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MINING AND MINERAL PROCESSING
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CONVATEC LIMITED

CONVATEC GREEN MANUFACTURING HUB, RHYMNEY

SCOPING REQUEST REPORT

NOVEMBER 2023

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SCOPING REQUEST REPORT

NOVEMBER 2023

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GLOSSARY OF ABBREVIATIONS

ALC	Agricultural Land Classification
AMAAA	Ancient Monuments and Archaeological Areas Act
AOI	Area of Influence
ASIDOHL	Assessment of the Significance of the Impact of Development on Historic Landscape
ATCT	Air Traffic Control Tower
bgl	Below Ground Level
BGS	British Geological Society
BMV	Best and Most Versatile
BPM	Best Practicable Means
CAA	Civil Aviation Authority
CAST	Combined Aerodrome Safeguarding Team
CCBC	Caerphilly County Borough Council
CEMP	Construction Environmental Management Plan
CIfA	Chartered Institute for Archaeologists
CLVIA	Cumulative Landscape and Visual Impact Assessment
CMRA	Coal Mining Risk Assessment
CO_2	Carbon Dioxide
CRM	Collision Risk Mortality
CTMP	Construction Traffic Management Plan

DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DNS	Development of National Significance
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESDAL	Electronic Service Delivery for Abnormal Loads
FAA	Federal Aviation Administration
FTE	Full-time Employment
GGAT	Glamorgan-Gwent Archaeological Trust
GHG	Greenhouse Gas
GIS	Geographical Information System
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GVA	Gross Value Added
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HIA	Health Impact Assessment
IAIA	International Association for Impact Assessment
IEMA	Institute Environmental Management and Assessment
IFC	International Finance Corporation
IPCC	Intergovernmental Panel on Climate Change
JNCC	Joint Nature Conservation Committee
km	kilometre
LBAP	Local Biodiversity Action Plan
LDP	Local Development Plan
LEP	Local Enterprise Partnership
LiDAR	Light Detection and Ranging
LLP	Limited Liability Partnership
LPA	Local Planning Authority
LPP	Local Planning Policy
LSOA	Lower layer Super Output Area
LVIA	Landscape and Visual Impact Assessment
MBBS	Moorland Breeding Bird Survey
MW	Megawatt
NBN	National Biodiversity Network

NCN	National Cycle Network
NE	Northeast
NGR	National Grid Reference
NLCA	National Landscape Character Area
NPS	National Policy Statement
NRW	Natural Resources Wales
NTS	Non-Technical Summary
NVC	National Vegetation Classification
NVZ	Nitrate Vulnerable Zone
OS	Ordnance Survey
PAG	Procedure and Advice Guidance
PEDW	Planning and Environment Decisions Wales
P(LBCA)	Planning (Listed Building and Conservation Areas)
PPE	Personal Protective Equipment
PPW	Planning Policy Wales
PRA	Preliminary (Bat) Roost Appraisal
PRoW	Public Rights of Way
PSED	Public Sector Equality Duty
PV	Photovoltaic
RCP	Representative Concentration Pathway
RD	Rotor Diameter
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation
SAGHT	Solar Glare Hazard Analysis Tool
SE	Southeast
SEP	Stakeholder Engagement Plan
SEPA	Scottish Environment Protection Agency
SEWBReC	South East Wales Biodiversity Records Centre
SIA	Social Impact Assessment
SNH	Scottish Natural Heritage (now NatureScot)
SPG	Supplementary Planning Guidance
SSSI	Site of Special Scientific Interest
TA	Transport Assessment
TAN	Technical Advice Note
TBC	To Be Confirmed
UHOVI	Universities of the Heads of the Valleys Institute
UKCP	United Kingdom Climate Projections

UNECE	United Nations Economic Commission Europe's
UNGP	United Nations Guiding Principles on Business and Human Rights
UXO	Unexploded Ordnance
VP	Vantage Point
WHO	World Health Organisation
WIMD	Welsh Index of Multiple Deprivation
ZTV	Zone of Theoretical Visibility

1 INTRODUCTION

1.1.1 This Scoping Report has been prepared by Wardell Armstrong LLP on behalf of Convatec Limited (hereafter referred to as the 'Applicant') in support of a request for a formal Scoping Opinion under the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (the 'EIA Regulations'), regarding the proposed development of a combined wind and solar development known as The Convatec Green Manufacturing Hub (the 'Proposed Development') on land to the south west of Heads of the Valley Industrial Park (the 'Site'), Rhymney, Caerphilly (Figure 1.1).

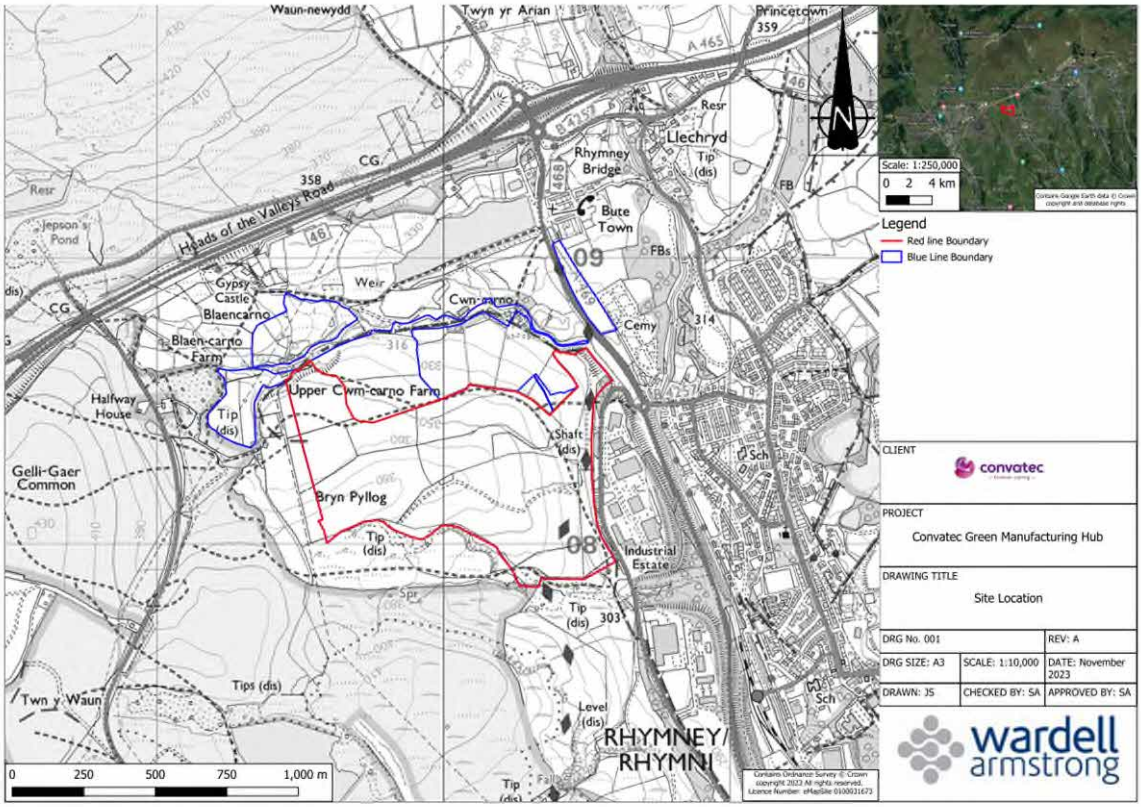

Figure 1.1 Site Location Plan

1.1.2 The Proposed Development would comprise of three wind turbines, expected to be approximately 150m to tip, with an installed capacity of approximately 15MW, along with a solar farm of approximately 5MW installed capacity. The Proposed Development would be connected via private wire to Convatec Rhymney's manufacturing facility, with any excess to be exported locally.

1.1.3 The total installed capacity would be approximately 20MW, which exceeds the 10MW threshold for Local Authority decisions in Wales. As such, the proposal is considered

to be a 'Development of National Significance' (DNS), requiring submission to Planning and Environment Decisions Wales (PEDW) for determination by Welsh Ministers.

1.1.4 The Proposed Development falls under Schedule 2(3(i)) of the EIA Regulations, "installations for the harnessing of wind power for energy production (wind farms)" and meets the applicable thresholds and criteria given the size of the development. A Schedule 2 development constitutes EIA development if it is "likely to have significant effects on the environment by virtue of factors such as its nature, size or location".

1.1.5 Given the scale and location of the Proposed Development, the Applicant will undertake an EIA to assess potentially significant environmental effects. This Scoping Report sets out the proposed scope of the EIA to be undertaken in respect of the Proposed Development. As required by Regulation 14 of the EIA Regulations, the Scoping Report includes the following information:

- a plan sufficient to identify the land (Figure BR10167/001);
- a brief description of the nature and purpose of the development, including its location and technical capacity (Chapter 2); and
- its likely significant effects on the environment (considered within Chapters 5 to 18).

1.1.6 This report also sets out the proposed methodologies to be used in assessing potentially significant environmental effects and, where relevant, potential mitigation measures that may be implemented.

2 SITE AND PROJECT DESCRIPTION

2.1 Site Location and Description

2.1.1 The Site lies on the east/south-east facing hillside adjacent to the west boundary of the Heads of the Valley Industrial Estate in the town of Rhymney, Caerphilly, South Wales. The Site currently consists of several fields of improved grassland, bound by a mix of scrub, hedgerows and open/featureless boundaries.

2.1.2 The Site is broadly bound by the Nant Carno stream, local roads with scattered properties and further improved grassland to the north, the Heads of the Valley Industrial Estate and the A469 to the east, further unimproved grassland and disused tips to the south and an un-named local road, unimproved grassland and disused tips to the west.

2.1.3 The A465 'Heads of the Valleys' Road is located c. 200m to the north of the Site. The Biffa Trecatti Landfill site and opencast workings are located c. 800m and c. 1.4km to the south-west, respectively. An overhead line and pylons pass through the western parts of the site on a broadly south-west to north-east direction.

2.1.4 The nearest bodies of standing water are c. 100m to the north and c. 600m to the south.

2.1.5 The town of Rhymney lies c. 230m to the east on the opposite side of the A469. The town of Merthyr Tydfil is located c. 1.86km to the west, and the village of Fochriw is located c. 1.96km to the south.

2.1.6 There are several existing wind turbines within the area, the nearest being three 110m tip high wind turbines at Pen Bryn Oer 1.6km to the east, a single 77m tip high turbine at Pengarnddu Industrial Estate 2.1km to the north-west, and a single 74m tip high wind turbine at Tafarnaubach Industrial Estate, Tredegar 2.4km to the north-east.

2.1.7 There is one existing solar farm within the area, c. 2.4km to the south-west.

2.1.8 The site is within National Landscape Character Area (NLCA) 37: South Wales Valleys.

2.1.9 This NLCA is described as:

*"*Many deep, urbanised valleys dissect an extensive upland area. Combined with industrial heritage and the distinct identity of its people, the South Wales Valleys provide some of Wales' most widely known and iconic national images. Extensive ribbon development fills many valley bottoms and lower slopes. Their urban and

industrial character is juxtaposed with dramatic upland settings with steep hillsides, open moors or forests. Networks of railways and roads connect valley settlements. Topography constrains passage between valleys, and there are only a limited number of high passes between valleys. The noise and business of many valleys contrast with the relatively remote and wild qualities of adjacent hill plateaux".

2.1.10 Rhymney is built around a rich heritage of heavy industry and mining, with the establishment of the Union Ironworks in 1801 using local coking coal, iron ore and limestone. From the mid-19th century, steam coal pits were sunk to the south of the town.

2.1.11 There are several recreational routes within the site and surrounding area. Footpath RHYM/FP96/1, RHYM/FP95/5 and RHYM/FP91/1 are the main footpaths that pass through the site in a broadly east to west direction. There are a number of other Public Rights of Way (PRoW) within the 45km study area, forming a comprehensive network of public access throughout the Heads of the Valley Area.

2.1.12 The nearest residential property is Cwm Carno Farm, 530m north of the site (owned by the project Landowner). Further residential properties are located 640m east of the site, on the edge of the settlement of Rhymney, and 650m northwest of the site at Blaencarno Farm.

2.2 Project Description

2.2.1 The Proposed Development would comprise of three wind turbines, expected to be a maximum of 150m to tip, with an installed capacity of approximately 15MW, along with a solar farm of approximately 5MW installed capacity. The Proposed Development would be connected via private wire to Convatec Rhymney's manufacturing facility, with any excess to be exported locally.

2.2.2 The main elements of the Proposed Development are as follows:

- Three wind turbines of approximately 150m tip height, with a combined installed capacity of approximately 15MW, each with external transformers, foundations, crane hardstandings and storage areas
- Ground mounted solar photovoltaic panels with an installed capacity of approximately 5MW
- Electrical substation and control building
- Access tracks

- Underground power cables to link the turbines and solar array to the substation and Convatec's manufacturing facility
- Steel tower anemometer mast for monitoring wind speeds and turbine performance
- Temporary construction and storage compounds

2.3 Wind Turbines

2.3.1 The scoping exercise has been undertaken on the basis of a turbine of the horizontal axis type with a rotor consisting of three blades. The blades are mounted to the wind turbine nacelle. The approximate height to vertical blade tip will be 150m but a definitive maximum height will be established for the formal application. Accordingly, the landscape and visual assessment scoping exercise has been undertaken on the basis of a turbine approximately 92m to hub height and approximately 150m to blade tip. The final choice of turbine, which will be selected through a competitive tendering process will be required to be within approved size parameters and comply with or perform better than the noise performance characteristics of the turbine on which modelling will be based.

2.3.2 Each turbine requires its own transformer to step up the voltage to comply with the requirements of the local electricity grid. Transformers may be internally housed within turbine nacelle or towers, or housed externally within a cabinet adjacent to each tower base. Cabinets may also be required for external switchgear, although only a single cabinet will be required for each proposed wind turbine. If external cabinets are used, they will be located close to towers and coloured appropriately for the site and would be c. 3m high, 3m wide and 2.5m long. Due to their relatively small size they are generally indistinct from the tower base unless viewed close up or in silhouette against the skyline at greater distances.

2.3.3 Typically, the turbines will be supported on reinforced concrete foundations, which can be square, circular or octagonal in plan and will be of reinforced concrete construction. Rock anchors and piled foundations may be considered dependent upon ground conditions. For the size of turbine proposed, the foundation will be approximately 25m x 25m. The overall depth to the underside of the foundation will be approximately 4m. The final choice of foundation design will depend on the size of turbine, the magnitude of the loads and the ground conditions on site, but the configuration will be optimised to ensure the minimum volume of concrete is poured. Foundations will be constructed by first excavating the ground using conventional

construction equipment. The excavated topsoil and subsoil will be stockpiled separately for use in later backfill and reinstatement. If drainage is required, typically a French drain will be installed around the edge of the foundation.

2.3.4 A permanent hardstanding area approximately 40m x 30m will be located adjacent to each turbine foundation to accommodate the cranes required for construction and to provide laydown space for each turbine.

2.4 Ground Mounted Solar Photovoltaic Panels

2.4.1 The solar PV panels would be located to the south of the proposed wind turbines, orientated in an east-west direction. They would be tilted southwards at an angle of approximately 25 degrees. The panels would be fixed to metal framing with the lower edge of the panels raised approximately 0.8 m, within a range of 0.5m to 1.2m, from the ground and the higher edge around 3m off the ground. The frame would be attached to posts inserted around 1.5m into the ground.

2.4.2 All cabling associated with the solar PV panels would be underground within trenches, connecting to the onsite substation and to the Convatec manufacturing facility via private wire. Additionally, fencing of approximately 2m height and close circuit television (CCTV) would be required surrounding the panels for health and safety and security purposes.

2.5 Development Layout

2.5.1 The Indicative Development layout is shown on Figure 2.1below.

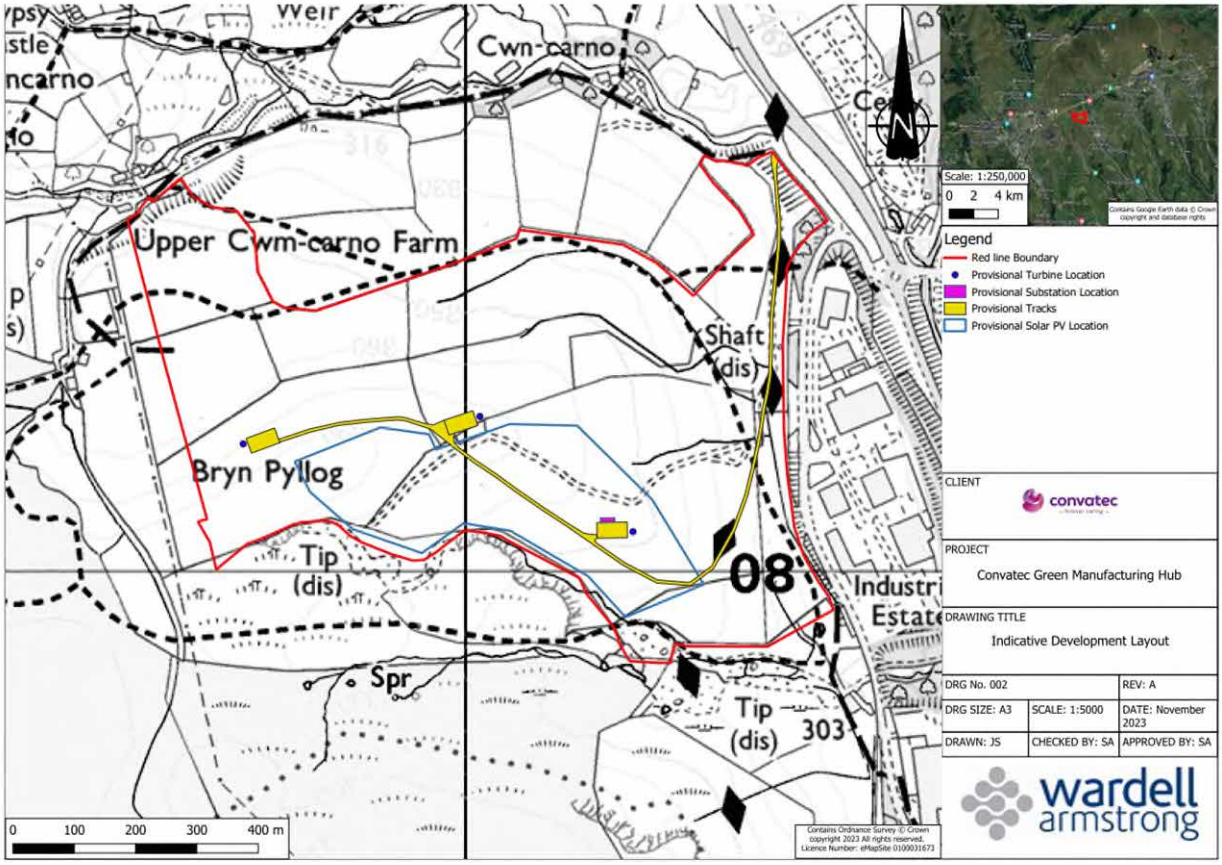

Figure 2.1 Indicative Development Layout

2.6 Meteorological Mast

2.6.1 The wind turbines themselves would be fitted with anemometry equipment which would be capable of recording the wind regime at the site. In addition, a temporary onsite meteorological mast may also be erected prior to construction. This is likely to consist of a guyed mast of tubular steel construction. The location of the meteorological mast remains to be determined but it would be sited to provide best information relating to the Site's wind regime and any turbulence effects that might be experienced. Once the Proposed Development becomes operational, the temporary mast would be removed.

2.7 Abnormal Load Access Routes

2.7.1 This Scoping Request Report is prepared on the assumption that the Industrial Estate access road will provide a connection to the site. For turbine components and electrical and other equipment access to the Proposed Development will be via the Industrial Estate access road, the A469 and then on to the A465.

2.8 Electrical Substation

2.8.1 The proposed wind turbines would generate electricity at typically up to 1,000 Volts. The electricity would then be transformed to either 11,000 Volts (11kV) or 33,000 Volts (33kV) via a step-up transformer within or located immediately adjacent to the tower of each turbine, depending on the final turbine model used. The transformers would be linked to an on-site substation via high voltage underground cables placed in trenches which would generally follow the route of the on-site tracks. In addition, where appropriate, the transformers would connect to the substation via underground cables across open ground with electrical marker posts used to identify their locations.

2.9 Onsite Access Tracks and Cabling

2.9.1 The Proposed Development would be served by new on-site access tracks to enable construction and maintenance once operational. These tracks are anticipated to have a maximum running width of approximately 4.5 m with widening at bends and internal passing places. They would follow the path of existing tracks wherever possible.

2.9.2 It is anticipated that electric cabling connecting the turbines, ground mounted solar array and the control building would be laid in trenches running alongside the access tracks. The layout of the tracks would be determined by the final turbine and solar panel positions and informed by consideration of relevant environmental receptors and effects, such as on-site ecology and ground conditions.

3 EIA PROCESS AND ASSESSMENT METHODOLOGY

3.1 Introduction

3.1.1 The EIA will be undertaken in accordance with the EIA Regulations, having regard to Schedule 4 which sets out the information for inclusion within an Environmental Statement (ES). Paragraph 5 of Schedule 4 states that the description of likely significant effects in the EIA should cover *"*direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development*"* on the environment.

3.2 Proposed Scope of Assessment

3.2.1 Regulation 4(2) outlines the factors to be considered as part of the EIA process, in relation to potential direct and indirect significant effects of the Proposed Development. These environmental factors are outlined as follows along with confirmation of where these topics are considered in the Scoping Report:

- Population: Landscape and Visual (Chapter 5), Noise and Vibration (Chapter 6), Transport (Chapter 11), and Socio-economics (Chapter 16).
- Human health: Noise and Vibration (Chapter 6), Ground Conditions (Chapter 8), Transport (Chapter 11), Socio-economics (Chapter 16) and Health (Chapter 17).
- Biodiversity: Ecology and Ornithology (Chapter 9).
- Land: Ground Conditions (Chapter 8) and Soil and Agricultural Land (Chapter 10).
- Soil: Ground Conditions (Chapter 8) and Soil and Agricultural Land (Chapter 10).
- Water: Water Resources (Chapter 18).
- Air: Climate Change (Chapter 12).
- Climate: Ecology and Ornithology (Chapter 9) and Climate Change (Chapter 12).
- Material assets: Archaeology and Heritage (Chapter 7), Ground Conditions (Chapter 8), and Socio-economics (Chapter 16).
- Cultural heritage: Archaeology and Heritage (Chapter 8).
- Landscape: Landscape and Visual (Chapter 5).
- Major accidents and disasters: Risks of Major Accidents and / or Disasters (Section 3.8), Ground Conditions (Chapter 8), and Climate Change (Chapter 12).

3.2.2 Information relating to the scope of each of the technical chapters of the ES, covering the environmental topics listed in Section 3.2.1, together with a preliminary summary of baseline information and the potential significant effects related to each of these aspects, is provided in Chapters 5 to 18 of this Scoping Report. Details relating to the non-technical chapters, and the technical aspects to be 'scoped out' of the ES, are provided in this chapter.

3.2.3 A Non-Technical Summary (NTS) of the ES will be produced as a separate standalone document.

3.3 Non-Technical Chapters

3.3.1 The following non-technical chapters will be included within the ES:

- Introduction: this chapter will outline the background to the application and provide a brief overview of the proposals.
- Site Description: this chapter will describe the location of the Proposed Development and provide a broad overview of the current state of the Site and surrounding area. Detailed baseline information will be provided within the relevant technical chapters.
- Development Description: this chapter will describe the Proposed Development, including a description of the proposed construction, operational and decommissioning phase activities.
- Consideration of Alternatives: this chapter will describe any reasonable alternatives considered by the Applicant, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.
- Approach to Environmental Impact Assessment: this chapter will detail the requirement for EIA, set out the applicable legislative and policy context of the Proposed Development, outline the overarching methodology for assessing potentially significant environmental effects, and list the schemes to be considered within the cumulative assessment.
- Summary of Residual and Cumulative Effects: this chapter of the ES will summarise the residual significant effects and the cumulative effects identified within the technical chapters of the ES.

3.3.2 In accordance with Regulation 17 (4) of the EIA (Wales) Regulations, the ES will be prepared by persons who "have sufficient expertise to ensure the completeness and quality of the statement" and will be accompanied by a statement outlining the relevant expertise and / or qualifications of these experts.

3.3.3 The ES will also be accompanied by a reference list detailing the sources used for the descriptions and assessments included in the Environmental Statement, and a glossary of abbreviations used in the ES.

3.4 Approach to EIA

Evaluation of Significant Effects

3.4.1 The ES will set out the assessment methodologies relevant to each environmental topic, based on recognised guidance and good practice. Each technical assessment will consider potential effects of the Proposed Development and evaluate the significance of these effects.

3.4.2 To evaluate the significance of effects, consideration of the sensitivity of a receptor, and the magnitude of change that could affect that receptor, is required.

Receptor Sensitivity

3.4.3 The sensitivity or value of a receptor may be classified by its proximity to the Proposed Development, its use, or its importance, as informed by legislation, policy, and guidance, and qualified by professional judgement.

Magnitude of Change

3.4.4 The magnitude of change that could affect a receptor as a result of the Proposed Development would be identified on a scale of change from minor alterations to major change or loss of a receptor. For some environmental topics, guidance on levels of acceptability means such change is based on quantitative parameters whilst for other topics this can be informed by professional judgement using qualitative parameters.

Determining Significance

3.4.5 Significance is determined with reference to the sensitivity of receptors that could be affected, together with the magnitude of change likely to occur. This is often determined across the environmental topics through a significance evaluation matrix.

3.4.6 For some environmental topics e.g., Ecology and Ornithology and Landscape and Visual, variations in this approach may be applicable and where relevant will be detailed in the assessment methodology section of each ES chapter.

3.4.7 Definitions for the categories used within the matrix will be derived for each environmental topic and outlined in each ES chapter, along with descriptions of receptor sensitivity, magnitude of change and levels of significant effect.

3.4.8 Table 3-1 outlines the overall significance matrix that will be used for the EIA. Effects can be beneficial or adverse.

Table 3-1 Matrix for Evaluating Significance

		Magnitude of Change				
		Very Low	Low	Medium	High	Very High
Sensitivity	Very Low	Negligible	Negligible	Negligible	Minor	Minor
	Low	Negligible	Negligible	Minor	Moderate	Moderate
	Medium	Negligible	Minor	Moderate	Major	Major
	High	Minor	Moderate	Major	Major	Major
	Very High	Minor	Moderate	Major	Major	Major

3.4.9 Major effects, where accepted limits or standards are exceeded will be determined as significant in EIA terms.

3.4.10 Moderate effects, within accepted limits or standards, but close to reaching the relevant threshold may be determined as significant, although there may be scenarios where such effects are considered not significant based on the specific circumstances being considered and professional judgement.

3.4.11 Minor effects, well within accepted limits or standards, or negligible effects, will be determined as not significant.

Assessment Scenarios

3.4.12 The EIA will consider the likely significant effects of the Proposed Development during construction and upon completion / operation of the development, assuming a likely 'worst case' scenario for the purposes of assessment.

3.4.13 The EIA will consider the Proposed Development as a whole (both outline and detailed elements).

3.4.14 A baseline scenario of 2023 will be considered, with work anticipated to commence in 2025.

3.4.15 In order to assess likely significant effects arising during construction, a peak construction year will be defined based on peak construction traffic movements and activity in order to assess a worst-case scenario.

3.5 Cumulative Effects Assessment

3.5.1 In accordance with Schedule 4 of the EIA (Wales) Regulations, the ES will consider potential significant effects arising from the cumulation of effects with other existing and / or approved projects. It is proposed that the ES will consider the schemes set out within Table 3-2, within the assessment of cumulative effects.

3.5.2 A review of planning applications submitted to Caerphilly County Borough Council and the neighbouring Merthyr County Borough Council and Blaenau Gwent County Borough Council has been undertaken to identify potential development schemes that could give rise to in-combination effects with the Proposed Development.

3.5.3 The EIA Regulations outline cumulative schemes as being *"*other existing and / or approved development*"* therefore the schemes in Table 3-2 are either permitted schemes (under construction or not yet implemented) or submitted schemes (with the potential for applications to be determined prior to submission of the Proposed Development application).

Table 3-2 Cumulative Developments

Location	Technology	Height to Tip	Distance from Site	Planning Authority	Reference Number	Status
Pen Bryn Oer Wind Farm	Wind (3no turbines)	110m	1.6km NE	Caerphilly County Borough Council	13/0483/FULL	Operational
Pengarnddu Industrial Estate	Wind (1no turbine)	77m	2.1km NW	Merthyr County Borough Council	P/12/0078	Operational
Bedlwyn Farm	Wind (1no turbine)	86m	6.8km SE	Caerphilly County Borough Council	14/0704/FULL	Operational
Penrhiwgwaith Farm	Wind (1no turbine)	87m	6.7km SE	Blaenau Gwent County Borough Council	C/2012/0373	Operational
Pen-yr-heol Farm.	Wind (1no turbine)	77m	6.8km SE	Caerphilly County	15/0597/FULL	Operational

				Borough Council		
Gelli-wen Farm	Wind (1no turbine)	77m	7.6km SE	Caerphilly County Borough Council	13/0488/FULL	Operational
Cruglwyn, Mynydd Mamoel	Wind (2no turbines)	86m	7km SE	Caerphilly County Borough Council	14/0761/FULL and 17/0521/FULL	Operational
Cefn Bach Farm	Wind (1no turbine)	78m	7km SE	Caerphilly County Borough Council	15/0097/FULL	Operational
Unit 29 Tafaranaubach Industrial Estate, Tredegar	Wind (1no turbine)	74m	2.5km NE	Blaenau Gwent County Borough Council	C/2012/0327	Operational
Eurocaps Ltd, Crown Business Park, Dukestown	Wind (2no turbines)	45m	4.9km NE	Blaenau Gwent County Borough Council	C/2015/0309	Operational
Rassau Industrial Estate	Wind (1no turbine)	72m	5.7km NE	Blaenau Gwent County Borough Council	C/2006/0559	Operational
Rassau Industrial Estate	Wind (1no turbine)	77m	7km NE	Blaenau Gwent County Borough Council	C/2012/0369	Operational
Pengarnddu Industrial Estate, Dowlais Top	Wind (1no turbine)	77m	2.2km NW	Merthyr County Borough Council	P/15/0241	Pre-Construction
Rassau Industrial Estate	Wind (1no turbine)	80m	6.3km NE	Blaenau Gwent County Borough Council	C/2018/0293	Pre-Construction
Wauntysswg solar farm	Solar		3.6km SE	Blaenau Gwent County Borough Council	DNS/3213639	Pre-Construction
Silent Valley Waste Services, Cwm, Ebbw Vale	Wind (1no turbine)	102m	8.5km SE	Blaenau Gwent County Borough Council	C/2016/0270	Live application

Rassau Industrial Estate	Wind (1no turbine)	80m	6.3km NE	Blaenau Gwent County Borough Council	C/2020/0301	Live application
Pen March	Wind (6no turbines)	180m	2.7km NW	Caerphilly County Borough Council and Merthyr County Borough Council	DNS/3253147	Submitted October 2023 (Development of National Significance)

3.6 Mitigation

3.6.1 Mitigation measures to avoid, reduce or offset the consequences of the Proposed Development will be embedded within its design whilst others may require adherence to particular constraints on construction methodology or mode of operation. The final assessment of significance will take into account the mitigation measures and constraints that have been incorporated into the Proposed Development (i.e., the assessment of residual effects).

3.7 Aspects to be scoped out of the EIA

3.7.1 Specific chapters / assessments will not be included for the following topics, as it is considered that these will be addressed sufficiently elsewhere within the ES or planning application, and / or the Proposed Development is unlikely to result in significant environmental effects relevant to these topics:

- Invertebrate and Amphibian Surveys
- Fish Surveys
- Passerine Bird Species Surveys
- Further Terrestrial Mammal Surveys
- Further Bat Surveys
- Targeted Surveys for Nightjar and Black Grouse
- Migratory Waterfowl Surveys

3.8 Risks of Major Accidents and / or Disasters

3.8.1 The EIA (Wales) Regulations state that an EIA should consider the vulnerability of the development to risks of major accidents and / or disasters, relevant to the project concerned.

3.8.2 'Risk' can be defined as 'the likelihood of an impact occurring, combined with effect or consequence(s) of the impact on a receptor, if it does occur'; a 'Major Accident' can be defined as 'events that threaten immediate or delayed serious damage to human health, welfare and / or the environment'; and a 'Disaster' can be defined as 'naturally occurring extreme weather events (e.g. storm, flood, temperature) or ground-related hazard events (e.g. subsidence, landslide, earthquake) with the potential to cause an event or situation'. Disaster and natural disaster are often used interchangeably.

3.8.3 Owing to the nature of the Proposed Development, it is considered that the likelihood of it resulting in / causing an event to occur that threatens (either immediate or delayed) serious damage to human health, welfare and / or the environment is low.

3.8.4 During construction measures will be implemented to ensure safe working practices in the vicinity of any utilities.

3.8.5 The design of the Proposed Development will also incorporate measures to reduce the vulnerability of the development to naturally occurring extreme weather events (i.e., flooding, storms and extreme temperatures) and / or ground related hazard events (e.g., subsidence, earthquakes).

3.8.6 Such scenarios will be considered across the relevant environmental topics of the ES, for example the Ground Conditions, Climate Change and Health chapters. It is therefore proposed that the topic of major accidents and / or is considered sufficiently elsewhere within the ES and a standalone chapter is not required.

4 PLANNING POLICY, LEGISLATION AND GUIDANCE

4.1.1 The Planning Policy, Legislation and Guidance Chapter of the ES would set out the relevant energy, climate change and planning considerations for the Proposed Development, with regard to international, UK, national and local legislation, policy and guidance.

4.1.2 A standalone Planning Statement will also be submitted, which will assess the Proposed Development against the relevant policy, legislation and guidance.

4.2 International Legislation

4.2.1 The framework of international agreements, binding targets and climate change global advisory reports upon which UK and national policy and legislation is based comprises the following:

- The Paris Agreement (2016).
- The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report

4.3 UK Legislation and Guidance

4.3.1 At a UK level, legislative and guidance considerations are as follows:

- The Climate Change Act (2008)
- Committee on Climate Change, Net Zero, the UK's Contribution to Stopping Global Warming (May 2019)
- Committee on Climate Change, Sixth Carbon Budget (2021)
- The British Energy Security Strategy (2022)
- The UK Net Zero Strategy (2021)
- 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)
- The UK Clean Growth Strategy (2017)
- National Planning Policy Framework 2023

4.3.2 Under the 2008 Climate Change Act, the UK committed to a net reduction in Greenhouse Gas (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 requires a reduction in UK greenhouse gas emissions of 78% by 2035 relative to 1990 levels.

4.4 National Legislation and Planning Policy

4.4.1 At a national level, the following legislation and policy is relevant:

- 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)
- Net Zero Wales, Carbon Budget 2 (2021-2025)
- National Development Framework 'Future Wales – the National Plan 2040' (2021)
- Planning Policy Wales Edition 11 (2021)
- The Socio-economic Duty Equality Act 2010
- National Health Service (Wales) Act 2006
- Mental Health (Wales) Measure 2010

4.4.2 In 2019, the Welsh Government declared a Climate Emergency, which highlights the need for urgent action to cut carbon dioxide and other greenhouse gas emissions.

4.5 Local Planning Policy

4.5.1 The Site is located within the jurisdiction of Caerphilly County Borough Council (CCBC). The Local Development Plan (LDP) was adopted in 2010 and comprises three components: a Written Statement, Appendices to the Written Statement and a Proposals Map. Policies of relevance to these proposals include the following:

- SP1 – Development Strategy – Development in the Heads of Valleys Regeneration Area
- SP5 – Settlement Boundaries
- CW2 - Amenity
- CW3 – Design Considerations Highways
- CW4 – Natural Heritage Protection
- CW6 - Trees, Woodland and Hedgerow Protection
- CW15 - General Locational Constraints
- CW19 – Rural Development and Diversification
- CW22 – Locational Constraints – Minerals
- NH1 – Special Landscape Areas
- NH2 – Visually Important Landscapes
- NH3 – Site of Importance for Nature Conservation

4.5.2 Preparation of a second replacement LDP up to 2035 has commenced. The published Delivery Agreement sets the target for the adoption of the new LDP for December 2024.

4.5.3 Supplementary Planning Guidance (SPG) should also be used to inform the assessment of the proposals. SPG of relevance includes:

- LDP4 – Trees and Development
- LDP10 – Buildings in the Countryside

4.5.4 Caerphilly Council also provides a wind turbine technical guidance note: Planning Guidance for Smaller Scale Wind Turbine Developments – Landscape and Visual Impact Assessment Requirements. This will be taken into consideration in the final design of the Proposed Development and the Landscape and Visual Impact Assessment which will be submitted as an ES Chapter.

4.5.5 The technical ES chapters will provide a description of the policy provisions from the LDP and any applicable Supplementary Planning Guidance where they are relevant to the assessment. The Planning Statement, as noted being separate from the ES, will contain an appraisal of the Proposed Development against the LDP policy provisions for both local planning authorities and other relevant material considerations.

4.6 Questions for Consultees

- What weight should be placed on local planning policy vs national policy and guidance for nationally significant strategic development?
- Are there any additional policy documents/legislation that need to be assessed that are not listed above?

5 LANDSCAPE AND VISUAL IMPACT

5.1 Introduction

5.1.1 The Landscape and Visual Impact Assessment (LVIA) will consider direct and indirect effects upon landscape and on visual receptors. The landscape component will include visual receptors such as physical landscape resources, landscape character and designated landscapes. The visual component will examine the nature and extent of effects on existing views and visual amenity. The effects of the proposed solar panels and turbines, as well as the ancillary infrastructure (access track, masts, transformers, battery storage, and other potential co-located technologies) will be assessed during the construction and operational phases of the proposed Development. The LVIA will also consider cumulative effects, i.e. the incremental effects of the proposed Development in combination with other solar and windfarm developments.

5.1.2 The LVIA will inform modifications and refinements to the layout design and will be undertaken following the approach set out in Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3)[1]. As there is no Welsh equivalent, the LVIA will also draw upon current good practice guidance issued by Nature Scot[2] (formally known as Scottish Natural Heritage (SNH)).

5.2 Existing Conditions

5.2.1 The Site lies on the east/south-east facing hillside adjacent to the west boundary of the Heads of the Valley Industrial Estate in the town of Rhymney, Caerphilly, South Wales (See Drawing BR10167/001). The Site currently consists of several fields of improved grassland, bound by a mix of scrub, hedgerows and open/featureless boundaries.

5.2.2 The Site is broadly bound by the Nant Carno stream, local roads with scattered properties and further improved grassland to the north, the Heads of the Valley Industrial Estate and the A469 to the east, further unimproved grassland and disused tips to the south and an un-named local road, unimproved grassland and disused tips to the west. The A465 - Heads of the Valleys Road is located c. 200m to the north. The Biffa Trecatti Landfill site and opencast workings are located c. 800m and c. 1.4km to

[1] Landscape Institute and Institute of Environmental Impact Assessment (2013), Guidelines for Landscape and Visual Impact Assessment, 3rd Edition.
[2] SNH (2018), A Handbook on Environmental Impact Assessment, Appendix 2: Landscape and Visual Impact Assessment, Version 5.

the south-west, respectively. An overhead line and pylons pass through the western parts of the site on a broadly south-west to north-east direction.

5.2.3 The nearest bodies of standing water are c. 100m to the north and c. 600m to the south.

5.2.4 The town of Rhymney lies c. 230m to the east on the opposite side of the A469. The town of Merthyr Tydfil is located c. 1.86km to the west and the village of Fochriw is located c. 1.96km to the south.

5.2.5 There are several existing wind turbines within the area, the nearest being a single 74m tip high wind turbine at Tafarnaubach Ind Est, Tredegar 2.4km to the north-east, three 110m tip high wind turbines at Pen Bryn Oer 1.6km to the east and a single 77m tip high turbine at Pengarnddu Industrial Estate 2.1km to the north-west. There is one existing solar farm within the 5km study area, c. 2.4km to the south-west.

Landscape Character Baseline

5.2.6 The site is within National Landscape Character Area (NLCA) 37: South Wales Valleys.

5.2.7 This NLCA is described as:

*"*Many deep, urbanised valleys dissect an extensive upland area. Combined with industrial heritage and the distinct identity of its people, the South Wales Valleys provide some of Wales' most widely known and iconic national images. Extensive ribbon development fills many valley bottoms and lower slopes. Their urban and industrial character is juxtaposed with dramatic upland settings with steep hillsides, open moors or forests. Networks of railways and roads connect valley settlements. Topography constrains passage between valleys, and there are only a limited number of high passes between valleys. The noise and business of many valleys contrast with the relatively remote and wild qualities of adjacent hill plateaux.*"*

5.2.8 The site falls within the following LANDMAP Aspect Areas:

Visual and Sensory

- CYNONVS209 West of Rhymney; and
- CYNONVS193 Rhymney

Landscape Habitat

- CYNONLH109 Unnamed;
- CYNONLH108 Unnamed; and

- CYNONLH113 Unnamed

Historic Landscape

- CYNONHL633 H10 Ogmore Forest;
- CYNONHL866 Blaen Rhymni; and
- CYNONHL701 Rhymney Valley

Geological Landscape

- CYNONGL007 Uppermost Rhymney valley

Cultural Landscape

- CYNONCLS025 West of Rhymney; and
- CYNONCLS022 Rhymney

5.2.9 In accordance with NRW's LANDMAP in Landscape and Visual Impact Assessments Guidance Note 46[3], filters will be applied to all aspect areas within the 45km study area in order to help focus the assessment and identify relevant landscape units. The LVIA will then consider the potential for direct and indirect effects upon the identified landscape units.

Landscape Designations

5.2.10 The closest Nationally and locally designated landscapes within Caerphilly County Borough Council are shown on Drawing BR10167/003.

5.2.11 A small north-east section of the site falls within the Upper Rhymney Valley Special Landscape Area (SLA). It should be noted that although this area is currently shown as being part of the site boundary, actual development is not anticipated to take place in this area.

5.2.12 The Bannau Brycheiniog (Brecon Beacons) National Park (BBNP) and International Dark Sky Reserve is located c. 2.5km to the north, the Llechryd and Rhymney Green Wedge is located c. 400m to the east and an area of Visually Important Local Landscape is located c 1.5km to the south-east. Brynbach County Park is located c. 400m to the east at its closest point.

[3] NRW's Using LANDMAP in Landscape and Visual Impact Assessments GN46, available at https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/using-landmap-in-landscape-and-visual-impact-assessments-gn46/?lang=en

5.2.13 Designated areas with theoretical visibility of the Proposed Development will be described in the LVIA, and used as a means of identifying which designated areas require further assessment.

5.3 Visual Receptors

5.3.1 The LVIA will consider potential effects upon visual receptors within the study area, i.e. the people who may be affected by changes in views resulting from the proposed Development. Visual receptors to be considered will include:

- people within settlements, including individual properties within 2 km of the nearest turbine;
- people travelling on major roads and railways;
- people using walking routes and cycle routes; and
- people visiting areas of interest such as visitor attractions, scenic viewpoints and hill summits.

5.3.2 Visual receptors also include people making recreational use of the area, e.g. those travelling on the Public Right of Way network and long distance routes, cycling on the National Cycle Network (NCN) or walking towards landmarks such as hill tops.

5.3.3 There are several recreational routes within the Site and study area. Footpath RHYM/FP96/1, RHYM/FP95/5 and RHYM/FP91/1 are the main footpaths that pass through the Site in a broadly east to west direction. There are a number of other Public Rights of Way within the 45km study area, forming a comprehensive network of public access throughout the Heads of the Valley Area. Zone of Theoretical Visibility (ZTV) analysis will determine which Public Rights of Way are to be included in the LVIA.

5.4 Proposed Study Area

5.4.1 The SNH guidance indicates that a study area extending to 45km from the Proposed Development is appropriate for the LVIA of turbines of approximately 150m height. However, as also identified in GLVIA 3, LVIAs should focus on the likely significant effects of the Proposed Development, therefore, after a review of the ZTV, a reduced study area of 20km is proposed for the wind turbines and a 5km study area is proposed for the Solar Farm.

5.4.2 A Zone of Theoretical Visibility (ZTV) plan will be used to identify which landscape and visual receptors require consideration in the assessment, and which can be scoped out because they are unlikely to be significantly affected. While the design of the

Proposed Development is subject to change, Drawing BR10167/013 is provided to illustrate the theoretical visibility of the current solar panel and turbine layout.

5.5 Proposed Surveys and Assessment Methodologies

Surveys

5.5.1 Field survey work will be carried out and records will be made in the form of field notes and photographs. Field survey work will include visits to the Site, viewpoints, designated landscapes and extensive travel around the study area to consider potential effects on landscape character and on experiences of views seen from designated landscapes, settlements and routes.

Visualisations

5.5.2 Wireframes and photomontages will be used to consider and illustrate changes to views. Photomontages will involve overlaying computer-generated perspectives of the Proposed Development over the photographs of the existing situation to illustrate how the views will change against the current baseline. Visualisations will be prepared in accordance with current SNH visualisation guidance.

5.5.3 Ancillary elements such as permanent anemometer masts, access tracks, battery storage and the on-site substation will be shown in photomontages for viewpoints within 5km when they would be visible. Beyond 5km it is considered unlikely that these ancillary elements would form more than a minor element of the entire development when compared to the solar panels and wind turbines.

5.6 Landscape Effects

5.6.1 Predicted changes on both the physical landscape of the site and landscape character within the 20km study area will be identified. Effects will be considered in terms of the magnitude and type of change to the landscape, including its key characteristics as set out in published landscape character assessments. The sensitivity of the landscape will also be taken into account, acknowledging value placed on the landscape through designation.

5.7 Visual Effects

5.7.1 Visual effects are experienced by people at different locations throughout the study area, at static locations (for example settlements or viewpoints) and transitional locations (such as sequential views from routes, including roads and foot paths). Visual

receptors are the people who will be affected by changes in views at these places, and they are usually grouped by what they are doing at those places (for example residents, motorists, recreational users etc.).

5.7.2 GLVIA3 states that the nature of visual receptors, commonly referred to as their sensitivity, should be assessed in terms of the susceptibility of the receptor to change in views/visual amenity and the value attached to particular views. The nature of the effect should be assessed in terms of the size and scale, geographical extent, duration and reversibility of the effect.

5.7.3 These aspects will all be considered to inform a judgement regarding the overall significance of effect.

5.7.4 Assessment of the visual effects of the Proposed Development will be based on analysis of the ZTVs, field studies and assessment of representative viewpoints. Drawing BR10167/013 shows a maximum turbine blade tip height (150m) ZTV of an indicative solar panel and turbine layout, with proposed assessment viewpoint locations. The final turbine tip height will be determined subject to turbine availability and a tendering process but is expected to be approximately 150m to tip. The assessment viewpoint locations have been selected to provide a representative range of viewing distances and viewing experiences, including views from settlements, points of interest and sequential views from routes. The list of proposed viewpoints for assessment is set out in Table 5-1.

Table 5-1: Suggested Viewpoints for Assessment

VP	VIEWPOINT NAME	OS GRID REF	DISTNACE FROM SITE	DIRECTION FROM SITE	REASON FOR SELECTION
1	Bute Town	310351E 209128N	840m	N	Representative of view from settlement and footpath RHYM/FP102/1
2	Upper Rhymney	311282E208 855N	1,150m	NE	Representative of view from settlement and footpath RHYM/RBW23/1
3	Rhymney South	312390E206 754N	2,630m	SE	Representative of view from settlement and B-road into settlement
4	Fochriw	310828E 206010N	2,370m	S	Representative of view from settlement and Rumney Valley Ridgeway Walk

5	Merthyr Common	308119E 204025N	4,800m	SW	Representative of view from common
6	Pant Y Ffawydden	316950E192 684N	16,990m	S	Shows the view from a point of multiple intersecting footpaths
7	Nantybwch	312902E 210905N	3,760m	NE	Representative of view from settlement
8	A4059	298882E 214906N	13,300m	NW	Representative of view from road in southern part of the Brecon Beacons.

5.8 Cumulative LVIA (CLVIA)

5.8.1 The cumulative landscape and visual assessment (CLVIA) will be carried out in accordance with the principles contained in SNH's Assessing the Cumulative Impact of Onshore Wind Energy Developments (March 2012).

5.8.2 A review of patterns of development will be provided for operational, consented, and proposed windfarms which are the subject of a valid planning application, up to 20 km from the site, following SNH guidance.

5.8.3 The CLVIA will focus on wind and solar energy developments considered to have potential to give rise to significant cumulative effects. Turbines with blade tip height below 50 m and single turbines and solar farms beyond 5 km from the site will not be included.

5.8.4 The LVIA will consider the potential effects of the addition of the proposed Development to the existing landscape against a baseline that includes existing wind and solar farms and those under construction. The CLVIA will consider the potential additional effects of the proposed Development, against a baseline that includes wind and solar farms that may or may not be present in the landscape in the future (i.e. including wind and solar farms that are consented but unbuilt, undetermined planning applications or currently at scoping). Consideration will also be given to 'total' cumulative effects (assessment which considers all current and future proposals, including the proposed Development). Wind and solar farm proposals that have been refused but that are going to appeal will also be considered in the assessment.

5.9 Residential Visual Amenity Assessment (RVAA)

5.9.1 There is no published guidance for the method or best practice approach for completing an assessment of effects upon residential visual amenity of properties in the vicinity of a proposed solar and wind farm. Subsequently, the RVAA will be undertaken in accordance with The Landscape Institute's Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19[4]. The evaluation of potential significant effects upon residential properties will also be based upon professional judgement supported by site surveys (where public access is available), photography, aerial imagery and wireframes.

5.9.2 A detailed assessment of potential visual effects on residential properties within a 2km study area (measured from the nearest proposed turbines) will be undertaken as follows:

- Production of a ZTV for the 2km study area including the location of all residential properties (with reference) indicated as having theoretical visibility of the Proposed Development;
- A detailed description of existing and proposed views from the primary orientation of residential properties (or groups of properties) will be prepared, taking consideration of the distance and direction to the Proposed Development, proportion of attainable view occupied and the context/ baseline situation at the residence (for example number of floors or the presence of curtilage vegetation) to determine the nature of the predicted change to residential visual amenity.

5.9.3 The assessment will also be supported by baseline photography (from the nearest publicly accessible location) and a wireframe of the Proposed Development.

5.10 Approach to Mitigation

5.10.1 The primary form of mitigation for landscape and visual effects is through iterative design of the layout of the turbines, solar panels and infrastructure, as seen from key viewpoints. Design development will be set out in detail in the design strategy that

[4] Landscape Institute, Residential Visual Amenity Assessment (RVAA)Technical Guidance Note 2/19, available at https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/03/tgn-02-2019-rvaa.pdf

will form part of the EIA Report. Secondary mitigation in the form of a Landscape Mitigation Plan will be included in the LVIA.

5.11 Questions for Consultees

- Are there any comments on the proposed list of assessment viewpoint locations?
- Has the consultee identified any particular windfarm or solar farm sites to be considered as part of the cumulative assessment?
- Has the consultee identified any further landscape or visual receptors to be considered within the assessment (i.e. where it is expected that significant effects may occur)?

6 NOISE AND VIBRATION

6.1 Introduction

6.1.1 A Noise Assessment will be undertaken by Wardell Armstrong LLP and will be included as a chapter within the ES.

6.2 Legislation, Policy and Guidance

6.2.1 The assessment will be carried out with due regard to the following:

- Future Wales: The National Plan 2040 (February 2021)
- Planning Policy Wales (Edition 11, February 2021)
- ETSU-R-97: The Assessment & Rating of Noise from Wind Farms, 1996
- British Standard 'Methods for Rating and Assessing Industrial and Commercial Sound' (BS4142:2014+A1:2019)
- British Standard 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS8233:2014)
- British Standard 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' – Part 1: Noise (BS5228-1:2009+A1:2014) and Part 2: Vibration (BS5228-2:2009+A1:2014)

6.3 Baseline Conditions

6.3.1 The baseline noise and vibration conditions will be set out in the ES chapter. Noise monitoring (daytime and night-time) will be undertaken to establish the existing acoustic environment at existing and proposed noise sensitive receptor locations, measured in accordance with guidance, at final locations to be agreed with the determining authority.

6.3.2 The ambient and background sound levels in the vicinity of the Site and at local sensitive receptors, are likely to be dominated by local road traffic. Some noise from the quarry to the west of the site and the industrial area to the east of the site may be audible at the nearest receptors. All noise sources will be observed during the baseline monitoring and reported within the baseline section of the Noise and Vibration chapter.

6.4 Scope of Assessment – Key Receptors and Potential Impacts

6.4.1 There are a number of residential receptors in the area surrounding the site. To the north of the site lies areas of open land with the A465 beyond. There is one receptor located adjacent to the site boundary (belonging to the Landowner). To the east of the Site lies an industrial area (The Heads of the Valleys Industrial Estate, in which Convatec is based) and the A469, beyond which lies residential areas of Rhymney, approximately 200m from the site boundary at their closest point. To the south lies open land, with the nearest sensitive receptor approximately 1.9km from the site boundary. To the west of the site lies an area of open land with an un-named road approximately 100m beyond. There a small number of residential receptors located along the road.

6.4.2 There is potential for the operations of the Proposed Development to have a noise impact on existing and proposed residential receptors.

6.4.3 Potential noise and vibration impacts during the construction and operational phases to be addressed by the ES are as follows:

- the impact of the construction phase noise and vibration of the Proposed Development on existing sensitive receptors;
- the impact of proposed sources of noise associated with the Proposed Development on existing sensitive receptors. Proposed sources of noise include:
    - Wind Turbines – The assessment will consider noise associated with the proposed wind turbines in line with ETSU guidelines during the daytime and night-time.
    - Plant – The assessment will consider the noise impact from all noise emitting plant associated with the wind turbines or solar panels, throughout the development at the nearest receptors, during the daytime and night-time. All noise sources of an industrial nature will be assessed in accordance with BS4142.

Limitations

6.4.4 The assessment will be reliant on the availability of suitable noise data provided by the Applicants or using Wardell Armstrong's database.

6.5 Assessment Methodology

6.5.1 The data gathered during noise monitoring, together with the Proposed Development layout and information regarding noise generating equipment and sources, will be used to inform a computer noise model in SoundPLAN v8 modelling software. This allows for specific and cumulative noise impacts to be considered.

6.5.2 Noise modelling is an important tool to accurately establish the propagation of noise across an area of interest, and the predicted noise levels will be used to assess any likelihood of an adverse impact due to the Proposed Development. Particular attention will be given to the types of noise sources associated with the Proposed Development, the timings of their possible occurrence and the nature of the noise receptors in the area.

6.5.3 Where required, mitigation measures will be explored using the noise model to control noise emissions from the Proposed Development.

6.5.4 A qualitative construction noise and vibration assessment will be undertaken following guidance contained in BS5228-1 and BS5228-2. The Standards contain information on noise and vibration reduction measures and promote a 'best practicable means' (BPM) approach to control noise and vibration, minimising associated impacts on local residents. Advice on construction noise will be provided using the 'ABC' method presented in Annex E (informative) of BS5228.

6.5.5 Recommendations regarding the requirement and type of any mitigation measures will be made in the Noise and Vibration ES chapter based on the results of the noise modelling and data gathered during noise monitoring.

6.6 Consultation

6.6.1 Consultation will be undertaken with the Environmental Health Officer (EHO) at the Caerphilly County Borough Council in order to agree a suitable methodology for the assessment prior to commencing work on the assessment.

6.6.2 As part of the consultation, suitable noise limits would be agreed for the assessment of wind farm and industrial noise.

6.7 Questions for Consultees

- Are there any proposed noise limits with reference to existing background noise levels in line with relevant guidelines?

- Are there any particular windfarm or solar farm sites to be considered as part of the cumulative assessment?
- Are there any specific receptors to be considered within the assessment, beyond the nearest residential receptors?

7 HISTORIC ENVIRONMENT

7.1 Introduction

7.1.1 This chapter has been produced by Wardell Armstrong LLP, a Registered Organisation with the Chartered Institute for Archaeologists (CIfA). It sets out the preliminary archaeological and cultural heritage background for the proposed combined wind and solar development site at Rhymney, Caerphilly, South Wales, centred on NGR SO 09933 08381.

7.1.2 The proposed development would comprise of three wind turbines, expected to be approximately 150m to tip, with an installed capacity of c. 15MW, along with a c. 5MW solar farm.

7.1.3 Potential impacts to the archaeological and heritage resource which can be identified through a review of recorded archaeological remains and designated historic assets in the area, and which would be a material consideration in the planning process, are identified.

7.1.4 In order to inform this scoping assessment, baseline data was obtained from the following:

- Glamorgan-Gwent Archaeological Trust Historic Environment Record (HER) – consulted 28th July 2023
- National Monuments Record of Wales (Coflein website)
- GIS datasets (Cadw 2023) for:
  - Scheduled Monuments;
  - Listed Buildings;
  - Registered Parks and Gardens;
  - Registered Battlefields; and
  - Historic Landscapes.

7.2 Historic Environment Legislation and Planning Policy

7.2.1 Designated historic assets protected by statutory legislation comprise scheduled monuments, protected wrecks, listed buildings and conservation areas.

7.2.2 The Ancient Monuments and Archaeological Areas Act (AMAAA) 1979, as amended by the Historic Environment (Wales) Act 2016, provides for a schedule of nationally important monuments that are legally protected.

7.2.3 The Historic Environment (Wales) Act also has amended the AMAAA 1979 to require the Welsh Ministers to compile, maintain and publish a statutory 'register of historic parks and gardens'. When the statutory register comes into force, it will replace the existing non-statutory Register of Parks and Gardens of Special Historic Interest in Wales.

7.2.4 The Planning (Listed Building and Conservation Areas) (P(LBCA)) Act 1990, as amended by the Historic Environment (Wales) Act 2016, provides for the protection of listed buildings and their settings (Section 66(1)); and the preservation and / or enhancement of the character and appearance of conservation areas (Section 72). The statutory duty only covers development that is within a conservation area – the 'setting' of a conservation area is addressed by planning policy.

7.2.5 Hedgerows are afforded protection under the Hedgerow Regulations 1997 (amended 2002).

7.2.6 National Planning Policy relevant to the historic environment comprises:

- Planning Policy Wales (PPW) (2021); and
- Technical Advice Note (TAN) 24 'The Historic Environment' (2017).

7.2.7 PPW Chapter 6 sets out the Welsh Governments objectives to the protection, management and conservation of the historic environment in Wales. It sets out the Welsh Government's objectives to:

- protect the Outstanding Universal Value of the World Heritage Sites;
- conserve archaeological remains, both for their own sake and for their role in education, leisure and the economy;
- safeguard the character of historic buildings and manage change so that their special architectural and historic interest is preserved;
- preserve or enhance the character or appearance of conservation areas, whilst the same time helping them remain vibrant and prosperous;
- preserve the special interest of sites on the register of historic parks and gardens; and
- protect areas on the register of historic landscapes in Wales.

7.2.8 For listed buildings, PPW states *"…a general presumption in favour of the preservation or enhancement of a listed building and its setting…"* (paragraph 6.1.10) in line with the P(LBCA) Act.

7.2.9 PPW also states that "There should be a general presumption in favour of the preservation or enhancement of the character or appearance of conservation areas or their settings." (paragraph 6.1.14).

7.2.10 PPW also directs that other, non-statutory, heritage designations should be taken into account in planning authority decision making. With regard to historic parks and gardens, PPW states that "Planning authorities should value, protect, conserve and enhance the special interest of parks and gardens and their settings included on the register of historic parks and gardens in Wales" (paragraph 6.1.18).

7.2.11 With regard to historic landscapes, PPW states that "Planning authorities should protect those assets included on the register of historic landscapes in Wales" (paragraph 6.1.21).

7.2.12 With regard to archaeological remains, PPW states that "The conservation of archaeological remains and their settings is a material consideration in determining planning applications, whether those remains are a scheduled monument or not." (paragraph 6.1.23).

7.2.13 With regard to development, PPW outlines the need for "an application [to] be accompanied by sufficient information, through desk-based assessment and/or field evaluation, to allow a full understanding of the impact of the proposal on the significance of the remains" (paragraph 6.1.26). Thereafter, the guidance states that *"…*where archaeological remains are affected by proposals that alter or destroy them, the planning authority must be satisfied that the developer has secured appropriate and satisfactory provision for their recording and investigation, followed by the analysis and publication of the results and the deposition of the resulting archive…" (paragraph 6.1.27).

7.2.14 The objectives set out in PPW are emphasised within Technical Advice Note (TAN) 24 'The Historic Environment' (2017) which defines a historic asset as "an identifiable component of the historic environment. It may consist or be a combination of an archaeological site, a historic building or area, historic park and garden or a parcel of historic landscape." (TAN24 paragraph 1.7).

7.2.15 Where historic assets are to be affected by a proposed development TAN 24 advises that is for the applicant to provide the local planning authority with sufficient information to allow the assessment of their proposals in respect of designated assets and their settings.

7.2.16 TAN24 and Conservation Principles for the Sustainable Management of the Historic Environment in Wales (2011) describe the significance of historic assets as deriving from an understanding of the associated heritage values, these being evidential value, historical value, aesthetic value and communal value. The significance of an asset also derives from its setting which "includes the surrounding in which it is understood, experienced and appreciated embracing present and past relationships to the surrounding landscape" (TAN24 paragraph 1.25).

7.2.17 The Caerphilly County Borough Local Development Plan up to 2021, adopted in November 2010, makes reference to the historic environment. Of particular relevance is Policy SP6 'Place Making', the key objectives of which are:

- Maintain the vitality, viability and character of the County Borough's town and village centres and re-establish them as a focus for economic activity and community pride.
- Maintain, enhance and develop a hierarchy of town and village centres which are easily accessible, and which meet the needs of all sections of the population.
- Protect and enhance the overall quality of the historic natural and built environment of the County Borough.

Best Practice Guidance

7.2.18 Cadw have prepared and published a series of best-practice guidance documents which, along with TAN24, are intended to enhance the provisions of the Historic Environment (Wales) Act 2016. The following documents will be considered in the EIA:

- Setting of Historic Assets in Wales (May 2017);
- Heritage Impact Assessment in Wales (May 2017);
- Caring for Historic Landscapes (2007); and
- A Guide to Good Practice on Using the Register of Landscapes in the Planning and Development Process (2nd Revision, 2007).

7.3 Summary of Current Baseline

7.3.1 The term 'Site' is used to refer to the area subject to initial assessment as defined by the Client. The Site is indicated on the Drawing BR10167-011.

Non-Designated Historic Assets

7.3.2 The Glamorgan-Gwent Archaeological Trust (GGAT) Historic Environment Record (HER) was consulted for non-designated historic assets within the Site and a wider

search area (taken as an area of approximately 1km radius from the Site boundary). Besides identifying historic assets that may be directly affected by the Proposed Development within the Site, this search boundary is expected to provide sufficient data to represent the archaeological character of the area and assist in informing upon the archaeological potential of the land within the Site.

7.3.3 No archaeological investigations have been undertaken within the Site.

7.3.4 Within the Site there are numerous non-designated historic assets recorded. The recorded non-designated historic assets are shown on Drawing BR10167-014.

7.3.5 The majority of the non-designated historic assets are associated with the Rhymney Extractive Area (HER EA155); an area typified by heavily industrial and extractive activity, with many features relating to the extraction of both ironstone and coal. In brief, the Site was formerly traversed by the Rhymney Limestone Railway (HER 02929.0m; IWT016) and the Bute Tramroad (HER IWT020). A number of water infrastructure – including reservoirs, sluices, streams and leats related to the Rhymney Ironworks – are also recorded within the bounds of the Site (HER 02927.0m; 03042m; 03044m; 09001m; 09003m; 09044m; IWW124; IWW129; IWW132; IWW134 IWW179).

7.3.6 Several further industrial features are recorded across the Site, including an ironstone quarry (HER 01320m); a possible building (HER 03047m); colliery works (HER 03046m); a ventilation shaft (HER 03048m); old coal level (HER 03045m). Partially extending into the southernmost portion of the Site further historic assets including least, pits and quarries are recorded (HER 02917m; 02918.0m; 02909m; 02916.0m; 02912m; 02914m; 02915m; 02910m; 02490m; 02413m; 02287.0m; 02920m; 02926.0m; 02927.0m; 02928m).

7.3.7 Beyond the industrial assets recorded within the Site, the only asset predating this activity is a farmstead that has now been completely removed by opencast mining (HER 03041m).

7.3.8 Much of the Site, particularly in the north and in the west, as evidenced by modern cartographic sources dating to 1961 and 1972, has been subject to wide-spread opencast mining that would have entirely destroyed many of the abovementioned historic assets and any unknown archaeological remains with earlier origins that may have been present.

Designated Historic Assets

7.3.9 Cadw GIS datasets were searched for designated historic assets.

7.3.10 Due to the nature of the proposals and the height of the wind turbines, a 10km search area has been implemented for the following highly designated historic assets as assets of national importance:

- World Heritage Sites;
- Scheduled Monuments;
- Grade I and Grade II* Listed Buildings;
- Registered Parks and Gardens;
- Registered Historic Landscapes;
- Conservation Areas; and
- Historic Battlefields.

7.3.11 A 5km search area has been implemented for Grade II Listed Buildings as assets of regional importance.

7.3.12 Historic assets located beyond this search area but included due to their significance and status is the Blaenavon Industrial Landscape World Heritage Site (UNESCO 984), which is situated approximately 12km to the east of the Site.

7.3.13 Following discussion with the consultees and the outcome of scoping, further historic assets beyond the outlined search area may be included within the final assessment.

7.3.14 Within the search area parameters specified above, there are the following designated historic assets:

- One World Heritage Site
- Two Grade I Listed Buildings
- 24 Grade II* Listed Buildings
- 137 Grade II Listed Buildings
- Four Registered Historic Landscapes
- Four Registered Parks and Gardens
- 100 Scheduled Monuments

- 11 Conservation Areas

7.3.15 From the baseline collation it has been established that a limited portion of the north-easternmost element of the Site partially extends into the Bute Town Conservation Area.

7.3.16 Recorded assets identified within the search parameters are presented within Appendix A, Table 1 and shown on Drawing BR10167-014.

7.4 Proposed Methodology

7.4.1 The effect of the proposals on the archaeological and cultural heritage resource will be assessed within an Archaeological Desk Based Assessment and Heritage Impact Statement, which will assess the potential direct impact to the significance of buried archaeological remains and the potential indirect impact to the significance of designated historic assets as a consequence of introducing change within their setting. The Archaeological Desk Based Assessment and Heritage Impact Statement would either be submitted as standalone documents or as technical appendices to an ES chapter.

7.4.2 The Archaeological Desk Based Assessment and Heritage Impact Statement would include reference to field observations and primary and secondary resources. The Archaeological Desk Based Assessment would be undertaken with due regard to the guidelines on desk-based assessment prepared by the Chartered Institute for Archaeologists[5]. The Heritage Impact Statement would be undertaken with due regard to the guidelines on assessing the significance of assets and setting prepared by Cadw[6].

7.4.3 Where an Assessment of the Significance of the Impact of Development on Historic Landscape (ASIDOHL) is required, this would be undertaken in accordance with Cadw guidance[7].

7.4.4 In ascribing levels of importance to historic assets, the Design Manual for Roads and Bridges (DMRB), LA 104 Environmental Assessment and Monitoring, Revision 1 (Highways Agency 2020) will be used, see Table 7-1 below.

[5] CIfA (2020) Standards and Guidance for Historic Environment Desk-Based Assessment. Reading: Chartered Institute for Archaeologists.
[6] Cadw (2017) Setting of Historic Assets in Wales. Cardiff: Cadw; Cadw (2017) Heritage Impact Assessment in Wales. Cardiff: Cadw;
[7] https://cadw.gov.wales/sites/default/files/2019-05/LandscapesRegisterGoodPractice_EN_0.pdf

7.4.5 The identification of the importance of setting to the overall significance of a historic asset uses Cadw's best practice guidance presented in the Setting of Historic Assets in Wales (2017). Section 4 of the guidance identifies a four-stage process to assess the impact of change to the setting of the historic asset which, whilst not explicitly expressed, has been applied to this assessment:

- Stage 1 – Identify historic assets that might be affected by a proposed change or development;
- Stage 2 – Define and analyse the settings to understand how they contribute to the significance of the historic assets and the ways in which the assets are understood, appreciated and experienced;
- Stage 3 – Evaluate the potential impact of a proposed change or development on that significance; and
- Stage 4 – If necessary, consider options to mitigate or improve the potential impact of a proposed change or development on that significance.

7.4.6 The guidance within this Cadw publication will be used alongside the DMRB methodology for assessing the significance of impacts; see Table 7-3 and Table 7-4 below.

7.4.7 The assessment of potential impacts to the significance of historic assets is made through the lens of professional judgement and experience.

7.4.8 The magnitude of impact is measured from the condition that would prevail in a 'do nothing' scenario and it is assessed without regard to the importance of the receptor (Highways Agency 2020).

7.4.9 Historic assets are susceptible to numerous forms of development during the construction process and as a consequence of the operational life of the proposed development. These can be either direct (physical) impacts or indirect (non-physical) impacts.

7.4.10 The worst magnitude of impact would be complete physical removal of the heritage asset. In some instances, it is possible to discuss percentage loss when establishing the magnitude of impact. However, complex receptors will require a much more sophisticated approach (Highways Agency 2020).

7.4.11 The significance of an impact is devised by cross referencing the importance of the receptor with the magnitude of the impact, see Table 7-1 below. The significance

categories are set out in Table 7-4Table 7-3 below.

Table 7-1 Establishing the Importance of a Heritage Asset	
Value (sensitivity)	Typical description
Very High	Very high importance and rarity, international scale and very limited potential for substitution
High	High importance and rarity, national scale, and limited potential for substitution
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale
Negligible	Very low importance and rarity, local scale

Design Manual for Roads and Bridges, LA 104 Environmental Assessment and Monitoring (Highways England 2020)

Table 7-2 Establishing the Magnitude of Impact		
Magnitude of impact (change)		Typical description
Major	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Moderate	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Design Manual for Roads and Bridges, LA 104 Environmental Assessment and Monitoring (Highways England, 2020)

Table 7-3 Establishing the Significance of Impact						
Value/Importance	Very High	Neutral	Slight	Moderate/large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral/slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate

	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight
		No change	Negligible	Minor	Moderate	Major
		Magnitude of impact				

Design Manual for Roads and Bridges, LA 104 Environmental Assessment and Monitoring (Highways England, 2020)

Table 7-4 Significance Categories	
Significance Category	Typical Description
Very large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Design Manual for Roads and Bridges, LA 104 Environmental Assessment and Monitoring (Highways England, 2020)

7.5 Potential Impacts

Construction Phase

7.5.1 Ground disturbance has the potential to remove/truncate any remains of archaeological and historic interest.

7.5.2 Preliminary research undertaken as part of this scoping report has indicated that the Site has witnessed extensive industrial and extractive activity during the post-medieval and modern periods. As noted during the Southeast Wales Industrial Ironworks Landscapes (Roberts and Graham 2008[8]) and demonstrated by cartographic sources, the majority of the Rhymney Extractive Area has been subject to opencast mining. Much of the northern and western portion of the Site, as indicated by cartographic sources dating to 1961 and 1972, has been subject to extensive opencast mining that would have entirely destroyed any archaeological remains in these areas, if present.

7.5.3 Nevertheless, cartographic sources and rapid review of LiDAR data indicate that there is an area in the east of the Site that has not been subject to opencast mining that may contain archaeological remains related to post-medieval and early modern mining

[8] Roberts, R. and Graham, E. (2008). Southwest Wales Industrial Ironworks Landscapes Year 4: Extraction Areas. Glamorgan-Gwent Archaeological Trust.

activity. The visible remains appear to represent an element of the Rhymney Limestone Railway (HER 02929.0m) and part of the infilled reservoir (HER 03044m) and its associated sluice (HER 09044m), and would likely include quarry pits and ventilation shafts; these remains would likely be of negligible to low interest. In view of the proposed location of the turbines and the solar array, ground disturbance in this area would be limited to the creation of the proposed access track and the excavation of the private wire route.

7.5.4 Archaeological potential for remains of unknown character predating the wide-spread mining activity, although low, however, may be held in the north-westernmost elements of the Site where no opencast mining has occurred. No ground disturbance is planned in these areas.

Operational Phase

7.5.5 With regard to impacts caused as a consequence of changes within the bounds of the Site to the setting of designated historic assets, the baseline has highlighted a number of assets to be assessed as part of the Heritage Statement. The designated historic assets which are within study area specified above are set out in Table 1, Appendix A.

7.5.6 Of the designated historic assets listed in Table 1, Appendix A, it is anticipated that the significance of the asset types listed below would not be affected by the proposals such that their significance would be sustained. This is due to their significance lying wholly/predominantly within their fabric and/or the lack of change which the proposals are anticipated to cause in respect to elements of setting which contribute towards their significance. These types of assets would not therefore be taken forward for detailed assessment within the Heritage Impact Statement which would support the ES Chapter. Assets anticipated to be scoped out include:

- Scheduled buried remains and/or earthworks which do not hold topographically advantageous views of the Site or the area in which the Site is located such that the Site could not be said to be significant in an understanding/appreciation of the interests of the monument;
- Assets in built up areas for which cones of view to/from are not significant;
- Industrial and commercial assets for which their significance lies in their function and fabric and were not built to have designed views over the landscape;
- Distant farmhouses with no historic links to the land within the footprint of the site;

- Ornamental garden features set within private gardens;
- Ancillary farm buildings to which an understanding and a perception of is restricted to the principal farmhouse and/or the immediate rural backdrop which would be unaffected;
- Distant cottages and houses to which rural setting is restricted with no historic link to the land within the footprint of the site;
- War memorials to which setting is restricted with no historic link to the land within the footprint of the Site;
- Bridges whose setting elements providing an appreciation of their use and function are limited to waterbodies; and
- Mileposts whose setting is restricted to the road and roadside verge.

7.5.7 It is proposed the historic assets listed in Table 2, Appendix A be subject to field observations as part of the Heritage Impact Statement to determine the necessity for preparing assessments of their significance in accordance with Cadw's best practice guidance presented in the Setting of Historic Assets in Wales (2017).

7.6 Significance of Impact

Impact Prediction Confidence

7.6.1 The impacts below detail those which can be anticipated at the scoping stage. These have been considered for the construction and operational stages of the Proposed Development, without mitigation, and are based on information gained from the known baseline position at this time. Effects will be reviewed as part of the comprehensive ES technical paper and reported in the ES Chapter. Further impacts including cumulative impacts may be identified during additional baseline data collection undertaken as part of the ES process.

7.6.2 The criteria for impact prediction confidence are set out below:

Table 7-5 Confidence Level

Confidence Level	Description
High	The predicted impact is either certain i.e. a direct impact, or believed to be very likely to occur, based on reliable information or previous experience.
Low	The predicted impact and its levels are best estimates, generally derived from first principles of relevant theory and experience of the assessor. More information may be needed to improve confidence levels.

Construction Phase

7.6.3 Ground disturbance would have the potential to affect heritage assets of archaeological and/ or historic interest. This potential impact would need to be considered within any planning application. Specific assets identified during the preliminary baseline prepared for scoping are identified in Table 7-6. The potential for other 'unknown' assets would be researched further as part of a full Archaeological Desk Based Assessment which would be appended to the ES paper as a technical appendix.

Table 7-6 Predicted Construction Impacts

Nature of Impact	Receptor (importance)	Magnitude of Impact	Significance Impact	Confidence Level
Ground disturbance	Features associated with post-medieval and early modern mining in the east of the Site. Likely associated with railway and reservoir (negligible to low).	Major	Slight or Moderate	Low *
Ground disturbance	Unknown buried remains in the northern-western portion of the Site (low to medium)	Major	Slight or Moderate	Low *

*further research and field observations will be required to inform the level of impact with a greater degree of confidence, where this is possible.

7.6.4 A full Archaeological Desk Based Assessment would be undertaken to identify, confirm and fully assess the predicted potential direct impacts to archaeological remains from the development. This would include reference to field observations and primary and secondary resources.

Operational Phase

7.6.5 There would be potential indirect impacts to the significance of designated historic assets within the vicinity of the redline boundary as a result of introducing changes to their settings. For this assessment, the search area applied would be 10km from the redline boundary bar the inclusion of Blaenavon Industrial Landscape WHS located 12km from the Site boundary.

7.6.6 The predicted impacts to historic assets identified as being potentially sensitive to the Proposed Development (Table 2, Appendix A) are as set out below in Table 7-7.

Table 7-7 Predicted Operational Impacts					
Nature of Impact	Receptor (importance)	Magnitude of Impact	Significance Impact (DMRB)	Level of Harm (NPPF)	Confidence Level
Setting impacts	Blaenavon Industrial Landscape (Very High)	No change	Neutral	None	Low*
Setting impacts	Cyfarthfa Castle (High)	No change	Neutral	None	Low/moderate **
Setting impacts	School at Cyfarthfa Castle (High)	No change	Neutral	None	Low/moderate **
Setting impacts	The Town Clock (High)	No change	Neutral	None	Low/moderate **
Setting impacts	SW Roundhouse at Roundhouse Farm (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Cefn Railway Viaduct (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Pontsarn Railway Viaduct (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Church of St David (High)	Minor	Slight or moderate	Less than substantial	Low*
Setting impacts	Penuel Baptist Church (High)	Minor	Slight or moderate	Less than substantial	Low*
Setting impacts	Milgatw	No change	Neutral	None	Low*
Setting impacts	Church of St Sannan (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Bedwellty House (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	Harcourt Terrace Wesleyan Methodist Chapel, including schoolroom and front railings (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	Tower of Old Church of St Gwynno (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	Catholic Church of St Mary incl. attached presbytery (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	Church Hall at Capel Tabernacl (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	St David's Church (Medium)	No change	Neutral	None	Low/moderate **

Table 7-7 Predicted Operational Impacts					
Nature of Impact	Receptor (importance)	Magnitude of Impact	Significance Impact (DMRB)	Level of Harm (NPPF)	Confidence Level
Setting impacts	St Tydfil's Church (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	High Street Baptist Church (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	Gwaelodygarth House (Medium)	No change	Neutral	None	Low*
Setting impacts	Ivor English Congregational Church including forecourt walls (Medium)	No change	Neutral	None	Low*
Setting impacts	Catholic Church of St Illtyd (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	Nos 1-14 (consec) Collins Row (Medium)	Minor	Slight	Less than substantial	Low*
Setting impacts	Nos 14-28 (consec) Lower Row (Medium)	Minor	Slight	Less than substantial	Low*
Setting impacts	Nos 1-13 (consec) Middle Row & attached Windsor Arms PH (Medium)	Minor	Slight	Less than substantial	Low*
Setting impacts	Rhymney House Hotel (Medium)	Minor	Slight	Less than substantial	Low*
Setting impacts	St David's (Masonic Hall) and attached NE and SW garden walls (Medium)	No change	Neutral	None	Low*
Setting impacts	No.2 The Terrace and attached garden wall with gate piers (Medium)	No change	Neutral	None	Low*
Setting impacts	House and attached garden wall (Medium)	No change	Neutral	None	Low*
Setting impacts	1-4 Susannah Houses (consec) (Medium)	No change	Neutral	None	Low*
Setting impacts	Timber Aqueduct over Former Taff Bargoed Railway (Medium)	No change	Neutral	None	Low*
Setting impacts	Old Furnace Farmhouse (Medium)	Minor	Slight	Less than substantial	Low*

Table 7-7 Predicted Operational Impacts					
Nature of Impact	Receptor (importance)	Magnitude of Impact	Significance Impact (DMRB)	Level of Harm (NPPF)	Confidence Level
Setting impacts	Church of St John (Medium)	No change	Neutral	None	Low*
Setting impacts	Ebenezer Calvinistic Methodist Chapel including vestry (Medium)	Minor	Slight	Less than substantial	Low*
Setting impacts	St George's Church (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	Church of St Tyfaelog (Medium)	No change	Neutral	None	Low*
Setting impacts	Former Pay Office Noddfa Buildings (Medium)	No change	Neutral	None	Low*
Setting impacts	Nos 1 and 2 The Lawn (Medium)	No change	Neutral	None	Low*
Setting impacts	The Vicarage (Medium)	No change	Neutral	None	Low*
Setting impacts	Ysgol Lawnt (Medium)	No change	Neutral	None	Low*
Setting impacts	No.3 The Terrace and attached garden wall with gate piers (Medium)	No change	Neutral	None	Low*
Setting impacts	No.4 The Terrace and attached garden wall with gate piers (Medium)	No change	Neutral	None	Low*
Setting impacts	No.5 The Terrace and attached garden wall with gate piers (Medium)	No change	Neutral	None	Low*
Setting impacts	No.6 The Terrace and attached garden wall with gate piers (Medium)	No change	Neutral	None	Low*
Setting impacts	No.7 The Terrace and attached garden wall with gate piers (Medium)	No change	Neutral	None	Low*
Setting impacts	No.8 The Terrace and attached garden wall with	No change	Neutral	None	Low*

Table 7-7 Predicted Operational Impacts					
Nature of Impact	Receptor (importance)	Magnitude of Impact	Significance Impact (DMRB)	Level of Harm (NPPF)	Confidence Level
	gate piers (Medium)				
Setting impacts	Hy Brasail (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	Cae Burdydd Castle (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Ponsticill Inscribed Stone (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Nant Crew Inscribed Stone (now in Cefn Coed Church) (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Carn y Bugail and Carn Felen (High)	No change	Neutral	None	Low*
Setting impacts	Waun y Gwair Cairn (High)	No change	Neutral	None	Low*
Setting impacts	Garn Fawr round cairn (High)	No change	Neutral	None	Low*
Setting impacts	Twyn Ceilog Round Cairn (High)	No change	Neutral	None	Low*
Setting impacts	Morlais Castle (High)	No change	Neutral	None	Low*
Setting impacts	Rectangular Earthworks 530m SSW of Heol-Ddu-Uchaf (High)	No change	Neutral	None	Low*
Setting impacts	Gelligaer Common Round Cairns (High)	No change	Neutral	None	Low*
Setting impacts	Gelligaer Common Standing Stone (High)	No change	Neutral	None	Low*
Setting impacts	Merthyr Common Round Cairns (High)	No change	Neutral	None	Low*
Setting impacts	Garn Las Earthwork (High)	No change	Neutral	None	Low*
Setting impacts	Fforest Gwladys Roman practice camp (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Brynbychan Round Cairn (High)	No change	Neutral	None	Low*
Setting impacts	Graig-y-Gilfach round cairn and earthwork (High)	No change	Neutral	None	Low*
Setting impacts	Platform Houses on East Side of	No change	Neutral	None	Low*

Table 7-7 Predicted Operational Impacts					
Nature of Impact	Receptor (importance)	Magnitude of Impact	Significance Impact (DMRB)	Level of Harm (NPPF)	Confidence Level
	Gelligaer Common (High)				
Setting impacts	Cairn 270m N of Pont Ffosyrhebog (High)	No change	Neutral	None	Low*
Setting impacts	Platform Houses and Cairn Cemetery on Dinas Noddfa (High)	No change	Neutral	None	Low*
Setting impacts	Carn Pentyle-Hir & Adjacent Round Cairn (High)	No change	Neutral	None	Low*
Setting impacts	Rhymney Upper Furnace (High)	Minor	Slight or moderate	Less than substantial	Low*
Setting impacts	Remains of Blast Furnaces, Cyfarthfa Ironworks (High)	No change	Neutral	None	Low*
Setting impacts	Sarn Howell Pond and Watercourses (High)	No change	Neutral	None	Low*
Setting impacts	Deserted Iron Mining Village, Ffos-y-fran (High)	No change	Neutral	None	Low*
Setting impacts	Pillow Mound at Bryn y Gwyddel (High)	No change	Neutral	None	Low*
Setting impacts	Enclosure on Coedcae'r Ychain (High)	No change	Neutral	None	Low*
Setting impacts	Penmoelallt Round Barrows (High)	No change	Neutral	None	Low*
Setting impacts	Two Round Cairns at Onllwyn (High)	No change	Neutral	None	Low*
Setting impacts	Gelligaer Common Roman Road (High)	No change	Neutral	None	Low*
Setting impacts	Morlais Hill ring cairn (High)	No change	Neutral	None	Low*
Setting impacts	Coetgae'r Gwartheg barrow cemetery (High)	No change	Neutral	None	Low*
Setting impacts	Carn Ddu platform cairn (High)	No change	Neutral	None	Low*
Setting impacts	Carn Castell y Meibion ring cairn (High)	No change	Neutral	None	Low*

Table 7-7 Predicted Operational Impacts					
Nature of Impact	Receptor (importance)	Magnitude of Impact	Significance Impact (DMRB)	Level of Harm (NPPF)	Confidence Level
Setting impacts	Y Domen Fawr round cairn (High)	No change	Neutral	None	Low*
Setting impacts	Cefn Cil-sanws, cairn on SW side (High)	No change	Neutral	None	Low*
Setting impacts	Cefn Cil-sanws defended enclosure (High)	No change	Neutral	None	Low*
Setting impacts	Black Pins early ironstone workings (High)	No change	Neutral	None	Low*
Setting impacts	Cwm Glo Chapel (High)	No change	Neutral	None	Low*
Setting impacts	Cwm Glo pit and ironstone tip (High)	No change	Neutral	None	Low*
Setting impacts	Tredegar Ironworks Cholera Cemetery (High)	No change	Neutral	None	Low*
Setting impacts	Trefil Quarries North (High)	No change	Neutral	None	Low*
Setting impacts	Twyn Bryn March round cairn (High)	No change	Neutral	None	Low*
Setting impacts	Cefn Man Moel cross-ridge dyke (High)	No change	Neutral	None	Low*
Setting impacts	Cefn Coed Cemetery & Jewish Burial Ground (High)	No change	Neutral	None	Low*
Setting impacts	Cyfarthfa Castle (High)	No change	Neutral	None	Low*
Setting impacts	Bedwellty Park (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Aberfan: Cemetery, Garden of Remembrance and Former Tip and Slide Area (High)	No change	Neutral	None	Low*
Setting impacts	Clydach George (High)	No change	Neutral	None	Low/moderate **
Setting impacts	Merthyr Tydfil (High)	Minor	Slight or moderate	Less than substantial	Low*
Setting impacts	East Fforest Fawr and Mynydd-y-Glog (High)	Minor	Slight or moderate	Less than substantial	Low*
Setting impacts	Gelli-Gaer Common (High)	Minor	Slight or moderate	Less than substantial	Low*

Table 7-7 Predicted Operational Impacts					
Nature of Impact	Receptor (importance)	Magnitude of Impact	Significance Impact (DMRB)	Level of Harm (NPPF)	Confidence Level
Setting impacts	Bedwellty Park CA (Medium)	No change	Neutral	None	Low/moderate **
Setting impacts	Bute Town CA (Medium)	Minor	Slight	Less than substantial	Low*
Setting impacts	Rhymney Town CA (Medium)	Minor	Slight	Less than substantial	Low*
Setting impacts	Council And Urban Street, Penydarren CA (Medium)	No change	Neutral	None	Low*
Setting impacts	Dowlais CA (Medium)	No change	Neutral	None	Low*
Setting impacts	Cyfarthfa, Merthyr Tydfil CA (Medium)	No change	Neutral	None	Low*

*Further research and field observations will be required to inform the level of impact with a greater degree of confidence, where this is possible.

**Low to medium confidence is based on the lack of intervisibility within the current ZTV. Further research and field observations will be required to inform the level of impact with a greater degree of confidence.

7.6.7 A Heritage Impact Statement would be undertaken to confirm/assess the predicted potential indirect impacts to the significance of assets of historic assets. This would include reference to field observations and primary and secondary resources were relevant.

7.7 Mitigation

7.7.1 The detailed design and evolution of the scheme is ongoing and, as such, any mitigation requirements will be determined through the full environmental assessment to reduce any effects, where considered necessary. Any mitigation measures deemed necessary will be confirmed in the resulting ES.

7.7.2 With regards to indirect impacts, due to the nature of the proposals and the height of the wind turbines, mitigation such as screening would not be appropriate.

7.7.3 The necessity for archaeological fieldwork to determine the application, or as a condition to consent, would be ascertained through discussions held with the County Archaeological Advisor at GGAT It is anticipated that, if required, archaeological fieldwork could comprise an archaeological watching brief of the any ground disturbance associated with the construction of the access route and the private wire route in the abovementioned area that has not been subject to opencast mining that

appears to preserve archaeological remains related to post-medieval and early modern industrial activity.

7.8 Conclusion

7.8.1 The scoping assessment has not been able to confidently predict low level impacts and, as such, there remains a potential for impacts to the archaeological and historic resources in terms of EIA.

7.8.2 It is anticipated that the assessment of potential impacts to the archaeological and historic resource will be assessed within specialist technical appendices (e.g. an Archaeological Desk Based Assessment, Heritage Impact Statement and ASIDOHL), which will provide an evidence base for an ES chapter.

7.8.3 Archaeology and Heritage is therefore scoped into EIA on this basis.

7.8.4 Table 7-8 below confirms the details to be 'Scoped In' to the environmental assessment in respect of cultural heritage.

Table 7-8 Work 'Scoped In'

Environmental Issue	Reason for "scoping in"
Construction: Direct impacts to buried archaeological remains remaining on site	The potential for ground disturbance to remove/truncate buried archaeological remains
Operation: Potential indirect impacts to the setting of designated historic assets	The potential for changes within the setting of the identified designated heritage assets which could affect an understanding and appreciation of their significance

7.9 Questions for Consultees

- Is there agreement on the historic assets, as listed within Table 2, Appendix A to be taken forward for detailed assessment within the Heritage Impact Statement that would support the ES Chapter?
- Are there any additional historic assets that would be required to be taken forward for detailed assessment beyond the parameters specified above?
- Based on the baseline data presented, do you agree that pre-determination archaeological fieldwork will not be required?
- We anticipate that consultation with Glamorgan-Gwent Archaeological Trust (GGAT), Cadw, and the local Conservation and Design Officer will be required. Are

there any further consultees that would need to be consulted as part of the assessment?

- Will an ASIDOHL assessment be required and, if so, what areas should be included within the assessment?

8 GROUND CONDITIONS

8.1 Introduction

8.1.1 This section of the Scoping Report considers whether there would be likely significant effects related to ground conditions as a result of the Proposed Development. Such effects relate to the historical, geological, and environmental setting of the Site, including potentially sensitive geological sites, geological resources and the potential for 'contamination' (that could potentially cause harm) arising from naturally occurring substances and/or past land use activity.

8.1.2 This assessment will be based on receptor sensitivity and the potential magnitude of the effect, as well as the probability of the effect occurring. This approach reflects the requirement of relevant legislation and guidance for effects to be considered using a risk-based approach.

8.2 Sources of Information

8.2.1 The study area for the Ground Conditions baseline assessment is the site boundary.

8.2.2 The following sources of information have been used to inform the baseline assessment and identify any sensitive receptors:

- British Geological Survey (BGS) published 1:50,000 Superficial and Bedrock Geology Mapping:
  - Sheet 232 – Abergavenny 1:50,000, 1990.
  - Sheet SO00NE, 1:10,560, 1972, and
  - Sheet SO10NW, 1:10,560, 1979.
- A review of British Geological Survey (BGS) geological data available on their Onshore GeoIndex webpage, including digital geological mapping, historical borehole records and mining (other than coal mining).
- A review of the Coal Authority Interactive Map Viewer for coal mining information and to inform whether more detailed review is required.
- Review of the Lle Geo-Portal website (developed as a partnership between Welsh Government and Natural Resources Wales) and DEFRA Magic Map website to identify sensitive geological sites and relevant statutory designated sites.

- Zetica Unexploded Ordnance online mapping.

8.3 Baseline Assessment

Geology

Artificial Deposits

8.3.1 The BGS map sheets indicate that the majority of the Proposed Development is underlain by Artificial Deposits. The deposits were recorded by the BGS as "Made Ground (Undivided)" and "Worked Ground – Void" likely to be associated with historic coal mining across the local area. The Worked Ground – Void area is described as "Worked out opencast coal seam area" on the 1:10,560 mapping and indicate the "Royal Arms Site".

8.3.2 The closest available BGS borehole record to the Proposed Development area is located approximately 50m east within Rhymney Industrial Estate. The borehole record (SO10NW/79) pertains to a 39.5m deep borehole named Pontlottyn Borehole No.9 and drilled by Geotechnical Engineering Ltd in 1978. The borehole record indicates "Colliery Spoil, coarse discard" present at ground level to approximately 1.4m below ground level (bgl).

Superficial Deposits

8.3.3 The Proposed Development area is shown to be partially underlain by Glacial Till deposits in the north of the Site.

Bedrock Geology

8.3.4 The BGS mapping indicated the bedrock geology to be the South Wales Lower Coal Measures Formation in the northern half of the site, and the South Wales Middle Coal Measures in the southern half of the site. The BGS generally describe the South Wales Coal Measures as 'Grey, (productive) coal-bearing mudstones/siltstones, with seatearths and minor sandstones'.

8.3.5 One geological fault is present in the east of the Site, which generally trends north to south.

8.3.6 No geological Sites of Special Scientific Interest (SSSI) are located within 2km of the Site boundary.

8.3.7 The Site is located within a Coal Mining Reporting Area.

Hydrogeology

8.3.8 The superficial Glacial Till deposits at the site are classified as Secondary Undifferentiated Aquifers. The South Wales Coal Measures beneath the Site is classed as a Secondary A aquifer.

8.3.9 The Site is not located within a Nitrate Vulnerable Zone (NVZ), Source Protection Zone, or a drinking water safeguard zone. The majority of groundwater within the Site and surrounding areas is classed as 'low vulnerability', based on the MAGIC Interactive Map groundwater vulnerability mapping.

Hydrology

8.3.10 There are no records of surface water features directly on the Site. However, the Nant Carno tributary of the Rhymney River is present 40m-260m along the northern and western boundary of the Site. Rhymney River is present approximately 260m east of the Site, orientated north to south. Butetown Reservoir is located 460m north of the Site 770m southwest of the Site.

8.3.11 The potential effects of the Proposed Development on surface water receptors has been included as part of the assessment but only in relation to land contamination. The assessment of other potential effects to surface water receptors are considered to be outside the scope of Ground Conditions and will, instead, be considered (as necessary) as part of separate Water Resources assessment.

Environmental

8.3.12 There are no historical landfills recorded within the Site boundary. The closest recorded historical landfill is the Nant Liesg Quarry located approximately 525m southeast from the Site boundary. This historical landfill is recorded to have accepted inert waste, however, the input dates were not recorded. No permitted waste sites or authorised landfills, nor any areas of recorded current landfilling are recorded within the Site or surrounding areas.

Ground Gases

8.3.13 The Site is indicated to lie entirely within a zone of low radon risk, with the highest radon potential indicated to be <1%, suggesting that less than 1% of homes in this area are at or above the action level for radon.

8.3.14 The Site is indicated to lie within an area that has been subject to past coal mining and mine gases such as mine gases (methane, carbon dioxide etc.) may be present and should be considered as during all stages of the development including investigation, construction and end-use.

Mining

8.3.15 The Site and surrounding areas are located within a Coal Mining Reporting Area or Development High Risk Area. Non-coal mining is not recorded within the Site or surrounding areas, based on the Coal Authority Interactive Map Viewer.

8.3.16 A review of BGS geology maps shows that site is recorded as open cast mining and four coal seams intersect the site, listed in the following:

- Seven-Feet
- Yard
- Bute
- Lower Nine-Feet

8.3.17 A borehole log pertaining to "PONTLOTTYN 9" provided the Coal Authority Interactive Viewer indicated that the topsoil is overlain by coarse discarded colliery spoil. The borehole log recorded the following coal seams presented in Table 8-1.

Table 8-1 Coal Seam Borehole Records

Name	Depth (m bgl)	Thickness (m)
Bute coal seam	6.7	0.3
Unnamed coal seam	16.64	0.34
Coal	19.05	0.05
Yard Coal Seam	20.06	0.51
Yard Coal Seam	20.20	0.12
Yard Coal Seam	20.60	0.07
Coal	30.10	0.03
Coal	33.90	0.5

8.3.18 It is likely that the Five-Feet Gellideg coal seam may also intersect the site due to faulting east of the site.

Geological Resources

8.3.19 Based on a review of the BGS records, geology, historical mapping and mining records, it is not considered that there are any important economic geological resources present with the Proposed Development area that could or would potentially be developed in the future. It is likely that any economic resources will have likely been removed by past opencast mining operations.

Unexploded Ordnance

8.3.20 The Site is indicated on Zetica's online risk mapping to be entirely within an area of low risk from unexploded ordnance (UXO).

8.4 Sensitive Receptors

8.4.1 The potential sensitive receptors relating to Ground Conditions are considered to be:

- Construction workers.
- Adjacent land users (i.e., residents, farmers) during construction.
- Future Site users – workers or maintenance staff.
- Built environment.
- Groundwater within the superficial deposit aquifers (Secondary Undifferentiated and Secondary A).
- Surface water features present along the northern and western boundary of the Site.

8.5 Potential Effects

8.5.1 A Phase 1 Desk Study has not been undertaken to date. The potential effects have initially been based on a review of publicly available data.

Construction

8.5.2 At this stage, it is considered that construction will involve the site preparatory works including installation of access roads and site compounds etc. Construction will also involve excavation relating to the wind turbine/solar array foundations, trenches

along the cable routes (should underground cables be used and associated infrastructure.

8.5.3 A Phase 1 Ground Conditions and Contamination Desk Study report will be prepared and included within the ES to be submitted with the DNS application. This will establish the nature and significance of any contaminant sources (mainly associated with past mining) within the Site and surrounding areas and will consider environmental ground instability risks based on the BGS GeoSure geohazards database. At this stage, based upon the review of publicly available data and subject to confirmation following completion of the Phase 1 Desk Study Report, there is considered to be a high likelihood of any significant effects relating to the Proposed Development.

8.5.4 A Coal Mining Risk Assessment (CMRA) is required because the Site is located within a Development High Risk Area relating to historical coal mining. The CMRA may recommend an intrusive ground investigation to identify the potential presence of historical coal workings beneath the Site and assess the potential risk to the Proposed Development.

8.5.5 It is anticipated that the findings of the Coal Mining Risk Assessment and ground investigation works (if required) will recommend a series of necessary mitigation measures to ensure potential effects associated with ground conditions across the Site will be effectively managed. A Construction Environmental Management Plan (CEMP) will be prepared to accompany the application, which will include the adoption of industry best practice and appropriate personal protective equipment (PPE) measures.

Operation

8.5.6 The nature of the Proposed Development is such that, during the operational phase, the regular and widespread use of machinery or vehicles is not anticipated. The Proposed Development is also not likely to introduce new risks to the sensitive receptors as it does not involve any substantial built development or permanent Site users.

8.5.7 There is a risk for potential ground instability at the site due to the presence of potentially unconsolidated/voided and compressible made ground (opencast backfill). Additionally, there is a potential ground instability risk associated with shallow mine workings beneath the historic opencast site that may not have been removed as part of the opencast coal mining operation.

8.5.8 There is potential for chemical attack on buried structures or services due to the presence of made ground across the site. This is a standard engineering design consideration that can be addressed by designing below ground materials to be suitable for the ground conditions.

8.5.9 Based on the review of publicly available data and the nature of the Proposed Development (i.e., PV panels arrays and three wind turbines), there is considered to be a likely probability of significant risk to receptors during the operational phase. As with the potential construction phase effects, this is subject to confirmation following completion of the Phase 1 Desk Study Report.

8.6 Summary

8.6.1 Based on the initial review of publicly available data and in consideration of the nature of the Proposed Development, there is considered to be a moderate to high risk to sensitive receptors during both the construction and operational phases of the Proposed Development. Due to the site history, the confirmed presence of artificial deposits across the Site, and the potential for shallow coal mine workings beneath the Site, it is considered necessary to prepare a ground conditions chapter.

8.6.2 The inclusion of a ground conditions chapter will ensure that potential contamination and ground conditions risks have been fully considered and addressed (e.g., as required by the government's Land Contamination Risk Management Guidance and the relevant National Policy Statements for Energy). It is, therefore, intended to produce a standalone Phase 1 Ground Conditions Desk Study and Coal Mining Risk Assessment for inclusion within the ES. This will ensure that a proportionate level of information and assessment is provided.

8.7 Questions for Consultees

8.7.1 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Are the consultees content with and/or have any comments on the list of information sources used as part of scoping opinion?
- Are the consultees content with and/or have any comments on the list of effects and key sensitive receptors identified?

- Are the consultees aware of any additional information or documentation available pertaining to ground condition (including land contamination and ground stability) within and up to 250m beyond the site boundary?

9 ECOLOGY AND ORNITHOLOGY

9.1 Introduction

9.1.1 The Site is located to the west of the town of Rhymney, in the county borough of Caerphilly, South Wales. Ecological and ornithological surveys to support the Proposed Development have been undertaken by (or on behalf of) Avian Ecology Ltd. This Ecology and Ornithology section has also been prepared by Avian Ecology, by Dr Colin Bonnington DPhil MSc BSc (Hons) MCIEEM, Senior Ecologist. Dr Bonnington has over ten years' experience as a professional ecologist, specialising in renewable energy projects. Dr Bonnington has contributed to, and led on, many large-scale wind farm projects, including in Wales, and this has included writing scoping input and impact assessments during the last decade. Avian Ecology is a specialist ecological consultancy with considerable experience in the undertaking of ecological and ornithological surveys and assessment to inform renewable energy projects (including wind energy developments) in Wales. As such, all field surveys and subsequent assessment has been undertaken by suitably qualified, experienced and competent ecologists.

9.2 Methodologies and Summary of Surveys (and Desk Study) Undertaken

9.2.1 Where specific Welsh guidance is not available, guidance from NatureScot (formerly Scottish Natural Heritage (SNH)) is adopted, where appropriate.

Desk Study

9.2.2 A desk study will be undertaken to supplement the baseline information gathered from field surveys. The following key sources have been (or will be) consulted:

- DEFRA (MAGIC Map[9]) and Natural Resources Wales (NRW) search function[10];
- South East Wales Biodiversity Records Centre (SEWBReC[11]);
- Aerial imagery;
- NatureScot pre-application guidance for onshore wind farms (2023[12]); and
- National Biodiversity Network (NBN) Gateway.

[9] https://magic.defra.gov.uk/ (Accessed 19/09/2023).
[10] https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en
[11] http://www.sewbrec.org.uk/ (Accessed 19/09/2023).
[12] https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms(Accessed 19/09/2023).

9.2.3 Desk study information to be gathered will include details of statutory designated sites within 10km (extended to 20km for any such sites with migratory goose interest), non-statutory sites within 2km and notable and protected species within 2km of the Site.

9.2.4 Peer reviewed literature and publicly available resources will also be reviewed and will be referred to where relevant within the ES.

Field Surveys

9.2.5 Field surveys have been undertaken since 2021 and are due for completion in November 2023 (with dates provided in the description of surveys undertaken). In summary these ecological and ornithological surveys have comprised:

- Extended Phase 1 Habitat Survey;
- National Vegetation Classification (NVC) Survey;
- Preliminary (Bat) Roost Appraisal (PRA);
- Bat Activity Survey;
- Vantage Point (VP) Flight Activity Survey;
- Schedule 1/Annex 1 Breeding Raptor and Owl Searches; and
- Moorland Breeding Bird Surveys (MBBS).

9.3 Extended Phase 1 Habitat Survey, NVC Survey & PRA

9.3.1 In the absence of Welsh-specific guidance, surveys have been typically undertaken in accordance with relevant Scottish guidance, particularly NatureScot.

9.3.2 In accordance with NatureScot guidance applicable at the time (NatureScot, 2022[13]) and also in accordance with the current guidance (NatureScot,2023[14]) a phase 1 habitat and NVC survey were completed, in August 2023, following respective guidance in JNCC (2010[15]) and Rodwell (2006[16]). The NVC survey further classified any noteworthy[17] or wetland habitats and identify any potential Groundwater Dependent Terrestrial Ecosystems (GWDTEs)[18] (as per SNIFFER guidance, 2009[19]). The phase 1 survey was extended to record any evidence (or potential) of protected species (such

[13] NatureScot (2022) General pre-application and scoping advice for onshore wind farms. August 2022.
[14] NatureScot (2023) Pre-application guidance for onshore wind farms. September 2023.
[15] JNCC (2010) Handbook for Phase 1 habitat survey. A technique for environmental audit.
[16] Rodwell, J.S. (2006) National Vegetation Classification: Users' handbook.
[17] Including any EC Habitats Directive Annex 1 and/or UKBAP Priority Habitats in accordance with NatureScot guidance (SNH, 2016).
[18] Note this information should be passed to the assigned project hydrologist for their assessment.
[19] SNIFFER (2009) – WFD95: A Functional Wetland Typology for Scotland - Project Report. ISBN: 978-1-906934-21-7. Scotland and Northern Ireland Forum for Environmental Research. Edinburgh.

a [redacted] water vole, reptiles and amphibians) and noting any suitable features that could potentially support roosting bats (PRA) within 200m (plus blade length) of the turbine locations[20]. The PRA was undertaken from ground-level and followed guidance in Collins (2016[21]) and NatureScot *et al.* (2021[22]). The survey identified whether any additional dedicate terrestrial mammal surveys would be required.

9.3.3 The survey area for the phase 1 habitat and NVC surveys comprised all lands within the Site extended to include all lands within 250m of potential turbine locations and 100m of potential access tracks and additional infrastructure, where known, and where access allows (in accordance with SEPA[23]).

9.4 Bat Activity Survey

9.4.1 Ground-level static surveys following wind farm and bat guidance (NatureScot *et al*., 2021) were undertaken. Static detectors were focused where turbines are most likely to be located, given these are the areas which will be most impacted by the proposed development. The static detectors were placed in situ over three seasons in 2023 (spring, summer and autumn) for a period sufficient to capture 10 days of suitable weather conditions.

9.4.2 Based on the guidance, three static detectors were used, as three turbines are proposed.

9.5 VP Flight Activity Survey

9.5.1 Based on a number of factors, including our professional experience of important ornithological features that have been considered for ornithology surveys close to the Site in Wales, we consider the following as Target Bird Species for this assessment:

- All Schedule 1 and Annex 1 listed breeding raptors and owls; and
- All waders, waterfowl (excl. feral species and mallard *Anas platyrhynchos*) and other wetland species (e.g. herons, egrets).

[20] Any potentially suitable features that could support roosting bats would have been considered for further investigation/ survey.

[21] Collins, J. (2016) *Bat surveys for professional ecologists: good practice guidelines* (3rd edition). The Bat Conservation Trust, London.

[22] NatureScot *et al.* (2021) *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.* Version: August 2021. https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation (Accessed 19/09/2023).

[23] SEPA (2014) *Planning guidance on windfarm developments.* Land Use Planning System Guidance Note 4. Version 7, May 2014. Scottish Environment Protection Agency.

9.5.2 Kestrel Falco tinnunculus was treated as a Target Bird Species during surveys in Year 2 (December 2022 to November 2023), given it is a Bird of Conservation Concern Red List species in Wales[24].

9.5.3 Secondary species are considered to comprise all commoner raptors (buzzard Buteo buteo and sparrowhawk Accipiter nisus), all gulls and any notable passerines e.g. Red-listed Birds of Conservation Concern and Schedule 1 listed species.

9.5.4 VP surveys commenced in December 2021 and are due for completion in November 2023 (when two full years of survey will have been completed), in accordance with NatureScot guidance (SNH, 2017[25]).

9.5.5 Following preliminary VP viewshed analysis and a reconnaissance visit, one VP survey location (located at grid reference: SO 09398 08404) was selected to provide sufficient coverage of the survey area (turbine layout plus as much of the 500m buffer as possible). Drawing BR10167-AV1 shows the extent of the viewshed coverage from the VP, with the turbine layout, plus 500m buffer included. The Site boundary is also included as it was the intention for as much of the Site to be covered by the VP viewsheds, in addition to the turbine layout plus 500m buffer.

9.5.6 The VP viewshed covered much of the survey area with the locations of the proposed turbines covered. Some gaps in coverage are often unavoidable due to undulating topography such as within the Site. However, this is not considered a substantive limitation for the VP surveys with the flight activity recorded, considered characteristic of the locality, and those identifying those flights which are considered 'at-risk' from collision with operational turbines.

9.5.7 In accordance with NatureScot guidance (SNH, 2017) a minimum of 36 hours per VP per season was carried out during the seasons broadly 'breeding' (March to August) and 'non-breeding' (September to February).

9.5.8 Table 9-1 confirms the survey effort for VP surveys in the two survey years.

[24] https://www.bto.org/sites/default/files/birds_of_conservation_concern_wales_4_2022.pdf (Accessed 19/09/2023).

[25] SNH (2017) Recommended bird survey methods to inform impact assessment of onshore windfarms. https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms (Accessed 19/09/2023).

Table 9-1 VP Survey Effort													
VP	2021	2022											Total
	Non-breeding			Breeding						Non-breeding			
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
1	6	6	6	6	0	12	12	12	0	12	6	6	84
VP	2022	2023											Total
	Non-breeding			Breeding						Non-breeding[26]			
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
1	6	6	6	6	6	6	6	6	6	6	6	6	78

9.5.9 Flight activity of all Target Species was mapped and assigned into height bands to allow for the classification of flight activity "at" "below" or "above" collision risk height to be determined.

9.5.10 The activity of secondary species was also recorded in approximately 15-minute summary intervals, noting the number of birds present and general behaviour in order to build an overall picture of activity within the survey area.

9.6 Schedule 1/Annex 1 Breeding Raptor and Owl Searches

9.6.1 In accordance with NatureScot guidance (SNH, 2017) searches for breeding raptors and owls was undertaken between April (May in Year 1) and July, inclusive, out to 2km from the Site (where accessible), with reference to species-specific guidance stipulated in Hardey et al. (2013[27]).

9.7 MBBS

9.7.1 Areas of open land within and around the Site were surveyed for breeding waders and waterfowl. The methodology followed an amended Brown and Shepherd (1993) approach (in accordance with guidance; SNH, 2017), with the survey area comprising the Site, plus 500m (where access allows). The surveys were carried out, over four visits, between April (May in Year 1) and July, inclusive. During the survey, any Section

[26] Survey are ongoing.
[27] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) Raptors: a field guide to survey and monitoring (3rd edition). The Stationary Office, Edinburgh.

7 priority species of the Environment (Wales) Act (2016), such as skylark Alauda arvensis, were also recorded.

9.8 Baseline Site Conditions

9.8.1 Baseline ecological and ornithological conditions to inform the design and assessment of the Proposed Development, will be established through desk study and field surveys. Full details will be presented within the ES. A brief summary of key findings to date is provided below. Information on non-statutory local sites relevant to the Site will be obtained during the desk study and information will be provided in the ES.

9.9 Statutory Designated Sites

9.9.1 The Site does not form a part of any internationally or nationally designated site for nature conservation. Those statutory designated sites within 10km of the Site (extended to 20km for statutory designated sites with migratory goose interest) are provided in Table 9-2 and Drawing BR10167-AV2.

Table 9-2 Statutory Designated Sites

Designated Site	Distance / Orientation	Qualifying Interests
European Sites		
Usk Bat Sites SAC	7.99km, north-east	• Blanket bog • Mixed woodland on base-rich soils associated with rocky slopes • Plants in crevices in base-rich rocks • Caves not open to public • Degraded raised bogs • Dry heaths • Lesser horseshoe bat Rhinolophus hipposideros
Nationally Designated Sites		
Cwm Taf Fechan Woodlands SSSI	3.66km, west	Mixed deciduous woodland with one of few Glamorgan sites supporting limestone fern Gymnocarpium robertianum
Cefn y Brithdir SSSI	4.56km, south	Best example of dwarf shrub heath in Mid Glamorgan. Community has crowberry Empetrum nigrum as co-dominant species
Nant Glais Caves SSSI	5.21km, north-west	Principally geological interest but also important for unusually large population of white trout Cynoscion arenarius

Table 9-2 Statutory Designated Sites		
Designated Site	Distance / Orientation	Qualifying Interests
Cwm Glo a Glyndyrys SSSI	5.46km, south-west	Extensive areas of marshy grassland, species-rich neutral grassland and acid grassland, and association of these habitats with others, including woodland and heath. Outstanding diversity of grassland fungi
Penmoelallt SSSI	7.22km, west	Mixed woodland, including Ley's whitebeam
Daren Fach SSSI	7.29km, north-west	Open scrub on limestone cliffs, with screes and woodlands on gentler slopes. Primary plant interest is Sorbus spp. including rare Ley's whitebeam Sorbus leyana
Mynydd Llangatwg SSSI	7.99km, south-east	• Base-rich grassland, heather dominant blanket mire and dry heath are of special interest • Rare and scarce vascular plants, bryophytes and lichens • Lesser horseshoe bat Additional habitat interest is wet heath, acid grassland, modified blanket mire and other habitats including small raised mire.
Cwm Merddog Woodlands SSSI	8.01km, east	Highest known beech Fagus sylvatica woodland in Britain, with interesting transition zones between beech and alder Alnus glutinosa
Caeau Nant y Groes SSSI	8.65km, south-west	Species-rich neutral grassland

9.10 Field Surveys

9.10.1 Field surveys revealed that the Site:

- Is predominantly semi-improved (acid) grassland, with areas of marshy grassland particularly in the west, with much of the Site livestock grazed.
- Is dominated by mesotrophic grassland, assigned as MG6 Lolium perenne-Cynosurus cristatus grassland particularly where it is heavily grazed, and MG10a Holcus lanatus – Juncus effusus rush-pasture, but with Juncus conglomeratus as the dominant rush, in the west.
- Supported a modest breeding bird assemblage, principally comprising of passerine species (such as skylark, meadow pipit Anthus pratensis and willow warbler Phylloscopus trochilus), with red kite Milvus milvus and kestrel Falco tinnunculus also breeding offsite, but close to the Site boundary.

- Was over-flown by a modest number of Target bird species, with the most regularly recorded species being red kite.

9.10.2 There was no evidence that the Site supported protected or notable species, with no evidence of protected mammal species recorded during surveys. Furthermore, there were no features identified that have potential to support roosting bats within 200m plus indicative blade length of the proposed turbines.

9.11 Policy and Legislation

9.11.1 National

- Planning Policy Wales – Chapter 6 Distinctive and Natural Places (2021[28]);
- [redacted]
- Technical Advice Note 5 – Nature Conservation and Planning (2009[29]);
- Conservation of Habitats and Species Regulations 2017 (as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) (hereafter the 'Habitats Regulations');
- The Environment (Wales) Act 2016;
- Welsh Government 'Biodiversity deep dive: recommendations' (2022[30]);
- The United Kingdom Biodiversity Action Plan (UK BAP) Priority Species and Habitats (2007); and,
- The Wildlife and Countryside Act 1981 (as amended)

9.11.2 Local

- Caerphilly County Borough Local Development Plan up to 2021 (adopted November 2020[31]);
- Caerphilly County Borough Local Development Plan Review Report (1st June 2021[32]); and
- Caerphilly County Borough Action Plan Volume 1 & 2 (2002[33]).

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[28] https://www.gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf (Accessed 19/09/2023).
[29] https://gov.wales/sites/default/files/publications/2018-09/tan5-nature-conservation.pdf (Accessed 19/09/2023).
[30] https://www.gov.wales/sites/default/files/pdf-versions/2022/10/1/1664785835/biodiversity-deep-dive-recommendations.pdf (Accessed 19/09/2023).
[31] https://www.caerphilly.gov.uk/caerphillydocs/ldp/written-statement.aspx (Accessed 19/09/2023).
[32] www.caerphilly.gov.uk/caerphillydocs/ldp/ldp_draft_review_report.aspx (Accessed 19/09/2023).
[33] https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly-county-borough.aspx and https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-for-caerphilly-county-bor.aspx (Accessed 19/09/2023).

9.12 Surveys Scoped Out

9.12.1 In accordance with NatureScot guidance (2023), there are some protected species (such as invertebrates and amphibians) that with standard mitigation, are unlikely to experience any significant environmental effects from wind farm developments, and targeted surveys are not a requirement, assuming mitigation is applied to legally protect such species. In addition, there are no statutory designated sites with such qualifying interests within 10km of the Site. Surveys for invertebrates and amphibians were therefore scoped out.

9.12.2 Given the habitats present within the Site (predominantly heavily grazed semi-improved grassland), targeted reptile surveys were scoped out, and it is considered that the above approach (mitigation) is proportionate and precautionary in the event that any reptiles are present in any part of the Site.

9.12.3 Given watercourses will not be directly affected by the proposed development (with an appropriate buffer of 50m applied between works and watercourses) fish surveys (including fish habitat surveys) were scoped out.

9.12.4 Following the results of extended phase 1 habitat survey (no evidence of protected species, including absence of features that could potentially be suitable for supporting roosting bats), further terrestrial mammal surveys and bat surveys to check for roosting bats (such as emergence surveys) were scoped out.

9.12.5 In accordance with NatureScot guidance (SNH, 2017) passerine bird species are not significantly impacted by wind farms, and Target Species should be instead restricted to those species likely to be affected by wind farms. S7 species like skylark were considered during the MBBS, but given passerines are not significantly impacted by wind farms, accordingly, further targeted surveys for passerines species were scoped out.

9.12.6 Given the lack of suitable habitat within the Site for species like nightjar and black grouse (predominantly heavily grazed semi-improved grassland with some areas of marshy grassland onsite, and a lack of suitable woodland habitat), and restricted range of black grouse in the south of Wales, targeted surveys for nightjar and black grouse were scoped out.

9.12.7 The Site is not within 20km of any statutory designated site with migratory goose interest. Furthermore, the habitat is appraised as sub-optimal for supporting any

populations of migratory/wintering waterfowl, such as roosting or foraging geese/swans. Migratory/wintering waterfowl surveys were therefore scoped out.

9.13 Features Scoped Out of Assessment

9.13.1 Those features that were not subject to further survey (summarised above in 'Surveys Scoped Out' section) will be accordingly scoped out of further assessment in the ES, although standard mitigation will be detailed within the ES which will ensure that any works associated with the proposed development would proceed in a legally compliant manner.

9.13.2 In terms of ornithology, only those Target Bird Species that meet the threshold of ≥3 'at-risk' flights for collision risk mortality modelling (CRM) and Target Bird Species breeding within 1km of the Site will be scoped into the assessment.

9.13.3 In terms of ecology, bats (but not roosting bats given the lack of suitable roosting features within 200m plus blade length of the proposed turbines) and effects on notable habitats (thus restricting effects on Annex I, S7 and LBAP habitats only) will be scoped into the assessment. Given information on non-statutory local sites has yet to be obtained, these sites will not be scoped out from assessment. However, it is proposed that deciding whether a non-statutory local site is scoped in (or out) of assessment, will be based on the extent of spatial separation, level of connectivity between the Site and such a local site and nature of the qualifying interest (e.g. whether stationary features, like habitats, or features that move considerable distances).

9.13.4 Given the spatial separation and lack of connectivity between the Site and all statutory designated sites listed in Table 9-2, and the nature of the qualifying interest (typically stationary features such as habitats), effects on statutory designated sites are scoped out of assessment. This also includes the Usk Bat Sites SAC (approximately 8km from Site) which has lesser horseshoe bat as a qualifying feature, given this bat species forages in woodland habitats (and areas of high habitat diversity; absent from the Site), travels distances <2.5km from roost sites (SAC is c.8km from Site) and given the species typically flies low (5m)[34] so below collision risk height from operational turbine blades.

[34] https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/lesserhorseshoe.htm (Accessed 19/09/2023).

9.14 Questions for Consultees

- Do Consultees agree that the scope of ecological and ornithological desk study and field surveys undertaken is sufficient and appropriate to inform an assessment?
- Do consultees agree with the approach (including methodologies followed in the absence of Welsh-specific guidance) to field surveys and desk study proposed?
- Are there any other relevant consultees/key sources who should be contacted with respect to baseline ecological and/or ornithological information gathering and assessment?
- Do consultees agree with the surveys, and features for assessment, scoped out?
- Does NRW have any up-to-date information on the red kite population within Caerphilly?
- Does NRW have a list of those wind farm developments (and any other major development) which should be considered as part of the cumulative assessment, and any recommendations on the distance from the Site that these should be considered out to?
- Do consultees have any recommendations on biodiversity enhancement measures that they feel should be considered as part of the habitat management plan for the proposed development?

10 SOILS AND AGRICULTURE

10.1 Introduction

10.1.1 The soils and agriculture chapter of the ES would determine the impacts to soil resources (in terms of damage and loss) and agricultural land (in terms of land quality and loss of land for agricultural use); and where required propose appropriate soil management and mitigation to minimise impact of soil and land resources.

10.1.2 Agricultural Land Classification (ALC) is a standardised method for classifying the quality of agricultural land, based on factors such as soil type, climate, topography and drainage. The ALC places land into five Grades (with Grade 3 subdivided into Subgrades 3a and 3b) from Excellent to Very Poor. Grades 1, 2 and Subgrade 3a (Excellent, Very Good and Good quality land are termed Best and Most Versatile (BMV) land. National Planning policy promotes the development of non-BMV land over BMV land, or of land of the lowest quality where BMV avoidance is not possible.

10.1.3 The Predictive ALC map of Wales shows the Site as Grade 5 agricultural land. No detailed post 1988 surveys have been conducted in the vicinity of the Site.

10.2 Baseline Conditions

10.2.1 The ES will describe the baseline conditions of the site based on desk studies and field survey information. This will include a review of applicable legislation, policy and guidance.

10.2.2 Information about the soils and agricultural land present on the site has been obtained from the following published sources:

- Predictive Agricultural Land Classification for Wales,
- Soil Survey of England and Wales (1984). Soils and their Use in Wales, with accompanying 1:250,000 map, Sheet 2.
- Met Office (1989) Climatological Data for Agricultural Land Classification (ALC): Grid point datasets of climatic variables at 5 km intervals for England and Wales.

10.2.3 The Soil Survey of England and Wales (1984) indicated the Site lays in an area of disturbed soil (92c; opencast coal workings), and Wilcocks 1 (721c) soil association. A summary of the characteristics of this soil associations is provided in Table 10-1.

Table 10-1 The Soil Associations based on the Soil Survey of England and Wales (1984)+.	
Soil Association	721c Wilcocks 1
Soil Series	Wilcocks
Soil characteristic	Slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey upland soils with a peaty surface horizon. Coarse loamy soils affected by groundwater in places. Very acid where not limed.
Soil Water Regime	The main soils are severely waterlogged near the surface (Wetness Class V or VI). The wetness being due to a combination of high rainfall, slowly permeable subsoil, and gentle relief. Winter rainwater is not readily absorbed and runs off rapidly. Large available water capacity avoids droughtiness conditions.
Erodibility*	
+Soil Survey of England and Wales (1984) Soils and their Use in Wales, with accompanying 1: 250,000 map, Sheet 8. *Taken from Cranfield University (2015)[35]	

10.2.4 The baseline soils information indicates that organic soils may be present across the site and peat may also occur. Organic soils are classed as highly sensitive under current planning guidance.

10.2.5 The 'Predictive ALC' 1:250,000 mapping provided by Defra shows the site to be ALC Grade 5 (very poor quality agricultural land) meaning it has little potential to be considered as BMV. The scale of the mapping is not accurate at the field scale as it does not pick up variations in ALC grade for areas less than approximately 80 ha; additionally, the data does not provide a distinction between Subgrade 3a (good quality, BMV) and Subgrade 3b (moderate quality, non-BMV) land. Therefore, the Provisional ALC data cannot be used to identify the scale of potential BMV land take due to the proposed extension but provides a strategic overview of the predominant ALC grading(s) within the wider area.

10.2.6 Current guidance from the Welsh Government is that land with a predicative ALC of Subgrade 3b or lower does not require a detailed ALC for to support planning. It is recommended that this be confirmed with the Land Quality Advisory Service.

[35] Cranfield University (2015). Research to Develop the Evidence Base on Soil Erosion and Water Use in Agriculture: Final Technical Report

10.2.7 Soil profile characteristics would be investigated across the site by an experienced soil scientist using a 70mm diameter hand-held Edelman auger capable of sampling to a depth of 120cm. Samples will be examined at a density of approximately one soil profile inspection per hectare, on an approximate 100m grid. This will give sufficient coverage of the site to enable accurate assessment.

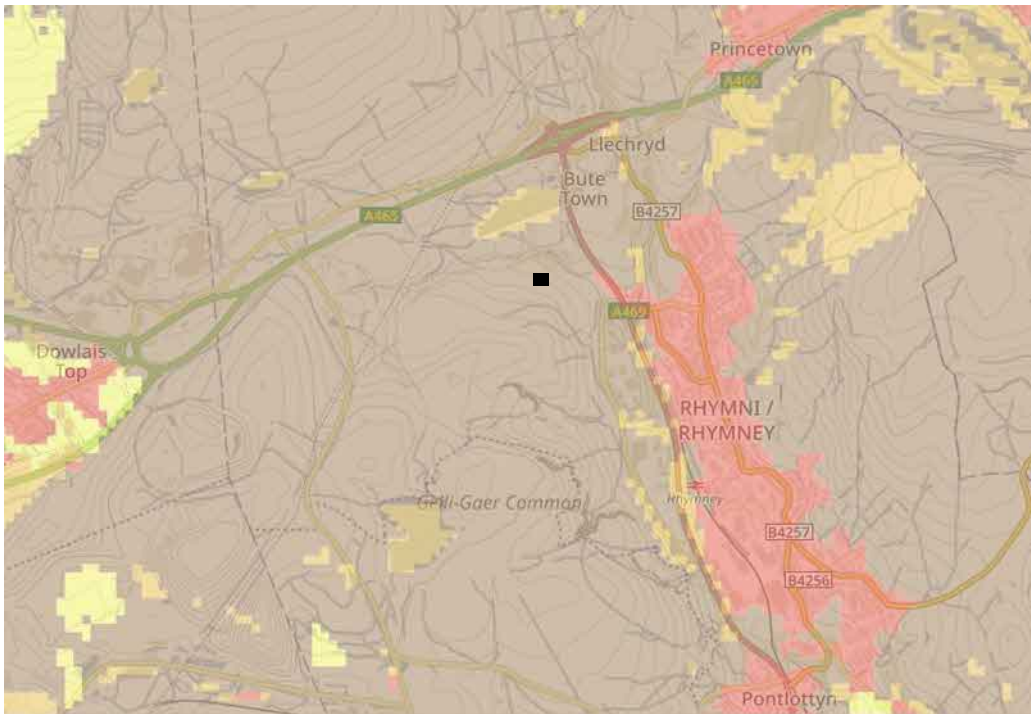


Figure 10.1 Predictive ALC (1:250,000) ALC data
(reproduced from datamap.gov.wales)

10.2.8 The baseline soils data will then be used to assess the agricultural land classification at the site. The potential impacts pre and post mitigation upon agriculture, the soil resource and drainage will then be considered. Additional comment on the safeguarding of soils during handling and storage will also be made. The purpose of this is to provide guidance and advice concerning likely constraints and liabilities to the proposed operation.

10.3 Identification and Assessment of Potential Environmental Impacts

10.3.1 The loss of agricultural land and impact on soil resources will be assessed based on three aspects.

10.3.2 Firstly, for solar PV array developments in planning, Local Planning Authorities (LPA's) are required to consult with the Welsh Government before granting planning

permission for any proposals which do not accord with the Development Plan and would involve the loss (both permanent and temporary) of 20 hectares or more of BMV land. This includes losses which are less than 20 hectares but likely to lead to further losses amounting cumulatively to 20 hectares or more (Article 14 (1) of the Town and Country Planning (Development Management Procedure) (Wales) Order 2012/801 imposes this requirement)[36]. Whilst LPAs are not required to consult with the Welsh Government on planning applications which do not 'trigger' the statutory requirement as set out in Annex B, paragraph B2, any loss of BMV land may be a material consideration in the determination of planning applications. For planning applications which do not 'trigger' the statutory requirement, as set out in Annex B, paragraph B2, the Welsh Government may take the initiative in commenting on planning applications as set out under Annex B, paragraph B5.

1.1.1 The second methodology draws upon the IEMA guidance 'A New Perspective on Land and Soil in Environmental Impact Assessment' which was published on 17 February 2022. The aim of the guidance is to advocate 'a broader approach that involves assessing the natural capital and functional ecosystem services provided by land and soils. The assessment methodology assesses the impact of the proposed development on agricultural land and soil resource by evaluating the sensitivity of each receptor and the magnitude of change the proposed development will have on each receptor. The assessment will consider the identified ALC land quality in relation to food and biomass production and the soil resources in relation to its sensitivity to damage (the resistance and resilience of the soil environment, not only the importance of the land for agricultural use) and susceptibility to erosion and/or presence of organic rich soils/peat; and the degree of loss of soil resource that could potentially occur due to the Proposed Development.

1.1.2 Additionally, the extent of the susceptibility of soils to loss both in situ (i.e. as an undisturbed soil profile) and during soil stockpiling, due to wind or water erosion (natural erosion potential), is taken in consideration. Generally, heavy (clay rich) soils

[36] The Town and Country Planning (Development Management Procedure) (Wales) Order 2012 No 801 (W.110). Checked at 5 October 2023. https://www.legislation.gov.uk/wsi/2012/801

are classified as low sensitivity (low soil erodibility), whilst fine sandy and silty soils are classified as high sensitivity (high soil erodibility).

10.3.3 However, it is important to note that soils of differing texture and structural development will behave differently following reinstatement. For example, the incorrect handling/reinstatement of a heavy (clay rich) soil whilst in a plastic state may result in a reinstated soil profile with poor internal drainage and a subsequent increased risk of soil loss (erosion) due to surface water runoff, whereas, the permeable nature of sandy soils means that the internal drainage potential of the soils is more easily maintained upon reinstatement. However, as appropriate mitigation measures may mitigate against any potential adverse impacts during reinstatement regardless of the soil texture or prevailing structure, only soil erodibility (i.e. the sensitivity of the undisturbed soil profile or soil stockpiles) is considered in the sensitivity criteria of the soil assessment.

10.4 Summary

10.4.1 The provisional ALC for the Site shows it is Grade 5 agricultural land and based on current guidance a detailed ALC survey may not be required for planning purposes. However, it is recommended this be confirmed with the Land Quality Advisory Service.

10.4.2 To support the proposal in terms of soil management a detailed soil survey would be required to both assesses and mitigate any potential impact on soil quality and determine the presence and extend of any organic soils. The assessment of effect would follow IEMA guidance.

10.5 Questions for Consultees

- Has a consultation been made with Welsh Land Quality Advisory service on the requirement for a full ALC survey?
- The site is shown as have section of historic disturbance (open cast), are any historical planning documents available that provide detailed information on this?

11 TRANSPORT

11.1 Introduction

11.1.1 A Transport Assessment (TA) will be undertaken to determine the potential transport impacts of the Proposed Development and included as a Technical Appendix to the ES. The potential significant environmental effects of the development will be assessed in a Transport ES chapter.

11.1.2 The TA will be undertaken in accordance with guidance in Welsh Government Technical Advice Note (TAN) 18: Transport dated March 2007 and other good practice. The Transport ES chapter will be prepared with due cognisance of 'Environmental Assessment of Traffic and Movement' (IEMA 2023).

11.1.3 Scoping discussions will be undertaken with the local highway authority Caerphilly County Borough Council and the Welsh Government's South Wales Trunk Road Agent prior to preparation of the Transport Assessment.

11.2 Current Baseline

11.2.1 The site is at present agricultural (grazing) land. It has frontage to the east onto the Heads of the Valley Industrial Estate access road and an unnamed lane running parallel to the A469. The A469 is a major single carriageway road which in turn leads north to the Heads of the Valley A465 dual carriageway trunk road. This scoping chapter is prepared on the assumption that the Industrial Estate access road will provide a connection to the site. For turbine components and electrical and other equipment access to the Proposed Development will be via the Industrial Estate access road, the A469 and then on to the A465.

11.2.2 Within the site are minor access roads and tracks. There are isolated residential properties and a farm at Nant Carno within the site boundary although these are to the north of proposed works. Nant Carno is accessed from the west of the Proposed Development and does not have a direct highway connection to Rhymney.

11.2.3 Also within the site there is a network of public rights of way, both footpaths and bridleways[37]. In addition, National Cycle Network Route (NCN) 468 runs the length of the Rhymney Valley (bar a gap to the south), through Rhymney town centre and up to the A465 via the A469.

[37] https://www.caerphilly.gov.uk/things-to-do/green-spaces/public-rights-of-way

11.2.4 UK Department for Transport (DfT) data includes a manual count site (reference 99675) on the A469 approximately 1.5 miles south of Rhymney at Pontlottyn. The latest count was undertaken in 2016 and shows an estimated annual average daily vehicle flow of 6,926 vehicles, of which just 1.6% were Heavy Goods Vehicles (HGVs). It is likely that there are additional HGVs travelling on the A469 from the A465 to the Heads of the Valleys Industrial Estate which would not be picked up at the DfT count site further south.

11.2.5 Another UK Department for Transport count site is available on the Heads of the Valleys Road, the A465, north-east of its junction with the A469. The most recent count was undertaken in 2019 and shows an estimated annual average daily flow of 26,884 vehicles of which 4.7% were HGVs.

11.3 Key Sensitive Receptors

11.3.1 Given that site access is via the Heads of the Valleys Industrial Estate access road, the only residential properties that would be impacted by construction traffic are located on the A469 to the immediate south of the junction with the Heads of the Valleys A465. Previous experience strongly suggests that the development impacts on these residents are likely to be imperceptible. However, this will be assessed further as part of the Transport chapter.

11.3.2 Users of the A469/A465 junction may be impacted by development related traffic. Impacts are more likely due to the passage of abnormal load vehicles than the volume of vehicles.

11.3.3 Local people as follows are also within the geographic scope of development related traffic:

- Road users on the A469, including cyclists on the NCN 468; and
- Road users on the Heads of the Valleys Industrial Estate access road, including pedestrians, cyclists and equestrian users of the contiguous public bridleway.

11.4 Potential Significant Effects

11.4.1 Traffic generated by the Proposed Development during construction is likely to be negligible in the context of existing traffic flows on the A-road network. During operation the traffic generated is likely to comprise occasional light vehicle movements for maintenance and security purposes, which is again negligible.

11.4.2 People using public rights of way in the vicinity of the site (and to a lesser extent, the NCN 468 on the A469) would be affected by disruption during construction. Mitigation would be addressed with the Caerphilly County Borough Council.

11.4.3 Abnormal loads would be required for the development, this may have an effect on people using the Heads of the Valleys Industrial Estate road, the A469 and its junction with the A465. This is likely to have potential for significant effects prior to mitigation, to be discussed with the local highway authority (Caerphilly County Borough Council) and the South Wales Trunk Road Agent.

11.4.4 It is therefore proposed that the ES is primarily focussed on the consideration of effects of abnormal load movements during the construction phase. However, there will also be consideration of effects of impacts associated with general normal HGV and light vehicle construction, even though these are not anticipated to be significant.

11.5 Proposed Methodology

11.5.1 The TA will include collection of baseline traffic data at junctions where the Proposed Development may have a material traffic impact. The development generated traffic will be estimated and distributed on the local road network.

11.5.2 The proposed extent of the TA study network comprises the following study junctions:

- Site Access/Heads of Valleys Industrial Estate access road;
- Heads of Valleys Industrial Estate road/A469; and
- A469/Heads of Valleys A465.

11.5.3 The IEMA guidance sets out two rules to 'delimit the scale and extent of the environmental 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 where traffic flows have increased by 10% or more.

11.5.4 The IEMA guidance (paragraph 2.18) states:

"It is generally accepted that accuracies greater than 10% are not achievable. It should also be noted that the day-to-day variation of traffic on a road is frequently at least +

or -10%. At a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact."

11.5.5 The assessment will therefore adopt 30% change in traffic flow and give consideration of the 10% increase in traffic in sensitive areas.

11.5.6 In accordance with IEMA guidance, the assessment will consider the following:

- Construction;
- Severance;
- Driver stress and delay;
- Pedestrian amenity and delay;
- Cyclist amenity and delay;
- Fear and intimidation; and
- Accidents and safety.

11.5.7 The effects will be considered for construction phases.

11.5.8 IEMA guidance references the Department for Transport's (DfT's) 'Manual of Environmental Appraisal' which sets out that changes in traffic flow of 30%, 60% and 90% would be likely to produce 'slight', 'moderate' and 'substantial' impacts respectively, when assessing severance.

11.5.9 The nature of each residual transportation impact will be established, and the significance of each effect is assessed as:

- Beneficial - Meaning that they produce environmental benefits in transportation terms, i.e. where overall traffic flows or percentage HGV decrease, where the performance of the local highway network is predicted to improve or there are improved facilities for pedestrians, cyclists or public transport users.
- Negligible - Meaning that changes are too small to meaningfully measure.
- Adverse - Meaning that they produce environmental dis-benefits in transportation terms, i.e. where overall traffic flows or percentage HGV increase, where the performance of the local highway network is predicted to decline or there are reductions in facilities for pedestrians, cyclists or public transport users.

11.5.10 Beneficial and adverse effects will be further characterised as:

- Slight - Very short or highly localised changes of no significance.
- Moderate - Limited change by extent, duration or magnitude.
- Substantial - Considerable change by extent, duration or magnitude of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

11.5.11 For the purposes of the ES, substantial effects, and moderate effects, will be considered significant in EIA terms.

11.6 Mitigation

11.6.1 It is anticipated that a construction traffic management plan (CTMP) will be required to mitigate any significant effects. These plans will specify approved HGV routes and mechanisms for enforcement of these, which will minimise the impact of sensitive receptors.

11.6.2 The majority of HGV traffic generated by the Proposed Development during the construction phase are normal HGV loads carrying non-hazardous substances. There will be some abnormal loads associated with the delivery of turbine components. It is also possible that other components such as cable drums, cranes, and drilling equipment may be brought in by abnormal load. The proposed route of these abnormal loads is yet to be but is likely to comprise the A469/A465. All abnormal load movements are regulated by the Welsh Government and will be subject to separate agreement with the relevant highway authorities and police through the Electronic Service Delivery for Abnormal Loads (ESDAL) system.

11.6.3 A suitably qualified and experienced specialist abnormal load contractor will determine suitable abnormal load routes and appropriate standard safety mitigation measures, such as:

- Night-time or off-peak movement of abnormal loads to minimise impact on other road users;
- Rolling road closures (where necessary) to ensure safety; and
- Escort vehicles and signage.

11.6.4 Details of the above will be included within the Transport Assessment.

11.6.5 Diversion of the existing PRoW within the Site may be required to enable the development. As part of this, consideration will be given to safe and convenient

infrastructure during construction and operation, through liaison with the Caerphilly County Borough Council.

11.7 Questions for Consultees

- The Welsh Government PAG 'Pulling Together, Best Practice for Transporting Abnormal Loads in Wales, states that Transport Assessments should identify 'Abnormal Mitigation proposals where necessary for route to safely accommodate load'. Who is the consultee for which the level and detail of mitigation should be agreed in the context of the ES?
- Where impacts on PRoW users are not directly related to road transport, can these be assessed in the Socio-Economic chapter, and cross-referenced in the Transport chapter where appropriate?
- Do PEDW or the South Wales Trunk Road Agent have traffic data or information on recent abnormal load movements at the A465/A469 junction?

12 CLIMATE CHANGE

12.1 Introduction

12.1.1 A Climate Change chapter of the Environmental Statement (ES) will be produced by Wardell Armstrong.

12.1.2 The EIA Regulations (2017) introduced the requirement to consider climate as part of the EIA process and require a consideration of "the impact of the project on climate" and "the vulnerability of the project to climate change" (Schedule 4, paragraph 5(f)).

12.1.3 The climate change assessment will identify and assess the likely significant effects of the Proposed Development on the climate (i.e. greenhouse gas / carbon emissions), and how to minimise these. The assessment also considers how the Proposed Development adapts to a changing climate, how other EIA topics / receptors could be affected, and how resilience can be designed into this.

12.1.4 A baseline scenario will be established, and an assessment of Greenhouse Gas (GHG) emissions from the project will be undertaken including where possible, consideration of emissions as a result of the proposed wind and solar development.

12.2 Legislation, Policy and Guidance

12.2.1 The Institute of Environmental Management and Assessment (IEMA), 'Environmental impact assessment guide to assessing greenhouse gas emissions and evaluating their significance' (2022) provides a prescribed methodology to use in the assessment of GHG effects and will form the basis of the assessment.

12.2.2 Several guidance publications have been produced containing suggested methods for establishing a baseline and limited advice on techniques for applying significance thresholds. The following guidance documents will be used to inform the assessment:

- European Commission, 'Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment' (2013);
- European Investment Bank (EIB) 'Project Carbon Footprint Methodologies' (2022);
- BSI - PAS 2080:2016 'Carbon Management in Infrastructure'; and
- IEMA's guidance 'Climate Change Resilience and Adaption' (2020).
- United Nations Economic Commission Europe's (UNECE), 'Carbon Neutrality in the UNECE Region: Integrated Life-cycle Assessment of Electricity Sources' (2022).

12.2.3 Additionally, the GHG Protocol, which dictates standards in GHG accounting methods, will be utilised in defining emission scopes.

12.2.4 It is anticipated that IEMA's 'Environmental impact assessment guide to assessing greenhouse gas emissions and evaluating their significance' (2022) will act as the primary guidance for the climate change assessment, as this is the most recent available and is applicable to the UK. It is also considered to be the most holistic method of assessing GHG emissions, as it applies a whole life cycle methodology, incorporating not just the construction and operational phase of development, but also the decommissioning / end of life and beyond asset life cycle stages, allowing a more robust 'worst case scenario' to be applied. The EIB 'Project Carbon Footprint Methodologies' (2022) guidance will be used to establish the baseline scenario, as this goes into greater detail in terms of baseline methodology.

12.2.5 Guidance on the whole life cycle emissions of the BaU alternative baseline, in this case natural gas, is described through the UNECE assessment 'Carbon Neutrality in the UNECE Region: Integrated Life-cycle Assessment of Electricity Sources' (2022).

12.2.6 The assessment will also consider any national and local planning policy requirements, which include the following:

- The Town and Country Planning (EIA) (Wales) Regulations (2017);
- The Climate Change Act 2008 (2050 Target Amendment) Order 2019;
- The National Development Framework – Future Wales – the National Plan 2040 (2021);
- Planning Policy Wales Edition 11 (2021);
- Caerphilly County Borough Council Local Development Plan (2010)

12.3 Baseline Conditions, Key Receptors and Potential Impacts

12.3.1 The Site is located in Caerphilly, South Wales at the head of the Rhymney River valley. The site is adjacent to the Heads of the Valleys industrial estate. The Proposed Development will occupy Grade 5 agricultural land to the south west of Rhymney.

12.3.2 The location of a site has a considerable influence when assessing vulnerability and adaptability to future climate change. The Climate Change chapter will review this in detail, however Site location features that may have the potential to cause, mitigate or be at risk from climate change can be initially identified as:

- The increasing frequency of heatwaves, and more extreme temperatures being encountered could lead to the Proposed Development being more exposed to risk from wildfires at certain times of the year.
- Higher intensity of rainfall which could result in the Proposed Development being exposed to risk from surface water flooding during storm events.

12.3.3 The Proposed Development will impact global greenhouse gas concentrations. Therefore, within a climate change context, the key sensitive receptor to the impacts of the development will be global climate. This receptor differs from others listed within an EIA context as it is not at a distinct local scale, but a global one.

12.3.4 For the purpose of the assessment, the baseline scenario will assume that there is an energy demand. The baseline emissions will be calculated with the assumption that the equivalent energy generated from the development will be used from grid electricity, as this would deliver the same output as the Proposed Development.

12.3.5 Once the baseline emissions have been established, predicted emissions arising from the Proposed Development will be judged against them and, if it can be shown that the emissions are expected to be lower than the baseline, it will be deemed to have a positive impact, whereas, if emissions are worse than the typical development, it will have adverse impact.

12.4 Scope of Assessment

12.4.1 The scope of the climate change impact assessment is considered to be those activities associated with the Proposed Development that either directly or indirectly release GHG emissions which contribute to climate change effects.

12.4.2 The impacts of the Proposed Development on climate change will be assessed based on the emissions associated with the whole life cycle of the development, i.e., during the construction, operational and end of life stage, compared to the baseline scenario. To assess the significance of the impacts, the intensity GHG emissions per unit of output) will be compared against a baseline value.

12.5 Assessment Methodology

12.5.1 The assessment will consider both potential impacts on climate and the resilience/adaptation of the Proposed Development to climate change.

Potential Impacts on Climate (GHG Emissions Assessment)

12.5.2 The method of baseline data collection and assessment will be undertaken in accordance with current guidance and industry best practice.

12.5.3 Whole lifecycle GHG emissions for the development will be calculated following the six-step methodology established by IEMA (2022), which comprises:

1) Set the scope and boundaries of the GHG assessment.
2) Develop the baseline.
3) Decide upon the emissions calculation methodologies.
4) Data collection.
5) Calculate/determine the GHG emissions inventory.
6) Consider mitigation opportunities and repeat steps 4 and 5.

12.5.4 The approach to assessing the potential impact of the Proposed Development on climate will be undertaken following the IEMA guidance (2022). This advises that the following steps should be presented as part of the assessment:

- Baseline emissions: the existing and future emissions within the assessment boundary without construction and operation of the project.
- Net emissions (Year 1 and lifetime): the direct and indirect emissions of the project during the first year of operation and for the full lifetime of the project expressed as a change compared to the current and/or future baseline.
- Significance: a significance value should be assigned to effects based on the criteria set out.
- Further mitigation: the GHG reductions that could be achieved through the application of further mitigation (this will be expressed conditionally and may be quantitative or qualitative).
- Residual effects: a new significance value is assigned to effects taking account the further mitigation measures that have been outlined.

GHG Emissions Associated with Whole Lifecycle Stages

12.5.5 The potential environmental impact of the Proposed Development is the release of greenhouse gas (GHG) emissions into the environment as a result of the project's

whole life cycle. The assessment will focus on CO_2 emissions associated with the whole lifecycle stages of the development, defined by IEMA (2022) as: before life stage (pre-construction, product and construction process stage); use stage; end of life stage; and beyond asset life cycle (benefits and loads beyond the system boundary).

12.5.6 Following the IEMA guidance (2020), the assessment of resilience will use a combination of probability and consequence to reach a reasoned conclusion on the magnitude of the effect of climate change on the Proposed Development, including risk of vulnerability to increased heatwaves, flooding and extreme weather.

Calculating GHG Emissions

12.5.7 Emissions will be calculated by multiplying the activity data with the emission factors published annually by the Department for Energy Security and Net Zero and the Department of Business, Energy and Industrial Strategy, in line with IEMA (2022) best practice guidance.

GHG emission factor × Activity data = GHG emission or removal

12.5.8 In terms of CO_2e emissions, the project as a whole is assessed for its 'relative emissions (Re)' or net emissions. This is expressed as the difference between absolute emissions generated by the proposed project and the baseline emissions.

Relative Emissions (Re) = Absolute Emissions (Ab) – Baseline Emissions (Be)

12.5.9 This methodological approach is recommended by the EIB (2022).

Determining Significance

12.5.10 The IEMA and PAS 2080 guidance reinforces a key principle of EIA which is to reduce the impact of a project's emissions through mitigation. Therefore, it is important to look at what measures can be implemented through the design and EIA process to reduce the release of GHG emissions.

Assessing GHG Emissions

12.5.11 The EIA will quantify the 'net GHG emissions' by:

- producing an inventory of construction and operational activities likely to cause GHG emissions both directly within the project boundary and indirectly from off-site emissions (e.g. grid electricity generation);

- identifying those sources of emissions that are not expected to result in a material contribution and excluding them from further assessment;
- presenting measures that will be adopted as mitigation, following the principles of the carbon management hierarchy (i.e. avoid, reduce, off-set), to show how the anticipated GHG emissions of the Proposed Development will be reduced as far as reasonably practicable;
- considering the points above, the residual GHG emissions (following mitigation) will be compared against local policy requirements for energy demand and carbon emission reductions. This will enable professional judgement to determine the significance of the effect.
- In the absence of conflicting guidance, significance criteria will be established based on a percentage reduction against the baseline. This will be used to determine the impact of the development on climate change.
- The impact assessment will compare the predicted GHG emissions against the baseline and identify any likely significant effects, either positive or negative, based on the difference between predicted emissions and the baseline. Should significant effects be identified then mitigation will be proposed that will reduce the GHG emissions from the project down to acceptable levels.

12.5.12 Effects that are deemed to be significant for the purposes of this assessment are different to those associated with other technical chapters. The IEMA (2022) guidance states that an impact is only significant if it is major adverse, moderate adverse, or beneficial.

12.5.13 With consideration to the IEMA (2022) guidance, minor adverse and negligible effects are not considered to be significant. Impacts are only considered to be minor adverse if the project's GHG impacts are fully consistent with existing and emerging policy requirements and good practice. Impacts are only considered negligible if the development goes well beyond existing policy and design standards. It needs to be viewed as well 'ahead of the curve' for the net zero trajectory and have minimal residual emissions.

Resilience to Climate Change

12.5.14 IEMA's guidance 'Climate Change Resilience and Adaption' (2020) presents a methodology for the consideration of climate change resilience and adaption in the EIA process, which will be followed in the EIA.

12.5.15 The aim of the assessment will be to assess the vulnerability of the Proposed Development to global climate change, which will highlight the potential risk of major accidents, and to identify adaptation and resilience measures to mitigate risk.

Future Climate Scenario

12.5.16 The first stage of the assessment is to is review the future climate projections published by the Met Office (through the UK Climate Projections (UKCP18) website), which includes variables such as annual mean temperatures and annual changes in summer and winter precipitation.

12.5.17 It is proposed that the Site is assessed for climate projections under four different future climate scenarios, to cover the life of the development in varying future conditions. These range from representative climate pathway, RCP2.6 where atmospheric emission concentrations are strongly reduced, through to the worst-case scenario, RCP8.5, where emission concentrations continue to rise, unmitigated. A range of probability levels are available, although this study will use the 50% probability level (i.e. a central estimate with less uncertainty).

Assessment Methodology

12.5.18 The principal steps that will be undertaken are to:

- define the current climate at the site and surrounding region;
- assess the future climate scenario for the site and region;
- qualitatively assess, using professional judgement, how any sensitive receptors identified across other EIA topics are likely to be affected by the future climate scenario described above; and
- consider and identify the resilience and adaptive measures associated with the scheme's design or management to mitigate the risk to receptors and the development as a whole.

12.6 Cumulative Effects

12.6.1 In terms of climate change, the cumulative impacts of the Proposed Development in conjunction with any committed developments within the vicinity of the Site as identified through the scoping process are classed as Scope 3 emissions.

12.7 Likely Significant Effects

12.7.1 As climate change is a global phenomenon, highly localised climate change impacts as a direct result of emissions associated with the Proposed Development are not assessed in the same way as in other technical EIA disciplines, which consider the significance of effects on individual receptors within a specified geographical location.

12.7.2 It is certain that the emissions from the Proposed Development will contribute to global climate change. The assessment will consider these as far as possible given the information available at the outline planning stage. Effects that are deemed to be significant will have relative GHG emissions above the baseline scenario (negative impact on climate change) or below the baseline scenario (positive impact on climate change).

12.7.3 Following the IEMA guidance (2020), the assessment of resilience will use a combination of probability and consequence to reach a reasoned conclusion on the magnitude of the effect of climate change on the Proposed Development, including risk of vulnerability to increased heatwaves, flooding and extreme weather.

12.8 Mitigation Measures

12.8.1 The IEMA and PAS 2080 guidance reinforces a key principle of EIA which is to reduce the impact of a project's emissions through mitigation. Therefore, it is important to look at what measures can be implemented through the design and EIA process to reduce the release of GHG emissions. Designing in mitigation measures can also build the Proposed Development's resilience to future climate change.

12.8.2 Potential mitigation measures for the Proposed Development could include:

- introduce sustainability measures for construction;
- improved sustainable drainage to reduce flood risk; and
- provision for biodiversity, including climate resilient landscaping.

12.9 Questions for Consultees

- Do you agree with the proposed methodology?
- Are there any other receptors you consider should be included?

13 ELECTRO-MAGNETIC INTERFERENCE AND AVIATION

13.1 Introduction

13.1.1 This section relates to the potential impact of the proposed Rhymney Wind and Solar Farm on aviation assets operating in the vicinity of the Proposed Development, and the potential for electro-magnetic interference (EMI) from the turbines on communication signals being transmitted and received in the local area.

13.1.2 Wind farms have the potential to interfere with electromagnetic signals passing above ground. This can potentially affect television reception, fixed telecommunication links and other network signals. Constructing the wind and solar farm also has potential to directly impact upon existing utilities below ground if the presence of these is not clearly understood in advance.

13.1.3 An initial feasibility assessment has been carried out with consideration given to the potential impact on civil and military aviation interests and the relevant aviation stakeholders. This assessment was undertaken by means of desktop study methods, including review of the relevant aviation policy and legislation documents, and prior experience of dealing with statutory aviation bodies.

13.1.4 Poorly designed wind turbine development has potential to adversely affect aviation assets. These effects are widely publicised, and the primary concern is one of safety. In general terms, wind turbines can affect aviation in the following ways

- Physical obstacles: Turbines can present physical obstacles at, or close to, an aerodrome, or to aircraft flying at low level;
- Air Traffic Control (ATC) and Air Defence (AD) radar systems: Turbines can generate unwanted returns on Primary Surveillance Radar (PSR) displays and in some cases, affect the performance of the radar system itself;
- Communications, Navigation and Surveillance (CNS) equipment. A wide range of systems (ILS, VOR/DME, and Direction Finders) together with air-ground communications facilities, can potentially be affected by wind turbine developments.

13.2 Legislation, Policy and Guidance

13.2.1 A full explanation of the impact of wind turbines on aviation is contained in Civil Aviation Publication 764 (Policy and Guidelines on Wind Turbines)

13.2.2 The following guidance and industry standards on the potential effects of wind turbines on aviation will be used in undertaking the aviation assessment:

- Civil Aviation Publication (CAP) 168 Licensing of Aerodromes;
- CAP 493 Manual of Air Traffic Services Part 1;
- CAP 738 Safeguarding of Aerodromes;
- CAP 764 Policy and Guidelines on Wind Turbines;
- CAP 774 UK Flight Information Services;
- CAP 793 Safe Operating Procedures at Unlicensed Aerodromes;
- Military Aviation Authority (MAA) Air Traffic Management (3000 series) Regulatory Instructions;
- MAA Low Flying Manual;
- UK Military Aeronautical Information Publication (AIP);
- UK AIPs; and,
- Civil Aviation Authority (CAA) 1:500,000 Visual Flight Rules (VFR) Charts

13.2.3 There is no overarching guidance relating to the assessment of electromagnetic interference (EMI) effects.

13.3 Baseline

Aviation

13.3.1 The Site is located on agricultural fields neighbouring Heads Of The Valley Industrial Estate, in the town of Rhymney, South Wales.

13.3.2 Radar signal range can vary depending on the radar type. Air defence radar can reach distances over 60 nautical miles while PSR can detect wind turbines within 35km so there are operational implications for aircraft. As a minimum, consultation will occur with aviation receptors within 40km from the Site.

13.3.3 There are a number of aviation receptors within a 40km radius of the Site, which are shown in Table 13.1 along with their potential for radar interference.

Table 13-1: Aviation Receptors within 40km of the Site

Aviation Receptor	Distance From Site (km)
Brecon VOR	4.7
Abergavenny Hardwick Airport	21
Kemeys Commander Airstrip	25

Rhigos Airfield	18
Cardiff International Airport	40
Pen-y-Parc Farm	26

13.3.4 Consultation will be carried out at the earliest opportunity with the following aviation stakeholders and will continue throughout the planning process in order to resolve any potential aviation objections:

- Brecon VOR - The safeguarding distance for VOR equipment is 10km but the Site is 5.7km away;
- Abergavenny Hardwick Airport;
- Kenneys Commander Airstrip;
- Rhigos Airfield;
- Cardiff International Airport – There is potential visibility to two of the turbines from the Primary Surveillance Radar (PSR) at Cardiff Airport;
- Pen-y-Parc Farm;
- Ministry of Defence (MoD); and
- NATS En-Route PLC (NERL).

EMI

13.3.5 A preliminary search of the OFCOM Spectrum Information Portal has been undertaken and telecommunications transmitters/receiver licence fixed links within 500m of the Site are highlighted and are considered for potential EMI interference. The data from the portal is correct as of 12/10/2023. Further consultation with the network operator will be required for identified links.

Figure 13.1: Telecommunications Fixed Links Within 500m of the Site Boundary

13.3.6 The preliminary study has established there are three fixed links within 500m of the Site boundary: one north and two south. These links are split between five licenses which are detailed in Table 13-2 and shown in Figure 13.1. These links do not travel directly through or over the suggested locations of the wind turbines.

Table 13-2: Fixed Link Transmitters and Receivers within 2km of the Site

License No.	Issue Date	Licensee Company
1197895/1	01/07/2019	National Grid Telecoms Limited
1197863/1	01/07/2019	National Grid Telecoms Limited
1295235/1	15/11/2022	Airwave Solutions Limited
1198152/1	01/07/2019	National Grid Telecoms Limited
1197769/1	01/07/2019	National Grid Telecoms Limited

13.4 Assessment Methodology

Aviation

13.4.1 In line with other EIA topics, the assessment of effect significance will be derived from combining the sensitivity (defined as very high, high, medium, low or negligible) of the receptor with the magnitude (defined as high, medium, low or negligible) of the effect to produce an overall significance rating. However, with respect to impacts on civil

and military aviation, given the safety critical function of aviation receptors, any predicted effect upon aviation stakeholders which results in restricted activities, or has the potential to affect aviation or navigation abilities, is regarded as significant. Consequently, the threshold for distinguishing whether an effect is not significant will be when the magnitude is assessed as being negligible.

13.4.2 Assessment will include a line-of-sight analysis for radar visibility to the Proposed Development.

13.4.3 Any potential infringements of protected surfaces will also be considered.

13.4.4 The general approach to wind farm development is to avoid adverse effects on aviation and, if this cannot be achieved, find technical mitigation solutions to resolve the issues.

EMI

13.4.5 A wind turbine can potentially interfere with an electromagnetic transmission either by emitting an electromagnetic signal itself, or by physically interfering with other electromagnetic signals.

13.4.6 The distance between a turbine and a link which could result in interference can vary. Where there is a risk of interference it is industry-standard practice to calculate the Fresnel zones surrounding the link. A Fresnel zone is a 3D cylindrical ellipsoid region of space, that exists between a transmitter and receiver, surrounding the link centreline. Concentric Fresnel zones represent regions of diminishing signal strength. It is commonly accepted that a turbine should be located beyond the second Fresnel zone, to minimise the risk of electromagnetic interference.

13.4.7 There is no overarching guidance relating to the assessment of electromagnetic interference (EMI) effects.

13.4.8 A more detailed examination of the OFCOM portal information will be undertaken at an early point. In accordance with industry standard practice, consultation will be undertaken with OFCOM and telecommunication providers to determine whether there would be any effects on the links identified nearby or other links not included in the portal information.

13.4.9 To assess any potential impacts on utilities a desk-based study will be undertaken. A consultation with gas, electricity and water suppliers will take place to aid with the

identification of any utilities infrastructure that may be impacted by the Proposed Development.

13.5 Mitigation

Aviation

13.5.1 Depending on the pre-planning and scoping responses from the various aviation stakeholders, the applicant will commence detailed consultation on mitigation options such that any adverse impact on aviation operations can be alleviated.

13.5.2 Consultation will establish the potential operational impact of the Proposed Development on the PSR at Cardiff International Airport and determine whether mitigation is considered necessary.

EMI

13.5.3 If microwave or other telecommunication links are identified though the consultation process, the Applicant will seek to modify the design of the proposed wind farm to avoid creating any disruptive EMI effects. Should this not be possible, mitigation measures will be investigated in order to ensure the continued operation of the identified links. Alternative mitigation measures may involve agreement with the network operators.

13.6 Questions for Consultees

Aviation

- Do you agree with the proposed methodology?
- Are there any other receptors you consider should be included?
- Do you recommend any additional upfront consultation?

EMI

- Do consultees agree that the assessment method of determining telecoms is sufficient?
- Are consultees in agreement with the use of industry standard practice in the absence of overarching guidelines?

14 GLINT EFFECTS

14.1 Introduction

14.1.1 An assessment will be undertaken of the likely significant effects of the Proposed Development on the environment with respect to 'glint'.

14.1.2 Glint, glare and dazzle are often used interchangeably depending on the definition attached to each term by different organisations. For example, the Sandia National Laboratories defines glare as the specular direct reflection of sunlight off smooth materials, such as solar panels and does not account for the diffuse component. The US Federal Aviation Administration (FAA) on the other hand defines glint as a 'momentary flash of bright light' and glare as a 'continuous source of bright light'. The UK Building Research Establishment makes use of the terms glint and dazzle when referring to reflected sunlight from a glazed façade.

14.1.3 In all cases, reflected sunlight can be either in the form of specular reflections, which are caused by reflections from smooth surfaces or diffuse reflections which are reflections from rough surfaces. The glint assessment will interpret glint as the reflected sunlight off smooth surfaces, which causes a specular reflection and glare as the reflected sunlight off a rough surface. Owing to the intensity of glint being much higher than glare, the assessment will focus on glint effects that have potential to cause more significant impacts.

14.2 Legislation, Policy and Guidance

14.2.1 The relevant legislation, policy and guidance are listed below:

Legislative Framework

14.2.2 The applicable legislative framework is the National Planning Policy Framework (Sept 2023) – and the Planning Practice Guidance.

Planning Policy

14.2.3 The applicable planning policy is summarised as follows:

National Policy Statements (NPS)

- Overarching National Policy Statement for Energy (NPS EN-1), March 2023;
- National Policy Statement for Renewable Energy (NPS EN-3), March, 2023;
- Future Wales, The National Plan 2040, Policy 17, September 2020;

- Future Wales, The National Plan 2040, Policy 18, September 2020;

Guidance

14.2.4 The applicable guidance is summarised as follows:

- Aviation Guidance (CAA);
- Aviation Guidance (FAA); and
- Aviation Guidance (CAST).

14.3 Study Area

14.3.1 The study area for general ground-based receptors is taken to be the area within 5km of the solar panels. For aviation assets, where aircraft (and occupants of any air traffic control tower) may be at a much higher elevation, the distance is increased. Any airfields within 15km for at least initial appraisal. This study area is consistent with standard practice and hard limits within the modelling software.

14.4 Current Baseline

14.4.1 For the purpose of the assessment, the baseline is considered to be a 'zero glint baseline'. That is, the assessment will not consider other sources of glint in the surrounding environment as part of the assessment baseline. In practice, glint effects could arise from sunlight being reflected off most surfaces from glass in windows and car windscreens, to exposed metal and even tarmac and grass. It is not realistically feasible to identify and model all of these items, so it is safer to model the effects of the solar farm in isolation and determine the effects that it introduces to the environment.

14.5 Embedded Mitigation & Design Assumptions

14.5.1 For the purposes of scoping, the following design assumptions has been made: The final layout will be optimised to maximise generation whilst at the same time minimising any adverse environmental effects. Part of this consideration will be whether the type, height, orientation and inclination of the panels can be varied to reduce effects. The layout evolution throughout the design process is, therefore, considered to be a part of the embedded mitigation.

14.6 Proposed Methodology

14.6.1 Despite 'glint and glare' being acknowledged within several guidance and policy documents in the UK, there is no specific guidance on how to assess glint effects. The assessment will, therefore, rely on the approach that was originally developed by Sandia National Laboratories in the US, on behalf of the FAA to assess aviation glint impacts. The FAA approved the use of the Solar Glare Hazard Analysis Tool (SGHAT) software model, and this has now been utilised effectively in numerous countries around the world including extensively in the UK.

14.6.2 Modern solar PV panels have an anti-reflective coating that gives the panels a dark colour with a textured finish. This feature reduces the potential of glint effects occurring but cannot prevent glint effects entirely.

14.6.3 The scope of the glint assessment focus on the operational phase of the Proposed Development. It is expected that the construction and decommissioning phases of the Proposed Development will be undertaken in line with guidance provided in a Construction Environmental Management Plan (CEMP). Recommendations around minimising construction and decommissioning glint will be made but no formal assessment of the glint effects will be undertaken as this.

14.6.4 The operational effects of glint are expected to be consistent over the duration of the Proposed Development (i.e. it is assumed that the receptors considered within the assessment are fixed and present over the Proposed Development lifetime). Receptors that may be susceptible to glint effects from the Proposed Development will be identified and assessed using ForgeSolar's GlareGauge software tool (a licensed version of the SGHAT tool) to model the effects of glint on receptors for a given panel array and specification.

14.6.5 The model can predict 'low intensity glint', which is termed 'green glint', and 'medium intensity glint with potential for temporary after image', which is termed 'yellow glint'. Temporary after image is a phenomenon whereby, after glancing at a bright light, the image remains burned into the retina for a short time after looking away.

14.6.6 The glint prediction model will indicate glint effects from the Site on receptors that may be exposed to glint, if there are any at all over the course of a full year. This will include key data on the timing and frequencies of any predicted glint events. The frequency of theoretical glint events based on geometric analysis will be processed

further to present more realistic results with respect to the local weather conditions occurring at the Site.

14.6.7 The assessment will identify glint effects that are predicted to occur for ground-based receptors. Consideration will be given to the following:

- The visibility of the panels from the receptor, based on a Zone of Theoretical Visibility (ZTV);
- The geometrical area within which glint reflections can theoretically occur;
- The screening that is present in the form of trees, hedgerows and buildings etcetera; and
- Historic weather conditions in the region and the likelihood of glint-producing sunlight being present.

14.6.8 For licensed aviation receptors, the assessment will be made in-line with FAA requirements, which, in the absence of their own specific guidance, have been accepted by the UK Civil Aviation Authority (CAA). The FAA recently relaxed the requirement that no 'medium intensity glint with potential for temporary after image' be visible to pilots on final approach to the runway, from their normal viewing angles, citing glint to be an occurrence that pilots routinely deal with in the built and natural environment. However, it remains a requirement that no glint (yellow or green) be visible at an Air Traffic Control Tower (ATCT).

14.6.9 Although it is noted that unlicensed aviation receptors are afforded less safeguarding protection than their licensed equivalents, the same considerations will be given for determining the level of effect that these will experience.

14.7 Significance Criteria

14.7.1 Effects that are deemed to be 'Significant' for the purposes of this assessment are those that are predicted 'yellow glint' before mitigation. In general, low intensity green glint is considered to be 'Not Significant' unless the receptor in question happens to be an ATCT, which, due to its high sensitivity, is not permitted to tolerate green glint.

Sensitivity

14.7.2 For the purposes of this assessment, the sensitivity of the receptor is judged based on the likely consequence of a negative effect. For example, the potential consequence of a motorist or train driver being dazzled by glint could be (in a worst-case scenario) a collision or major accident.

14.7.3 A receptor that is considered to present a possible health and safety risk is allocated as a High sensitivity. A receptor that has little or no potential for physical harm, but where residents could experience a nuisance, such as glint being visible from a property, is allocated as a Medium sensitivity. A receptor that is uninhabited and irregularly frequented, or a building that does not have windows, such as a substation or warehouse, is allocated as a Low sensitivity. A place where people are not usually present, such as an agricultural field with no public access, is considered to have Negligible sensitivity (i.e. it is unlikely to cause any issues even if glint were to be visible).

14.7.4 Table 14-1 illustrates how the sensitivity is defined for each receptor.

Table 14-1 - Sensitivity Criteria for Receptors

		SENSITIVITY								
	Type of Receptor:	Dwelling	Commercial Property	Major Rd	Minor Rd	Motorway	Railway	Footpath	Aircraft	ATCT
Distance from receptor	0-500m	High	Medium	High	Medium	High	High	Low	Medium	High
	500m-1km	Medium	Medium	Medium	Medium	High	High	Low	Medium	High
	1-2km	Medium	Low	Medium	Low	High	Medium	Low	Medium	High
	3-4 km	Low	Low	Low	Low	Medium	Low	Low	Low	High
	4-5km	Low	Low	Low	Low	Low	Low	Low	Low	Medium

Magnitude

14.7.5 For the purpose of this assessment, the magnitude of effect is primarily based on the output of the computer model, which, in the event that any glint is visible, provides a binary result for standard glint effects. Green glint is low intensity glint with no potential for temporary after image. In this context 'after image' is the residual effect that remains temporarily visible after glancing towards and then away from a very bright light source. Yellow glint is higher intensity glint that does have some potential for temporary after image. Further context for the magnitude of effect is provided by the duration of effect and the time of the day that it occurs.

14.7.6 The computer model predicts glint effects in the absence of any consideration of screening and it assumes optimum sunlight conditions persist throughout the year. It does not recognise whether there is any intervisibility between the solar panels and

the receptor and does not of its own accord account for changing weather. These elements of assessment require human intervention to consider whether, in reality, visibility to panels capable of reflecting light is possible.

14.7.7 Table 14-2 illustrates how the magnitude of effects is defined for each receptor.

Table 14-2 - Magnitude Criteria							
MAGNITUDE							
Minutes	Green Glint			Yellow Glint			Red Glint
	No Screening	Partial screening	Full Screening	No Screening	Partial screening	Full Screening	All Instances
0-3000 Peak	Minor	Minor	Negligible	Major	Moderate	Minor	Major
0-3000 Off Peak	Negligible	Negligible	Negligible	Moderate	Minor	Minor	Major
3000-6000 Peak	Minor	Minor	Negligible	Major	Moderate	Minor	Major
3000-6000 Off Peak	Negligible	Negligible	Negligible	Moderate	Minor	Minor	Major
6000-9000 Peak	Minor	Minor	Negligible	Major	Moderate	Minor	Major
6000-9000 Off Peak	Negligible	Negligible	Negligible	Moderate	Minor	Minor	Major
9000 + Peak	Minor	Minor	Negligible	Major	Moderate	Minor	Major

Significance

14.7.8 This assessment is focussed on considering High and Medium sensitivity receptors. It is considered that, unless guidance suggests otherwise, yellow glint received at these receptors should be considered to be Significant. If yellow glint is predicted in the Forge Solar model (which does not account for screening), but, in reality, the receptor is already screened and there is no visibility or if visibility to potential glint effects will be removed by mitigation, effects at these receptors will be considered to be Not Significant. In general, low intensity green glint is considered to be Not Significant unless the receptor in question happens to be an ATCT is not permitted to tolerate green glint.

14.7.9 Table 14-3 illustrates the significance of the magnitude of change impact and the sensitivity of the receptors assessed.

Table 14-3 - Significance of Effect Matrix

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

14.8 Likely Significant Effects

14.8.1 Modelling of the receptors exposure to glint will be undertaken as described in the methodology section above. Once the level of glint effects at all the sensitive receptors are understood, a level of significance will be assigned. For the purpose of the assessment, unmitigated glint with the potential for after image (also termed yellow glint) will be considered potentially significant at all receptors other than Air Traffic Control Towers (for which any glint will be considered significant). The degree of screening and the sensitivity of the receptor will also be taken into account when determining the level of Significance. For example, residential receptors will have a slightly lower sensitivity than route receptors because any effect is will be a nuisance rather than posing a tangible risk to health and safety. Where a dwelling only has limited visibility from upstairs windows, this will be considered less sensitive again.

14.8.2 Table 14-4 provides a summary of the key issues to be considered in relation to glint.

Table 14-4 Summary of Likely Significant Effects

Receptor	Potential Effects	Scoped In
Construction Phase		
Residential receptors (various TBC)	Discussion provided but no quantitative assessment	X
Road receptors	Discussion provided but no quantitative assessment	X
Rail receptors	Discussion provided but no quantitative assessment	X
Aviation receptors	Discussion provided but no quantitative assessment	X
Operational Phase		
Residential receptors (various TBC)	Glint visibility – Intensity, duration and timings	✓
A465 (Main Road)	Glint visibility – Intensity, duration and timings 0.19km from the array at its closest point	✓

Table 14-4 Summary of Likely Significant Effects		
Receptor	Potential Effects	Scoped In
A469 (Main Road)	Glint visibility – Intensity, duration and timings 0.04km from the array at its closest point	✓
A4060 (Main Road)	Glint visibility – Intensity, duration and timings 1.43km from the array at its closest point	✓
A4048 (Main Road)	Glint visibility – Intensity, duration and timings 3.74km from the array at its closest point	✓
A470 (Main Road)	Glint visibility – Intensity, duration and timings 5.4km from the array at its closest point	✓
B4257 (Minor Road)	Glint visibility – Intensity, duration and timings 0.40km from the array at its closest point	✓
B4256 (Minor Rd)	Glint visibility – Intensity, duration and timings 3.40km from the array at its closest point	✓
High Street (Dowlais Top) (Minor Road)	Glint visibility – Intensity, duration and timings 1.82km from the array at its closest point	✓
Victoria Steet (Minor Road)	Glint visibility – Intensity, duration and timings 2.8km from the array at its closest point	✓
Valley Lines network: Rhymney line running south towards Cardiff	Glint visibility – Intensity, duration and timings 0.24km from the array at its closest point	✓
Merthyr Tydfil Line	Glint visibility – Intensity, duration and timings 5.06km from the array at its closest point	✓
Decommissioning Phase		
Residential receptors (various TBC)	Discussion provided but no quantitative assessment	X
Road receptors	Discussion provided but no quantitative assessment	X
Rail receptors	Discussion provided but no quantitative assessment	X
Aviation receptors	Discussion provided but no quantitative assessment	X

14.8.3 Further to the above, Table 14-5 below provides details on the matters to be scoped out of further assessment within the ES.

Table 14-5 Matters to be scoped out of the assessment	
Matter	Rationale
Construction	The installation works are temporary, and it is not possible to model effects within the standard software. Although there is a slight risk of reflections from steel legs prior to mounting the panels on top, this is limited and adopting a progressive approach to installation should considerably limit these.

Table 14-5 Matters to be scoped out of the assessment	
Matter	Rationale
Decommissioning	The decommissioning works will be virtually the mirror opposite of installation. No different effects are expected to be present and all will be temporary.

14.9 Potential Mitigation Measures

14.9.1 Glint has potential to cause different levels of effect, linked to the intensity of the glint, the time when it occurs and the receptor that is affected. Low intensity effects are not considered to require mitigation. Medium intensity glint, with potential for temporary after image, may require mitigation, especially if the affected receptor is highly sensitive.

14.9.2 Depending on situation, there are various mitigation measures that can be used. These include screening the Proposed Development by deploying hedgerow planting or fencing, re-orientating the panels so they do not present glint at certain receptors, changing the panel angle or using tracking panels rather than fixed panels. The final option is to remove sections of panels from parts of the Site if they are creating unavoidable issues.

14.10 Questions for Consultees

- Is the proposed methodology considered acceptable?
- Are there any receptors that need to be included that are not already listed above?

15 SHADOW FLICKER

15.1 Introduction

15.1.1 Under certain daylight conditions the relative position of the Earth and Sun can cause shadows to be cast from wind turbines. These shadows move as the turbine blades rotate and as the sun tracks across the sky. When observed from inside a building and viewed through a narrow aperture such as a window, the effect created may appear as a flickering of light and shadow known as shadow flicker. The ES chapter will seek to identify potential significant effects caused by the shadow flicker effect.

15.2 Guidance

15.2.1 Guidance is available for the assessment of shadow flicker effects both in the UK and internationally. The shadow flicker assessment will consider the guidance contained within:

- National Policy Statement EN3 (2011)
- Planning for Renewable Energy – A companion guide to PPS22 (2004) (now superseded but still relevant)
- Planning Implications of Renewable and Low Carbon Energy, Planning Division – Welsh Assembly Government (2010)
- Generating Your Own Energy. Wind: A Planning Guide for Householders, Communities and Businesses - Welsh Assembly Government (2010)
- Update of the UK Shadow Flicker Evidence Base (2011); and
- Wind Farm Impacts Study – Commissioned by the Scottish Government (2015)

15.3 Methodology

15.3.1 The methodology will follow best practice guidelines and consider the evidence base provided above. Only properties located approximately within 130 degrees either side of north, relative to the turbines can be affected at these latitudes in the UK, as turbines do not cast long shadows in their southern quadrant. The further the observer is from the turbine the less pronounced the effect will be.

15.3.2 Current guidelines suggest an assessment of effects should be undertaken for buildings located within 10 times the turbine rotor diameter (10RD) as effects are more diminished at distances beyond 10RD. The turbine rotor likely to be up to 140m therefore the 10RD is 1.4 km. A search will be undertaken using OS Address Base data for properties located within 10RD with a margin for error, to account for turbine

micro siting. Aerial photography will be analysed to identify properties that are not shown on the Address Point data.

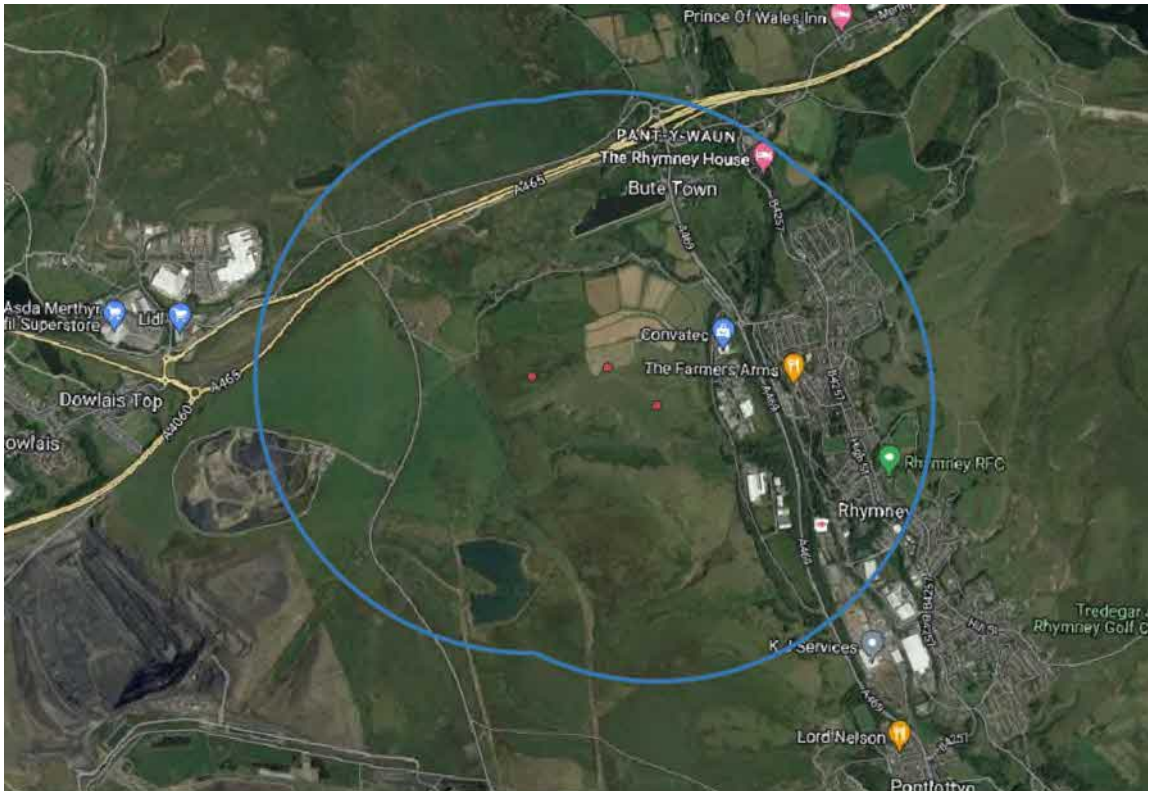


Figure 15.1 Combined 10RD radius of the three turbines. An assessment of effects should be undertaken for all buildings that fall within the blue radius.

15.3.3 It will be assumed that each house within the study area has a window of 1m x 1m, positioned at a height-to-centre of 2m above ground level on each properties north, east, south and west faces. Where properties are west of the turbine location only windows in the north, east and south faces need be considered – any west facing windows are not subject to flicker effects. Similarly, properties to the north of the turbine need only have their west, south and east facing windows considered.

15.3.4 Assessment of potential shadow flicker from the turbines will be undertaken using WindFarm®, an industry standard software package widely used for design and assessment of wind farms.

15.3.5 The results of the computer modelling will be provided, showing the total number of shadow flicker each dwelling is expected to receive each year under worse case conditions. The results will be processed to account for local prevailing climatic

conditions at the site which will reduce the predicted number of annual shadow flicker hours. The modelled shadow flicker effects may not be expected to occur due to screening provided by trees, buildings and other features and the existence of any screening features will be considered.

15.4 Significance and Mitigation

15.4.1 All shadow flicker effects will be assessed as causing an adverse impact and require mitigation. The assessment will explore mitigation measures available and provide recommendations on their implementation. Mitigation measures could be secured by a suitably worded planning condition.

15.5 Questions for Consultees

- Do you agree that 10RD is a suitable distance to assess the shadow flicker effects over?
- Do you agree with the approach of selecting representative houses to assess the shadow flicker effects rather than assessing every individual house in Rhymney that lies within 10RD?
- Do you agree with an approach of prioritising consideration of effects in residential properties rather than commercial buildings?
- Do you have any suggested receptors that you would recommend for inclusion in the assessment?

16 SOCIO-ECONOMICS

16.1 Introduction

16.1.1 This Chapter will describe the potential socio-economic effects of the Proposed Development, including impacts on livelihood activities, employment, and transport. These effects will be reviewed within a socio-economic study area (detailed below as Area of Influence) which encompasses Rhymney, and its neighbouring Counties.

16.1.2 The Scoping approach for socio-economic aspects includes the following :

- Identify and describe the applicable Legislation and Guidance around socio-economics for the Proposed Development;
- Determine and present a preliminary Area of Influence (AOI) in relation to the social effects of the Proposed Development, which can be updated in the EIA and ES stage;
- Describe at a high-level the social baseline conditions of the Area of Influence, including population profiles, employment, education, public rights of way (PRoW) and other household information on livelihoods and access to services;
- Identify and determine the impacts of the Proposed Development on the current population, their expected significance and their scoping status;
- Present the socio-economic impact methodology that will be used within the EIA; and
- Provide indicative mitigation measures, to prevent negative impacts and enhance positive impacts, to be expanded on the EIA.

16.2 Applicable Legal Framework and Guidance

16.2.1 The following section aims to summarise the applicable legal framework and guidelines for socio-economic impacts of the Proposed Development.

Guidance for socio-economic assessments

16.2.2 The socio-economic aspects review in this Scoping chapter and the corresponding Social Impact Assessment (SIA) in the Environmental Statement (ES) is based on the following guidance and standards:

- Guiding Principles from the International Association for Impact Assessment (IAIA);

- Social Impact Assessment: Guidance for Assessing and Managing the Social Impacts of Projects. Fargo ND: International Association for Impact Assessment (Vanclay, F., Esteves, A.M., Aucamp, I. & Franks, D. 2015)
- International Finance Corporation (IFC) Performance Standards and Guidance Notes, including Performance Standards 1, 2 (partially), 4, 5 and 8 (see cultural heritage chapter); and
- United Nations Guiding Principles on Business and Human Rights (UNGP).

National Legislation and Policy

16.2.3 The Well-being of Future Generations (Wales) Act 2015, including:

- Alignment with the seven well-being goals (i.e., sustainable development with prosperous, resilient, healthier, more equal, globally responsible, cohesive communities and vibrant culture and thriving Welsh language). The following goals are presented below as indicative alignments with socio-economics:
  - A 'prosperous Wales, requires a skilled and well-educated population in an economy which generates wealth and provides employment opportunities', including fair and local procurement, decent work, local economies, community energy and a low carbon society, and building skills for the future;
  - A 'more equal Wales, that enables people to fulfil their potential no matter what their background or circumstances', including 'achieving more diversity in our (…) broader workforce, and ensuring that organisations in Wales are taking preventative, integrated approaches to end poverty and reduce inequalities' through fair work, educational opportunities, participation, and equality of health outcomes (see Chapter 17 on Human Health);
  - A 'Wales of cohesive communities which are attractive, safe, viable and well-connected', including means for people to be active in their communities, more connected spaces, with increased access to key services, and cohesive or 'anchor' community organisations; and
  - A 'Wales of vibrant culture and thriving Welsh languages' through developing skills as a bilingual nation, supporting people to engage with culture, addressing wider societal issues, using the culture and Welsh language as a driver for economic and environmental change, and engaging with culture.

16.2.4 The Socio-economic Duty Equality Act 2010, including:

- Alignment with the Welsh authorities' due regard to the 'need to reduce the inequalities of outcome resulting from socio-economic disadvantage'; and
- Provision of evidence, assessment and potential improvement (enhancement measures), so that inequalities are reduced, 'encourage better decision making and ultimately deliver better outcomes for those who are socio-economically disadvantaged'.

16.2.5 The Equality Act (2010), known as the Public Sector Equality Duty (PSED) in Wales, including:

- Private sector's respect of the goals to 'eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Act, advance equality of opportunity between people who share a protected characteristic and those who do not, and foster good relations between people who share a protected characteristic and those who do not';

16.2.6 Planning Policy Wales Edition 11 (2021), including:

- 'Walking, cycling and public transport are prioritised to provide a choice of transport modes and avoid dependence on private vehicles'; and
- 'Well designed and safe active travel routes connect to the wider active travel and public transport network and public transport stations and stops are positively integrated'.

16.2.7 As mentioned in Chapter 4, the applicable EIA legislation is considered in this chapter, including:

- Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (EIA Regulations);
- The Developments of National Significance (Wales) Regulations 2016; and
- The Environment (Wales) Act 2016.

Local Planning Policy (LPP)

16.2.8 The Local Development Plan (LDP) (Caerphilly County Borough Local Development Plan up to 2021) was adopted in 2010. Key priorities for the County include:

- 'A vibrant economic landscape offering new opportunities';
- 'An appealing and coherent tourism and leisure experience';

- 'To make Caerphilly County Borough a clean, green, safe and pleasant place to live and work with decent public services';
- 'To enhance the vibrancy and diversity of local communities, in order to ensure good health and social cohesion';
- 'To ensure equal opportunities for all to proposed and existing facilities and services within and outside the County Borough';
- 'To increase the economic prosperity of the people and communities of the County Borough through the provision of land for employment opportunities, supported by appropriate housing and ancillary facilities and services (including community and health facilities, recreation, leisure etc)'; and
- 'To improve education facilities to 'up skill' the population'.

16.2.9 Merthyr Tydfil County Borough Council Replacement LDP (2016 - 2031) addresses similar issues, including, but not limited to:

- 'The impact of development on community identity and characteristics and amenity';
- 'Issue with low skills levels'; and
- 'The need to encourage and promote leisure and tourism'.

16.2.10 Blaenau Gwent County Borough Council up to 2021 (under review at the time of writing) aims to tackle the following:

- 'High levels of unemployment and economic inactivity, high benefit dependence and limited employment opportunities which together result in low household income'; and
- 'High proportion of adults have no qualifications and education attainment is generally low'.

16.3 Area of Influence

16.3.1 The Site of the Proposed Development is located directly west of the town of Rhymney, in the statutory boundary of Caerphilly County Borough. Rhymney is located in the northernmost tip of Caerphilly and is adjacent to the County Boroughs of Merthyr Tydfil to the west, Blaenau Gwent to the east, and Powys to the north.

16.3.2 The approach to determine a study area for socio-economic aspects consists of identifying the localities (cities, towns, households) in relation to the Site location and

county boroughs. In this case, the study area comprises the town of Rhymney in Caerphilly. The neighbouring County Boroughs of Merthyr Tydfil and Blaenau Gwent will also be assessed due to their close proximity to Rhymney, as the area of community effect is often not entirely corelated with statutory boundary. Residents of an area may use other facilities located within towns, districts, counties or regions outside the statutory boundary.

16.3.3 Within the study area, the social Area of Influence (AOI) is used to help assess the potential impacts on local people or communities (i.e., 'receptors' in EIA terms) from the Proposed Development. The social AOI will be defined within three levels: the Core, Direct and the Indirect AOI.

16.3.4 The Core AOI includes the area within the Site redline boundary (see Figure 16.1 below, including an indicative location of the Proposed Development). The Core AOI predominantly consists of grassland which is privately owned and currently being used for agricultural grazing.

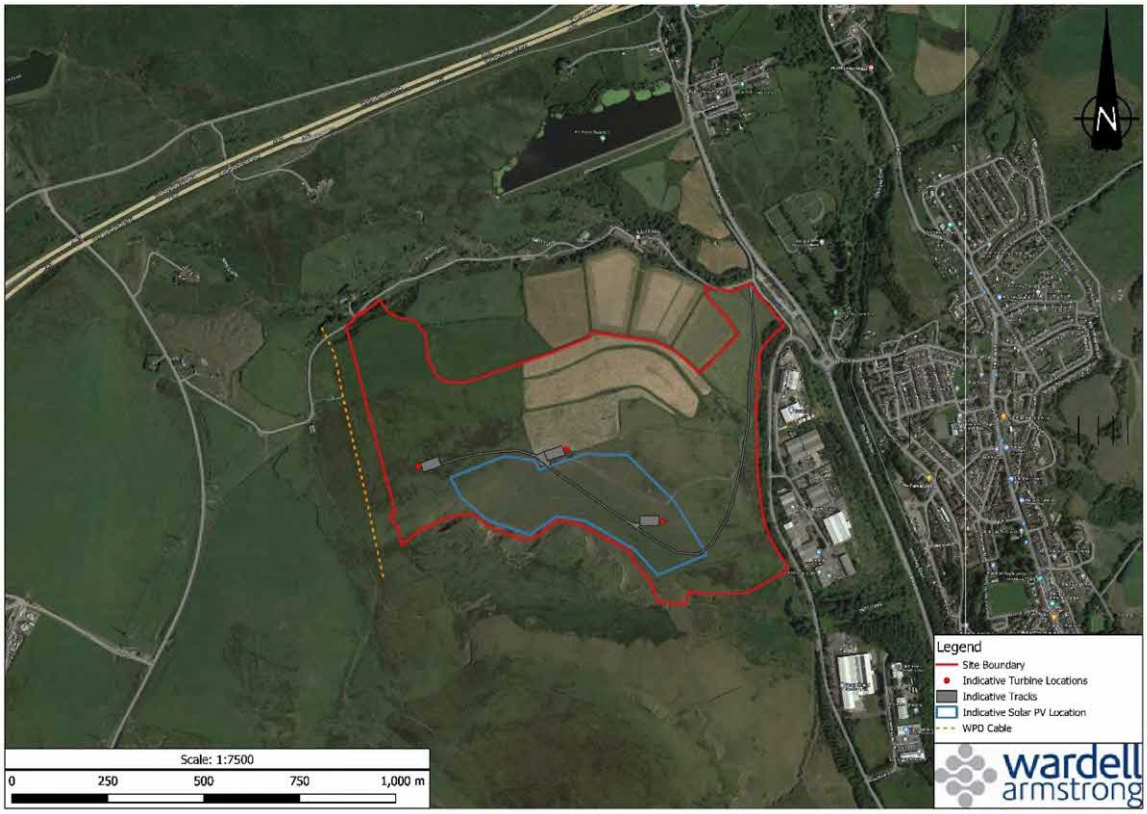


Figure 16.1 The Site, with Core Area of Influence

1.1.3 The Direct AOI relates to the area where direct effects from socio-economic impacts are expected, including the most immediate localities (cities, towns, households) that are linked through social, cultural or economic interactions to the Site, approximately within 1km of the Site. The Direct AOI for the Proposed Development includes the town of Rhymney (specifically its northern area), Bute Town and local farmhouses. The Direct AOI includes predominantly residential buildings, and alongside this, local businesses, healthcare facilities, education facilities, railway station and leisure, recreation and religious establishments (see Figure 16.2 below). Buildings of note include the Convatec premises, approximately 30 m from the Site boundary. Convatec are the Applicant and will be the main economic receptor of the Proposed Development. The proposed development is also exploring opportunities to provide direct benefits to other nearby economic receptors through the provision of low carbon electricity directly from the Site.

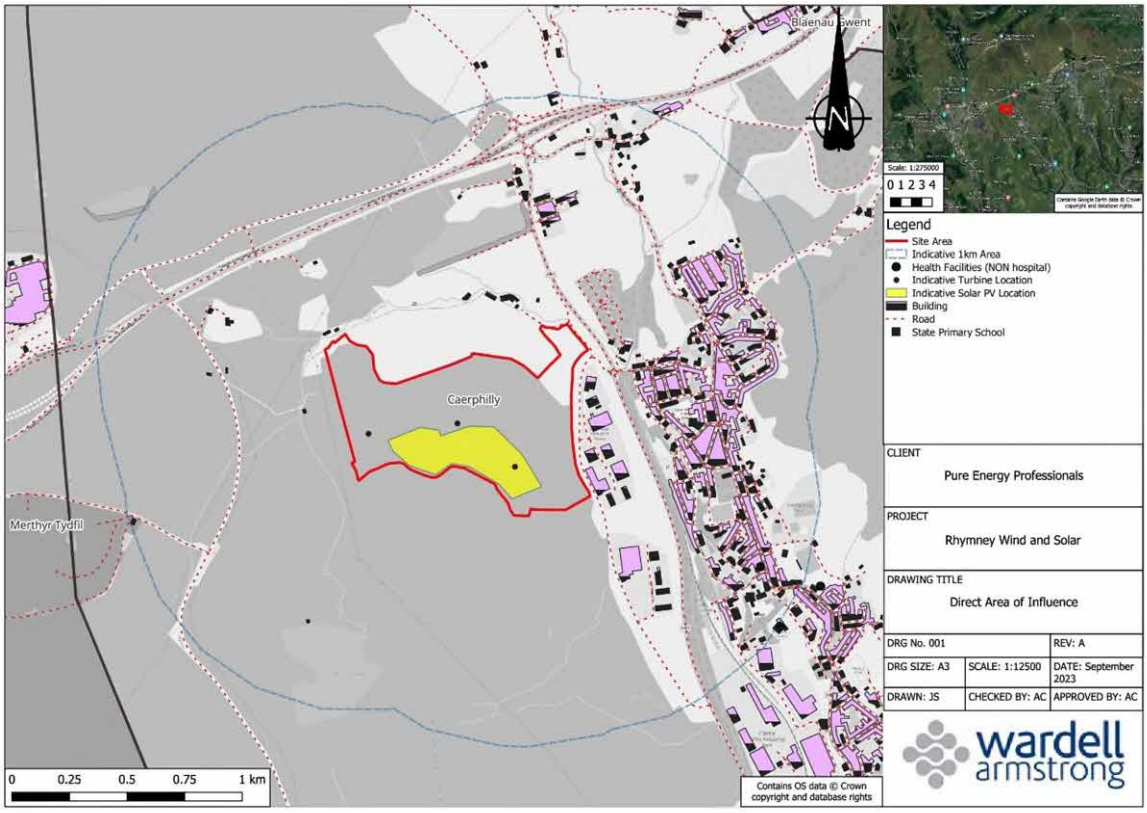


Figure 16.2 The Site, with Direct AOI (indicative 1km area), including buildings of note.

16.3.5 The Indirect AOI relates to the area where indirect and other cumulative effects from socio-economic impacts are expected, including other localities and receptors that are linked through wider transport networks, economic activities, and links to ecosystem

services (e.g. downstream effects). The Indirect AOI for the Proposed Development has been established approximately around a 5km area around the Site boundary, and includes the rest of Rhymney Town in Caerphilly (including Pontlottyn, Abertysswg, Fochriw, Pentwyn), Tredegar in Blaenau Gwent (including Cefn Golay, Nantybwch, Dukestown and Sirhowy) and the East area of Merthyr Tydfil (including Pant and Dowlais) (see Figure 16.3 below). Some of the key connectors between the Counties include roads, mainly the A465 or 'Heads of the Valleys' Road, and the electricity transmission lines between the Counties.

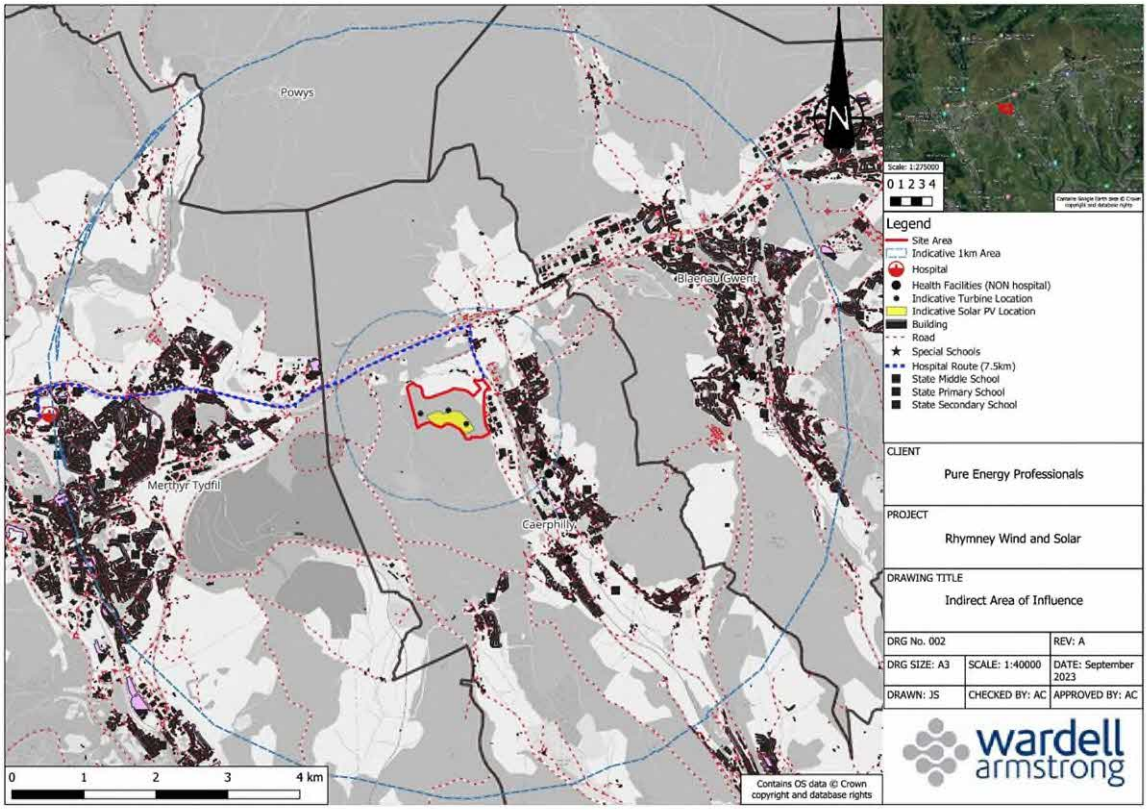


Figure 16.3 The Site, with Indirect AOI (indicative 5km area) and buildings of note.

16.4 High-level Baseline Conditions

Population

16.4.1 According to the 2021 Census of Wales, Rhymney has a population of 8,543 people with approximately 3,900 households. The ethnicity of the population is predominantly white, with 98.2% of the population in Rhymney listing under this demographic, compared to the national rate of 93.8%. There is a higher than national

percentage of people in Rhymney within working age. An age breakdown of the town and its county can be seen in Figure 16.4 below.

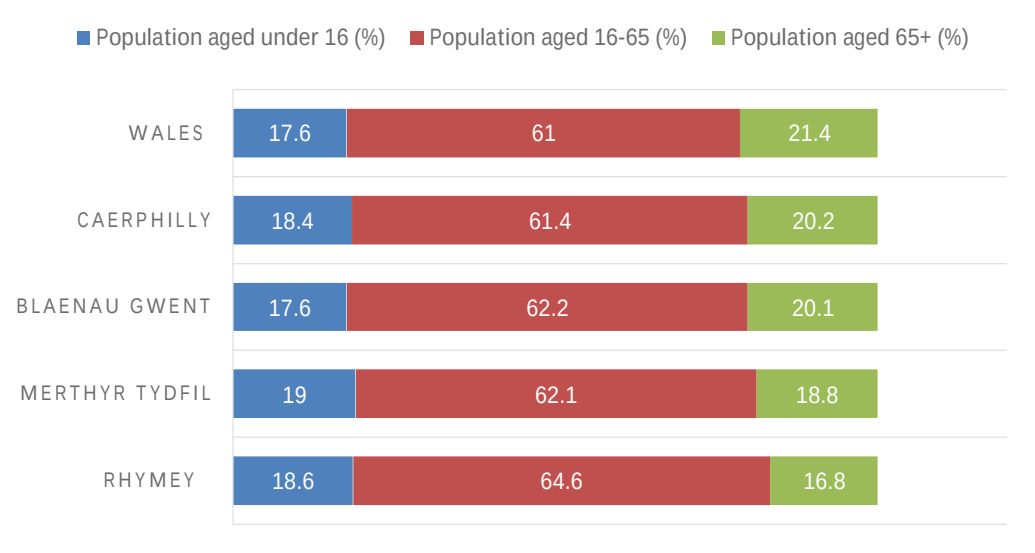


Figure 16.4 Population Distribution in percentage of Rhymney, in relation to its county Caerphilly, neighbouring Counties Merthyr Tydfil and Blaenau Gwent, and wider country (Wales) (Census, 2021).

Households

16.4.2 According to the 2021 Census, Rhymney has high rates of household deprivation, with 66.5% of households deprived in one or more dimension, compared to the national average of 54.1% (see Figure 16.5). Rhymney has a higher deprivation rate compared to the average rates of the nearby country boroughs (Wales, 2021 Census).

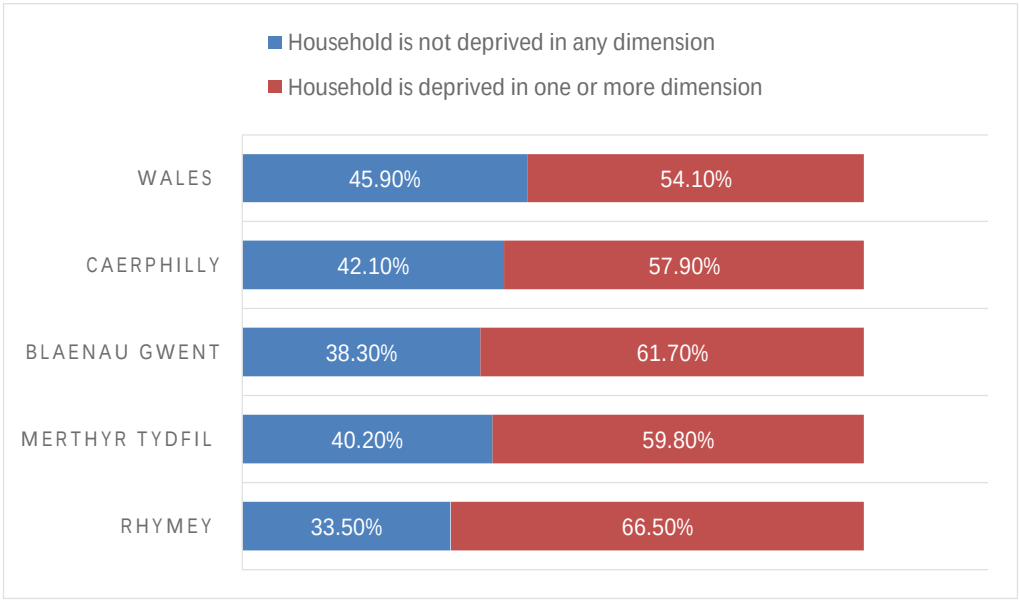


Figure 16.5 Household Deprivation of Rhymney in percentage, in relation to its county Caerphilly, neighbouring Counties Merthyr Tydfil and Blaenau Gwent, and wider country (Wales) (Census 2021).

16.4.3 The Welsh Index of Multiple Deprivation (WIMD) from 2019 highlights that there are significant levels of deprivation in pockets across the county borough. The Caerphilly County has 62.7% of its Lower layer Super Output Area[38] (LSOAs) within the top 50% most deprived category; this is the fifth highest proportion in Wales. Neighbouring Blaenau Gwent has the highest proportion at 85.1%, followed by Merthyr Tydfil at 77.8% (WIMD, 2019).

16.4.4 In addition, Caerphilly is home to four small areas (LSOAs) of 'deep-rooted' deprivation (those that have remained within the top 50 most deprived, small areas in Wales for the last five publications of WIMD ranks). Three of them are located in the AOI: Twyn Carno 1, is located in the Direct AOI, and Tredegar Central and West 2, are located within the Indirect AOI. See Twyn Carno in Figure 16.6 below.

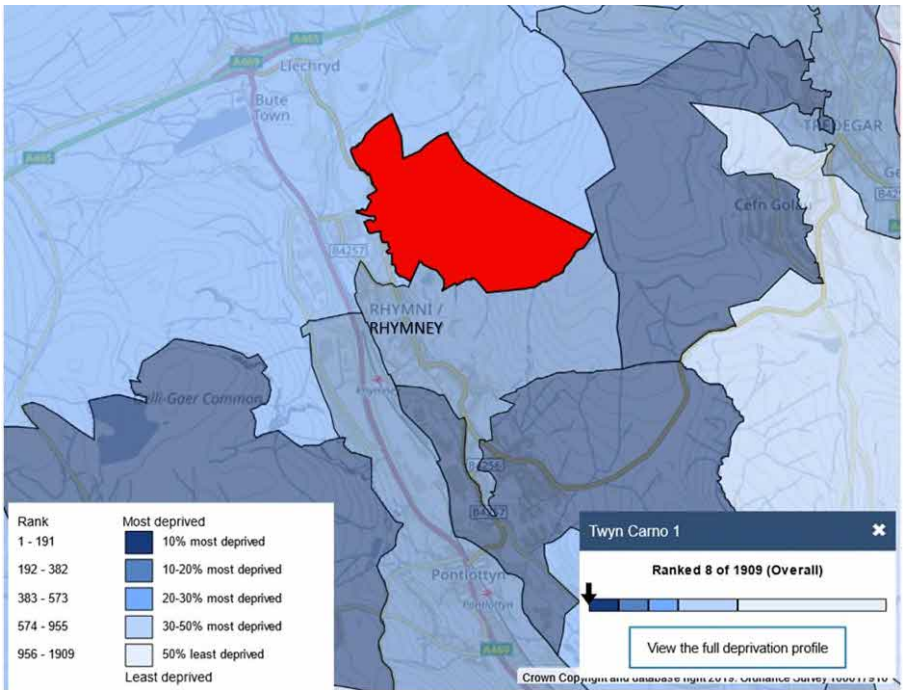


Figure 16.6 Area of deep-rooted deprivation 'Twyn Carno 1' in Rhymney (Direct AOI) (Ministry of Housing, Communities and Local Government, GOV, 2023).

[38] Lower layer Super Output Areas (LSOAs) are made up of groups of OAs, usually four or five. They comprise between 400 and 1,200 households and have a usually resident population between 1,000 and 3,000 persons. (https://www.ons.gov.uk/methodology/geography/ukgeographies/censusgeographies/census2021geographies)

Transport and Public Right of Way (PRoW)

16.4.5 The A465 Heads of the Valleys Road runs through the north of the county borough and provides good road links to Merthyr Tydfil, Swansea, and West Wales to the west, and to Ebbw Vale and the Midlands to the east. The north of the county borough links to the M50 and M5 via the Heads of the Valleys Road and the A449.

16.4.6 The town of Rhymney is also connected to local communities including Blackwood to Merthyr Tydfil via the A469.

16.4.7 Rhymney has a railway station, that connects directly to Caerphilly and Cardiff, and indirectly to multiple local towns. Alternately, there are public bus routes that run from Rhymney to Merthyr Tydfil, Tredegar and Bargoed.

16.4.8 Regarding PRoW within the Site, although land is privately owned, there is a public footpath running through the Site (RHYM/FP95/4, FP95/5 and FP95/6 alongside RHYM/FP90/2) at several points, including the border to the Projected Solar PV location (see Figure 16.7 below).

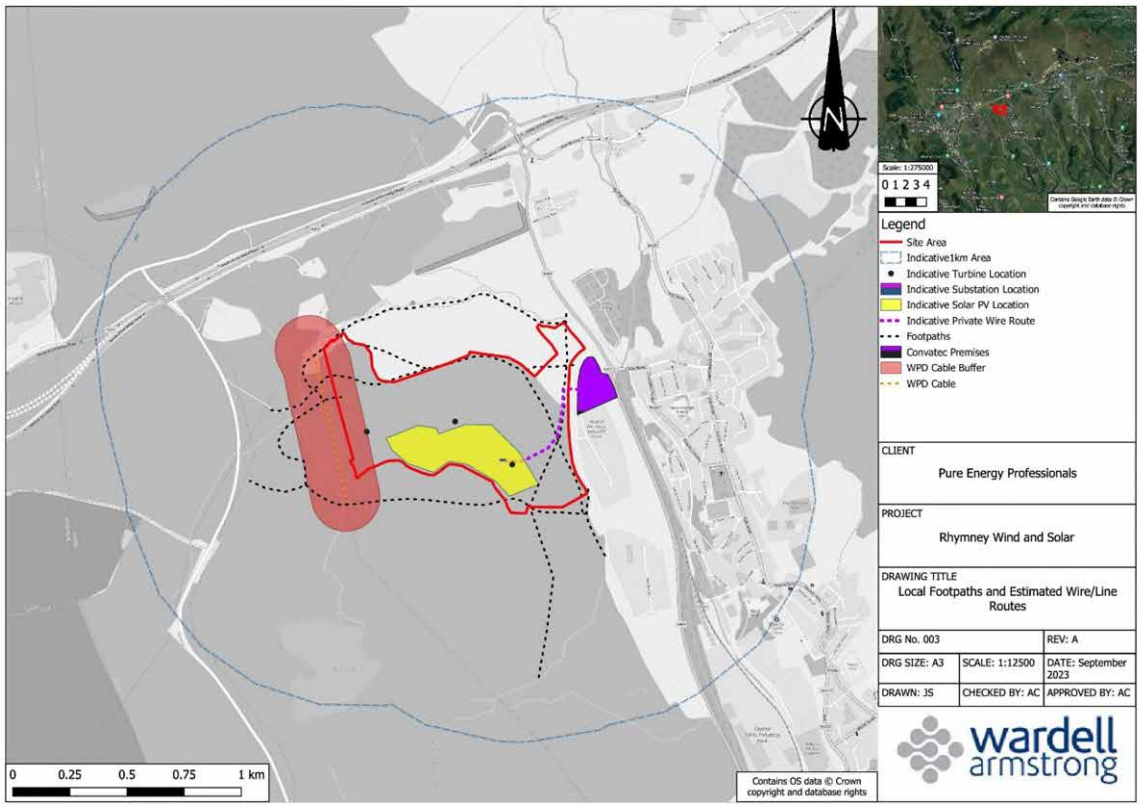


Figure 16.7 Local Footpaths and Public Rights of Way with Estimated Line Routes.

Cultural Background

16.4.9 According to the 2021 Census, Welsh speaking ability in Caerphilly county was reported at 10.5% of the population, a decrease by 0.7% from 2011 (Wales, 2021 Census). The LPP reiterates the importance of local community to propagate their heritage throughout language for future generations.

16.4.10 The majority of the population (58.9%) self-describes as having no religion (Wales, Census 2021). However, there are three churches within Rhymney, and a cemetery east of the Site boundary.

16.4.11 According to early stakeholder engagement feedback (Grasshopper Communications, 2023), there is a complex relation with mining and industrial heritage within the Direct and Indirect AOI. The Site of the Proposed Development was reportedly commissioned for coal mining historically and early stakeholder engagement in the AOI has shown that local towns are proud of their local industrial heritage. However, the historical disaster in Aberfan in 1966, less than 10 miles southwest of Rhymney, remains as a vivid and deeply-engrained legacy of mining impacts in the area.

Employment

16.4.12 In Rhymney, the percentage of population travelling less than 10km and those travelling between 10km to less than 30km, is higher than national rates, with slightly less of Rhymney's population traveling over 30km to work, compared to the National rate. This data may suggest there are local jobs in Rhymney which are in line with the existing skillset from the workforce. Workers in Rhymney have a lower rate of working from home (15.7%) compared to the national average (25.6%) (Wales, Census 2021). See Figure 16.8 below.

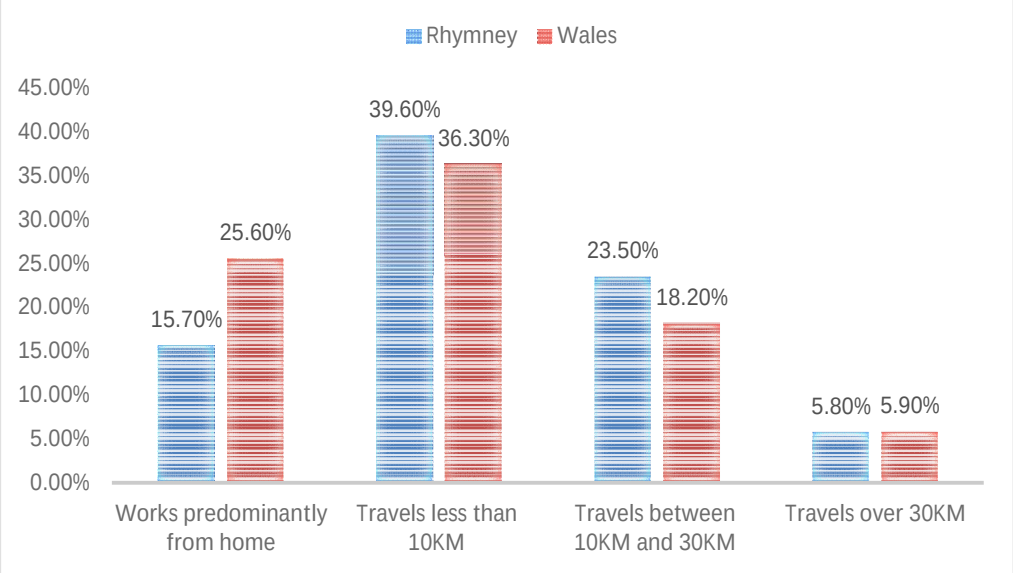


Figure 16.8 Distance travelled to work in Rhymney, compared to National rates (Census, 2021).

16.4.13 According to the 2021 Census, Rhymney has higher-than-national rates of employment in caring, leisure and other service occupations, process, plant and machine operatives and elementary occupations (see Figure 16.9). Alongside this, lower-than-national rates can be seen in occupations such as managers, directors and senior officials, professional occupations and associate professional and technical occupations. These trends can be seen across Caerphilly, and neighbouring Counties, Merthyr Tydfil and Blaenau Gwent.

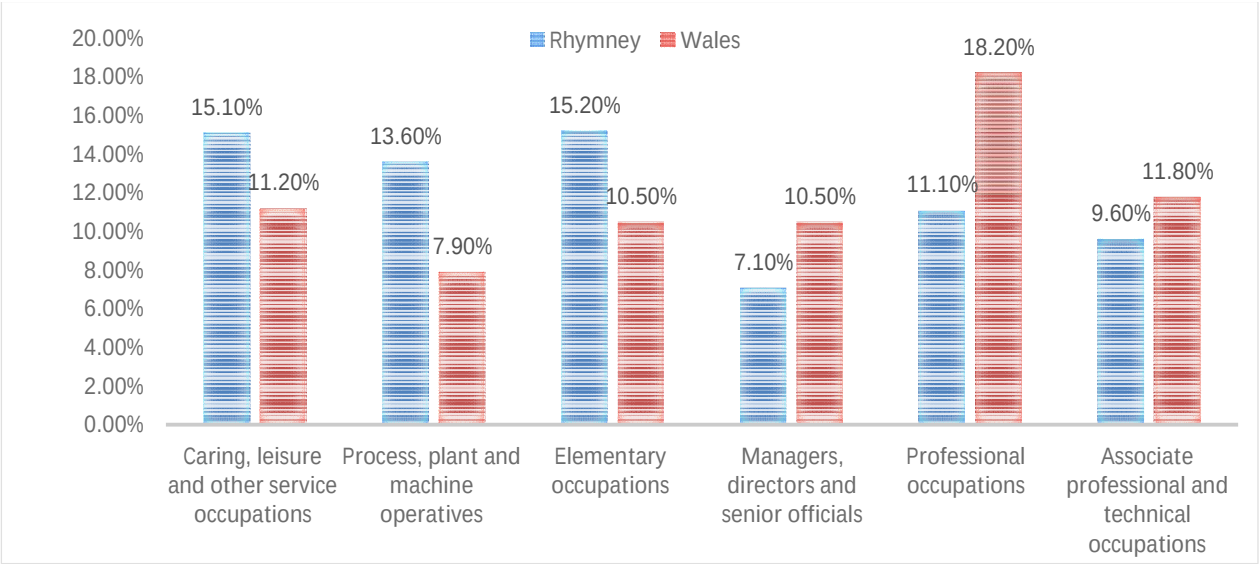


Figure 16.9 Job Profiling of Rhymney, in terms of strongest and weakest industries, compared to National rates (Census, 2021).

16.4.14 The economic activity status of the working age population in Rhymney varies from national levels, with a higher percentage of unemployed people (49.1%, compared to 43.5%). In addition, there is a higher proportion of the population that have never worked (33.2%, compared to the national figure of 23.1%).

16.4.15 Locally, Rhymney and the District Angling Society conduct fishing on Rhos Las Reservoir, also known as Rhaslas Pond, which is a 15 acre reservoir, as well as on Bryn Brith Pond and Bute Town Reservoir (approximately 675 meters from Site Boundary).

Education and Schooling

16.4.16 In the town of Rhymney there are two Primary Schools, (one Welsh, one English), two Secondary Schools, (one Welsh, one English) and a pre-school. There is also a nearby school for three to 19 year olds with special educational needs, a military school and an online college offering skill training courses. However, there is little information available on what level of qualifications can be obtained at this institution. According to early stakeholder engagement records, local proposals have been discussed to create a new school building with shared facilities to accommodate the Ysgol Y Lawnt, Upper Rhymney Primary School, and for wider community use.

16.4.17 Institutions offering University level degrees include: the University of South Wales, Cardiff University, Cardiff Metropolitan University and Swansea University, all of which are within 40 miles of Rhymney. In addition, Universities of the Heads of the Valleys Institute (UHOVI), is 14 miles from central Rhymney, primarily offering foundations degrees.

16.4.18 Full-time students in Rhymney comprise 4.6% of the population, compared to the national figure of 7.6%, according to the 2021 Census data.

16.4.19 The percentage of the population holding no qualification in Rhymney is higher than the national average. Although those holding Level 1, 2, or 3 qualifications exceeds the national average, those holding a level 4 or above, is much lower, as shown below (see Figure 16.10).

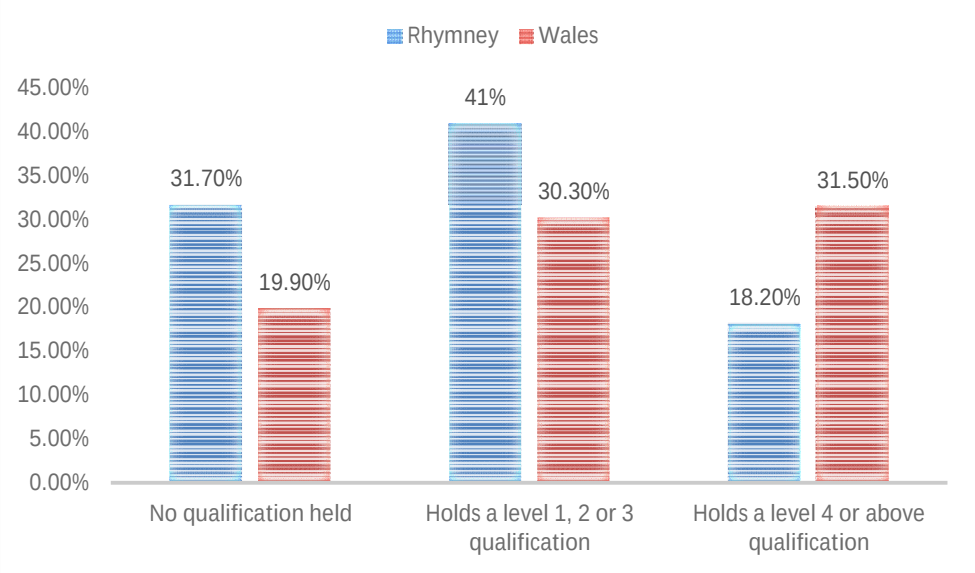


Figure 16.10 A Qualification breakdown on the population of Rhymney, compared to wider Wales (Census, 2021)

16.5 Impact Assessment Methodology

16.5.1 Whilst the scoping approach was presented in section 16.1.2 above, this section presents the Social Impact Assessment (SIA) methodology proposed for the ES. The impact assessment will be separated into a two-stepped evaluation, including a pre-mitigation and a post-mitigation assessment to identify residual impacts. The pre-mitigation assessment assumes compliance of the Proposed Development activities with the applicable regulatory framework and standard industry practices. This methodological approach is compliant with the applicable framework and also consistent with international best practice guidelines and standards.

16.5.2 The following impact assessment methodology analyses the interrelation between receptor sensitivity and impact magnitude. The first stage is identifying the list of potential receptors (listed below), to analyse potential sensitivity (resilience) against the expected effects from the planned activities, resulting in the preliminary list of impacts. These impacts will be identified throughout different stages of the Proposed Development, namely its land clearance and acquisition, construction, operation and decommissioning.

Receptor Sensitivity

16.5.3 In contrast with environmental receptors, the degree of sensitivity of social receptors is based on an individual or group's abilities and capacity to adapt to changes and maintain their quality of life, livelihood and health conditions. Sensitivity can be

understood in terms of resilience to change (e.g., capacity to cope with socioeconomic changes) and the individual's access to resources and social support networks to adapt to them. Sensitivity can be further determined by several factors such as a receptor's age, gender, ethnicity, access to employment opportunities, livelihood, education, health, level of marginalisation and dependence on natural or common resources. This is highlighted in Table 5-1Table 16-1 below.

Table 16-1 Social Receptor Sensitivity Scale

Sensitivity of receptor	Description of receptor
Negligible	A social receptor with no need to adapt to change or has a high capacity to adapt completely and almost immediately. Receptor has no shortage of access to adequate resources (material, financial, social) and will have no difficulty adapting to changes.
Low	A social receptor with capacity and means to adapt to change and maintain/improve current conditions on its own after a certain time. Receptor has a high level of access to resources and has a high capacity to adapt to changes.
Medium	A receptor with limited capacity and means to adapt to change and maintain/improve current conditions. Adaptation may take time and/or may only be partial and can require support from mitigation measures. Receptor has some access to resources and retains capacity to partially adapt to changes.
High	An already vulnerable receptor with very little capacity and means to adapt to change and maintain/improve current conditions. Receptor has very limited access to resources, resulting in multiple levels of vulnerability that limits capacity to adapt to changes.

Impact Magnitude

16.5.4 In alignment with the environmental methodology, the magnitude of a potential social impact is a measure of the degree of change from the social baseline conditions and is comprised of different 'elements' that result in different magnitude levels. Each element is described in Table 16-2 below.

Table 16-2 Elements of Impact Magnitude

Element	Description
Type	Beneficial (positive): An impact that is considered to represent an improvement to social baseline conditions or the introduction of a new desirable factor. Adverse (negative): An impact that is considered to represent an adverse change from social baseline conditions, or the introduction of a new undesirable factor.

Table 16-2 Elements of Impact Magnitude	
Element	Description
Duration	Short term: Impacts that are predicted to last for a limited period (during construction) or will cease within less than a year. Medium term: Impacts that are predicted to last through construction and the beginning part of operations or for a period of one to five years. Long term: Impacts that are estimated to occur throughout construction and operations or from six to the end of operations stage. Very long term: Impacts that affect a receptor during the development lifecycle and will remain post-closure.
Reversibility	Reversible: Impacts are predicted to be reversed after the end of the development activities or on application of mitigation. Irreversible: Impacts that cause a permanent change in the affected receptor or resource that endures substantially beyond the development lifetime.
Spatial Extent	Local: Include the Core, Direct and Indirect Area of Influence. Regional: Include multiple districts or Counties. National: Encompass most of the national territory. International: Encompass more than one country.

16.5.5 Following this step, a definition of the overall magnitude level is made considering the combination of elements, presented in Table 16-3 below.

Table 16-3 Magnitude of Change Scale (Social)	
Magnitude Level	Description
Negligible	Potential impact will not result in any measurable or perceivable changes to baseline conditions. They are largely local, reversible and short-term.
Low	A potential impact that is unlikely to have a measurable effect on the wellbeing of people so that the baseline conditions will not be considerably affected beyond a local, reversible and medium term.
Medium	A potential impact that is likely to be medium term or above, spatially regional (likely to affect a limited number of social receptors) and reversible.
High	Potential impact will result in measurable change on baseline conditions and is likely to affect a moderate number of social receptors, causing livelihood change on a moderate scale. May or may not be reversible depending on specific conditions.

16.5.6 The level of effect is defined through the matrix in Table 16-4 below.

Table 16-4 Level of Effect Matrix (Social)				
Receptor Sensitivity	Magnitude of Change			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible	Minor	Moderate
Low	Negligible	Minor	Minor	Moderate
Medium	Negligible	Minor	Moderate	Major

Table 16-4 Level of Effect Matrix (Social)				
Receptor Sensitivity	Magnitude of Change			
	Negligible	Low	Medium	High
High	Minor	Moderate	Major	Major

16.6 Scoping Potential Impacts

16.6.1 Identified Receptors in relation to the Core, Direct and Indirect AOI include:

- The Landowner of the Site;
- Local residents of AOI;
- Local Workforce of AOI;
- Agriculture employees;
- Business Owners;
- Economically active population (EAP);
- Road users;
- Employees of Convatec; and
- County Borough Councils of Caerphilly, Merthyr Tydfil and Blaenau Gwent.

16.6.2 Identified Receptors outside of the AOI include:

- Road users outside AOI; and
- Workforce out of AOI.

16.6.3 The following tables will identify potential impacts of the Proposed Development, throughout the construction (see Table 16-5) operational (see Table 16-6) and decommissioning stage of development (see Table 16-7), in relation to their receptors, and whether they are to be scoped in, or scoped out.

Table 16-5 Potential Impacts of Proposed Development within Construction Phase.		
Receptor	Potential impact	Scoped in or Out
Economically active population, specifically those with construction skills, residents of AOI, business owners	There will be a positive impact on employment within the construction phase of development, creating short term employment opportunities.	Scoped In

Residents and business owner in Direct and Indirect AOI, road users in Rhymney and Blackwood	For a temporary period during construction, it is likely there will be increased exposure to traffic and some potential for delays, as well as a light increased risk of road traffic accidents from construction vehicles and construction employee vehicles.	Scoped In
Residents and business owners in Direct AOI and Indirect AOI, road users	During the construction period there may be some associated construction noise. This was a concern noted during initial Stakeholder Engagement. Consideration to be given to effects on tourism / leisure activities near the Site, including recreation in/on the local reservoir.	Scoped In
Residents and business owners in the Direct AOI, wider County economy	Influx of construction workers causing increased spending and GVA.	Scoped In

Table 16-6 Potential Impacts of Proposed Development within Operation Phase.

Receptor	Potential impact	Scoped in or Out
Residents and business owners within the direct AOI,	There will be some visual impact for the Site, which could affect tourism and leisure time spent near the Site, including recreation in/on local reservoir. This was a concern noted during initial Stakeholder Engagement. In particular, concern was raised over the adjacent cemetery, with visiting areas overlooking the Site of the Proposed Development.	Scoped In
Residents and business owners in the Direct AOI, wider County economy	Increased spending and GVA from job opportunities and wider supply chain support.	Scoped In
Employees of Convatec	Increased job security for existing employees due to increased energy and economic security for Convatec.	Scoped In
Economically active population, specifically those with construction skills, residents of AOI, business owners	Increase in full-time, long-term employment, leading to increased GVA	Scoped In
Landowner	No further impacts from land acquisition from the Proposed Development are expected with the current design. As such, there is no further economic displacement during operations.	Scoped Out

Table 16-7 Potential Impacts of Proposed Development within Decommissioning Phase.		
Receptor	Potential impact	Scoped in or Out
Economically active population, specifically those with construction skills, residents of AOI, business owners	There will be a temporary positive impact on employment within the decommissioning phase of development, creating short term employment opportunities.	Scoped In

16.7 Cumulative effects

16.7.1 The impacts listed above may be exacerbated by the already large number of wind and solar farms in the area. For example, cumulative impacts could have temporal, spatial and synergic effects due to workers from different projects placing a greater strain on healthcare infrastructure, aggregated traffic and accumulated changes to place-based attachment in the area.

16.7.2 Current Operational Wind Farms in the Indirect AOI include:

- Pen Bryn Oer Wind Farm (1.6 km northeast from Site boundary).

16.8 Environmental Context

16.8.1 The assessment of socio-economic impacts has been undertaken in relation to the environmental context of the Proposed Development, see listed chapter for further details:

- Landscape (see Chapter 5);
- Noise (see Chapter 6);
- Transport (see Chapter 11); and
- Human Health (see Chapter 17).

16.9 Design Assumptions

16.9.1 For the purpose of this Scoping Report, the following design assumptions have been made about the Site:

- The number of employment opportunities presented, is based on benchmark academic studies, as no information has been given at this time regarding construction, or Full-time employment (FTE) plans, regarding maintenance and operation of the Proposed Development.

- WA assumes that these roles will be sought locally, although no specific plans for local employment have been shared.
- The lifespan of the Proposed Development has been assumed to be 30 years.
- The cable location and buffer have been designed to connect the Proposed Development to the Electricity Transmission System, potentially affecting local footpaths. WA has assumed that these cable corridors will affect the usage of Public Right of Way temporarily, and that the public will regain access shortly after their installation and based on landowner agreements. The location of cable routes and corridor will be refined during the Environmental Statement.
- An assumption has been made that other Chapters have fully assessed the environmental impact of the Proposed Development, in regards to their primary focus.

16.10 Indicative Mitigation Measures and Enhancements

16.10.1 The following mitigation measures are presented as indicative and not exhaustive to the measures that will be developed in the ES:

- Limiting increased commuting time due to construction and workforce traffic in the area and manage exposure to traffic incidents through the implementation of a Traffic Management Plan. The Plan would include key roads, sensitive crossings and nearby pathways to determine the least impactful traffic and equipment transport plan and access road locations, with prior disclosure;
- Limiting economic displacement by allowing agriculture and grazing whenever possible within the Proposed Development footprint;
- Maintaining access to PRoWs whenever possible, in agreement with the landowner and as long as safe and secure passage is feasible; and
- Limiting visual impact to local sensitive areas such as the cemetery in the east.

16.10.2 The following indicative enhancement measures will be further developed in the ES:

- Promoting local employment and supply chain provision, focussing on increasing more equitable opportunities for the most deprived areas through a Local Employment Plan. The LEP could upskill local workforce to become solar / wind farm maintenance workers during operations and develop transferable skills;

- Proposing a Community Investment Plan or, developing a Social Value Strategy for the AOI in which the Proposed Development community fund is targeted at key areas identified through stakeholder engagement with Convatec and local communities. For instance, preserving Welsh culture and language, increasing accessibility to education services (also upskilling through the LEP), or proposing energy saving strategies and renewable energy micro-projects for local schools, in alignment with the LDP; and
- Discussing with the local authorities and community how the potential excess power generated from the Proposed Development could indirectly help with local development, in line with Convatec's priorities.

16.10.3 The following stakeholder engagement approaches are proposed:

- Continuing voluntary stakeholder engagement with Direct and Indirect AOI communities, through the development of a Stakeholder Engagement Plan (SEP);
- The SEP could include communication strategies through local newsletters in the AOI, use adverts in local press prior to consultation (e.g., Rhymney Valley Express), frame future engagement with communities and businesses in the AOI, propose collaboration with local organisations to undertake exhibitions of relevance for the communities, and develop physical and digital disclosure information; and
- The SEP could include a Grievance Mechanism, consisting of a continuous means to receive, register, address and reply to feedback from local stakeholders.

16.11 Summary

16.11.1 The Proposed Development will aim to align with key Welsh legislation, most importantly the Well-being of Future Generations Act (Wales) 2015. This scoping study aimed to determine potential effects of the Proposed Development on the surrounding area, both positive and negative. Mitigation and enhancement measures for the assessment should be consistent with the aforementioned Act, primarily through increased equitability in socio-economic opportunities.

16.11.2 In order to collect relevant socio-economic data and scope potential socio-economic effects of the Proposed Development, this study has determined three Areas of Influence: Core, Direct and Indirect. The Core AOI is comprised of the footprint of the Proposed Development and the area most likely to be impacted, while

the Direct and Indirect AOI were determined over an adjacent, wider area outside of the Site footprint.

16.11.3 This scoping study sets out a two-staged IA methodology, with a pre-mitigation assessment considering expected industry standard practices and a post-mitigation assessment with additional mitigation and enhancement measures, resulting in a residual impact. Impact significance is based on the correlation between receptor sensitivity and impact magnitude, with specific criteria for socio-economic aspects.

16.11.4 The high-level socio-economic baseline data included in this Chapter helped determine a preliminary list of social receptors and a preliminary list of expected effects per stage of development. Baseline data collection showed that Rhymney and the surrounding areas of the Caerphilly County Borough are some of the most deprived parts of Wales, which suggests relative vulnerability to changes to baseline conditions, and high sensitivity of social receptors. Some of the main impacts that were scoped in include the creation of employment opportunities, as well as negative impacts from increased traffic and reduced access to PRoWs and green spaces.

16.11.5 This scoping study also recognised a need to assess cumulative socio-economic effects from other neighbouring projects in the Indirect AOI, depending on construction schedules. These cumulative effects have a potential to become substantial in terms of construction traffic and landscape impacts. Conversely, these projects may provide cumulative beneficial impacts from employment creation which could be harnessed locally through Local Employment Plans.

16.11.6 The existing baseline study highlights the need for enhancement measures to reduce inequality in the Area of Influence and potentially boost the resilience through skilling-up training, which should be explored further in the Environmental Statement.

16.12 Questions for Consultees

- What is the preferred approach to assessing cumulative impacts?
- Are there are potential vulnerable groups in the area that should be the focus of more equitable project benefit distributions?
- Are there any further socio-economic impacts to Rhymney that need to be addressed, both beneficial or adverse for the community and wider Country?

17 HUMAN HEALTH

17.1 Introduction

17.1.1 This chapter will describe the potential human health effects of the Proposed Development, including physical health, wellbeing and access to healthcare facilities. These effects will be reviewed within a human health study area (detailed below as Area of Influence), which encompasses Rhymney and its neighbouring Counties.

17.1.2 The Scoping approach for human health aspects includes the following:

- Identifying and describing the applicable Legislation and Guidance around health, in relation to the Proposed Development;
- Determine and present a preliminary Area of Influence (AOI) in relation to the social effects of the Proposed Development, which can be updated in the Environmental Impact Assessment (EIA) and (Environmental Statement) ES stage;
- Describe at a high-level the social baseline conditions of the Area of Influence, including population profiles, general health, health inequality and access to services;
- Identify and determine the impacts of the Proposed Development on the current population, their expected significance and their scoping status;
- Present the human health impact methodology that will be used within the EIA; and
- Provide indicative mitigation measures, to prevent negative impacts and enhance positive impacts, to be expanded on the EIA.

17.2 Applicable Legal Framework and Guidance

17.2.1 The following section aims to summarise the applicable legal framework and guidelines for human health impacts of the Proposed Development.

Guidance for human health assessments

17.2.2 The review of human health aspects in this Scoping chapter and the corresponding Health Impact Assessment (HIA) in the ES are based on the following guidance and standards:

- Effective Scoping of Human Health in Environmental Impact Assessment, Institute of Environmental Management and Assessment (IEMA), 2022.
- Determining Significance for Human Health in Environmental Impact Assessment, IEMA, 2022.
- London Healthy Urban Development Unit (HUDU) Rapid HIA Tool, 2019.
- Health Impact Assessment (HIA) Overview, Wales Health Impact Assessment Support Unit (WHIASU), 2020.

- Health Impact Assessment, International Best Practice Principles, IAIA, 2021.
- Human Health: Ensuring a high level of protection, International Association for Impact Assessment (IAIA), 2020.
- Health Impact Assessment (HIA) tools and methods, World Health Organisation (WHO).

National Legislation and Policy

17.2.3 Well-being of Future Generations (Wales) Act 2015,

- Alignment with the seven well-being goals (i.e., sustainable development with prosperous, resilient, healthier, more equal, globally responsible, cohesive communities and vibrant culture and thriving Welsh language). The following goals present a legislative framework in which health is indicated as a key element in local planning policy and development management decision.
- 'A healthier Wales' including the maximisation of physical and mental well-being and the understanding of healthy choices and behaviour.
- 'A Wales of cohesive communities' highlights social well-being, including 'attractive, viable , safe and well-connected communities'.
- 'A Wales of vibrant culture and thriving Welsh language', includes the promotion of sports and recreation.
- 'A globally responsible Wales' places global well-being as the overarching focus of economic, social, environmental and cultural well-being in Wales.

17.2.4 Planning Policy Wales 2021;

- 'The local community are involved in the development of proposals. The needs, aspirations, health and well-being of all people are considered at the outset';
- 'Proposals are shaped to help to meet these needs as well as create, integrate, protect and/or enhance a sense of community and promote equality.'

17.2.5 Other National Legislation and Policy around Health in Wales include the following;

- Public Health (Wales) Act 2017;
- The Environment (Wales) Act 2016;
- Mental Health (Wales) Measure 2010;
- Planning Policy Wales Edition 11 (2021);
- National Health Service (Wales) Act 2006 highlight the importance of community health within the climate emergency:
- 'The health and well-being of people and places and the need to address the climate emergency and its consequences provide added inputs for proactive action through the planning system'.

17.2.6 The applicable EIA legislation is also considered withing this chapter, including:

- Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (EIA Regulations);
- The Developments of National Significance (Wales) Regulations 2016; and
- The Environment (Wales) Act 2016.

Local Planning Policy (LPP)

17.2.7 The Local Development Plan (LDP) (Caerphilly County Borough Local Development Plan up to 2021) was adopted in 2010 and its priorities include:

- 'A well-educated, skilled and healthier population'; and
- 'To enhance the vibrancy and diversity of local communities, in order to ensure good health and social cohesion; to contribute to improving public health, by promoting land use developments that contribute to healthy lifestyles and wellbeing'.

17.2.8 The Caerphilly Community Strategy and the Health, Social Care and Wellbeing Strategy aim to:

- 'reduce health inequalities by tackling deprivation and the wider determinants of health'; and
- 'improve public health by promoting factors that contribute to healthy lifestyle and well-being'.

17.2.9 Merthyr Tydfil Replacement Local Development Plan 2016 – 2031 also encourages:

- 'To improve human health and well-being and reduce inequalities'; and
- A vision where 'People live, work, have a safe, healthy and fulfilled life'.

17.2.10 Blaenau Gwent County Borough Council up to 2021 (currently under review as of September 2023) Challenge 9: Promoting health and well-being for all aims to tackle the following issues:

- 'Blaenau Gwent has low life expectancy and high numbers of people with limiting long-term illness'; and
- 'Fear of crime is also a key issue for residents'; and 'the challenge is to create environments that promote safety, health and a sense of well-being for all'.

17.3 Area of Influence

17.3.1 The Site of the Proposed Development is located directly west of the town of Rhymney, in the administrative boundary of Caerphilly County Borough. Rhymney is located in the northernmost tip of Caerphilly and is adjacent to the County Boroughs of Merthyr Tydfil to the west, Blaenau Gwent to the east, and Powys to the north.

17.3.2 The approach to determine a study area for human health aspects consists of identifying the localities (cities, towns, households) in relation to the Site location and County Boroughs. In this case, the study area comprises the town of Rhymney in Caerphilly. The neighbouring County Boroughs of Merthyr Tydfil and Blaenau Gwent will also be assessed due to their close proximity to Rhymney, as the area of community effect is often not entirely corelated with statutory boundary. Residents of an area may use other facilities located within towns, districts, counties or regions outside the statutory boundary.

17.3.3 Within the study area, the social Area of Influence (AOI) is used to help assess the potential impacts on local people or communities (i.e., 'receptors' in EIA terms) from the Proposed Development. The social AOI will be defined within three levels: the Core, Direct and the Indirect AOI. The Core AOI includes all that is within the Site redline boundary (see Figure 17.1 The Site, with Direct AOI (indicative 1km area), including buildings of note.). The Core AOI mainly consists of grassland which is privately owned and currently being used for agriculture – grazing.

17.3.4 The Direct AOI relates to the area in which direct effects from human health impacts are expected, including the most immediate localities (cities, towns, households) that are linked through social, cultural or economic interactions to the Site, approximately within 1km of the Site. The Direct AOI for the Proposed Development includes the town of Rhymney (specifically its northern area), Bute Town and local farmhouses. The Direct AOI is predominantly residential buildings. Alongside this, there are local businesses, leisure and recreation facilities and healthcare facilities, such as the Meddygfa Cwm Rhymney Practice, within Rhymney Integrated Health & Social Care Centre (see Figure 17.1 The Site, with Direct AOI (indicative 1km area), including buildings of note.).

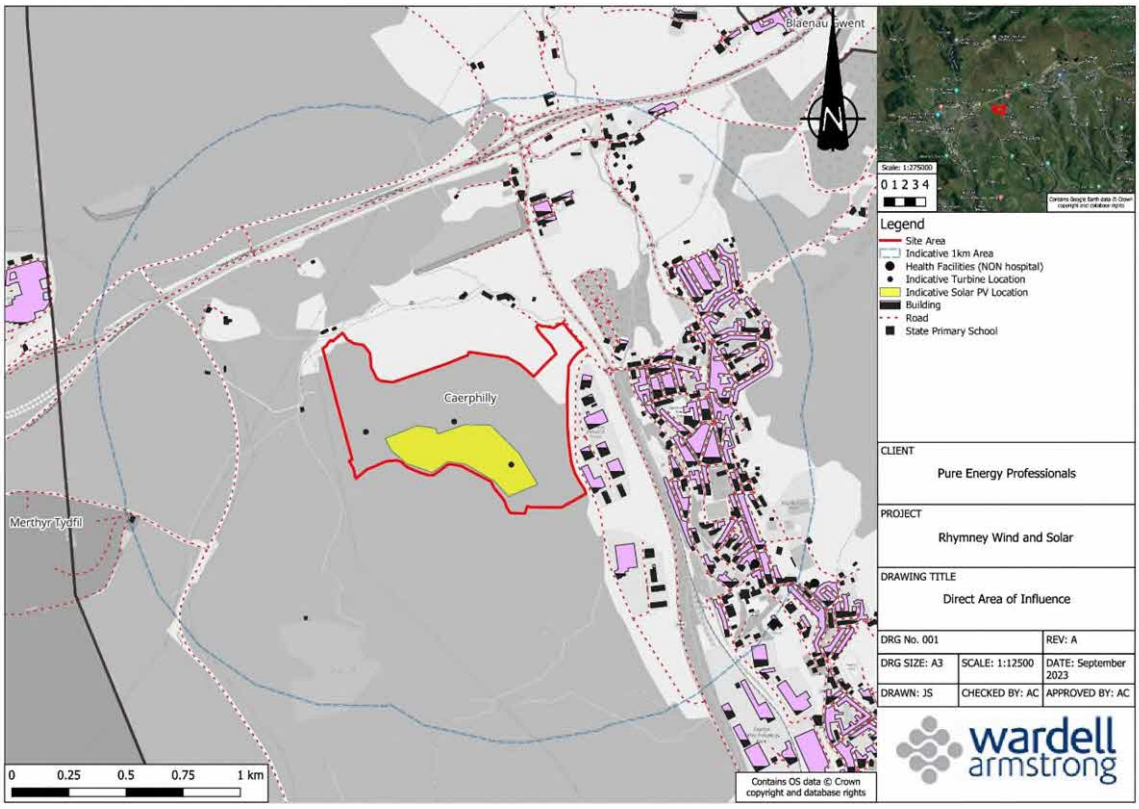


Figure 17.1 The Site, with Direct AOI (indicative 1km area), including buildings of note.

17.3.5 The Indirect AOI relates to the area where Indirect and other cumulative effects from human health impacts are expected. The Indirect AOI for the Proposed Development has been established approximately around a five-kilometre area of the Site boundary, and includes the rest of Rhymney Town in Caerphilly, (including Pontlottyn, Abertysswg, Fochriw, Pentwyn), Tredegar in Blaenau Gwent (including Cefn Golay, Nantybwch, Dukestown and Sirhowy) and the East area of Merthyr Tydfil (including Pant and Dowlais). According to the 2021 Census, these areas are home to a further four GP surgeries, including Tredegar Health Centre, Glan Yr Afon Surgery, Dowlais Medical Practice and Morlais Medical Practice (see Figure 17.2). The nearest Hospital with an Emergency Department is located within the Indirect AOI, named Prince Charles Hospital (see Figure 17.2). There is limited accessible green space in Rhymney, subject to further analysis.

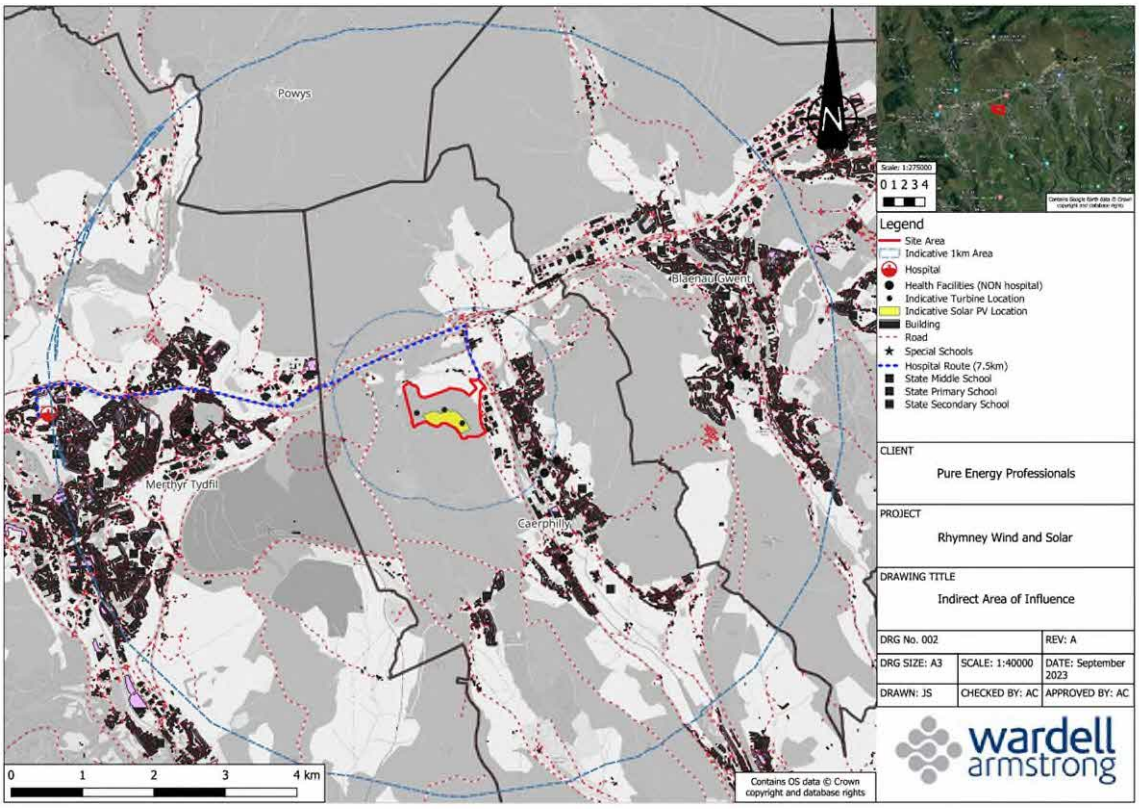


Figure 17.2 The Site, with Indirect AOI (indicative 5km area), including buildings of note.

17.4 High-level Baseline Conditions

Population and households

17.4.1 According to the 2021 Census of Wales, Rhymney has a population of 8,543 people with approximately 3,900 households. There is a higher than national percentage of people in Rhymney within working age, which can be seen in Figure 17.3below.

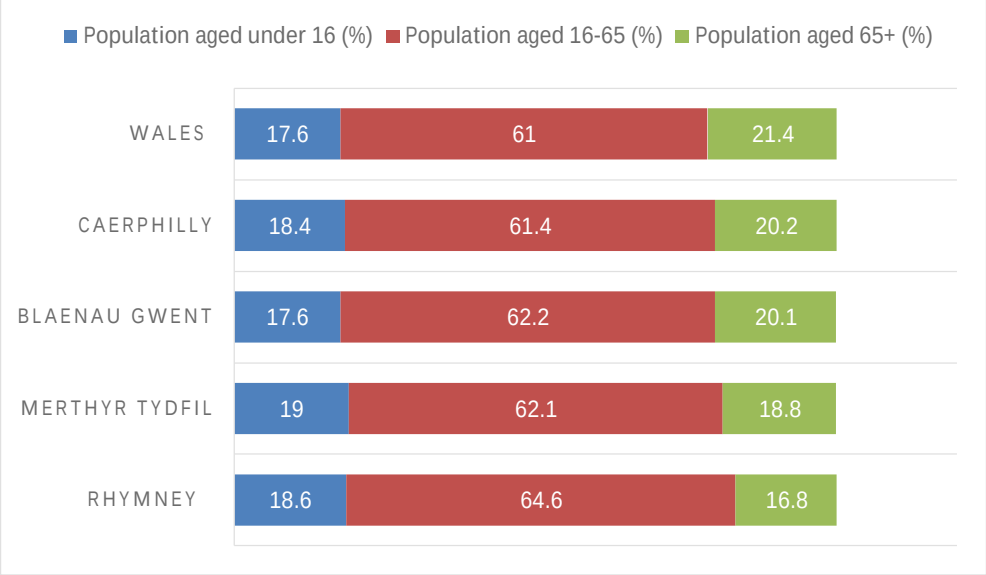


Figure 17.3. Age distribution in percentage, of Rhymney, in relation to its County Caerphilly, neighbouring Counties Merthyr Tydfil and Blaenau Gwent, and wider Country (Wales) (Census, 2021).

Households

17.4.2 According to the 2021 Census, Rhymney has high rates of household deprivation, with 66.5% of households deprived in one or more dimension[39], compared to the national average of 54.1% (see Figure 17.4). Rhymney has a higher deprivation rate compared to the average rates of the nearby Country boroughs.

[39] The Welsh Index of Multiple Deprivation, based on Census 2021 data classifies households in England and Wales by four dimensions of deprivation: employment, education, health and disability and household overcrowding.

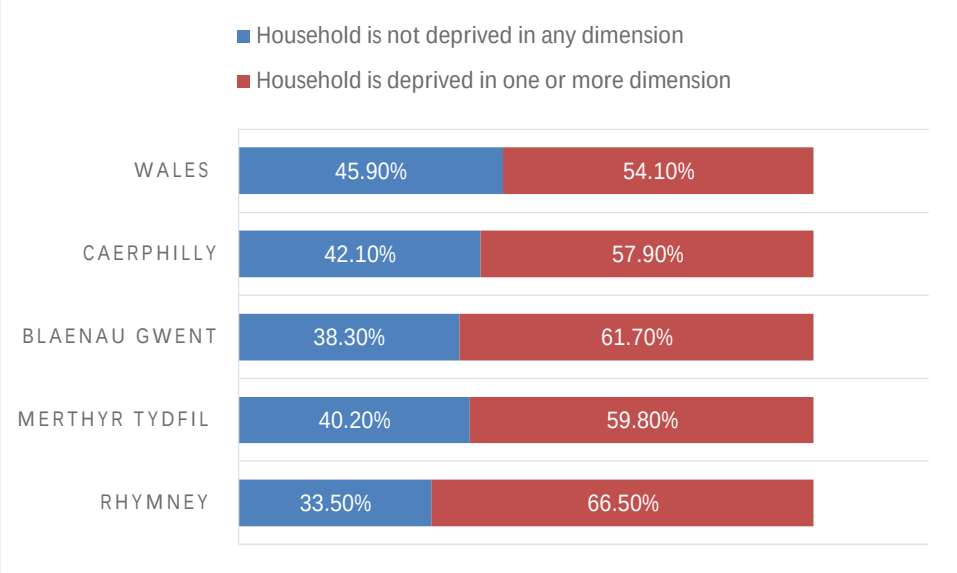


Figure 17.4. Household Deprivation of Rhymney in percentage, in relation to its County Caerphilly, neighbouring Counties Merthyr Tydfil and Blaenau Gwent, and wider Country (Wales) (Census 2021).

17.4.3 The Welsh Index of Multiple Deprivation (WIMD) from 2019 highlights that there are significant levels of deprivation in pockets across the County borough. The Caerphilly County has 62.7% of its Lower Layer Super Output Area (LSOAs)[40] within the top 50% most deprived category; this is the fifth highest proportion in Wales. Neighbouring Blaenau Gwent has the highest proportion at 85.1%, followed by Merthyr Tydfil at 77.8%.

17.4.4 In addition, Caerphilly is home to four small areas (LSOAs) of 'deep-rooted' deprivation[41]. Three of them are located in the AOI: Twyn Carno 1, located in the Direct AOI, and Tredegar Central and West 2 located within the Indirect AOI. See Twyn Carno in Figure 17.5 below.

[40] Lower layer Super Output Areas (LSOAs) are made up of groups of OAs, usually four or five. They comprise between 400 and 1,200 households and have a usually resident population between 1,000 and 3,000 persons. (https://www.ons.gov.uk/methodology/geography/ukgeographies/censusgeographies/census2021geographies).

[41] Those that have remained within the top 50 most deprived, small areas in Wales for the last five publications of The Welsh Index of Multiple Deprivation ranks, based on Census 2021.

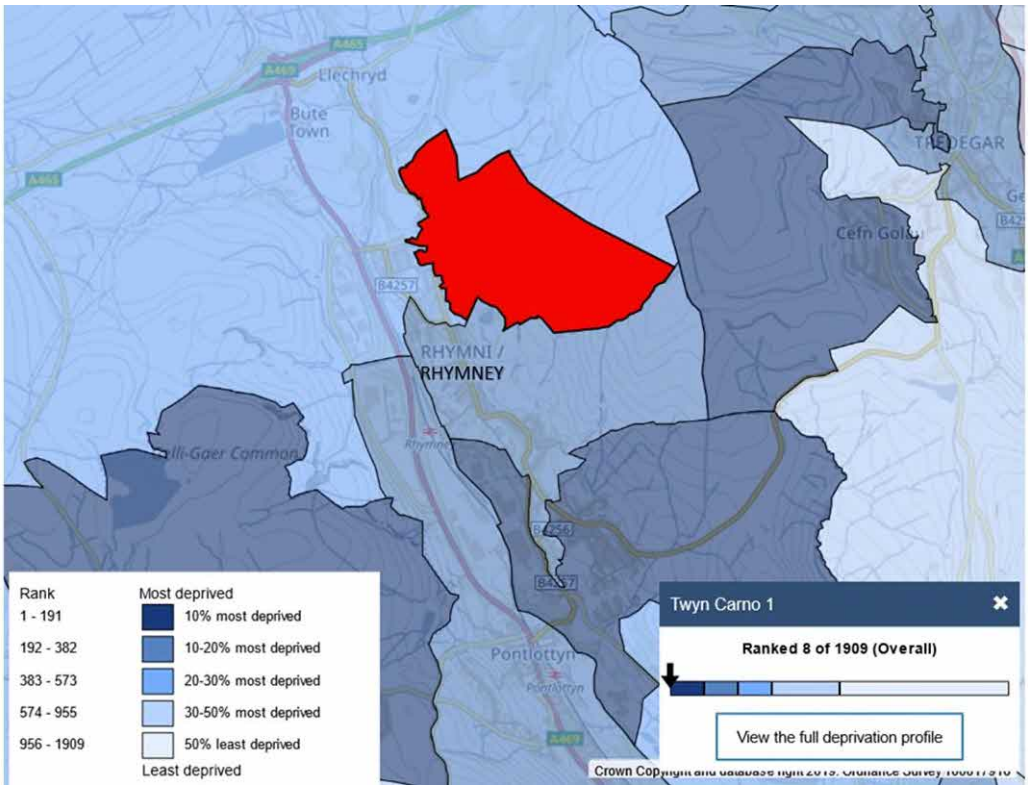


Figure 17.5. Area of deep-rooted deprivation 'Twyn Carno 1' in Rhymney (Direct AOI) (Ministry of Housing, Communities and Local Government, GOV, 2023).

Disability and Care

17.4.5 According to the 2021 Census, disability[42] is higher in Rhymney (27.8%), when compared to wider Wales (21.6%). Similarly, these heightened rates can be seen within Caerphilly (23.6%) and in neighbouring Counties: Merthyr Tydfil (23.8%) and Blaenau Gwent (24.9%).

17.4.6 While the percentage of Rhymney population that provide no unpaid care or provide 19 hours or less unpaid care a week, are both lower than national rates. However, the percentage of the population providing between 20 and 49 hours a week is higher (3.3%, compared to national average of 2.2%), alongside population providing of 50 or more hours a week (5.2% in Rhymney, compared to 3.6% nationally).

17.4.7 This identification of deprivation and disability provide us with information on vulnerable groups within the Indirect AOI. This helps provide stronger mitigation to receptors of the Proposed Development.

[42] As defined in the Equality Act 2010, known as the Public Sector Equality Duty (PSED) in Wales.

General Health

17.4.8 According to the 2021 Census of Wales, fair health in Rhymney is above average, while rates of very good health are lower than average, and good health rates are lower in Rhymney when compared to Wales, alongside heightened rates of bad health and very bad health in Rhymney (see Figure 17.6).

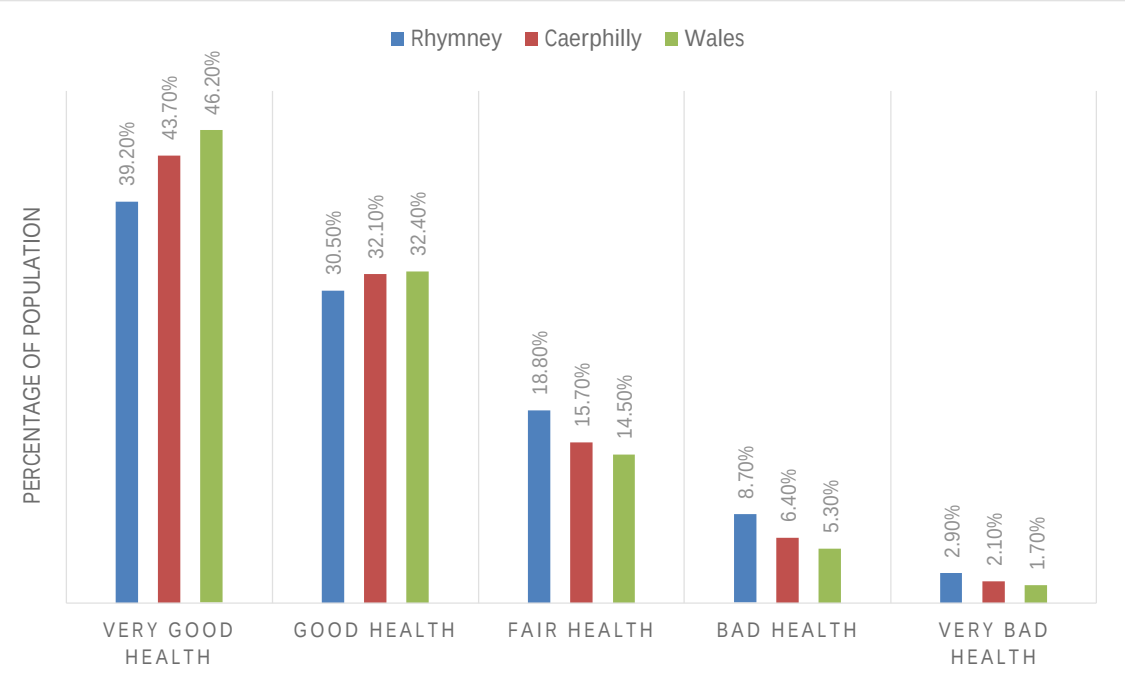


Figure 17.6. General Health levels of Rhymney, in relation to its County Caerphilly, and wider Country (Wales) (Census, 2021).

Health Indicators

17.4.9 The WIMD Results Report identifies health indicators as a measure of good health, which provide an insight into any health inequalities within the area, which further help identify potential vulnerable groups.

17.4.10 The first of seven indicators is General Practitioner (GP)-recorded chronic conditions, which accounts for asthma, hypertension, coronary heart disease, chronic obstructive pulmonary disease, diabetes, epilepsy and heart failure. Rhymney sees higher percentages of all chronic conditions, when compared the County and National records (see Figure 17.7).

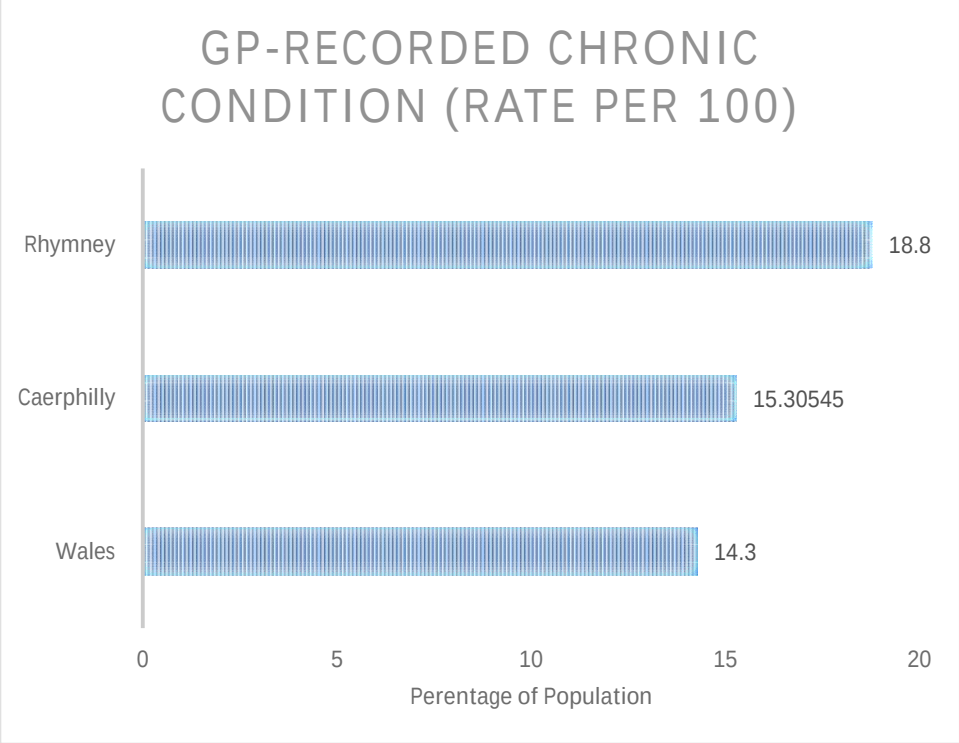


Figure 17.7. The rate of reported chronic conditions in Rhymney (LSOA's 'Twyn Carno 1', 'Moriah 2' and 'Moriah 3'), Caerphilly and Wales (Census, 2021).

17.4.11 Limiting long-term illness[43], the second WIMD health indicator of good health, sees similarly high levels of these long-term limiting illness in Rhymney, when compared to wider County and Country (see Figure 17.8).

[43] According to the Welsh Index of Multiple Deprivation includes chronic obstructive pulmonary disease, heart failure, diabetes, inflammatory bowel disorders, musculoskeletal conditions, alcohol and other addictions, as well as many others.

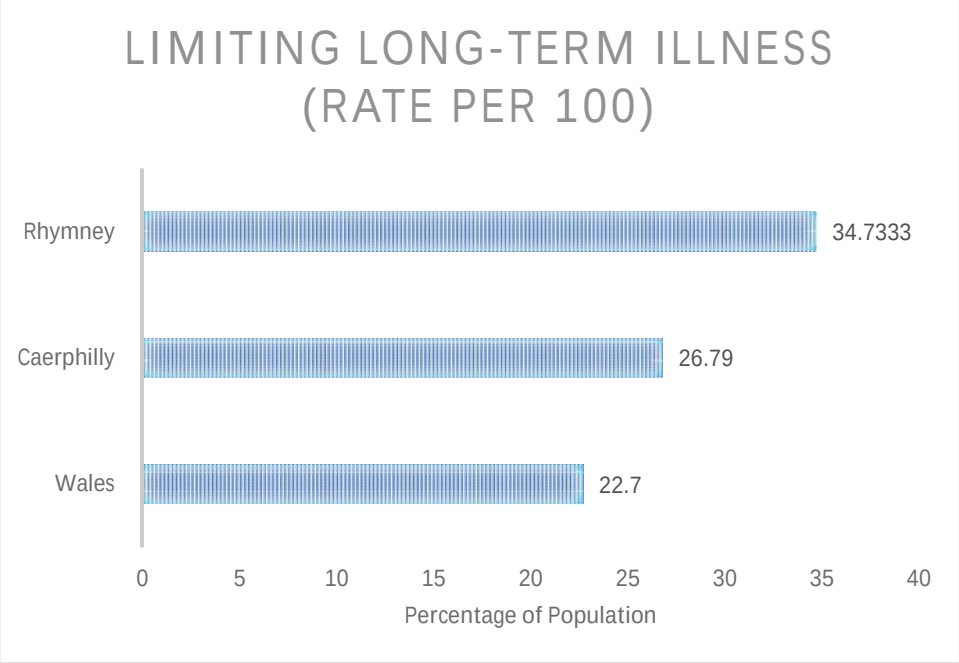


Figure 17.8. The rate of reported limiting long-term illness in Rhymney (LSOA's 'Twyn Carno 1', 'Moriah 2' and 'Moriah 3'), Caerphilly and Wales (Census, 2021).

17.4.12 Premature deaths and low birth weight (live single births less than 2.5kg) are further indicators of good health, that also see similar heightened patterns in Rhymney, when compared to County and Country levels (see Figure 17.9 and Figure 17.10).

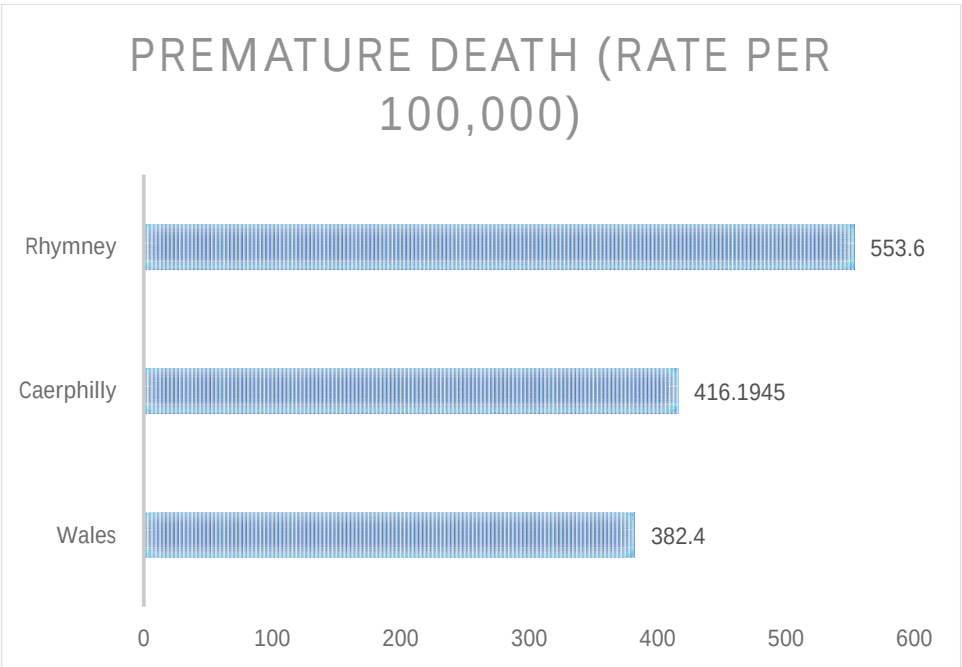


Figure 17.9. The rate of premature death in Rhymney (LSOA's 'Twyn Carno 1', 'Moriah 2' and 'Moriah 3'), Caerphilly and Wales (Census, 2021).

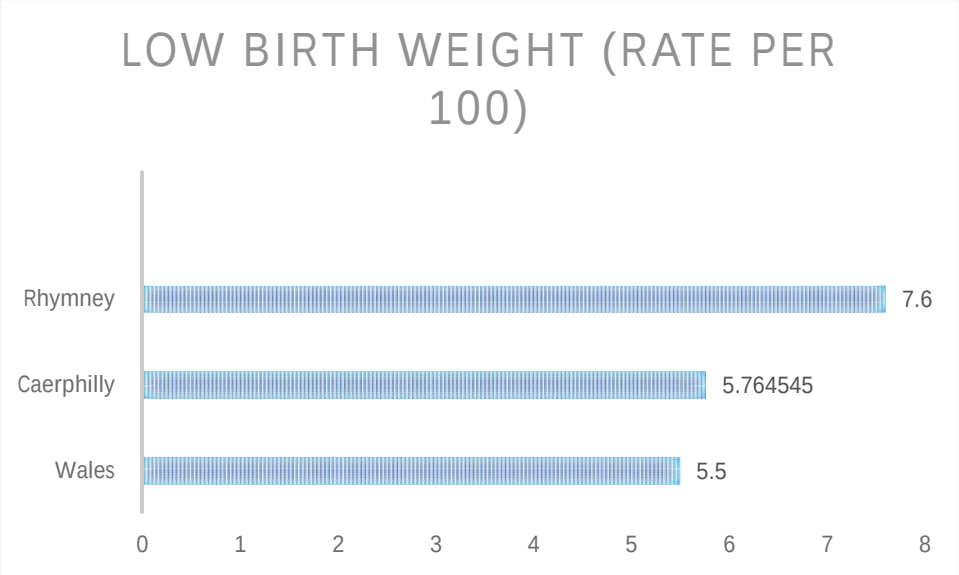


Figure 17.10. The rate low birth rate (live single births less than 2.5kgs) in Rhymney (LSOA's 'Twyn Carno 1', 'Moriah 2' and 'Moriah 3'), Caerphilly and Wales (Census, 2021).

17.4.13 GP-recorded mental health conditions further indicate levels of health; levels in Rhymney exceeding National and County Rates (see Figure 17.11).

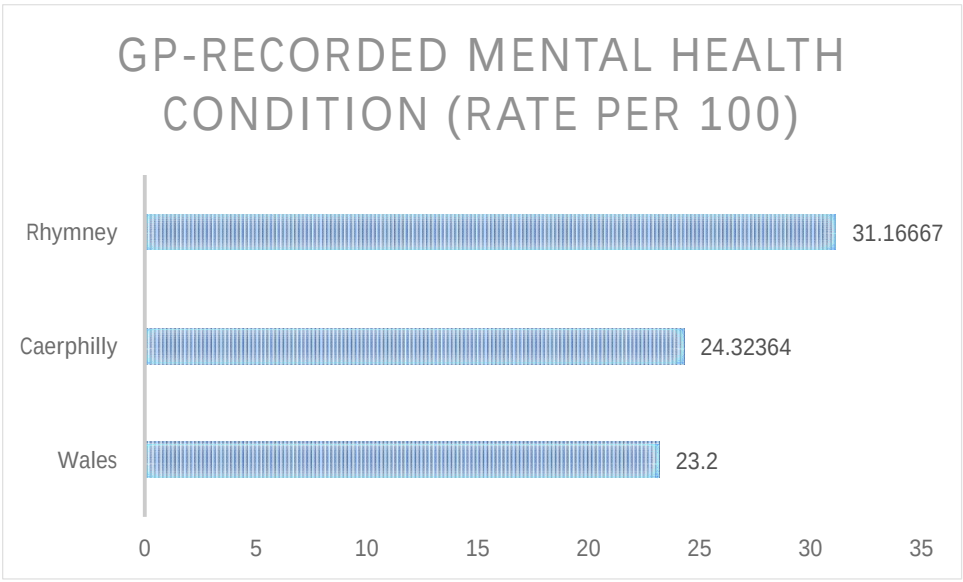


Figure 17.11. The rate of reported mental health condition in Rhymney (LSOA's 'Twyn Carno 1', 'Moriah 2' and 'Moriah 3'), Caerphilly and Wales (Census, 2021).

17.4.14 Cancer incidence also gives an indication of health, showing higher rate of incidence in Rhymney (see Figure 17.12).

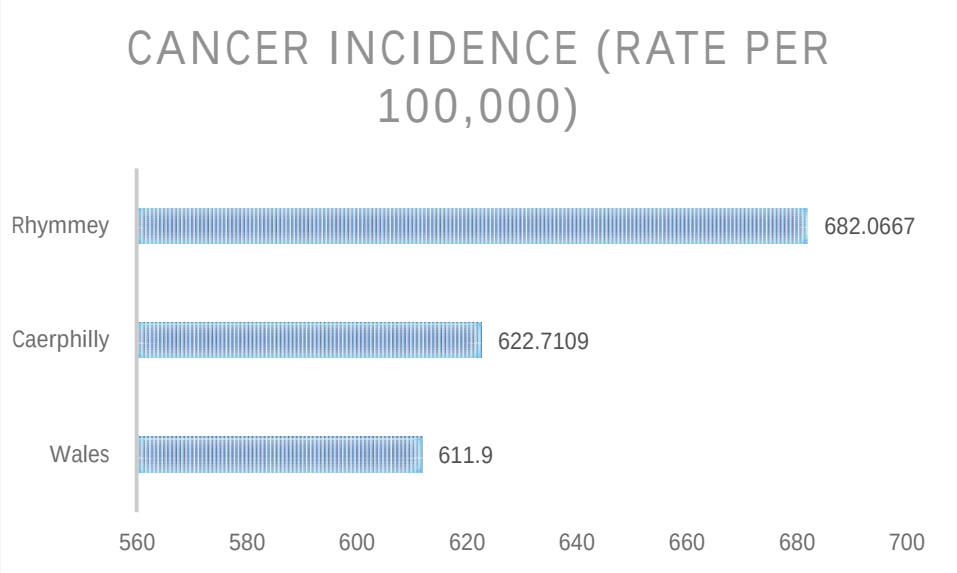


Figure 17.12. The rate of reported cancer incidents in Rhymney (LSOA's 'Twyn Carno 1', 'Moriah 2' and 'Moriah 3'), Caerphilly and Wales (Census, 2021).

17.4.15 Demonstrating a low number of children aged 4-5 who are obese, is the final WIMD indication of good health. In Caerphilly, this is as high as 13%, above the National average of 11.8%. There is no current data to analyse on child obesity in Rhymney.

Blue and Green Space

17.4.16 There is a public footpath crossing the Site (RHYM/FP95/4, FP95/5 and FP95/6 alongside RHYM/FP90/2) at several points, including close to the border of the proposed solar array, as seen in Figure 17.13. This is one of the few green spaces within the Indirect AOI, subject to further analysis.

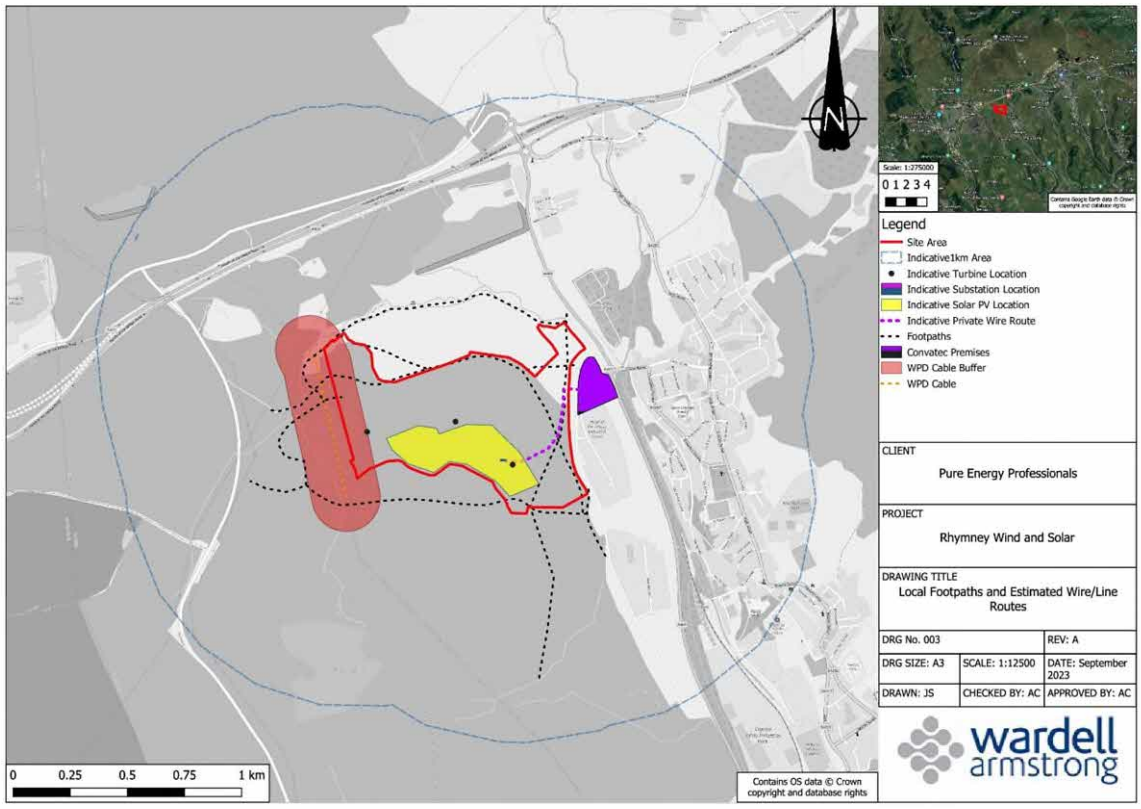


Figure 17.13 Local footpaths and estimated wire routes

17.4.17 Rhymney and District Angling Society fishes on Rhos Las Reservoir, also known as Rhaslas Pond (a 15-acre reservoir), as well as on Bryn Brith Pond and Bute Town Reservoir (approximately 675 meters from Site Boundary).

17.5 Impact Assessment Methodology

17.5.1 Whilst the scoping methodology was presented in section 17.1.2 above, this section explains the Impact Assessment Methodology proposed for the ES. The impact assessment will be separated into a two-stepped evaluation, including a pre-mitigation and a post-mitigation assessment to identify residual impacts. The pre-mitigation assessment assumes compliance of the Proposed Development activities with the applicable regulatory framework and standard industry practices. This methodological approach is compliant with the applicable framework and also consistent with international best practice guidelines and standards.

17.5.2 This methodology analyses the interrelation between receptor sensitivity and impact magnitude. The first stage is identifying the list of potential receptors, to analyse potential sensitivity (resilience) against the unexpected, resulting in a preliminary list

of impacts. These impacts will be identified throughout multiple stages of the Proposed Development, including Land Clearance and Acquisition, Construction, Operation and Decommission.

17.5.3 The following will be consulted when assessing health impacts in the context of an EIA:

- The Wales Health Impact Assessment Support Unit (WHIASU), based in the World Health Organization (WHO) Collaborating Centre on 'Investment for Health and Well-being', Policy and International Health Directorate, Public Health Wales;
- The Institute of Environmental Management and Assessment (IEMA) documents, 'Effective Scoping of Human Health in Environmental Impact Assessment' and 'Determining Significance For Human Health In Environmental Impact Assessment', 2022;
- The Institute of Public Health (IPH), Health Impact Assessment Guidance, Standalone HIA and health in environmental assessment (2021);
- Human health: Ensuring a high level of protection. A reference paper on addressing Human Health in Environmental Impact Assessment (2020) International Association for Impact Assessment (IAIA) and European Public Health Association (EUPHA); and
- The International Association for Impact Assessment (IAIA) Psycho-social Impact assessment Guidance.

Receptor Sensitivity

17.5.4 In contrast with environmental receptors, the degree of sensitivity of social receptors is based on an individual or group's abilities and capacity to adapt to changes and maintain their quality of life, livelihood and health conditions. Sensitivity can be understood in terms of resilience to change (e.g., capacity to cope with changes of the determinants of health) and the individual's access to resources and social support network to adapt to them. Sensitivity can be further determined by several factors such as a receptor's age, gender, ethnicity, access to employment opportunities, livelihood, education, health, level of marginalisation and dependence on natural or common resources (see Table 17-1).

Table 17-1 Social Receptor Sensitivity Scale

Sensitivity of receptor	Description of receptor
Negligible	A social receptor with no need to adapt to change or has a high capacity to adapt completely and almost immediately. Receptor has no shortage of access to adequate resources (material, financial, social) and will have no difficulty adapting to changes.

Low	A social receptor with capacity and means to adapt to change and maintain/improve current conditions on its own after a certain time. Receptor has a high level of access to resources and has a high capacity to adapt to changes.
Medium	A receptor with limited capacity and means to adapt to change and maintain/improve current conditions. Adaptation may take time and/or may only be partial and can require support from mitigation measures. Receptor has some access to resources and retains capacity to partially adapt to changes.
High	An already vulnerable receptor with very little capacity and means to adapt to change and maintain/improve current conditions. Receptor has very limited access to resources, resulting in multiple levels of vulnerability that limits capacity to adapt to changes.

Impact Magnitude

17.5.5 In alignment with the environmental methodology, the magnitude of a potential social impact is a measure of the degree of change from the social baseline conditions and is comprised of different 'elements' that result in different magnitude levels (see Table 17-2).

Table 17-2: Elements of Impact Magnitude

Element	Description
Type	Beneficial (positive): An impact that is considered to represent an improvement to human health baseline conditions or the introduction of a new desirable factor. Adverse (negative): An impact that is considered to represent an adverse change from human health baseline conditions, or the introduction of a new undesirable factor.
Duration	Short term: Impacts that are predicted to last for a limited period (during construction) or will cease within less than a year. Medium term: Impacts that are predicted to last through construction and the beginning part of operations or for a period of one to five years. Long term: Impacts that are estimated to occur throughout construction and operations or from six to the end of operations stage. Very long term: Impacts that affect a receptor during the development lifecycle and will remain post-closure.
Reversibility	Reversible: Impacts are predicted to be reversed after the end of the development activities or on application of mitigation. Irreversible: Impacts that cause a permanent change in the affected receptor or resource that endures substantially beyond the development lifetime.
Spatial Extent	Local: Include the Core, Direct and Indirect Area of Influence. Regional: Include multiple districts or Counties. National: Encompass most of the national territory. International: Encompass more than one Country.

17.5.6 Following this step, a definition of the overall magnitude level is made considering the combination of elements is presented in Table 17-3 below.

Table 17-3: Magnitude of Change Scale (Social)

Magnitude Level	Description
Negligible	Potential impact will not result in any measurable or perceivable changes to baseline conditions. They are largely local, reversible and short-term.
Low	A potential impact that is unlikely to have a measurable effect on the wellbeing of people so that the baseline conditions will not be considerably affected beyond a local, reversible and medium term.

Table 17-3: Magnitude of Change Scale (Social)	
Magnitude Level	Description
Medium	A potential impact that is likely to be short or medium term or above, spatially regional (likely to affect a limited number of social receptors) and reversible.
High	Potential impact will result in measurable change on baseline conditions and is likely to affect a moderate number of social receptors, causing livelihood change on a moderate scale. May or may not be reversible depending on specific conditions.

17.5.7 The level of effect is defined through the matrix in Table 17-4, below.

Table 17-4: Level of Effect Matrix (Social)				
Receptor Sensitivity	Magnitude of Change			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible	Minor	Moderate
Low	Negligible	Minor	Minor	Moderate
Medium	Negligible	Minor	Moderate	Major
High	Minor	Moderate	Major	Major

17.6 Scoping Potential Impacts

17.6.1 Identified Receptors in relation to the Proposed Development include:

- Local residents within the Core and Direct AOI
- Local resident within Indirect AOI
- Local healthcare workers
- Users of footpaths (PRoWs)
- Road users within the Direct and Indirect AOI
- Site workers
- Vulnerable population[44]
- Economically active population
- Landowners

17.6.2 The following tables will identify potential impacts of the Proposed Development, throughout the Construction (see Table 17-5), Operational (see Table 17-6) and Decommissioning stages (see Table 17-7) of the Proposed Development in relation to their receptors, and whether these impacts are to be scoped in, or scoped out.

Table 17-5: Potential Impacts of Proposed Development within Construction Phase.		
Receptor	Potential Impact	Scoped In or Out
Residents within Direct AOI, Site workers	Increased exposure to noise and vibration is likely to occur within the construction phase.	Scoped In

[44] The elderly, marginalized and particularly deprived households lacking resources to adapt to change, people with disabilities and long-term health conditions.

Economically active population, Site workers	Reduced deprivation and increase in financial well-being, due to job creation and Gross Value Added within construction	Scoped In

Table 17-6: Potential Impacts of Proposed Development within Operational Phase.		
Receptor	Potential Impact	Scoped In or Out
Residents within Direct AOI, Site workers, Landowner	Increased exposure to noise and vibration is possible within Core AOI, and potentially Direct AOI	Scoped In
Residents within Direct AOI, Users of footpaths (ProWs), Vulnerable populations	Initial Stakeholder Engagement (Grasshopper Communications, 2023) findings suggest that the local population is worried about the health effects of the the electromagnetic radiation from turbines.	Scoped In
Economically active population, Site workers	Reduced deprivation and increased financial well-being, due to job creation and Gross Value Added within operations	Scoped Out due to limited job opportunities within operation

Table 17-7: Potential Impacts of Proposed Development within Decommissioning phase.		
Receptor	Potential Impact	Scoped In or Out
Residents within Direct AOI, Site workers	Increased exposure to noise and vibration is likely to occur within the decommissioning phase.	Scoped In

17.7 Cumulative effects

17.7.1 It is to note, that these impacts above may be increased by the presence of other wind and solar farms locally. For example, cumulative number of construction impacts could have temporal, spatial and synergic effects, due to workers from different projects placing a greater strain on existing infrastructure. These impacts will be further assessed in the ES.

17.7.2 Current Wind and Solar Farms in the Indirect AOI include:

- Pen Bryn Oer Wind Farm (1.6km North-East from Site boundary);
- Wauntysswg solar farm (3.6km South-East from Site boundary)

17.8 Environmental Context

17.8.1 The assessment of health impacts has been done in relation to the environmental context of the Proposed Development, see listed chapters for further details:

- Landscape (see Chapter 5);
- Noise (see Chapter 6);
- Transport (see Chapter 11); and
- Socioeconomics (see Chapter 16).

17.9 Design Assumption

17.9.1 For the purpose of this Scoping Report, the following design assumptions have been made about the Site:

- The number of employment opportunities presented, is based on benchmark academic studies, as no information has been given at this time regarding construction, or Full-time employment (FTE) plans, regarding maintenance and operation of the Proposed Development.
- WA assumes that these roles will be sought locally, although no specific plans for local employment have been shared.
- The lifespan of the Proposed Development has been assumed to be 30 years.
- The cable location and buffer have been designed to connect the Proposed Development to the Electricity Transmission System, potentially affecting local footpaths. WA has assumed that these cable corridors will affect the usage of Public Right of Way temporarily, and that the public will regain access shortly after their installation and based on landowner agreements. The location of cable routes and corridor will be refined during the Environmental Statement.
- An assumption has been made that other Chapters have fully assessed the environmental impact of the Proposed Development, in regards to their primary focus.

17.10 Mitigation Measures and Enhancements

17.10.1 The following indicative mitigation measures are suggestive of non-exhaustive solutions to some of the scoped impacts to the Proposed Development, further to be developed in the ES.

17.10.2 A Construction Traffic Management Plan would ensure key roads are left with limited exposure to traffic, including key pathways to Emergency Facilities, including the hospital. In addition, key social infrastructure would remain accessible for well-being purposes, through the identification of key roads, sensitive crossings and pathways.

17.10.3 A Healthcare Management Plan including engagement with the Local Health board would ensure resources are being distributed among the Indirect AOI to ensure efficiency within Construction and Decommissioning.

17.10.4 A Stakeholder Engagement Plan could be used to raise awareness of health resources, to eradicate any perceived negative health impacts of the Proposed Development. This could also raise awareness of the positive health effects of using renewable energy over non-renewable. Communication between stakeholders could include newsletters, adverts in local press, drop-in sessions and feedback forms.

17.10.5 The proposition of a Community Investment Plan, or Social Value Strategy to develop Rhymney including tackling health inequality, in line with legislation and LDP. Alongside this, a Local Employment Plan, with the focus on reskilling local residents, has the potential to decrease deprivation through providing opportunity, in turn increasing well-being.

17.10.6 Maintaining access to green space/ PRoW in Core AOI through the introduction of alternate foot paths, will help enable access to green space through and protect PRoW.

17.10.7 See chapters 6 and 11 for Noise and Traffic mitigation measures.

17.11 Summary

17.11.1 In conclusion, there are potentially a multitude of health impacts from the Proposed Development, which are likely to fall harder on what is an already a deprived population. However, the Proposed Development will aim to align with key Welsh legislation pertaining to health, most importantly the Well-being for Future Generations Act prioritising 'a Healthier Wales'.

17.11.2 The potential impacts were scoped in and out after collection of relevant health data within the three areas of influence determined for this assessment: Core, Direct and Indirect, with Core AOI being in the footprint of the Proposed Development and most likely the most impacted, and Direct and Indirect AOI determining a wider area outside of the Site footprint.

17.11.3 This study has set out a two-staged IA methodology, with assessment pre- and post-mitigation, based on receptor sensitivity and impact magnitude correlation to assess impact significance.

17.11.4 The basic human health baseline data included in this Chapter helped determine a preliminary list of social receptors and a preliminary list of effects per stage of development. Baseline data collection showed that Rhymney and the surrounding areas are more deprived than the County and National population in terms of health, which suggests relative vulnerability and high sensitivity of social receptors in the Area of Influence. Some of the main scoped-in impacts include psychological stress from perceived health impacts, increased exposure to noise and vibration and reduced access to healthcare during construction and decommissioning and reduced access to footpaths during all stages of the Proposed Development.

17.11.5 This scoping study also recognised a need to assess cumulative human health effects from other neighbouring projects in the Indirect AOI, depending on construction schedules. These cumulative effects have a potential to become substantial in terms of construction noise and vibration impacts and reduced healthcare capacity impacts.

17.11.6 The existing baseline study highlights the need for enhancement measures to reduce inequality in the Area of Influence and potentially boost the resilience through improved access to quality green spaces, access to healthcare and skilling-up training to reduce socio-economic deprivation negatively impacting health of the local population. These measures should be explored further in the Environmental Statement.

17.12 Questions for Consultees

- What key stakeholders should be engaged regarding the Proposed Development?
- How can the Community Fund be used to tackle health inequality within Rhymney?

18 WATER RESOURCES

18.1 Introduction

18.1.1 An assessment will be undertaken to identify the likely hydrogeological and hydrological effects of the Proposed Development.

18.2 Baseline Conditions

Surface Water Features

18.2.1 The Site is located upon the Bryn Pyllog part of the Gelli-Gaer Common, which has two unnamed, eastward draining water courses that flow to Nant Llesg and a north-south water course with possible connection to the Rhaslas Pond.

18.2.2 There are no records of surface water features directly on the Site. However, the Nant Carno tributary of the Rhymney River is present 40m-260m along the northern and western boundary of the Site. Rhymney River is present approximately 260m east of the Site, orientated north to south. Butetown Reservoir is located 460m north of the Site 770m southwest of the Site.

Groundwater

18.2.3 The whole area overlies a Secondary A aquifer category for bedrock and superficial cover with at least three wells located to the east on the outskirts of Rhymney including a water supply for a brewery. The site and surroundings have a medium aquifer vulnerability designation.

18.2.4 The Site is not located within a Nitrate Venerable Zone or a drinking water safeguard zone.

18.2.5 The Glacial Till are shown on the 'Aquifer Designation Map' as secondary (undifferentiated) aquifer. The superficial Glacial Till deposits at the site are classified as Secondary Undifferentiated Aquifers. The South Wales Coal Measures beneath the Site is classed as a Secondary A aquifer. The BGS generally describe the South Wales Coal Measures as 'Grey, (productive) coal-bearing mudstones/siltstones, with seatearths and minor sandstones'.

18.2.6 BGS mapping shows the underlying bedrock of the Site comprises of:

- South Wales Lower Coal Measures Formation in the northern half of the site
- South Wales Middle Coal Measures in the southern half of the site

18.2.7 The BGS have also identified a single geological fault onsite, which generally trends north to south.

18.3 Flood Risk

18.3.1 NRW Flood Mapping indicates the Site is located in within Flood Zone 1, which means it has a low probability of flooding. A standalone Flood Risk Assessment will be submitted as part of the full application.

18.4 Legislation, Policy and Guidance

18.4.1 The following legislation, policy and guidance are appliable to the assessment of water resources:

- European Directive: The Water Framework Directive (2000/60/EC)
- European Directive: The Groundwater Daughter Directive (2006/118/EC)
- European Directive: The Priority Substances Directive (2008/105/EC)
- Act of Parliament: The Environment Protection Act 1990
- Act of Parliament: The Land Drainage Act 1991
- Act of Parliament: The Water Resources Act 1991, Water Act 2003 and Water Act 2014
- Welsh Government: Water Strategy for Wales 2015
- Welsh Government: Statutory Guidance: Sustainable Drainage (SuDS) 2008
- Welsh Government: Statutory National Standards for Sustainable Drainage Systems 2018
- Caerphilly County Borough Council Local Development Plan 2010
- Guidance: Construction Information Research and Information Association CIRIA) C532 Control of Water Pollution from Construction Sites
- Guidance: CIRIA C741 Environmental good practice on site guide
- Guidance: CIRIA C750 Groundwater control - design and practice
- Guidance: CIRIA C753 SuDS manual
- Guidance: CIRIA C786 Culvert, screen and outfall manual

18.5 Scope of Assessment – Key Receptors and Potential Impacts

Desk-Based Baseline Study

18.5.1 The desk-based baseline study will examine the condition of watercourses on site and downstream of Site. The hydrology and hydrogeology study area will be a 3km buffer

from the Site boundary. In order to ensure the baseline data provides the necessary information for the assessment of the Proposed Development's likely significant effects, it is advised that the following tasks will be undertaken:

- Review of Ordnance Survey (OS) maps to identify surface water features;
- Review of NRW's River Basin Management Plans;
- Identification of the locations and characteristics of catchments, surface water features and springs within and adjacent to the Site;
- Identification of WFD classifications and objectives, obtained from the NRW website for watercourses and waterbodies within and adjacent to the Site;
- Collation of data and location of abstractions and discharge consents within and adjacent to the Site;
- Collation of information on climate (including long term average monthly rainfall figures), surface hydrology and flood risk;
- Identification of hydrogeological conditions and groundwater resources (including groundwater vulnerability and productivity); together with secondary information relating to:
    - Bedrock and superficial geology mapping; and
    - Review of soil mapping.

18.6 Assessment Methodology

18.6.1 The assessment will identify likely significant effects from the Proposed Development on watercourses and waterbodies. Some activities also have the potential to continue having an effect during the operational phase of the Proposed Development. The potential effects (construction and operational) identified include the following:

- Increased runoff on exposed ground causing erosion and pollution;
- Increase in silt and sediment loads as a result of construction works;
- Disturbance or erosion of bed and banks of watercourses;
- Loss / alternation on onsite watercourses and waterbodies;
- Increased runoff from hardstanding areas causing erosion and pollution;
- Changes to watercourse morphology;

- Point source pollution from accidental spillages; and
- Disruption/cut off natural surface and groundwater pathways.

18.6.2 Following a review of the baseline conditions the following key receptors are likely to be at risk by the Proposed Development:

- Groundwater within the superficial deposit aquifers (Secondary Undifferentiated and Secondary A).
- Surface water features present along the northern and western boundary of the Site.

18.6.3 Due to all of the Site being located within Flood Zone 1 and the overall size of the Site (over 1ha in area), a Flood Risk Assessment will be prepared and appended to the ES chapter.

18.6.4 Mitigation measures (e.g., pollution prevention and the design and incorporation of Sustainable Drainage Systems (SuDS), with applicable climate change allowances in the design of the Proposed Development) will be designed to avoid, reduce or offset potential adverse effects and these will inform the Proposed Development's design, including its layout.

18.6.5 If significant effects are identified through the assessment, these would require the implementation of specific mitigation (such as specific receptor environmental protection plans and / or monitoring) in addition to the good design, pollution prevention measures and mitigation measures contained in the CEMP. Effects that are identified as minor or negligible are not considered to comprise a significant effect and no further mitigation, beyond the adoption of good industry practice and guidance, will be required.

18.7 Water Framework Directive Assessment

18.7.1 For the purposes of this assessment, it is considered that a WFD assessment will not be required in support of the proposed development, and it is therefore proposed that this is scoped out of the EIA.

18.8 Consultation

18.8.1 As part of the desk-based baseline study, NRW will be consulted regarding incidents of flooding, surface water and groundwater quality data within the Site and

surrounding area. Caerphilly County Borough Council will also be consulted regarding the presence of Private Water Supplies within or close to the Site.

18.9 Questions for Consultees

- Is the proposed methodology considered acceptable?
- Are there any known Private Water Supplies within or close to the Site?
- Are there any known incidents of flooding within the site?

19 SUMMARY OF QUESTIONS FOR CONSULTEES

19.1.1 Table 19-1 below provides a summary of questions for Consultees.

Table 19-1 Questions for Consultees	
Discipline/Chapter	Questions
Planning Policy, Legislation and Guidance	What weight should be placed on local planning policy vs national policy and guidance for nationally significant strategic development?
	Are there any additional policy documents/legislation that need to be assessed that are not listed above?
Landscape and Visual Impacts	Are there any comments on the proposed list of assessment viewpoint locations?
	Are there any particular windfarm or solar farm sites to be considered as part of the cumulative assessment?
	Are there any further landscape or visual receptors to be considered within the assessment (i.e. where it is expected that significant effects may occur)?
Noise and Vibration	Are there any proposed noise limits with reference to existing background noise levels in line with relevant guidelines?
	Are there any particular windfarm or solar farm sites to be considered as part of the cumulative assessment?
	Are there any specific receptors to be considered within the assessment, beyond the nearest residential receptors?
Historic Environment	Is there agreement on the historic assets, to be taken forward for detailed assessment within the Heritage Impact Statement that would support the ES Chapter?
	Are there any additional historic assets that would be required to be taken forward for detailed assessment beyond the parameters specified above?
	Based on the baseline data presented, do you agree that pre-determination archaeological fieldwork will not be required?
	We anticipate that consultation with Glamorgan-Gwent Archaeological Trust (GGAT), Cadw, and the local Conservation and Design Officer will be required. Are there any further consultees that would need to be consulted as part of the assessment?
	Will an ASIDOHL assessment be required and, if so, what areas should be included within the assessment?
Ground Conditions	Are the consultees content with and/or have any comments on the list of information sources used as part of scoping opinion?
	Are the consultees content with and/or have any comments on the list of effects and key sensitive receptors identified?

	Are the consultees aware of any additional information or documentation available pertaining to ground condition (including land contamination and ground stability) within and up to 250m beyond the site boundary?
Ecology and Ornithology	Do Consultees agree that the scope of ecological and ornithological desk study and field surveys undertaken is sufficient and appropriate to inform an assessment?
	Do consultees agree with the approach (including methodologies followed in the absence of Welsh-specific guidance) to field surveys and desk study proposed?
	Are there any other relevant consultees/key sources who should be contacted with respect to baseline ecological and/or ornithological information gathering and assessment?
	Do consultees agree with the surveys, and features for assessment, scoped out?
	Does NRW have any up-to-date information on the red kite population within Caerphilly?
	Does NRW have a list of those wind farm developments (and any other major development) which should be considered as part of the cumulative assessment, and any recommendations on the distance from the Site that these should be considered out to?
	Do consultees have any recommendations on biodiversity enhancement measures that they feel should be considered as part of the habitat management plan for the proposed development?
Soils	Do the Welsh Land Quality Advisory service require a full ALC survey?
	The site is shown as have section of historic disturbance (open cast), are any historical planning documents available that provide detailed information on this?
Transport	The Welsh Government PAG 'Pulling Together, Best Practice for Transporting Abnormal Loads in Wales, states that Transport Assessments should identify 'Abnormal Mitigation proposals where necessary for route to safely accommodate load'. Who is the consultee for which the level and detail of mitigation should be agreed in the context of the ES?
	Where impacts on PROW users are not directly related to road transport, can these be assessed in the Socio-Economic chapter, and cross-referenced in the Transport chapter where appropriate?
	Do PEDW or the South Wales Trunk Road Agent have traffic data or information on recent abnormal load movements at the A465/A469 junction?
Climate Change	Do you agree with the proposed methodology?

	Are there any other receptors you consider should be included?
EMI and Aviation	Aviation
	Do you agree with the proposed methodology?
	Are there any other receptors you consider should be included?
	Do you recommend any additional upfront consultation?
	EMI
	Do consultees agree that the assessment method of determining telecoms is sufficient?
	Are consultees in agreement with the use of industry standard practice in the absence of overarching guidelines?
Glint	Is the proposed methodology considered acceptable?
	Are there any receptors that need to be included that are not already listed above?
Shadow Flicker	Do you agree that 10RD is a suitable distance to assess the shadow flicker effects over?
	Do you agree with the approach of selecting representative houses to assess the shadow flicker effects rather than assessing every individual house in Rhymney that lies within 10RD?
	Do you agree with an approach of prioritising consideration of effects in residential properties rather than commercial buildings?
	Do you have any suggested receptors that you would recommend for inclusion in the assessment?
Socio-Economics	What is the preferred approach to assessing cumulative impacts?
	Are there are potential vulnerable groups in the area that should be the focus of more equitable project benefit distributions?
	Are there any further socio-economic impacts to Rhymney that need to be addressed, both beneficial or adverse for the community and wider Country?
Human Health	What key stakeholders should be engaged regarding the Proposed Development?
	How can the Community Fund be used to tackle health inequality within Rhymney?
Water Resources	Is the proposed methodology considered acceptable?
	Are there any known Private Water Supplies within or close to the Site?
	Are there any known incidents of flooding within the site?

20 SUMMARY

20.1.1 This Scoping Report has been produced to inform PEDW and relevant Consultees of the proposed scope of the Environmental Statement for the Development of National Significance application for the Convatec Green Manufacturing Hub.

20.1.2 In summary it is proposed that the Environmental Statement will include the following chapters and associated appendices:

- Introduction
- Site Description
- Development Description
- Consideration of Alternatives
- Approach to Environmental Impact Assessment
- Planning Policy and Legislation
- Landscape and Visual
- Noise and Vibration
- Archaeology and Heritage
- Ground Conditions
- Ecology and Ornithology
- Soils
- Traffic and Transport
- Climate Change
- EMI and Aviation
- Glint
- Shadow Flicker
- Socio-economics
- Human Health
- Water Resources
- Summary of Residual and Cumulative Effects

1.1.4 The application will be accompanied by an Environmental Statement and Non-Technical Summary in accordance with the EIA Regulations. Standalone technical

reports providing a Coal Mining Risk Assessment and Flood Risk Assessment will also be submitted as part of the planning application.

1.1.5 The Environmental Statement will draw upon the interactions identified in previous chapters of this report to provide an assessment of the scale and significance of the potential impacts which may occur as a result of the Proposed Development. The report will propose mitigation measures as appropriate to minimise any potential adverse impacts.

1.1.6 As an iterative process, the scope of the assessments will be refined following consultations with a wide range of authorities, statutory agencies, interested parties and public consultations.

1.1.7 The results of the studies and recommendations will be incorporated into the design of the scheme. Full regard will be given to the current national and local planning guidance in the preparation of the proposals and the Environmental Statement.

1.1.8 We hereby request on behalf of the Applicant, a formal Scoping Direction under the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017.

APPENDICES

Appendix A
Historic Environment
(Designated Heritage Assets)

Appendix A

Table 1: Designated Heritage Assets Within the Search Area		
Ref.	**Name**	**Status**
984	Blaenavon Industrial Landscape	World Heritage Site
11396	Cyfarthfa Castle	Grade I Listed Building
11397	School at Cyfarthfa Castle	Grade I Listed Building
1861	The Town Clock	Grade II* Listed Building
1863	SW Roundhouse at Roundhouse Farm	Grade II* Listed Building
1869	Former Boiler House at Dunlop Semtex Factory	Grade II* Listed Building
11377	Cefn Railway Viaduct	Grade II* Listed Building
11382	Cefn Railway Viaduct	Grade II* Listed Building
11408	Pont-y-Cafnau	Grade II* Listed Building
11444	Town Hall	Grade II* Listed Building
11484	Pontsarn Railway Viaduct (also in Vaynor)	Grade II* Listed Building
11490	Former Guest Memorial Library	Grade II* Listed Building
11491	Dowlais Works Blast Engine House	Grade II* Listed Building
13578	Church of St David	Grade II* Listed Building
16073	Ynysfach Engine House	Grade II* Listed Building
17086	NE Roundhouse at Roundhouse Farm	Grade II* Listed Building
17087	Agricultural Range at Roundhouse Farm	Grade II* Listed Building
21428	Hanbury Road Baptist Chapel and Schoolrooms, including gates and gatepiers	Grade II* Listed Building
21430	Penuel Baptist Church	Grade II* Listed Building
22494	Milgatw	Grade II* Listed Building
22496	Sirhowy Ironworks	Grade II* Listed Building
22530	British Steel Tinplate Works General Office	Grade II* Listed Building
22531	Furnace Bank	Grade II* Listed Building
25495	Elliot Colliery Winding Engine House and Engine	Grade II* Listed Building
25522	Church of St Sannan	Grade II* Listed Building
81196	Pontsarn Railway Viaduct (also in Pant Community)	Grade II* Listed Building
87523	Llwydcoed Crematorium	Grade II* Listed Building
1860	Blaen y Cwm Viaduct	Grade II Listed Building
1862	Bedwellty House	Grade II Listed Building
1877	Harcourt Terrace Wesleyan Methodist Chapel, including schoolroom and front railings	Grade II Listed Building
1878	Ice House to NW of Bedwellty House	Grade II Listed Building
1879	Great Exhibition Lump of Coal at Bedwellty Park	Grade II Listed Building
11376	The Court House	Grade II Listed Building
11384	Tower of Old Church of St Gwynno	Grade II Listed Building
11389	Vulcan House including attached rear range, and forecourt wall and gate	Grade II Listed Building
11393	Catholic Church of St Mary incl. attached presbytery	Grade II Listed Building
11394	Capel Tabernacl (Welsh Baptist Church)	Grade II Listed Building
11395	Church Hall at Capel Tabernacl	Grade II Listed Building
11425	Primrose Hill	Grade II Listed Building
11426	Merthyr Christian Centre	Grade II Listed Building
11427	Bryn Heulog	Grade II Listed Building
11428	Sunny Bank	Grade II Listed Building
11429	The Rectory	Grade II Listed Building
11430	Springfield Villa	Grade II Listed Building
11432	No.6 Coedcae'r Court,Twynyrodyn, Mid Glamorgan	Grade II Listed Building
11433	No.7 Coedcae'r Court,Twynyrodyn, Mid Glamorgan	Grade II Listed Building
11434	No.8 Coedcae'r Court,Twynyrodyn, Mid Glamorgan	Grade II Listed Building
11435	No.9 Coedcae'r Court,Twynyrodyn, Mid Glamorgan	Grade II Listed Building

Table 1: Designated Heritage Assets Within the Search Area		
Ref.	**Name**	**Status**
11436	Crown Inn	Grade II Listed Building
11437	Barclay's Bank	Grade II Listed Building
11438	Lloyds Bank	Grade II Listed Building
11439	St David's Church	Grade II Listed Building
11440	Church Hall at St David's Church	Grade II Listed Building
11441	Memorial Fountain in St David's Chuchyard Wall	Grade II Listed Building
11442	Carnegie Library	Grade II Listed Building
11443	Statue & Plinth to Henry Seymour Berry	Grade II Listed Building
11445	Former County Court	Grade II Listed Building
11446	Pillar Box at NE corner of Town Hall	Grade II Listed Building
11447	Flooks	Grade II Listed Building
11448	Ironwork Fountain Canopy	Grade II Listed Building
11449	St Tydfil's Church	Grade II Listed Building
11450	Gates & Railings at St Tydfil's Churchyard	Grade II Listed Building
11451	High Street Baptist Church	Grade II Listed Building
11452	Zoar Chapel (Welsh Congregational)	Grade II Listed Building
11453	Gates & Gatepiers at Entry to Zoar Chapel	Grade II Listed Building
11454	Former Wesley Methodist Church	Grade II Listed Building
11455	Merthyr Tydfil War Memorial	Grade II Listed Building
11456	Guard Rail & Steps at Merthyr Tydfil War Memorial	Grade II Listed Building
11457	Former Unitarian Chapel	Grade II Listed Building
11458	No.13 New Castle Street, Mid Glamorgan	Grade II Listed Building
11459	No.13A New Castle Street, Mid Glamorgan	Grade II Listed Building
11460	No.14 New Castle Street, Mid Glamorgan	Grade II Listed Building
11461	Trengrove House	Grade II Listed Building
11462	No.16 New Castle Street, Mid Glamorgan	Grade II Listed Building
11463	No.17 New Castle Street, Mid Glamorgan	Grade II Listed Building
11464	Theatre Royal	Grade II Listed Building
11465	Thespian House at Theatre Royal	Grade II Listed Building
11468	District Education Office of Mid-Glamorgan County Council	Grade II Listed Building
11469	Boer War Memorial & Railings	Grade II Listed Building
11470	Zion Chapel (Capel Seion)	Grade II Listed Building
11471	Schoolroom at Zion Chapel	Grade II Listed Building
11472	Tydfil House	Grade II Listed Building
11473	Newton House	Grade II Listed Building
11474	Newton House	Grade II Listed Building
11475	St Tydfil's Hospital: Entrance Block (Centre Part Only)	Grade II Listed Building
11476	Statue & Plinth to Sir W.T. Lewis	Grade II Listed Building
11477	Stables House	Grade II Listed Building
11478	Dowlais Works Stables	Grade II Listed Building
11481	Nos.11 & 12 New Castle Street, Mid Glamorgan	Grade II Listed Building
11482	Pont-sarn	Grade II Listed Building
11487	Gwaelodygarth House	Grade II Listed Building
11489	Ivor English Congregational Church including forecourt walls	Grade II Listed Building
11517	Catholic Church of St Illtyd	Grade II Listed Building
13546	Nos 1-14 (consec) Collins Row	Grade II Listed Building
13547	Nos 14-28 (consec) Lower Row	Grade II Listed Building
13548	Nos 1-13 (consec) Middle Row & attached Windsor Arms PH	Grade II Listed Building
13549	Rhymney House Hotel	Grade II Listed Building
13554	St David's (Masonic Hall) and attached NE and SW garden walls	Grade II Listed Building
13555	No.2 The Terrace and attached garden wall with gate piers	Grade II Listed Building
13556	House and attached garden wall	Grade II Listed Building

Table 1: Designated Heritage Assets Within the Search Area		
Ref.	**Name**	**Status**
13587	1-4 Susannah Houses (consec)	Grade II Listed Building
13588	Railway Viaduct	Grade II Listed Building
16011	Ogilivie Colliery Explosives Store	Grade II Listed Building
16143	Timber Aqueduct over Former Taff Bargoed Railway	Grade II Listed Building
16882	Old Furnace Farmhouse	Grade II Listed Building
17931	Church of St John	Grade II Listed Building
21159	Pont Sticill (also known as Pontsticill Bridge)	Grade II Listed Building
21214	Brecon and Merthyr Railway bridge beside Ponsticill Reservoir	Grade II Listed Building
21314	Bethania Independent Chapel	Grade II Listed Building
21431	Ebenezer Calvinistic Methodist Chapel including vestry	Grade II Listed Building
21731	Compensation Basin at Pontsticill Water Treatment Works	Grade II Listed Building
21732	Turbine House at Pontsticill Water Treatment Works	Grade II Listed Building
21733	Filter House at Pontsticill Water Treatment Works	Grade II Listed Building
22485	W boundary walls, gates and railings at St George's church	Grade II Listed Building
22486	Boundary Stone at Bedwellty House	Grade II Listed Building
22487	Bandstand at Bedwellty Park	Grade II Listed Building
22488	War Memorial at Bedwellty Park	Grade II Listed Building
22489	N.C.B. Club	Grade II Listed Building
22490	St George's Church	Grade II Listed Building
22491	Christina Louise Nursing Home (aka Central Surgery)	Grade II Listed Building
22492	Saron Congregational Chapel, including attached schoolroom	Grade II Listed Building
22493	Front Walls and railings at Saron Congregational Chapel	Grade II Listed Building
22495	Agricultural Range at Milgatw	Grade II Listed Building
22497	Former Tramroad Bridge over Sirhowy River	Grade II Listed Building
22498	Ironworks Boundary Stone	Grade II Listed Building
25179	Church of St Tyfaelog	Grade II Listed Building
25180	War Memorial	Grade II Listed Building
25181	Boundary Wall and Railings at St David's Churchyard	Grade II Listed Building
25182	Former Pay Office Noddfa Buildings	Grade II Listed Building
25183	Nos 1 and 2 The Lawn	Grade II Listed Building
25184	The Vicarage	Grade II Listed Building
25185	Ysgol Lawnt	Grade II Listed Building
25186	No.3 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25187	No.4 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25188	No.5 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25189	No.6 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25190	No.7 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25191	No.8 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25739	Former Tredegar Company Shop	Grade II Listed Building
27083	Dowlais Public Library	Grade II Listed Building
27084	Mile Post	Grade II Listed Building
27085	Lower Row	Grade II Listed Building
27086	Industrial building at former Ivor Works	Grade II Listed Building
80958	The War Memorial, screen walls and surrounding railings	Grade II Listed Building
80959	Blaenygarth	Grade II Listed Building
80963	White Gate Road Bridge and Aqueduct	Grade II Listed Building
80964	Aqueduct on Dowlais Free Drainage System	Grade II Listed Building
81187	Direction post near Church of St Gwynno	Grade II Listed Building
81188	Gravestone of Robert Thompson Crawshay and surrounding railings	Grade II Listed Building
81189	Hy Brasail	Grade II Listed Building
81194	Pont Sticill (also known as Pontsticill Bridge)	Grade II Listed Building
81195	Pont-Sarn	Grade II Listed Building

Table 1: Designated Heritage Assets Within the Search Area		
Ref.	**Name**	**Status**
81197	Road bridge near former Pontsarn Station	Grade II Listed Building
81199	Dam, valve tower, bridge and outflow on Pontsticill Reservoir	Grade II Listed Building
82671	Former Miner's Welfare Hall	Grade II Listed Building
87475	12 New Castle Street	Grade II Listed Building
87476	18 New Castle Street	Grade II Listed Building
87477	19 New Castle Street	Grade II Listed Building
87478	20 New Castle Street	Grade II Listed Building
87479	Former Chapel	Grade II Listed Building
87640	Dam, valve tower, bridge and outflow on Pontsticill Reservoir	Grade II Listed Building
87660	115 High Street	Grade II Listed Building
BR118	Cae Burdydd Castle	Scheduled Monument
BR123	Y Gaer, Dol-y-Gaer	Scheduled Monument
BR141	Ponsticill Inscribed Stone	Scheduled Monument
BR145	Nant Crew Inscribed Stone (now in Cefn Coed Church)	Scheduled Monument
BR166	Pant Sychbant Round Cairn and Earthworks	Scheduled Monument
BR249	Abercynafon Neolithic Site	Scheduled Monument
BR252	Pen Bwlych Glascwm Pillow Mounds	Scheduled Monument
BR254	Cwm Criban Prehistoric Settlement	Scheduled Monument
BR277	Carn y Bugail and Carn Felen	Scheduled Monument
BR278	Waun y Gwair Cairn	Scheduled Monument
BR279	Nant Morlais Hafod	Scheduled Monument
BR286	Buarth y Caerau Cairn	Scheduled Monument
BR322	Garn Fawr round cairn	Scheduled Monument
BR354	Carreg Wen Fawr y Rugos cairn cemetery	Scheduled Monument
BR355	Carn Caws round cairn	Scheduled Monument
BR356	Carn Caws, round cairn to N of	Scheduled Monument
BR362	Pontsticill platform cairn	Scheduled Monument
BR372	Clo Cadno platform cairn	Scheduled Monument
BR373	Pant Serthfa round cairn	Scheduled Monument
BR374	Pant Serthfa stone row	Scheduled Monument
BR389	Twyn Ceilog Round Cairn	Scheduled Monument
GM028	Morlais Castle	Scheduled Monument
GM164	Rectangular Earthworks 530m SSW of Heol-Ddu-Uchaf	Scheduled Monument
GM220	Gelligaer Common Round Cairns	Scheduled Monument
GM221	Gelligaer Common Standing Stone	Scheduled Monument
GM222	Merthyr Common Round Cairns	Scheduled Monument
GM236	Garn Las Earthwork	Scheduled Monument
GM239	Gwersyll	Scheduled Monument
GM260	Dyke 315m E of Tyla-Glas	Scheduled Monument
GM261	Dyke 387m E of Clawdd Trawscae Farm	Scheduled Monument
GM270	Tir Lan round barrow cemetery	Scheduled Monument
GM271	Coed Cae Round Cairns	Scheduled Monument
GM272	Cefn Merthyr Round Cairns	Scheduled Monument
GM273	Fforest Gwladys Roman practice camp	Scheduled Monument
GM286	Brynbychan Round Cairn	Scheduled Monument
GM287	Darren Fawr Round Cairns	Scheduled Monument
GM288	Graig-y-Gilfach round cairn and earthwork	Scheduled Monument
GM309	Capel Gwladys	Scheduled Monument
GM311	Platform Houses on East Side of Gelligaer Common	Scheduled Monument
GM313	Cairn 270m N of Pont Ffosyrhebog	Scheduled Monument
GM314	Platform Houses and Cairn Cemetery on Dinas Noddfa	Scheduled Monument
GM317	Three Platform Houses on Cefn Brithdir	Scheduled Monument

Table 1: Designated Heritage Assets Within the Search Area		
Ref.	**Name**	**Status**
GM320	Platform Houses on Coly Uchaf	Scheduled Monument
GM331	Ynys Fach Iron Furnaces	Scheduled Monument
GM339	Site of Tegernacus Stone	Scheduled Monument
GM359	Merthyr Tramroad: Pont y Gwaith section and associated bridges	Scheduled Monument
GM368	Ring Cairn South of Twyn Blaennant	Scheduled Monument
GM401	Hut Circles & Enclosures on Buarth Maen	Scheduled Monument
GM402	Carn Pentyle-Hir & Adjacent Round Cairn	Scheduled Monument
GM403	Rhymney Upper Furnace	Scheduled Monument
GM424	Pont y Cafnau Tramroad Bridge	Scheduled Monument
GM425	Remains of Blast Furnaces, Cyfarthfa Ironworks	Scheduled Monument
GM451	Capel y Brithdir	Scheduled Monument
GM460	Cwmdu Air Shaft & Fan	Scheduled Monument
GM467	Cyfarthfa Canal Level	Scheduled Monument
GM478	Gurnos Quarry Tramroad & Leat	Scheduled Monument
GM479	Tai Mawr Leat for Cyfarthfa Iron Works	Scheduled Monument
GM486	Iron Canal Bridge from Rhydycar	Scheduled Monument
GM494	Sarn Howell Pond and Watercourses	Scheduled Monument
GM495	Cyfarthfa Tramroad Section at Heolgerrig	Scheduled Monument
GM496	Deserted Iron Mining Village, Ffos-y-fran	Scheduled Monument
GM517	Pillow Mound at Bryn y Gwyddel	Scheduled Monument
GM518	Enclosure East of Nant Cwm Moel	Scheduled Monument
GM519	Enclosure on Coedcae'r Ychain	Scheduled Monument
GM528	Penmoelallt Round Barrows	Scheduled Monument
GM529	Two Round Cairns at Onllwyn	Scheduled Monument
GM530	Onllwyn Round Cairn	Scheduled Monument
GM532	Pant Sychbant Medieval House	Scheduled Monument
GM554	Iron Ore Scours and Patch Workings at Winch Fawr, Merthyr Tydfil	Scheduled Monument
GM556	Gelligaer Common Roman Road	Scheduled Monument
GM563	Morlais Hill ring cairn	Scheduled Monument
GM567	Cefn Cil-Sanws ring cairn	Scheduled Monument
GM568	Coetgae'r Gwartheg barrow cemetery	Scheduled Monument
GM569	Garn Pontsticill ring cairn	Scheduled Monument
GM570	Carn Ddu platform cairn	Scheduled Monument
GM571	Cefn Car settlement	Scheduled Monument
GM572	Abercanaid haystack boiler	Scheduled Monument
GM573	Merthyr Tramroad Tunnel (Trevithick's Tunnel)	Scheduled Monument
GM586	Carn Castell y Meibion ring cairn	Scheduled Monument
GM588	Y Domen Fawr round cairn	Scheduled Monument
GM594	Merthyr Tramroad: Morlais Castle section	Scheduled Monument
GM599	Cefn Cil-sanws, cairn on SW side of	Scheduled Monument
GM600	Cefn Cil-sanws defended enclosure	Scheduled Monument
GM606	Vale of Neath railway cutting and tunnel portal	Scheduled Monument
GM607	Cwm Pit and head of railway	Scheduled Monument
GM608	Cyfarthfa balance pond and leat	Scheduled Monument
GM609	Black Pins early ironstone workings	Scheduled Monument
GM610	Cwm Glo Chapel	Scheduled Monument
GM611	Cwm Glo pit and ironstone tip	Scheduled Monument
GM624	Rhaslas Pond South Dam	Scheduled Monument
MM181	Incline Haulage Winding Engine, Mynydd Bedwellty	Scheduled Monument
MM185	Sirhowy Ironworks, Site of	Scheduled Monument
MM218	Marine Colliery Pumping Engine	Scheduled Monument
MM287	Tredegar Ironworks Cholera Cemetery	Scheduled Monument

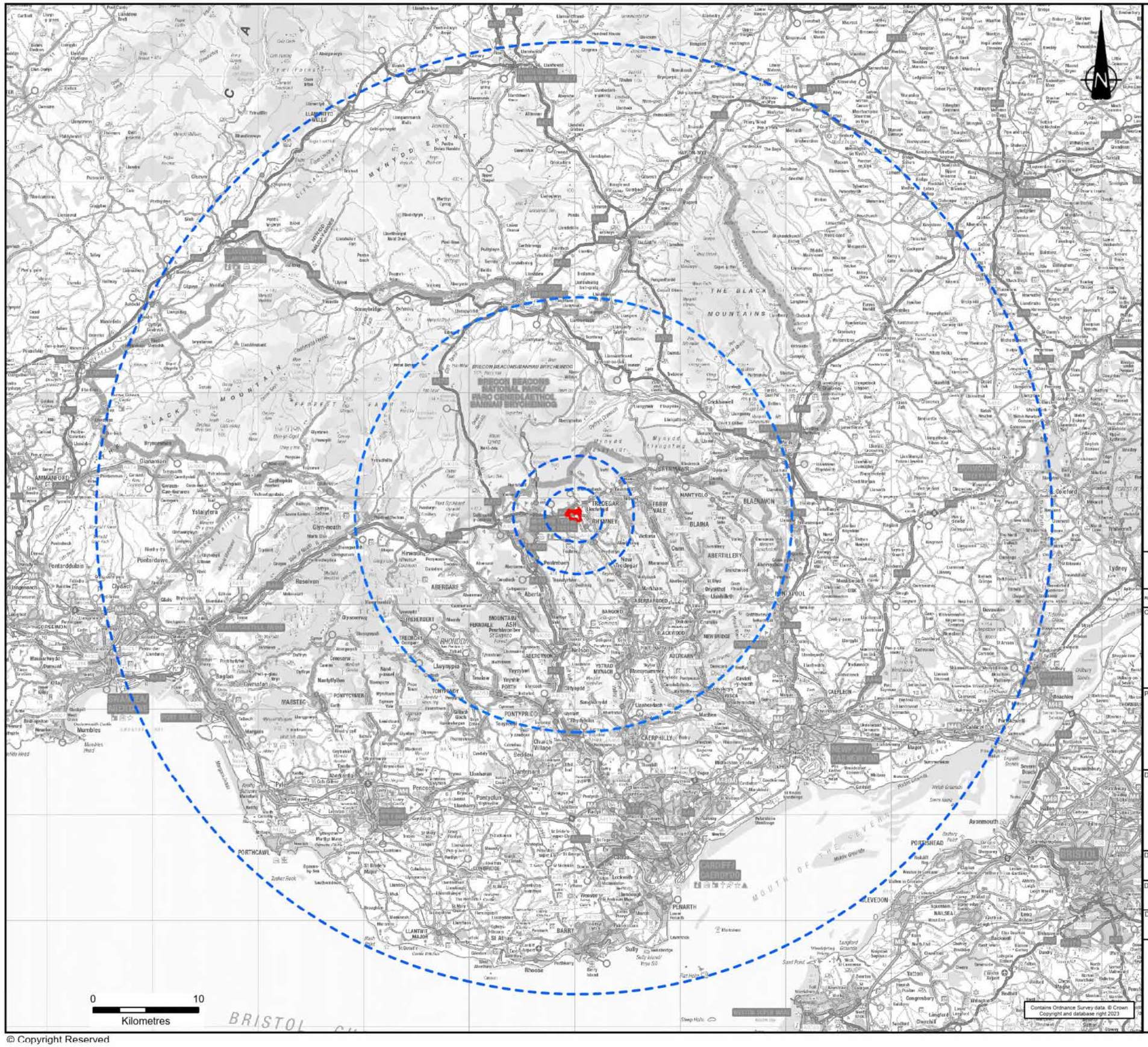
Table 1: Designated Heritage Assets Within the Search Area		
Ref.	Name	Status
MM310	St. Sannan's Churchayrd Cross, Bedwellty	Scheduled Monument
MM338	Trefil Quarries North	Scheduled Monument
MM339	Trefil Tramroad	Scheduled Monument
MM344	Twyn Bryn March round cairn	Scheduled Monument
MM345	Cefn Man Moel cross-ridge dyke	Scheduled Monument
MM347	Afon Sirhowy hut circle	Scheduled Monument
PGW(Gm)70(MER)	Cefn Coed Cemetery & Jewish Burial Ground	Registered Parks and Gardens
PGW(Gm)1(MER)	Cyfarthfa Castle	Registered Parks and Gardens
PGW(Gt)39(BLG)	Bedwellty Park	Registered Parks and Gardens
PGW(Gm)69(MER)	Aberfan: Cemetery, Garden of Remembrance and Former Tip and Slide Area	Registered Parks and Gardens
PGW(Gm)70(MER)	Cefn Coed Cemetery & Jewish Burial Ground	Registered Parks and Gardens
PGW(Gm)1(MER)	Cyfarthfa Castle	Registered Parks and Gardens
PGW(Gt)39(BLG)	Bedwellty Park	Registered Parks and Gardens
PGW(Gm)69(MER)	Aberfan: Cemetery, Garden of Remembrance and Former Tip and Slide Area	Registered Parks and Gardens
PGW(Gm)70(MER)	Cefn Coed Cemetery & Jewish Burial Ground	Registered Parks and Gardens
PGW(Gm)1(MER)	Cyfarthfa Castle	Registered Parks and Gardens
PGW(Gt)39(BLG)	Bedwellty Park	Registered Parks and Gardens
PGW(Gm)69(MER)	Aberfan: Cemetery, Garden of Remembrance and Former Tip and Slide Area	Registered Parks and Gardens
PGW(Gm)70(MER)	Cefn Coed Cemetery & Jewish Burial Ground	Registered Parks and Gardens
PGW(Gm)1(MER)	Cyfarthfa Castle	Registered Parks and Gardens
PGW(Gt)39(BLG)	Bedwellty Park	Registered Parks and Gardens
PGW(Gm)69(MER)	Aberfan: Cemetery, Garden of Remembrance and Former Tip and Slide Area	Registered Parks and Gardens
PGW(Gm)70(MER)	Cefn Coed Cemetery & Jewish Burial Ground	Registered Parks and Gardens
HLW (Gt) 4	Clydach George	Registered Historic Landscape
HLW (MGL) 2	Merthyr Tydfil	Registered Historic Landscape
HLW (MGl) 3	East Fforest Fawr and Mynydd-y-Glog	Registered Historic Landscape
HLW (MGl) 4	Gelli-Gaer Common	Registered Historic Landscape
-	Bedwellty Park	Conservation Area
-	Tredegar Heritage Initiative	Conservation Area
-	Bute Town	Conservation Area
-	Rhymney Town	Conservation Area
-	Council And Urban Street, Penydarren	Conservation Area
-	Cwmfelin	Conservation Area
-	Dowlais	Conservation Area
-	Cyfarthfa, Merthyr Tydfil	Conservation Area
-	Morgantown, Merthyr Tydfil	Conservation Area
-	Thomastown, Merthyr Tydfil	Conservation Area
-	Town Centre, Merthyr Tydfil	Conservation Area

Table 2: Designated Heritage Assets that may be affected by the proposals		
Ref.	Name	Status
984	Blaenavon Industrial Landscape	World Heritage Site
11396	Cyfarthfa Castle	Grade I Listed Building
11397	School at Cyfarthfa Castle	Grade I Listed Building
1861	The Town Clock	Grade II* Listed Building
1863	SW Roundhouse at Roundhouse Farm	Grade II* Listed Building
11377	Cefn Railway Viaduct	Grade II* Listed Building

Table 2: Designated Heritage Assets that may be affected by the proposals		
Ref.	**Name**	**Status**
11484	Pontsarn Railway Viaduct (also in Vaynor)	Grade II* Listed Building
13578	Church of St David	Grade II* Listed Building
21430	Penuel Baptist Church	Grade II* Listed Building
22494	Milgatw	Grade II* Listed Building
25522	Church of St Sannan	Grade II* Listed Building
1862	Bedwellty House	Grade II Listed Building
1877	Harcourt Terrace Wesleyan Methodist Chapel, including schoolroom and front railings	Grade II Listed Building
11384	Tower of Old Church of St Gwynno	Grade II Listed Building
11393	Catholic Church of St Mary incl. attached presbytery	Grade II Listed Building
11395	Church Hall at Capel Tabernacl	Grade II Listed Building
11439	St David's Church	Grade II Listed Building
11449	St Tydfil's Church	Grade II Listed Building
11451	High Street Baptist Church	Grade II Listed Building
11487	Gwaelodygarth House	Grade II Listed Building
11489	Ivor English Congregational Church including forecourt walls	Grade II Listed Building
11517	Catholic Church of St Illtyd	Grade II Listed Building
13546	Nos 1-14 (consec) Collins Row	Grade II Listed Building
13547	Nos 14-28 (consec) Lower Row	Grade II Listed Building
13548	Nos 1-13 (consec) Middle Row & attached Windsor Arms PH	Grade II Listed Building
13549	Rhymney House Hotel	Grade II Listed Building
13554	St David's (Masonic Hall) and attached NE and SW garden walls	Grade II Listed Building
13555	No.2 The Terrace and attached garden wall with gate piers	Grade II Listed Building
13556	House and attached garden wall	Grade II Listed Building
13587	1-4 Susannah Houses (consec)	Grade II Listed Building
16143	Timber Aqueduct over Former Taff Bargoed Railway	Grade II Listed Building
16882	Old Furnace Farmhouse	Grade II Listed Building
17931	Church of St John	Grade II Listed Building
21431	Ebenezer Calvinistic Methodist Chapel including vestry	Grade II Listed Building
22490	St George's Church	Grade II Listed Building
25179	Church of St Tyfaelog	Grade II Listed Building
25182	Former Pay Office Noddfa Buildings	Grade II Listed Building
25183	Nos 1 and 2 The Lawn	Grade II Listed Building
25184	The Vicarage	Grade II Listed Building
25185	Ysgol Lawnt	Grade II Listed Building
25186	No.3 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25187	No.4 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25188	No.5 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25189	No.6 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25190	No.7 The Terrace and attached garden wall with gate piers	Grade II Listed Building
25191	No.8 The Terrace and attached garden wall with gate piers	Grade II Listed Building
81189	Hy Brasail	Grade II Listed Building
BR118	Cae Burdydd Castle	Scheduled Monument
BR141	Ponsticill Inscribed Stone	Scheduled Monument
BR145	Nant Crew Inscribed Stone (now in Cefn Coed Church)	Scheduled Monument
BR277	Carn y Bugail and Carn Felen	Scheduled Monument
BR278	Waun y Gwair Cairn	Scheduled Monument
BR322	Garn Fawr round cairn	Scheduled Monument
BR389	Twyn Ceilog Round Cairn	Scheduled Monument
GM028	Morlais Castle	Scheduled Monument
GM164	Rectangular Earthworks 530m SSW of Heol-Ddu-Uchaf	Scheduled Monument
GM220	Gelligaer Common Round Cairns	Scheduled Monument

Table 2: Designated Heritage Assets that may be affected by the proposals		
Ref.	**Name**	**Status**
GM221	Gelligaer Common Standing Stone	Scheduled Monument
GM222	Merthyr Common Round Cairns	Scheduled Monument
GM236	Garn Las Earthwork	Scheduled Monument
GM273	Fforest Gwladys Roman practice camp	Scheduled Monument
GM286	Brynbychan Round Cairn	Scheduled Monument
GM288	Graig-y-Gilfach round cairn and earthwork	Scheduled Monument
GM311	Platform Houses on East Side of Gelligaer Common	Scheduled Monument
GM313	Cairn 270m N of Pont Ffosyrhebog	Scheduled Monument
GM314	Platform Houses and Cairn Cemetery on Dinas Noddfa	Scheduled Monument
GM402	Carn Pentyle-Hir & Adjacent Round Cairn	Scheduled Monument
GM403	Rhymney Upper Furnace	Scheduled Monument
GM425	Remains of Blast Furnaces, Cyfarthfa Ironworks	Scheduled Monument
GM494	Sarn Howell Pond and Watercourses	Scheduled Monument
GM496	Deserted Iron Mining Village, Ffos-y-fran	Scheduled Monument
GM517	Pillow Mound at Bryn y Gwyddel	Scheduled Monument
GM519	Enclosure on Coedcae'r Ychain	Scheduled Monument
GM528	Penmoelallt Round Barrows	Scheduled Monument
GM529	Two Round Cairns at Onllwyn	Scheduled Monument
GM556	Gelligaer Common Roman Road	Scheduled Monument
GM563	Morlais Hill ring cairn	Scheduled Monument
GM568	Coetgae'r Gwartheg barrow cemetery	Scheduled Monument
GM570	Carn Ddu platform cairn	Scheduled Monument
GM586	Carn Castell y Meibion ring cairn	Scheduled Monument
GM588	Y Domen Fawr round cairn	Scheduled Monument
GM599	Cefn Cil-sanws, cairn on SW side of	Scheduled Monument
GM600	Cefn Cil-sanws defended enclosure	Scheduled Monument
GM609	Black Pins early ironstone workings	Scheduled Monument
GM610	Cwm Glo Chapel	Scheduled Monument
GM611	Cwm Glo pit and ironstone tip	Scheduled Monument
MM287	Tredegar Ironworks Cholera Cemetery	Scheduled Monument
MM338	Trefil Quarries North	Scheduled Monument
MM344	Twyn Bryn March round cairn	Scheduled Monument
MM345	Cefn Man Moel cross-ridge dyke	Scheduled Monument
PGW(Gm)70(MER)	Cefn Coed Cemetery & Jewish Burial Ground	Registered Parks and Gardens
PGW(Gm)1(MER)	Cyfarthfa Castle	Registered Parks and Gardens
PGW(Gt)39(BLG)	Bedwellty Park	Registered Parks and Gardens
PGW(Gm)69(MER)	Aberfan: Cemetery, Garden of Remembrance and Former Tip and Slide Area	Registered Parks and Gardens
HLW (Gt) 4	Clydach George	Registered Historic Landscape
HLW (MGL) 2	Merthyr Tydfil	Registered Historic Landscape
HLW (MGl) 3	East Fforest Fawr and Mynydd-y-Glog	Registered Historic Landscape
HLW (MGl) 4	Gelli-Gaer Common	Registered Historic Landscape
-	Bedwellty Park	Conservation Area
-	Bute Town	Conservation Area
-	Rhymney Town	Conservation Area
-	Council And Urban Street, Penydarren	Conservation Area
-	Dowlais	Conservation Area
-	Cyfarthfa, Merthyr Tydfil	Conservation Area

DRAWINGS



KEY

Site Boundary

2, 5, 20 and 45 km Buffer

Notes:

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

convatec
— forever caring —

PROJECT

CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

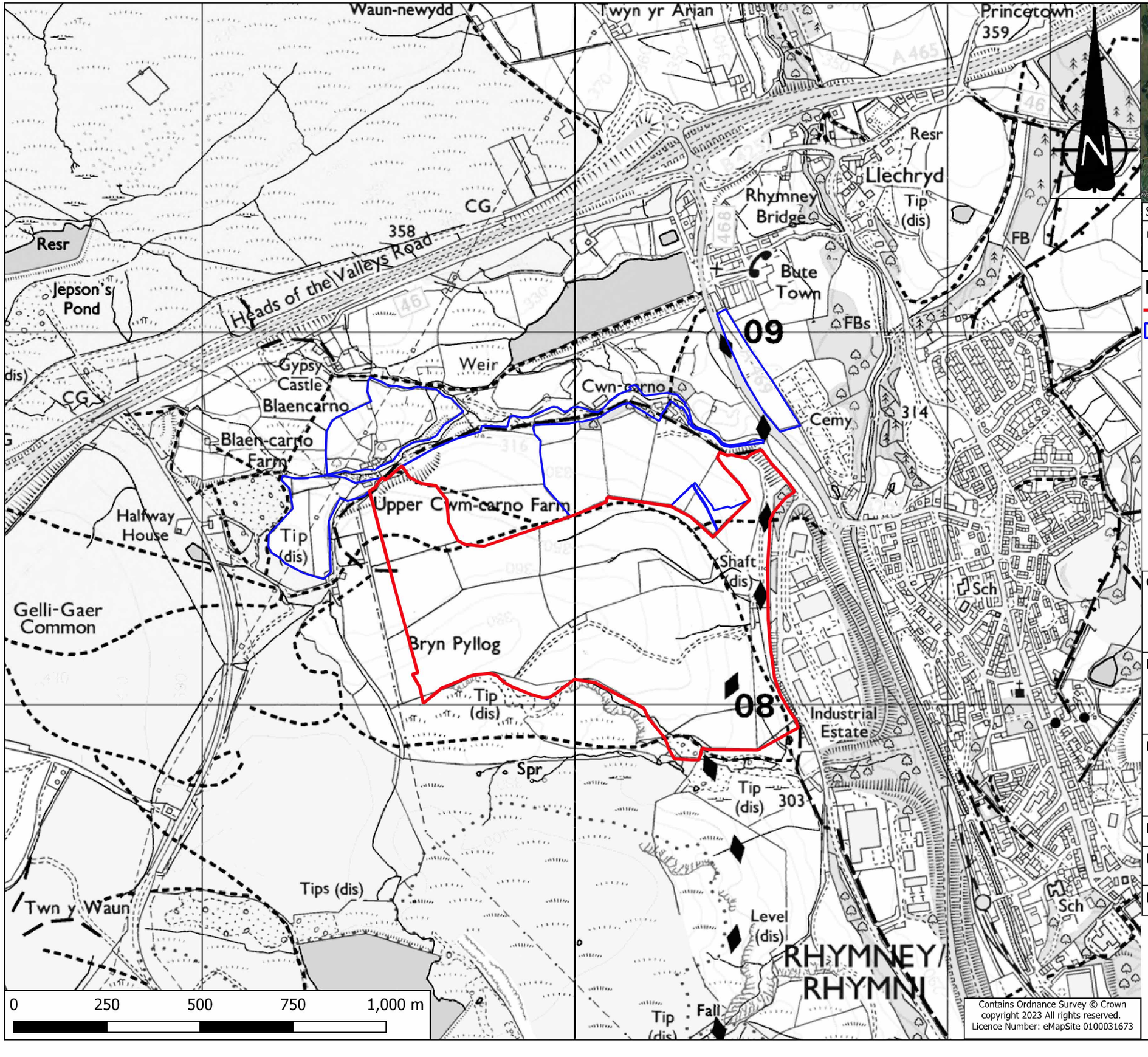
SITE LOCATION PLAN AND VISIBILITY BUFFER ZONES

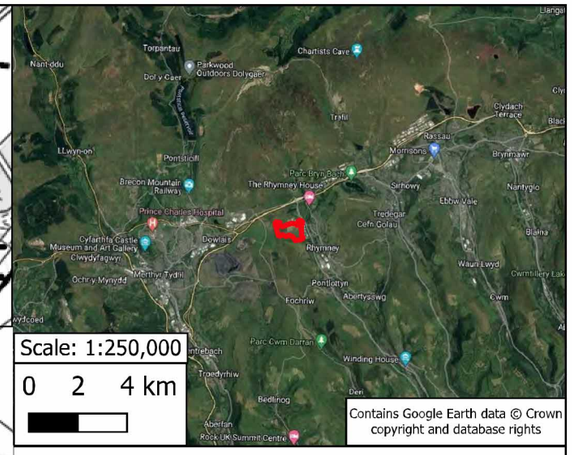
DRG No.	REV	SUIT. CODE
BR10167/001	A	Sc

DRG SIZE	SCALE	DATE
A3	1:350,000	31/10/2023

DRAWN BY	CHECKED BY	APPROVED BY
GER	GS	SA

wardell armstrong





Legend

- Red line Boundary
- Blue Line Boundary

CLIENT

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PROJECT

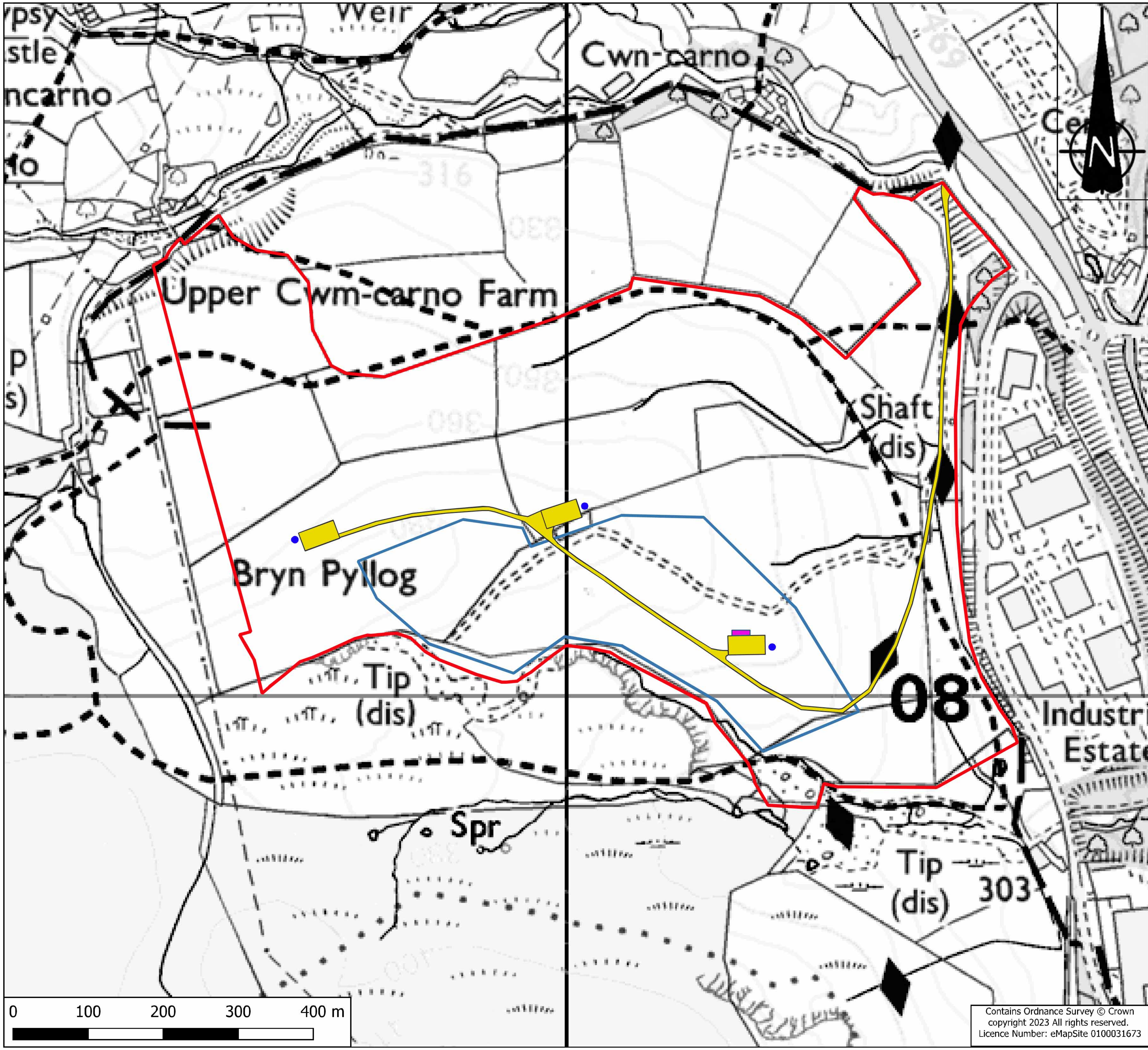
Convatec Green Manufacturing Hub

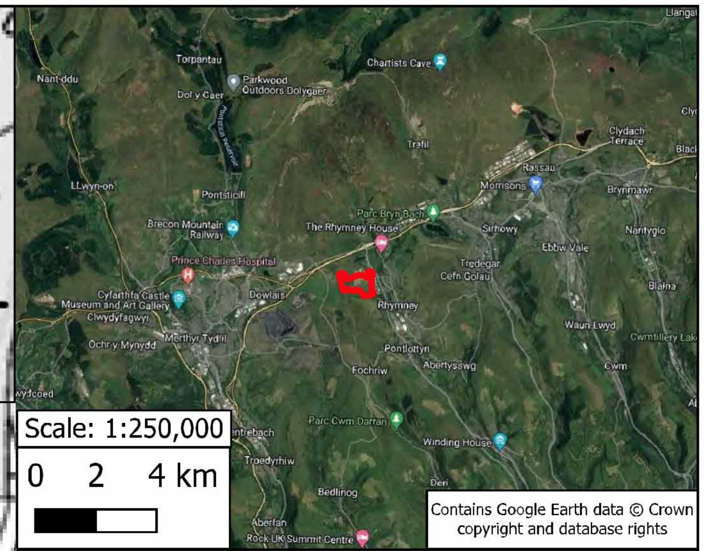
DRAWING TITLE

Site Location

DRG No. BR10167 002		REV: A
DRG SIZE: A3	SCALE: 1:10,000	DATE: November 2023
DRAWN: JS	CHECKED BY: SA	APPROVED BY: SA

wardell armstrong





Legend

- Red line Boundary
- Provisional Turbine Location
- Provisional Substation Location
- Provisional Tracks
- Provisional Solar PV Location

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PROJECT

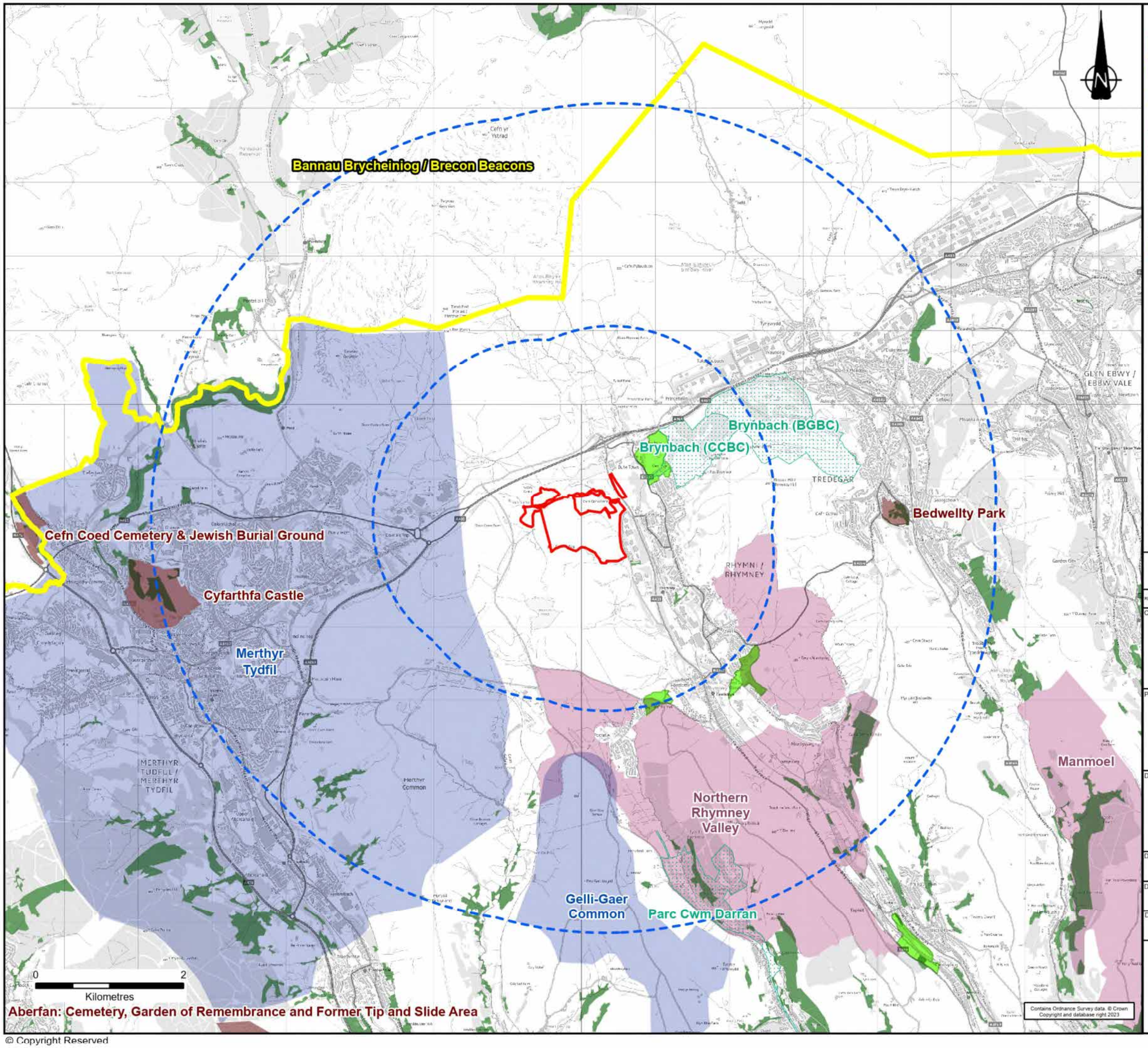
Convatec Green Manufacturing Hub

DRAWING TITLE

Indicative Development Layout

DRG No. BR10167 SL3		REV: A
DRG SIZE: A3	SCALE: 1:5000	DATE: November 2023
DRAWN: JS	CHECKED BY: SA	APPROVED BY: SA

wardell armstrong



KEY

- Site Boundary
- 2 and 5 km Buffer
- Bannau Brycheiniog / Brecon Beacons National Park
- Ancient Woodland
- Country Parks
- Registered Landscapes of Outstanding and of Special Interest
- Visually Important Local Landscapes
- Registered Historic Landscapes
- Green Wedges

Notes:

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

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PROJECT

CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

DESIGNATED AREAS

DRG No.	REV	SUIT. CODE
BR10167/003	A	Sc

DRG SIZE	SCALE	DATE
A3	1:50,000	31/10/2023

DRAWN BY	CHECKED BY	APPROVED BY
GER	GS	SA

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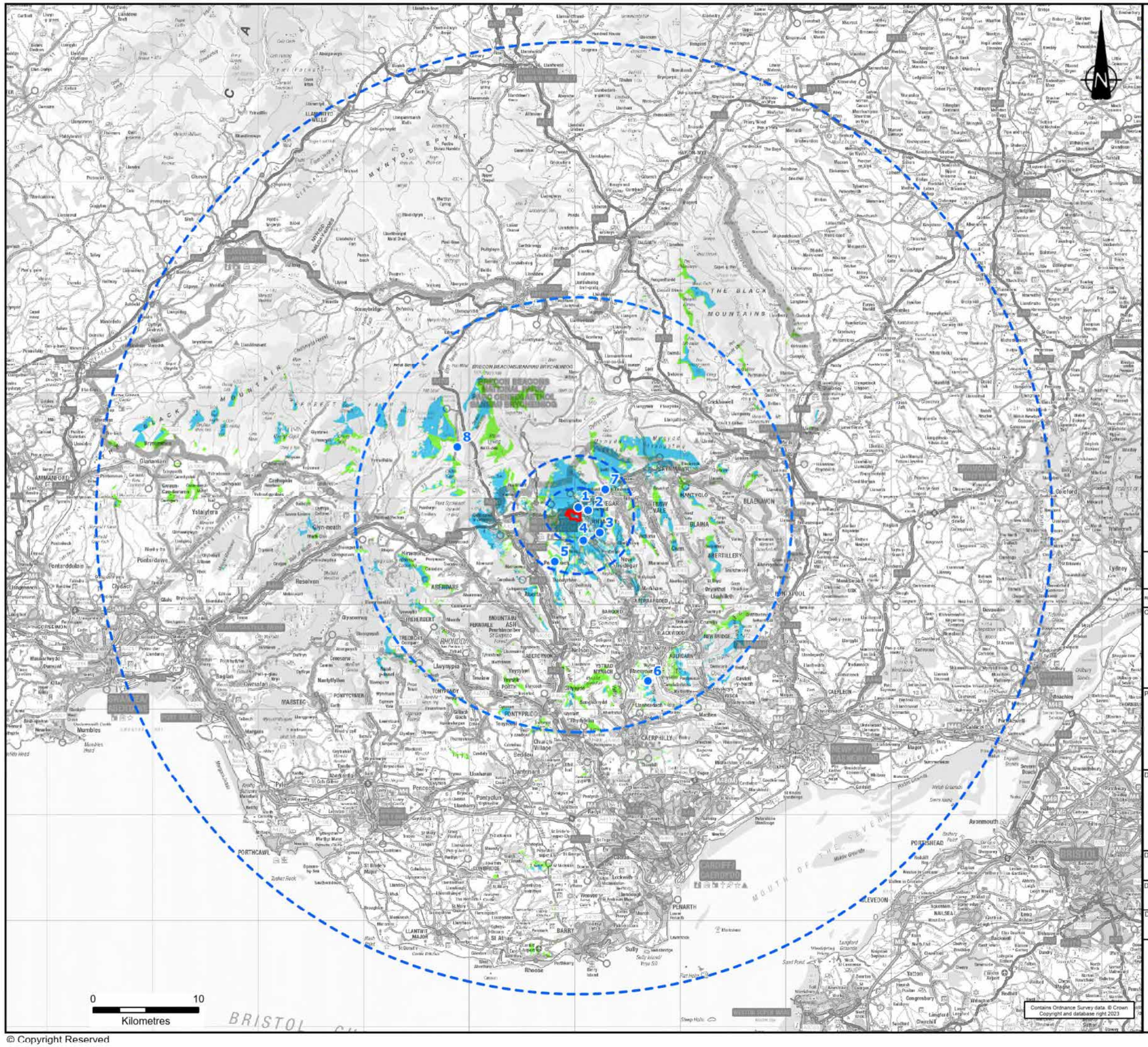

KEY

- Site Boundary
- 2, 5, 20 and 45 km Buffer
- Viewpoint Locations
- Area where the Turbine Tips would be theoretically visible
- Area where the Solar Panel, Turbine Hubs and Turbine Tips would be theoretically visible

Notes:
Boundaries are indicative.

The ZTV for the solar panels is based on a 30 m spaced, multi-point grid within the site boundary. Each point is 3 m above ground level. The solar panel visibility is only considered within 5 km of the site boundary.

The ZTV for the wind turbines is based on the proposed turbine locations at a hub height of 92 m and tip height of 150 m. The ZTV was run for 45 km from the site boundary.

Welsh Government Lidar DSM and DTM was used to create the model form which the ZTV was produced.

The ZTV takes into account an eye height of 2 m.

The ZTV was created using QGIS Software which takes into account the curvature of the Earth.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

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CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

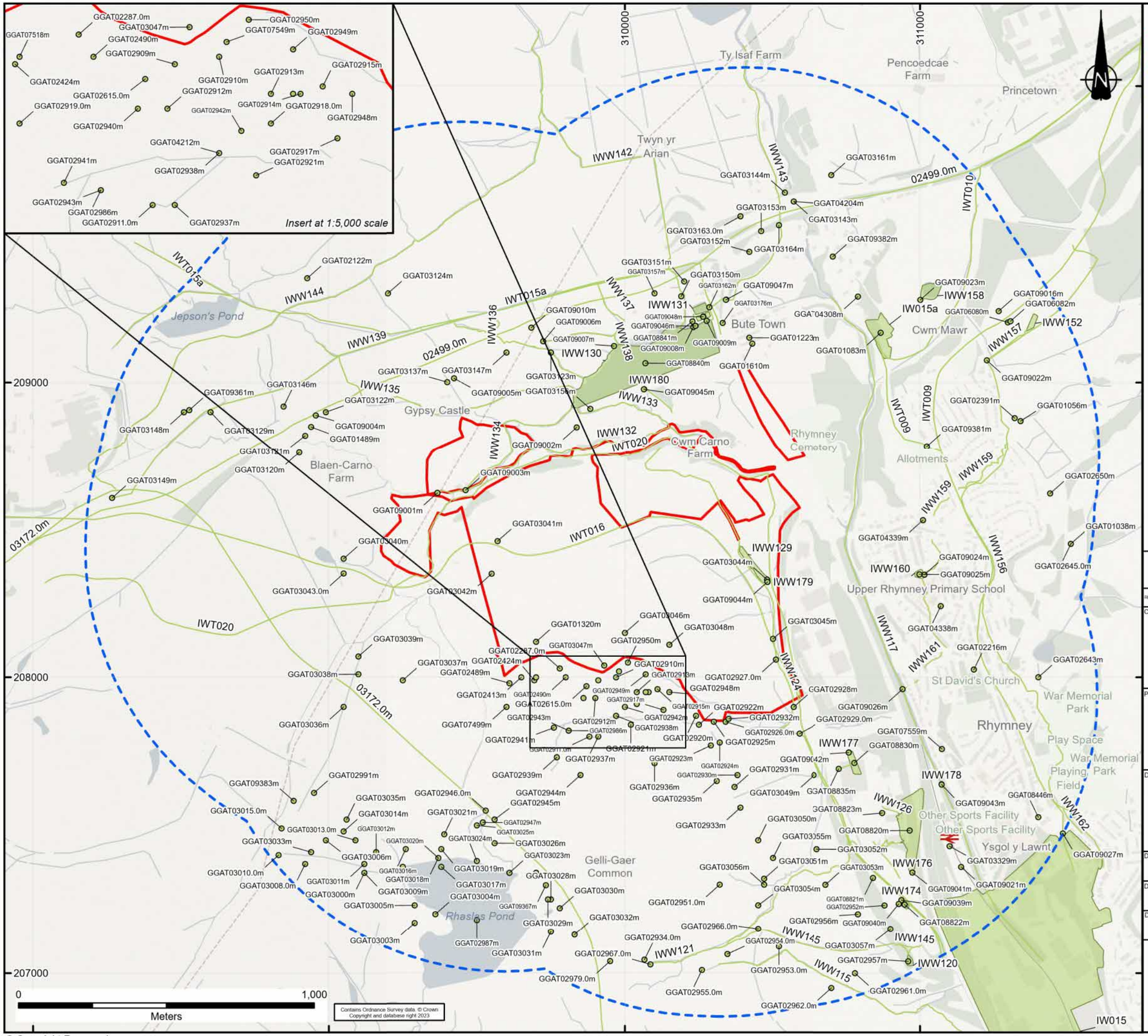
SCREENED ZONE OF THEORETICAL VISIBILITY
(45 KM STUDY AREA)

DRG No.	REV	SUIT. CODE
BR10167/013	A	Sc

DRG SIZE	SCALE	DATE
A3	1:350,000	31/10/2023

DRAWN BY	CHECKED BY	APPROVED BY
GER	GS	SA

wardell armstrong



KEY

- Site Boundary
- 1km Study Radius
- Non-Designated Historic Assets
- Non-Designated Historic Assets
- Non-Designated Historic Assets

Notes:

Boundaries are indicative.

Site boundary digitsied from Rhymney_Indicative layout_06Oct22

Derived from information held by the GGAT HER Charitable Trust Database Right

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D
A	First Issue	12/09/23	HP	LP	LG

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CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

NON-DESIGNATED HISTORIC ASSETS

DRG No.	REV	SUIT. CODE
BR10167-014	A	--

DRG SIZE	SCALE	DATE
A3	1:12,500	13/09/2023

DRAWN BY	CHECKED BY	APPROVED BY
HP	LP	LG

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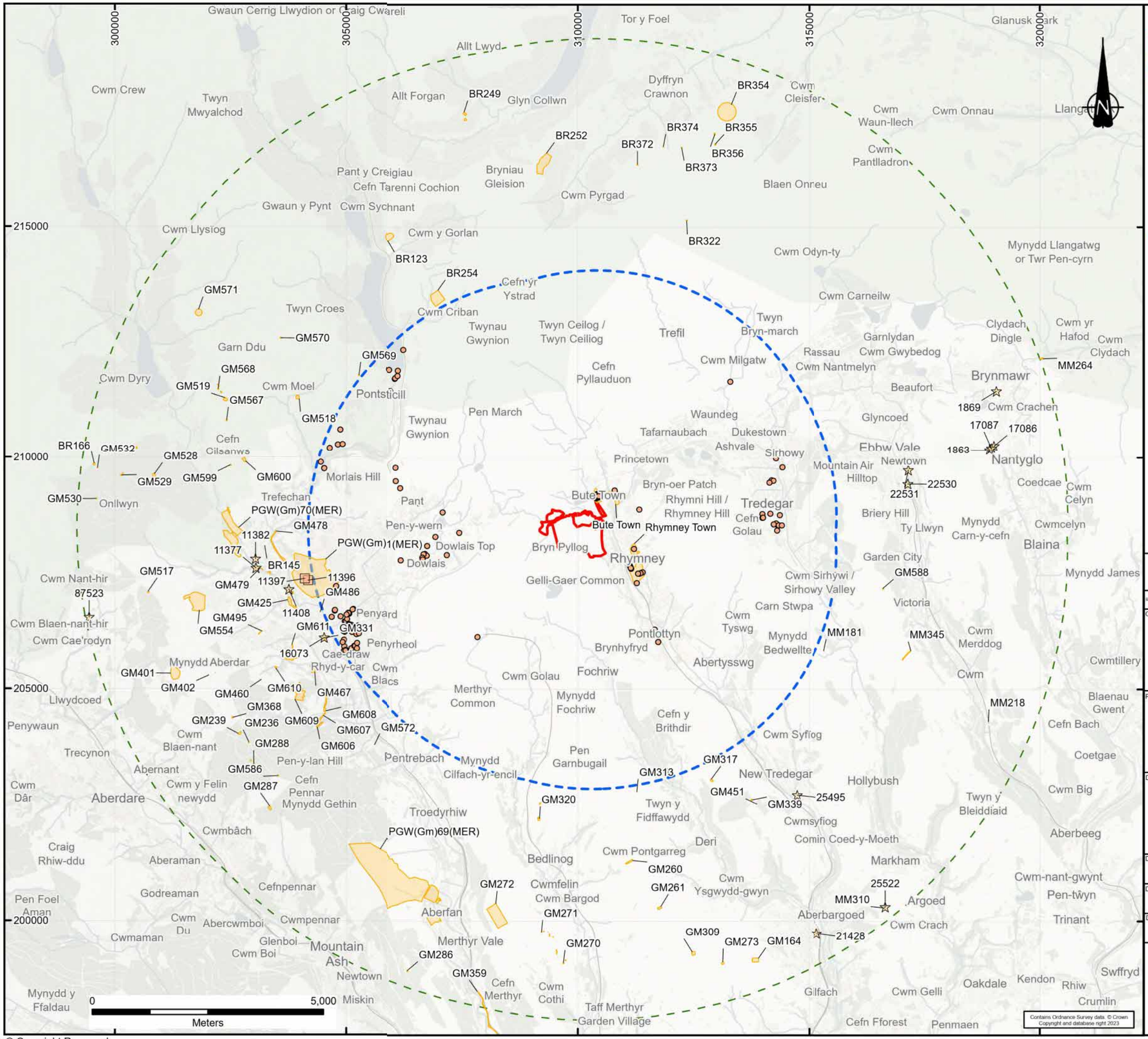

KEY

- Site Boundary
- 5km Study Radius
- 10km Study Radius
- Designated Historic Assets

Grade

- I
- II*

Grade

- II

- Designated Historic Assets

Notes:

Boundaries are indicative.

Site boundary digitsied from Rhymney_Indicative layout_06Oct22

Listed Buildings within 5km labels shown on following pages 1-4

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
A	First Issue	12/09/23	HP	LP	LG

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CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

DESIGNATED HISTORIC ASSETS

DRG No.	REV	SUIT. CODE
BR10167-015	A	--

DRG SIZE	SCALE	DATE
A3	1:80,000	13/09/2023

DRAWN BY	CHECKED BY	APPROVED BY
HP	LP	LG

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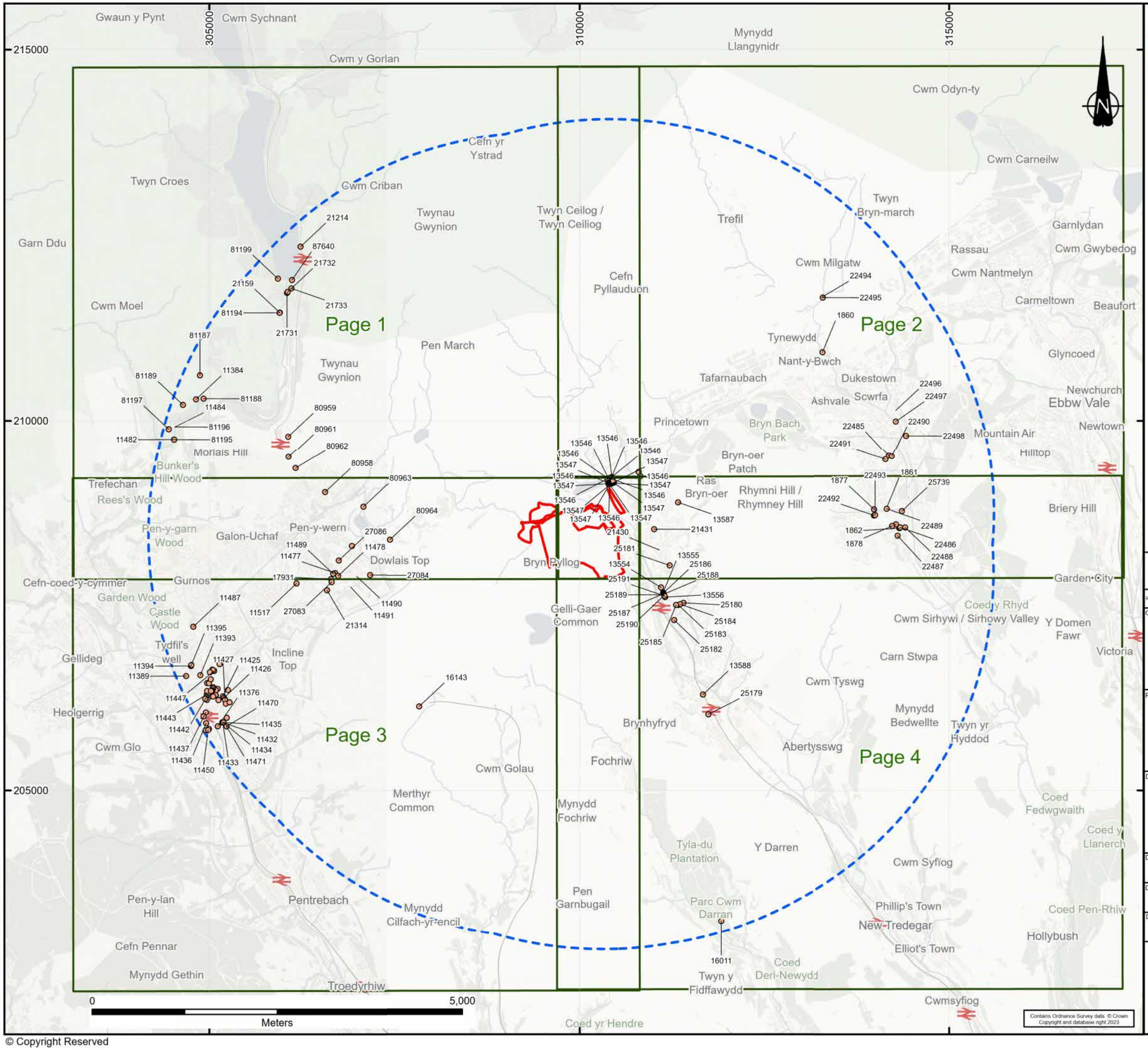

KEY

- Site Boundary
- 5km Study Radius
- Page Reference

Designated Historic Assets

Grade

- II

Notes:

Boundaries are indicative.

Site boundary digitsied from Rhymney_Indicative layout_06Oct22

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
A	First Issue	12/09/23	HP	LP	LG

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CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

DESIGNATED HISTORIC ASSETS KEY SHEET

DRG No.	REV	SUIT. CODE
BR10167-015	A	--

DRG SIZE	SCALE	DATE
A3	1:50,000	13/09/2023

DRAWN BY	CHECKED BY	APPROVED BY
HP	LP	LG

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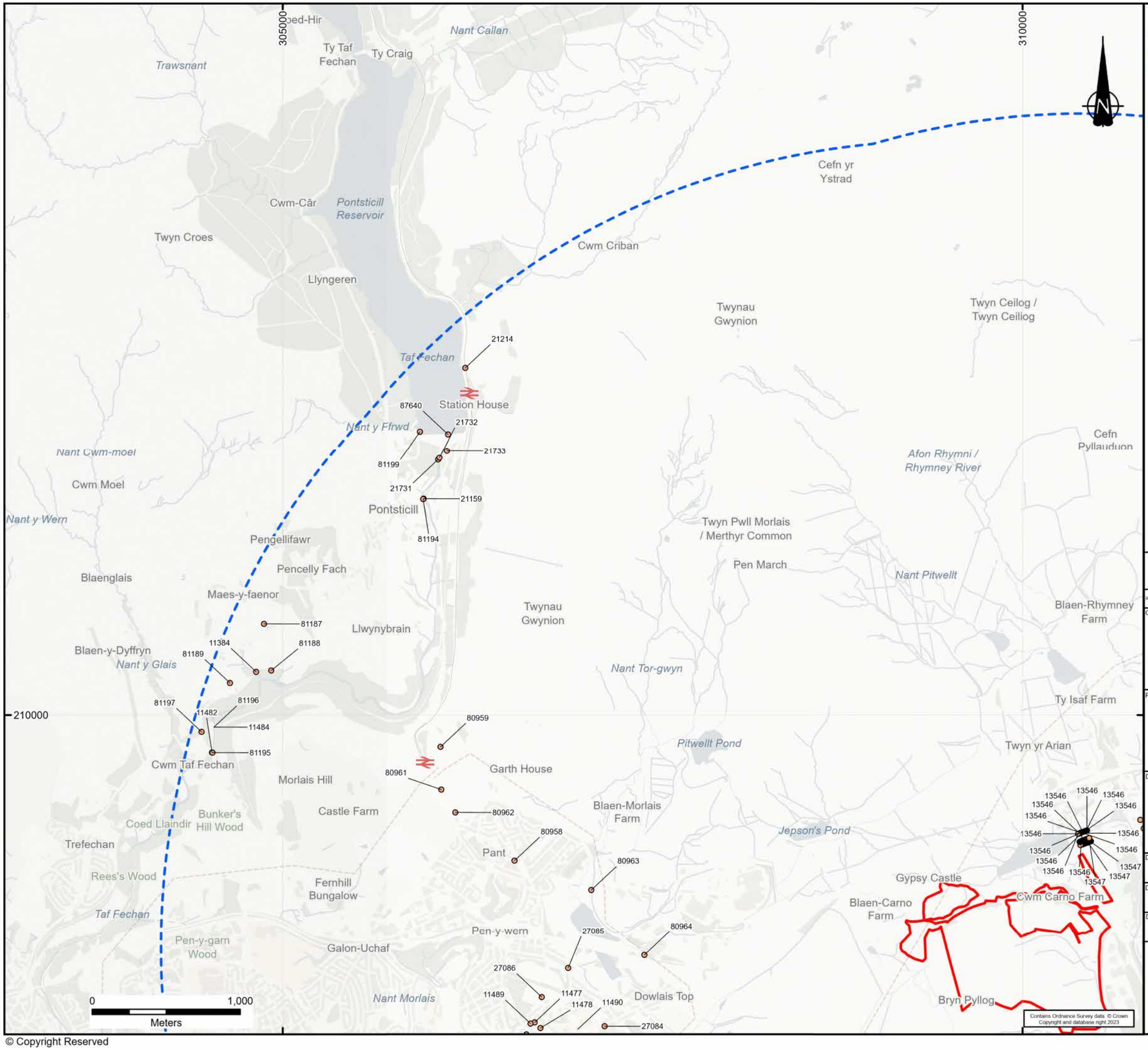

KEY

Site Boundary

5km Study Radius

Designated Historic Assets

Grade

II

Notes:

Boundaries are indicative.

Site boundary digitsied from Rhymney_Indicative layout_06Oct22

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
A	First Issue	12/09/23	HP	LP	LG

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CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

DESIGNATED HISTORIC ASSETS PAGE 1 OF 4

DRG No.	REV	SUIT. CODE
BR10167-015	A	--

DRG SIZE	SCALE	DATE
A3	1:25,000	13/09/2023

DRAWN BY	CHECKED BY	APPROVED BY
HP	LP	LG

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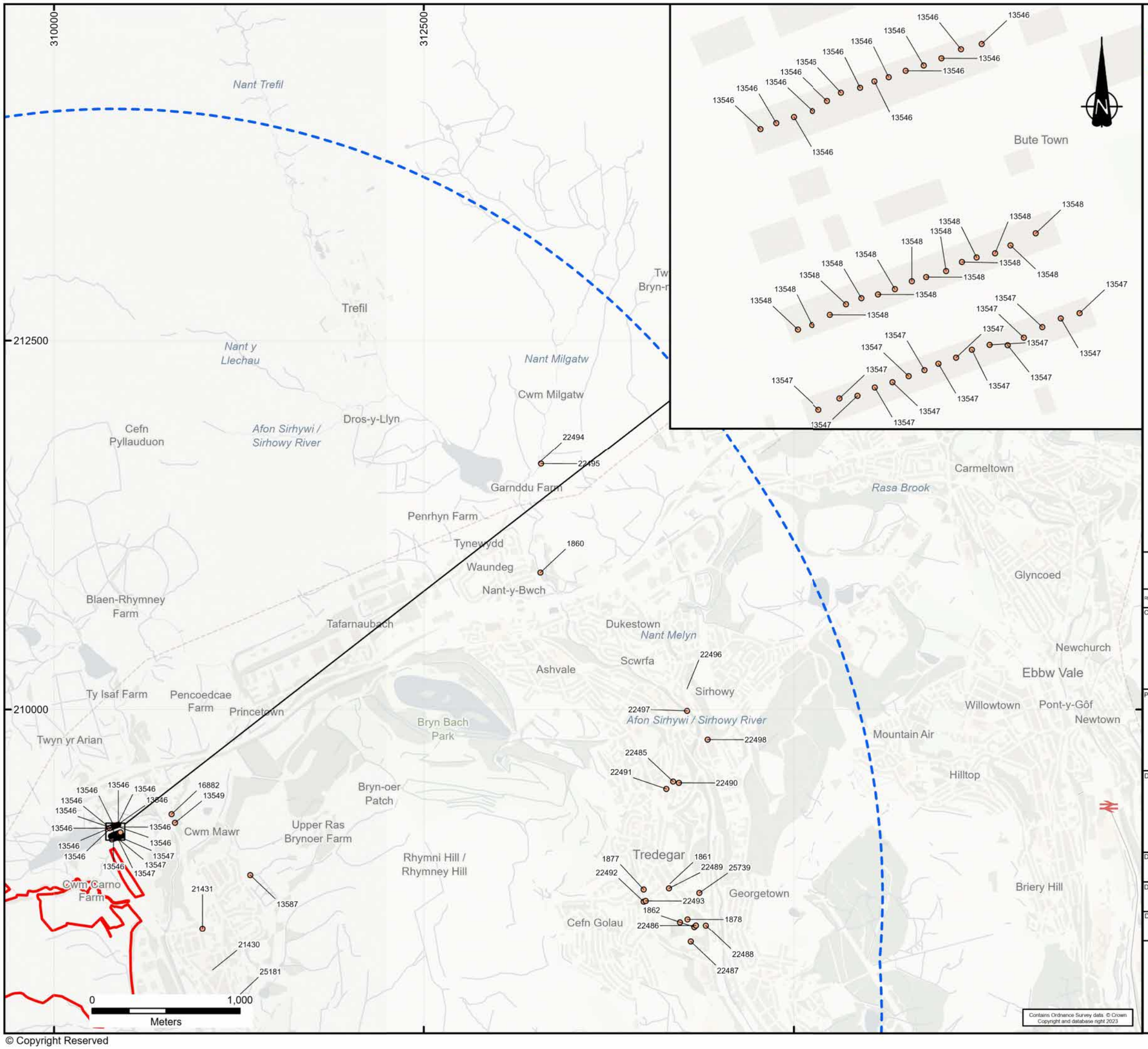

KEY

Site Boundary

5km Study Radius

Designated Historic Assets

Grade

II

Notes:

Boundaries are indicative.

Site boundary digitsied from Rhymney_Indicative layout_06Oct22

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
A	First Issue	12/09/23	HP	LP	LG

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CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

DESIGNATED HISTORIC ASSETS PAGE 2 OF 4

DRG No.	REV	SUIT. CODE
BR10167-015	A	--

DRG SIZE	SCALE	DATE
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DRAWN BY	CHECKED BY	APPROVED BY
HP	LP	LG

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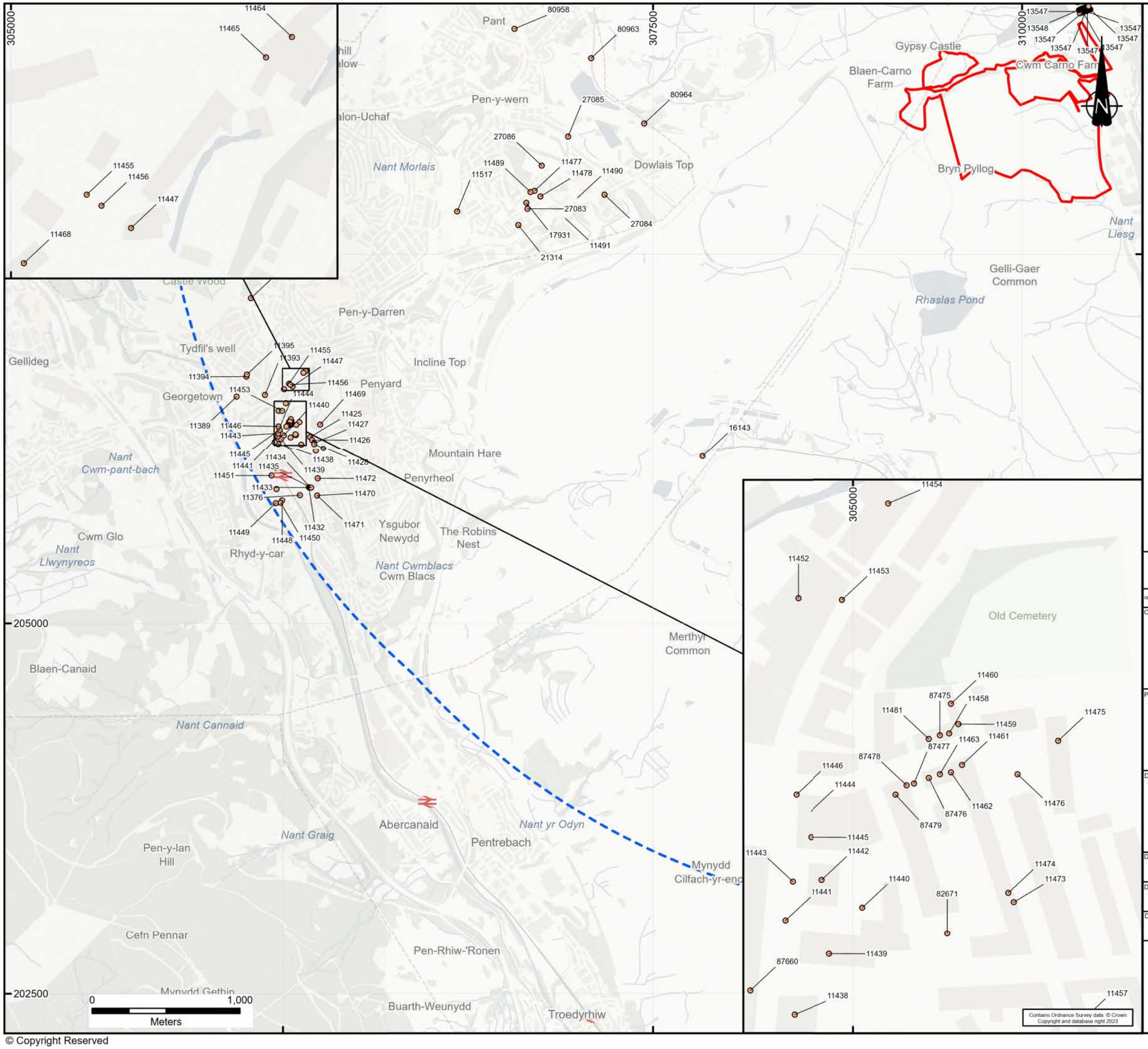

KEY

- Site Boundary
- 5km Study Radius

Designated Historic Assets

Grade

- II

Notes:

Boundaries are indicative.

Site boundary digitsied from Rhymney_Indicative layout_06Oct22

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
A	First Issue	12/09/23	HP	LP	LG

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CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

DESIGNATED HISTORIC ASSETS
PAGE 3 OF 4

DRG No.	REV	SUIT. CODE
BR10167-015	A	--

DRG SIZE	SCALE	DATE
A3	1:25,000	13/09/2023

DRAWN BY	CHECKED BY	APPROVED BY
HP	LP	LG

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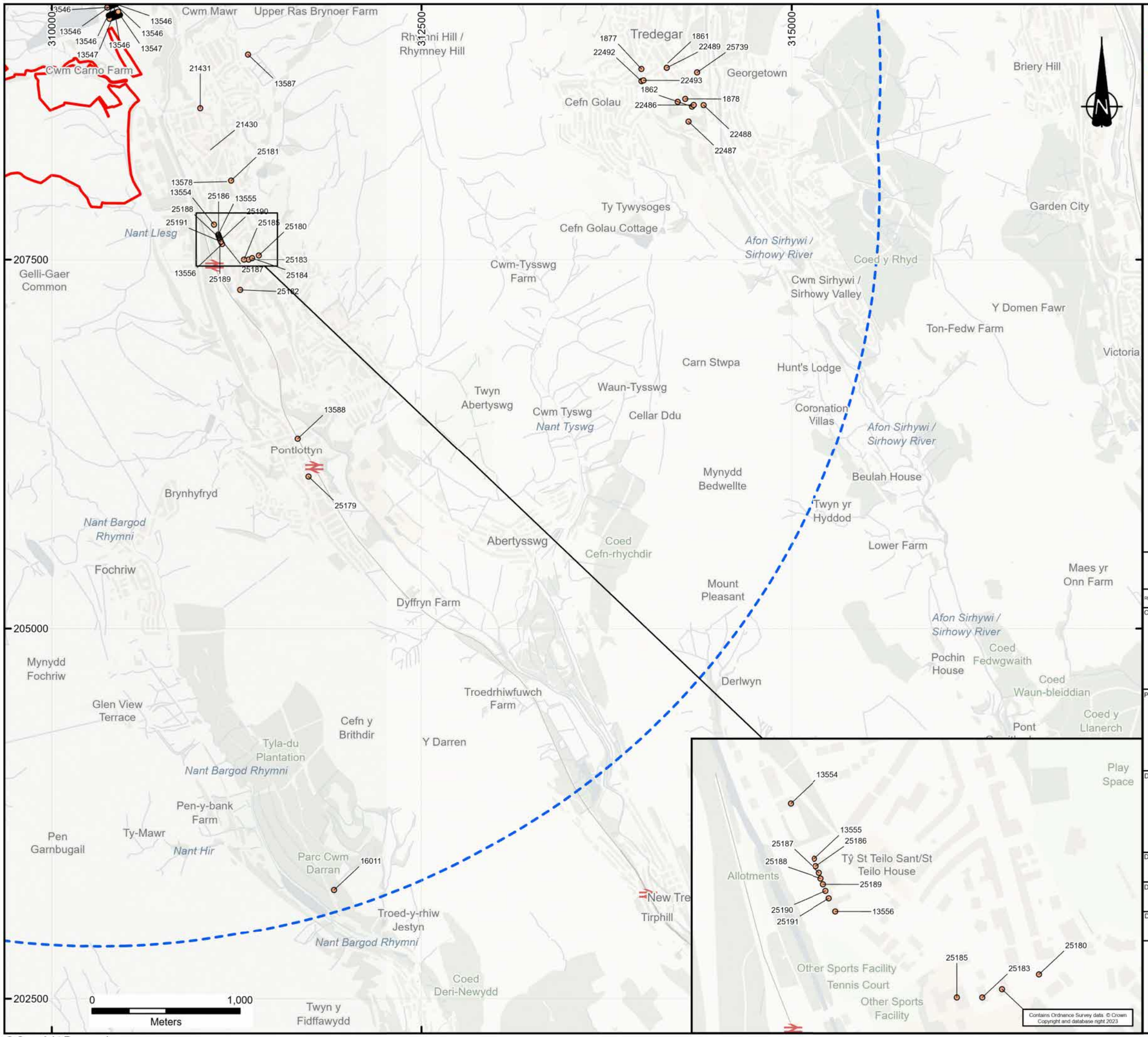

KEY

Site Boundary

5km Study Radius

Designated Historic Assets

Grade

II

Notes:

Boundaries are indicative.

Site boundary digitsied from Rhymney_Indicative layout_06Oct22

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
A	First Issue	12/09/23	HP	LP	LG

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CONVATEC GREEN MANUFACTURING HUB

DRAWING TITLE

DESIGNATED HISTORIC ASSETS
PAGE 4 OF 4

DRG No.	REV	SUIT. CODE
BR10167-015	A	--

DRG SIZE	SCALE	DATE
A3	1:25,000	13/09/2023

DRAWN BY	CHECKED BY	APPROVED BY
HP	LP	LG

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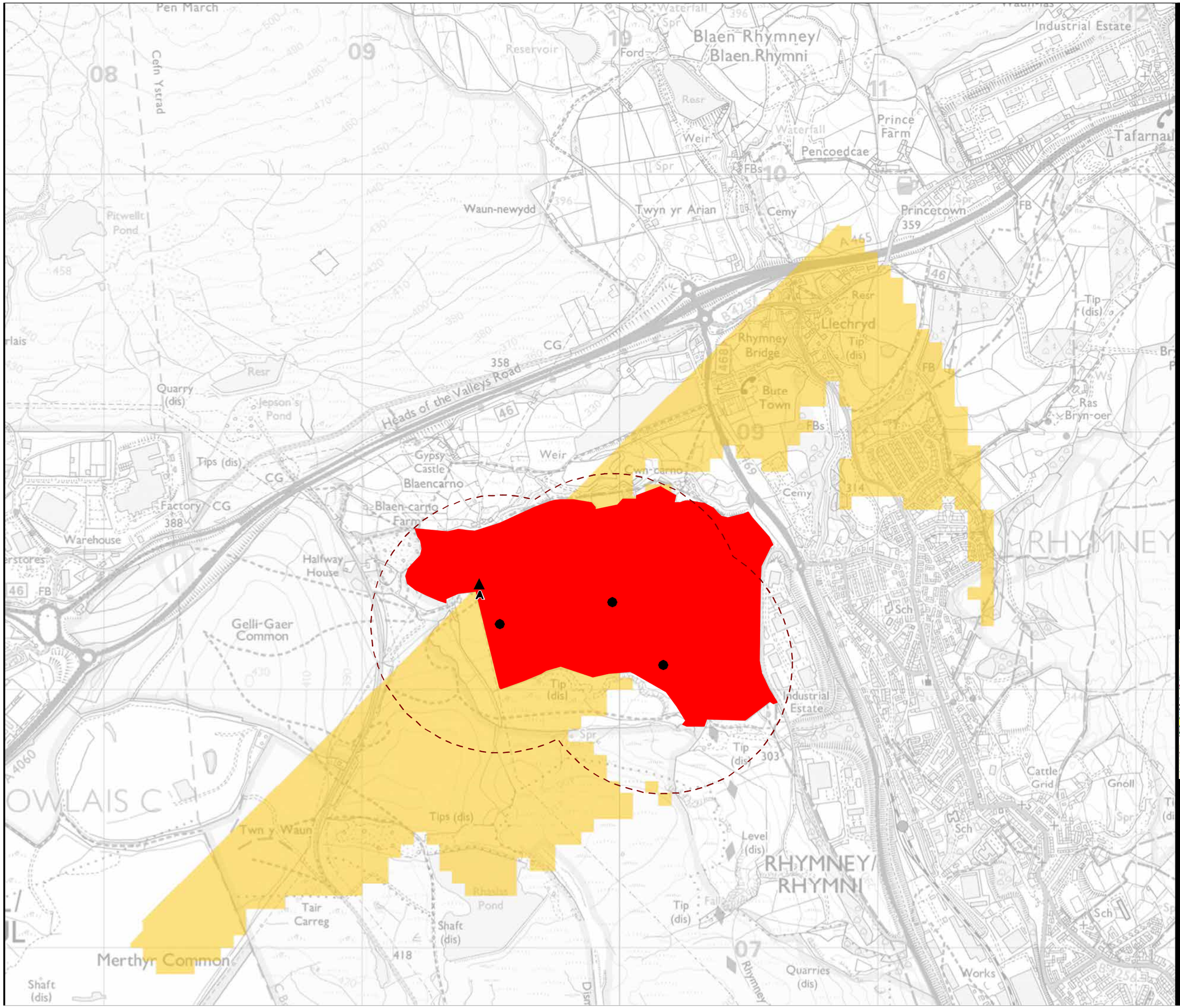

Legend

- Site
- Turbine
- 500m Turbine Buffer

Vantage Point (VP)

- VPA (SO 09398 08404)
- Viewshed A

Rev	Date	Description	Dr	App
00	20/09/2023		MR	MJR

This map contains data from the following sources:
Ordnance Survey (2021)

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Licence number 0100031673.

OS Grid Reference - British National Grid
Projection: Traverse Mercator
Datum: OSGB 1936
Units: Metres

RHYMNEY

VANTAGE POINT SURVEY PLAN

avian ecology

Avian Ecology, Suite 3c Walnut Tree Farm, Northwich Road, Lower Stretton
WA4 4PC
Tel: 01925 511511
www.avianecology.co.uk

0 500

meters

Legend

Site

10km Site Buffer

Designated Site

Special Area of Conservation (SAC)

Site of Special Scientific Interest (SSSI)

Usk Bat Sites / Safleoedd Ystlumod Wysg

Mynydd Llangatwg (Mynydd Llangattock)

Cwm Clydach Woodlands / Coedydd Cwm Clydach

Cwm Clydach

Daren Fach

Nant Glais Caves

Penmoelallt

Cwm Taf Fechan Woodlands

Cwm Merddog Woodlands

Cwm Glo a Glyndyrys

Cefn y Brithdir

Caeau Nant y Grees

00 | 20/09/2023 | | MR | MJR

Rev | Date | Description | Ck | App

Co-ordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Metres

RHYMNEY

DESIGNATED SITES

avian ecology

Avian Ecology, Suite 3c Walnut Tree Farm, Northwich Road, Lower Stretton
WA4 4PG
Tel: 01925 511 [illegible]
www.avianecology.co.uk

0 2

Kilometers

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Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

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Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

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Redcliffe
Bristol
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