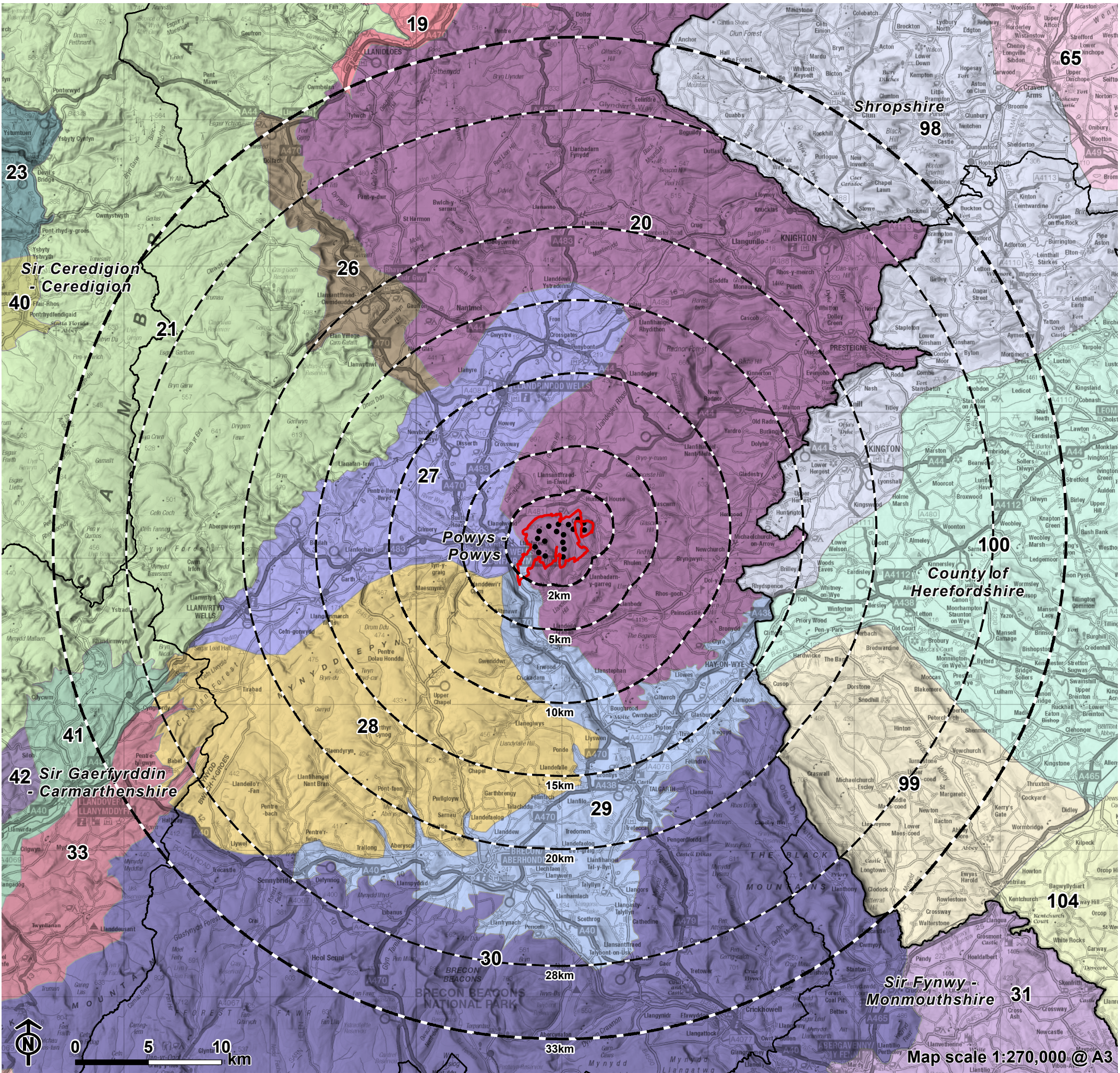
Additional Attributes
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Figure 4.2: Scoping Turbine Layout



Site boundary
Turbine

Figure 4.3: National Landscape Character Areas



Site boundary

Turbine

Buffer intervals from the turbine layout

33km from outermost turbine

Local authority boundary

National Landscape Character Areas

Wales

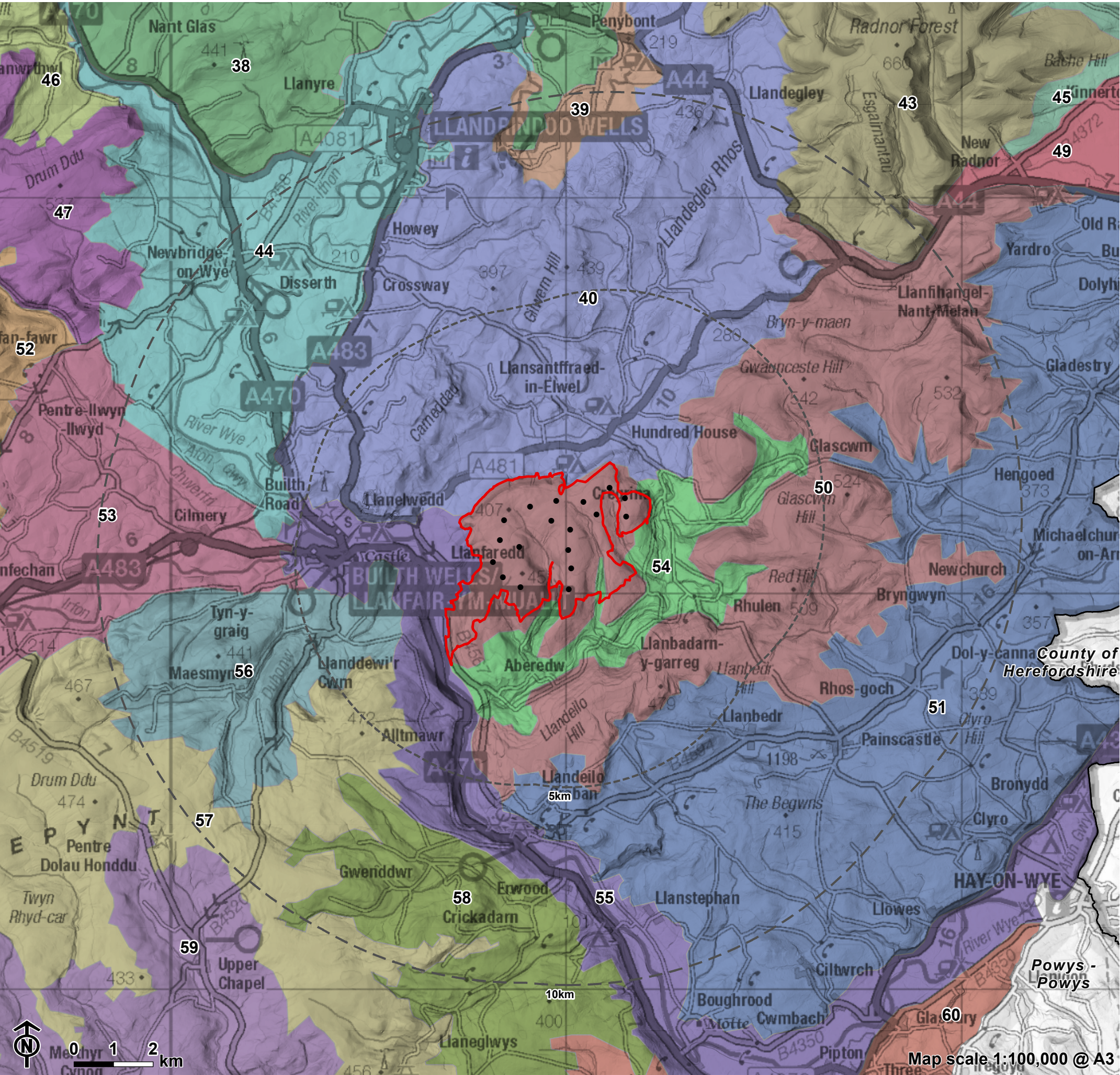
- 19: Dyffryn Hafren / Severn Valley
- 20: Bryniau Sir Faesyfed / Radnorshire Hills
- 21: Bryniau'r Canolbarth / Cambrian Mountains
- 23: Bryniau a dyffrynnoedd Rheidol ac Ystwyth / Rheidol and Ystwyth Hills and Valleys
- 26: Blaenau Gwy / Upper Wye Valley
- 27: Dyffrynnoedd Irfon ac Ieithon / The Vales of Irfon and Ithon
- 28: Epynt / Epynt
- 29: Dyffrynnoedd Gwy ac Wysg / Wye and Usk Vales
- 30: Bannau Brycheiniog a'r Mynyddoedd Du / Bannau Brycheiniog and Black Mountains
- 31: Canol Sir Fynwy / Central Monmouthshire
- 33: Cymoedd Gwendraeth / Gwendraeth Vales
- 37: Cymoedd y De / South Wales Valleys
- 40: Dyffryn Tefi / Teifi Valley
- 41: Dyffryn Tywi / Tywi Valley
- 42: Bryniau Dyfed / Pembroke and Carmarthen Foothills

England

- 65: Shropshire Hills
- 98: Clun and North West Herefordshire Hills
- 99: Black Mountains and Golden Valley
- 100: Herefordshire Lowlands
- 104: South Herefordshire and Over Severn



Figure 4.4: Local Landscape Character Areas (Powys) within 10km



Site boundary

Turbine

5km interval from outermost turbine

10km from outermost turbine

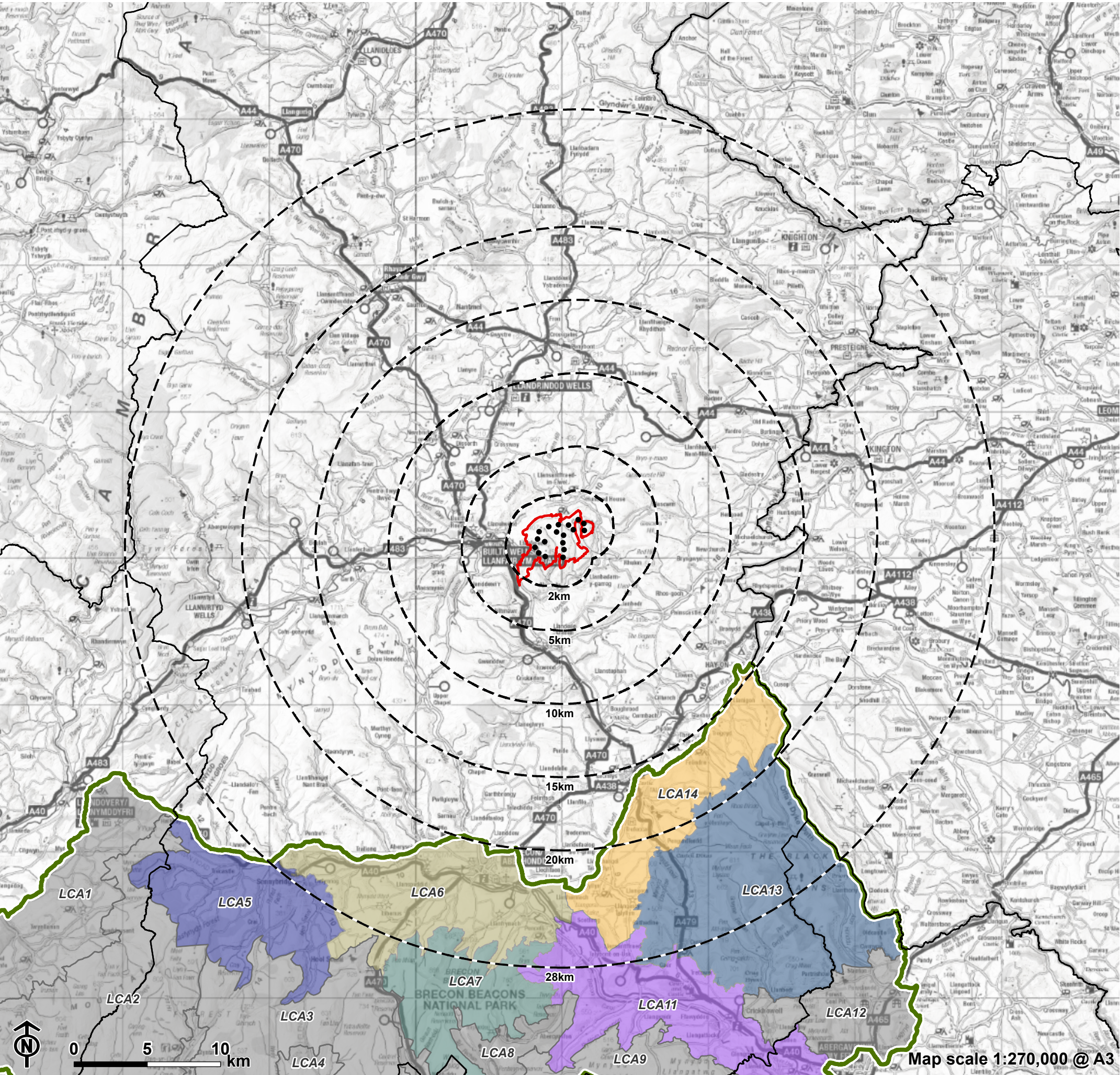
Local authority boundary

Powys Landscape Character Assessment (2021)

- 38: Bryniau a Dyffrynnoedd Afon Dulas / River Dulas Hills & Valleys
- 39: Dyffryn Ieithon / Ithon Valley
- 40: Ucheldir Llanbister – Pen-y-bont / Llanbister - Penybont Uplands
- 43: Coedwig Maesyfed / Radnor Forest
- 44: Dyffryn Gwy (Rhaeadr i Lanfair-ym-Muallt) / Wye Valley (Rhayader to Builth Wells)
- 45: Llethrau Llanandras a Beggar's Bush / Presteigne & Beggar's Bush Hillsides
- 46: Dyffryn Dulas / Dulas Valley
- 47: Ucheldir Bryn Glas / Bryn Glas Uplands
- 49: Dyffryn Maesyfed / New Radnor Valley
- 50: Ucheldir Aberedw / Aberedw Uplands
- 51: Ucheldir Castell-paen / Painscastle Uplands
- 52: Cymoedd Deheuol Bryn Glas / Southern Bryn Glas Valleys
- 53: Dyffryn Irfon / Irfon Valley
- 54: Dyffryn Aberedw / Aberedw Valley
- 55: Dyffryn Gwy (Llanfair-ym-Muallt i'r Gelli Gandryll) / Wye Valley (Builth Wells to Hay-on-Wye)
- 56: Gogledd Mynydd Epynt / Northern Mynydd Epynt
- 57: Mynydd Epynt/SENTA / Mynydd Epynt/SENTA
- 58: Bryniau Dwyreiniol Mynydd Epynt / Eastern Mynydd Epynt Hills
- 59: Dyffrynnoedd Deheuol Mynydd Epynt / Southern Mynydd Epynt Valleys
- 60: Ffermdir Llanfilo/Bronllys / Llanfilo/Bronllys Farmlands

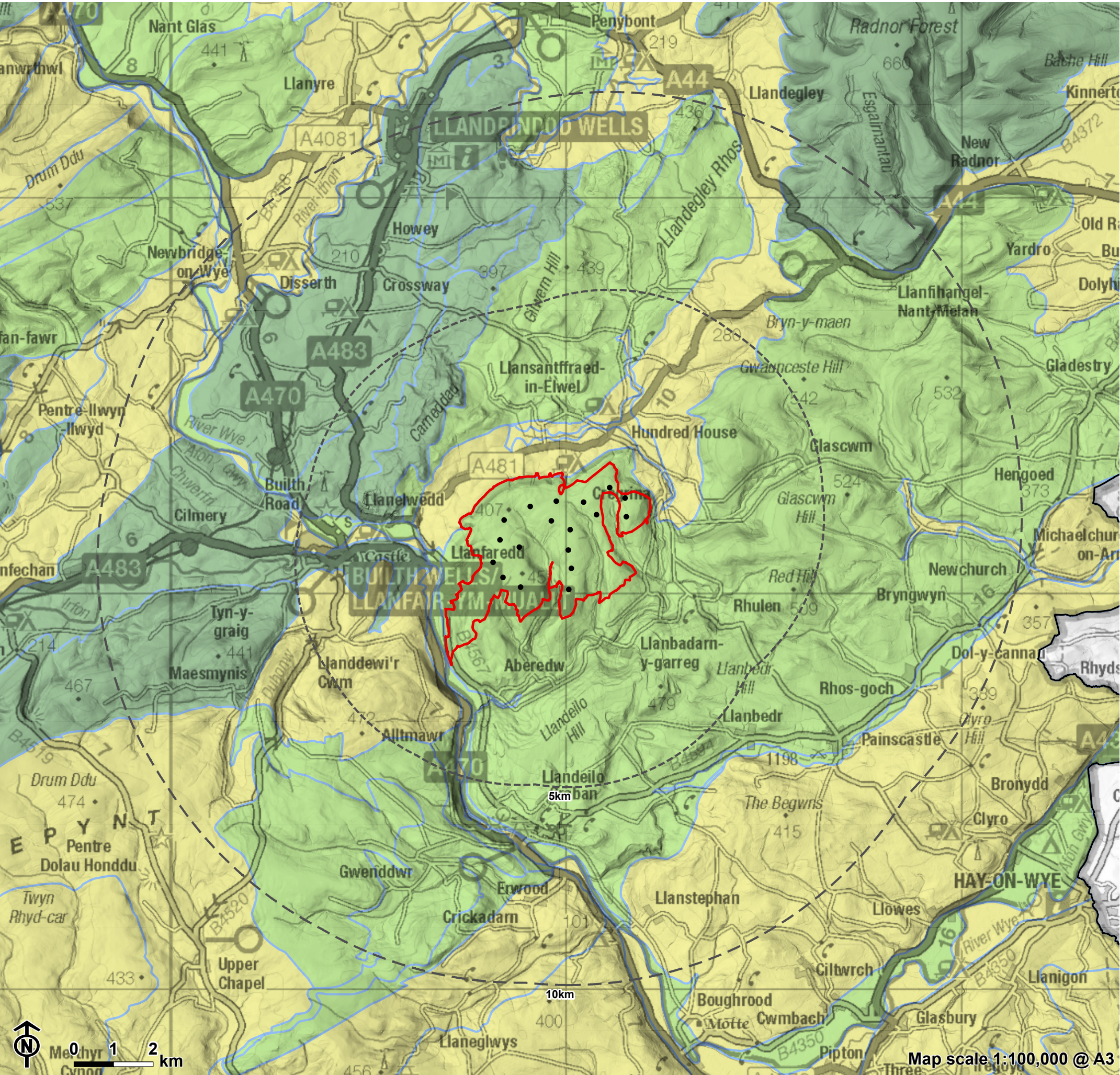
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Figure 4.5: Bannau Brycheiniog National Park Landscape Character Areas within 28km



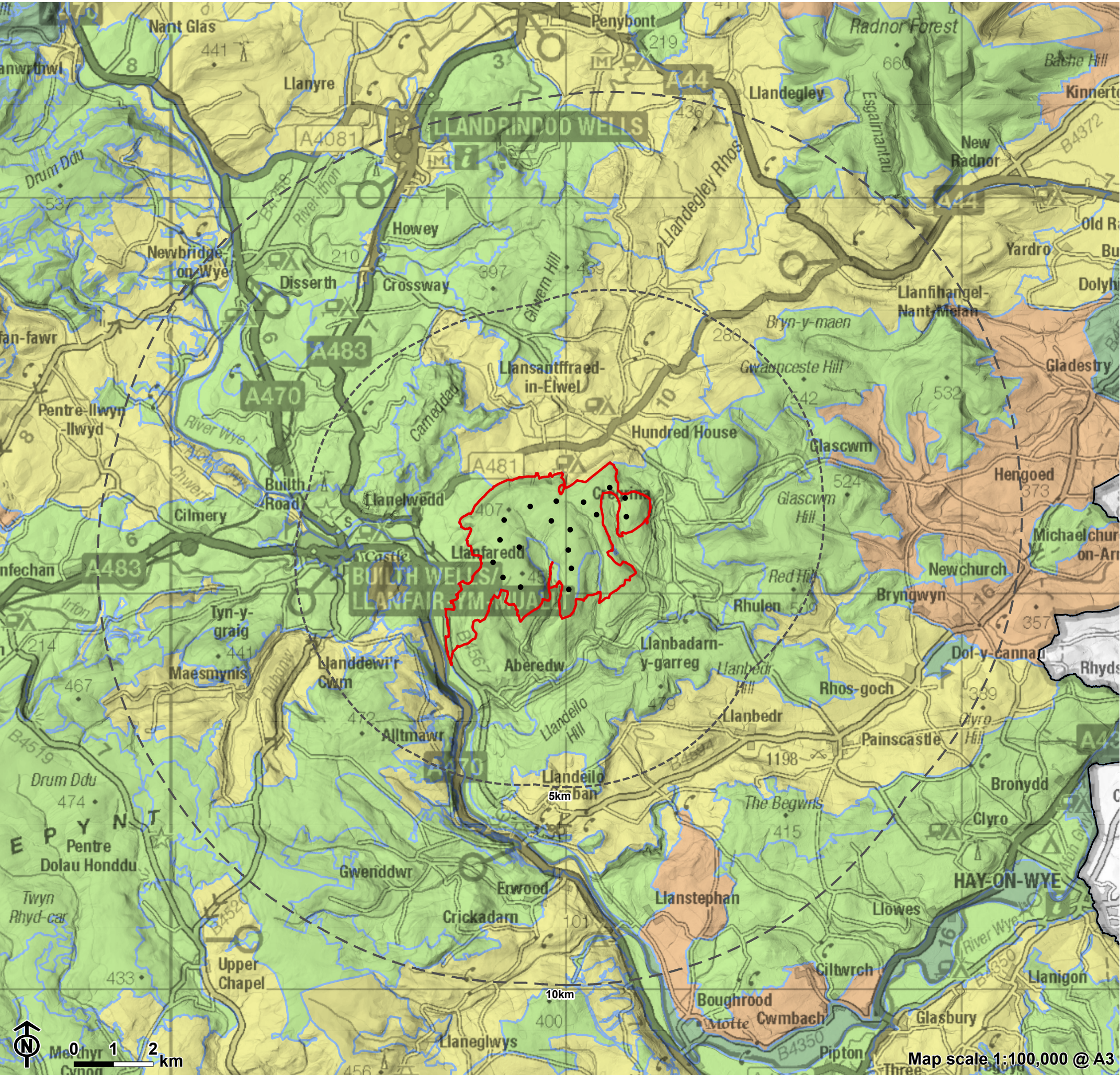
- Site boundary
 - Turbine
 - Buffer intervals from the turbine layout
 - 28km from outermost turbine
 - Local authority boundary
 - Bannau Brycheiniog National Park
- Brecon Beacons National Park Landscape Character Assessment (2012)**
- 7: Central Beacons
 - 6: Middle Usk Valleys
 - 5: Western Usk Valleys
 - 11: Eastern Usk Valley
 - 13: The Black Mountains
 - 14: Wye Valley Foothills
 - LCA outwith 28km from outermost turbine

Figure 4.6: LANDMAP Aspect Areas - Geological Landscape to 10km



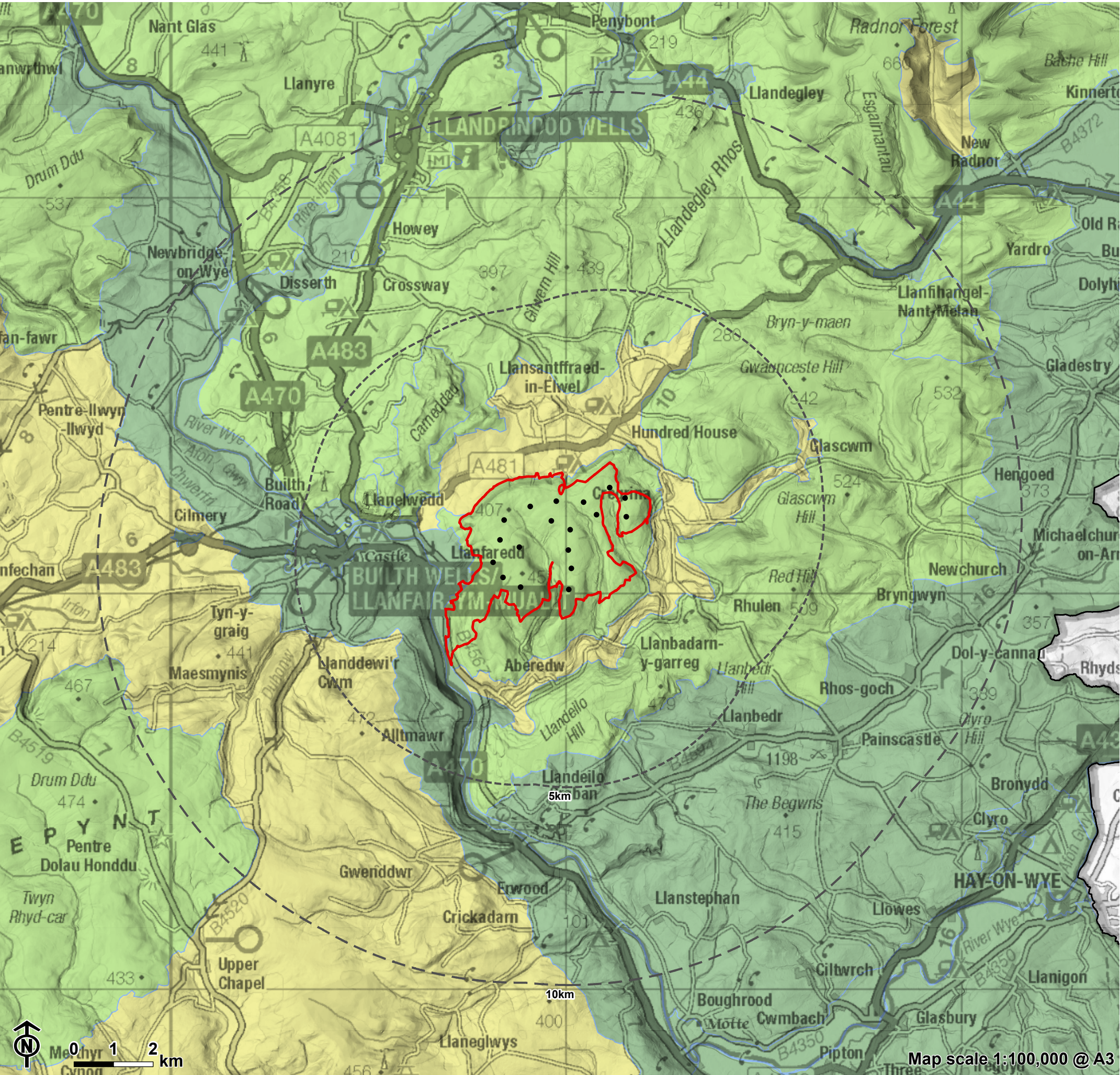
- Site boundary
 - Turbine
 - 5km interval from outermost turbine
 - 10km from outermost turbine
 - Local authority boundary
- LANDMAP - Geological Landscape**
- Overall Evaluation**
- Outstanding
 - High
 - Moderate

Figure 4.7: LANDMAP Aspect Areas -
Landscape Habitat to 10km



- Site boundary
 - Turbine
 - 5km interval from outermost turbine
 - 10km from outermost turbine
 - Local authority boundary
- LANDMAP - Landscape Habitats**
- Overall Evaluation**
- Outstanding
 - High
 - Moderate
 - Low

Figure 4.8: LANDMAP Aspect Areas - Cultural Landscape to 10km



- Site boundary
 - Turbine
 - 5km interval from outermost turbine
 - 10km from outermost turbine
 - Local authority boundary
- LANDMAP - Cultural Landscape**
- Overall Evaluation**
- Outstanding
 - High
 - Moderate

-  Site boundary
- Turbine
-  5km interval from outermost turbine
-  10km from outermost turbine
-  Local authority boundary

LANDMAP - Historic Landscape

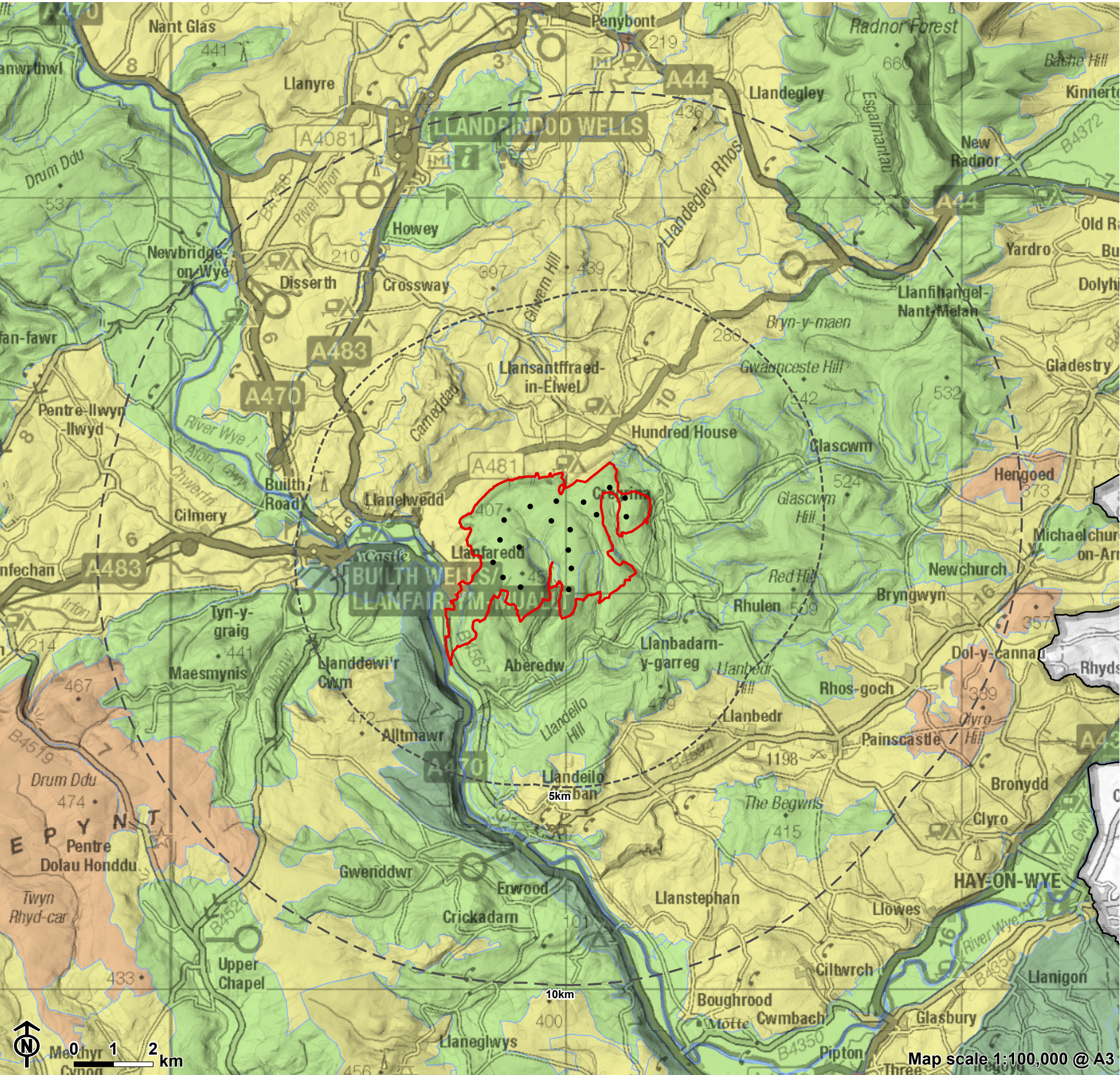
Overall Evaluation

-  Outstanding
-  High
-  Moderate
-  Low



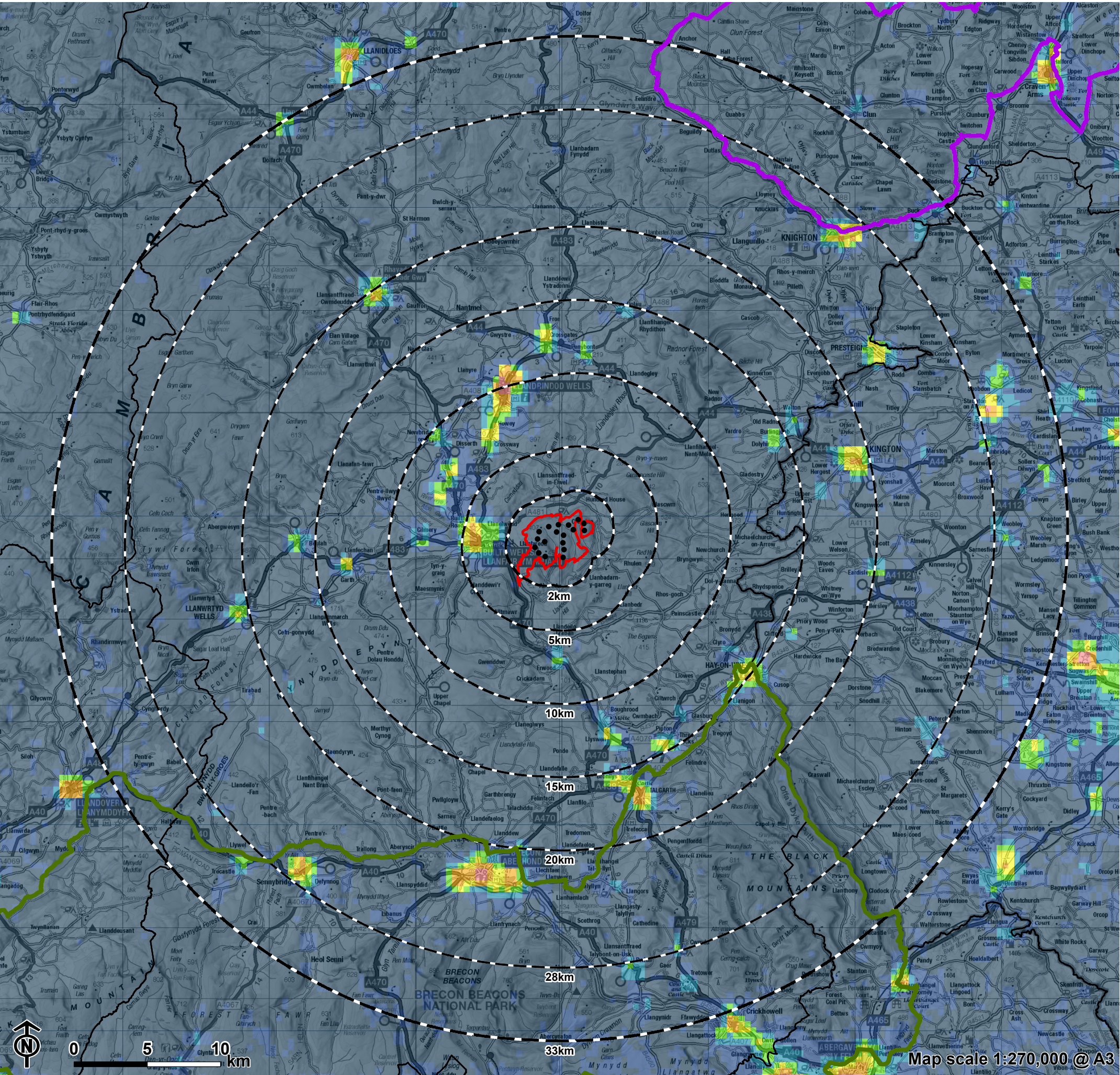


Figure 4.10: LANDMAP Aspect Areas - Visual And Sensory to 10km



- Site boundary
 - Turbine
 - 5km interval from outermost turbine
 - 10km from outermost turbine
 - Local authority boundary
- LANDMAP - Visual Sensory**
- Overall Evaluation**
- Outstanding
 - High
 - Moderate
 - Low

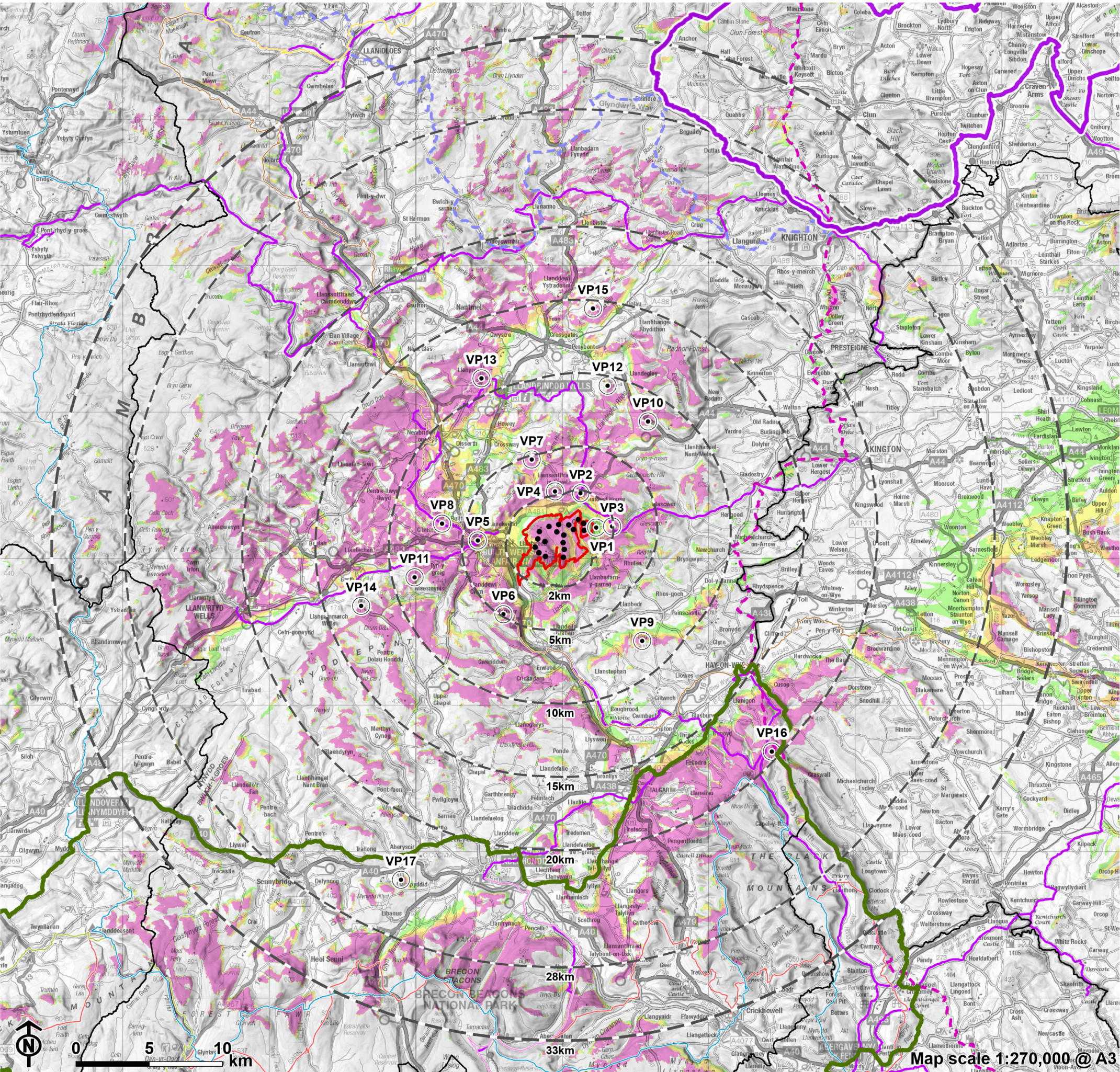
Figure 4.11: Dark Skies Mapping



- Site boundary
 - Turbine
 - Buffer intervals from the turbine layout
 - 33km from outermost turbine
 - Local authority boundary
 - Bannau Brycheiniog National Park and International Dark Sky Reserve
 - Shropshire Hills National Landscape
- Night lights**
(NanoWatts / cm²/sr)
- < 0.25
 - 0.25 - 0.5
 - 0.5 - 1
 - 1 - 2
 - 2 - 4
 - 4 - 8
 - 8 - 16
 - 16 - 32
 - >32



Figure 4.12: Bareground ZTV to Turbine Blade Tip Height (200m) with Scoping Viewpoints (to 33km)



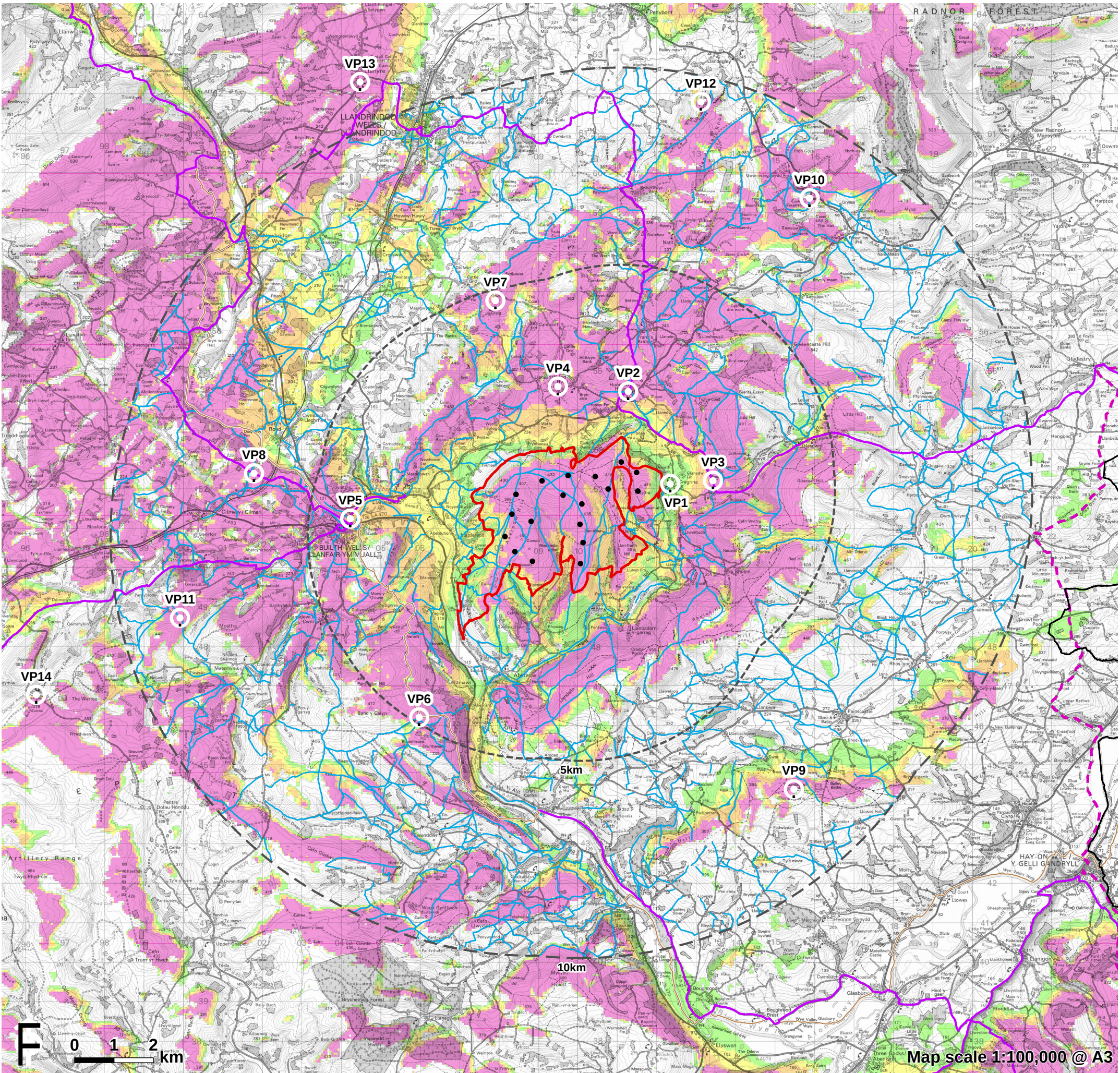
- Site boundary
- Turbine
- Buffer intervals from the turbine layout
- 33km from outermost turbine
- Bannau Brycheiniog National Park and International Dark Sky Reserve
- Shropshire Hills National Landscape
- National Cycle Network
- National Trails
 - Glyndwr's Way
 - Offa's Dyke
- Long Distance Walk
 - Brecon Beacons Way
 - Cambrian Way
 - Celtic Way
 - Severn Way
 - Taff Trail
 - Wye Valley Walk
- Bareground ZTV to tip height (200m)
 - 1 - 4 Turbines visible
 - 5 - 8 Turbines visible
 - 9 - 12 Turbines visible
 - 13 - 18 Turbines visible
- Viewpoint
 - VP1: St. David's Church, Cregrina
 - VP2: A481 at Hundred House
 - VP3: NCN 825 near Cregrina
 - VP4: Perthi Common
 - VP5: Wye Bridge, Builth Wells
 - VP6: Wye Valley Walk near Banc y Celyn
 - VP7: Gilwern Hills Common Land
 - VP8: NCN 8 near Cilmeri
 - VP9: The Begwns Roundabout
 - VP10: Bridleway off A44 near Castell Crugerydd
 - VP11: Heart of Wales Line Trail at Moelfre
 - VP12: Llandegley Rocks
 - VP13: A4081 at Llanyre
 - VP14: Promoted viewpoint south of Cwm Graig-ddu
 - VP15: Elan Valley Way near Cwmwrach
 - VP16: Path to Hay Bluff, Bannau Brycheiniog National Park
 - VP17: Twyn y Gaer

Notes
The ZTV indicates the theoretical visibility of the turbine blade tip height (200m) with a viewing height 2m above ground level. The terrain model is based on OS Terrain 50 (DTM) data obtained from Emapsite in 2023. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcGIS Pro 3.0.3 software.



Map scale 1:270,000 @ A3

Figure 4.13: Bareground ZTV to Turbine Blade Tip Height (200m) with Scoping Viewpoints (to 10km)

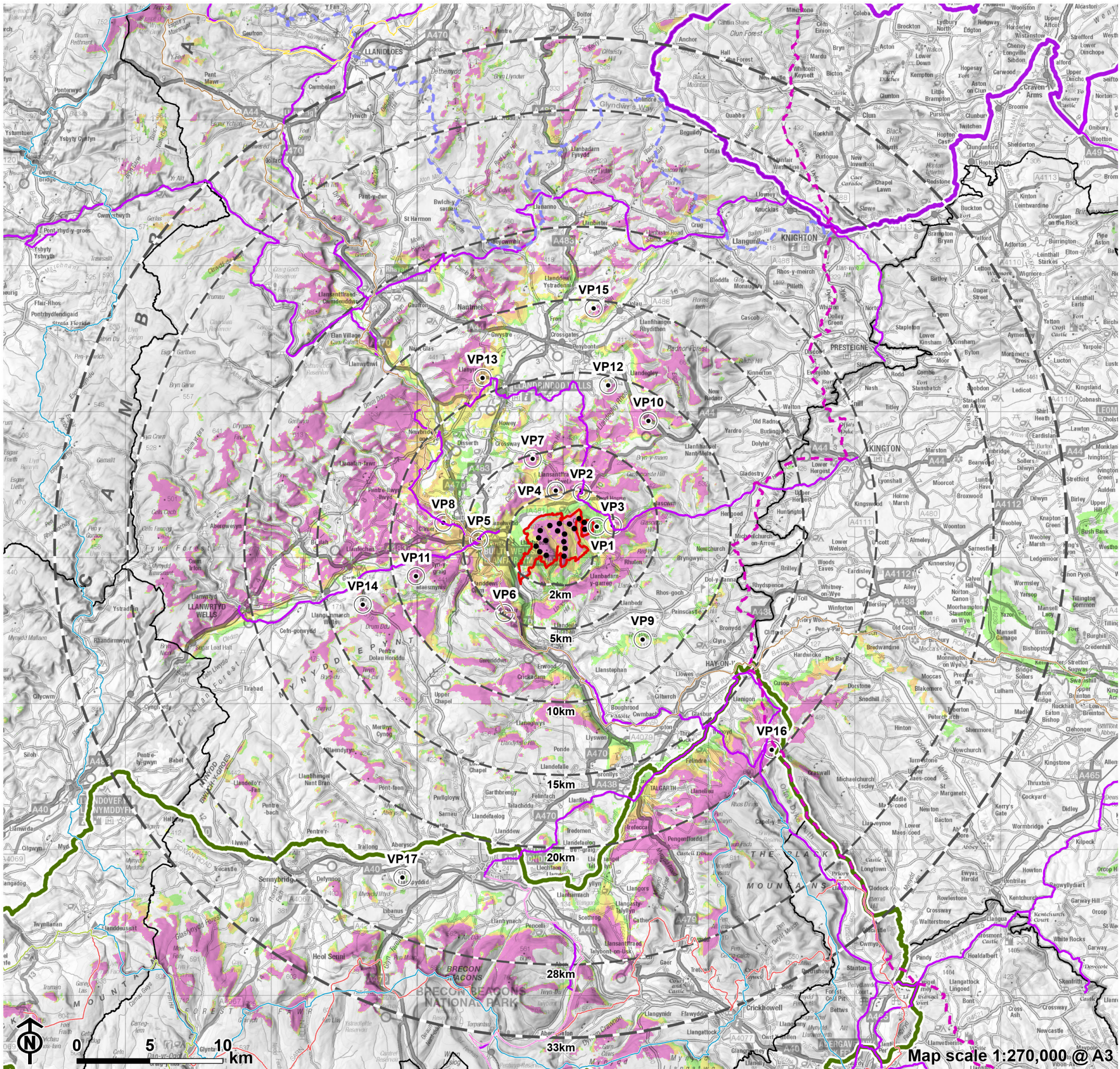


- Site boundary
- Turbine
- 5km interval from outermost turbine
- 10km from outermost turbine
- Local authority boundary
- National Cycle Network
- National Trails
 - Offa's Dyke
- Long Distance Walk
 - Wye Valley Walk
 - Public Right of Way
- Bareground ZTV to tip height (200m)
 - 1 - 4 Turbines visible
 - 5 - 8 Turbines visible
 - 9 - 12 Turbines visible
 - 13 - 18 Turbines visible

- Viewpoint
 - VP1: St. David's Church, Cregrina
 - VP2: A481 at Hundred House
 - VP3: NCN 825 near Cregrina
 - VP4: Perthi Common
 - VP5: Wye Bridge, Buith Wells
 - VP6: Wye Valley Walk near Banc y Celyn
 - VP7: Gilwern Hills Common Land
 - VP8: NCN 8 near Cilmerly
 - VP9: The Begwns Roundabout
 - VP10: Bridleway off A44 near Castell Crugerydd
 - VP11: Heart of Wales Line Trail at Moelfre
 - VP12: Llandegley Rocks
 - VP13: A4081 at Llanyre
 - VP14: Promoted viewpoint south of Cwm Graig-ddu

Notes
The ZTV indicates the theoretical visibility of the turbine blade tip height (200m) with a viewing height 2m above ground level. The terrain model is based on OS Terrain 50 (DTM) data obtained from Emapsite in 2023. Earth curvature and atmospheric refraction have been taken into account.
The ZTV was calculated using ArcGIS Pro 3.0.3 software.

Figure 4.14: Bareground ZTV to Turbine Hub Height (122.5m) with Scoping Viewpoints (to 33km)



- Site boundary
- Turbine
- Local authority boundary
- Buffer intervals from the turbine layout
- 33km from outermost turbine
- Bannau Brycheiniog National Park and International Dark Sky Reserve
- Shropshire Hills National Landscape
- National Cycle Network

National Trails

- Glyndwr's Way
- Offa's Dyke

Long Distance Walk

- Brecon Beacons Way
- Cambrian Way
- Celtic Way
- Severn Way
- Taff Trail
- Wye Valley Walk

Bareground ZTV to hub height (122.5m)

- 1 - 4 Turbines visible
- 5 - 8 Turbines visible
- 9 - 12 Turbines visible
- 13 - 18 Turbines visible

- Viewpoint

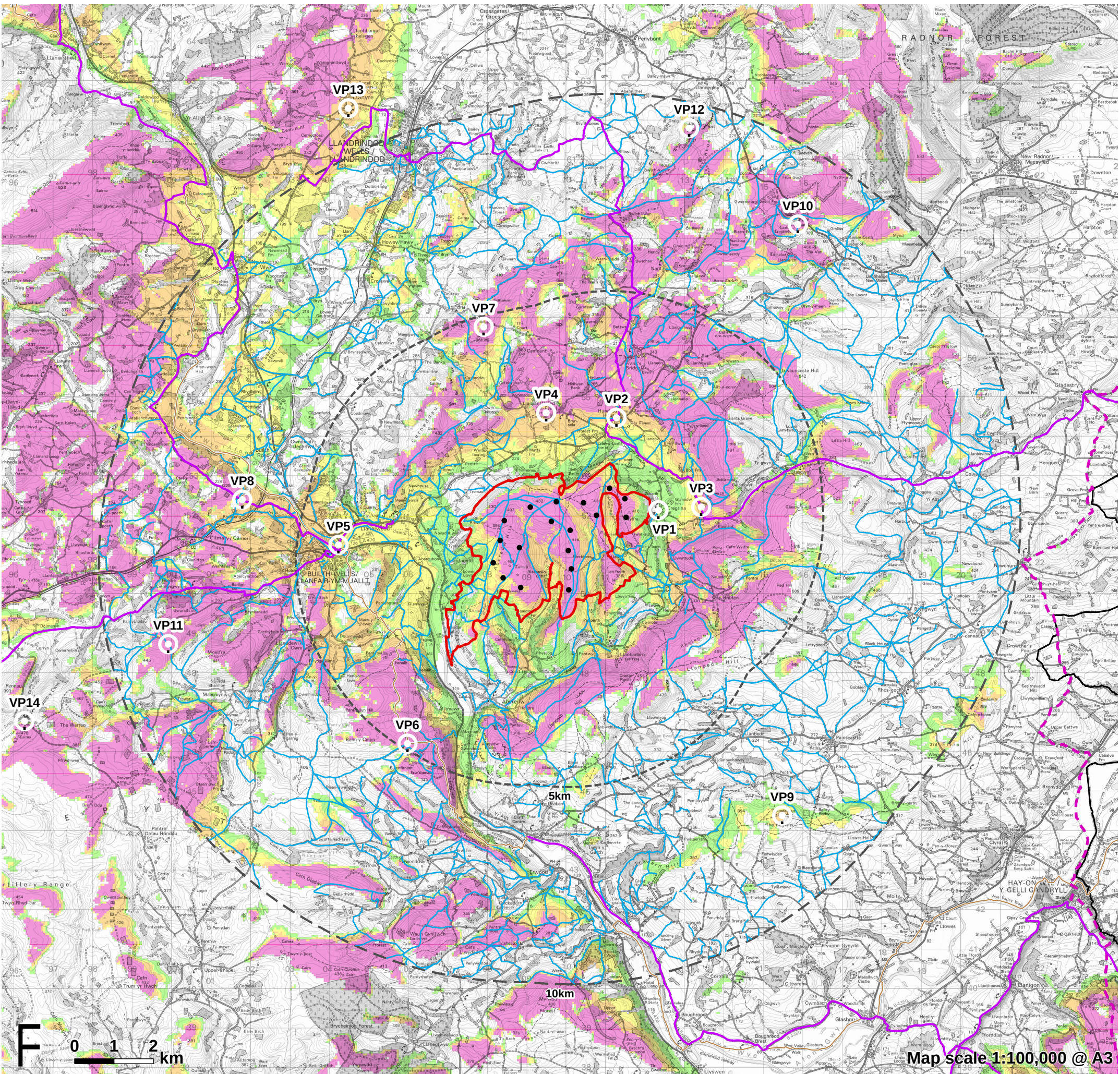
- VP1: St. David's Church, Cregrina
- VP2: A481 at Hundred House
- VP3: NCN 825 near Cregrina
- VP4: Perthi Common
- VP5: Wye Bridge, Builth Wells
- VP6: Wye Valley Walk near Banc y Celyn
- VP7: Gilwern Hills Common Land
- VP8: NCN 8 near Cilmeri
- VP9: The Begwns Roundabout
- VP10: Bridleway off A44 near Castell Crugerydd

- VP11: Heart of Wales Line Trail at Moelfre
- VP12: Llandegley Rocks
- VP13: A4081 at Llanyre
- VP14: Promoted viewpoint south of Cwm Graig-ddu
- VP15: Elan Valley Way near Cwmwrach
- VP16: Path to Hay Bluff, Bannau Brycheiniog National Park
- VP17: Twyn y Gaer

Notes

The ZTV indicates the theoretical visibility of the turbine blade hub height (122.5m) with a viewing height 2m above ground level. The terrain model is based on OS Terrain 50 (DTM) data obtained from Emapsite in 2023. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcGIS Pro 3.0.3 software.

Figure 4.15: Bareground ZTV to Turbine Hub Height (122.5m) with Scoping Viewpoints (to 10km)



- Site boundary
- Turbine
- 5km interval from outermost turbine
- 10km from outermost turbine
- Local authority boundary
- National Cycle Network
- National Trails
 - Offa's Dyke
- Long Distance Walk
 - Wye Valley Walk
 - Public Right of Way

Bareground ZTV to hub height (122.5m)

- 1 - 4 Turbines visible
- 5 - 8 Turbines visible
- 9 - 12 Turbines visible
- 13 - 18 Turbines visible

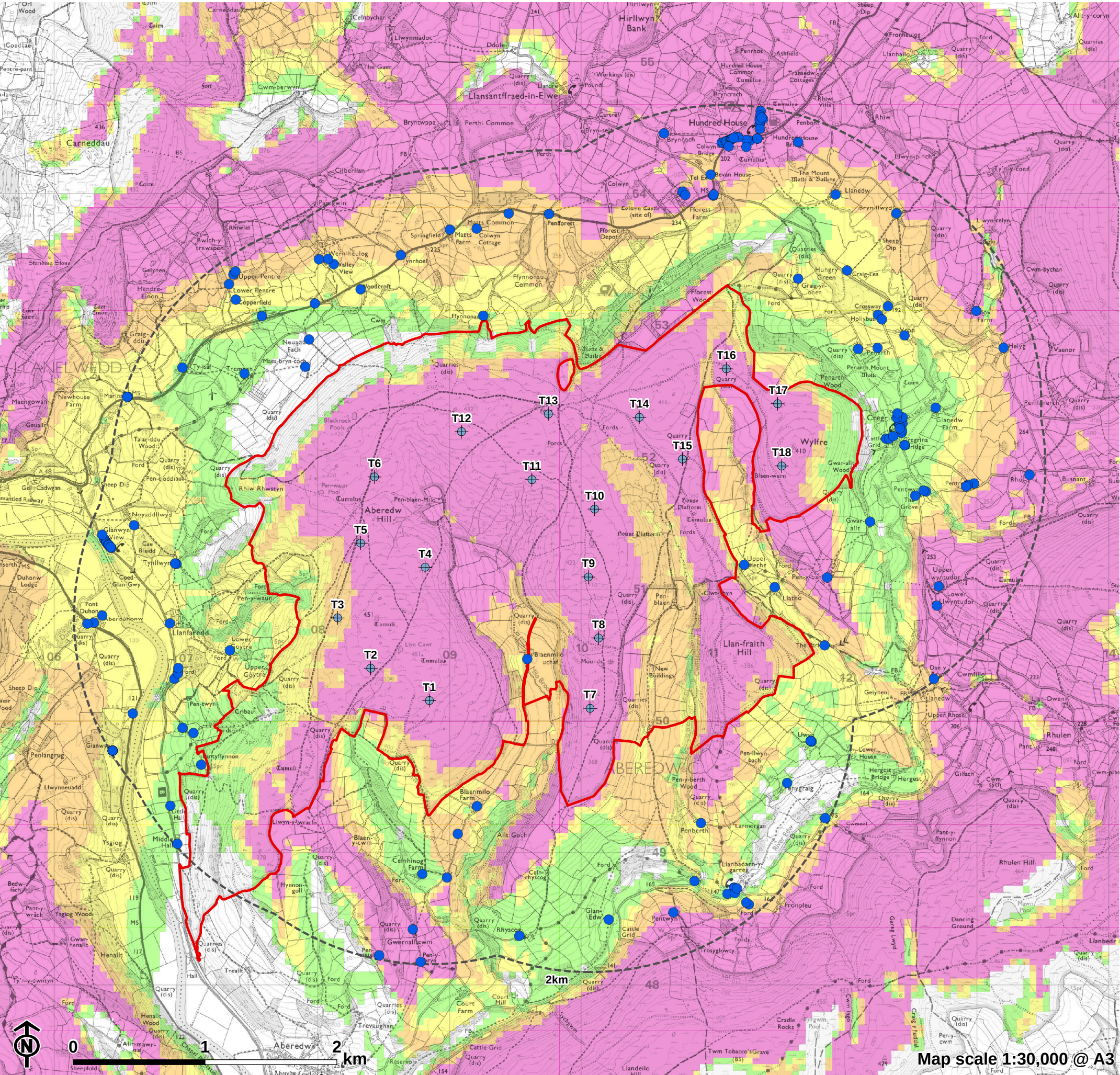
Viewpoint

- | | |
|--|---|
| VP1: St. David's Church, Cregrina | VP8: NCN 8 near Cilmerly |
| VP2: A481 at Hundred House | VP9: The Begwns Roundabout |
| VP3: NCN 825 near Cregrina | VP10: Bridleway off A44 near Castell Crugerydd |
| VP4: Perthi Common | VP11: Heart of Wales Line Trail at Moelfre |
| VP5: Wye Bridge, Builth Wells | VP12: Llandeigley Rocks |
| VP6: Wye Valley Walk near Banc y Celyn | VP13: A4081 at Llanyre |
| VP7: Gilvern Hills Common | VP14: Promoted viewpoint south of Cwm Graig-ddu |

Notes

The ZTV indicates the theoretical visibility of the turbine hub height (122.5m) with a viewing height 2m above ground level. The terrain model is based on OS Terrain 50 (DTM) data obtained from Emapsite in 2023. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcGIS Pro 3.0.3 software.

Figure 4.16: Residential Properties within 2km of Proposed Turbines on ZTV

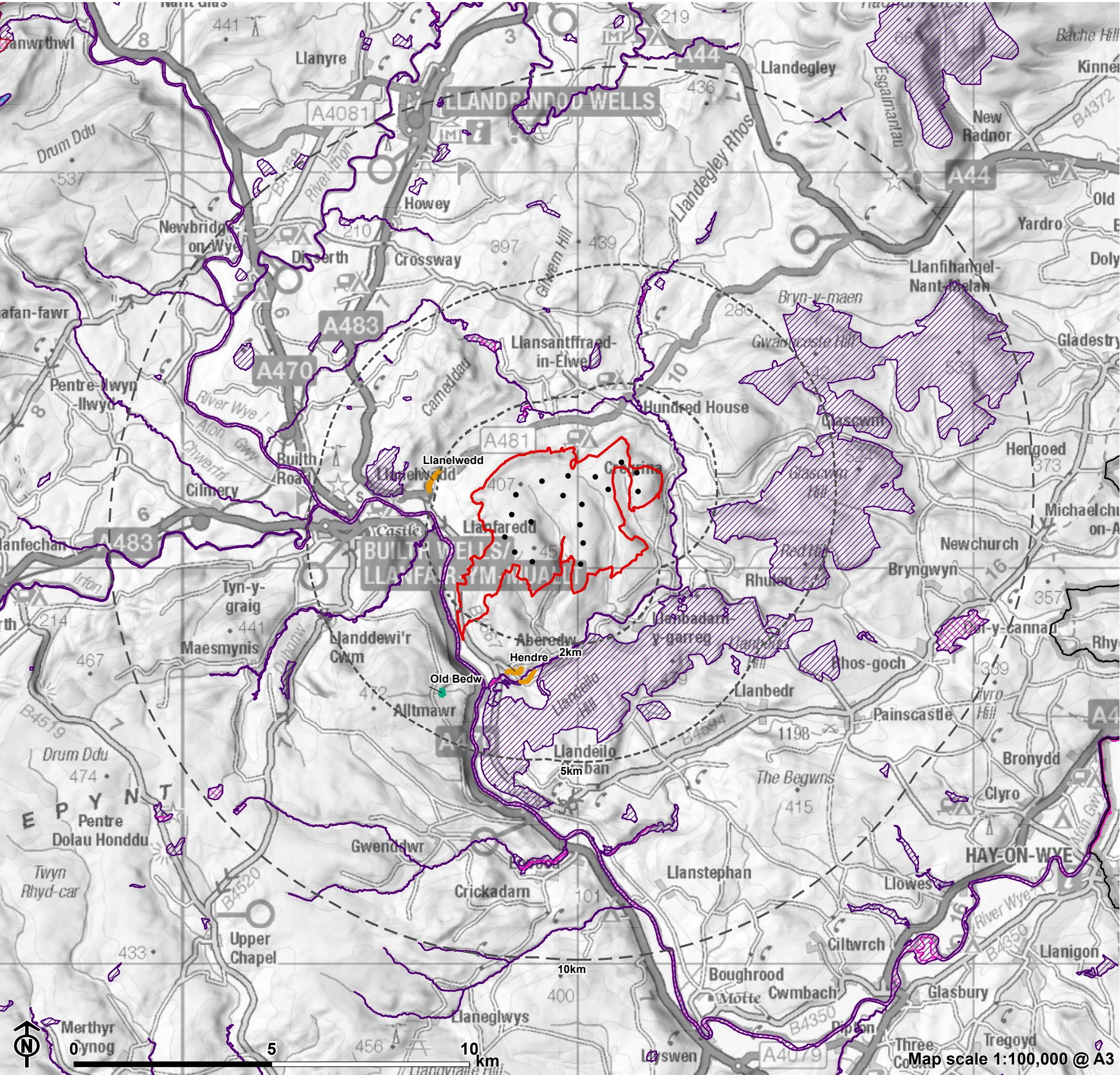


- Site boundary
 - Turbine
 - 2km from outermost turbine
 - Residential property
- Bareground ZTV to tip height (200m)
- 1 - 4 Turbines visible
 - 5 - 8 Turbines visible
 - 9 - 12 Turbines visible
 - 13 - 18 Turbines visible

Notes
The ZTV indicates the theoretical visibility of the turbine blade tip height (200m) with a viewing height 2m above ground level. The terrain model is based on OS Terrain 50 (DTM) data obtained from Emapsite in 2023. Earth curvature and atmospheric refraction have been taken into account.
The ZTV was calculated using ArcGIS Pro 3.0.3 software.



Figure 5.1: Designated Sites

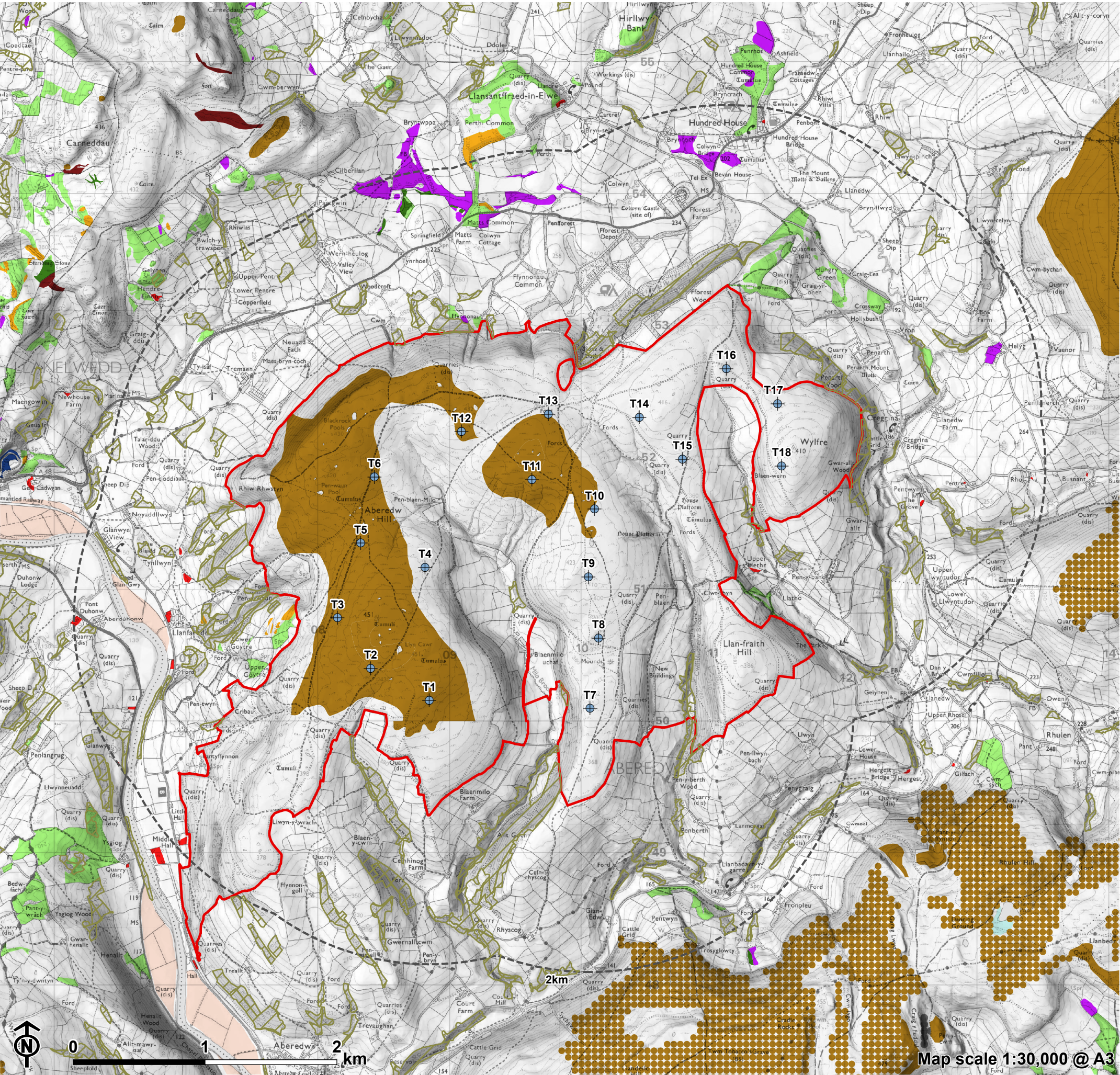


- Site boundary
- Turbine
- 2km from outermost turbine
- 5km interval from outermost turbine
- 10km from outermost turbine
- Local authority boundary
- Sites of Special Scientific Interest
- Special Areas of Conservation
- Special Protection Area
- Non statutory designated site**
- Roadside reserve
- SINC

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Figure 5.2: Priority Habitats



Site boundary

Turbine

2km from outermost turbine

Ancient Woodland Inventory

NRW Priority Habitats

Open Mosaic Habitats of Previously Developed Land

Coastal Grazing Marsh and Floodplain Grassland

Upland Heathland

Upland Flushes Fens and Swamps

Traditional Orchards

Raised Bog

Purple Moor Grass and Rush Pastures

Lowland Heathland

Lowland Fens and Reedbeds

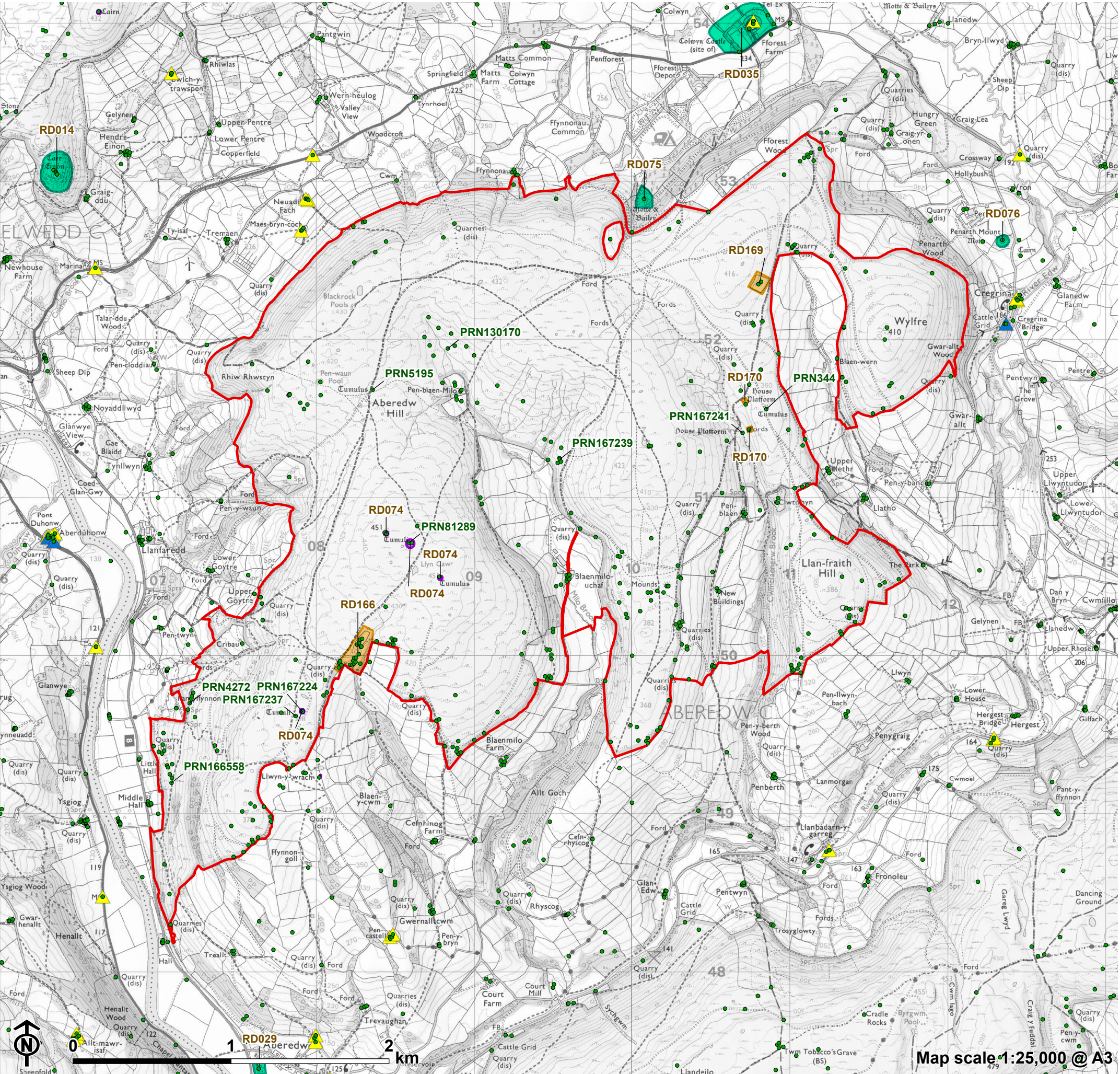
Lowland Dry Acid Grassland

Inland Rock Outcrop and Scree Habitats

Blanket Bog

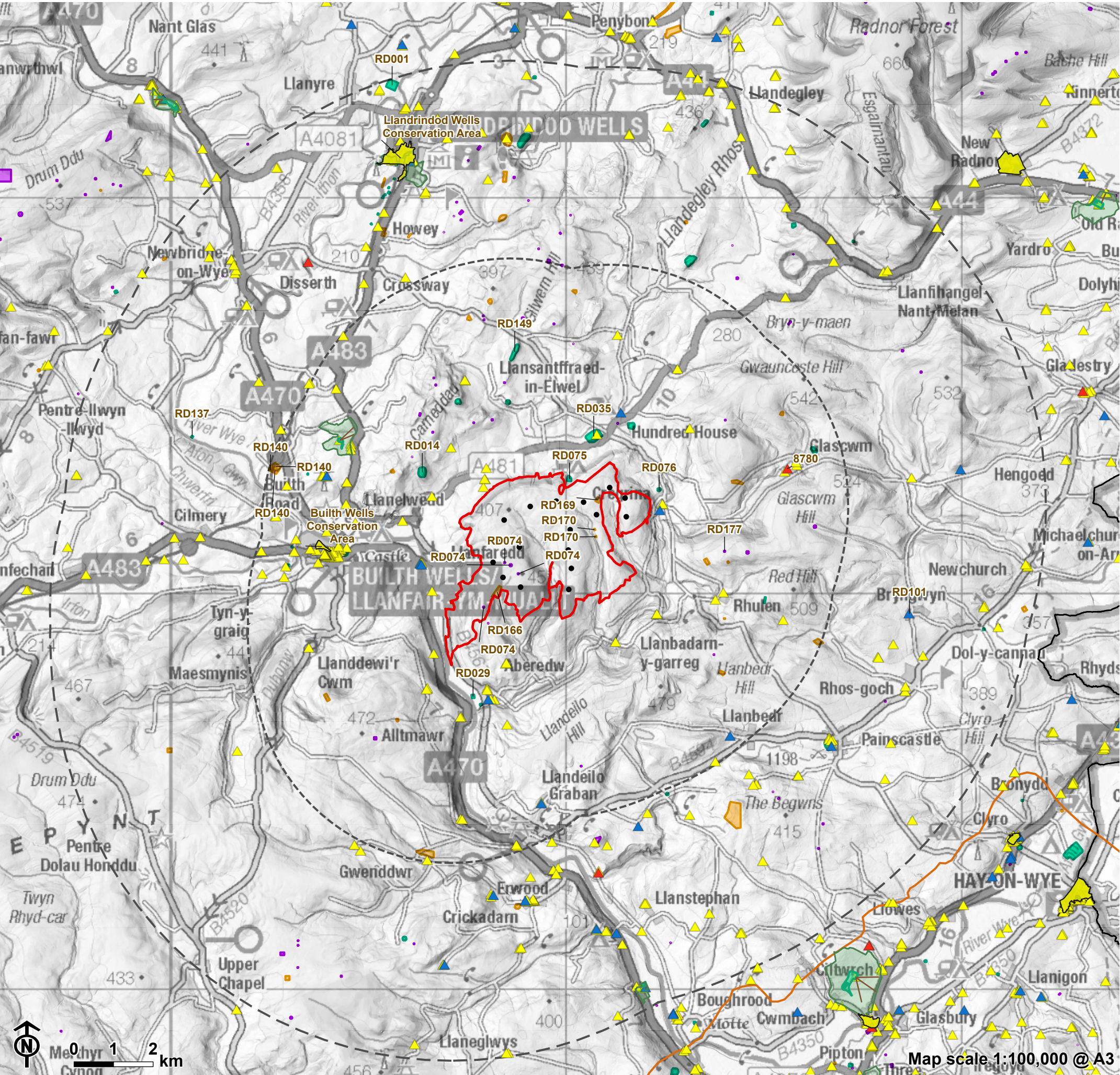


Figure 7.1: The Site, Designated Historic Assets and Historic Environment Record (HER) Entries



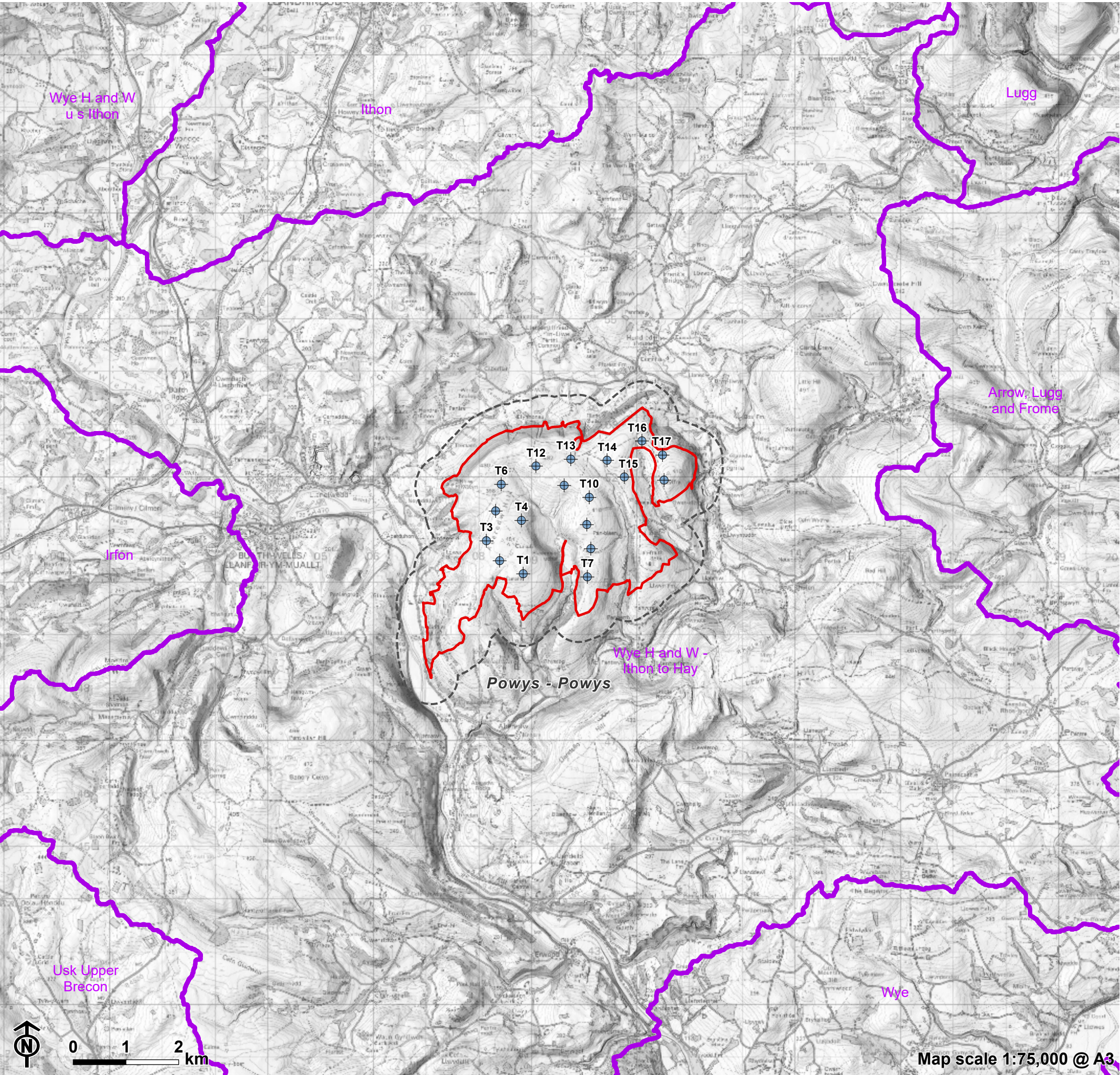
- Site boundary
- Scheduled Monument: Defence
- Scheduled Monument: Religious, Ritual and Funerary
- Scheduled Monument: Other class
- Grade II* Listed Building
- Grade II Listed Building
- HER Entries

Figure 7.2: Study Areas and Designated Heritage Assets



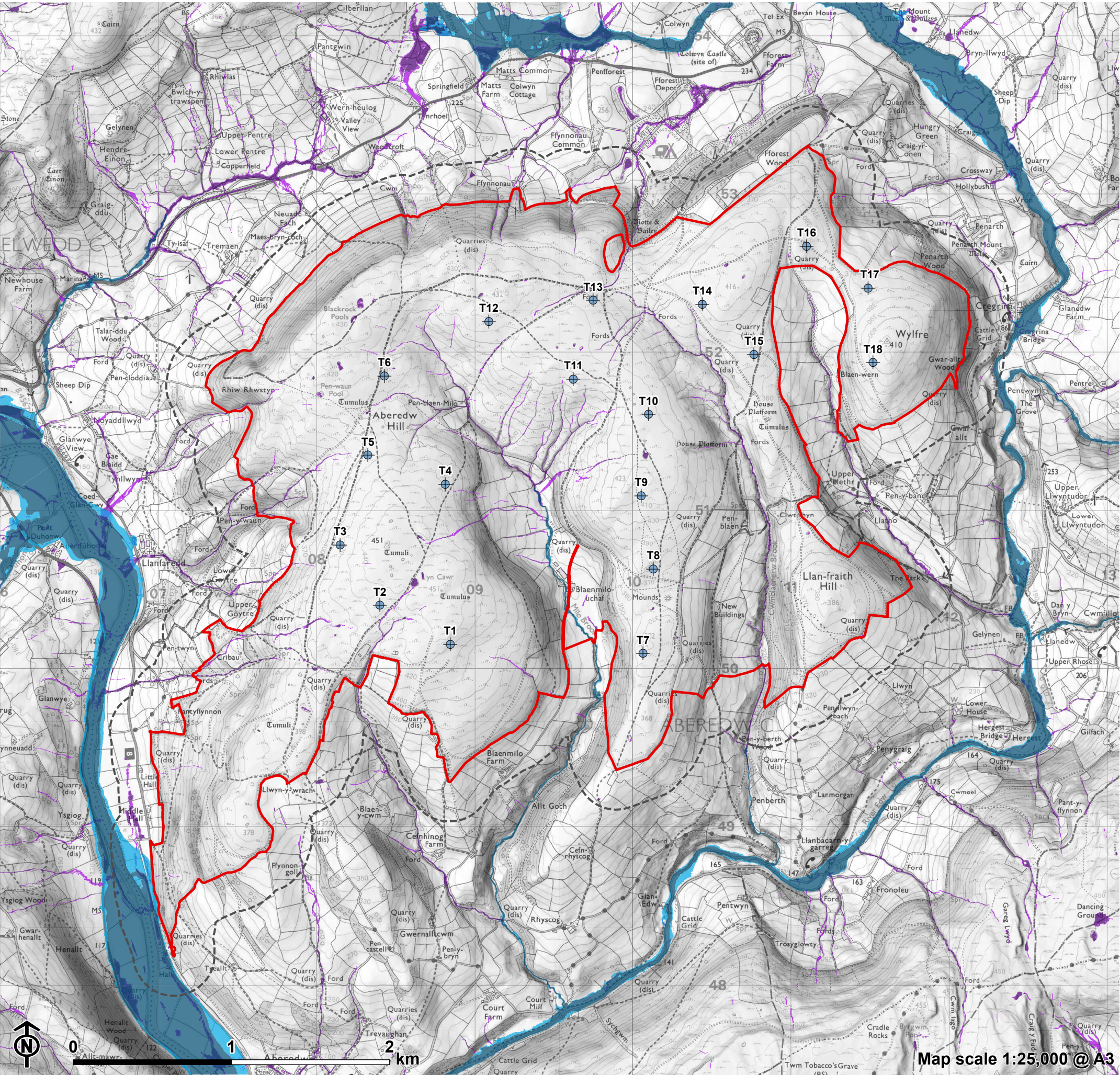
- Site boundary
- Turbine
- Core Study Area
- Wider Study Area
- Local authority boundary
- Scheduled Monument: Defence
- Scheduled Monument: Religious, Ritual and Funerary
- Scheduled Monument: Other class
- Conservation Area
- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building
- Historic Landscapes

Figure 8.1: River Catchments



- Site boundary
- 500m from site boundary
- Turbine
- Local authority boundary
- Water Framework Directive (WFD) Operational Catchments Cycle 2

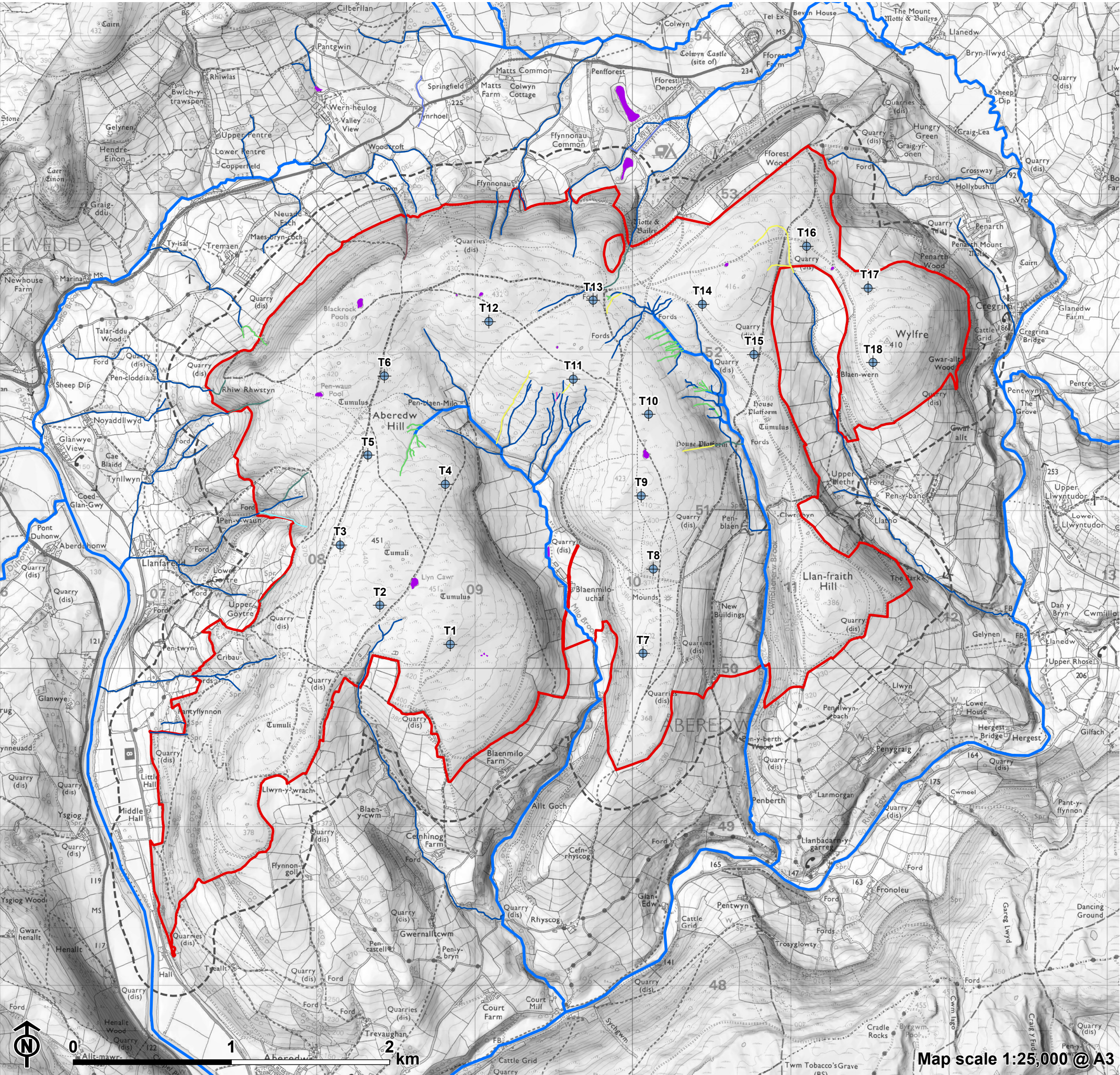
Figure 8.2: Pluvial and Fluvial Flood Risk



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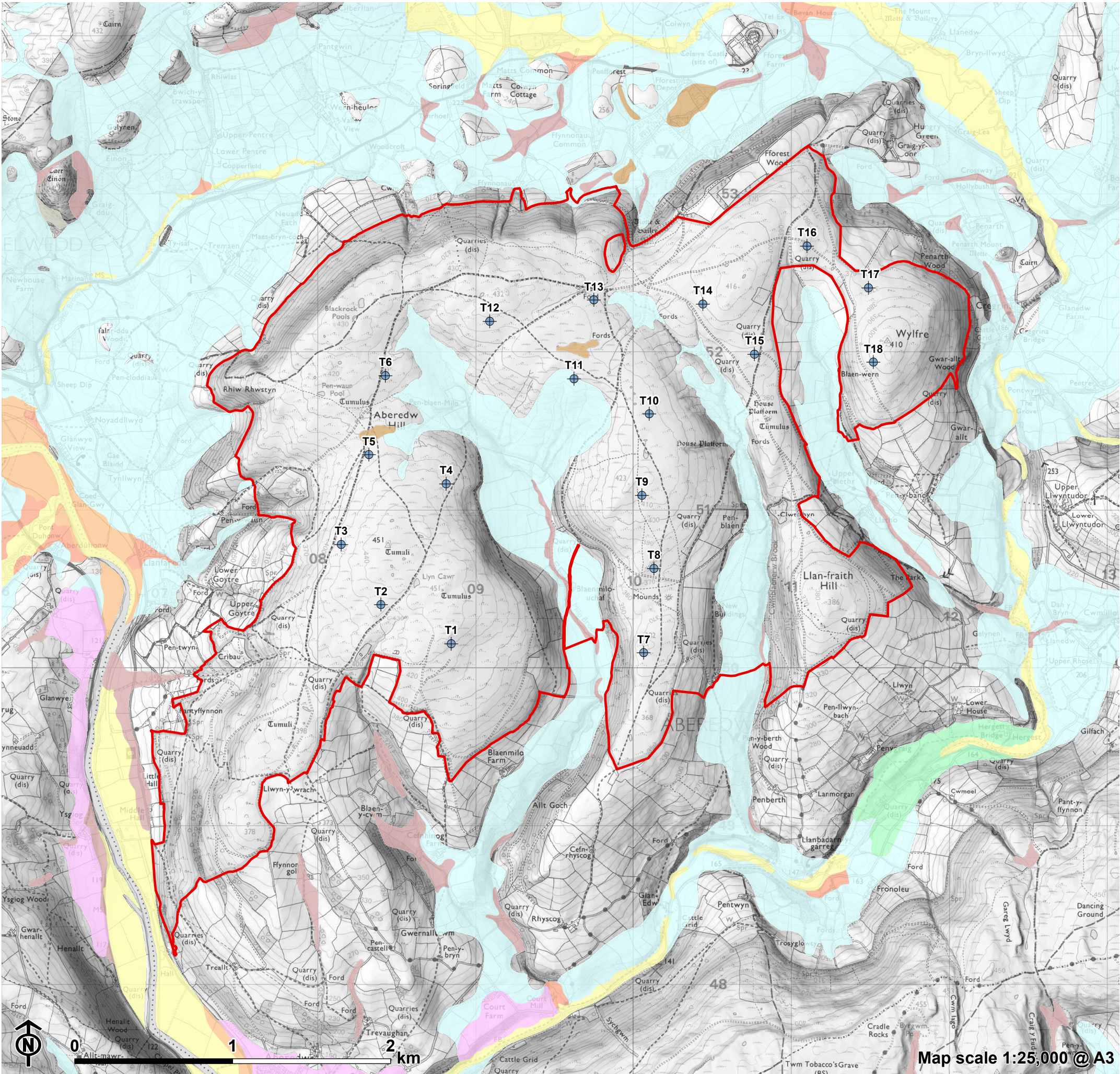
Figure 8.3: Water Features



- Site boundary
- 250m from site boundary
- Turbine
- OS Open Rivers
- Water Features**
- Pond
- Ditch
- Spring
- Spring - multiple
- Spring - possible
- Watercourse
- Watercourse - ephemeral
- Watercourse – no flow
- Watercourse - surface water fed



Figure 8.4a: Superficial Geology

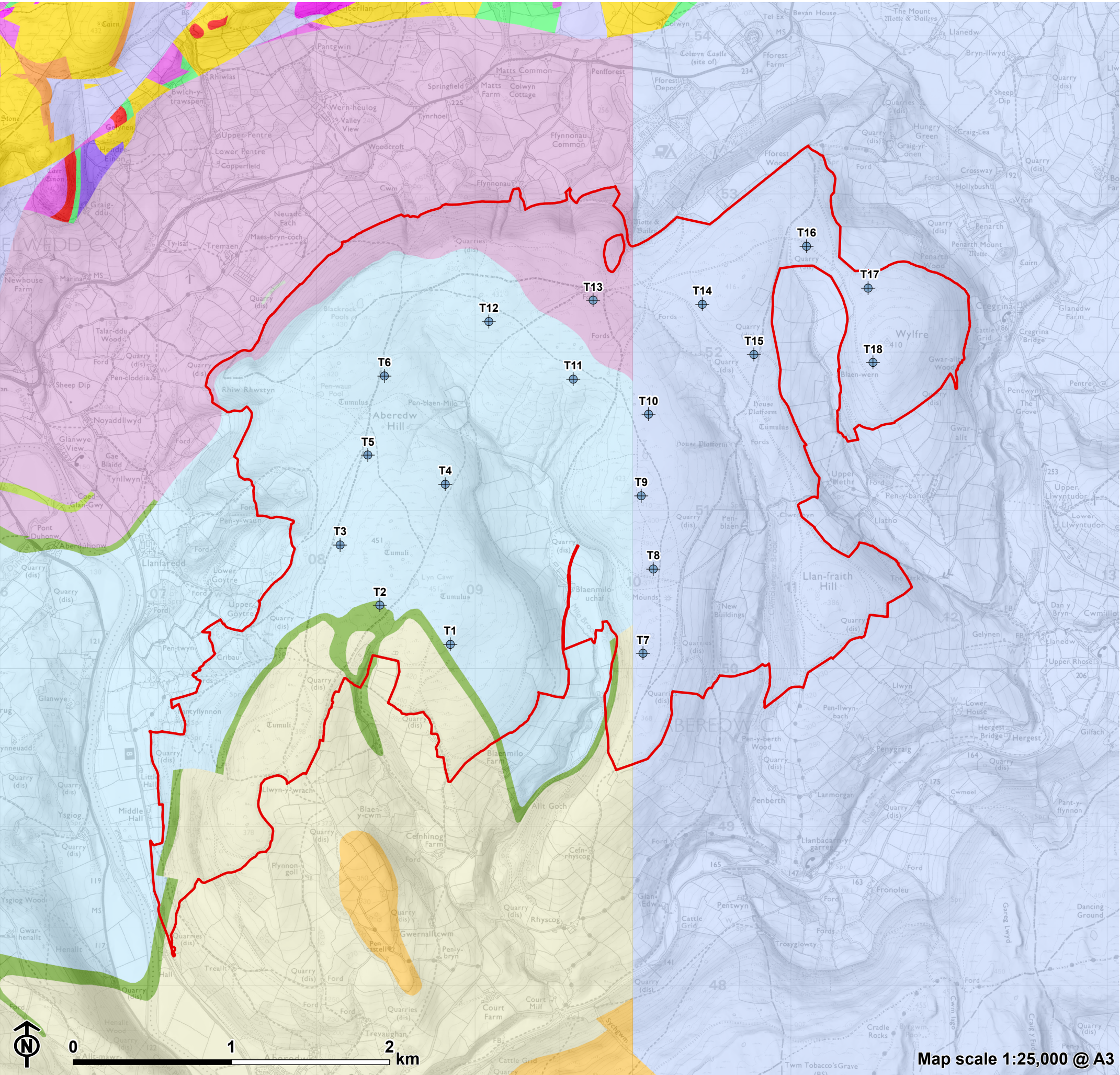


- Site boundary
- Turbine
- TILL, DEVENSIAN - DIAMICTON
- PEAT - PEAT
- HEAD - CLAY, SILT, SAND AND GRAVEL
- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL





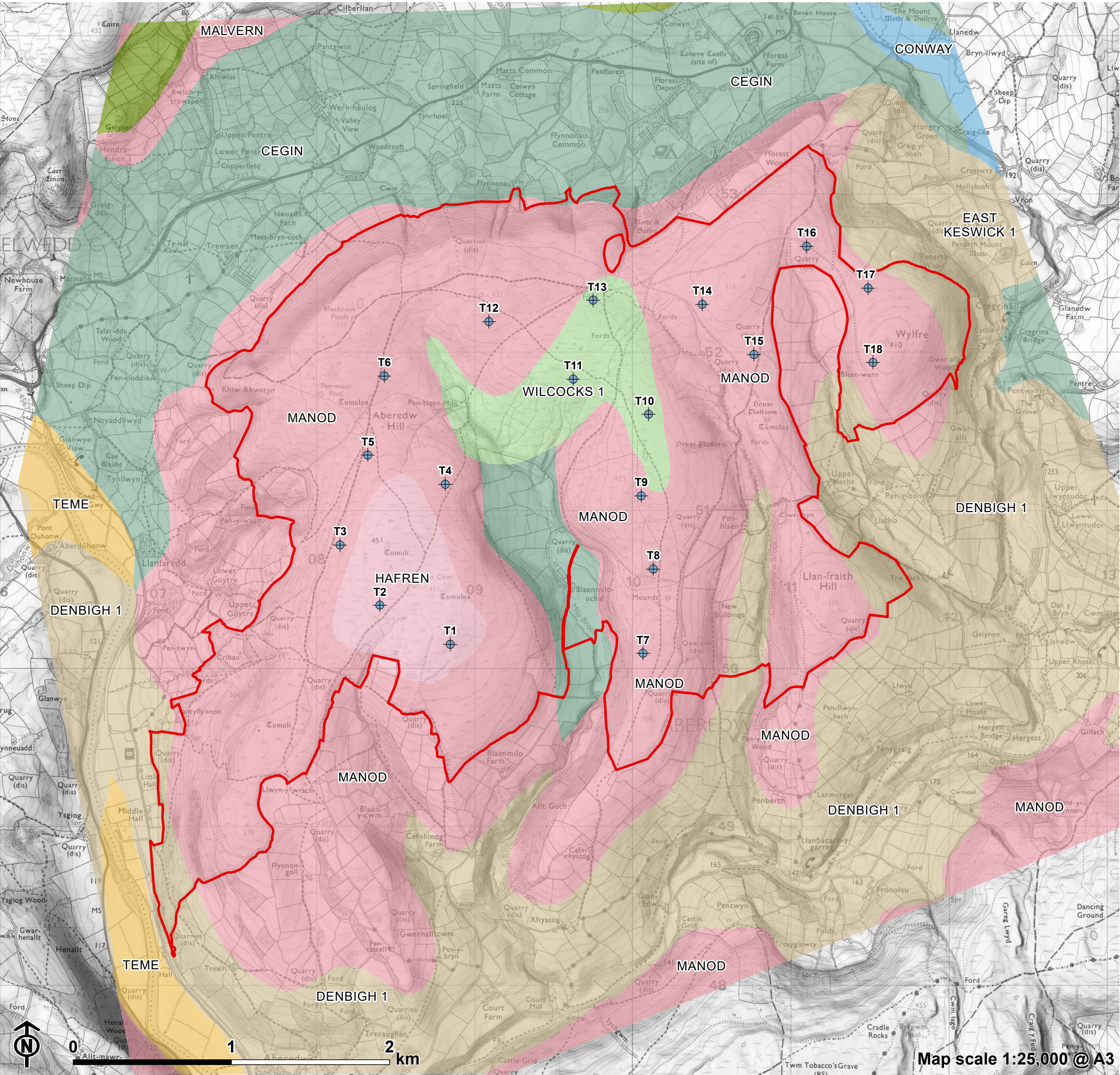
Figure 8.4b: Bedrock Geology



- Site boundary
- Turbine
- SILURIAN ROCKS (UNDIFFERENTIATED) - SILTSTONE AND MUDSTONE, INTERBEDDED
- BUILT MUDSTONES FORMATION - MUDSTONE AND LAMINATED HEMIPELAGIC MUDSTONE, INTERBEDDED
- IRFON FORMATION - MUDSTONE AND SILTSTONE
- IRFON FORMATION - SLUMPED MUDSTONE AND SLUMPED SILTSTONE
- CWM GRAIG DDU FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE



Figure 8.5: Soil Types



Site boundary

Turbine

Cranfield National Soil Map

DENBIGH 1

EAST KESWICK 1

TEME

MALVERN

MANOD

HAFREN

HALLSWORTH 1

CEGIN

BRICKFIELD 1

BRICKFIELD 2

WILCOCKS 1

CONWAY



Figure 9.1: Organic Soil Depth

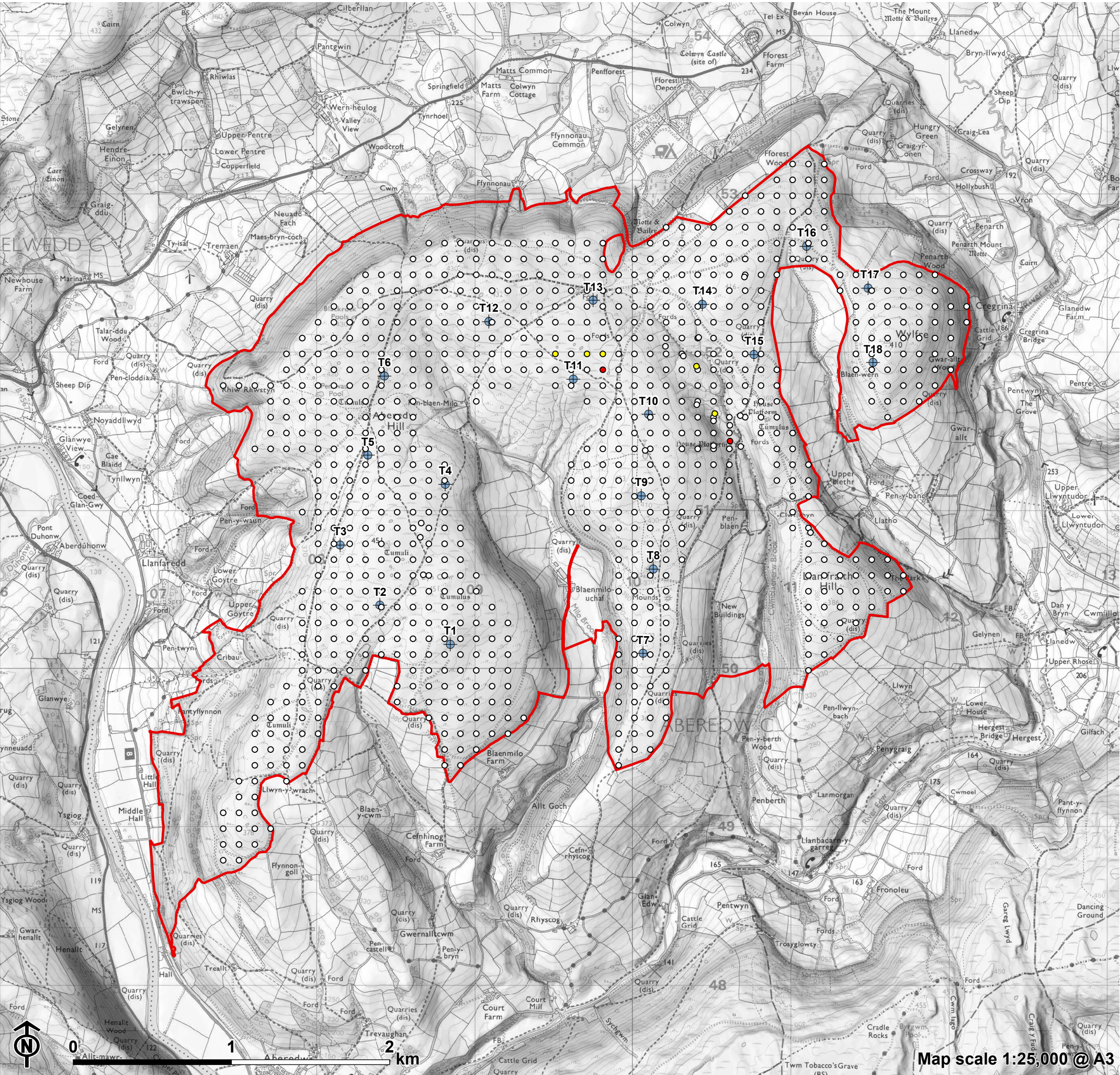
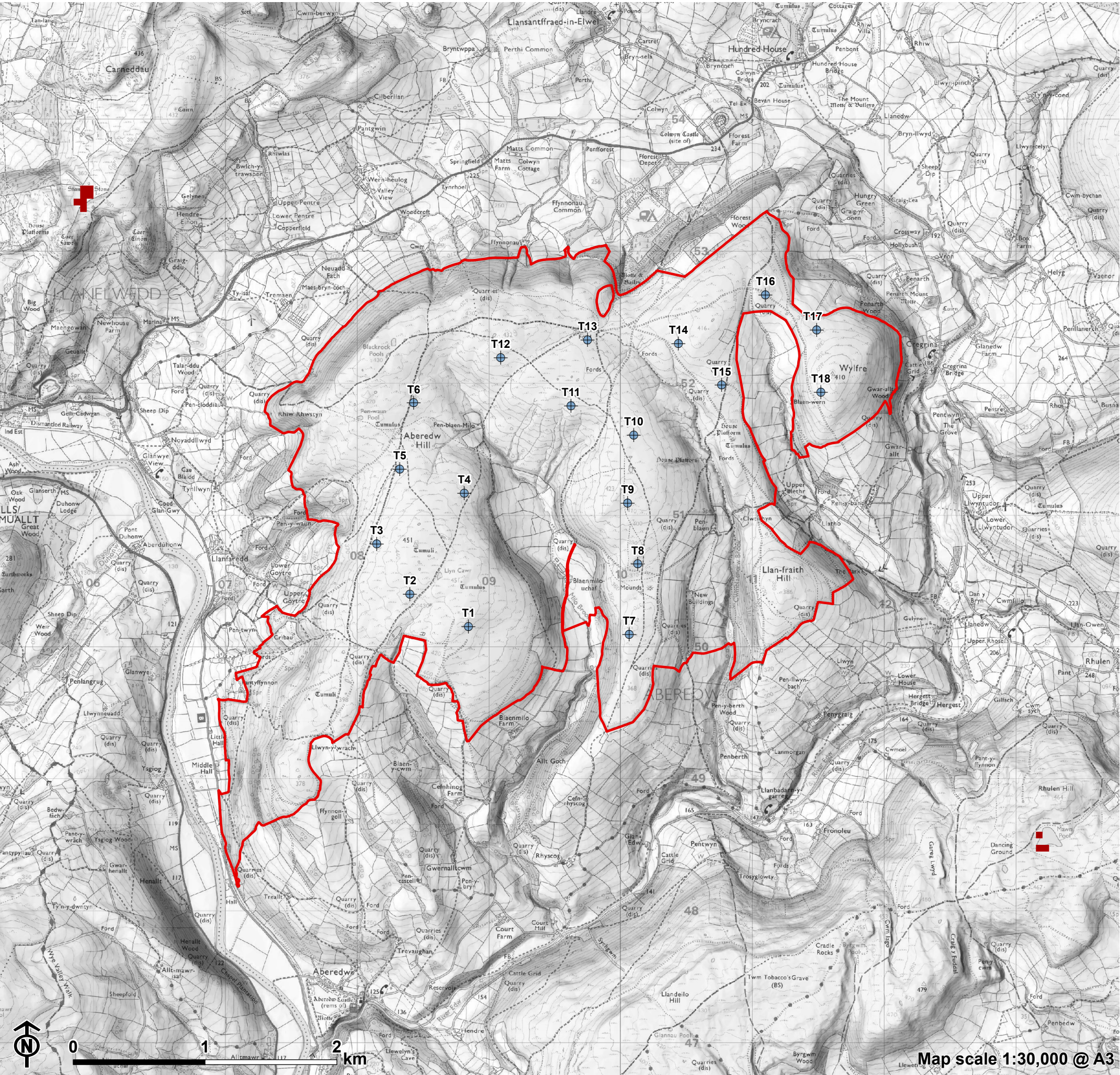




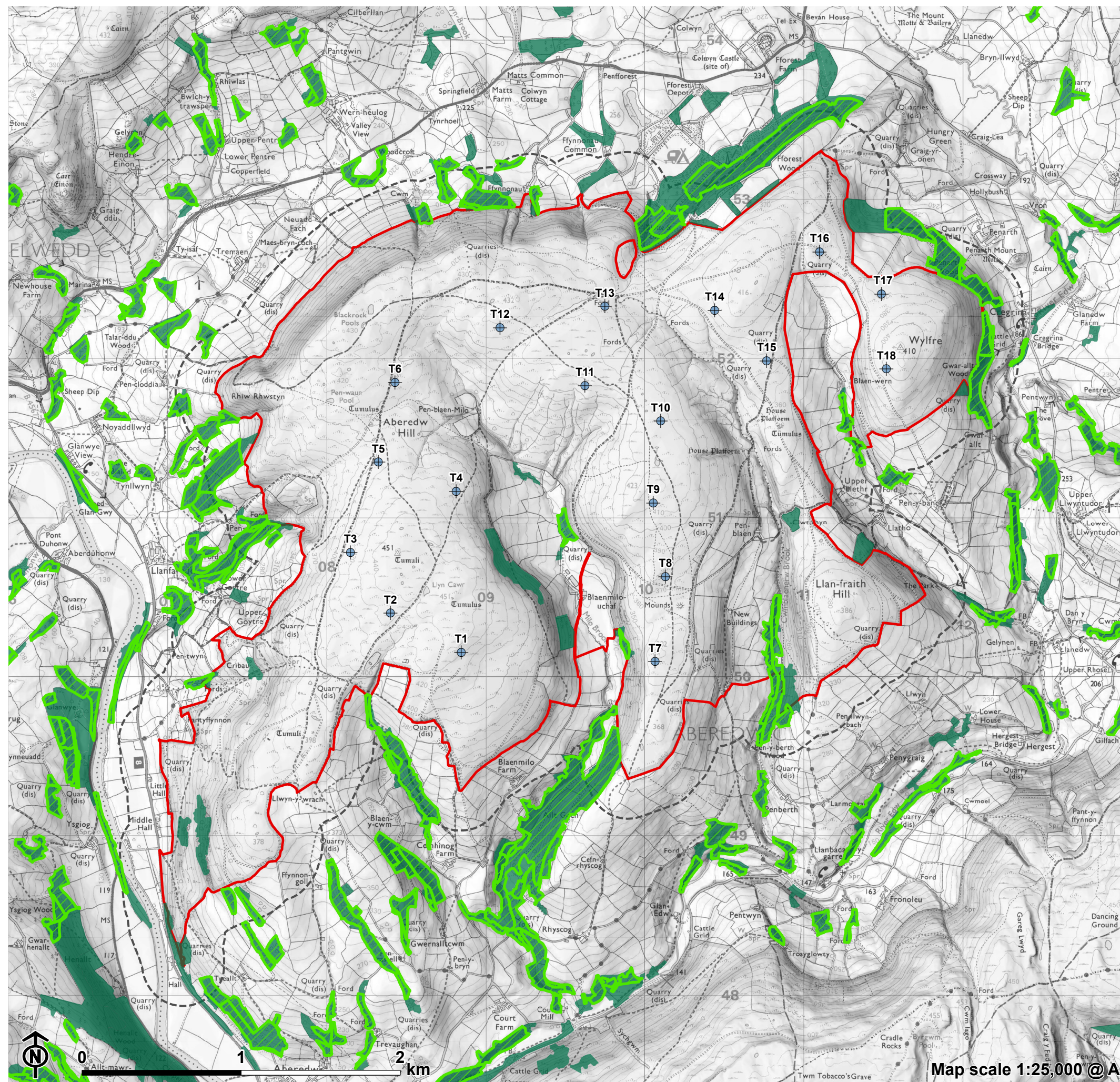
Figure 9.2: NRW Peatlands of Wales



- Site boundary
- Turbine
- Peatlands of Wales



Figure 12.1: Forestry Records in the vicinity of the Site



- Site boundary
- 250m from site boundary
- Turbine
- Ancient Woodland Inventory (AWI)
- National Forest Inventory (NFI)

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