

Chapter 12

Socio-Economics, Recreation & Tourism

Introduction

12.1 This chapter sets out the proposed scope of the socio-economic assessment. It outlines the information sources intended to be used for the assessment, the methodology, study area, and potential significant effects.

12.2 It is proposed that the effects on tourism and recreation will be considered in relation to landscape and visual amenity receptors (as outlined in Chapter 5). However, as there is no evidence that renewable energy developments have any substantial impact on tourism, with few visitors reporting disbenefits and recreational activity impacts are likely to be minimal, recreation and tourism are not considered in relation to socio-economics.

12.3 The location of other wind farms nearby is likely to mean the Development brings no additional impact on the local tourism economy or recreation use, and tourism data for NPT shows increases in the visitor numbers over recent years despite large wind farm developments in the Borough. Only temporary disruption during construction may affect recreation use, while there will be no impact on the Sarn Helen Road and access tracks will improve accessibility for access land.

12.4 This chapter has been prepared by Wavehill.

Existing Conditions

Information Sources

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

- ONS Statistics.
- Planning Policy Wales (Edition 11)⁹⁴.
- Welsh Government environmental and socio-economic policy (which are detailed under the Legislation, Policy and Guidance sub-section).
- Literature evidence and socio-economic impact appraisals of Strathly North and Clocaenog Forest.⁹⁵

⁹⁴ Planning Policy Wales, Edition 11, Welsh Government, February 2021

⁹⁵ Cited on following page and Economic Analysis of the Strathly North Wind Farm, BIGGAR Economics on behalf of SSE Renewables, January 2020; LM3

The Site and its Immediate Surroundings

12.6 The key existing conditions that have been considered include the recreation uses of the Site and the socio-economic baseline for the surrounding area (using data from the NPTCBC area⁹⁶).

12.7 The Site borders the Sarn Helen Roman Road and contains a small section of footpath and bridleway which both start from the village of Crynant to the south-west of the Site. Part of the Site is classified as open access land under the Countryside and Rights of Way (CROW) Act 2000. There is therefore some potential recreational use of parts of the Site and in its immediate surroundings.

12.8 No residential properties are located onsite. There is expected to be visibility of the Development from nearby villages, identified within the Zone of Theoretical Visibility (ZTV), described in **Chapter 5: Landscape and Visual**.

Socio-economic Baseline

12.9 A summary of the Neath Port Talbot (NPT) socio-economic characteristics is provided using several indicators against which the area can be assessed, and which enable a comparison to be undertaken with figures collected for Wales and the UK, where appropriate. This data is mainly drawn from ONS sources.

12.10 Neath Port Talbot has a resident population of 144,400, with an average age of 43.4 years⁹⁷ and has seen steady population growth since 2001, from both international and internal migrants. The top industry by employment is manufacturing (18% of all employment within NPT).⁹⁸ Although economic activity is similar to national levels, the availability of work in the area is lower, leading to commuting to places like Swansea and Cardiff.

12.11 Local productivity, as measured by Gross Value Added (GVA) per hour worked, for the Nomenclature of Territorial Units for Statistics (NUTS3) area of Bridgend and Neath Port Talbot is slightly above the Wales average⁹⁹ and qualifications are below the national and UK averages across all levels.

12.12 There are 3,110 enterprises in NPT,¹⁰⁰ with 88.4% (2,750) of these being micro in size (0-9 employees).

12.13 The Site is in Lower Super Output Area (LSOA) Crynant and Seven Sisters, which ranks in the top 50% and bottom 30% of deprivation in Wales respectively. Neighbouring LSOA Glynneath 1 is in the 20% most deprived in Wales. NPT overall

has the fifth highest percentage of areas in the most deprived 50 LSOAs.

Proposed Approach to Surveys and Assessment Methodology

Legislation, Policy and Guidance

12.14 This section presents a summary of the policy and guidance that will inform the approach to the socio-economic, recreation and tourism assessment of the Development.

Legislation

12.15 Legislation relevant to this topic are set out in the following:

- The Environment (Wales) Act (2016)¹⁰¹
- Well-being of Future Generations (Wales) Act (2015)¹⁰² which place emphasis on the importance of sustainable use of natural resources, decarbonisation and supporting a sustainable economy.

Policy

12.16 The UK government has made a commitment to reach net zero by 2050, and renewable energy is fundamental to achieving this. Welsh Government is also committed to sustainable development and net zero with a pledge campaign across the country to reduce carbon emissions.¹⁰³

12.17 Further, the Welsh Government seeks to reach 70% of energy consumption from renewable sources and 1GW of local ownership by 2030; both targets that the proposed Development will contribute to. Other policies and strategies either support, or will be supported by, renewable energy development and decarbonisation including:

- Future Wales: the national plan 2040 - Programme for Government.¹⁰⁴
- Planning Policy Wales (PPW)¹⁰⁵ provides further guidance to support the transition to a lower carbon economy. It places a priority on the objectives of the Well-being of Future Generation Act in the decision-making process.
- Prosperity for All: a low carbon Wales builds on the Environment (Wales) Act and furthers the importance of reducing greenhouse emission by 2050 and working

⁹⁶ Wavehill undertook a review of desk-based data but no recent tourism statistics were available for the area at the time of writing.

⁹⁷ Mid-year population estimates, ONS, 2020

⁹⁸ Business Register and Employment Survey, ONS, 2021

⁹⁹ Gross Value Added (balanced) by Region, ONS, 2018

¹⁰⁰ Ibid

¹⁰¹ The Environment (Wales) Act, Welsh Government, 2016

¹⁰² The Wellbeing of Future Generations (Wales) Act, Welsh Government, 2015

¹⁰³ Working together to reach net zero: All Wales Plan 2021-25, Welsh Government, October 2021

¹⁰⁴ Future Wales: the national plan 2040, Programme for Government, Welsh Government, 2021

¹⁰⁵ PPW (2021), Welsh Government, (Edition 11)

towards net zero goals.¹⁰⁶ It sets out how a low carbon economy for Wales can be achieved and its benefits, including clean growth, quality jobs, clean air and water and improved health. The development of new onshore wind farm sites, including the proposed Development, directly align and contribute to this and other policy areas, by creating high value jobs, improving sustainability and reducing emissions, diversifying the economy and increasing wellbeing.

- Capturing the Potential: a green jobs strategy for Wales¹⁰⁷ aims to strengthen the low carbon energy sector in Wales, focusing on the transition Wales needs to undergo to become a low carbon economy in all regards. This includes fostering innovation and technological progression, supporting sustainability in businesses and investing in a more sustainable economy (feeding into later strategies with similar objectives).

12.18 Ambitions of Future Wales include job creation (especially in rural areas) to tackle socio-economic inequality as well as reducing pollution, decarbonisation and becoming climate resilient, as well as embedding a response to the climate and nature emergency in everything. These ambitions underpin a number of the action policies including rural economic regeneration, natural resource utilisation and a whole thematic area on renewable and low carbon energy infrastructure.

12.19 At a regional level, the Swansea Bay City Deal aims to grow the area and develop high value sectors and employment to improve GVA and productivity.

12.20 Climate change is one of the overarching policies within the Neath Port Talbot Local Development Plan 2011-2026 (2016).¹⁰⁸ The LDP also highlights objectives for economic development. These include objectives to encourage employment opportunities and growth within the county which will be supported by the Development alongside skill development.

Guidance

12.21 Adherence will be made to the best practice and guidance highlighted in the latest PPW (Edition 11), Future Wales and other relevant policy, as appropriate, from Government and industry groups. This includes guidance on impact appraisals from HM Treasury (Green and Magenta

Book), the methodologies adopted by Renewable UK and the ORE Catapult, and industry practice from the Market Research Society and Institute of Economic Development. In addition, the latest published information from other wind farm sites, especially post-build impact assessments, will be considered when estimating the potential socio-economic impact of the Development.

- Green Book, HM Treasury¹⁰⁹
- Aqua Book, HM Treasury¹¹⁰
- Energy Generation in Wales, Welsh Government¹¹¹
- Onshore Wind: Economic Impacts in 2014, Renewable UK¹¹²
- Economic Opportunities for Wales from Future Onshore Wind Development, Renewable UK¹¹³
- Economic benefits from onshore wind farms, BVG Associates¹¹⁴
- Onshore Wind: Direct & Wider Economic Impacts, BiGGAR Economics¹¹⁵
- Quantifying the benefits of onshore wind to the UK, Vivid Economics¹¹⁶

Proposed Study Area

12.22 Three socio-economic study areas will be considered in the socio-economic assessment. A *local* study area established as the wards that fall within 10 km of the Site (see **Figure 12.1**), a study area covering *Wales* and then one for the *wider UK*. The location of the Site is in the northern part of NPT, with much of the county within 10 km of the Site, as well as parts of Powys. As outlined above, given socio-economic data is more recent and readily available at the Local Authority level, this geographic boundary will be the primary focus of the socio-economic baseline.

12.23 Should the data allow, information may be presented using electoral wards to provide more specific detail within the study area.

12.24 Socio-economic impacts from the Development will be considered on a national Welsh level and more widely across the UK. This will allow for the fact that many of the economic benefits such as jobs created and GVA will be to businesses based outside of NPT, and potentially even Wales. Sensitivity to the location of contractors and supply chains will be made to

¹⁰⁶ Prosperity for All: a low carbon Wales a Welsh Government plan, 2019

¹⁰⁷ Capturing the Potential. A green jobs strategy for Wales, Welsh Government, 2009

¹⁰⁸ Neath Port Talbot CBC Local Development Plan (2011-2026), Neath Port Talbot CBC, 2016

¹⁰⁹ Green Book, HM Treasury, March 2022

¹¹⁰ Aqua Book, HM Treasury, March 2015

¹¹¹ Energy Generation in Wales, Welsh Government, 2019

¹¹² Onshore Wind: Economic Impacts in 2014, Renewable UK, 2014

¹¹³ Economic Opportunities for Wales from Future Onshore Wind Development, Renewable UK, January 2013

¹¹⁴ Economic Benefits from Onshore Wind Farms, BVG Associates, September 2017

¹¹⁵ Onshore Wind: Direct and Wider Economic Impacts, BiGGAR Economics, May 2012

¹¹⁶ Quantifying the benefits of onshore wind to the UK, Vivid Economics, 2019

allow for the fact that some socio-economic impacts may be accrued outside of the UK (for instance turbine manufacture and supply is likely to be from a European based company).

Proposed Desk Study

12.25 The socio-economic impact assessment will involve a desk-based review of the Site and neighbouring areas, working with the Applicant to identify potential supply chains and expenditure on the final design and a review of the socio-economic baseline in NPT.

12.26 All relevant documentation to the Development and its potential socio-economic impact will be reviewed in preparation for the socio-economic impact assessment outlined below.

Proposed Field Surveys

12.27 The socio-economic, recreation and tourism impact assessment will require no field surveys.

Consultation

12.28 To support the understanding of the local context and potential impacts that the Development may have, a consultation of local stakeholders will be undertaken. This will include the following:

- Local council officers and members.
- Community interest groups.
- Brecon Beacons National Park Authority.
- Welsh Government.
- Swansea Bay City Region.

12.29 Further, consultation with local industry groups and representatives will also be carried out, where appropriate, to build on previous consultation evidence gathered by Wavehill to understand the potential supply chain benefits within the local area and the extent to which they will be able to support the Development.

Assessment Methodology

12.30 To assess the impacts of the Development in the socio-economic study areas, a desk based analysis will be carried out exploring the available evidence. This will include information from a review of economic policy and literature evidence of similar wind farm sites to identify comparable benchmarks. Where these can be established, they will be used in modelling the potential impacts of the Development on the local economy.

12.31 The impact assessment will include a review of the socio-economic baseline indicators for either the area proximate to the site or, given availability of data at the local authority level, for NPT. This will support an appraisal of the social and

economic policy context at the local, regional and national level. This information will help inform a modelling exercise conducted for the parameters of the Development to determine the likely scale and scope of any impacts on the GVA and jobs safeguarded and created indicators described above.

12.32 Recognised metrics for converting construction and operation spend will also be used, such as ONS turnover to GVA ratios for the sectors involved in the development of a renewable energy project.

12.33 The economic model will assess the impact of the Development across multiple scenarios to provide a range of different impacts to help demonstrate the potential effects. This will then be compared with the economic baseline for the area. The judgments and assumptions underpinning these scenarios and assessments will be based on professional experience of other projects, the insight offered from the economic baseline and the literature evidence available.

12.34 Modelling will consider how the scope and scale of the Development will bring economic opportunities and potential challenges to the area, the effects this will have on job creation or safeguarding and the overall GVA that will be created. Accounting for location of expenditure, multipliers, displacement, substitution and leakage will all be carried out to provide the final attributable impact of the Development on the economy in the area of study, Wales and the UK. This will also consider the effects of any shared ownership or community benefit fund established as part of the Development.

12.35 There is no published standard for assessing the significance of socio-economic impacts of a renewable energy developments. To determine the significance of an effect brought about by the Development (be it beneficial, neutral or adverse) the scale or severity of an impact and the importance or sensitivity of the receptor being affected are typically considered. As the socio-economic receptors considered have the same level of sensitivity (i.e. one job is considered the same as another) then only magnitude will be considered when determining the significance of an impact. Magnitude will be based on major, moderate, minor and negligible definitions as shown in **Table 12.1**. Where an impact is major or moderate, it will be considered significant in EIA terms.

Table 12.1: Levels of magnitude¹¹⁷

Magnitude	Definition
Major	A substantial change to socio-economic loss or gain in the area of impact affecting a large number of people (100+) and/or businesses (30+) to the extent of changing the business and employment structure sufficient to constitute a major long-term alteration of socio-economic conditions.
Moderate	A partial change to socio-economic loss or gain in the area of impact affecting a sizeable number of people (20-100) and/or businesses (10-30) to the extent of adjusting business operations and employment sufficient to constitute a moderate alteration of socio-economic conditions...
Minor	A small change to socio-economic loss or gain in the area of impact affecting a group of people (<20) and/or businesses (<10) to the extent of influencing business activities and employment opportunities sufficient to constitute a minor alteration of socio-economic conditions.
Negligible	No change to socio-economic loss or gain in the area of impact affecting no people and/or businesses permanently and very few people (<10) and/or businesses (<5) temporarily (for less than 1 year).

Cumulative Assessment Methodology

12.36 Given the proximity of the Development to other wind farm sites, cumulative effects across other developments need to be considered. Given other wind farms are operational in the area, it is unlikely there will be significant cumulative socio-economic effects beyond economies of scale and potential benefits for labour supply and training. Therefore it is proposed that cumulative socio-economic effects are scoped out of the impact assessment.

Potential Significant Effects of the Development

Construction

12.37 The Development represents a sizeable investment into the local area which will bring job and associated income, training opportunities, direct business activity and supply chain benefits, as well as induced effects from workers spending locally. This will likely generate significant socio-economic benefits and some socio-economic change to 20-100 local businesses. The socio-economic impacts, such as increased employment and contributions to GVA will be assessed based on expenditure in construction and operation. This will include

assumptions from the literature and evidence on the extent of local content of contracts issued. As UK supply chains are increasing annually while cost of production is falling, the latest figures from the literature may show a greater proportion of the socio-economic impacts in terms of jobs and GVA being retained in UK.

Operation

12.38 During the operation phase the socio-economic impacts are likely to be lower, however they will still represent a sizeable ongoing investment. Staff will have to be employed to service and maintain the onsite infrastructure and there will be indirect benefits from training and supply chain potential for local firms.

12.39 Further, Local ownership and any community benefit fund as part of the Development will bring additional social and community benefits. EDF will be offering up to 10% local ownership of the Development, in addition to the Community Fund benefits. Taken with the Site's operational impacts, there is the potential for moderate socio-economic change to 20-100 local people or 10-30 local businesses and therefore this will be assessed in the EIA for the duration of the operation. .

Effects Scoped Out

12.40 As outlined in the chapter's **Introduction**, it is proposed that the effects on tourism and recreation will be scoped out of the socio-economic assessment. Any disruption to recreation will be minor and mitigated by improved access following the works while there is no evidence that tourism is adversely affected by renewable energy sites.

Approach to Mitigation

12.41 It is not anticipated that mitigation measures will be required to address any socio-economic impacts. Where possible, it is anticipated that the Applicant will utilise approaches to enhance any potential benefits by encouraging local suppliers etc.

Questions

Question 12.1: Can consultees confirm the methodology outlined above is appropriate to inform the socio-economic impact assessment ?

Question 12.2: Do consultees agree that the proposed geographic study areas (10 km radius, Wales and the UK) are appropriate for reviewing socio-economic impact?

¹¹⁷ Note this table only refers to socio-economics effects as tourism and recreation effects are scoped out later in this chapter.

Question 12.3: Can the consultees identify any relevant stakeholders who should be included in our consultation exercise regarding the development of the socio-economic impact assessment?

Question 12.4: Are the consultees satisfied that tourism and recreation effects can be scoped out of the EIA?

Chapter 13

Other Issues

Introduction

13.1 This chapter of the Scoping Report considers other topics that will be addressed in the ES.

Aviation

13.2 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, if required.

13.3 This section has been prepared by WPAC.

Guidance and Legislation

13.4 There are a number of aviation publications relevant to the interaction of wind turbines and aviation 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 CAP764 CAA.
- Civil Aviation Authority (2019) Licensing of Aerodromes, Version 11 CAP 168 CAA.
- Civil Aviation Authority (2019) ATS Safety Requirements Version 3 CAP 670 CAA.
- Civil Aviation Authority (2017) UK Flight Information Services, Ed 3, CAP 774 CAA.
- Civil Aviation Authority (2006) Safeguarding of Aerodromes Version 2 CAP774 CAA.
- Civil Aviation Authority (2010) Safe Operating Practices at Unlicensed Aerodromes Ed 1 CAP 783 CAA.
- Civil Aviation Authority (2017) Manual of Air Traffic Services Part 1 Ed 7.0 CAP 493 CAA.
- Civil Aviation Authority (2020) Parachuting Ed 5, CAP660 CAA.
- 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.

Study Area

13.5 The aviation assessment of the proposed turbines will be based upon 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**. These 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 km – 17 km.
- Non radar licensed aerodrome with a runway of less than 1.1 km – 5 km.
- Licensed aerodromes where the turbines would lie within airspace coincidental with any published Instrument Flight Procedure (IFP).
- Unlicensed aerodromes with runways of more than 800 metres – 4 km.
- Unlicensed aerodromes with runways of less than 800 metres – 3 km.
- Gliding sites – 10 km.
- Other aviation activity such as parachute sites and microlight sites within 3 km – in such instances developers are referred to appropriate organisations.

13.6 CAP 764 further states 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 and will be reported upon in the ES. For example, Cardiff Airport has stated previously that they wish to be consulted in relation to wind farms out to 40 km or even further if it is likely to affect their operations.

13.7 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 that will be addressed in the ES include:

- Ministry of Defence Airfields, both radar and non-radar equipped.
- Ministry of Defence Air Defence Radars.
- Ministry of Defence Meteorological Radars.
- Military Low Flying.

13.8 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.

13.9 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 will also be reported on in the ES but initial surveys show there are no physical safeguarding issues associated with this proposal.

Radar Modelling Methodology

13.10 The radar calculation results discussed in this report 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 Development as its design evolves. The results will then be used as a basis for consultation and liaison with relevant aviation bodies, as detailed further below.

Existing Conditions and Proposed Scope of Assessment

13.11 The Development is located 45 km to the north-west of Cardiff International Airport and 29 km to the north-east of Swansea Airport. It is therefore in a location that is relatively remote from large aviation facilities as shown on **Figure 13.1**.

13.12 The Site is located under unregulated Class G airspace which extends up to approximately 9,500 ft and is over 20 km to the west of the Cardiff Control Zone and Area. Above Flight Level 95 (approximately 9,500 ft) is Class A controlled airspace known as the Strumble Control Area (CTA), controlled by NERL. In military terms, the Site is a considerable distance from any military airfields, the closest being RNAS Yeovilton, over 110 km to the south-east.

Licensed Aerodromes

13.13 There are no civil licensed aerodromes within consultation distance, however Cardiff International Airport is 45 km to the south-east. In addition to providing Air Traffic Control (ATC) services to aircraft operating in and out of the airport, it provides a Lower Airspace Radar Service (LARS) to any aircraft requesting a service below 10,000 ft and also provides ATC services to aircraft operating out of MOD St Athan, which is adjacent to the airport. Radar modelling has been undertaken against the scoping layout (**Figure 1.2**) and will be updated and reported in the ES. The results for radar line of sight are shown in Table 13.1.

Table 13.1: Radar Line of Sight Cardiff International Airport Radar

Turbine	Radar Line of Sight (m Above Ground Level (AGL))
1	388.7404.2
2	384.9382.2
3	393.3407.8
4	386.5304.3
5	374.5401.6
6	333.6252.1
7	252.1384.9

13.14 These results show that the turbines are completely screened by terrain and will not have any effect on the radar at Cardiff International Airport.

13.15 The Applicant will consult with Cardiff International Airport and with NATS, the airport's Air Navigation Service Provider when the layout is finalised and the outcome reported in the ES.

13.16 Swansea Airport is a licensed non-radar equipped airport 29 km to the south-west. Consultation is only required for developments within 17 km of this type of facility unless there is likely to be an effect on Instrument Flight Procedures. There are no published procedures for Swansea and consultation is therefore not required.

Unlicensed Aerodromes

13.17 There are no unlicensed aerodromes marked on aviation charts within standard consultation distance. There is a gliding site at Rhigos, 8 km to the east of the Site. Standard consultation for such facilities is only routinely required within 3 km, however, the British Gliding Association has requested that gliding clubs be consulted in relation to proposed wind farms within 10 km. The Applicant will consult with Rhigos and report the outcome in the ES, however, there is unlikely to be any effect on gliding at Rhigos.

Ministry of Defence

13.18 Military Air Traffic Control – the Development is located in an area with no radar equipped military airfields, the closest is RNAS Yeovilton in Somerset. Radar modelling shows that radar line of sight over Site is in excess of 800 m AGL and there is no possibility of the radar being affected. Additionally there is a military ATC radar located at Hartland Point in North Devon, 97 km to the south, currently used by the Royal Naval School of Fighter Control (RNSFC). Radar line of sight projections

show that the radar will detect the turbines, however, the RNSFC does not control aircraft in this location and additionally the radar is being decommissioned before the Development will be built. An MOD objection is therefore unlikely but the MOD DIO will be consulted and the outcome reported in the ES.

13.19 Other Military Radars – Aberporth Range Control - there is a military ATC radar located at Aberporth Range, 73 km to the west, used for range control in the offshore danger areas and also within overland danger areas allocated for Unmanned Aerial Vehicle (UAV) trials. Radar modelling shows that radar line of sight is in excess of 400 m AGL and there will be no reason for the MOD to object in relation to Aberporth. This will be confirmed through consultation with the MOD and reported in the ES. In any case the Development is not located in an area where Aberporth would be providing range control services.

13.20 MOD Air Defence Radar – the closest air defence radar is located at Portreath in North Cornwall. Radar modelling shows that there is no possibility of the 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.

13.21 MOD Low Flying – the Development is located within an area designated at 'Blue' in relation to military low flying. This is defined as a 'low priority military low flying area less likely to raise concerns'. A low flying objection is therefore very unlikely. 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 scoping and will be reported in the ES.

13.22 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 turbine within 5 km in line of sight and will examine the impact of any 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.
- Population density

13.23 In this case, the closest Met Office radar is at Crug-y-gorllwyn, over 58 km to the north-west. There will be no Met Office radar objection to this proposal and consultation is not required. This issue will not be considered further in the ES.

NATS En Route Ltd (NERL)

13.24 An initial assessment has been conducted to determine any effect of the Development on NERL communications, navigation and surveillance infrastructure. The closest radars in

the system are at Clee Hill, 106 km to the north-east and Burrington, 90 km to the south. Initial radar modelling shows that radar line of sight from Clee Hill is not below 365 m AGL and from Burrington it is not below 600 m AGL; these results show that the Development will not affect any NERL infrastructure. NERL will be consulted to confirm the results which will be reported in the ES.

Aviation Obstruction Lighting

13.25 A wind farm with tip heights in excess of 150 m will need to be illuminated at the hub of selected turbines with medium intensity red aviation obstruction lighting. WPAC will design a lighting layout which minimises the number of lit 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 the 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.

Solar Glint and Glare

13.1 This section considers the baseline conditions, glint and glare guidelines, methodology, and determination of whether glint and glare effects should be scoped into the EIA.

13.2 This section has been prepared by Pager Power Ltd.

Information Sources

13.3 Aerial photography and mapping of the Site and surrounding area has been used to inform the desk-based research for this Scoping Report.

Baseline Context

13.4 The Site is semi-rurally located with several regional roads, local roads, dwellings, and a railway track located within 1 km of the Site.

Proposed Surveys and Assessment Methodology

Guidance

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

- Pager Power Glint and Glare Guidance, Third Edition (3.1), April 2021.
- Renewable and low carbon energy, Ministry of Housing, Communities & Local Government, 18 June 2015.

- Technical Guidance for Evaluating Selected Solar Technologies on Airports, Federal Aviation Administration (FAA), 04/2018.

Proposed Study Area

13.6 The assessment will consider road users and dwellings within 1 km and train drivers and railway infrastructure within 500 m of the Development and with potential views of the solar panels. A high-level overview of aviation concerns for Rhigos Airfield (the only airfield within 10 km of the Site) will be included within the assessment.

Proposed Desk Study

13.7 A 'Solar Photovoltaic Glint and Glare Study' will be prepared for inclusion as a technical appendix to the ES and will consider the effect of the solar panel areas upon identified ground-based receptors.

13.8 Receptors are identified based on high-level consideration of aerial photography and mapping i.e. receptors are excluded if it is clear from the outset that no visibility would be possible. A more detailed assessment is then undertaken if the modelling reveals a reflection would be geometrically possible.

13.9 Pager Power's glint and glare assessment methodology has been derived from the information provided to Pager Power through consultation with stakeholders, assessment experience and by reviewing the available guidance and studies.

13.10 The methodology for ground level glint and glare assessments is as follows:

- Identify the key receptors in the area surrounding the Site.
- Consider direct solar reflections from the proposed Development towards the identified receptors by undertaking geometric calculations.
- Consider the visibility of the panels from the receptor's location. If the panels are not visible from the receptor, then no reflection can occur.
- Based on the results of the geometric calculations, determine whether a reflection can occur, and if so, at what time it will occur.
- Consider both the solar reflection from the Development and the location of the direct sunlight with respect to the receptor's position.
- Consider the solar reflection with respect to the published studies and guidance - including intensity calculations where appropriate.

- Determine whether a significant detrimental impact is expected in line with Páger Power's standard process and recommended methodology and advise the Applicant of suitable mitigation by design options.

Potential Significant Effects of the Development

Construction

13.11 No potential significant effects during construction are anticipated.

Operation

13.12 Potential effects on the identified ground-based receptors are caused by:

- Glint – a momentary flash of bright light (typically experienced by moving receptors).
- Glare – a continuous source of bright light (typically experienced by static receptors).

13.13 The term 'solar reflection' is used to refer to both reflection types i.e., glint and glare.

13.14 The significance of any effects will be determined by considering the visibility of the solar reflection including level of screening (existing or proposed), the sensitivity of the receptor, location of origin of the solar glare, time and duration of any reflection and the location of the Sun at the time a solar reflection is possible.

13.15 In the event that potentially significant effects are identified, these will be addressed through design measures which will be described in the Development Description ES chapter.

Decommissioning

13.16 No potential significant effects during decommissioning are anticipated.

Cumulative Effects

13.17 No cumulative effects are predicted because there are no significant solar developments near to the Development.

13.18 Páger Power is not aware of any consented solar developments within 5 km of the Site. However, Pencaerlan Solar/ Seven Sister Solar Farm is currently at the screening stage and the status of this and other solar applications will be reviewed prior to submission of the application for the Development.

Effects Scoped Out

13.19 Considering the Development's semi-rural location and relative geographic location of the surrounding ground-based

receptors, any "significant" effects identified through the process of modelling within the impact assessment, and prior to submission of the planning application, will be adequately mitigated such that any effects cannot be considered "significant" in the context of the EIA Regulations.

13.20 It is therefore recommended that glint and glare is scoped out of the EIA. However, a copy of the Glint and Glare Assessment will be included in the ES as a technical appendix.

Approach to Mitigation

13.21 Some examples of common mitigation strategies for ground-based receptors are presented below, but the site-specific mitigation measures will be need subject to confirmation of the design:

- Site surveys to inform visibility (and landscaping plans) more accurately.
- Provision of screening (planting or opaque fence) at the proposed development boundary or elsewhere between the observer and the reflecting areas.
- Changes to the site configuration. This may involve:
 - Changes to the azimuth angle of the solar panels; and/or
 - Changes to the elevation (tilt) angle of the solar panels.

13.22 The reflecting panels that should be obscured from view, based on the proposed configuration, will be defined within the impact assessment (if any).

13.23 Where screening solutions are not feasible changes to the design can be investigated.

Telecommunications and Utilities

13.24 LUC is leading on the assessment of impacts on telecommunications and utilities. Wind turbines can cause electromagnetic interference through physical and electrical interference. Physical interference can cut across electromagnetic signals resulting in a ghosting effect which largely affects television signals and radar. Electrical interference arises as a result of the operation of the generator within the nacelle of the turbine and can also affect communication equipment in proximity to the turbines. Where possible, any potential effects on radio-communication links and television will be mitigated at the turbine layout design stage using exclusion zones around any link paths.

13.25 The Office of Communications (Ofcom) is responsible for the licensing of two-way radio transmitters and holds a register of most microwave links. However, because not all microwave links are published, system operators will be individually consulted on the Development's potential to cause

electromagnetic interference. The outcome of this consultation process, including any mitigation actions taken, will be detailed in the ES.

13.26 An initial appraisal of potential effects of the Development on other telecommunications interests has been undertaken via a review of Ofcom's online open access information via the Spectrum Information System. The mapping service provided via the Spectrum Information System indicates that there are no communication links in the vicinity of the Site. The nearest fixed communication link is located approximately 27 km south-east of the Site. It is therefore considered unlikely that the Development will have any significant effect upon nearby links.

13.27 Notwithstanding this, consultation with the operators of any potentially affected links will be undertaken during the EIA process. In the event that the consultation process does not result in any objection from the relevant stakeholders, then it is proposed that telecommunications can be scoped out of detailed assessment within the ES. Instead, any relevant restrictions on Development's design in order to protect telecommunications interests (turbine heights, micro-siting etc.), will be referenced within the ES's Design and Evolution chapter.

13.28 However, if the stakeholder consultation process and any associated technical studies result in objections from stakeholders requiring detailed technical mitigation to overcome the objection, then the relevant effects will be subject to detailed assessment within the ES.

13.29 Defining grades of receptor sensitivity and effect magnitude is not considered appropriate in relation to telecommunications. Instead, any restriction to the required operational standards of telecommunications links will be treated as significant.

13.30 Utilities infrastructure (water, gas and electricity) may potentially be affected by turbines either due to disturbance during construction or in the very unlikely event of turbines components falling onto this infrastructure when the Development is in its operational stage. Utilities operators impose appropriate separation distances between turbines and infrastructure to mitigate the latter risk in particular.

13.31 Initial review of publicly-available data suggests that there is an 11 kV Overhead Line (OHL) that crosses the Site in the north-western extent. However, this does not intersect any proposed turbine locations. Turbine 1 is the nearest, located approximately 630 m east of the OHL. On this basis, it is proposed that utilities be scoped out of detailed assessment within the ES; the effect of observing required separation

distances on the Development's design will instead be reported on within the Design and Evolution ES chapter. Effects during construction can be readily mitigated via good practice measures that will be appropriate to any development, and that can be readily secured by planning condition. It is proposed that effects on utilities are therefore also scoped out of the ES.

Shadow Flicker

13.32 LUC is leading on the assessment of shadow flicker. Shadow flicker occurs when a certain combination of conditions prevail at a certain 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 turbine to flick on and off. This may have an adverse effect on the amenity of residents and occupants of affected properties. If shadow flicker cannot be avoided through design, technical mitigation solutions are available, such as shutting down turbines when the relevant conditions prevail.

13.33 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. A preliminary review indicates that there are several properties within this study area that could be affected, based on the scoping layout. Therefore it is proposed that shadow flicker is assessed in the EIA at this stage and if suitable mitigation measures identified and described in the ES.

13.34 If an assessment is required, it will be undertaken in accordance with guidance¹¹⁸ and using the Resoft Windfarm Shadow Flicker module, to determine the theoretical occurrence of shadow flicker at each property within the above parameters. This model will calculate the number of days per year, maximum hours per day giving a total number of hours per year that assessed properties can be expected to experience the effects of shadow flicker. The model will also determine which turbines will be the source of shadow flicker effects and at which time of day. OS AddressBase data will be used to identify the properties to be included in the assessment.

13.35 The occurrence of shadow flicker is only possible during the operation of the wind turbines (i.e. when the rotor blades are turning), when the sun is shining and when the sky is clear enough to cast shadows, therefore the instances of shadow flicker would always be less than that predicted by the model as these are based on a maximum case scenario. The model will also be run using the following assumptions, again making the results an overestimation of the likely occurrence of effects:

¹¹⁸ Department of Energy and Climate Change (DECC) (2011) Update of UK Shadow Flicker Evidence Base, Available [online] at: <https://www.gov.uk/government/publications/update-of-uk-shadow-flicker-evidence-base>. Department of Northern Ireland (2009) Practice Guidance for

Planning Policy Statement 18 (PPS18) - Available [online] at: https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/Best%20Practice%20Guidance%20to%20PPS%2018%20-%20Renewable%20Energy_0.pdf

- all properties within the zone of influence are assumed to have a specified window size (in this case 1.5 m x 2 m) facing directly on to each turbine that has the potential to cause an effect.
- the wind turbine blades are assumed to be rotating for 365 days per year.
- the wind turbine blades are assumed to always be positioned so that their full face would be between the sun and each property.
- the sun always shines in a clear sky on every day of the year, i.e. there are no periods of cloud cover or low visibility due to fog, mist and haze etc.
- a human receptor is deemed to be present in all affected rooms at all times.
- no account is taken of the potential shielding effects of trees or vegetation.
- curtains or blinds are assumed not to be fitted to windows.

13.36 The Department of Environment Northern Ireland (2009) Best Practice Guidance for Planning Policy Statement 18 (PPS18): Renewable Energy provides an indication of what may be an acceptable duration of shadow flicker stating that:

"It is recommended that shadow flicker at neighbouring offices and dwellings...should not exceed 30 hours per year or 30 minutes per day." (page 29)

13.37 The mitigation of shadow flicker effects could involve installing a shadow flicker occurrence system as part of the operational Development for those turbines deemed to be causing the effect. The control system would involve shutting down the selected turbines at the specified daily times throughout the year, as identified in the Resoft model. Other forms of mitigation could involve the planting of trees or the installation of blinds. Should mitigation be required, then this would likely form a condition of consent.

Climate Change

13.38 The key means by which a Renewable Energy Park may have effects relating to climate change is in its generation of low-carbon energy. The generation of electricity from Renewable Energy Parks 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 Development which will be presented in the ES. This calculation will employ the latest version of the Scottish Government Carbon Calculator, which remains the suitable standardised tool for use in relation to net carbon saving calculations.

Major Accidents and Disasters

13.39 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 etc. Act 1974. As described in **Chapter 7**, consideration of peat slide risk and mining will be fully covered and reported in the ES.

13.40 It is not therefore considered necessary to undertake an assessment of the Development with respect to major accidents and disasters within the ES. Relevant safety considerations informing the final design of the Development will instead be described in the Development Description and the Design Evolution ES chapters, respectively.

Population and Human Health

13.41 It is not considered necessary to include a standalone Human Health Impact Assessment chapter within the ES.

13.42 Potential effects of the Development with respect to human health will instead be considered via other relevant topics, including noise, shadow flicker (where potential for this is identified) and access, traffic and transport.

13.43 As described above in relation to major accidents and disasters, relevant safety considerations informing the final design will be described in the Development Description ES chapter.

Land Use

13.44 The Site is located on poor quality agricultural land (grades 4 and 5) which is currently used for sheep grazing (grades 4 and 5). Agricultural use will continue once the scheme is operational.

13.45 There are three areas of open access land onsite, with public rights of way crossing a small section in the west. It is understood from consultation with PEDW, that no secondary consents are required in relation to the areas of open access land. The design of the Development will seek to avoid the public footpaths; however, if this is not possible, the Development Description ES chapter will discuss alternative proposals.

13.46 Much of the Site is underlain by the active Aberpergwm coal mine which operates from a surface drift entrance to the west of Glynneath. The mine is operational and the Development will be designed in a way that the two developments can co-exist. The potential effects of the proposed Development in relation to mining activity are

described in **Chapter 7** and will be addressed through design and reported in the ES.

13.47 The ES will provide a summary of the Development's effect on current farming practices and land use.

Questions

Question 13.1: Do consultees agree with the scoping out of telecommunications, solar glint and glare and utilities?

Question 13.2: Do consultees agree with the proposals for the assessment of effects on aviation, shadow flicker, climate change, major accidents and disasters, population and human health and land use?

Question 13.3: Are there any other relevant consultees who should be consulted about the other EIA topic assessments?

Appendix A

List of Scoping Questions

List of Scoping Questions	
Chapter 2: The Environmental Impact Assessment	
Q2.1	Are consultees aware of other wind farms (in addition to those shown in Table 2.1), solar proposals, or other developments that should be added to list for consideration in the cumulative assessments?
Q2.2	Several measures are considered to be an integral part of the design/construction process as part of good practice, and it is proposed that these will be taken into account prior to assessing the likely effects of the Development. Can consultees please confirm they are happy with this approach to mitigation?
Chapter 5: Landscape and Visual Amenity	
Q5.1	Is the proposed approach and scope for the assessment of effects on landscape character and LANDMAP aspect areas / Landscape Character Areas considered to be appropriate? [NB can NRW provide the information required to enable us to complete the Stage 2 filtering process for Geological Landscape aspect areas i.e. data needs to provide a match between the Site IDs in the GIS data and the online survey records].
Q5.2	Is the proposed approach and scope for the assessment of effects on designated landscapes considered to be appropriate?
Q5.3	Is the proposed approach and scope for the assessment of visual effects appropriate?
Q5.4	Do consultees consider that the proposed viewpoints are appropriate to inform the visual assessment, and that the suggested presentation of visualisations is appropriate?
Q5.5	Is the approach to inclusion of schemes within the cumulative assessment appropriate?
Q5.6	Is the approach to the assessment of effects on residential visual amenity appropriate?
Q5.7	Do consultees consider the effects to be scoped in and out appropriate?
Q5.8	Is the approach to the aviation lighting assessment and night-time photography appropriate and proportionate, and are the suggested night-time viewpoints appropriate?
Q5.9	Are there any other relevant parties who should be included within the post-scoping consultation process for the LVIA?
Chapter 6: Cultural Heritage	
Q6.1	Do consultees agree with the scope and approach of the Cultural Heritage and Archaeology Assessment?
Q6.2	Are consultees happy with the proposed viewpoints for consideration in the cultural heritage assessment?
Chapter 7: Hydrology, Hydrogeology and Geology (including Peat and Mining)	
Q7.1	Is the proposed assessment methodology appropriate?
Q7.2	Are the proposed list of effects which are scoped in appropriate?
Q7.3	Is the use of the Scottish Government Carbon Calculator acceptable?

Appendix A
List of Scoping Questions

Hirfynydd Renewable Energy Park
October 2022

List of Scoping Questions	
Chapter 8: Ecology	
Q8.1	Are consultees content with the proposed approach to the ecological desk study and site survey work?
Q8.2	Do consultees agree that it should be possible to scope out effects on great crested newt, common species of reptile and amphibian, and badger, and detailed consideration of effects on designated sites other than Sarn Helen SINC and NPT Watercourses SINC?
Q8.3	Do consultees agree that the scope of cumulative assessment can be limited to wind farm developments within 10 km of the Site?
Chapter 9: Ornithology	
Q9.1	Are consultees content with the proposed approach to the ornithological desk study and site survey work?
Q9.2	Do consultees agree that the scope of cumulative assessment can be limited to wind farm developments within 10 km of the Site?
Chapter 10: Noise and Vibration	
Q10.1	Are the consultees happy with the suggested approach for the noise assessment?
Q10.2	Do the consultees agree with the proposed scope of the cumulative operational noise assessment?
Q10.3	Do the consultees have any comments on the effects proposed to be scoped out?
Chapter 11: Access, Traffic and Transport	
Q11.1	Is the proposed methodology acceptable, including what is proposed to be scoped out and the approach to the cumulative assessment?
Q11.2	Are the proposed traffic survey locations acceptable?
Q11.3	Is the use of Low National Road Traffic Forecasts (NRTF) acceptable for the whole of the study to determine future year traffic flows?
Q11.4	What committed development traffic flows should be included in the baseline traffic flows?
Q11.5	Is a Framework Abnormal Load Transport Management Plan sufficient for the planning consideration stage?
Chapter 12: Socio-Economics	
Q12.1	Can consultees confirm the methodology outlined above is appropriate to inform the socio-economic impact assessment ?
Q12.2	Do consultees agree that the proposed geographic study areas (10 km radius, Wales and the UK) are appropriate for reviewing socio-economic impact?
Q12.3	Can the consultees identify any relevant stakeholders who should be included in our consultation exercise regarding the development of the socio-economic impact assessment?
Q12.4	Are the consultees satisfied that tourism and recreation effects can be scoped out of the EIA?
Chapter 13: Other Issues	
Q13.1	Do consultees agree with the scoping out of telecommunications, solar glint and glare and utilities?
Q13.2	Do consultees agree with the proposals for the assessment of effects on aviation, shadow flicker, climate change, major accidents and disasters, population and human health and land use?
Q13.3	Are there any other relevant consultees who should be consulted about the other EIA topic assessments?

Appendix B

Indicative ES Structure

ES Structure

ES Volume 1: Non-Technical Summary

ES Volume 2: Main Chapters

Chapter 1: Introduction

- Rationale for the Hirfynydd Renewable Energy Park.
- Legislative Requirements for EIA.
- Responsibilities for ES.
- Structure of the ES.

Chapter 2: The Environmental Impact Assessment

- Introduction.
- The EIA Process.
- Scope of the EIA.
- The do-nothing scenario.

Chapter 3: Design Evolution and Alternatives

- Introduction.
- Site Context.
- Design Strategy.
- Design Evolution.
- Alternatives.

Chapter 4: Development Description

- Introduction.
- Development Description.
- Construction Process.
- Operational Overview.
- Decommissioning.

Chapters 5 to 14: Landscape and Visual Impact Assessment; Cultural Heritage; Hydrology, Hydrogeology, Geology and Peat; Mining, Ecology; Ornithology; Noise and Vibration; Access, Traffic and Transport; Socio-Economics; Other Issues topics

Each chapter will include:

- Introduction.
- Assessment Methodology.
- Existing Conditions.
- Modification to Development Design.
- Micro-siting.
- Proposed Good Practice Measures.
- Assessment of Construction Effects.
- Assessment of Operational Effects.
- Cumulative Effects.
- Mitigation and Future Monitoring.
- Residual Effects.
- Summary and Conclusions.

Chapter 15: Summary of Effects

ES Volume 3: Figures

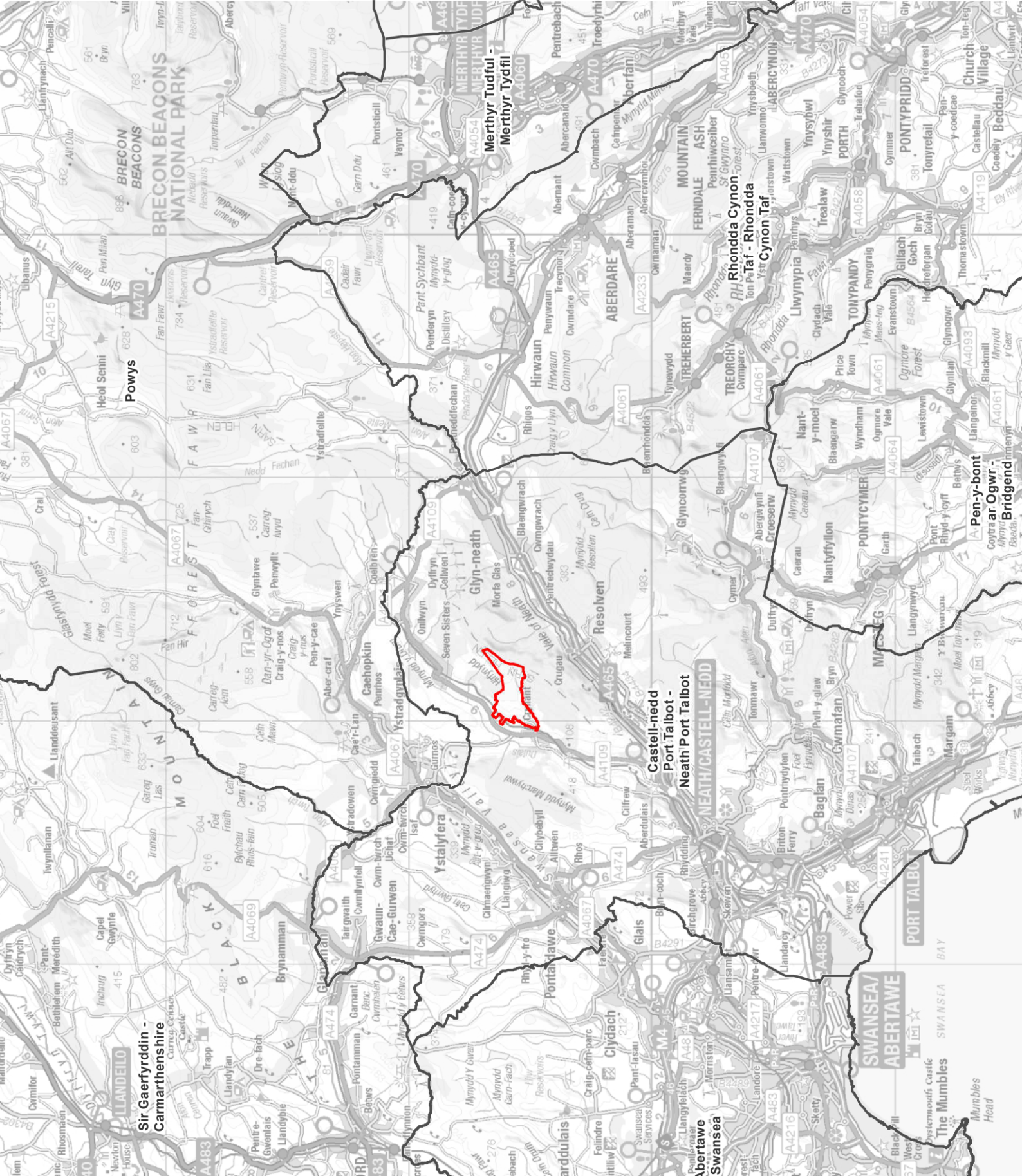
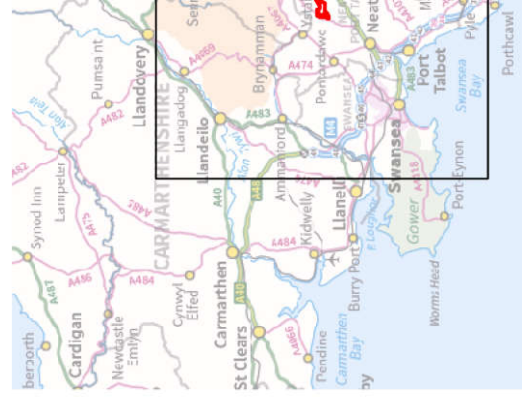
ES Volume 4: Technical Appendices

Examples of what the ES technical appendices could be include are presented below (this list is not exhaustive):

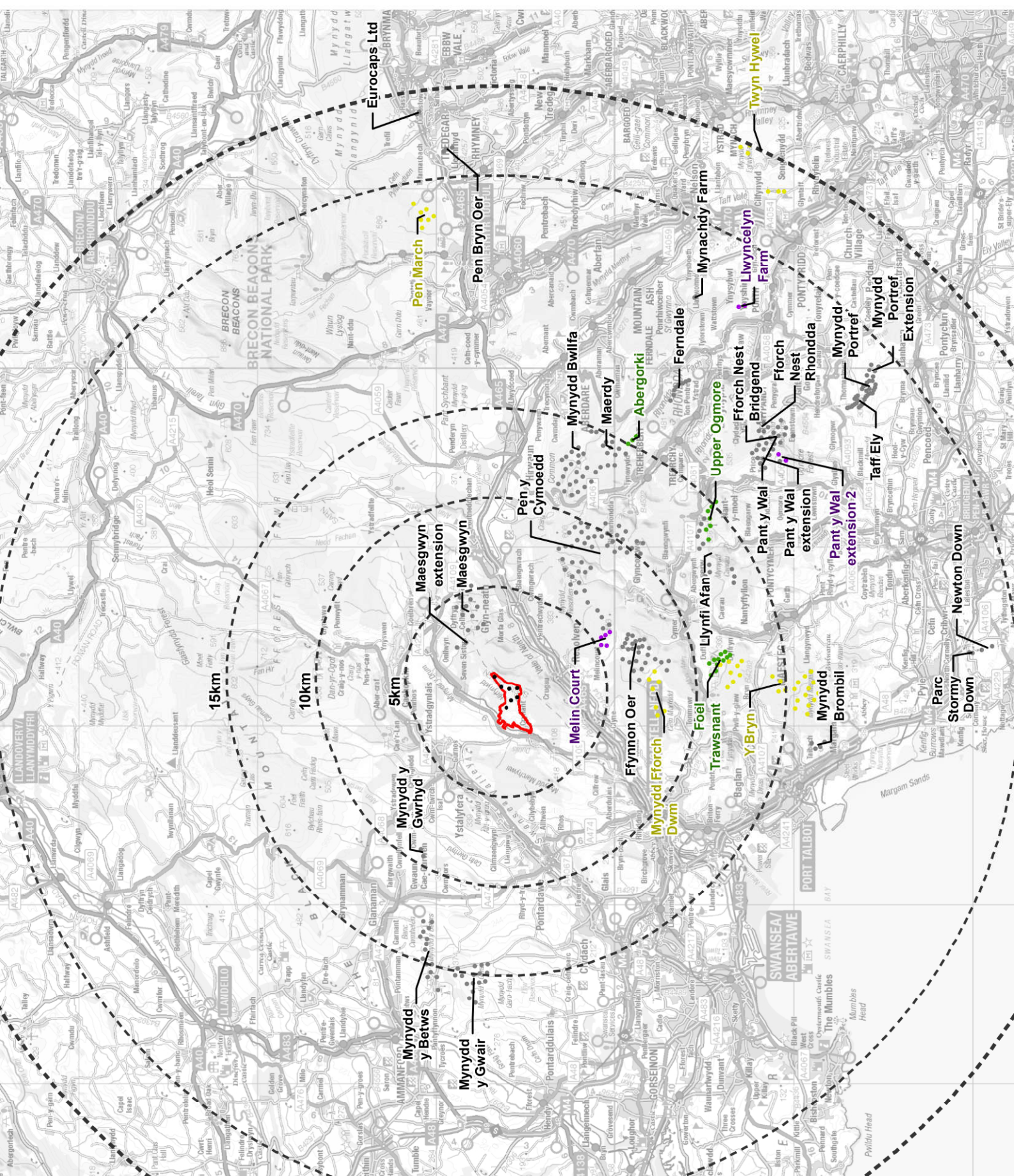
- Outline CEMP.
- Topic relevant survey data.
- LANDMAP Assessment.
- PMP.
- CMRA.
- PLHRA.
- HMP.
- Abnormal Loads Assessment (ALA).
- Schedule of Mitigation.
- High Level Grid Connection Assessment.

Appendix C

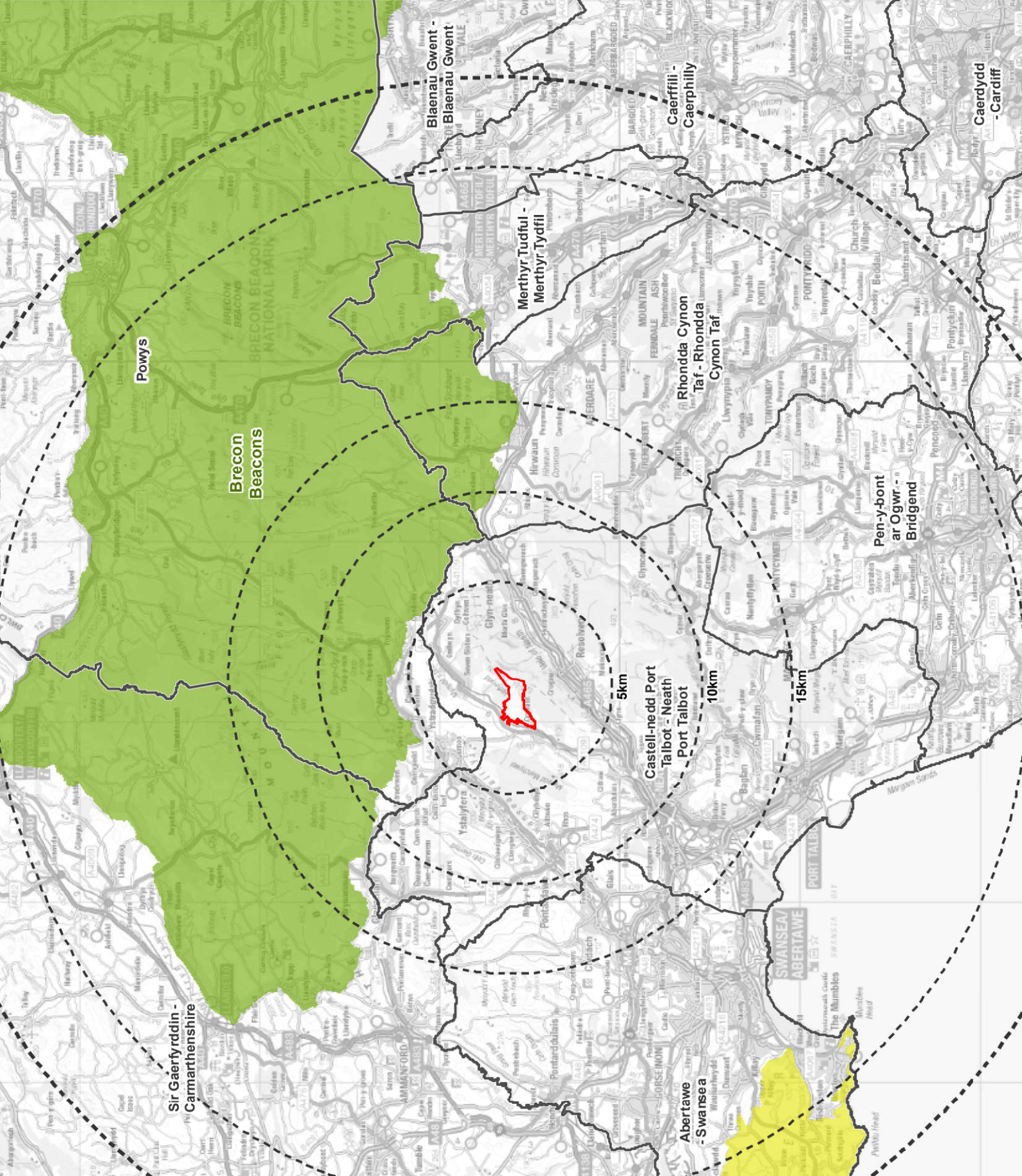
Figures



- Indicative turbine location
 -  Site boundary
 -  Buffer intervals from the turbine
 -  33km buffer from the turbine
- Wind Farms (by status)**
- Operational
 - Consented
 - Application submitted
 - Design/Scoping

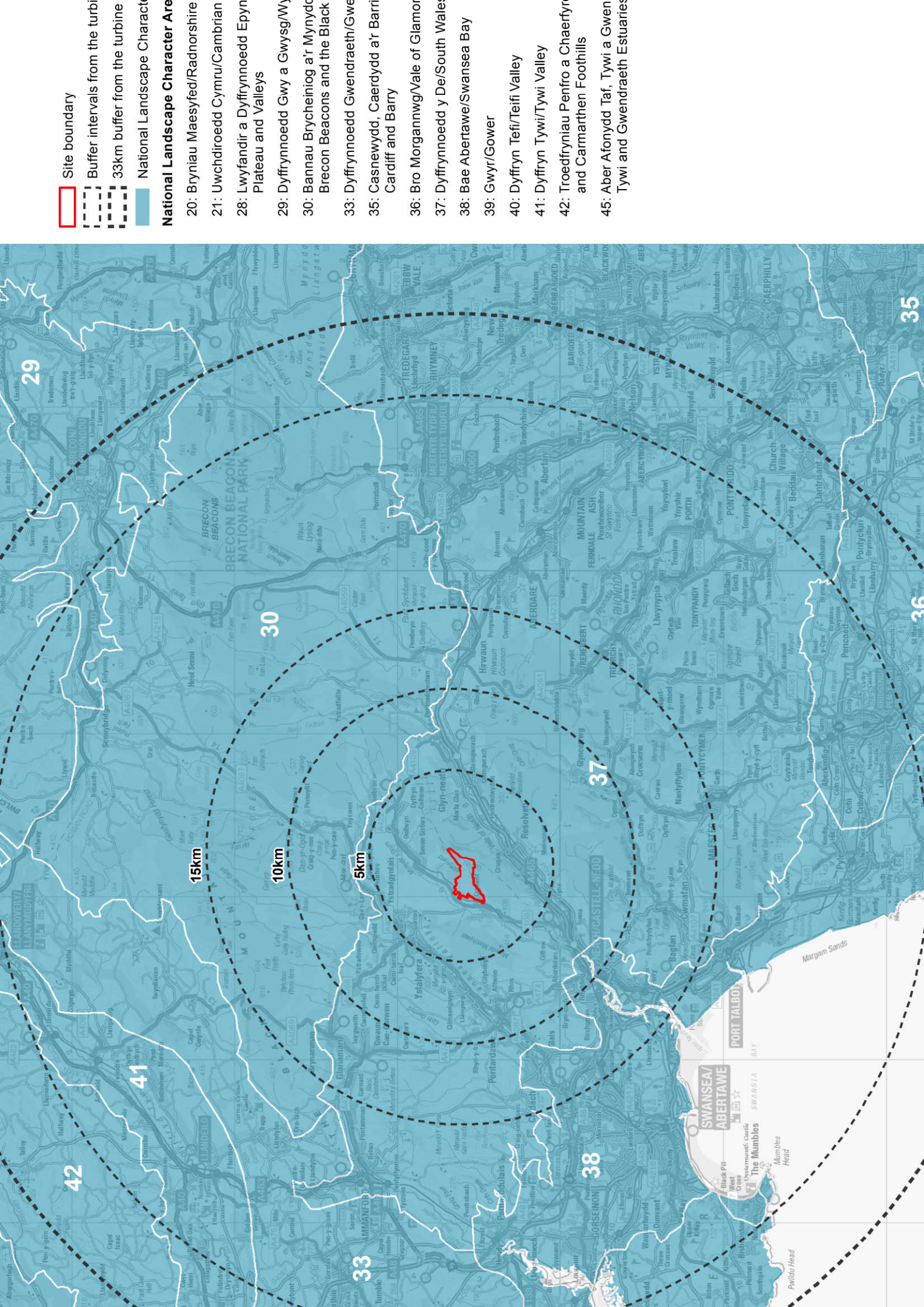


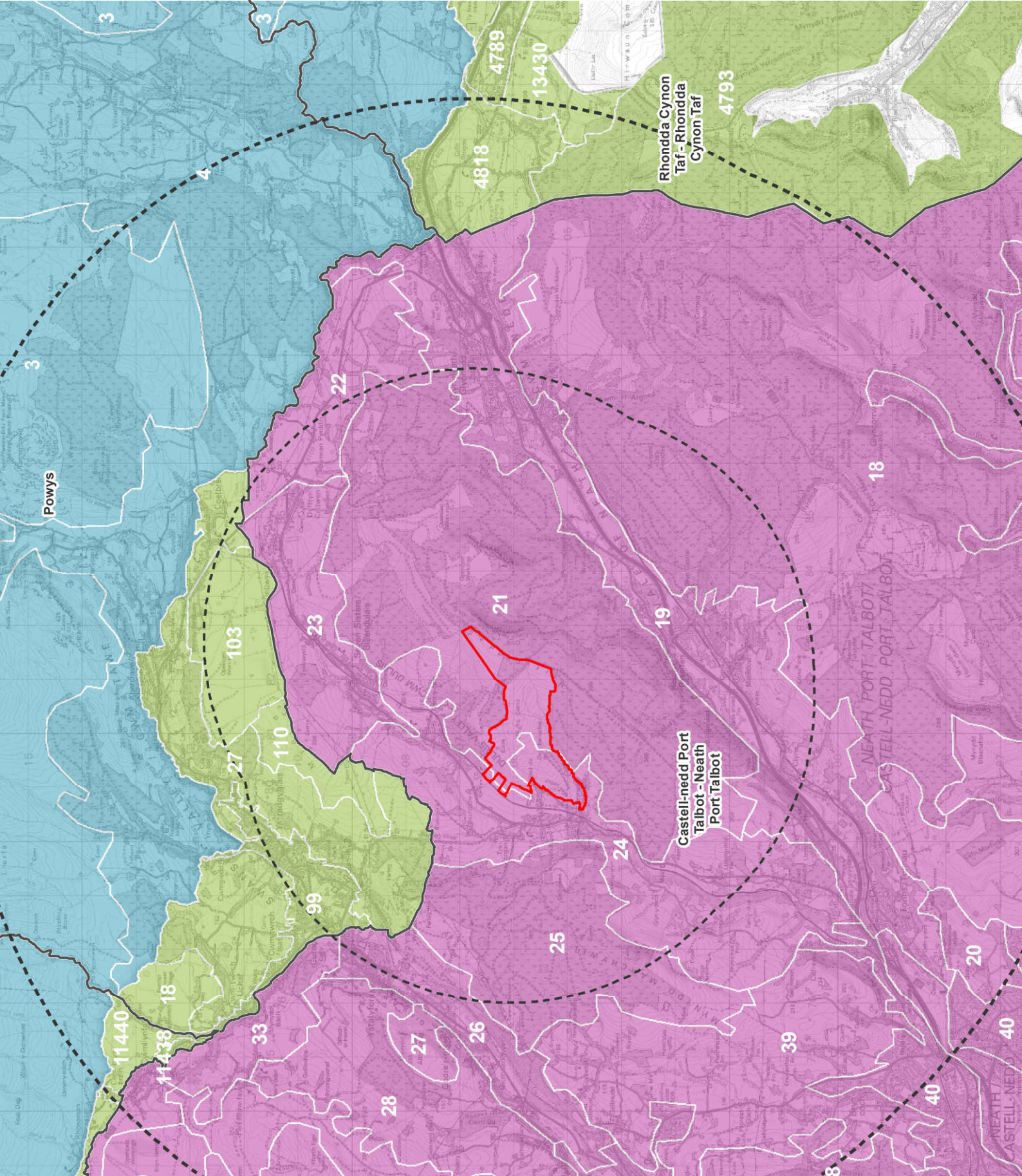
- Site boundary
- Buffer intervals from the turbine
- 33km buffer from the turbine
- Local Authority boundary
- Area of Outstanding Natural
- National Park



⊕ Indicative turbine location
□ Site boundary





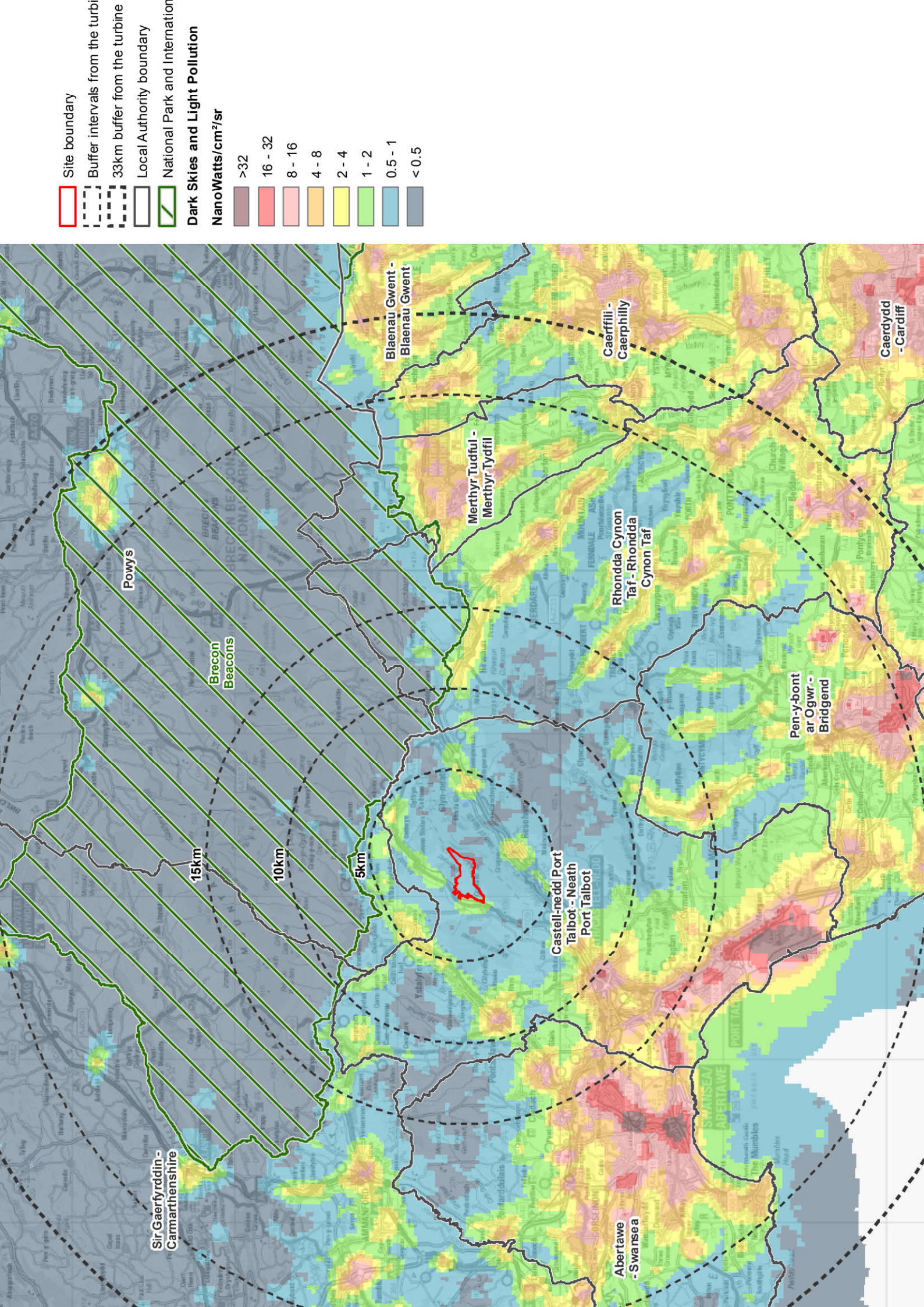


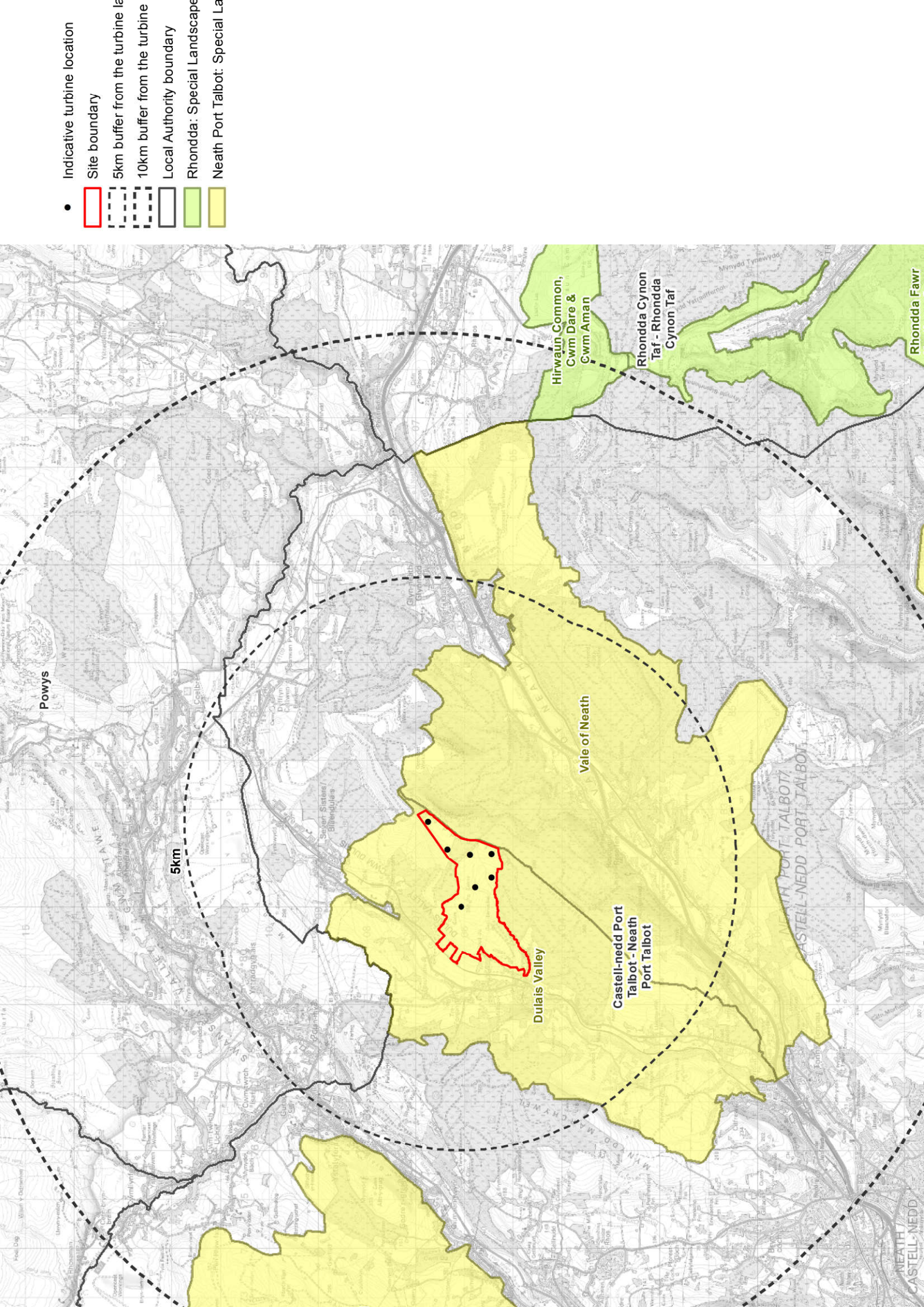
- Landscape Character Area - Brecon**

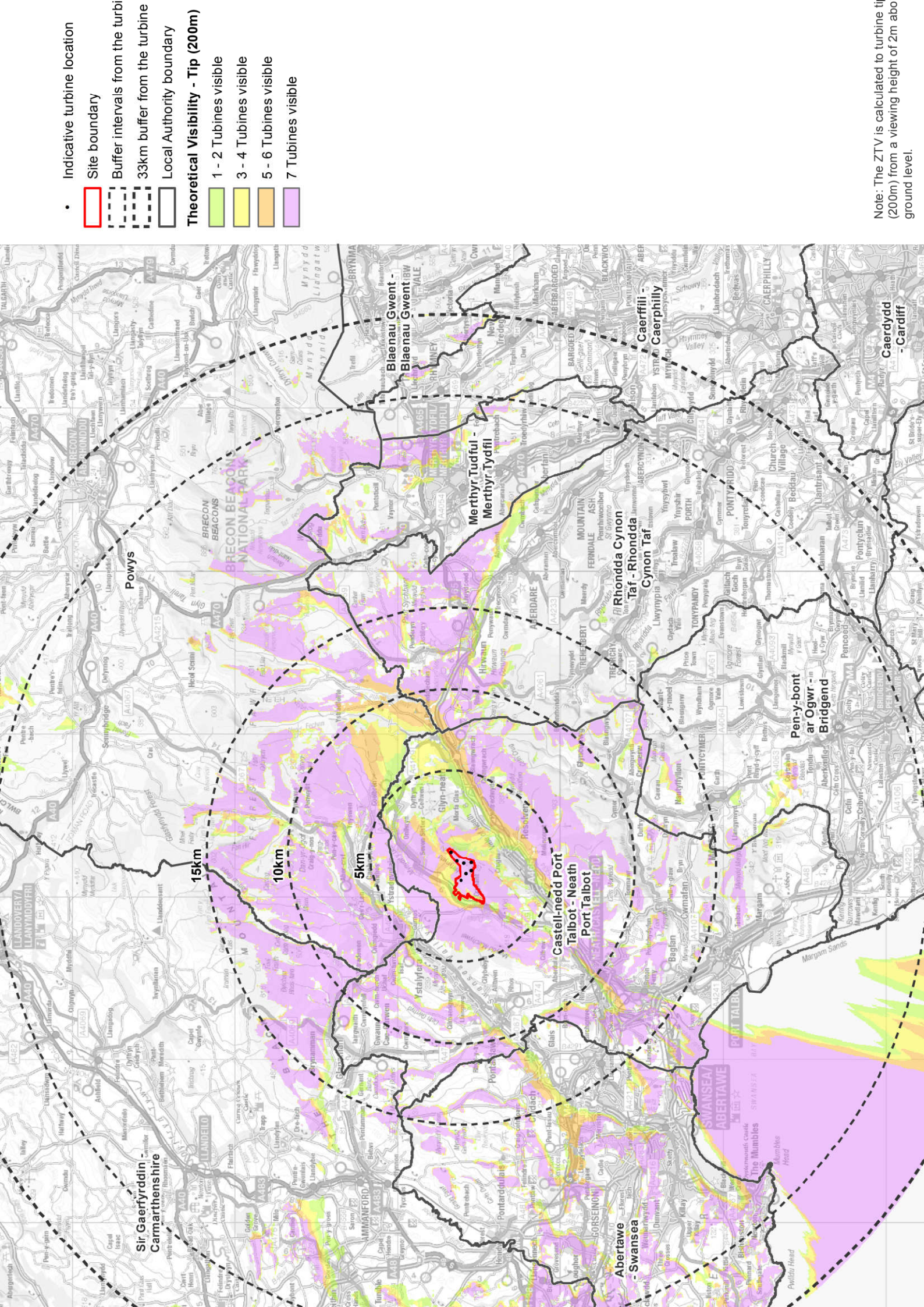
 - 2: Y Mynydd Du
 - 3: Forest Fawr
 - 4: Waterfall Country and Southern V

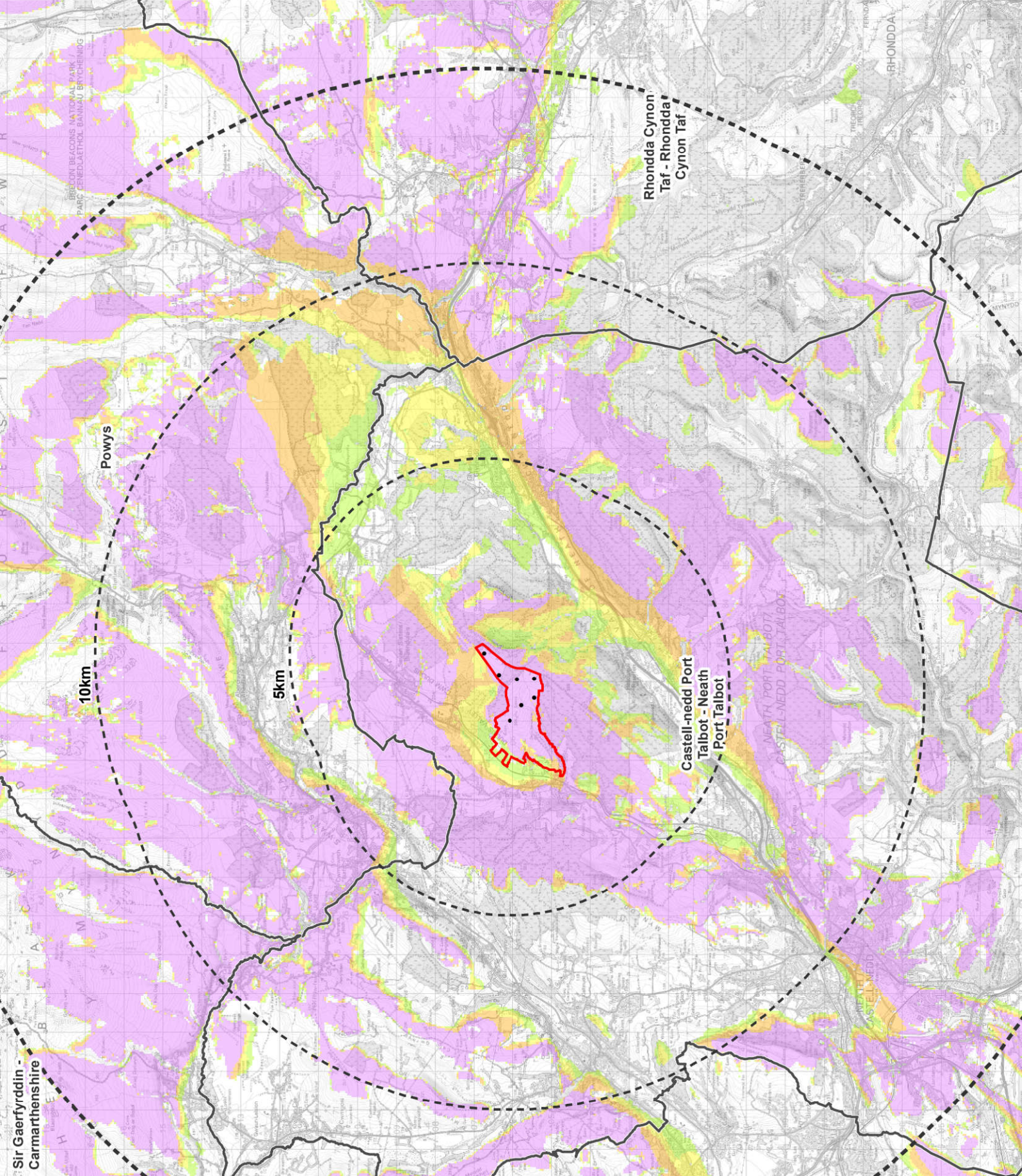
Landscape Character Area - Neath

 - 11: Cwm Afan and Cwm Pelenna
 - 14: Foel Fawr
 - 15: Mynydd y Gelli
 - 17: Feol Fynyddau
 - 18: Mynydd Resolfen, Craig y Llyn
 - 19: Neath Valley
 - 20: Gnoll Park
 - 21: Hirfynydd
 - 22: Banwen Pyrdin
 - 23: Head of Dulais Valley
 - 24: Dulais Valley
 - 25: Mynydd Marchwye
 - 26: Swansea valley
 - 27: Mynydd Allt y gug
 - 28: Slopes of Cefn Gwrhyd and Cw
 - 29: Mynydd Uchaf, Mynydd Garth a
 - 30: East Pit
 - 31: Cwm Aman
 - 32: Cwm Gors, Gwaun Cae Gurwe
 - 33: Cwm Twrch
 - 34: Nant Melyn and Bryn chwyth
 - 35: Bryn Mawr, Mynydd Camillecha
Mynydd Gellionnen
 - 36: Upper Clydach River valley and
Mynydd Gellionnen
 - 37: Pontardawe, Rhos, Alltwen and
 - 38: Mynydd Drumau
 - 39: Clydach valley, Cilybebyll and C
 - 40: Neath
 - 41: Neath Estuary



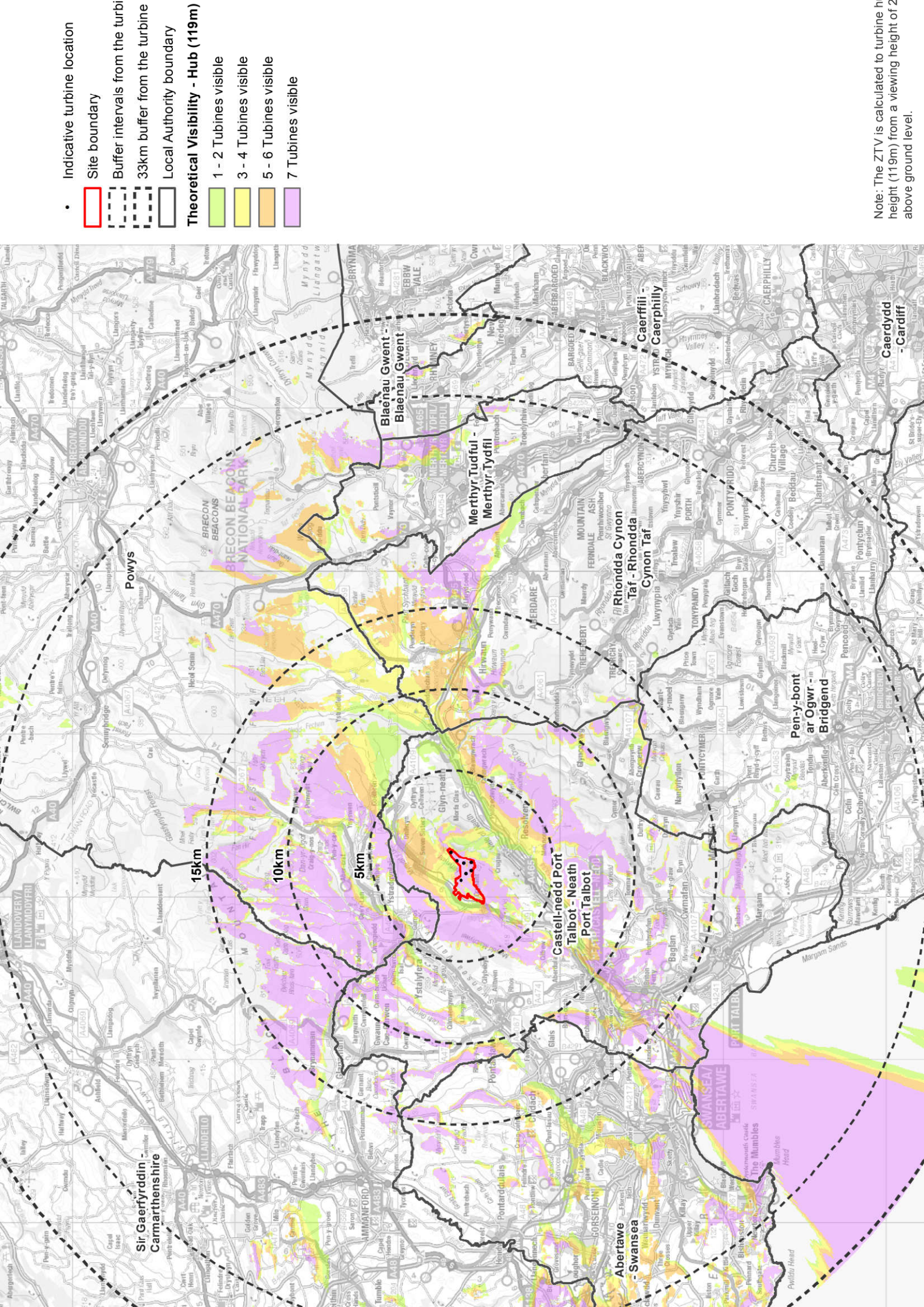


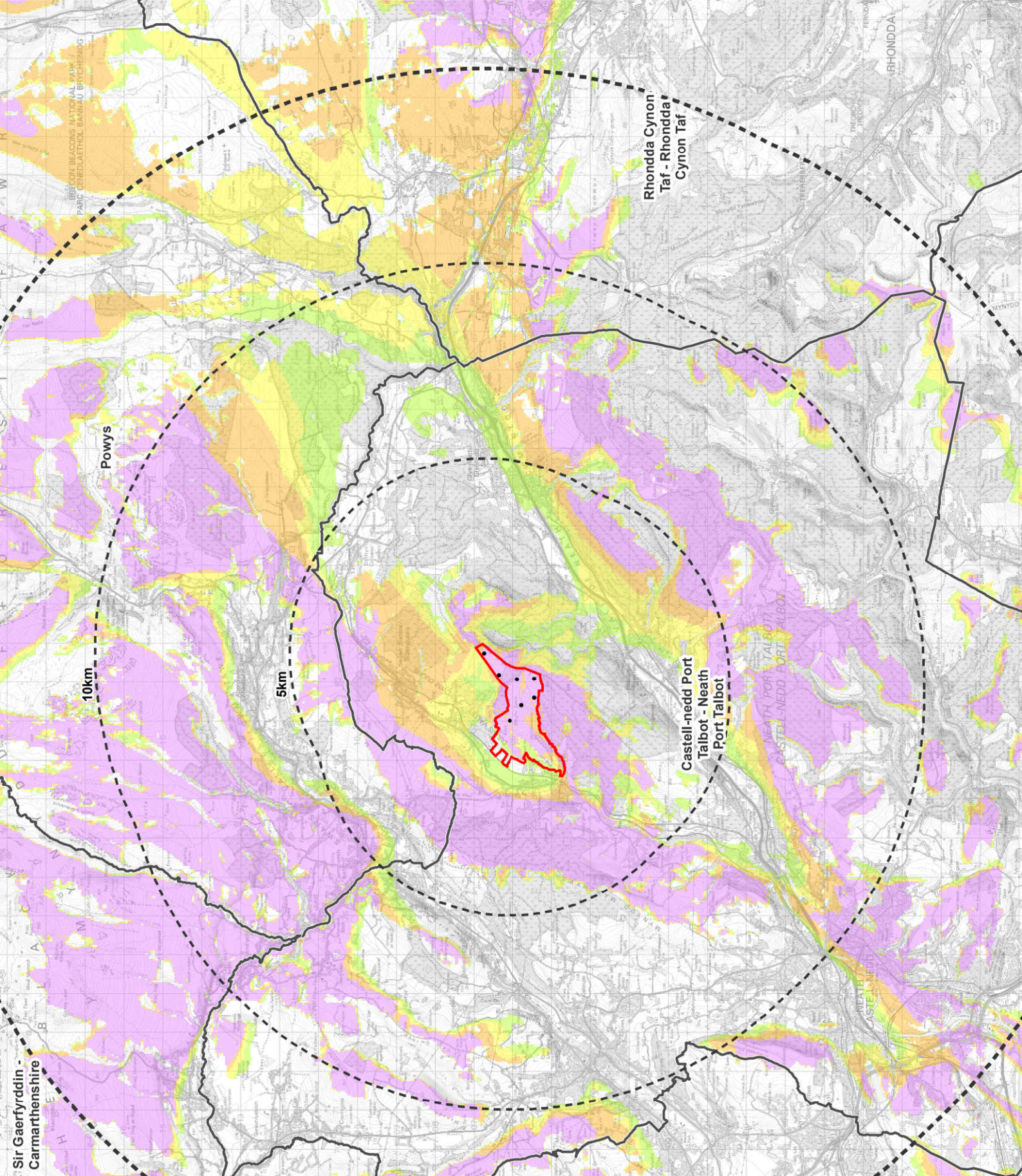




- Indicative turbine location
- Site boundary
- Buffer intervals from the turbine locations
- 15km buffer from the turbine locations
- Local Authority boundary
- Theoretical Visibility - Tip (200m)
- 1 - 2 Turbines visible
- 3 - 4 Turbines visible
- 5 - 6 Turbines visible
- 7 Turbines visible

Note: The ZTV is calculated to turbine tip height (200m) from a viewing height of 2m above ground level.



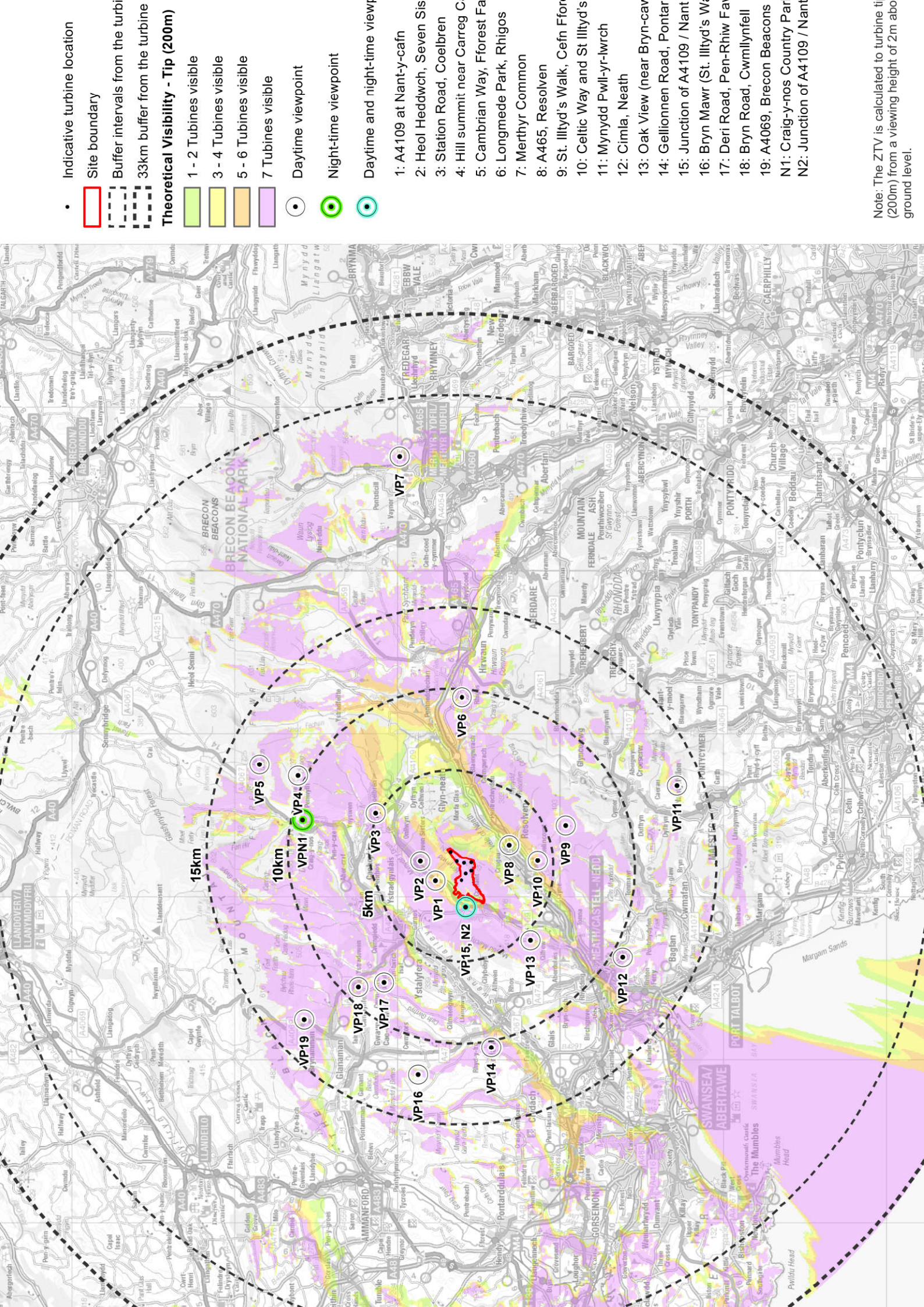


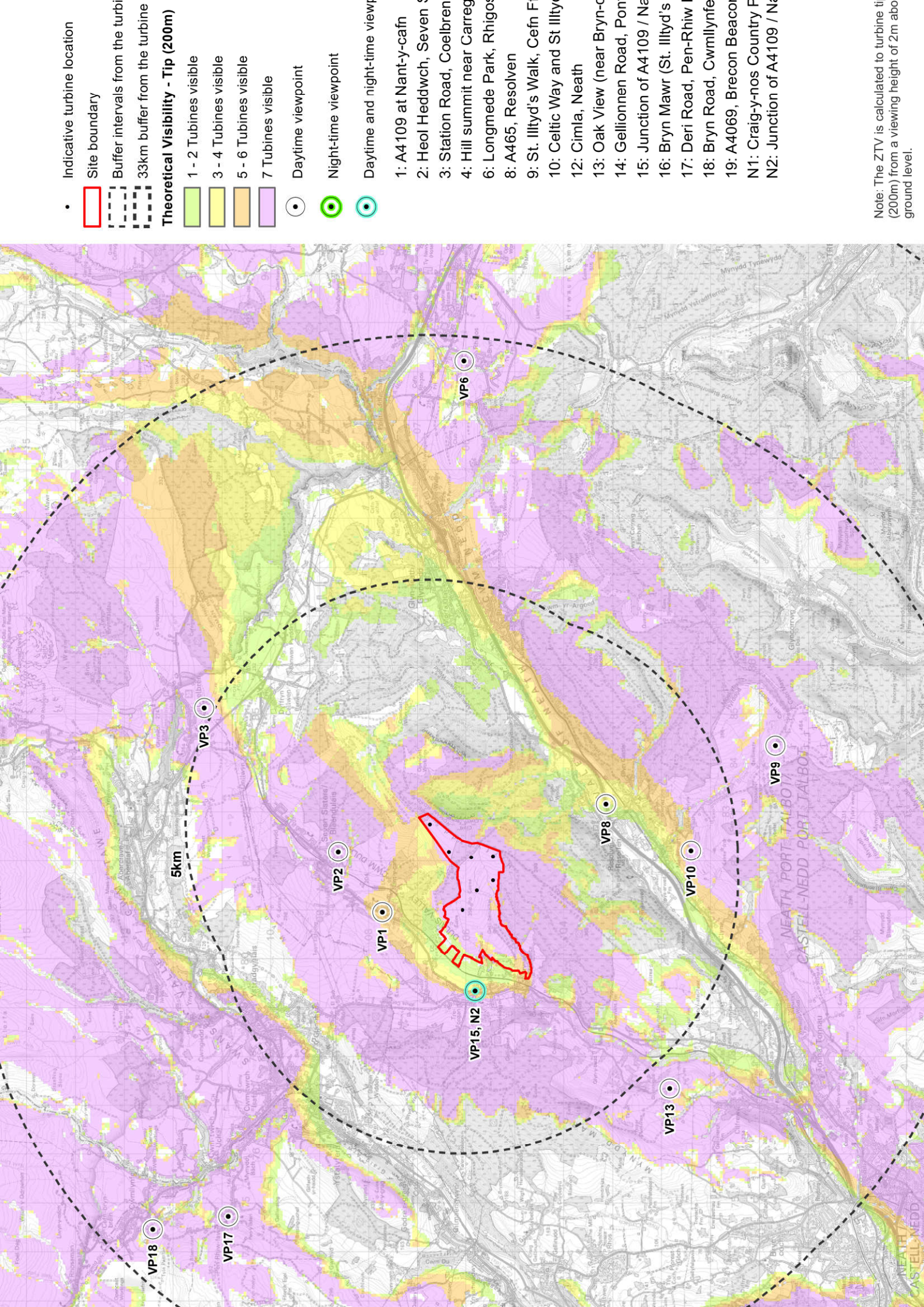
- Indicative turbine location
- Site boundary
- Buffer intervals from the turbine
- 15km buffer from the turbine
- Local Authority boundary

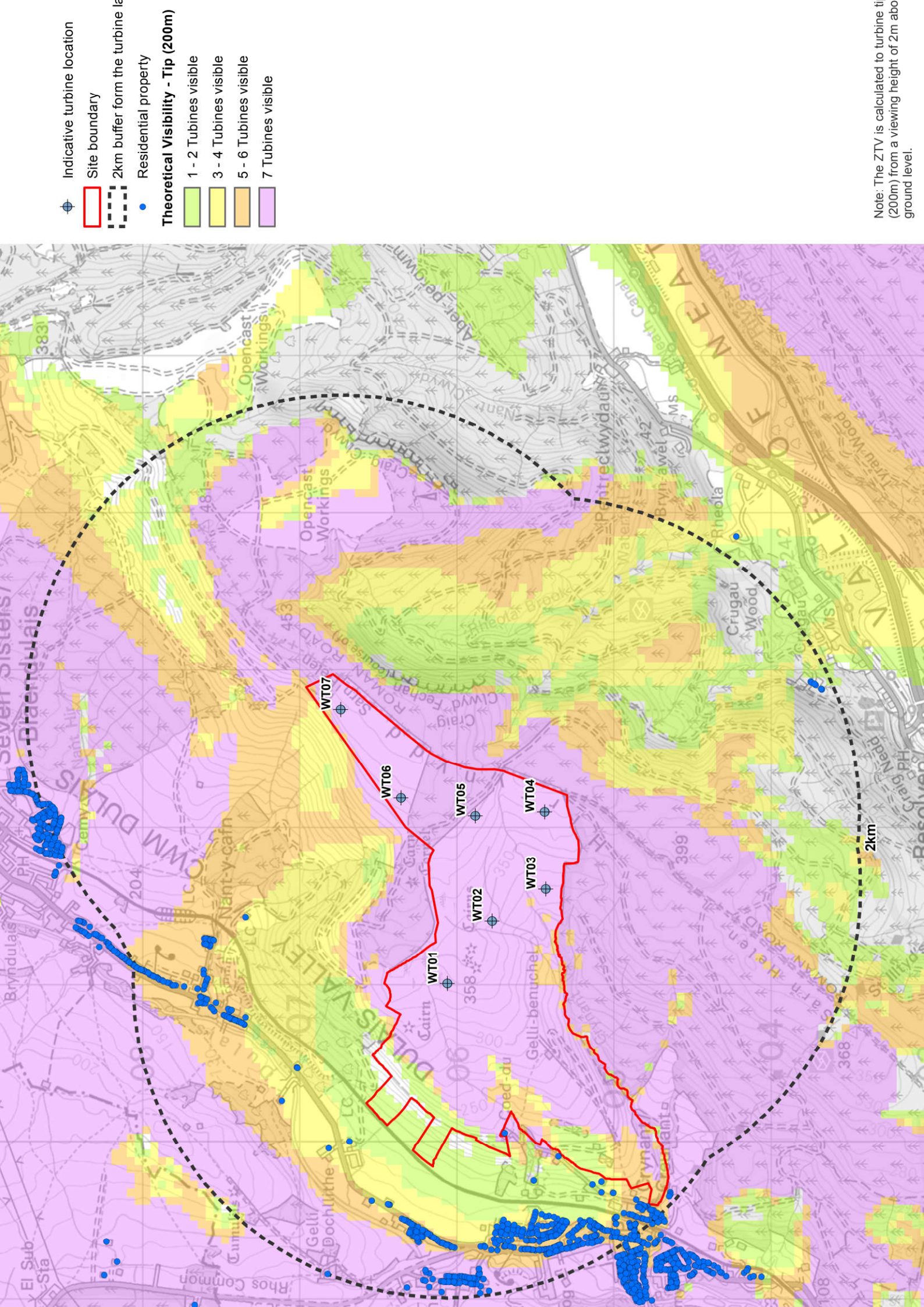
Theoretical Visibility - Hub (119m)

- 1 - 2 Turbines visible
- 3 - 4 Turbines visible
- 5 - 6 Turbines visible
- 7 Turbines visible

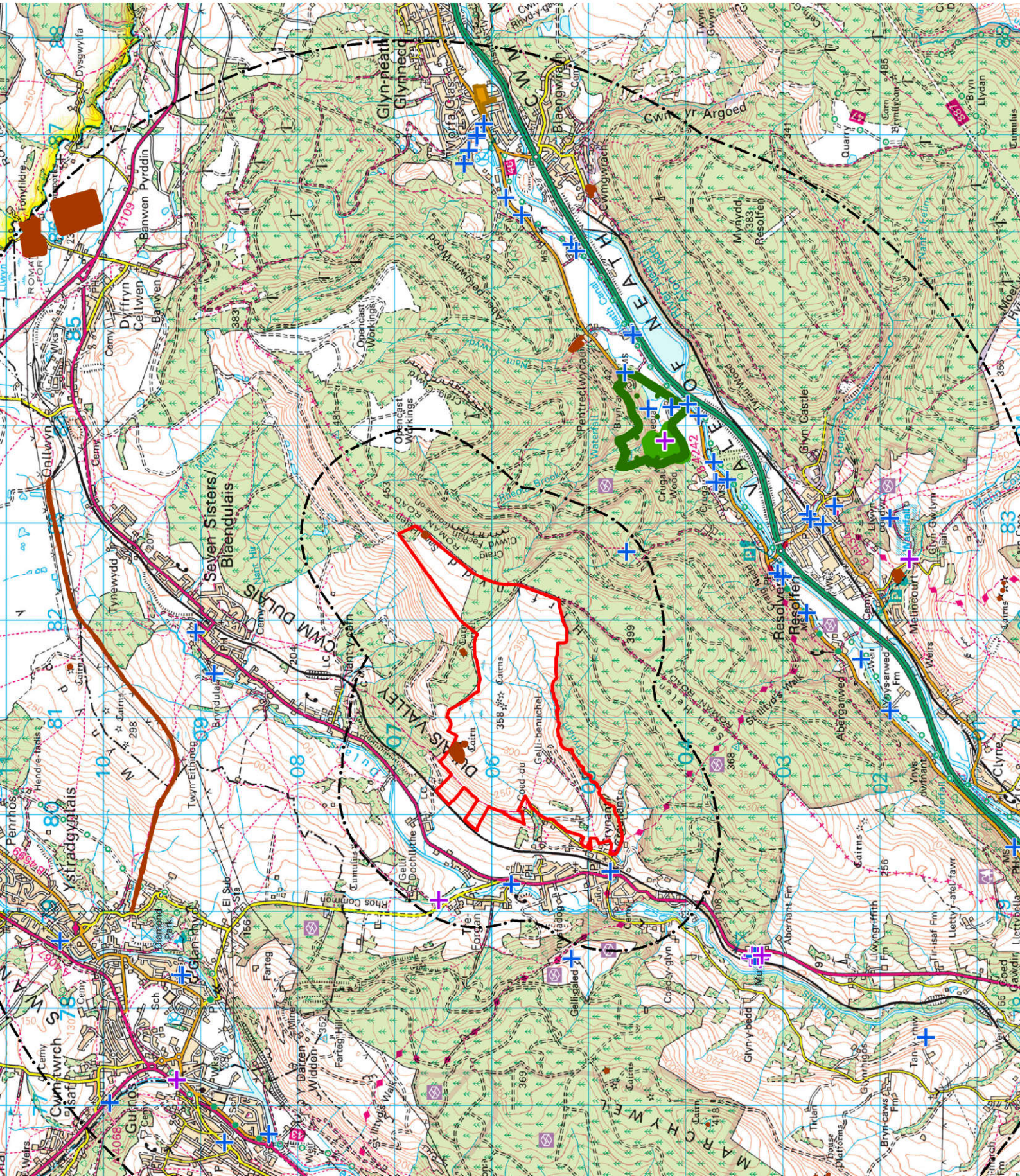
Note: The ZTV is calculated to turbine tip height (119m) from a viewing height of 2m above ground level.



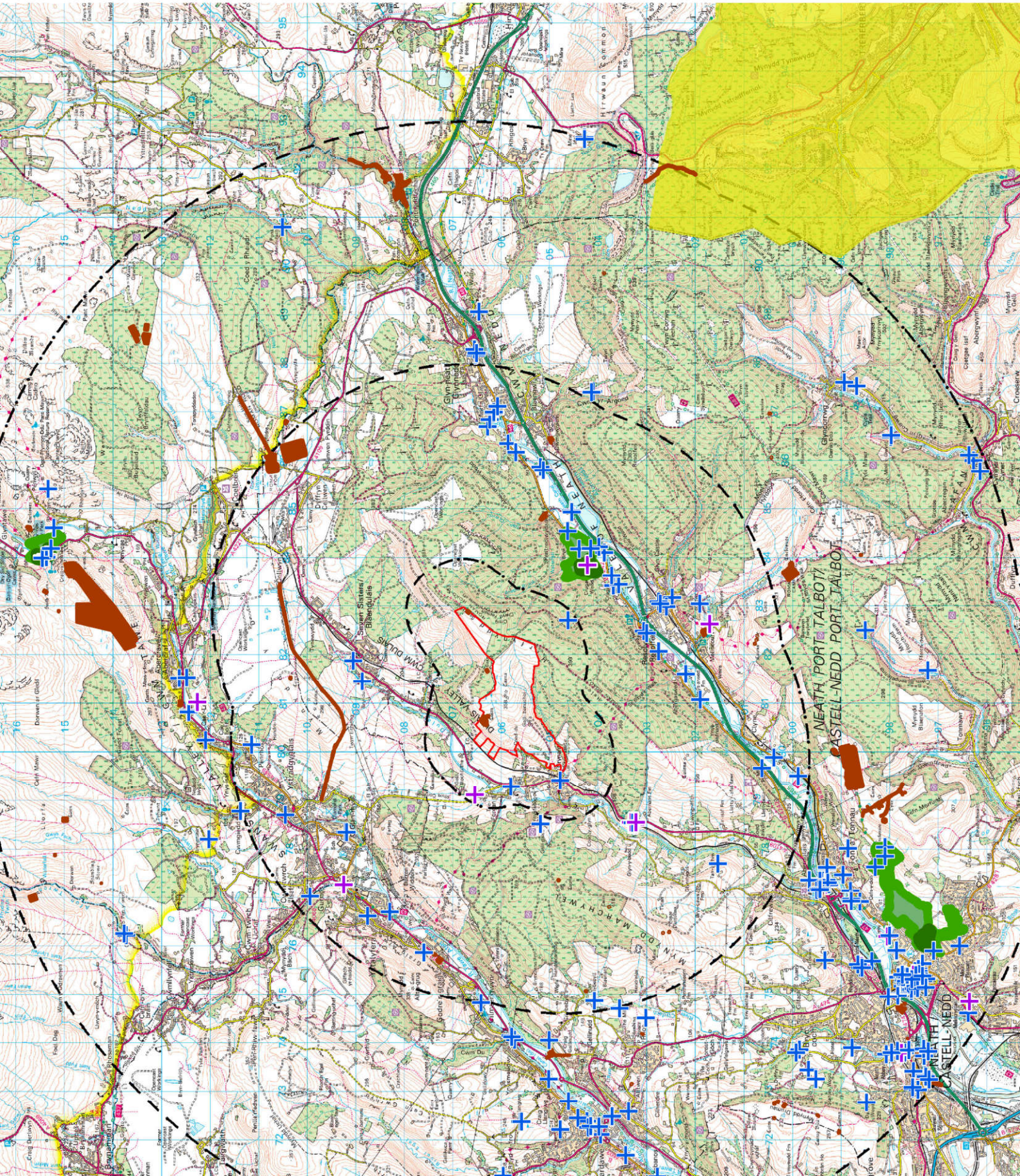




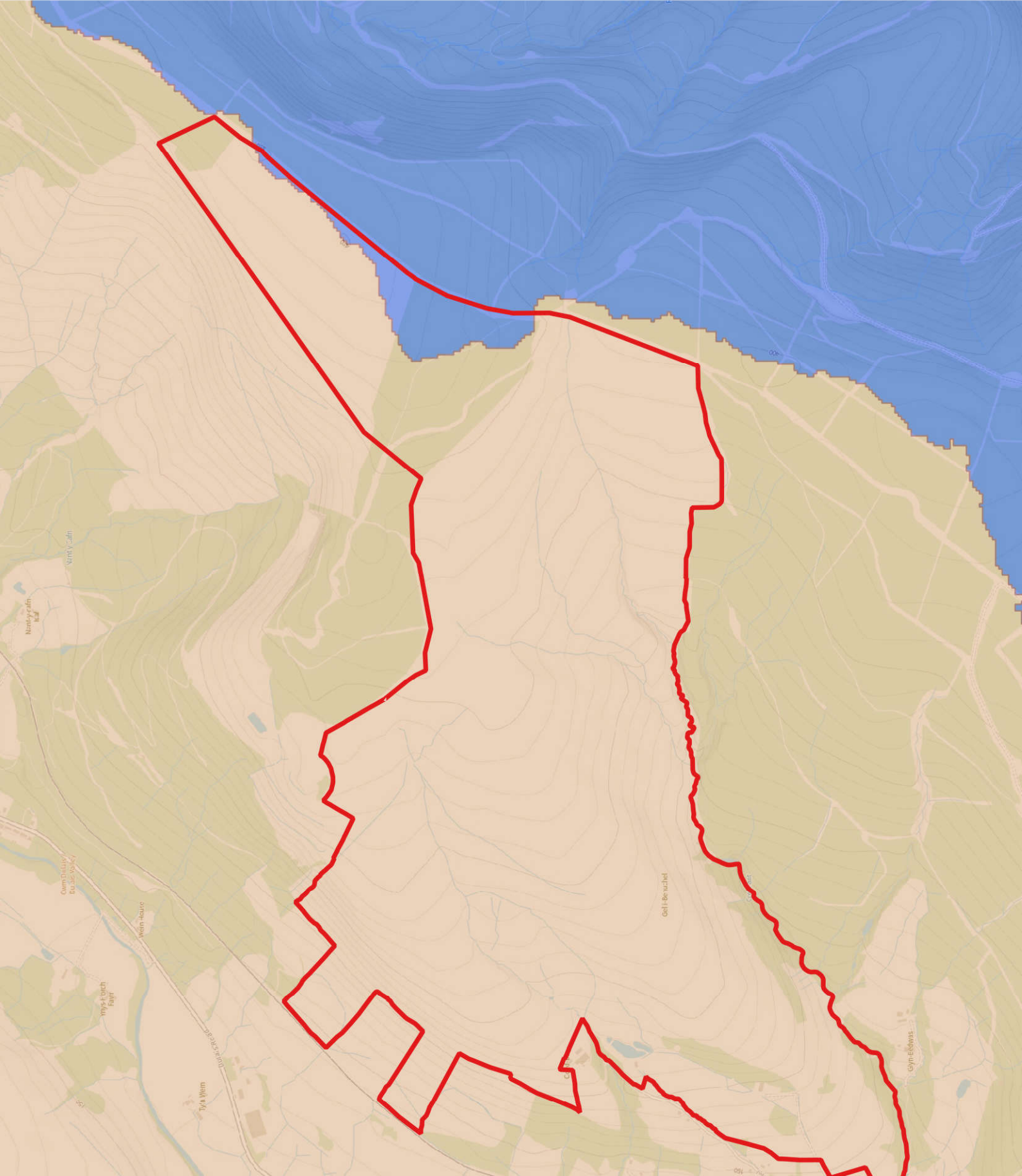
- Grade II* Listed Building
- Grade II Listed Building
- Scheduled Monument
- Conservation Area
- Registered Park
- Garden
- Site
- 1 km Buffer
- 5 km Buffer



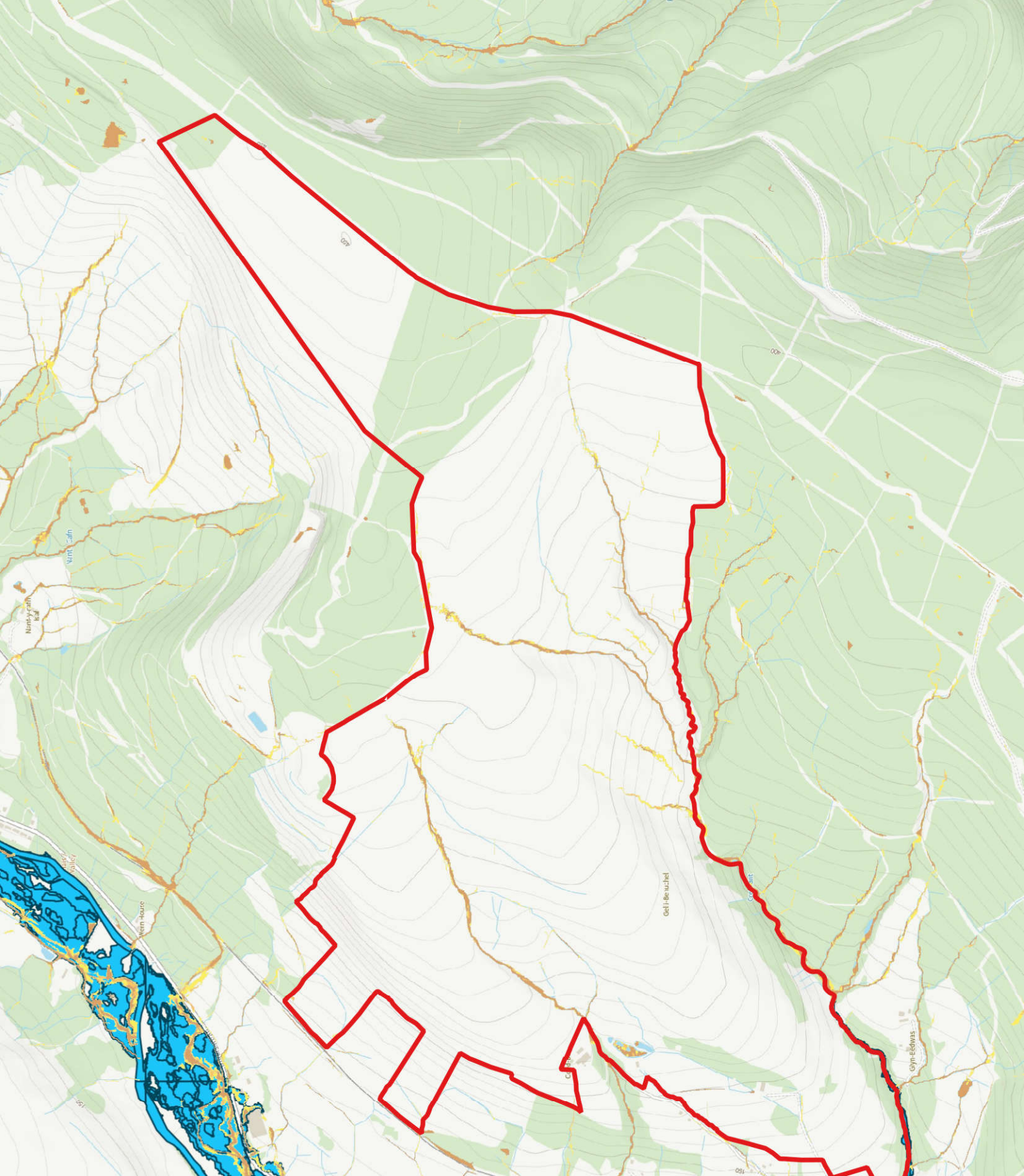
- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building
- Scheduled Monument
- Registered Park
- Garden
- Registered Historic Landscape
- Site
- 1 km Buffer
- 5 km Buffer
- 10 km Buffer



- Site Boundary
- Dulais - headwater to confl
- Neath - confluence with Ne



- Site Boundary
- Fluvial Flood Risk
- Surface Water Extent (3.3%)
- Surface Water Extent (1% AEP)
- Surface Water Extent (0.1% AEP)



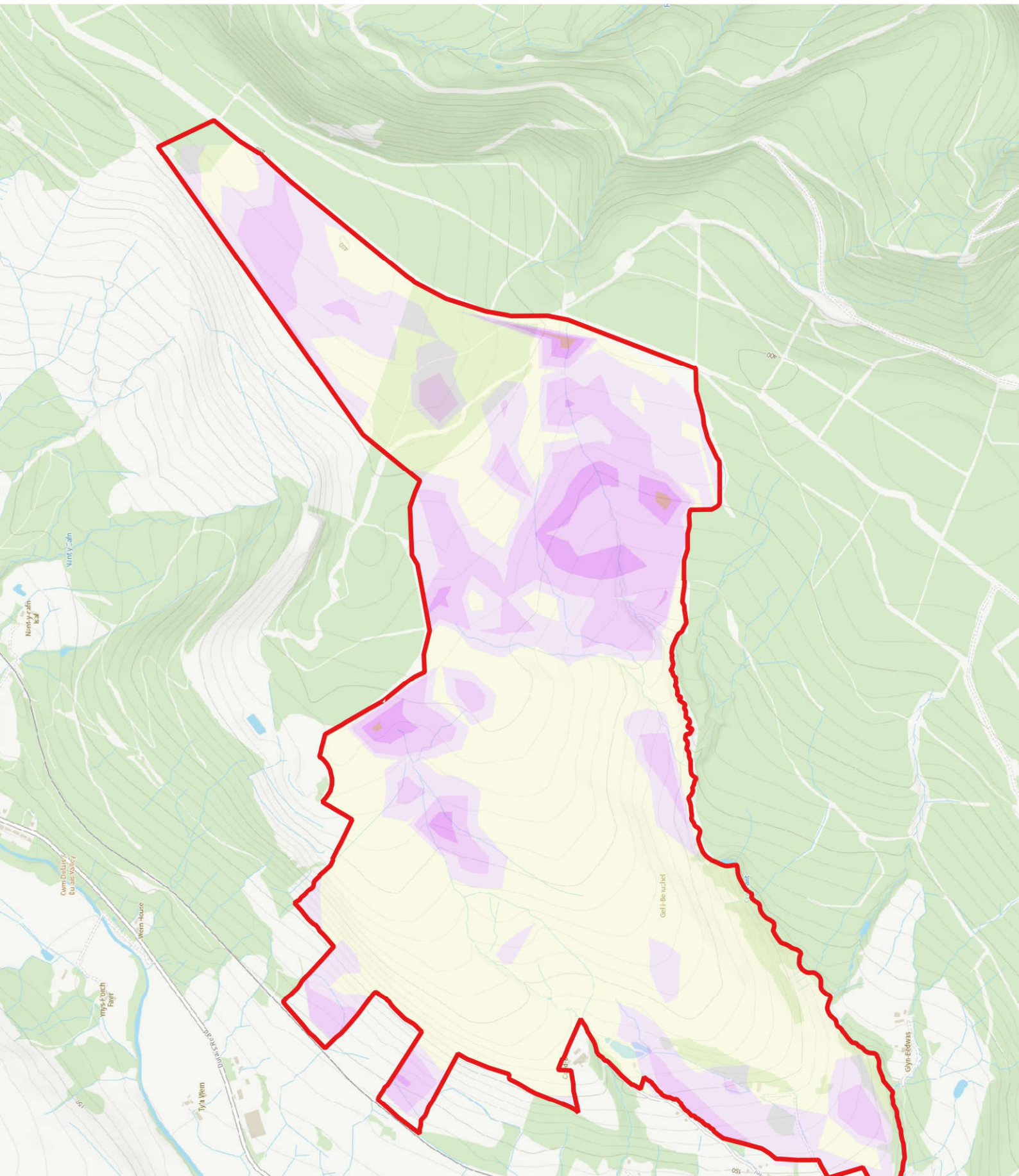
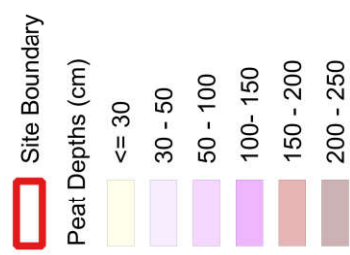


Figure 8.1: Designated Sites

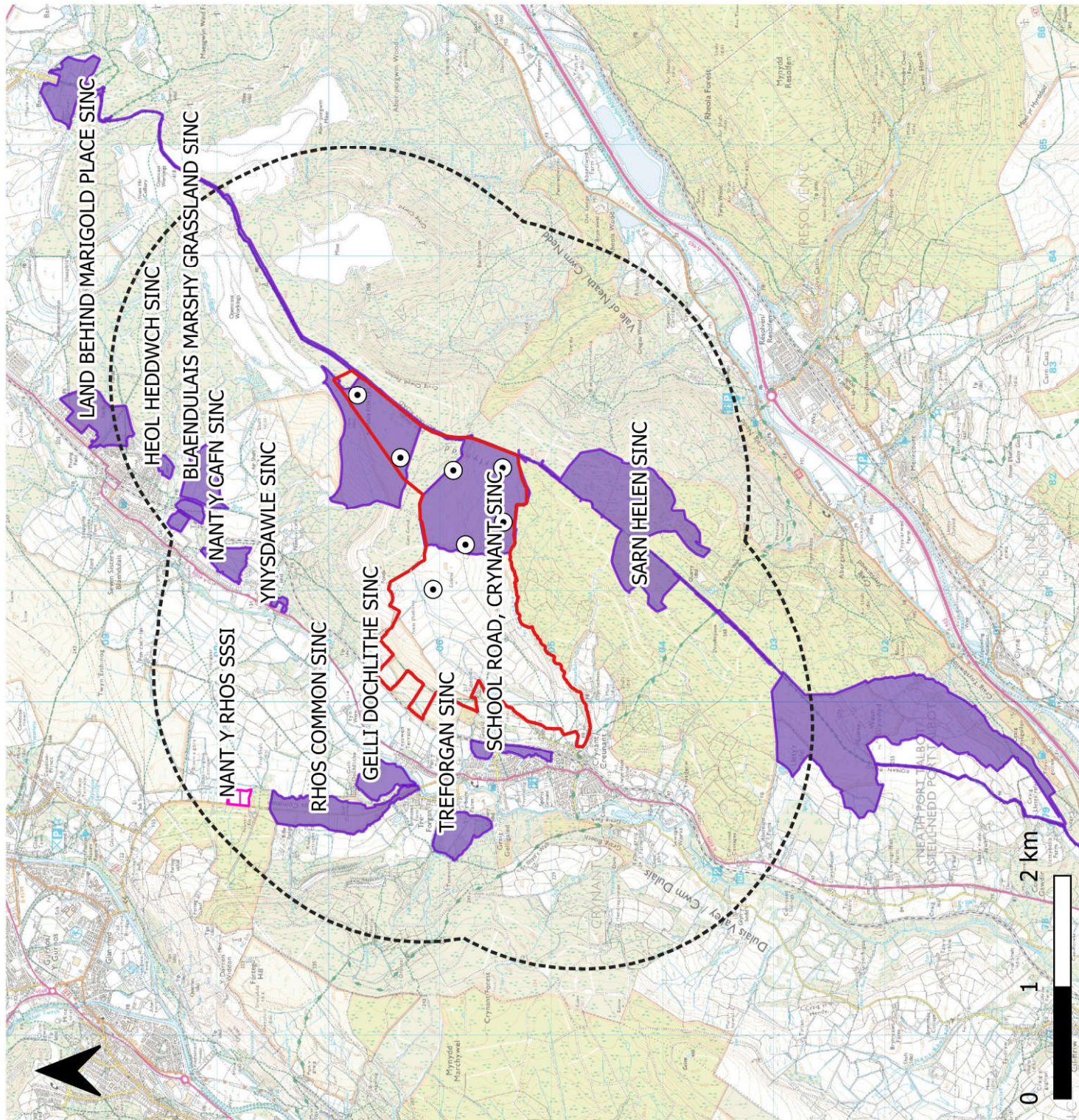
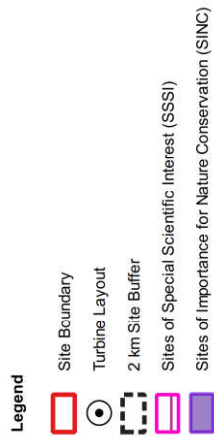


Figure 8.2: Habitats

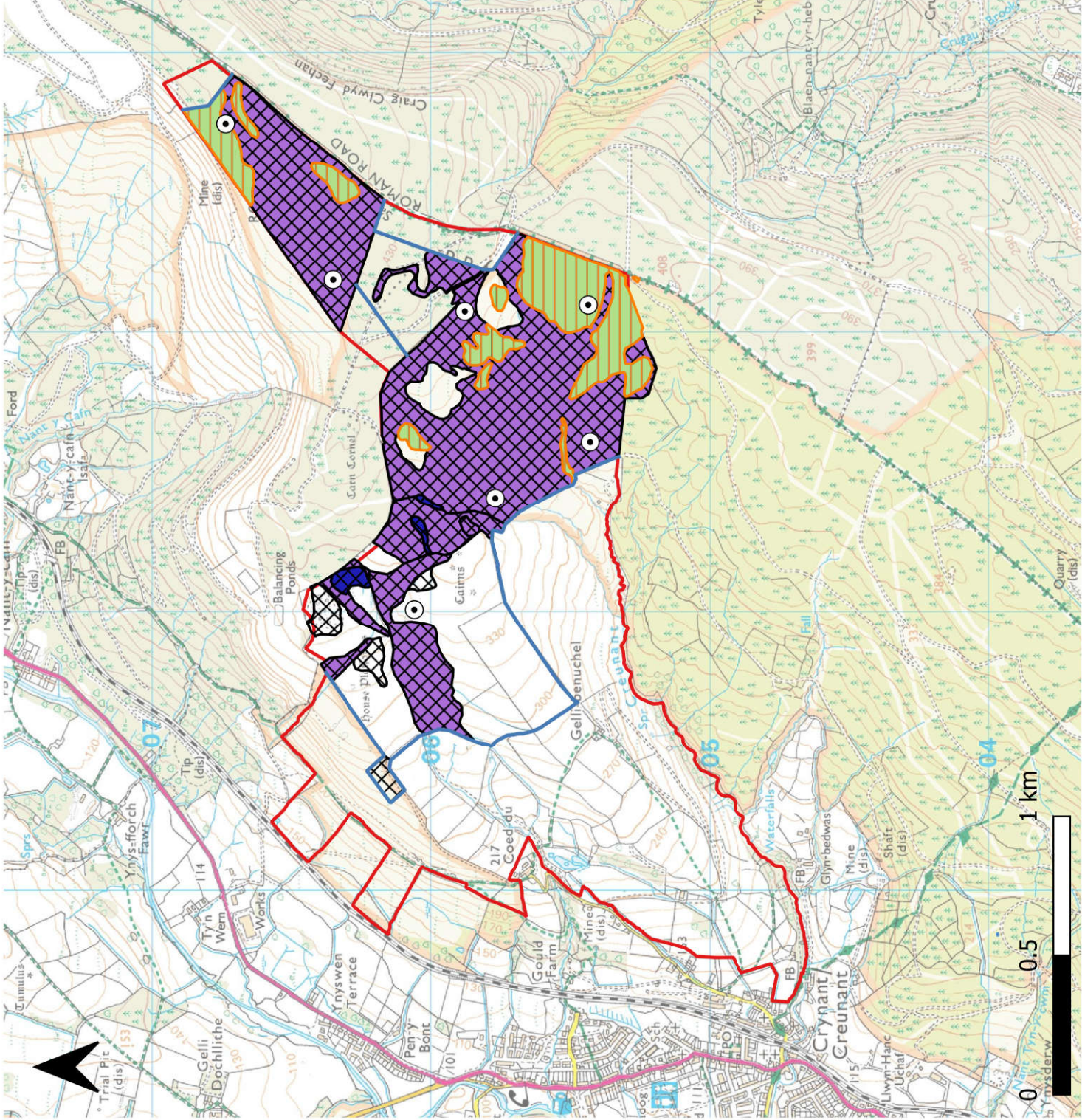
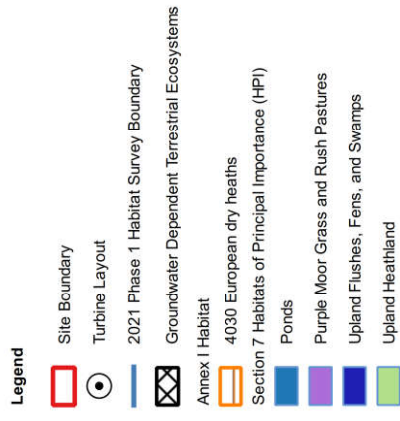


Figure 8.3: Protected Species Surveys

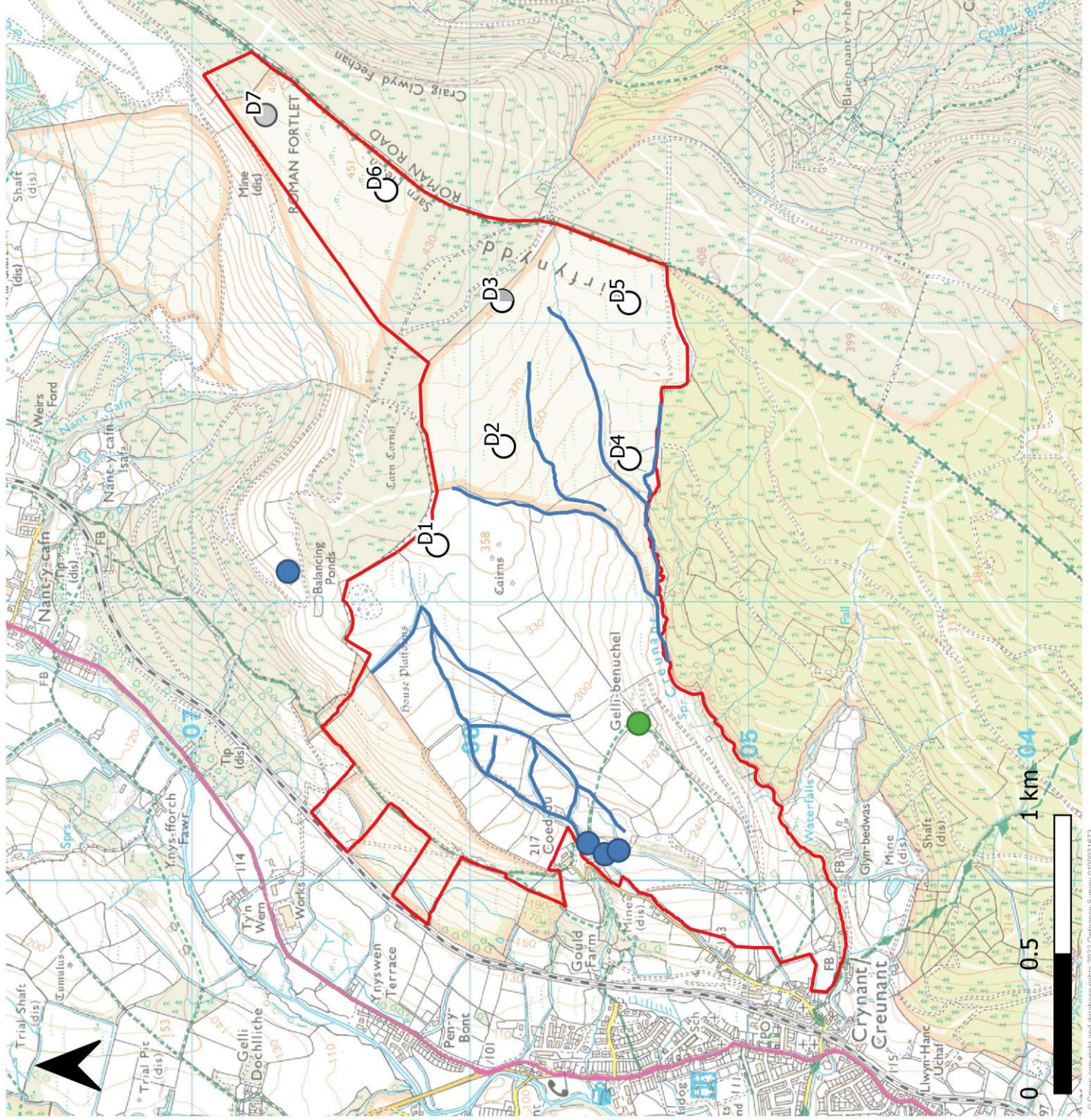


Figure 9.1: VP Locations

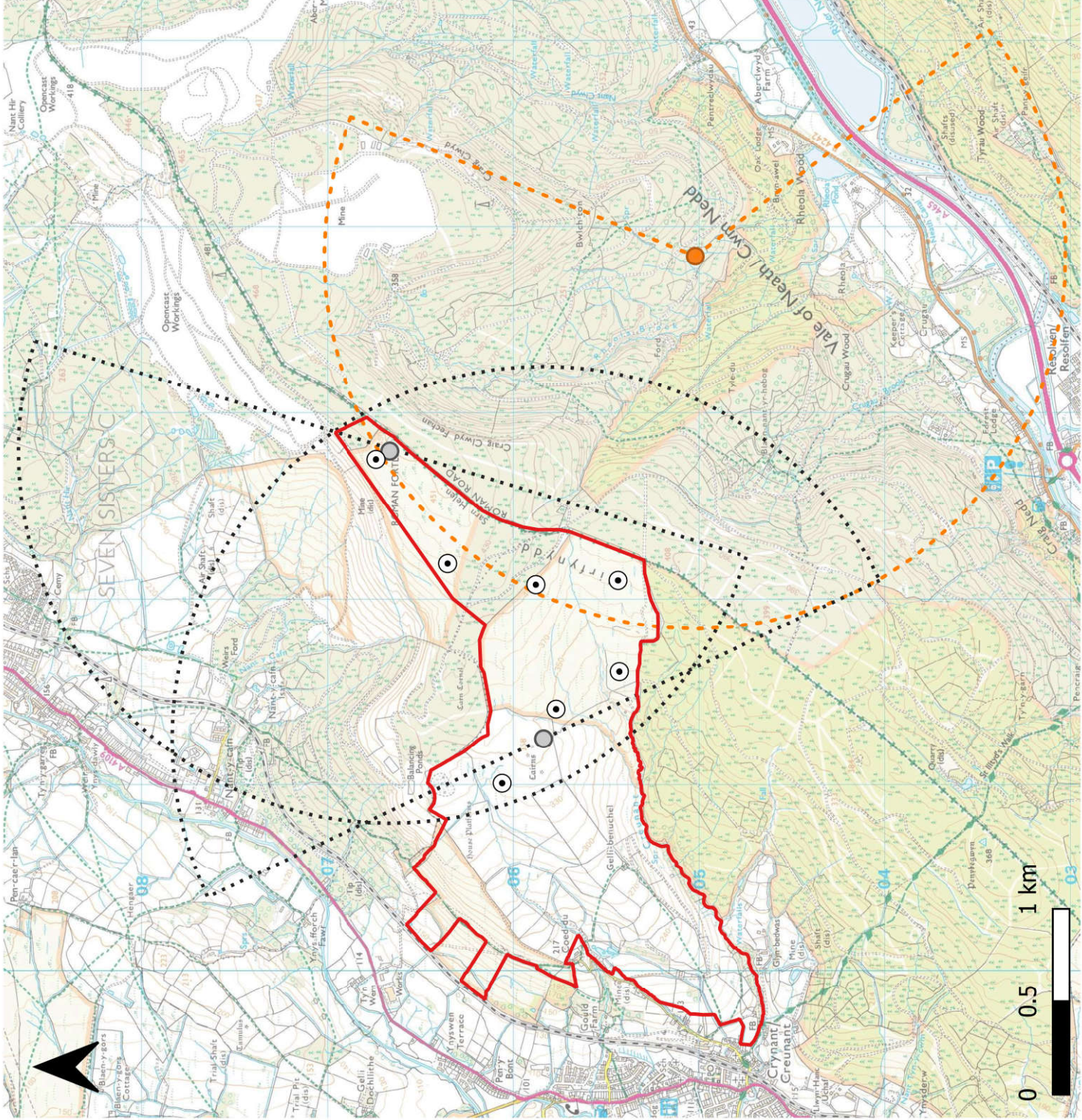
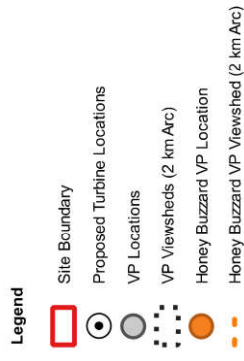
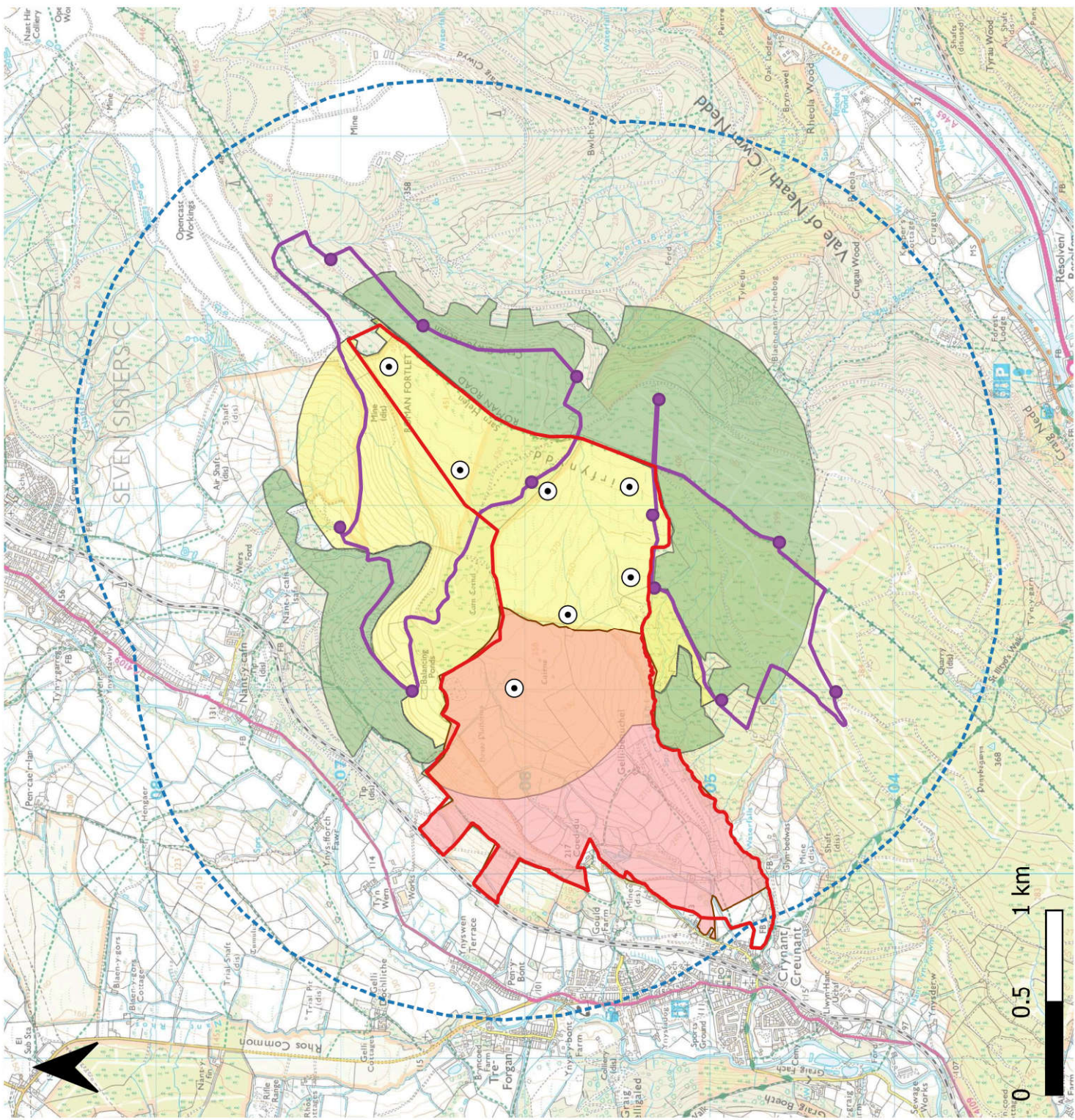


Figure 9.2: Bird Survey Area

- Legend**
- Site Boundary
 - Proposed Turbine Locations
 - Nighthjar Transect Route and Listening Points
 - Goshawk Search Area
 - Breeding Wader Survey Area 2021
 - Breeding Bird Survey Area 2022
 - Breeding Raptor Survey Area



- Site boundary
- Local Authority boundary
- Route from Swansea Docks

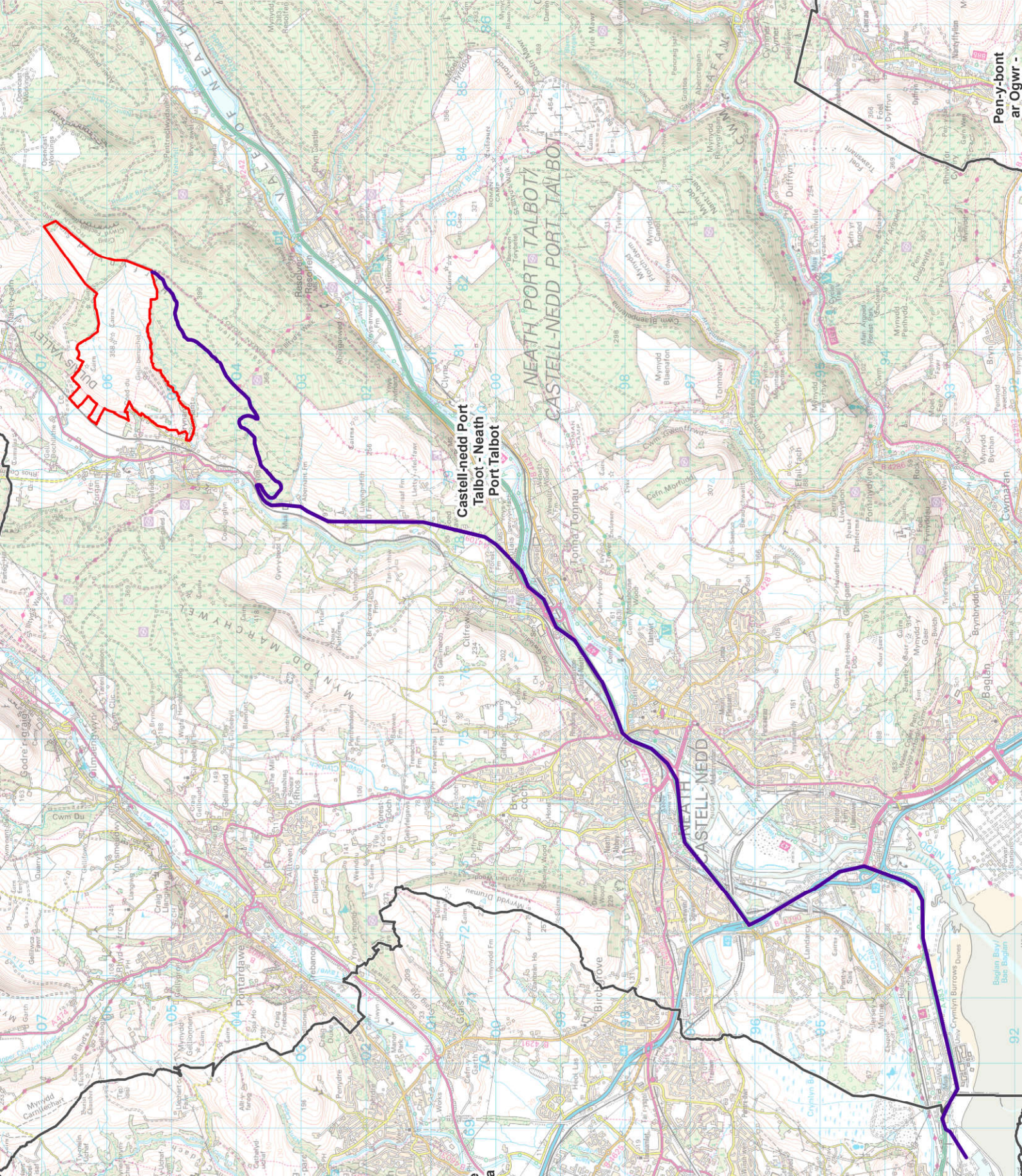


Figure 13.1 Airspace in the Vicinity of the Site (CAA 1:500K Aviation Chart Extract showing airspace up to 19500ft)



Figure 14.1 shows that the Site is located to the north-west of Cardiff Airport shown as a small blue circle within a light blue shaded area with thick blue lines denoting the Control Zone (CTR) and Control Area (CTA). Above the site the thick purple lines denote the boundaries of Class A Controlled Airspace (an airway) designated as the Strumble CTA running roughly east/west with a base of FL95 (approximately 9500ft). To the east of the Site is the Rhigos gliding site marked as a blue circle with a 'G' in the centre and to the south-west, Swansea Airport is shown with a blue circle with a parachute symbol designating a parachute drop zone. The chart extract also shows a number of wind turbine symbols, indicating the location of operational wind turbines.