

# CIL-LONYDD SOLAR FARM

Environmental Statement – Volume 3

JPW2051  
April 2024

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## Appendix 1.1 Author Competency

# CIL LONYDD SOLAR FARM

## Environmental Impact Assessment Report Appendix 1.1 Statement of Expertise

JPW2051  
Final  
April  
2024

Document status					
Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1	For PAC	RI	DP	DP	April 2024

Approval for issue		
Darren Parker		April 2024

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# 1 STATEMENT OF EXPERTISE

## RPS

### EIA Management

- 1.1 RPS is a member of the Institute of Environmental Management and Assessments (IEMAs) Environmental Impact Assessment (EIA) Quality Mark. This means that RPS adheres to the following quality mark commitments.
- EIA Management – We commit to using effective project control and management processes to deliver quality in the EIAs we co-ordinate and the Environmental Statements/EIA Reports we produce.
  - EIA Team Capabilities – We commit to ensuring that all our EIA staff have the opportunity to undertake regular and relevant continuing professional development.
  - EIA Regulatory Compliance – We commit to delivering Environmental Statements/EIA Reports that meet the requirements established within the appropriate UK EIA Regulations.
  - EIA Context and Influence – We commit to ensuring that all EIAs we co-ordinate are effectively scoped and that we will transparently indicate how the EIA process, and any consultation undertaken, influenced the development proposed and any alternatives considered.
  - EIA Content – We commit to undertaking assessments that include: a robust analysis of the relevant baseline; assessment and transparent evaluation of impact significance; and an effective description of measures designed to monitor and manage significant effects.
  - EIA Presentation – We commit to deliver Environmental Statements/EIA Reports that set out environmental information in a transparent and understandable manner.
  - Improving EIA Practice – We commit to enhance the profile of good quality EIA by working with IEMA to deliver a mutually agreed set of activities, on an annual basis, and by making appropriate examples of our work available to the wider EIA community.

## Topic Authors

### Landscape and Visual

- 1.2 The authors of the Landscape and Visual chapter are Stuart Galpin and Phil Mason.
- 1.3 Stuart (CMLI PGDip LA, BA(Hons)) is the Director of Galpin Landscape Architecture Ltd, a practice of Chartered Landscape Architects. He prepares landscape and visual impact assessments (LVIAs) for a number and range of schemes. He qualified as a chartered landscape architect in 2000, gaining a wide range of experience in both Landscape Design and Landscape and Visual Impact Assessments (LVIAs). He specialises in the preparation of LVIAs and the development of techniques and spatial data for a wide portfolio of schemes.
- 1.4 Phil (MEng (Hons) MA (Hons)) is a landscape architect working for Galpin Landscape Architecture Ltd. He is a jointly qualified engineer and landscape architect with extensive experience in the preparation of designs and LVIAs. He also has technical experience in 3D data and digital terrain models for the presentation of ZTVs, Wirelines and other visualisations. He has written LVIAs for a range of schemes including wind turbines, solar panels, housing and agricultural buildings

## Biodiversity

- 1.5 Kirsty Rogers MZoo, ACIEEM is a Senior Ecologist at BSG Ecology. Kirsty has worked as a professional ecologist since 2013, her project experience includes residential and commercial development, solar schemes, onshore wind projects, minerals extraction, waste, utilities, and transport schemes. Kirsty has experience in producing technical reports and Ecological Impact Assessments (EclA) for schemes that vary in their size and complexity and led the ecological input to projects requiring biodiversity gain assessments and District Level Licence applications. Kirsty has a particular interest in botany and has undertaken botanical surveys on projects using various techniques including Phase 1 and NVC. She has recently been awarded a Field Identification Skills Certificate (FISC) level 4 by Botanical Society of Britain and Ireland (BSBI).

## Cultural Heritage

- 1.6 The authors of the Historic Environment Chapter are Nick Cooke, Richard Conolly and Aline Behrendt.
- 1.7 Nick (BA (Hons), PhD, MCIfA, FSA) is a Director in RPS' Heritage team. He has led historic environment consultancy and archaeological field work teams on a diverse range of projects spanning infrastructure, renewables, energy, residential, employment and town centre re-development and brownfield / greenfield sites. With over twenty-five years of experience of working in the historic environment sector, he has an in-depth knowledge of the historic environment and development. This has included experience of working with Scheduled Monuments, Registered Landscapes of Outstanding or Special Historic Interest in Wales, and World Heritage Sites. He is a Member for the Chartered Institute for Archaeologists.
- 1.8 Richard (MA(Hons), MCIfA FSA Scot) is an Associate Director in RPS' Heritage team. He has over 25 years' professional experience and has prepared EIA chapters for a wide range of renewable energy and other projects throughout the UK. He has correspondingly wide experience of projects affecting Scheduled Monuments, Listed Buildings, Registered Landscapes and complex archaeology. In 2018, he authored guidance on cultural heritage impact assessment in the context of EIA on behalf of Historic Environment Scotland. He is a Member for the Chartered Institute for Archaeologists.
- 1.9 Aline (BA, MSc, ACIfA) is a Consultant in RPS' Heritage team and has five years' experience in consultancy, having previously been a field archaeologist. She has prepared numerous historic environment desk-based assessment for a range of developments including solar farms, residential and logistics schemes. She is an Associate of the Chartered Institute for Archaeologists.

## Human Health

- 1.10 The authors of the health chapter are Ryngan Pyper and Senuri Mahamithawa.
- 1.11 Ryngan (MA PGDip CEnv MIEMA PFPH) is the Director of Health and Social Impact at RPS. Ryngan is a registered public health practitioner with the Faculty of Public Health, as well as an Honorary Research Fellow and Member of the World Health Organization Collaborating Centre on Health in Impact Assessments at the University of Liverpool. He specialises in health impact assessments and has over 15 years' experience as a professional consultant. He has a public health, environmental science and legal practice background. He has authored UK and international guidance. He has advised the World Health Organization and United Nations Economic Commission for Europe on addressing health in environmental assessments. He also works with the Office for Health Improvement and Disparities on health assessment good practice in spatial planning. Ryngan is committed to quality, transparency and development that is safe, sustainable and promotes health and wellbeing. Ryngan is experienced with renewables projects, as well as many other sectors.



## CIL LONYDD SOLAR FARM

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1.12 Senuri is a Senior Consultant (Health and Social Impact) at RPS with over 6 years of professional experience within the health and environmental impact assessment sectors. Her qualifications include a MSc in Environmental Technology (specialising in Environmental Health and Epidemiology), and a BSc in Biology (Hons). Senuri has extensive experience in delivering bespoke Health Impact Assessments and Health ES chapters for a wide range of infrastructure projects including residential developments, urban expansions, airports and aviation, road and rail, energy facilities (including nuclear), waste management, and renewables. Senuri is an Associate member of IEMA. She has co-authored a WHO paper on circular economy and HIA, as well as presenting UK best practice on assessing health within EIA for the European Public Health Association.

### **Risk of Major Accidents**

1.13 The risk of major accidents assessment has been undertaken by Lucy Such and Ross Irvine.

1.14 Lucy BSc (Hons), MSc, has been a town planner since 2022. Lucy has been involved in the preparation of several Environmental Impact Assessments for large-scale renewable energy projects, including wind, battery storage, green hydrogen, and solar projects.

1.15 Ross Irvine (BA (Hons), MRTPI) is a chartered town planner. Ross has 10 years' experience of preparing and managing major, multi-disciplinary projects and planning applications. Many of the applications have involved the preparation of Environmental Impact Assessments.



**Appendix 2.1**  
Construction Traffic Management  
Plan

# CIL LONYDD SOLAR FARM

## Construction Traffic Management Plan

PLN-WWP-JPW2051-TRP-02  
Construction Traffic Management  
Plan  
Version -  
22 April 2024

## Document Status

Version	Purpose of Document	Authored By	Reviewed By	Approved By	Review Date
-	Planning Application	Daniel Innes	Anthony Bubb	David Archibald	April 2024

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## Appendices

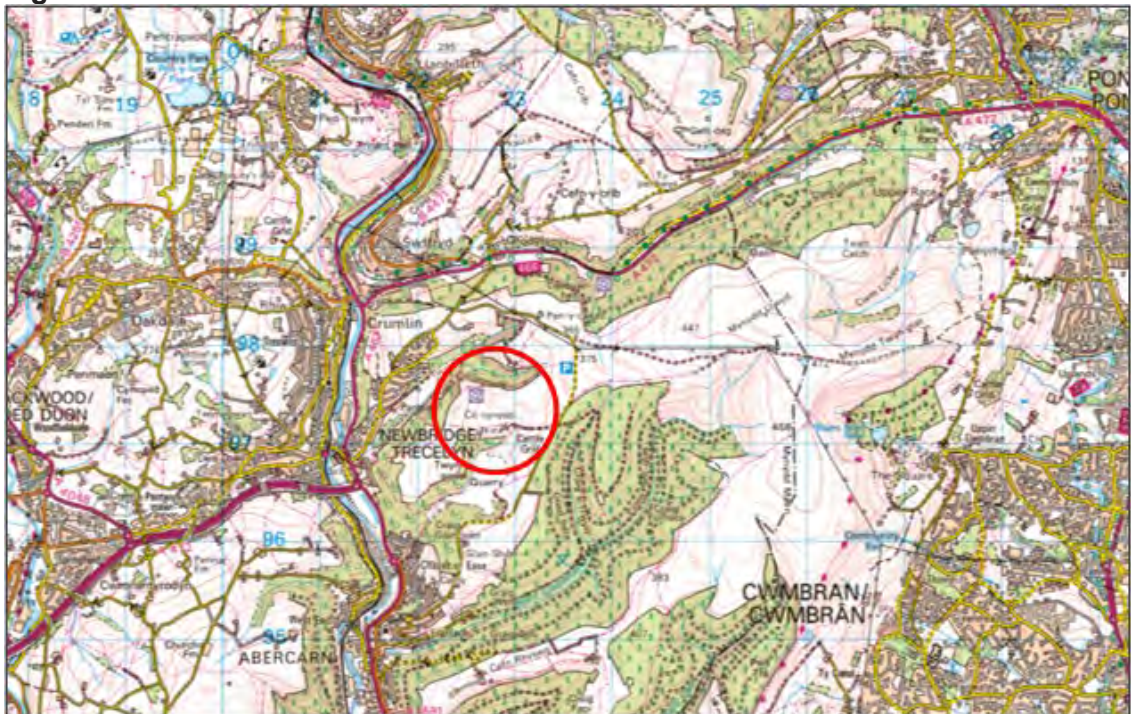
APPENDIX 1 – MASTERPLAN

APPENDIX 2 – PROPOSED ACCESS DRAWINGS

# 1 INTRODUCTION

- 1.1 This Construction Traffic Management Plan (CTMP) has been prepared by RPS on behalf of Cenin Renewables Limited in support of a Development of National Significance application for the development of a solar photovoltaic electricity generating station (or 'Solar Farm') and associated ancillary development (the 'Proposed Development') at Cil-Lonydd Farm to the east of Newbridge within the Caerphilly County Borough Council (CCBC) administrative area (the 'Site'). The location of the Site is shown in **Figure 1** below.

**Figure 1: Site Location**



- 1.2 The Site comprises land at Cil-Lonydd Farm between the towns of Newbridge and Cwmbran and adjoins registered common land to the east. The Site is approximately 28.6 hectares in size (excluding the cable route) and consists of several parcels of land which are irregular in shape and include several agricultural fields of varying sizes primarily used for pasture grazing and bound by a mixture of mature woodland, trees and hedgerow.

## Context and Scope

- 1.3 The principal aim of this CTMP is to ensure that the construction works are organised and delivered in a manner which safeguards the highway impact, highway safety and amenity of the area surrounding the Site.
- 1.4 This CTMP identifies a series of mitigation measures which aim to minimise the effect of construction traffic on the surrounding highway network, with respect to potential temporary changes to vehicular traffic and pedestrian movements.

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## Report Structure

1.5 Following this introduction, the structure of this CTMP is as below.

- **Section 2 – Construction Process:** Provides details of the proposed indicative development schedule and construction methodology.
- **Section 3 – Construction Traffic Generation:** Outlines the anticipated composition and volume of traffic during the construction phase of the Proposed Development.
- **Section 4 – Construction Vehicle Access:** Provides details of the access route to be used by HGVs during the construction phase of the Proposed Development.
- **Section 5 – Measures, Management and Control Processes:** Ensures that a suitable management strategy and structure is in place to control activity on site and to ensure a suitable reporting procedure for residents and stakeholders.
- **Section 6 – Construction Travel Plan:** Outlines appropriate travel planning measures.

## 2 CONSTRUCTION PROCESS

2.1 This section of the CTMP outlines the proposed indicative development schedule and construction methodology as well as the way in which deliveries to the Site will be managed and controlled.

### Proposed Development

2.2 The Proposed Development will comprise of a Solar Farm and BESS with the additional project components stated in the list below. The proposed layout of the Proposed Development is shown on the Masterplan in **Appendix 1** and comprises:

- Solar panels mounted on fixed frames in rows (arrays).
- A 40MW BESS facility comprising of storage units with associated transformers.
- Solar inverters and transformers.
- Internal access tracks.
- Perimeter security fencing (deer fencing).
- CCTV security cameras.
- Enhancements to landscaping and biodiversity.

2.3 The Proposed Development will also include a 3,043m long cable across Mynydd Maen Common which will connect to the substation of the Mynydd Maen Wind Farm development proposal. A secondary application under Section 38 of the Commons Act will be submitted to enable temporary works to be undertaken during construction of the Solar Farm, with trenches of approximately 1.0m deep and 0.5m wide required for the underground cable route.

### Delivery and Storage of Plant and Materials

2.4 All plant and materials associated with the Proposed Development will be stored within the footprint of the Site. A loading and unloading area for the plant and materials will be provided within the Site. It is anticipated that most deliveries will be made by rigid and articulated HGVs.

### Working Hours

2.5 All work will be undertaken between 08:00 and 18:00 hours Monday to Friday, with limited construction activities on Saturdays between 08:00 and 13:00 hours. No construction activities will take place on a Sunday or Bank Holiday.



### 3 CONSTRUCTION TRAFFIC GENERATION

- 3.1 This section of the CTMP sets out the estimated volume and type of vehicles that will be generated by the Site throughout the construction phase of the Proposed Development. This information has been used in subsequent sections to inform the set of management measures to be implemented.
- 3.2 It should be noted that the construction programme and corresponding construction traffic strategy may be subject to change following the appointment of a construction contractor and prior to work commencing on Site. Any substantial changes in the build programme and / or number of vehicle movements will be communicated to CCBC as the Local Highway Authority.

#### Construction Vehicles

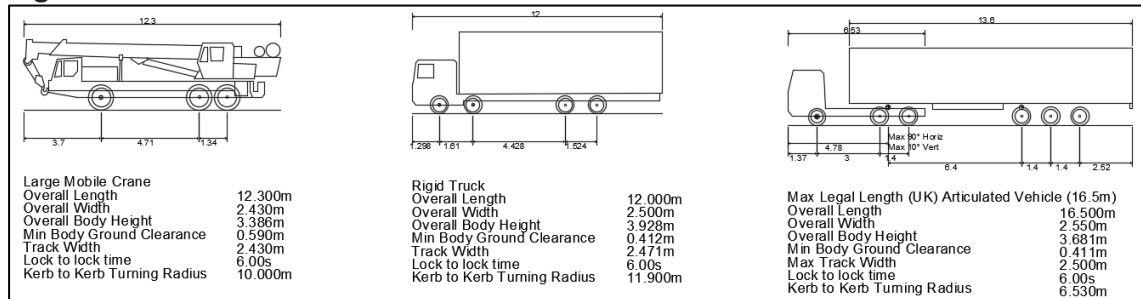
- 3.3 The potential trip generation of the Site during the construction phase of the Proposed Development has been informed through discussions with the Applicant based upon the construction programme and experience of similar projects across the United Kingdom.
- 3.4 The types of HGV and other construction vehicles that could typically be used for the construction of all elements of the project are set out in **Table 3.1** below. The use of these vehicles will be subject to the contractor.

**Table 3.1: Construction Vehicles**

Item	Vehicle Type
Battery Storage Units	16.5m Articulated HGV
Solar Panels	Rigid / Articulated HGV
Mounting System	Rigid HGV
Prefabricated Building	Rigid / Articulated HGV
Unloading Buildings	Mobile Crane
Cables	Rigid / Articulated HGV
Fencing	Rigid HGV
Small Deliveries	Rigid HGV
Plant Delivery	Rigid / Articulated HGV
Aggregate	Rigid HGV
Concrete	Rigid HGV

- 3.5 A range of vehicles will need to access the Site during the construction of the Proposed Development. These will include rigid and articulated HGVs, with the largest type of vehicle being a 16.5m long articulated HGV, as well as a large mobile crane associated with delivering the requisite and prefabricated buildings. The dimensions of the vehicle types are shown below in **Figure 2**.

**Figure 2: Vehicle Dimensions**



- 3.6 While the construction phase will take between 6 and 9 months to complete, the number of vehicle trips to and from the Site will fluctuate over this time. Some periods will see more trips when for example, deliveries are made to the Site, while other periods will see fewer trips when for example, only work at the Site is being undertaken.
- 3.7 The number of construction HGV movements per day will vary as the construction works progress and will be dependent upon the activities being undertaken at the Site. It is estimated however that there will be an average of six movements (three inbound movements plus three outbound movements) per day during the construction phase of the Proposed Development.
- 3.8 The Proposed Development will give rise to a maximum of 20 HGV movements (10 inbound movements plus 10 outbound movements) per day at the peak of the construction phase, with fewer number of HGV movements per day outside of peak activities.

## Dwell Time

- 3.9 All delivery vehicles are likely to attend the Site for approximately one hour per vehicle. There will be sufficient space within the curtilage of the Site compound to ensure that no vehicles will have to wait on the surrounding highway network or Abercarn Mountain Road through Mynydd Maen Common. Further measures that will be employed to control the number and frequency of vehicles arriving at the Site are detailed further below.

## Construction Staff

- 3.10 During construction, there is a balance to be made between the intensity of on-site activity and duration of activity. Experience of similar developments elsewhere suggests that car sharing promotion by the contractor will reduce the number of cars on Site. This will be achieved through management of staff travel patterns and activity encouraging car sharing as set out further in **Section 6**.
- 3.11 While the number of construction staff will fluctuate depending upon the Site activity taking place, it is estimated that the Site will generate up to 50 two-way construction staff trips during the construction phase of the Proposed Development.

- 
- 3.12 All members of staff will be encouraged to car share through the management of travel patterns and travel planning measures to reduce the number of construction staff vehicle trips to and from the Site per day during the construction phase. The Site Manager will promote car sharing as the primary method for construction workers to travel to and from the Site should they drive in by car, which will be enforced.
- 3.13 An area for car parking will be provided within the Site. No contractor or visitor will be permitted to park their cars along the local highway network or Abercarn Mountain Road south through Mynydd Maen Common at any time during the construction phase and this will be strictly enforced by the Site Manager. All visitors will be advised of the car parking arrangements prior to travelling to the Site. **Section 6** of this CTMP sets out full details on construction worker trips and seeks to minimise travel by construction workers.
- 3.14 All staff are anticipated to arrive at the Site during the 30-minutes preceding the start of the working day (07:30 to 08:00 Monday to Saturday) and to depart the Site during the 30-minutes following the end of the operating day (18:00 to 18:30 Monday to Friday and 13:00 to 13:30 on Saturdays). It is anticipated that staff will likely travel to and from different origins and destinations and hence spread their movement across the local highway network.

## Operation and Maintenance

- 3.15 Once operational, the Proposed Development will be monitored remotely and will not require any permanent staff to be located on Site; therefore, only occasional visits (typically once a quarter) by 4x4 vehicles / LGVs will be required for maintenance, monitoring and cleaning purposes.
- 3.16 Due to the minimal vehicle movements generated by the Proposed Development during the operational phase, the Proposed Development will not have a significant impact upon the local highway network.

## Decommissioning

- 3.17 At the end of the operational phase, the Solar Farm will be fully decommissioned, with all project elements removed from the Site and recycled where possible. Any waste generated during this process will be removed and transported by a certified and licensed contractor. The solar panels will be removed from the Site, while the cables interconnecting the solar panels to the electricity grid system will be de-energised and removed along with any cable marker signs.
- 3.18 The decommissioning of the Site will be expected to generate a similar (or fewer) number of vehicle trips as the construction phase, since there will not be the same requirement to transport the material separately. The vehicle movements associated with the decommissioning phase will be discussed with CCBC prior to commencement and appropriate measures will be agreed as necessary at that time.

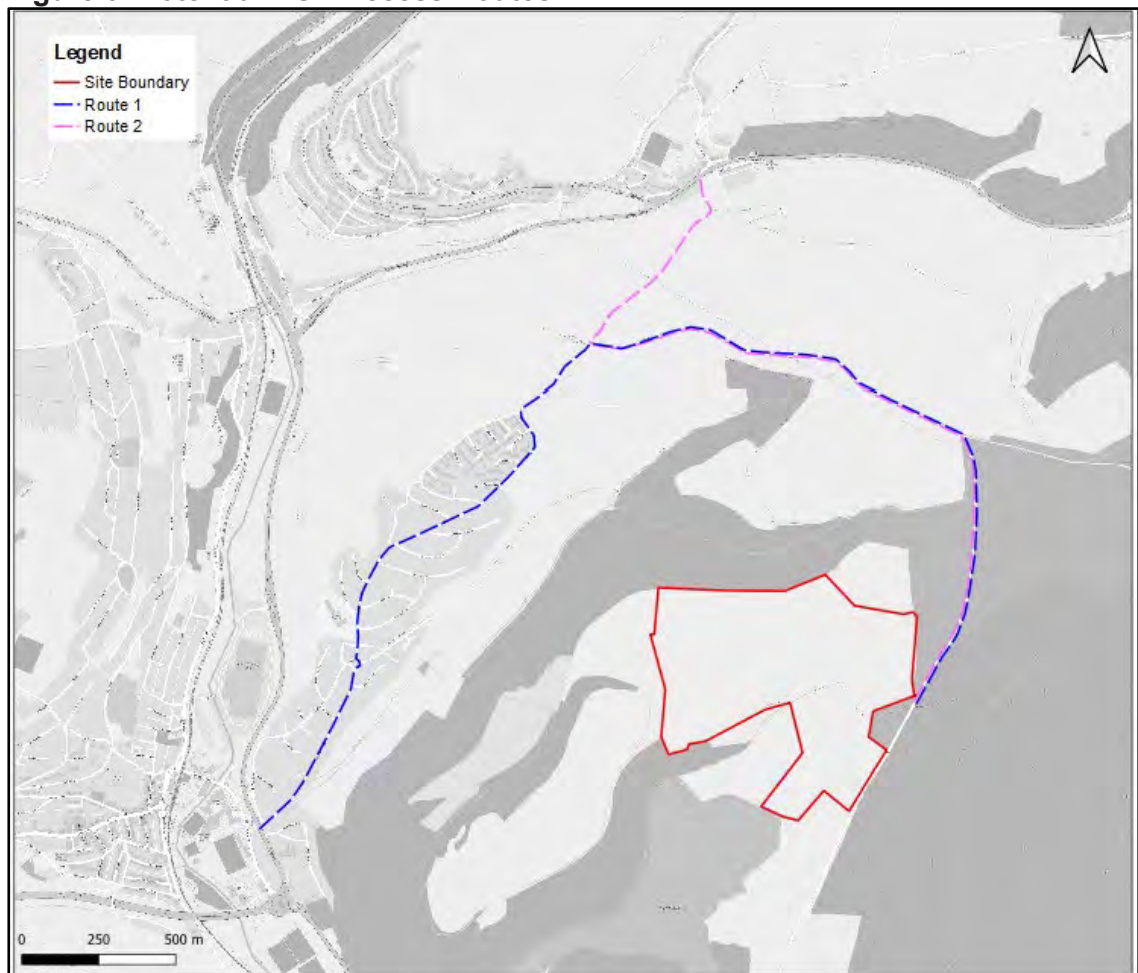
## 4 CONSTRUCTION VEHICLE ACCESS

4.1 This section of the CTMP discusses the access strategy for the Proposed Development and provides details on the Site access arrangement and the route HGVs will take to and from the Site during the construction phase.

### Construction Access Routeing

4.2 HGVs will travel either along the A472 and Herbert Terrace from the north or along the A467, Central Avenue, Old Pant Road and Herbert Terrace from the south. All construction HGVs will use Abercarn Mountain Road through Mynydd Maen Common from the bifurcated junction along Herbert Terrace to access the Site. These potential access routes are shown on **Figure 3** below and are described further below.

**Figure 3: Potential HGV Access Routes**



## Route 1

4.3 A description of this route is provided below.

- From the A467, turn right onto Central Avenue at the A467 / Central Avenue T-junction and continue north eastbound through the village of Panside along Central Avenue, Old Pant Road and Herbert Terrace.
- Turn right onto Abercarn Mountain Road at the Herbert Terrace / Abercarn Mountain Road bifurcated junction and continue eastbound along Abercarn Mountain Road.
- Continue southbound along Abercarn Mountain Road through Mynydd Maen Common towards the Site access.

## Route 2

4.4 A description of this route is provided below.

- From the A472, turn onto Herbert Terrace and continue south westbound along Herbert Terrace.
- Turn left onto Abercarn Mountain Road at the Herbert Terrace / Abercarn Mountain Road bifurcated junction and continue eastbound along Abercarn Mountain Road.
- Continue southbound along Abercarn Mountain Road through Mynydd Maen Common towards the Site access.

4.5 The adjacent Mynydd Maen Wind Farm development proposes two new passing bays along Abercarn Mountain Road suitable for use by 16.5m long articulated HGVs, as well as the extension of an existing bay along Abercarn Mountain Road to accommodate a 16.5m long articulated HGV.

4.6 These passing places are proposed as part of the Proposed Development. RPS Drawing Number 794-PLN-WWP-JPW2051-DR-008 in **Appendix 2** shows the location of the two new passing bays.

4.7 It is proposed that temporary signage in accordance with Chapter 8 of the Traffic Signs Manual is used to direct construction traffic to the Site along the proposed construction traffic route, using existing street furniture where possible.

4.8 A construction compound within the Site will provide an area for loading and unloading of vehicles and will provide a turning area to allow vehicles to exit the Site in a forward gear onto Abercarn Mountain Road. All delivery drivers and construction workers will be advised of the construction route prior to making their delivery or commencing work.

4.9 It is considered appropriate to avoid routes where scheduled roadworks and construction vehicles could cause conflict. The Site Manager will keep up to date on scheduled roadworks in the area using the one.network website. Any major roadworks on the preferred route that result in the deviation of the preferred route will be agreed with officers at CCBC in advance.

## Site Access

- 4.10 HGVs will access the Site via the existing access to Cil-Lonydd Farm located along the section of Abercarn Mountain Road south through Mynydd Maen Common. An internal access track constructed of permeable materials will lead to the temporary construction compound and car parking area from the Site access, as shown on the Masterplan in **Appendix 1**.
- 4.11 All construction HGVs will enter and exit the Site from and to the north along Abercarn Mountain Road. The arrangement of the Site access will safely enable right-in / left-out manoeuvres from and to Abercarn Mountain Road by a 16.5m long articulated HGV, as shown by RPS Drawing Number 794-PLN-WWP-JPW2051-DR-001 in **Appendix 2**.
- 4.12 Appropriate visibility splays of 2.4m x 31.5m to the left and 2.4m x 29.8m to the right for recorded 85<sup>th</sup> percentile vehicle speeds along Abercarn Mountain Road can be achieved at the Site access. There is considerable visibility in all directions along Abercarn Mountain Road through Mynydd Maen Common.
- 4.13 All construction HGVs will be subject to a booking system to ensure fixed arrival and departure times to and from the Site. This will avoid HGVs waiting along the public highway and Abercarn Mountain Road through Mynydd Maen Common, as well as passing along Abercarn Mountain Road.
- 4.14 It is proposed that temporary signage will be provided in both directions at the extent of the highway boundary on the Abercarn Mountain Road to the north of Mynydd Maen Common, during the construction phase of the Proposed Development to warn drivers of the Site entrance and to advise motorists of HGVs turning through the Site entrance. An example of this temporary signage is shown in **Figure 4** and **Figure 5**.

**Figure 4: Temporary Signage at Site Access**



**Figure 5: Temporary Signage on Public Highway**



## Highway Safety

- 4.15 An analysis of Personal Injury Accident (PIA) data across the local highway network within the vicinity of the Site for the latest available five-year period has been undertaken. PIA data for the most recent available five-year period January 2019 to December 2023 has been requested and provided by the Welsh Government on a confidential basis with strict controls over its reporting, hence the below analysis reflects this.
- 4.16 The study area includes the A472 in the vicinity of the junction with Herbert Terrace, the A467 between Newbridge Roundabout and Central Avenue, Herbert Terrace, Old Pant Road, Central Avenue and Abercarn Mountain Road.
- 4.17 A detailed analysis has been undertaken to identify any consistent contributory factors of injury accidents within the study area and to identify clusters of injury accidents within the study area. PIA clusters are determined as areas with four or more injury accidents in one location.
- 4.18 From this analysis, it is concluded that there are no clusters of injury accidents within the study area with consistent contributory factors which highlight potential deficiencies in the design of the

highway network and that there are no prevailing highway safety issues along the local highway network.



## 5 MEASURES, MANAGEMENT AND CONTROL PROCESSES

5.1 This section of the CTMP sets out the measures, management structure and control processes that will be put in place to implement, monitor and manage the CTMP. The Site Manager will be responsible for the Site works which will ensure that the control processes are efficiently communicated and implemented.

### Transport Co-ordination

5.2 The Applicant will appoint a Site Manager for the project and the details will be provided to CCBC once confirmed. The Site Manager for the project will undertake the transport co-ordination role for the Site. In this respect, their main responsibilities will include:

- Managing implementation of the CTMP;
- Vehicle scheduling;
- Checking for scheduled road works, events, or incidents in the local area which may cause HGVs to deviate from the designated vehicle route;
- Checking for scheduled refuse collections to avoid conflict with HGV deliveries within built up areas;
- Informing local residents and CCBC of the commencement of construction works;
- Informing local residents and CCBC of any major or noise intensive works associated with the construction phase to avoid / minimise disruption.
- Handling any complaints; and
- Acting as a point of contact for employees, CCBC, contractors, the general public, and any other interested parties.

5.3 The Site Manager will ensure that there is adequate liaison between the following key stakeholders throughout the construction phase:

- The Contractor;
- The Applicant;
- Site neighbours;
- CCBC; and
- Other local stakeholders such as emergency services or local transport providers.

5.4 Regular review meetings and telecommunication will be held between the Site Manager and CCBC, if requested. It is envisaged that update meetings will be held on an ad-hoc basis, as and when / if requested by CCBC. Furthermore, the Site Manager will provide any monitoring data, delivery schedules, complaints, or breaches of agreements to CCBC if requested.

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## On-going Review of Access Routes

### Route Management

- 5.5 It is considered appropriate to avoid routes where scheduled roadworks and construction vehicles could conflict. The Site Manager will keep up to date on scheduled roadworks, events and incidents in the nearby area which could impact construction vehicle routeing. Any major roadworks or events identified on the access route that result in the deviation of the route will be agreed with officers at CCBC in advance where feasible.

### Route Compliance

- 5.6 The contractor is responsible for communicating the use of agreed HGV routes to all individuals involved in the construction process, prior to works commencing. It is envisaged that this information will be communicated in the form of a leaflet or email and will be circulated to all individuals associated with the construction. The information will include details of times of operation and delivery routes for HGVs, as well as how to access the delivery booking system.
- 5.7 Any repeated non-compliance of the proposed construction routes could result in disciplinary procedures or the termination of the worker's / supplier's contract. The circulation of all required construction routeing information is therefore vital.

## Booking System

- 5.8 On a weekly basis, the Site Manager will evaluate the details of the daily profile of deliveries proposed for the upcoming week. Through discussions with hauliers, the Site Manager will, as far as practicable, ensure that the deliveries are spread out across the week and across the day to minimise any potential disruption.
- 5.9 The proposed deliveries will be checked against the weekly and daily delivery schedules. This will be overseen by the Site Manager to ensure that construction deliveries are managed in an efficient manner with minimal disruption and delays.
- 5.10 The proposed construction compound could provide an area for an additional vehicle to wait if required. All hauliers will be required to contact the Site Manager to give an indicative delivery time to ensure that the delivery space and banksmen (if required) are ready for their arrival onsite.
- 5.11 Where possible, sufficient time will be given between deliveries to allow for any delays due to the delivery vehicle getting stuck in traffic or the loading / unloading taking longer than expected and to avoid any vehicles waiting.

## Construction Compound

- 5.12 The construction compound will provide a turning area to allow vehicles to exit the Site in a forward gear. All delivery drivers and construction workers will be advised of the construction routes prior to making their delivery or commencing work.

- 
- 5.13 The construction compound will be capable of accommodating a turning HGV while at least one HGV is parked, to ensure no vehicles wait on the public highway. All hauliers will be required to contact the Site Manager to give an indicative delivery time to ensure that the delivery space and banksmen (if required) are ready for their arrival at the Site.
  - 5.14 All plant and materials associated with the development process will be stored within the construction compound. All staff will park within the construction compound, which are designed to enable all vehicles to park on Site to avoid obstruction to the operation of the public highway and Abercarn Mountain Road through Mynydd Maen Common. This shall be strictly enforced by the Site Manager.
  - 5.15 The temporary construction compound area will be fully reinstated as part of the demobilisation from the Site. The permeable geogrid base of the construction compound will facilitate easy removal and reinstatement.

## **Dust and Dirt Control**

- 5.16 Mud and debris on the road are regarded as one of the main environmental nuisances and safety problems arising from construction sites. A wheel washing facility will be provided for the duration of the construction works to ensure levels of soil on roadways near the construction site is minimised. All vehicle wheels will be cleaned whenever a vehicle leaves the Site. The contractor will ensure that the area around the construction site, including Abercarn Mountain Road, is regularly and adequately swept to prevent any accumulation of dust and dirt.

## **Site Fencing**

- 5.17 A security fence will be constructed around the Site prior to any significant construction works taking place. The security fence will be erected on the inside of any hedgerows, so that it will be screened by any such hedgerow in views from the surrounding area, further mitigating any visual impact.

## **Communication Strategy**

- 5.18 As identified above, the Site Manager will be responsible for ensuring that there is adequate liaison between all stakeholders throughout the construction phase. Prior to any works starting, the contractor shall inform neighbours which may be affected by noise, dust or vehicular movements arising from the construction work of the nature of the works, proposed hours of work and their expected duration. In addition to this, a notice will be placed at the main entrance of the Site informing neighbours of the hours of work.

## **Complaints Procedure**

- 5.19 While the Site Manager will use reasonable endeavours to ensure that site neighbours are fully informed of the construction programme and associated impacts, it is possible that complaints may be raised. The Site Manager will therefore be responsible for listening to any potential raised complaints and should be available to meet and explore issues with concerned neighbours directly via a pre-arranged appointment.

- 
- 5.20 All complaints raised shall be taken seriously and addressed immediately by the construction team. All complaints that are received will be reviewed in weekly site meetings to ensure that any required actions are communicated to all employees on site. This will prevent similar concerns being raised.
- 5.21 To minimise the number of potential complaints received during the construction phase, all personnel on site will be given a specific site induction prior to construction commencing. This induction will incorporate health and safety, as well as any issues or sensitivities in the context of the surrounding community. In addition, all personnel on site during construction will be made aware of the CTMP and the mitigation strategies imposed on site. The contact details of the Site Manager will be provided to CCBC prior to work commencing on the Site and these details will be displayed at the entrance to the Site.

## **Fuel Consumption / Emissions**

- 5.22 The contractor will strive to procure local contractors for the construction programme to minimise transport costs and the impact on the local environment. The use of the booking system will also help to ensure that the construction site is serviced in an efficient manner which will help minimise the number of vehicle movements generated by the Site. The booking system will also reduce the likelihood of construction vehicles queueing to enter the Site with idle engines. If queuing does occur, all vehicles will be encouraged to switch off their engines as they are waiting at the Site, thereby preventing idling vehicles.

## 6 CONSTRUCTION TRAVEL PLAN

- 6.1 A Travel Plan is a package of measures aimed at promoting greener, cleaner travel choices and reducing reliance on the private car. It enables employers to reduce the impact of travel on the environment, whilst also bringing several other benefits to the organisation as an employer and to staff.
- 6.2 This Travel Plan seeks to address activities related to the construction of the Site, which includes commuter journeys for construction workers, material supplies and deliveries. By successfully addressing these different types of travel by promoting travel via sustainable modes and sourcing labour and goods locally, the Travel Plan objectives can be achieved.

### Trip Generation

- 6.3 The number of construction staff at the Site will fluctuate over the construction phase of the Proposed Development depending upon the activity that is taking place. It is estimated however that the Site will generate up to 50 two-way construction staff trips during the construction phase. Experience of similar developments elsewhere suggests car sharing can reduce the number of cars on site by around half, to 25 in this case. This can be achieved through the management of staff travel patterns and actively encouraging car sharing. As such, the Site Manager will actively promote the use of car sharing as the primary method for construction workers to and from the Site.
- 6.4 **Section 3** of this CTMP has estimated that the construction phase will generate up to 20 HGV movements (10 inbound movements plus 10 outbound movements) per day during the construction phase of the Proposed Development of between 6 and 9 months.

### Staff Infrastructure

- 6.5 The contractor, where feasible, will seek to recruit construction workers from the local area. This will help maximise the potential for construction workers to walk and cycle to the Site.
- 6.6 There is great potential for construction workers to car share to work, especially given the fact that some sub-contractors are likely to be travelling from the same origin (their local residence) to the same destination (the Site).
- 6.7 Car sharing represents a relatively convenient form of travel offering a significant potential to reduce overall private mileage of construction workers. It is this mode of transport which often forms one of the most convenient methods of sustainable travel for construction workers.
- 6.8 The Site Manager will promote a car-sharing scheme throughout the construction programme and will also make construction workers aware of existing car sharing schemes such as [liftshare.com/uk](https://liftshare.com/uk).
- 6.9 The Site Manager will determine the willingness of construction staff to car share. Furthermore, looking at workers home / local residence postal addresses, it will become evident whether there are any area groupings of people that would make the principle of car sharing a reasonable prospect of being successful. The Site Manager will then investigate setting up a database of construction workers willing to share journeys, including information such as their home / local residence addresses and could try and match suitable car sharers.

- 6.10 The Site will provide facilities in accordance with requirements set out in Health and Safety Executive guidelines. Consequently, the Site compound will provide a drying room, storage facilities, toilets and offices within the welfare area. This will encourage people to travel to the Site by sustainable modes while having the added benefit of reducing the number of trips made off Site during lunch breaks.

## Aims and Targets

- 6.11 The Site is a construction site and sustainable transport measures will be adopted. Through the adoption of car sharing, the number of cars on site can be reduced to 25. An area for car parking will be provided within the Site to accommodate all construction staff vehicles. No contractor or visitor will be permitted to park their cars along the local highway network or Abercarn Mountain Road south through Mynydd Maen Common at any time during the construction phase and this will be strictly enforced by the Site Manager. All visitors will be advised of the car parking arrangements prior to travelling to the Site.
- 6.12 Construction worker parking at the Site will be monitored, controlled and recorded by the Site Manager to ensure that site occupancy car use is minimised. The Site Manager will ensure there is space made available for any overspill parking during the early periods of construction.
- 6.13 This CTMP and Travel Plan will be communicated to all construction workers as part of their induction / training process. An up-to-date copy of the Travel Plan will always be available for consultation.

## Measures

- 6.14 As indicated above, there is potential for construction workers to car share or travel by bicycle to the Site. It is therefore deemed appropriate to promote the below measures to promote sustainable travel by staff.
- Providing changing areas and storage facilities for construction staff.
  - Assist in matching car sharers through a car sharing database.
  - Minimise where possible the number of contractors on site at any one time to reduce trips generated by the Site and promote car sharing.
- 6.15 Further to this, the below measures are to be promoted to minimise the environmental impacts of HGV trips generated by the Proposed Development.
- Initiate a weekly booking system for the delivery of plant and materials to the Site.
  - The Applicant will strive to procure local contractors for the project, thereby minimising transport costs and impact on the local environment.
  - All delivery vehicles will be required to switch off their engines as they are waiting at the Site, thereby preventing unnecessary idling vehicles.
  - Use of the agreed vehicle routes shall be included as a contractual requirement of the contractor and will be communicated to all individuals associated with the construction works.

- Provision of wheel washing facilities at the Site access / egress along Abercarn Mountain Road.

## Residual Impacts

- 6.16 A booking system will be initiated to ensure that construction deliveries are managed efficiently with minimal disruption and delay. Residents will be informed of the commencement of the construction process. The initiation of the Travel Plan measures alongside the targets will therefore minimise impacts upon the operation of the local highway network as well as reduce environmental impact.

## Appendices




## Appendix 1 – Masterplan


# Cil-Lonydd Solar Scheme Indicative Site Layout Plan

10/03/2024

Drwg: MM4-2b-R1

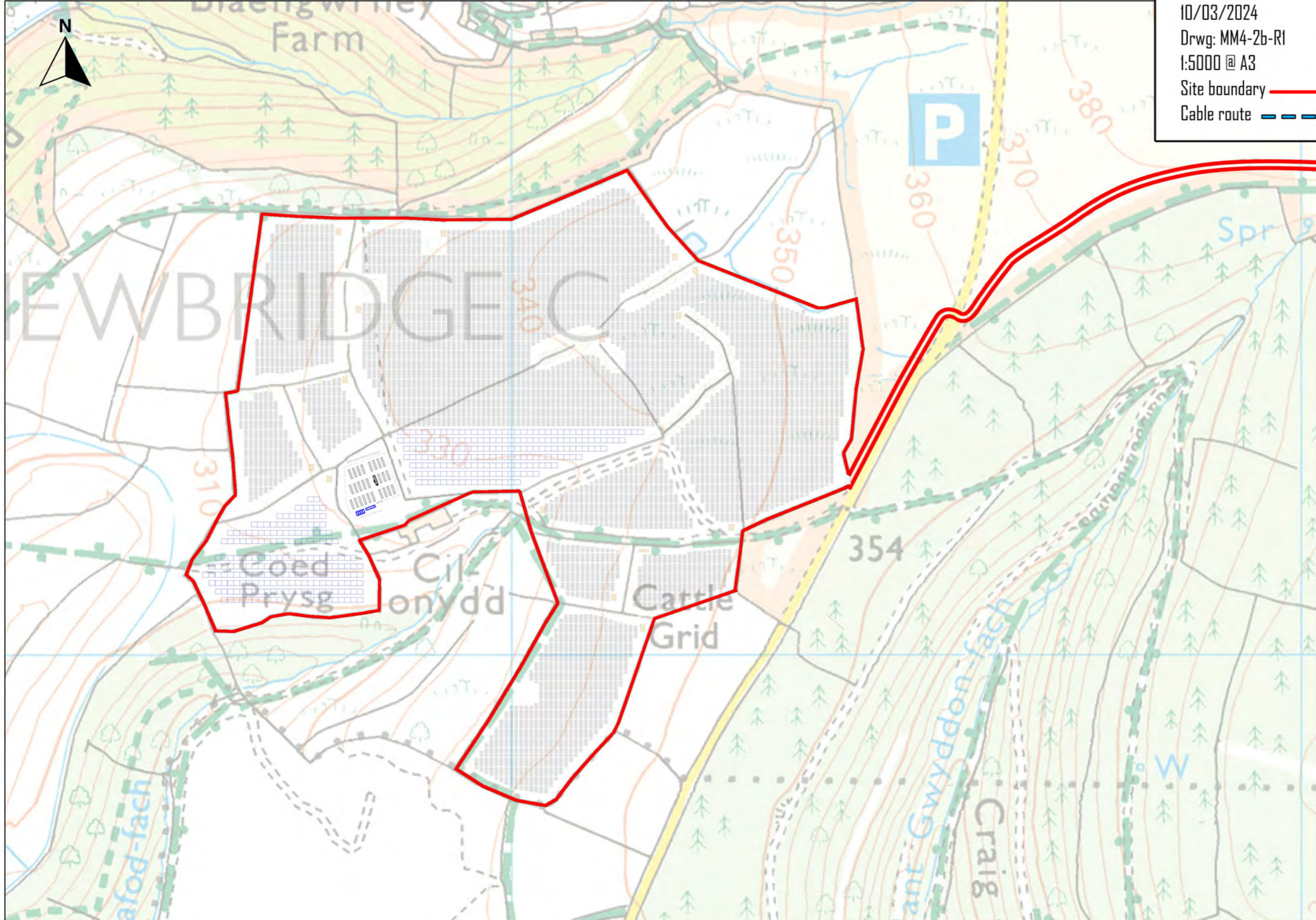
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Site boundary 

Cable route 

Inverters 

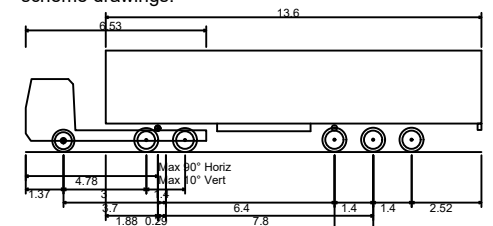
Trees 



## Appendix 2 – Proposed Access Drawings

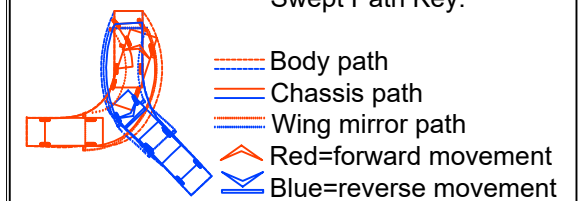
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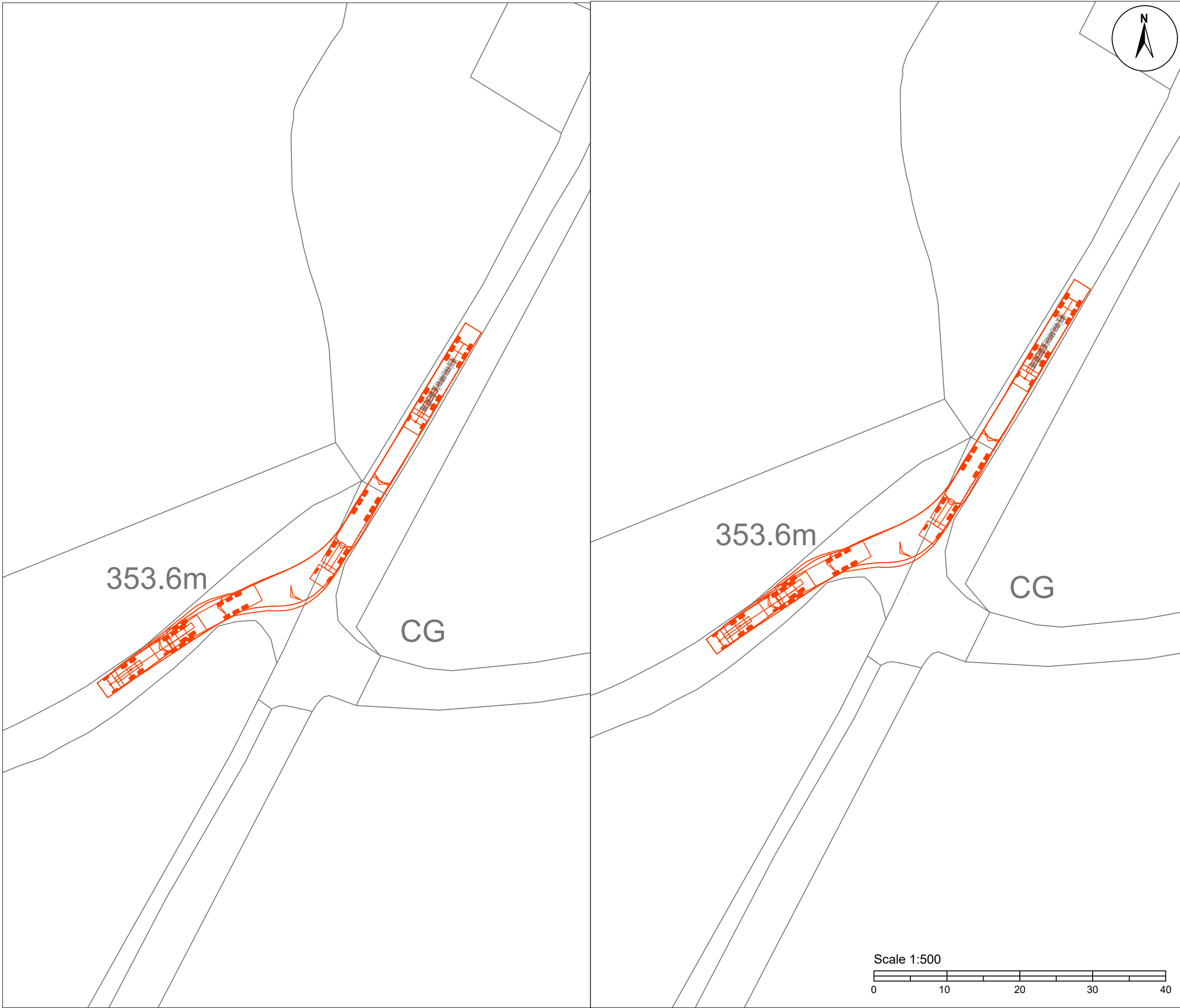


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Overall Length	2.550m
Overall Width	3.681m
Overall Body Height	0.411m
Min Body Ground Clearance	2.500m
Max Track Width	6.00s
Lock to lock time	6.530m
Kerb to Kerb Turning Radius	

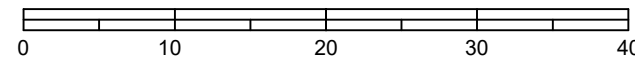
Swept Path Key:



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Scale 1:500



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Project Cil-Lonydd Solar Farm

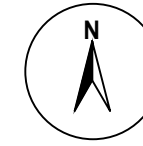
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Status INFORMATION Drawn By DI PM/Checked by DA

Project Number TRP-JPW2051 Scale @ A3 1:500 Date Created April 2024

RPS Drawing/Figure Number 794-PLN-TRP-JPW2051-DR-001 Rev -

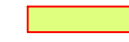
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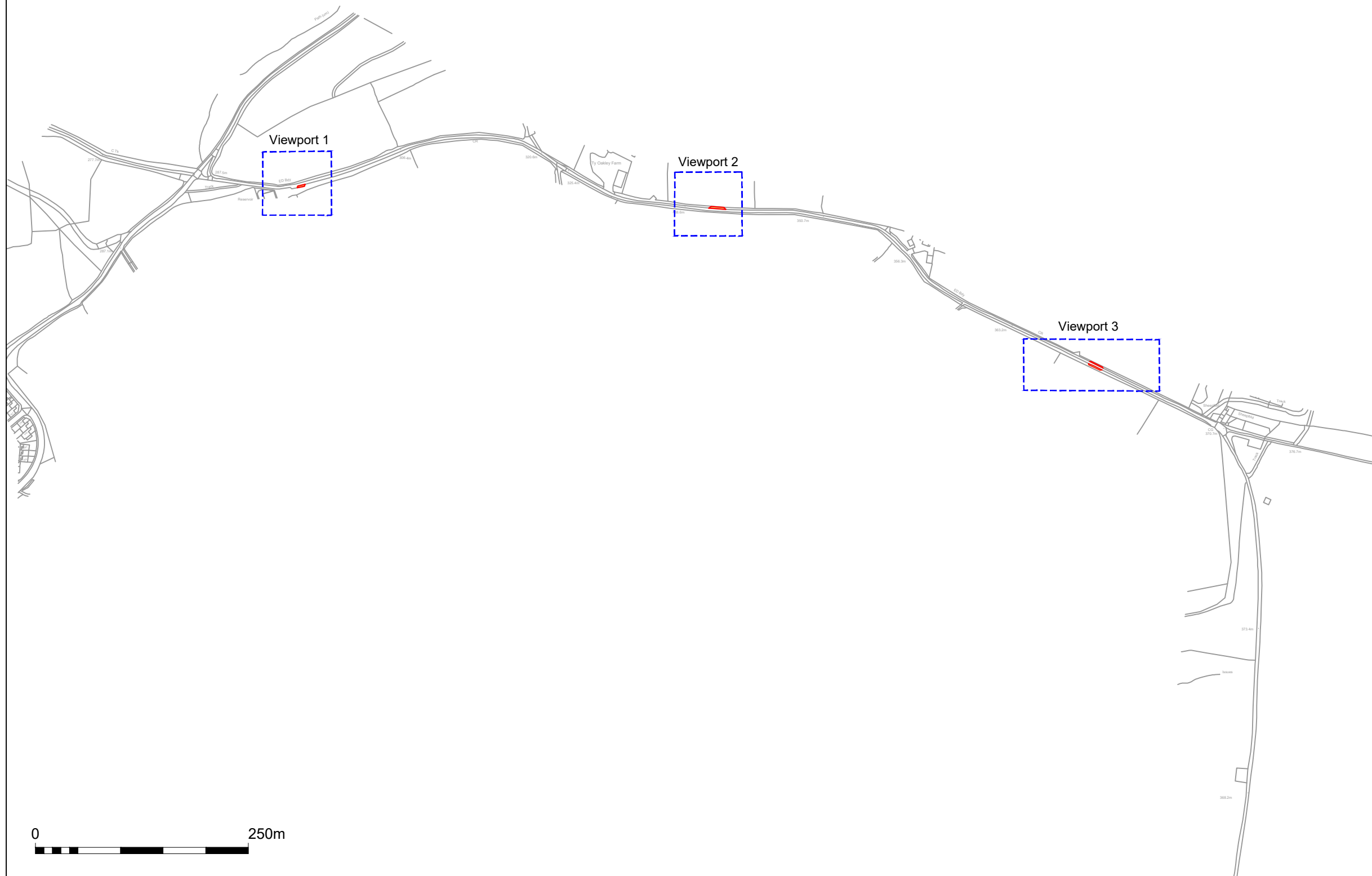
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 Proposed Passing Bay

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Project **Cil-Lonydd Solar Farm**

Title **Mynydd Maen Wind Farm Proposed Passing Bays Viewports Plan - Abercarn Mountain Road**

Status **INFORMATION** Drawn By **DI** PM/Checked by **DA**

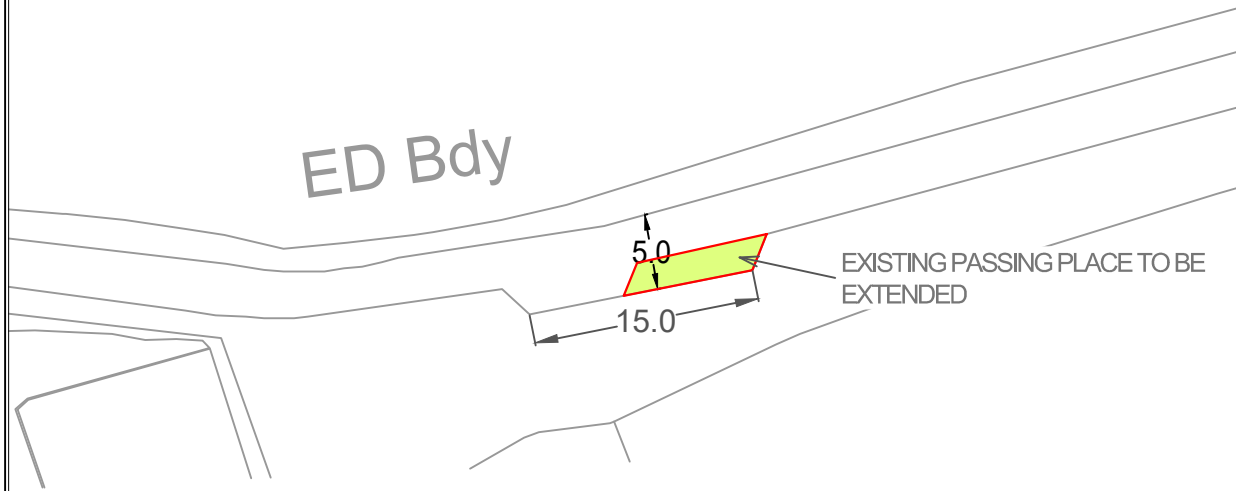
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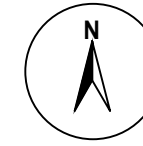
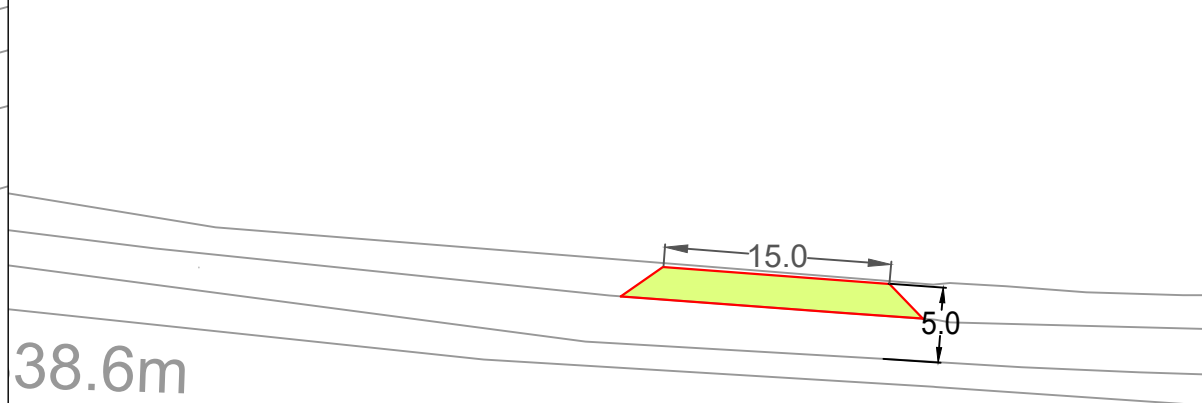
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Viewport 1



Viewport 2



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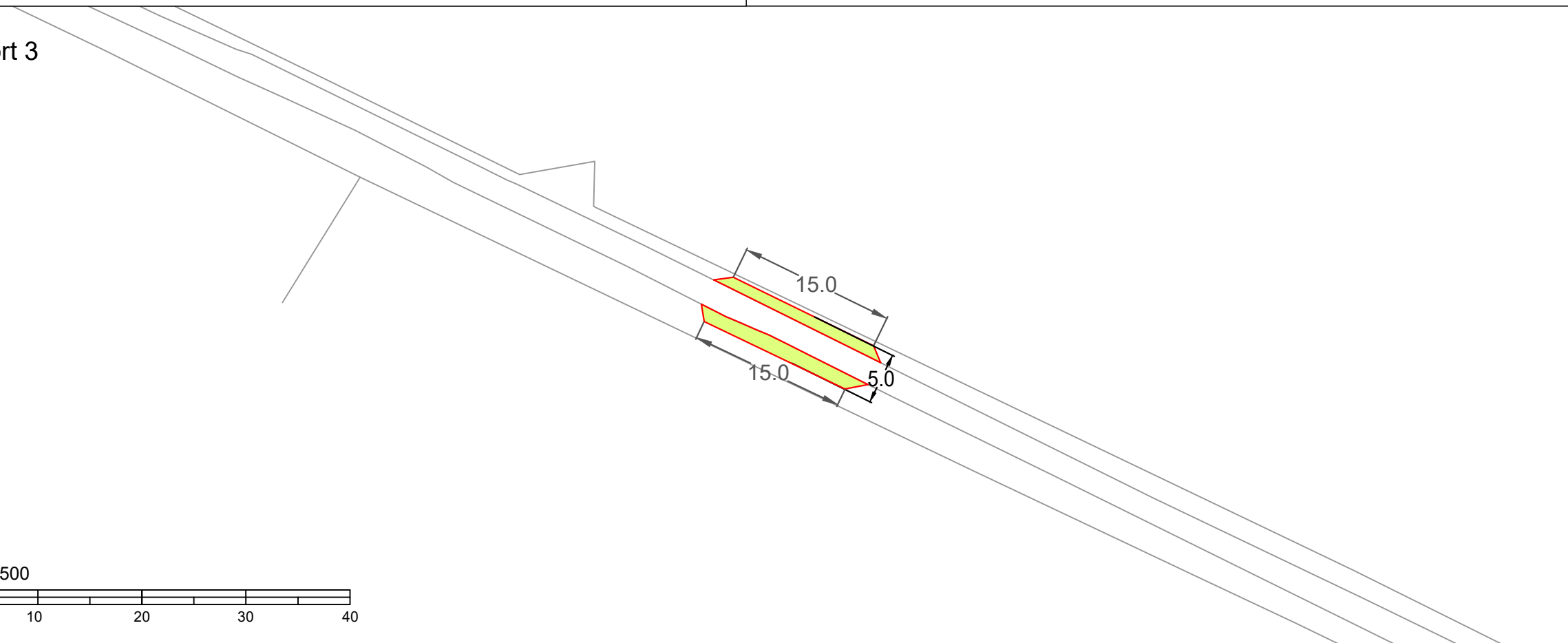
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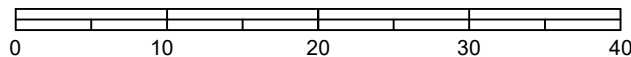
Proposed Passing Bay

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Viewport 3



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Project **Cil-Lonydd Solar Farm**

Title **Mynydd Maen Wind Farm Proposed Passing Bays - Abercarn Mountain Road**

Status **INFORMATION** Drawn By **DI** PM/Checked by **DA**


Project Number **TRP-JPW2051** Scale @ **A3** Date Created **April 2024**

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**Appendix 2.2**  
Transport Assessment



# CIL LONYDD SOLAR FARM

## Transport Statement

PLN-WWP-JPW2051-TRP-01  
Transport Statement  
Version -  
22 April 2024

**Document Status**

Version	Purpose of Document	Authored By	Reviewed By	Approved By	Review Date
-	Planning Application	Daniel Innes Anthony Bubb	David Archibald	David Archibald	April 2024

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6	SUMMARY AND CONCLUSIONS .....	17

## Appendices

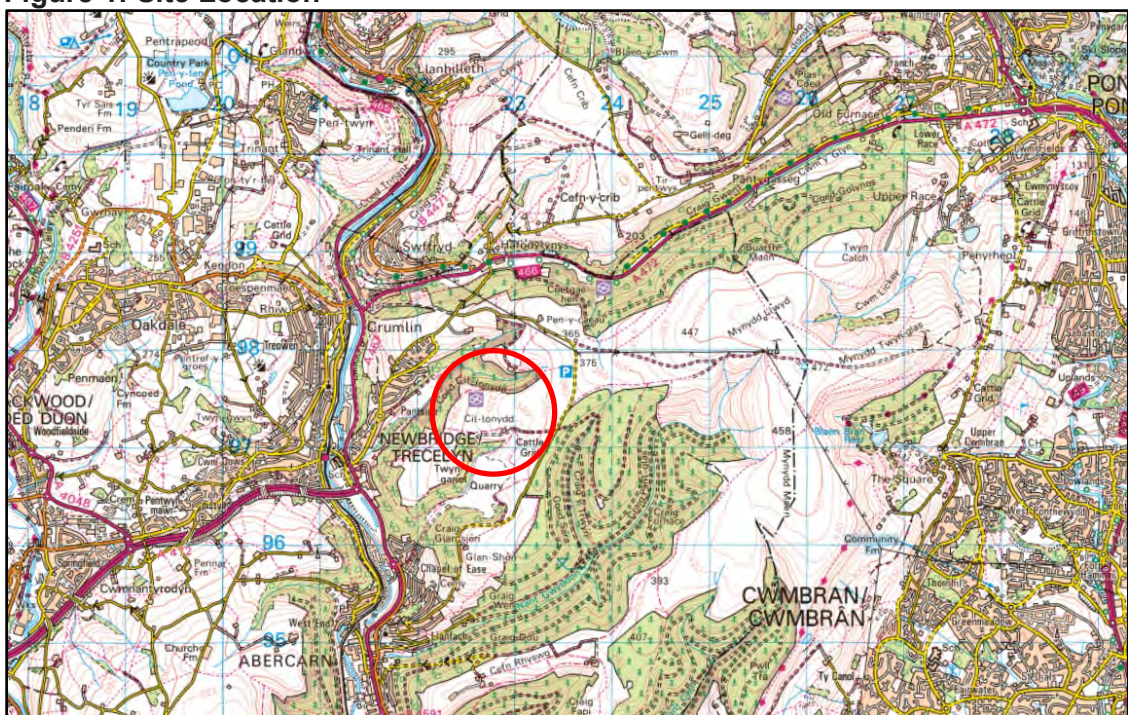
APPENDIX 1 – MASTERPLAN

APPENDIX 2 – PROPOSED ACCESS DRAWINGS

# 1 INTRODUCTION

- 1.1 This Transport Statement has been prepared by RPS on behalf of Cenin Renewables Limited in support of a Development of National Significance application for the development of a solar photovoltaic electricity generating station (or ‘Solar Farm’) and associated ancillary development (the ‘Proposed Development’) at Cil-Lonydd Farm to the east of Newbridge within the Caerphilly County Borough Council (CCBC) administrative area (the ‘Site’). The location of the Site is shown in **Figure 1** below.

**Figure 1: Site Location**



- 1.2 This Transport Statement provides details of the access arrangement for the Proposed Development and the route construction vehicles would take during its construction phase, as well as the impact these construction vehicles would have on the local highway network.
- 1.3 This Transport Statement focusses predominately on the construction phase of the Proposed Development as this is likely when most vehicle trips would be made to and from the Site, given the nature of the Proposed Development.

## Scope of Transport Statement

- 1.4 This Transport Statement has been prepared in accordance with Planning Policy Wales 12 published in February 2024 and Technical Advice Note 18 – Transport published in March 2007 to demonstrate that the Proposed Development would be acceptable in transport and highway terms.

- 1.5 Following this introduction, the structure of this Transport Statement is as below.
- **Section 2 – Existing Conditions:** Describes the existing conditions of the Site and the surrounding transport and highway network.
  - **Section 3 – Proposed Development:** Describes the Proposed Development from a transport and highways perspective, including trip generation of the construction and operational phases.
  - **Section 4 – Access Strategy:** Describes the access strategy of the Proposed Development and demonstrates that the access arrangements would be safe for all road users.
  - **Section 5 – Transport Impact:** Provides an assessment of the likely transport impact of the Proposed Development and traffic management measures.
  - **Section 6 – Summary and Conclusions:** Provides a summary and conclusion.
- 1.6 A Construction Traffic Management Plan (CTMP) has also been prepared by RPS under separate cover (Report Reference 794-PLN-WWP-JPW2051-TRP-02), which includes management measures to be implemented during the construction phase of the Proposed Development.

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## 2 EXISTING CONDITIONS

- 2.1 This section of the Transport Statement describes the surrounding transport and highway network of the Site, as well as the accessibility of the Site by different modes of transport through a review of existing walking and cycling infrastructure.

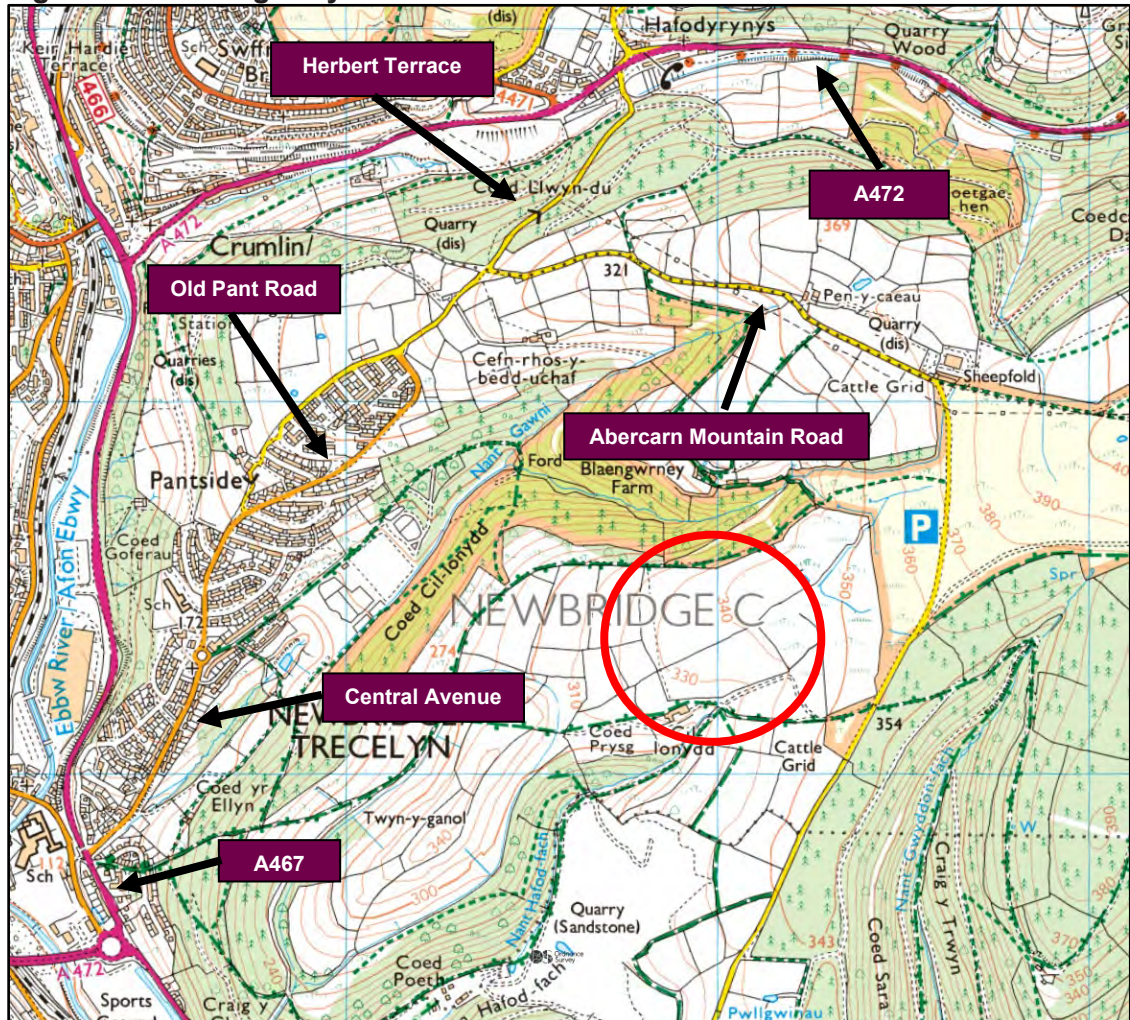
### Site Location

- 2.2 The Site comprises land at Cil-Lonydd Farm between the towns of Newbridge and Cwmbran and adjoins registered common land to the east. The Site is approximately 28.6 hectares in size (excluding the cable route) and consists of several parcels of land which are irregular in shape and include several agricultural fields of varying sizes primarily used for pasture grazing and bound by a mixture of mature woodland, trees and hedgerow.

### Local Highway Network

- 2.3 The local highway network of the Site relevant to the construction phase of the Proposed Development comprises predominately of the A472, the A467, Herbert Terrace, Old Pant Road, Central Avenue and the unnamed single carriageway road to Mynydd Maen Common, known as the Abercarn Mountain Road, as shown in **Figure 2**.

**Figure 2: Local Highway Network**



## A472

- 2.4 The A472 routes through Hafodyrnys between the A4042 at Pontypool Roundabout to the east and the A467 to the west. The majority of the A472 is single carriageway, except for the section between the roundabout junction with the A4043 and Pontypool Roundabout which is dual carriageway. The A472 is subject to a posted speed limit of 20mph through the village of Hafodyrnys.

## **A467**

- 2.5 The A467 is a single carriageway road which forms a roundabout junction with Aberbeeg Road to the north and the A472 to the south. The A467 is subject to a posted speed limit of 20mph through Newbridge with on-street car parking bays adjacent to the carriageway in the vicinity of residential properties.

## **Herbert Terrace**

- 2.6 Herbert Terrace is a single carriageway unclassified road which forms a priority T-junction with the A472 to the north and continues as Old Pant Road through the village of Panside to the south. Herbert Terrace is subject to the national speed limit of 60mph with several passing places between Hafodyrynys and Panside.

## **Old Pant Road**

- 2.7 Old Pant Road is a single carriageway road through the village of Panside which forms a roundabout junction with Central Avenue to the west and continues as Herbert Terrace to the north. Old Pant Road is subject to a posted speed limit of 20mph with footway provision and street lighting present and has a traffic calming scheme in the form of a priority chicane and several speed humps between the junction with Carlyon Road and the roundabout junction with Central Avenue.

## **Central Avenue**

- 2.8 Central Avenue is a single carriageway road which forms a roundabout junction with Old Pant Road to the north and a priority T-junction with the A467 to the south. Central Avenue is subject to a posted speed limit of 20mph with footway provision and street lighting present with on-street car parking bays adjacent to the carriageway in the vicinity of residential properties.
- 2.9 A Traffic Regulation Order is in force at the priority T-junction between the A467 and Central Avenue to prohibit right-turn manoeuvres from Central Avenue onto the A467. A traffic island in the middle of the Central Avenue carriageway discourages right-turn manoeuvres.

## **Abercarn Mountain Road**

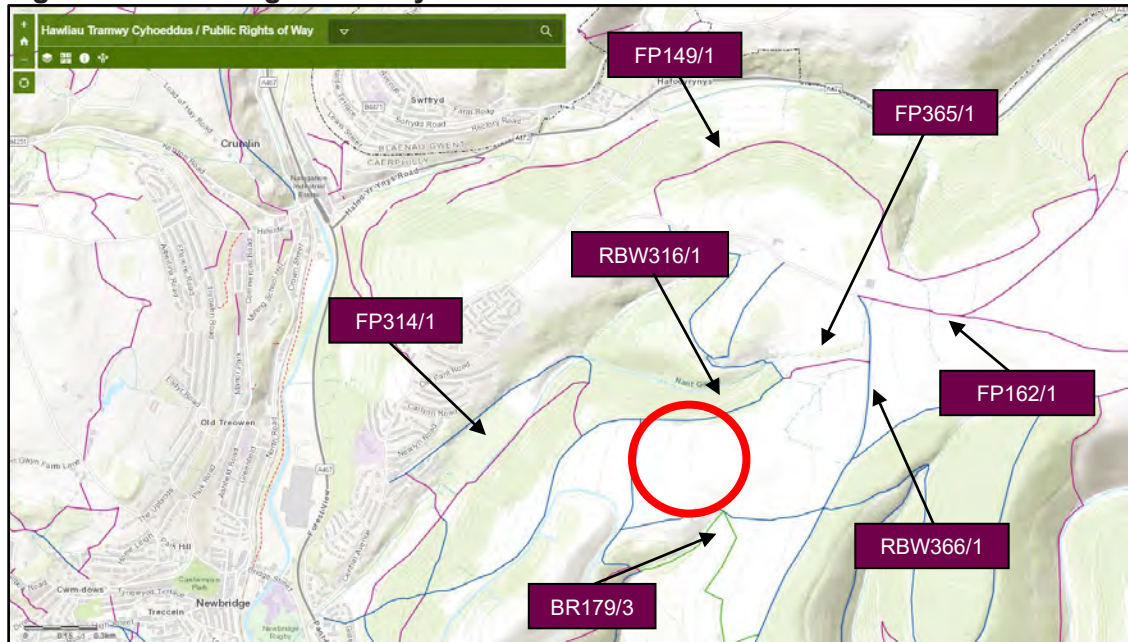
- 2.10 Abercarn Mountain Road is an unclassified road which forms a bifurcated junction with Herbert Terrace to the west and continues east then south through Mynydd Maen Common. Abercarn Mountain Road is a restricted byway to the south of Mynydd Maen Common.
- 2.11 The section of Abercarn Mountain Road between the bifurcated junction and the cattle grid before entering Mynydd Maen Common has restricted forward visibility due to the alignment of the carriageway and existing stone walls either side, although it does have several passing places. There is considerable visibility in all directions along Abercarn Mountain Road through Mynydd Maen Common.



## Site Accessibility

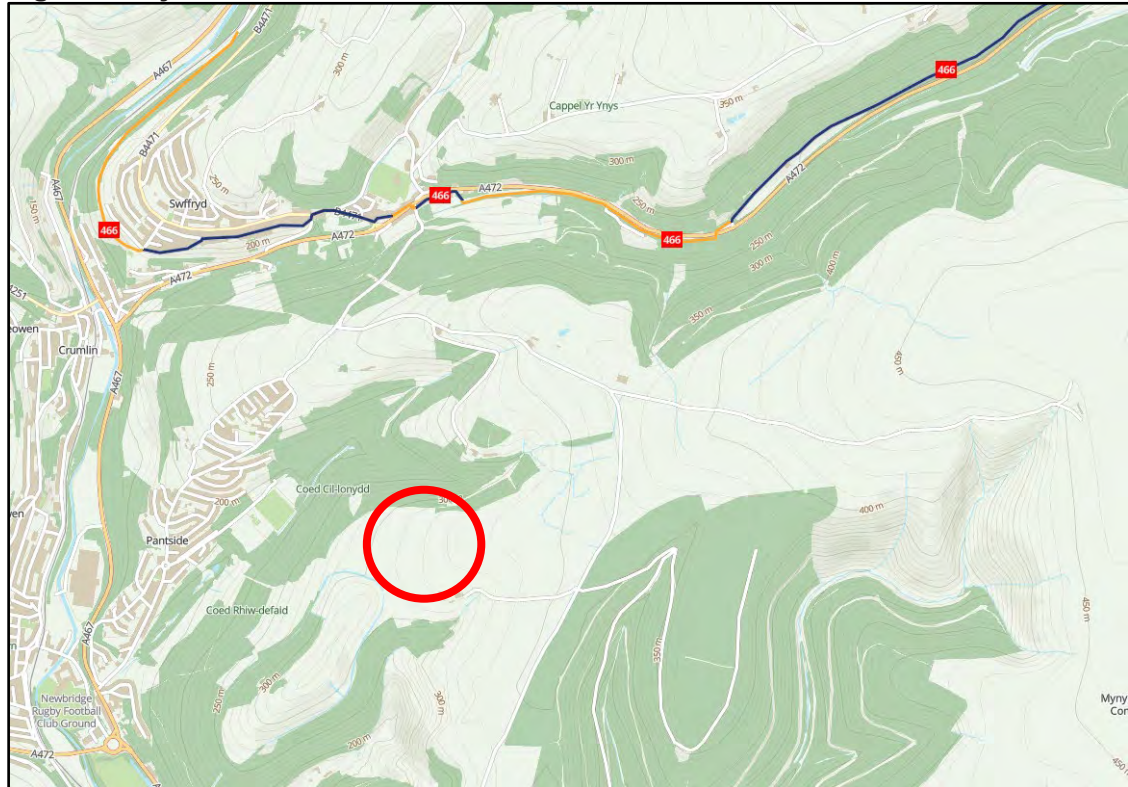
- 2.12 There are several Public Rights of Way within the vicinity of the Site. A relevant section of the CCBC Definitive Map is shown in **Figure 3**, with footpaths shown in purple, restricted byways shown in blue and bridleways shown in green.

**Figure 3: Public Rights of Way**



- 2.13 There is one designated cycle route, Route 466 of the National Cycle Network (NCN), in the vicinity of the Site, as shown by the section of Ordnance Survey mapping from the Sustrans website in **Figure 4**.

**Figure 4: Cycle Route**



- 2.14 Route 466 of the NCN routes between the Heads of the Valleys to the north west of the Site and Pontypool to the north east and follows the route of the Ebbw Valley Railway branch line, including along the A472 in the vicinity of the Site.

## Highway Safety

- 2.15 An analysis of Personal Injury Accident (PIA) data across the local highway network within the vicinity of the Site for the latest available five-year period has been undertaken. PIA data for the most recent available five-year period January 2019 to December 2023 has been requested and provided by the Welsh Government on a confidential basis with strict controls over its reporting, hence the below analysis reflects this.
- 2.16 The study area includes the A472 in the vicinity of the junction with Herbert Terrace, the A467 between Newbridge Roundabout and Central Avenue, Herbert Terrace, Old Pant Road, Central Avenue and Abercarn Mountain Road.
- 2.17 A detailed analysis has been undertaken to identify any consistent contributory factors of injury accidents within the study area and to identify clusters of injury accidents within the study area. PIA clusters are determined as areas with four or more injury accidents in one location.
- 2.18 From this analysis, it is concluded that there are no clusters of injury accidents within the study area with consistent contributory factors which highlight potential deficiencies in the design of the highway network and that there are no prevailing highway safety issues along the local highway network.

---

## Mynydd Maen Wind Farm

- 2.19 A Pre-Application Consultation (PAC) package was submitted to Planning and Environment Decisions Wales (PEDW) in July 2023 with reference DNS/3276725 as part of a Development of National Significance application for a wind farm comprising of 13 horizontal axis wind turbines, along with an improved site entrance, new and improved access tracks, crane hardstanding, control building and substation compound, electricity transformers, underground cabling, and drainage works, on land adjacent to the Proposed Development.
- 2.20 The PAC for the DNS/3276725 application is supported by an Environmental Statement prepared on behalf of RES Limited. This Environmental Statement indicates that the development would modify an existing field entrance on the Abercarn Mountain Road north of Mynydd Maen Common as the single site access for all construction vehicles during the construction phase of the development. Furthermore, the Environmental Statement sets out that two new passing bays suitable for HGVs would be provided along the Abercarn Mountain Road, in addition to the extension of an existing passing bay along the Abercarn Mountain Road, as part of the wind farm development.
- 2.21 All construction vehicles would travel along the Abercarn Mountain Road to access the development and along either Herbert Terrace from the A472 or along Old Pant Road and Central Avenue from the A467. The PAC for the DNS/3276725 application states that the HGV access route to the Abercarn Mountain Road (from the A472 or from the A467) would be confirmed with CCBC once a main contractor has been appointed.

---

## 3 PROPOSED DEVELOPMENT

- 3.1 This section of the Transport Statement describes the Proposed Development at the Site, as well as the likely number of construction vehicle trips and maintenance vehicle trips that the Proposed Development would generate during both the construction phase and operational phase.

### Proposed Development

- 3.2 The Proposed Development would comprise of a Solar Farm and BESS with the additional project components stated in the list below. The proposed layout of the Proposed Development is shown on the Masterplan in **Appendix 1** and comprises:

- Solar panels mounted on fixed frames in rows (arrays).
- A 40MW BESS facility comprising of storage units with associated transformers.
- Solar inverters and transformers.
- Internal access tracks.
- Perimeter security fencing (deer fencing).
- CCTV security cameras.
- Enhancements to landscaping and biodiversity.

- 3.3 The Proposed Development would also include a 3,043m long cable across Mynydd Maen Common which would connect to the substation of the Mynydd Maen Wind Farm development proposal. A secondary application under Section 38 of the Commons Act would be submitted to enable temporary works to be undertaken during construction of the Solar Farm, with trenches of approximately 1.0m deep and 0.5m wide required for the underground cable route.

- 3.4 The existing access to Cil-Lonydd Farm located along the section of Abercarn Mountain Road south through Mynydd Maen Common would be used to access the Site during both the construction phase and operational phase of the Proposed Development.

- 3.5 After the expected lifetime of the Proposed Development, the Solar Farm would be decommissioned, with all equipment being dismantled and recycled and the Site returning to full agricultural use.

- 3.6 A secure temporary construction compound would be required during the construction phase of the Proposed Development. The temporary construction compound would be located within the Site and be built using a geogrid base or similar, to facilitate easy removal and reinstatement. The temporary construction compound would house office cabins and welfare facilities for contractors, as well as for the storage of tools and materials.

### Construction Time Period

- 3.7 The construction phase of the Proposed Development would take between 6 and 9 months to complete. All work at the Site during the construction phase would be undertaken between 08:00 and 18:00 hours on Monday to Friday and between 08:00 and 13:00 hours on a Saturday. No construction activities would take place on a Sunday or Bank Holiday.

## Construction Trip Generation

- 3.8 The potential trip generation of the Site during the construction phase of the Proposed Development has been informed through a discussion with the applicant based upon the construction programme and experience of similar projects across the UK.
- 3.9 While the construction phase would take between 6 and 9 months to complete, the number of vehicle trips to and from the Site would fluctuate over this time. Some periods would see more trips when for example, deliveries are made to the Site, while other periods would see fewer trips when for example, only work at the Site is being undertaken.
- 3.10 The number of construction HGV movements per day would vary as the construction works progress and would be dependent upon the activities being undertaken at the Site. It is estimated however that there would be an average of six movements (three inbound movements plus three outbound movements) per day during the construction phase of the Proposed Development.
- 3.11 The Proposed Development would give rise to a maximum of 20 HGV movements (10 inbound movements plus 10 outbound movements) per day at the peak of the construction phase, with fewer number of HGV movements per day outside of peak activities.
- 3.12 The types of HGV and other construction vehicles that could typically be used for the construction of all elements of the project are set out in **Table 3.1** below. The use of these vehicles would be subject to the contractor.

**Table 3.1: Typical Construction HGV Movements**

Item	Vehicle Type
Battery Storage Units	16.5m Articulated HGV
Solar Panels	Rigid / Articulated HGV
Mounting System	Rigid HGV
Prefabricated Building	Rigid / Articulated HGV
Unloading Buildings	Mobile Crane
Cables	Rigid / Articulated HGV
Fencing	Rigid HGV
Small Deliveries	Rigid HGV
Plant Delivery	Rigid / Articulated HGV
Aggregate	Rigid HGV
Concrete	Rigid HGV

- 3.13 While the number of construction staff would fluctuate depending upon the Site activity taking place, it is estimated that the Site would generate up to 50 two-way construction staff trips during the construction phase of the Proposed Development.

- 3.14 All members of staff would be encouraged to car share through the management of travel patterns and travel planning measures to reduce the number of construction staff vehicle trips to and from the Site per day during the construction phase. The Site Manager would promote car sharing as the primary method for construction workers to travel to and from the Site should they drive in by car.
- 3.15 An area for car parking would be provided within the Site. No contractor or visitor would be permitted to park their cars along the local highway network or Abercarn Mountain Road south through Mynydd Maen Common at any time during the construction phase and this would be strictly enforced by the Site Manager. All visitors would be advised of the car parking arrangements prior to travelling to the Site.
- 3.16 All staff are anticipated to arrive at the Site during the 30-minutes preceding the start of the working day (07:30 to 08:00 Monday to Saturday) and to depart the Site during the 30-minutes following the end of the operating day (18:00 to 18:30 Monday to Friday and 13:00 to 13:30 on Saturdays). It is anticipated that staff would likely travel to and from different origins and destinations and hence spread their movement across the local highway network.

## Operational Trip Generation

- 3.17 Once operational, the Proposed Development would be monitored remotely and would not require any permanent staff to be located on Site; therefore, only occasional visits (typically once a quarter) by 4x4 vehicles / LGVs would be required for maintenance, monitoring and cleaning purposes.
- 3.18 Due to the minimal vehicle movements generated by the Proposed Development during the operational phase, the Proposed Development would not have a significant impact upon the local highway network.

## Decommissioning

- 3.19 At the end of the operational phase, the Solar Farm would be fully decommissioned, with all project elements removed from the Site and recycled where possible. Any waste generated during this process would be removed and transported by a certified and licensed contractor. The solar panels would be removed from the Site, while the cables interconnecting the solar panels to the electricity grid system would be de-energised and removed along with any cable marker signs.
- 3.20 The decommissioning of the Site would be expected to generate a similar (or fewer) number of vehicle trips as the construction phase, since there would not be the same requirement to transport the material separately. The vehicle movements associated with the decommissioning phase would be discussed with CCBC prior to commencement and appropriate measures would be agreed as necessary at that time.

---

## 4 ACCESS STRATEGY

- 4.1 This section of the Transport Statement considers the access strategy for the Proposed Development, including the Site access arrangement and potential route options for HGVs to and from the Site during the construction phase.

### Site Access

- 4.2 The existing access to Cil-Lonydd Farm located along the section of Abercarn Mountain Road south through Mynydd Maen Common would be used to access the Site. An internal access track constructed of permeable materials would lead to the temporary construction compound and car parking area from the Site access, as shown on the Masterplan in **Appendix 1**.
- 4.3 All construction HGVs would enter and exit the Site from and to the north along Abercarn Mountain Road. The arrangement of the Site access would safely enable right-in / left-out manoeuvres from and to Abercarn Mountain Road by a 16.5m long articulated HGV, as shown by RPS Drawing Number 794-PLN-WWP-JPW2051-DR-001 in **Appendix 2**.
- 4.4 An Automatic Traffic Count (ATC) survey was undertaken along Abercarn Mountain Road approximately 450m to the west of the cattle grid for a period of seven days to determine traffic volumes and an indication of 85<sup>th</sup> percentile vehicle speeds through Mynydd Maen Common.
- 4.5 The recorded 85<sup>th</sup> percentile vehicle speeds were 24.0mph eastbound and 23.0mph westbound and therefore, visibility splays of 2.4m x 31.5m to the left and 2.4m x 29.8mph to the right upon egress from the Site would be required. There is considerable visibility in all directions along Abercarn Mountain Road through Mynydd Maen Common and these required visibility splays would be achievable upon egress from the Site.
- 4.6 The CTMP prepared by RPS under separate cover (Report Reference 794-PLN-WWP-JPW2051-TRP-02) sets out traffic management measures, including appropriate signage to advise motorists of the Site access and construction HGVs using Abercarn Mountain Road through Mynydd Maen Common.

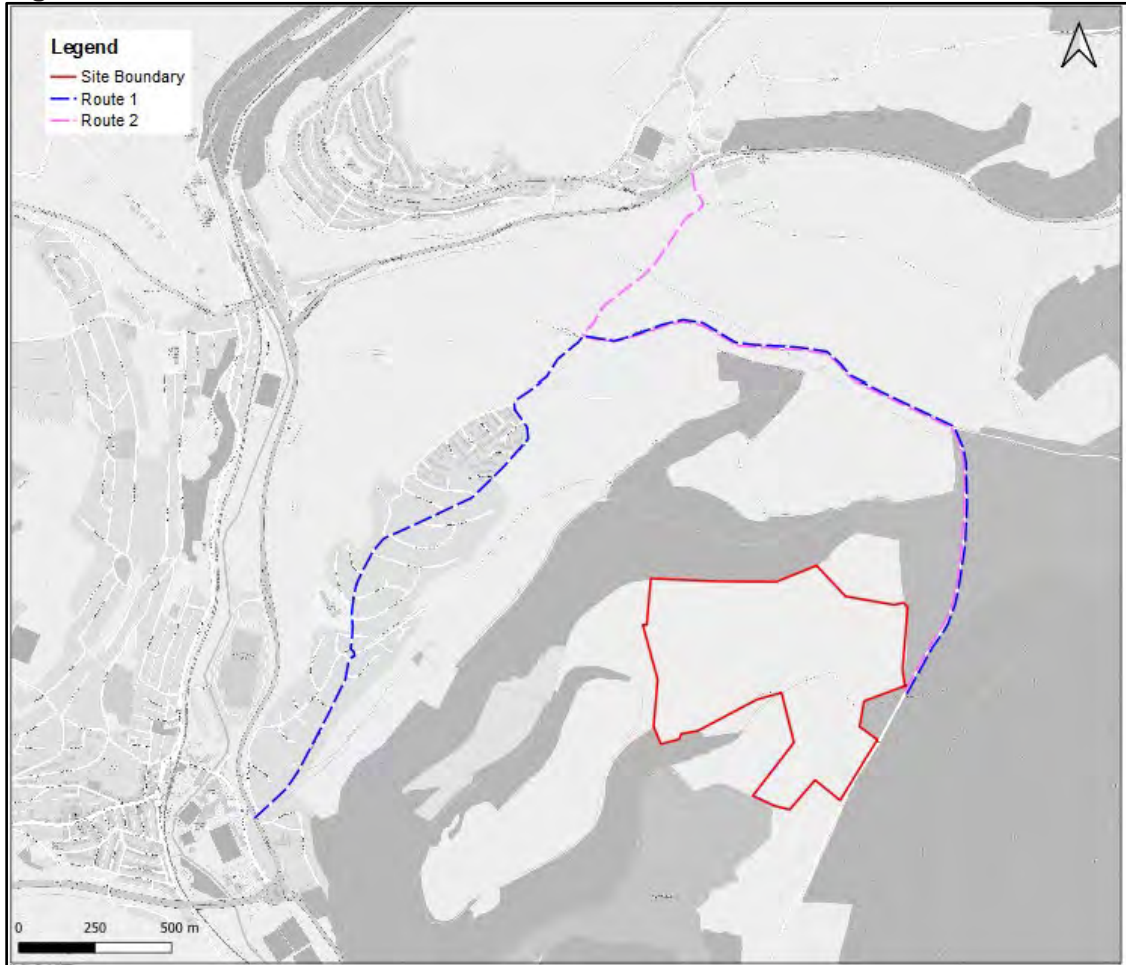
### HGV Access Strategy

- 4.7 An analysis of the local highway network was undertaken to identify the access strategy for HGVs during the construction phase of the Proposed Development. The analysis used professional judgement to consider the suitability of routes to safely accommodate both rigid and articulated HGVs.
- 4.8 The analysis considered that HGVs would route to the Site using predominately primary and secondary roads of the highway network where possible, before using unclassified roads and rural tracks. The A472 and A467 are the nearest 'A'-classified roads to the Site.
- 4.9 HGVs would travel either along the A472 and Herbert Terrace from the north or along the A467, Central Avenue, Old Pant Road and Herbert Terrace from the south. All construction HGVs would use Abercarn Mountain Road through Mynydd Maen Common from the bifurcated junction along Herbert Terrace to access the Site. This is the same access strategy as that proposed for the Mynydd Maen Wind Farm development.

## HGV Access Routes

4.10 As stated above, two potential HGV access routes to the Site are proposed from either the A467 or the A472. These potential access routes are shown on **Figure 5** and are described further below.

**Figure 5: Potential HGV Access Routes**



### Route 1

4.11 A description of this route is provided below.

- From the A467, turn right onto Central Avenue at the A467 / Central Avenue T-junction and continue north eastbound through the village of Panside along Central Avenue, Old Pant Road and Herbert Terrace.
- Turn right onto Abercarn Mountain Road at the Herbert Terrace / Abercarn Mountain Road bifurcated junction and continue eastbound along Abercarn Mountain Road.
- Continue southbound along Abercarn Mountain Road through Mynydd Maen Common towards the Site access.



## Route 2

4.12 A description of this route is provided below.

- From the A472, turn onto Herbert Terrace and continue south westbound along Herbert Terrace.
- Turn left onto Abercarn Mountain Road at the Herbert Terrace / Abercarn Mountain Road bifurcated junction and continue eastbound along Abercarn Mountain Road.
- Continue southbound along Abercarn Mountain Road through Mynydd Maen Common towards the Site access.

## Analysis of HGV Access Routes

### Route 1

- 4.13 From the A467, HGVs would turn right onto Central Avenue at the A467 / Central Avenue priority T-junction. A Traffic Regulation Order is in force at the priority T-junction between the A467 and Central Avenue to prohibit right-turn manoeuvres from Central Avenue onto the A467. A traffic island in the middle of the Central Avenue carriageway discourages right-turn manoeuvres. RPS Drawing Number 794-PLN-WWP-JPW2051-DR-002 in **Appendix 2** demonstrates that a 16.5m long articulated HGV would overrun onto the opposite side of the carriageway for all manoeuvres from the A467 to Central Avenue. The removal of the traffic island at this junction would therefore be required.
- 4.14 HGVs would continue through the village of Panside along Central Avenue and Old Pant Road. RPS Drawing Number 794-PLN-WWP-JPW2051-DR-003 in **Appendix 2** demonstrates that a 16.5m long articulated HGV would be required to use the full width of the carriageway through the roundabout junction.
- 4.15 HGVs would turn right onto Abercarn Mountain Road at the Herbert Terrace / Abercarn Mountain Road bifurcated junction. RPS Drawing Number 794-PLN-WWP-JPW2051-DR-004 in **Appendix 2** demonstrates that a 16.5m long articulated HGV would be required to use the full width of the carriageway at the bifurcated junction and associated works would be required.

### Route 2

- 4.16 From the A472, HGVs would turn onto Herbert Terrace at the A472 / Herbert Terrace T-junction. RPS Drawing Number 794-PLN-WWP-JPW2051-DR-005 in **Appendix 2** demonstrates that a 16.5m long articulated HGV would be required to overrun onto the opposite side of the carriageway for all manoeuvres from the A472 to Herbert Terrace.
- 4.17 HGVs would turn left onto Abercarn Mountain Road at the Herbert Terrace / Abercarn Mountain Road bifurcated junction. RPS Drawing Number 794-PLN-WWP-JPW2051-DR-006 in **Appendix 2** demonstrates that a 16.5m long articulated HGV would be required to use the full width of the carriageway at the bifurcated junction and associated works would be required.

## Abercarn Mountain Road

- 4.18 All construction HGVs would use Abercarn Mountain Road through Mynydd Maen Common from the bifurcated junction along Herbert Terrace to access the Site. Abercarn Mountain Road between Herbert Terrace and the cattle grid to the north of Mynydd Maen Common is a narrow single-track road with restricted forward visibility due to the alignment of the carriageway and existing stone walls either side.
- 4.19 RPS Drawing Number 794-PLN-WWP-JPW2051-DR-007 in **Appendix 2** demonstrates that a 16.5m long articulated HGV would be required to use the full width of the carriageway along Abercarn Mountain Road. While the body and wheels of the HGV would remain within the extent of the carriageway, passing places would be required to enable the HGV to pass oncoming vehicles.
- 4.20 The Mynydd Maen Wind Farm development proposes two new passing bays along Abercarn Mountain Road suitable for use by 16.5m long articulated HGVs, as well as the extension of an existing bay along Abercarn Mountain Road to accommodate a 16.5m long articulated HGV.
- 4.21 These same provisions are proposed for the Proposed Development. RPS Drawing Number 794-PLN-WWP-JPW2051-DR-008 in **Appendix 2** shows the location of the two new passing bays.

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## 5 TRANSPORT IMPACT

- 5.1 This section of the Transport Statement provides an assessment of the likely transport impact of the Proposed Development during both the construction phase and operational phase.

### Impact of Construction Phase

- 5.2 The construction phase is estimated to last between 6 and 9 months, with deliveries fluctuating within this period. It is estimated that there would be an average of six movements (three inbound movements plus three outbound movements) per day during the construction phase of the Proposed Development.
- 5.3 For the purposes of a robust assessment, the transport impact assessment considers that the Proposed Development would give rise to a maximum of 20 daily (10 inbound movements plus 10 outbound movements) HGV movements per day.
- 5.4 All work at the Site during the construction phase would be undertaken between 08:00 and 18:00 hours on Monday to Friday and between 08:00 and 13:00 hours on a Saturday. No construction activities would take place on a Sunday or Bank Holiday.
- 5.5 It is anticipated that all HGV trips to and from the Site would be spread across the 10-hour working day on Monday to Friday and the 5-hour working day on a Saturday, while all staff would arrive at the Site during the 30-minute period before the start of the working day and depart the Site during the 30-minute period that follows the end of the working day.
- 5.6 On average, around 1 two-way HGV movement would be made to and from the Site per hour each weekday, while staff vehicle trips would be made to the Site between 07:30 and 08:00 hours and from the Site between 18:00 and 18:30 hours. The arrival and departure times of construction staff would be outside of the typical highway network peak hours (08:00-09:00 and 17:00-18:00), while the trips would be made from different origins and to different destinations across the local highway network.
- 5.7 The impact of construction traffic on the local highway network is likely to be imperceptible. Furthermore, the CTMP prepared by RPS under separate cover (Report Reference 794-PLN-WWP-JPW2051-TRP-02) would ensure appropriate traffic management measures would be put in place to manage these additional HGV trips on the local highway network.

### Impact of Operational Phase

- 5.8 Once operational, the Proposed Development would be monitored remotely and would not require any permanent staff to be located on Site. Only occasional visits (typically once a quarter) by 4x4 vehicles / LGVs would be required for maintenance, monitoring and cleaning purposes.

---

## 6 SUMMARY AND CONCLUSIONS

- 6.1 This Transport Statement has been prepared by RPS on behalf of Cenin Renewables Limited in support of a Development of National Significance application for the development of a solar photovoltaic electricity generating station and associated ancillary development, at Cil-Lonydd Farm to the east of Newbridge within the CCBC administrative area.
- 6.2 All HGVs would access the Site through the existing field access along Abercarn Mountain Road in Mynydd Maen Common. The Site access would safely accommodate 16.5m long articulated HGVs.
- 6.3 HGVs would travel either along the A472 and Herbert Terrace from the north or along the A467, Central Avenue, Old Pant Road and Herbert Terrace from the south. All construction HGVs would use Abercarn Mountain Road through Mynydd Maen Common from the bifurcated junction along Herbert Terrace to access the Site. The use of both HGV access routes could fluctuate during the construction phase, with both routes being used on certain days or with one route only being used on a day.
- 6.4 The construction phase is anticipated to last between 6 and 9 months, with construction deliveries fluctuating during this period. It is estimated that there would be an average of six HGV movements (three inbound movements plus three outbound movements) per day during the construction phase, although at the peak of activity, there would be up to 20 HGV movements (10 inbound movements plus 10 outbound movements) per day.
- 6.5 The number of construction staff at the Site would fluctuate over the construction phase depending upon the activity that is taking place. All staff who drive to the Site would be encouraged to car share, with staff vehicle trips made to the Site between 07:30 and 08:00 hours and from the Site between 18:00 and 18:30 hours.
- 6.6 The CTMP prepared by RPS under separate cover (Report Reference 794-PLN-WWP-JPW2051-TRP-02) includes several traffic management measures to be implemented during the construction phase of the Proposed Development.
- 6.7 The Proposed Development would have a negligible impact on the local highway network during the operational phase given there would only be occasional visits to the Site throughout the year made by 4x4 vehicles / LGVs for maintenance and cleaning purposes.
- 6.8 In conclusion, the Proposed Development could achieve a safe means of access for construction and operational phases, and there would be no significant impact of highway safety.

## Appendices


## Appendix 1 – Masterplan


# Cil-Lonydd Solar Scheme Indicative Site Layout Plan

10/03/2024

Drwg: MM4-2b-R1

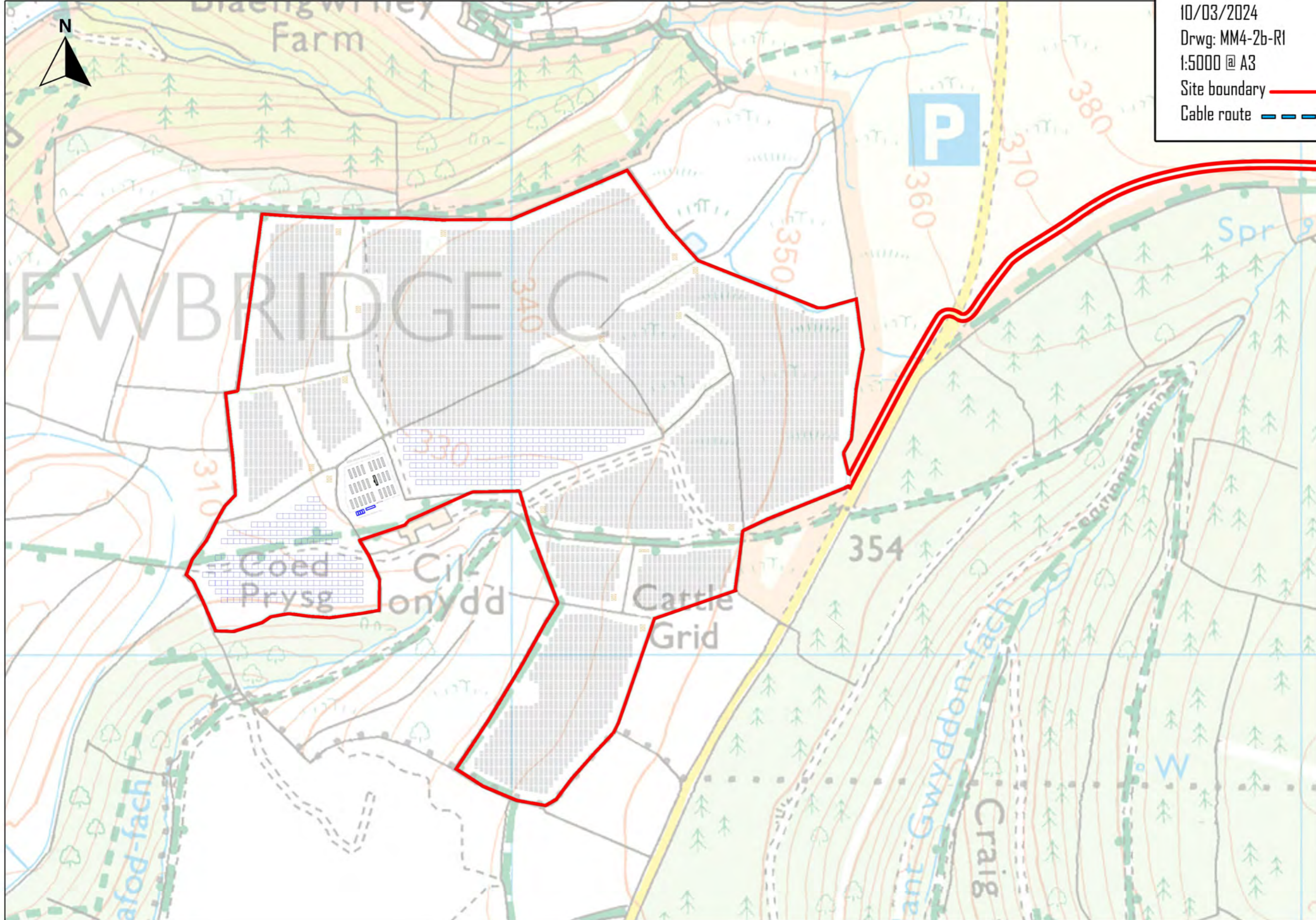
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Site boundary 

Cable route 

Inverters 

Trees 

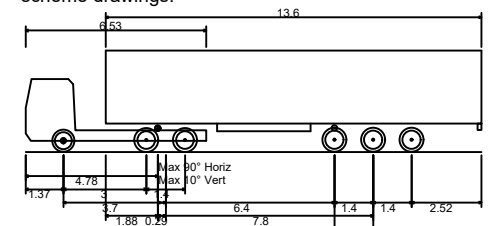


## Appendix 2 – Proposed Access Drawings



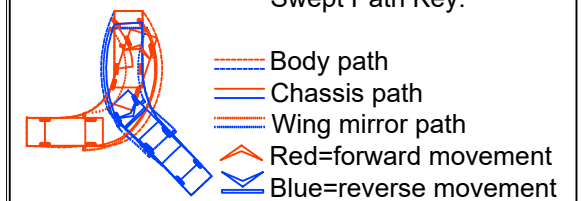
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Max Legal Length (UK) Articulated Vehicle (16.5m)	16.500m
Overall Length	2.550m
Overall Width	3.681m
Overall Body Height	0.411m
Min Body Ground Clearance	2.500m
Max Track Width	6.00s
Lock to lock time	6.530m
Kerb to Kerb Turning Radius	

Swept Path Key:



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Project Cil-Lonydd Solar Farm

Title Site Access Junction Swept Path Analysis

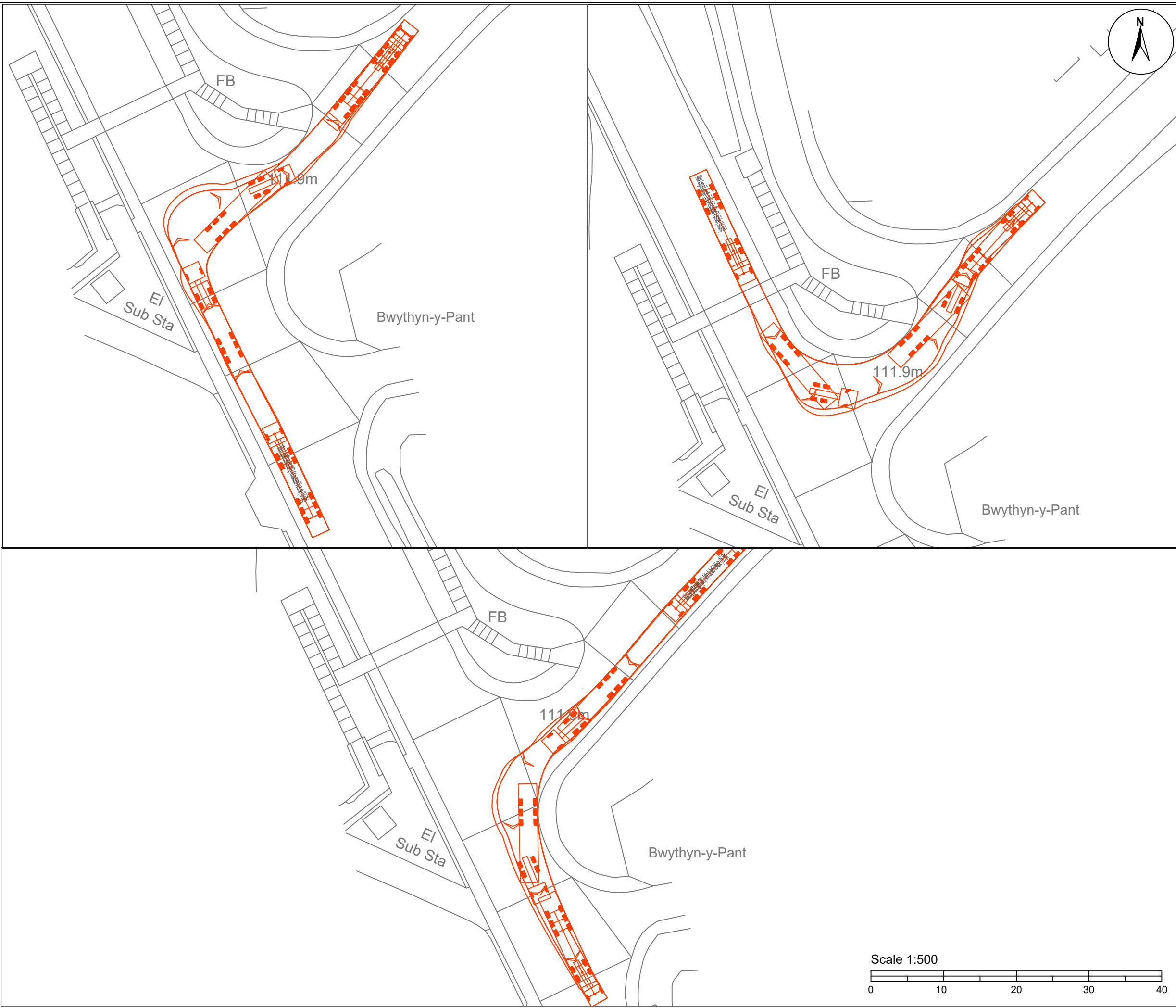
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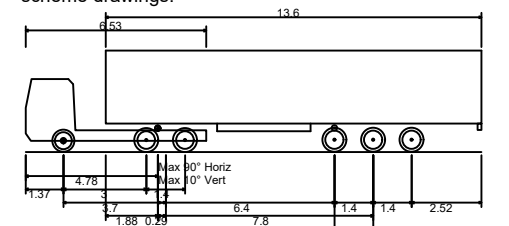




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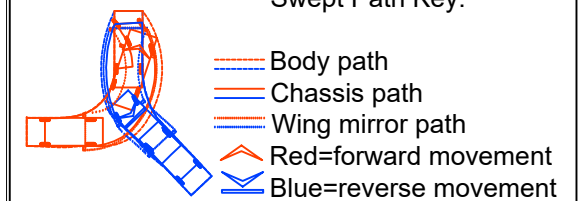
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Project **Cil-Lonydd Solar Farm**

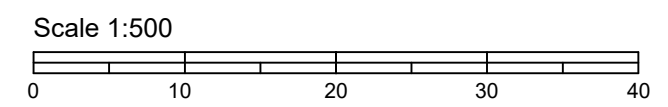
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INFORMATION	DI	DA

Project Number	Scale @ A3	Date Created
TRP-JPW2051	1:500	April 2024

RPS Drawing/Figure Number	Rev
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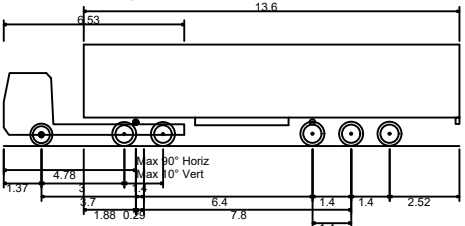




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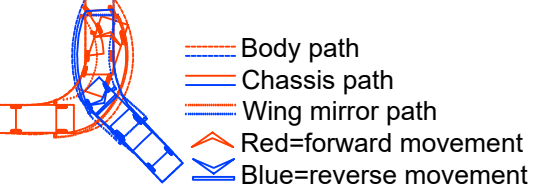
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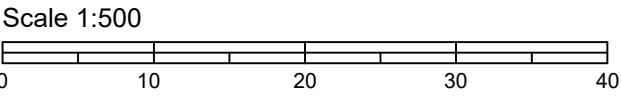
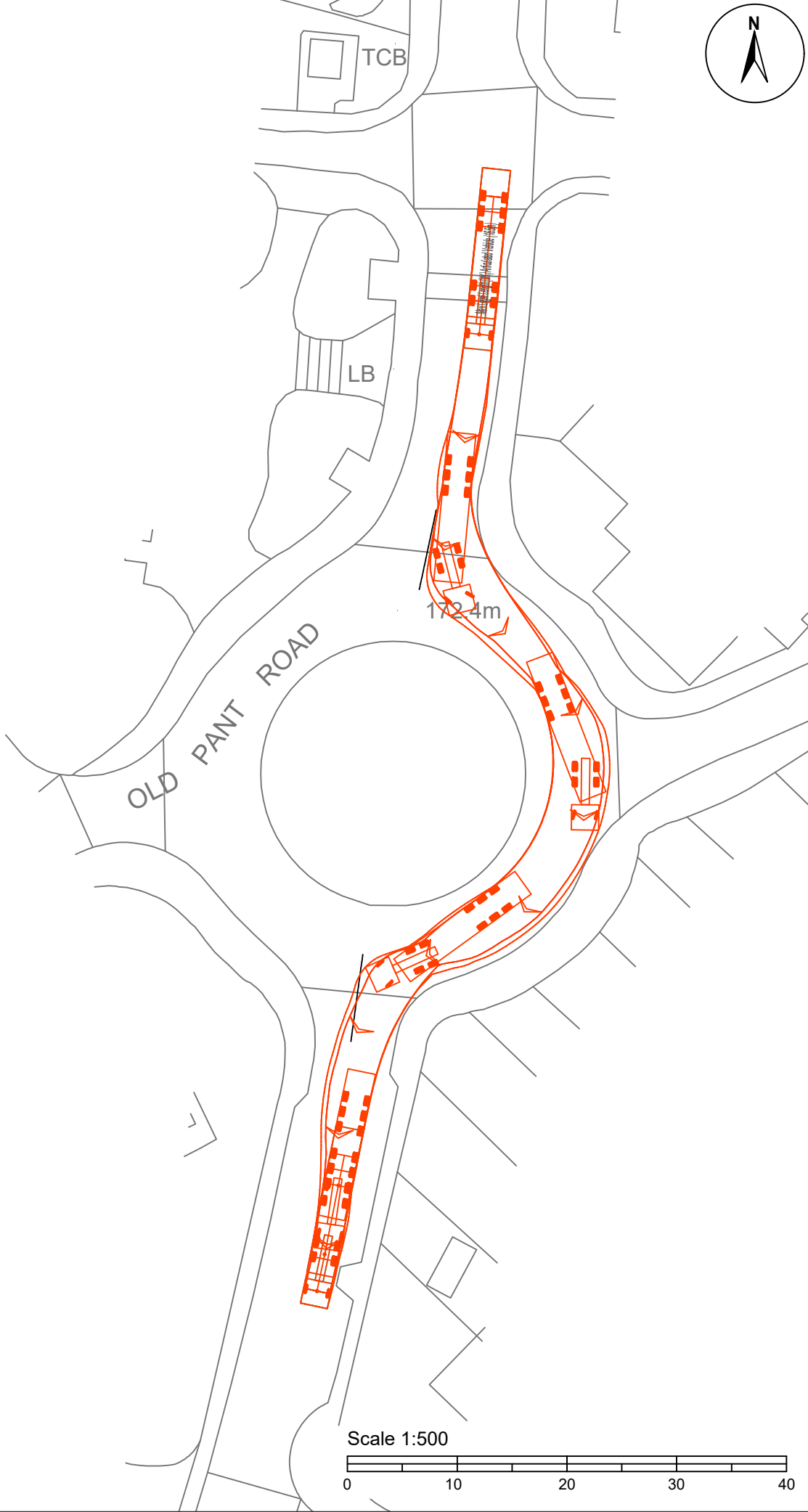
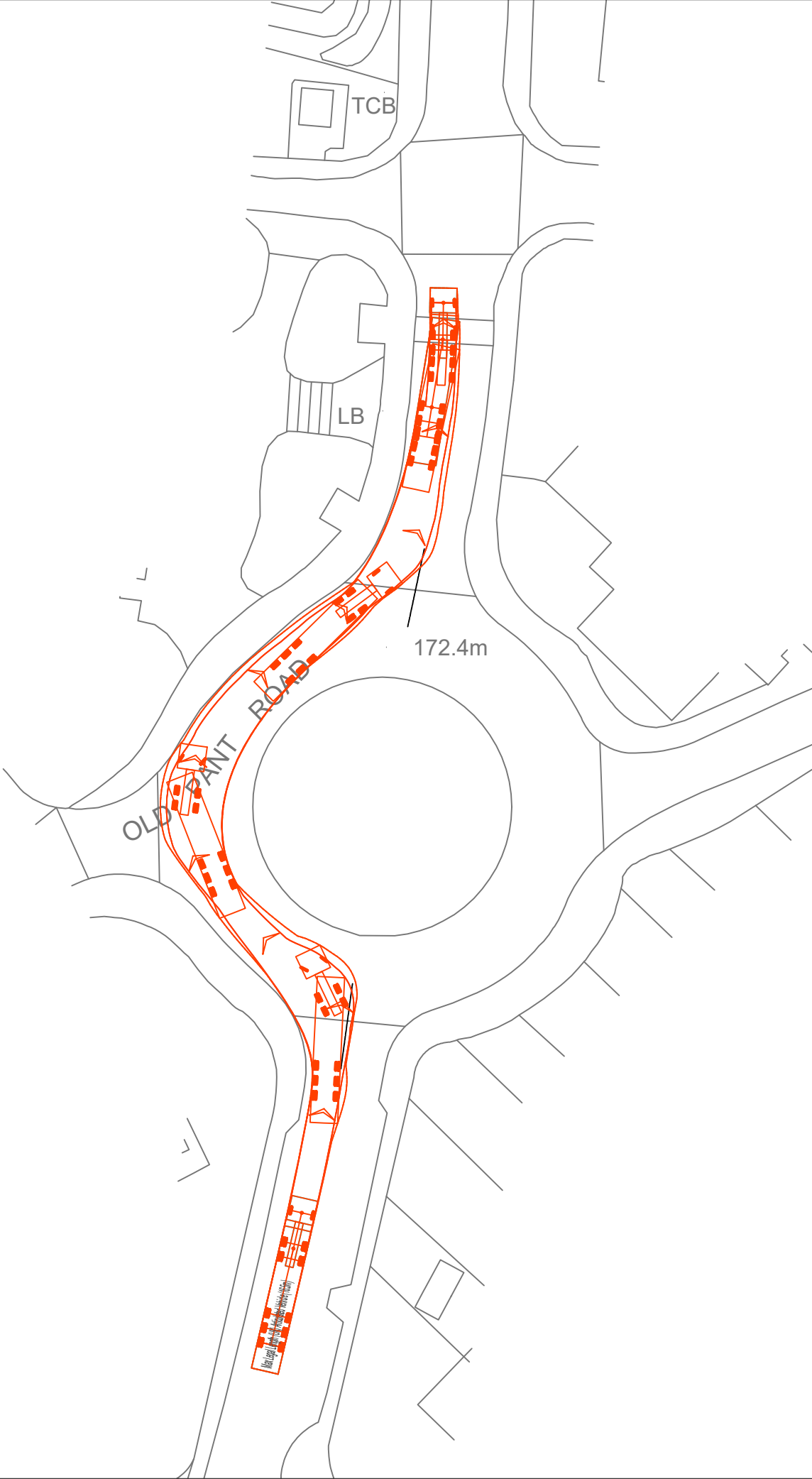
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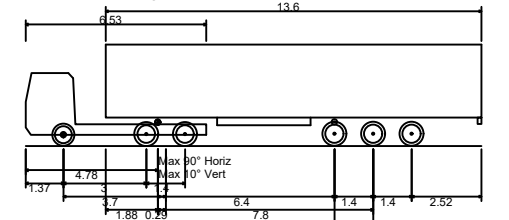




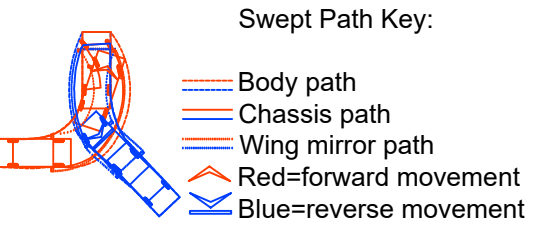
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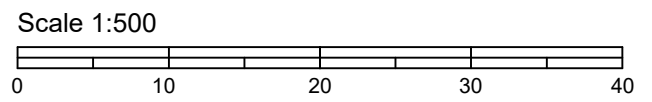
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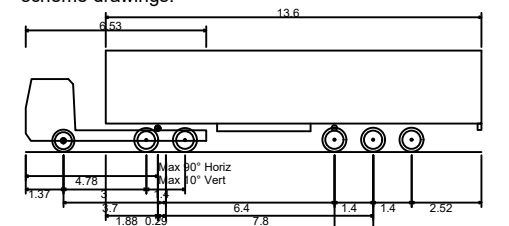




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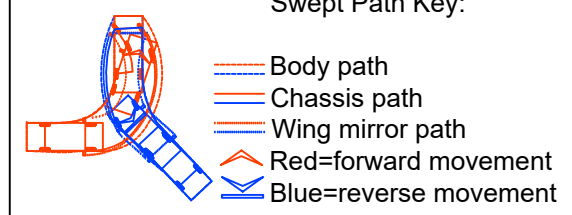
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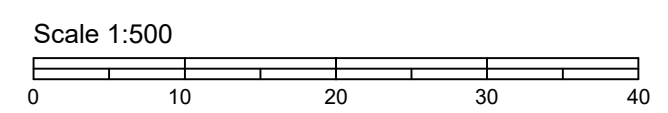
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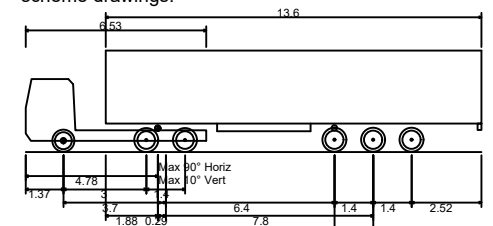
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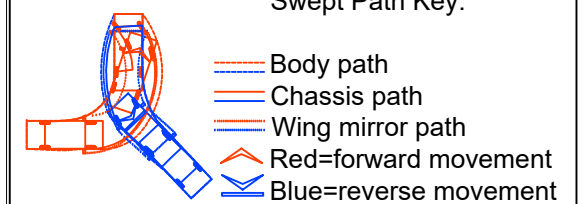
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Max Legal Length (UK) Articulated Vehicle (16.5m)	16.500m
Overall Length	2.550m
Overall Width	3.681m
Overall Body Height	0.411m
Min Body Ground Clearance	2.500m
Max Track Width	6.00s
Lock to lock time	6.530m
Kerb to Kerb Turning Radius	

Swept Path Key:



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Client Cenin Renewables Ltd

Project Cil-Lonydd Solar Farm

Title Bifurcated Junction Swept Path Analysis (Route 2)

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287.5m

Track

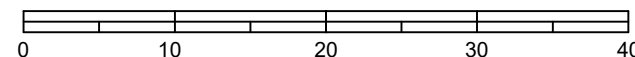
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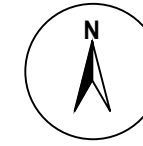
287.5m

Track

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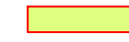




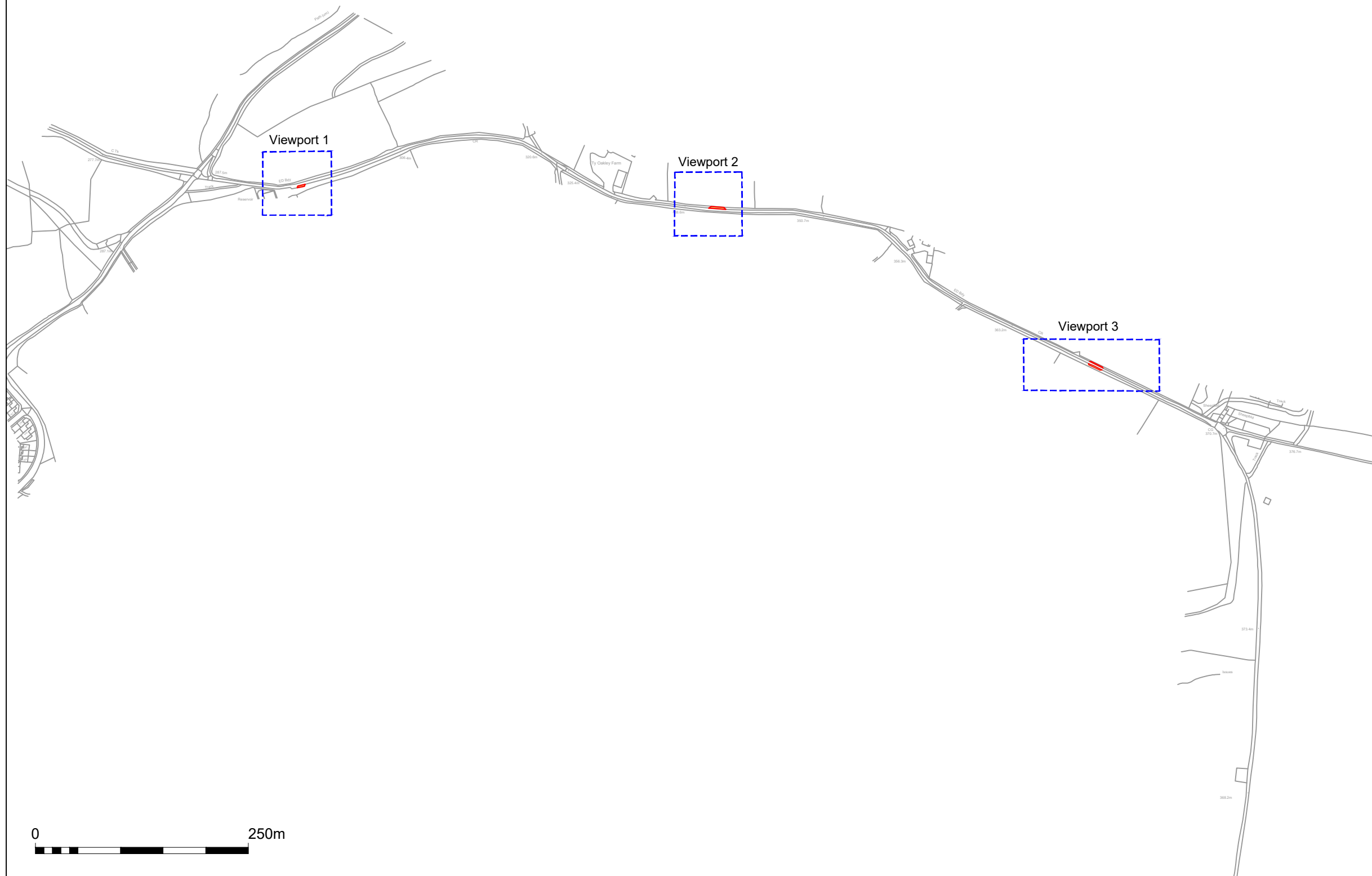
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 Proposed Passing Bay

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Client Cenin Renewables Ltd

Project Cil-Lonydd Solar Farm

Title Mynydd Maen Wind Farm Proposed  
 Passing Bays Viewports Plan -  
 Abercarn Mountain Road

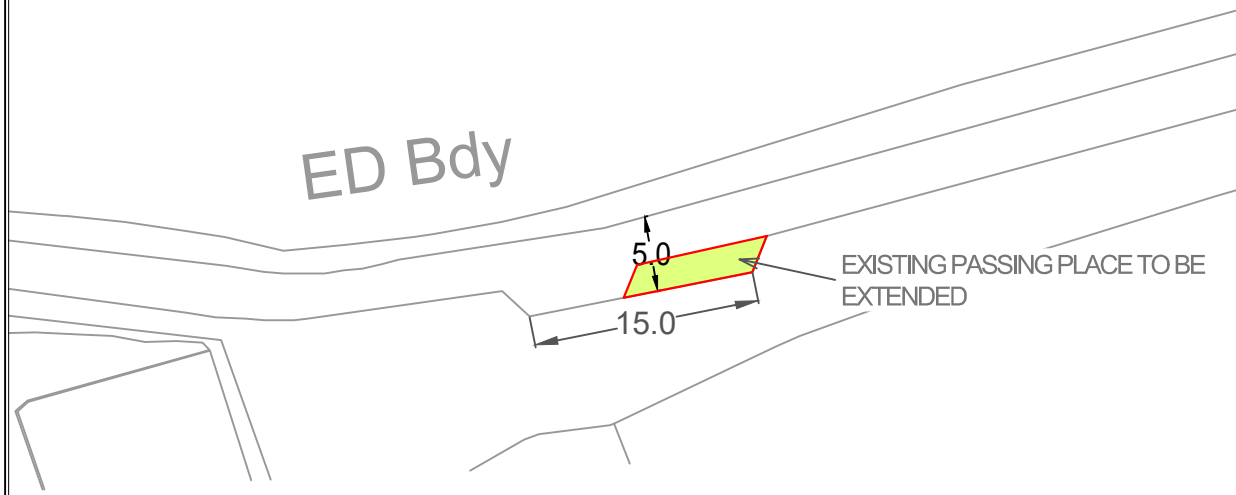
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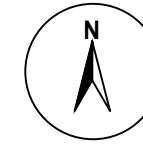
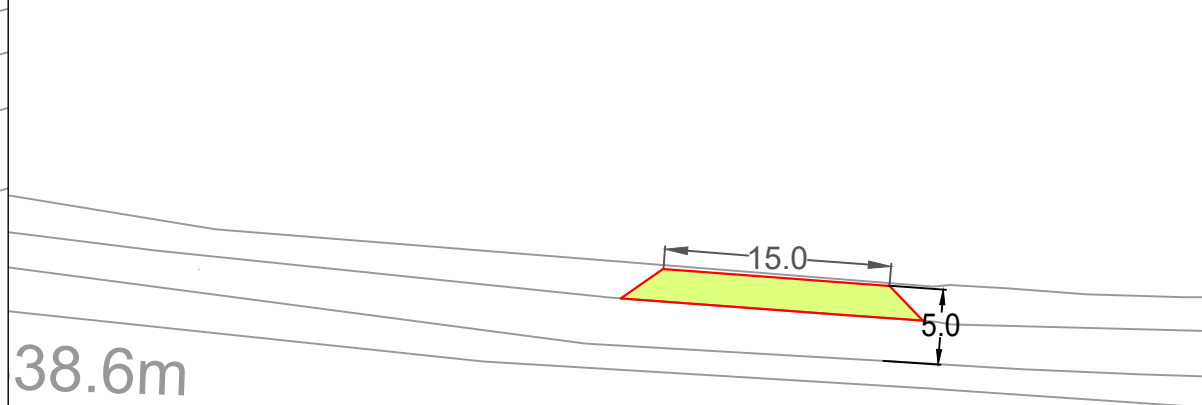
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Viewport 1



Viewport 2



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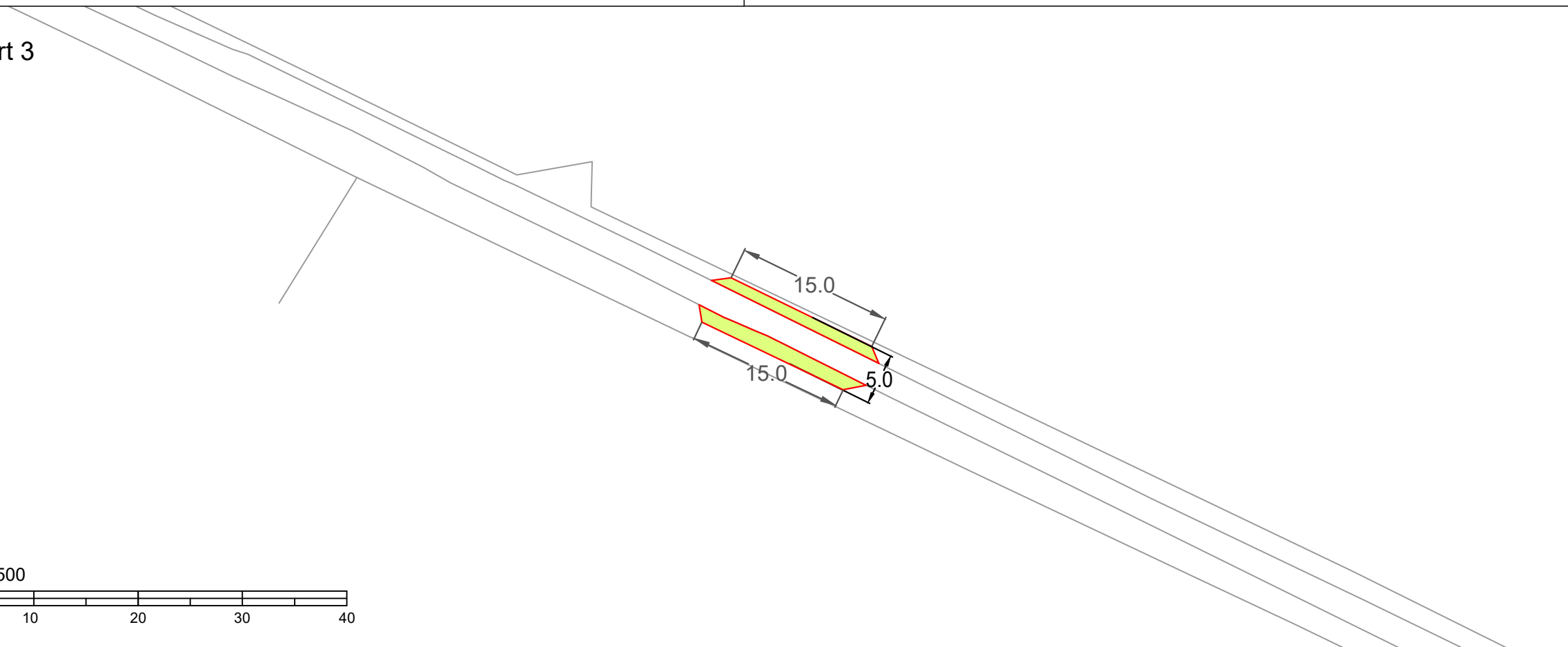
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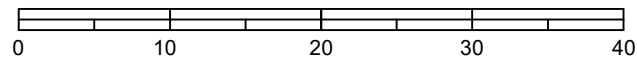
Proposed Passing Bay

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Viewport 3



Scale 1:500



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Client **Cenin Renewables Ltd**

Project **Cil-Lonydd Solar Farm**

Title **Mynydd Maen Wind Farm Proposed Passing Bays - Abercarn Mountain Road**

Status	Drawn By	PM/Checked by
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Project Number	Scale @ A3	Date Created
TRP-JPW2051	1:500	April 2024

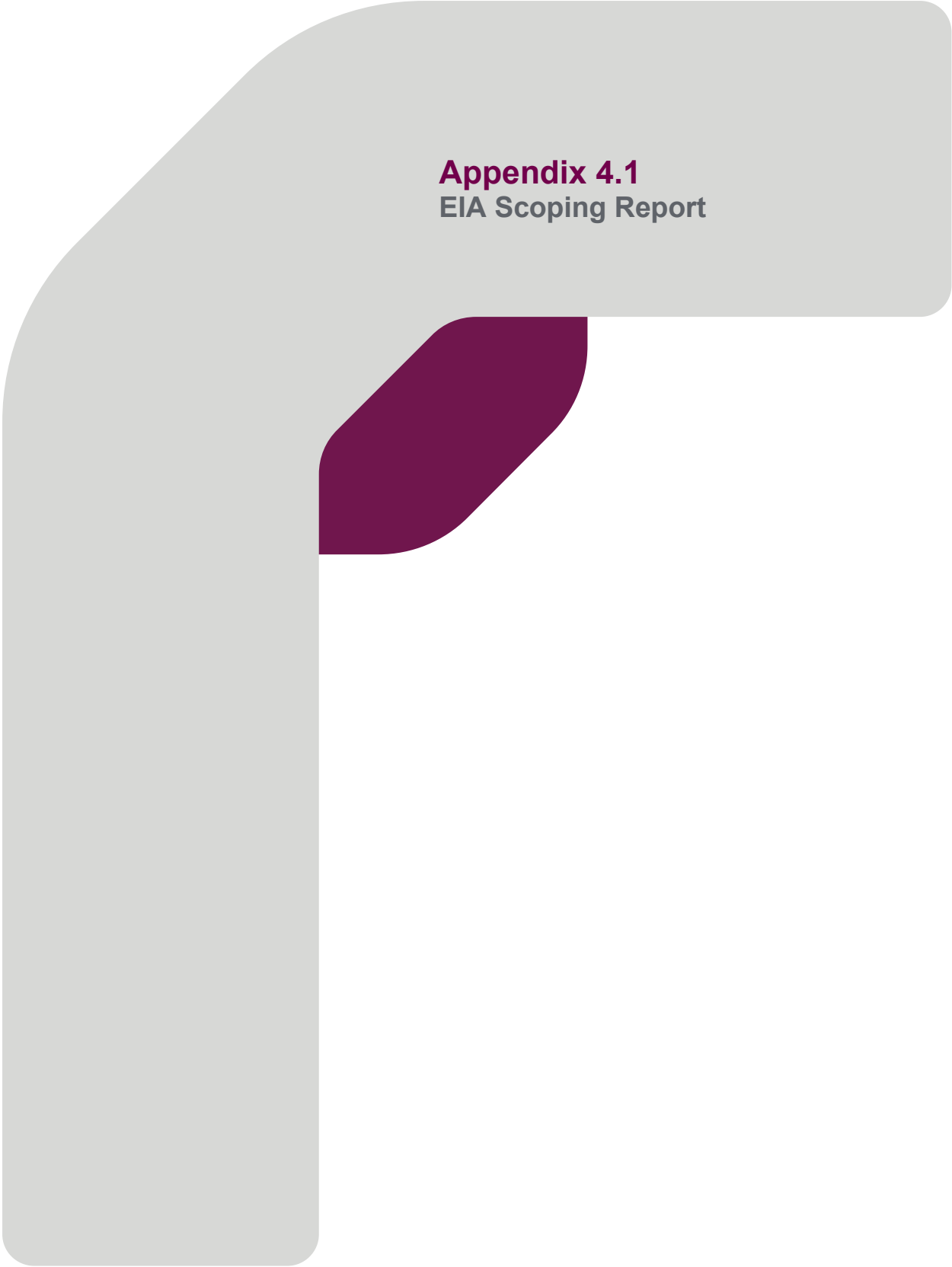
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## Appendix 4.1 EIA Scoping Report

# MYNYDD MAEN SOLAR FARM

## EIA SCOPING REPORT

Request for Scoping Direction under Town and Country Planning  
(Environmental Impact Assessment) (Wales) Regulations 2017

On behalf of CENIN Renewables



JPW2051  
1  
August 2023

**Document status**

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1	Final	MTJ	DP	DP	7/8/2023

**Approval for issue**

Darren Parker  7 August 2023

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Appendix 4: RPS Cultural Heritage desk-based assessment

# 1 INTRODUCTION

## Introduction

- 1.1 This Scoping Report has been prepared by RPS on behalf of CENIN Renewables. It proposes the scope of environmental assessment for the proposed solar farm and ancillary development at Mynydd Maen, Newbridge (**Figure 1**).
- 1.2 This report sets out the proposed scope of the Environmental Statement (the report of the EIA process), which will be prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Wales Regulations 2017 (2017 No.567(W.136)) (referred to hereafter as the EIA Regulations). The Environmental Statement (ES) will accompany a full Development of National Significance (DNS) planning application to be submitted to the Welsh Ministers.
- 1.3 The aim of this report is to provide information to the Welsh Ministers to enable an EIA Scoping Direction to be made under Regulation 15 of the EIA Regulations. A letter to Welsh Ministers requesting such a direction accompanies this report.

## Statutory Framework and Purpose of the Environmental Statement

### Purpose of EIA

- 1.4 EIA is the process of identifying and assessing the significance of effects likely to arise from a proposed development. This requires consideration of the likely changes to the environment, where these arise as a consequence of the proposed development, through comparison with the existing and likely future baseline conditions in the absence of the proposed development.

### Purpose of Scoping

- 1.5 The process of identifying the matters to consider within an ES (establishing the scope of the assessment) is known as scoping. Scoping is not a mandatory requirement under the EIA Regulations. However, it is recognised that through the scoping exercise, the key environmental matters are identified at an early stage, which permits subsequent work to concentrate on those environmental topics for which significant effects may arise as a result of a proposed development.

### Purpose of this Scoping Report

- 1.6 This document sets out details of the proposed development at Mynydd Maen, Newbridge, the proposed EIA methodology and the proposed scope of technical assessments and invites comments from Welsh Ministers and its consultees regarding the scope of works. The intention of this scoping exercise is to gain agreement from all key parties regarding the proposed methodology and scope of assessment.
- 1.7 This Scoping Report has been informed by the following:
- Informal discussions with Planning and Environment Decisions Wales (PEDW);
  - Correspondence from Caerphilly County Borough Council and its consultees;
  - Desk-top studies, site visits and surveys;
  - Review of relevant websites;
  - Local planning policy, Future Wales: The National Plan, Planning Policy Wales (PPW) and Technical Advice Notes (TANs);
  - The EIA Regulations and EIA good practice guidance; and

- Experience of other similar developments.

### **The applicant**

- 1.8 CENIN Renewables Ltd (the applicant) (CENIN) is a Bridgend based renewable integrated infrastructure company committed to powering a greener future. In 2021 CENIN was recognised for its work by the Queen’s Award for Enterprise – Sustainable Development. The founding principles of CENIN are based on energy generation using natural resources, recycling of materials and sustainable and secure job creation. These principles have led to the developments of its innovative integrated renewable energy centre at CENIN’s headquarters at Parc Stormy in Bridgend County Borough.
- 1.9 Through its innovative approach to renewable energy provision, CENIN unlocks hidden green energypotential and utilise the earth’s natural resources.

### **Public consultation**

- 1.10 The applicant will undertake informal consultation through brochure drops to local residences and providing a webpage which will contain all of the project information.
- 1.11 In addition, the applicant will follow the consultation requirements outlined by the DNS process.
- 1.12 As part of the consultation process, the applicant will engage with the local community in order to inform local people about the proposals, to explain the development and its likely effects and to take on board any concerns or issues. The ES will include a summary of the pre-application public consultation carried out.



## 2 THE SITE AND THE PROPOSED DEVELOPMENT

### The site and its surroundings

- 2.1 The site comprises land at Cil-Onnydd Farm between Newbridge to the west and Cwmbran to the east. It lies within the administrative boundary of Caerphilly County Borough Council (the Council).
- 2.2 The site itself extends to approximately 28.6 hectares (70.6 acres) (excluding the cable route) and consists of several parcels of land. The parcels are irregular in shape and comprise a series of agricultural fields of varying sizes. They are currently primarily used for pasture grazing, bound by a mixture of mature woodland, trees and hedgerows. The site adjoins registered common land to the east.

### Project description

- 2.3 CENIN Renewables (the applicant) proposes to develop a solar photovoltaic electricity generating station (or 'solar farm') with an installed generation capacity of approximately 40MW and associated ancillary development, including a substation. The power generated would be enough to power approximately 15,000 typical family homes.
- 2.4 The point of connection is proposed to be located at an existing 132kV substation to the southeast on Mynydd Maen Common, which would be connected to the site by a cable route of 3km.

### Solar farm

- 2.5 The main components of a solar farm are:
- Solar panels and frames;
  - Inverters;
  - Transformers;
  - Cabling; and
  - Substation.
- 2.6 Trenches of typically 1m deep and 50cm wide are required for the underground cabling. At this stage the technical requirements are being clarified and assessed but the proposal will include a substation, which would comprise an open compound with support stanchions and cabling. Battery storage is also proposed within the site.

### Dual and reversible use

- 2.7 The solar farm will be designed to accommodate sheep grazing beneath and between the rows of panels, providing an efficient dual use of land for renewable energy generation and agriculture. The solar farm will be enclosed by tall post and wire 'deer' fencing with security cameras in selected locations for security and insurance purposes.
- 2.8 A solar farm is a temporary and fully reversible use, unlike housing for example, with all equipment removed from site at the end of the installation's operational life (approximately 50 years). The methods used in construction mean that remediation works following the removal of the panels and associated infrastructure are relatively minor and will return the site to its previous greenfield character. This is an approach that will mean the proposed development would accord with one the Key Planning Principles of PPW of '*Maximising environmental protection and limiting environmental impact*' as it would not irreversibly damage or deplete the environment.

### 3 GENERAL APPROACH TO EIA

#### Information required

- 3.1 Although there is no statutory provision as to the form of an ES, it must contain the information specified in Regulation 17(3), including any relevant information specified in Schedule 4 of the EIA Regulations, as set out below:
1. A description of the development including in particular:
    - a. A description of the location of the development;
    - b. A description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
    - c. A description of the main characteristics and the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the minerals and natural resources (including water, land, soil and biodiversity) used;
    - d. An estimate, by type and quantity, of expected residues and emissions (such as water, air, soils and sub soil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.
  2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen opinion, including a comparison of the environmental effects;
  3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
  4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development; population, human health, biodiversity (for example fauna and flora), land, (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaption), material assets, cultural heritage, including archaeological aspects, and landscape.
  5. A description of the likely significant effects of the development on the environment resulting from, inter alia:
    - a. The construction and existence of the development, including, where relevant, demolition works;
    - b. The use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
    - c. The emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
    - d. The risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
    - e. The cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

- f. The impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
- g. The technologies and the substances used.

3.2 The description of the likely significant effects on the factors specified in regulation 4(2) should cover the 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. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC(a) and Directive 2009/147/EC(b).

1. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.
2. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.
3. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU(c) of the European Parliament and of the Council or Council Directive 2009/71/Euratom(d) or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.
4. A non-technical summary of the information provided under paragraphs 1 to 8.
5. A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.

3.3 The information supplied in the ES will provide a clear understanding of the likely significant effects of the project upon the environment. The following sections outline the overall approach to EIA in order to meet these legal requirements.

### **Structure of the Environmental Statement (ES)**

3.4 The ES will be structured logically, enabling all relevant environmental information to be found quickly and easily. The ES will describe the EIA process and its findings, and will include the following sections:

- Non-Technical Summary (as a stand alone document);
- Written Statement;
- Figures; and
- Appendices.

## EIA methodology

### Relevant EIA guidance

- 3.5 The EIA process will take into account relevant government or institute guidance, including:
- Welsh Office Circular 11/99: Environmental Impact Assessment;
  - Future Wales: The National Plan 2040;
  - Welsh Government: Planning Policy Wales (2021);
  - Department for Communities and Local Government (2014) Planning Practice Guidance at <http://planningguidance.planningportal.gov.uk>;
  - Department of the Environment, Transport and the Regions (DETR) (1997) Mitigation Measures in Environmental Statements. HMSO;
  - Highways Agency et al. (2008) Design Manual for Roads and Bridges, Volume 11, Section 2, Part 5. HA 205/08;
  - Institute of Environmental Management and Assessment (2004) Guidelines for Environmental Impact Assessment;
  - Institute of Environmental Management and Assessment (2011) The State of Environmental Impact Assessment Practice in the UK. Special Report;
  - Institute of Environmental Management and Assessment (2016) Environmental Impact Assessment: Guide to Shaping Quality Development;
  - Institute of Environmental Management and Assessment (2020) Climate Change Resilience and Adaptation;
  - Institute of Environmental Management and Assessment (2016) Environmental Impact Assessment: Guide to Delivering Quality Development;
  - Institute of Environmental Management and Assessment (2022) Environmental Impact Assessment: Assessing Greenhouse Gas Emissions and Evaluating their Significance; and
  - Institute of Environmental Management and Assessment (2017) Health in Environmental Impact Assessment: A Primer for a Proportional Approach.
- 3.6 Other topic-specific specialist methodologies and good practice guidelines will be drawn upon as necessary.

### Key elements of the general approach

- 3.7 The assessment of each environmental topic will form a separate chapter of the ES. For each environmental topic, the following will be addressed:
- Methodology and assessment criteria;
  - Description of the environmental baseline (existing conditions);
  - Identification of likely effects;
  - Evaluation and assessment of the significance of identified effects, taking into account any measures designed to reduce or avoid environmental effects which form part of the project and to which the developer is committed; and
  - Identification of any further mitigation measures envisaged to avoid, reduce and, if possible, remedy adverse effects (in addition to those measures that form part of the project).

## Methodology and assessment criteria

- 3.8 Each topic chapter will provide details of the methodology for baseline data collection and the approach to the assessment of effects. Details of the proposed approach for each topic are provided in Section 5 of this Scoping Report. Each identified environmental topic will be considered by a specialist in that area. The identification and evaluation of effects will take into account relevant topic-specific guidance where available.

## Description of the environmental baseline

- 3.9 The existing and likely future environmental conditions in the absence of the project are known as 'baseline conditions'. Each topic-based chapter will include a description of the current (baseline) environmental conditions. The baseline conditions at the site and within the study area form the basis of the assessment, enabling the likely significant effects to be identified through a comparison with the baseline conditions.
- 3.10 The baseline for the assessment of environmental effects will primarily be drawn from existing conditions during the main period of the EIA work. Consideration will also be given to any likely changes between the time of survey and the future baseline for the construction and operation of the project. In some cases, these changes may include the construction or operation of other planned developments in the area. Where such developments are built and operational at the time of writing and data collection, these will be considered to form part of the baseline environment. Where sufficient and robust information is available, such as expected traffic growth figures, other future developments will be considered as part of the future baseline conditions. In all other cases, planned future developments will be considered within the assessment of cumulative effects, where necessary.
- 3.11 The consideration of future baseline conditions will also take into account the likely effects of climate change, as far as these are known at the time of writing. This will be based on information available from the UK Climate Projections project (UKCP18), which provides information on plausible changes in climate for the UK (Environment Agency and Met Office, 2018) and on published documents such as the UK Climate Change Risk Assessment 2017 (Committee on Climate Change, 2016).

## Assessment of effects

- 3.12 The EIA Regulations require the identification of the likely significant environmental effects of the project. Each topic chapter will take into account both the sensitivity of receptors affected and the magnitude of the likely impact in determining the significance of the effect.

## Sensitivity or importance of receptors

- 3.13 Receptors are defined as the physical resource or user group that would be affected by a proposed development. The baseline studies will identify potential environmental receptors for each topic and will evaluate their sensitivity to the proposed development. The sensitivity or importance of a receptor may depend, for example, on its frequency or extent of occurrence at an international, national, regional or local level.

## Magnitude of impact

- 3.14 Impacts are defined as the physical changes to the environment attributable to the project. For each topic, the likely environmental impacts will be identified. The magnitude of the impact will be described using defined criteria within each topic chapter.
- 3.15 The categorisation of the impact magnitude may take into account the following four factors:

- Extent;
- Duration;
- Frequency; and
- Reversibility.

- 3.16 Impacts will be defined as either adverse or beneficial. Depending on discipline, they may also be described as:
- Direct: Arise from activities associated with the project. These tend to be either spatially or temporally concurrent;
  - Indirect: Impacts on the environment which are not a direct result of the project, often produced away from the project site or as a result of a complex pathway.
- 3.17 Impacts will be divided into those occurring during the construction phase and those occurring during operation. Where appropriate, some chapters may refer to these as temporary and permanent impacts.

### Significance of effects

- 3.18 Effect is the term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by correlating the magnitude of the impact to the sensitivity of the receptor or resource.
- 3.19 The magnitude of an impact does not directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the sensitivity or importance of the receptor.
- 3.20 Levels of significance that will be used in the assessment include, in descending order:
- Substantial;
  - Major;
  - Moderate;
  - Minor;
  - Neutral.
- 3.21 Where an effect is described as 'neutral' this means that there is either no effect or that the significance of any effect is considered to be negligible. All other levels of significance will apply to both adverse and beneficial effects. These significance levels will be defined separately for each topic within the methodology sections. In all cases, the judgement made as to significance will be that of the author of the relevant chapter with reference to appropriate standards/guidelines where relevant.

### Mitigation measures

- 3.22 The EIA Regulations require that where significant effects are identified 'a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce or, if possible, offset likely significant adverse effects on the environment' should be included in the ES.
- 3.23 The development of mitigation measures is part of an iterative EIA process. Therefore, measures will be developed throughout the EIA process in response to the findings of initial assessments. The project that forms the subject of the DNS planning application will include a range of measures designed to reduce or prevent significant adverse environmental effects arising, where practicable. In some cases, these measures may result in enhancement of environmental conditions. The

assessment of effects will therefore take into account all measures that form part of the project and to which Elgin are committed.

3.24 The topic chapters will therefore take into account all measures that form part of the proposed development, including:

- Measures included as part of the project design (sometimes referred to as primary mitigation);
- Measures to be adopted during construction to avoid and minimise environmental effects, such as pollution control measures. These measures would be implemented through the Code of Construction Practice; and
- Measures required as a result of legislative requirements.

3.25 Where required, further mitigation measures will be identified within topic chapters. These are measures that could further prevent, reduce and, where possible, offset any residual adverse effects on the environment.

3.26 In some cases, monitoring measures may be appropriate, for example, to ensure that proposed planting becomes established. Where appropriate, monitoring measures will be set out.

3.27 The ES will set out how the delivery of measures proposed to prevent/ minimise adverse effects is secured and whether relevant consultees agree on the adequacy of the measures proposed.

### **Summary tables**

3.28 Tables will be used to summarise the effects of the project for each environmental topic.

## 4 SCOPE OF ASSESSMENT

### Work undertaken to date

- 4.1 The following studies have been undertaken or are currently ongoing in relation to the proposed development.

#### Landscape and Visual

- 4.2 A preliminary, desk based, landscape and visual appraisal of the proposed development area was completed by Galpin Landscape Architecture in May 2023 (see **Appendix 2**). A Zone of theoretical visibility ('ZTV') with proposed viewpoint locations for assessment has been prepared and consultation with the local planning authority has been undertaken to agree these viewpoints.
- 4.3 The production of a comprehensive Landscape assessment as part of the EIA to accompany the planning application will help to inform the detailed landscape mitigation measures, including the assessment of the impacts and effects of the proposed development.

#### Ecology

- 4.4 A Preliminary Ecological Appraisal (PEA) of the area within the development red line boundary and surrounding buffer zones was undertaken, dated 10<sup>th</sup> October 2022, which included a desk study identifying nationally designated sites within 2 km (10 km for international designations) of the red line application boundary (see **Appendix 3**).
- 4.5 The PEA concluded that there are no anticipated adverse impacts of the proposed development on nearby designated sites other than the locally designated Mynydd Maen, East of Newbridge Site of Important Nature Conservation (SINC). Following consideration of this issue, the development red line boundary was amended to remove the area of SINC, and the cable route was relocated to follow an existing road along the common land to reduce its impact on the SINC.

#### Heritage

- 4.6 A Cultural Heritage desk-based assessment has been undertaken by RPS (see **Appendix 4**). The study site has been assessed for its below ground archaeological potential, and potential effects on the settings of designated archaeological and built heritage assets in the surrounding area.

### Topics scoped out of assessment

- 4.7 Taking into account the findings of the above studies, together with the feedback from the pre-application consultation with the Council and our knowledge of the site and surrounding area, it is proposed that the following topics are not included in the scope of the ES:
- Population,
  - Transport,
  - Human Health,
  - Land (for example land take),
  - Heritage,
  - Soil (for example organic matter, erosion, compaction, sealing),
  - Water (for example hydromorphological changes, quantity and quality),
  - Air,
  - Material Assets, and
  - Risk of Major Accidents.



## Planning policy context

- 4.8 The ES will provide an overview of relevant legislative and planning policy context within each topic chapter. The assessment will have regard to national and local policy documents, where relevant. However, it is not proposed to include a separate chapter on Planning Policy Context in the ES. The draft guidance on EIA from the Department for Communities and Local Government 'EIA: A Guide to Good Practice and Procedures' (DCLG 2006) (paragraph 155) states that there is no requirement to provide chapters on planning and sustainability in Environmental Statements. A separate Planning Statement will be submitted with the planning application and the environmental topic chapters within the ES will each set out the policy context relevant to that topic.

## Population

- 4.9 The construction will have a temporary effect on employment provision through the creation of construction jobs however, it is unlikely that the proposals will result in a significant change in population as workers are unlikely to relocate to an area on a permanent basis. Therefore, a minor beneficial effect is therefore anticipated for a temporary period.

## Transport

- 4.10 Construction access for the project would be from the A472 at Hafodyrynys (see **Figure 2**) and the anticipated duration of construction is 12 to 15 months. Heavy goods vehicle (HGV) movements during construction would be circa 20 (10 each way) per day during peak activity.
- 4.11 It is acknowledged that there are sensitive receptors in the vicinity of the site boundary; however, based upon the expected construction traffic flows they are considered to be low enough so as not to result in any significant environmental effects.
- 4.12 Once operational, the solar farm will be operated remotely and only require around 3 or 4 visits for maintenance, monitoring and cleaning of the panels and site on an as needed basis. The vehicle movements associated with the occasional visits to the site would have a negligible influence on the surrounding highway network.
- 4.13 On the basis of the above, it is therefore considered that transport - both construction and operational - can be scoped out of the EIA and adequately addressed through the submission of separate standalone technical reports, such as a Transport Assessment, which will accompany the planning application. This would align with comments made by the Council in its pre-application advice.
- 4.14 The planning application will also be supported by a Construction Traffic Management Plan (CTMP). This will include, amongst other things, details of the proposed construction vehicle movements and types of vehicles, consideration of the travel journeys for operation/maintenance workers, details of the proposed access junction arrangement, visibility splays (where relevant), details of the proposed haulage route and its suitability, details of traffic management measures to be adopted, construction working hours and duration of works.

## Human health

- 4.15 The direct human health effects of the proposed development are limited, the proposed development will displace primary fossil fuel derived electricity and the consequent Greenhouse Gases and other pollutants released during fossil fuel combustion and would result in a beneficial effect on human health.

### Land (for example land take)

- 4.16 The site comprises agricultural land which will be developed for the production of renewable energy. The site will be designed to be capable of enabling sheep grazing during its operational life, and therefore it is anticipated that energy and agriculture will remain in a co-use across the site. The proposed development is fully reversible and the agricultural potential of the site can be fully restored following decommissioning.
- 4.17 The site is also within an identified Mineral Resource Area, with the geology underlying the site containing sandstone resource. Whilst this resource is present, it is recorded to extend significantly beyond the site boundary and the proposed use is temporary, and therefore sterilisation of minerals is not considered a significant impact.
- 4.18 The southern portion of the site is within a Mineral Site Buffer Zone for the currently active Hafod Fach Quarry. There would be no overlap of the site boundary with the quarry boundary and subsequently no constraint to mineral working. The solar array would not be a sensitive development and as such it would be suitable for inclusion within the buffer zone, which would accord with the relevant policy of the adopted Caerphilly County Borough Council Local Development Plan (2010).
- 4.19 Overall, the land will not be sterilised in perpetuity from other forms of operations or development and will remain in agricultural use as grazing of sheep will be possible whilst the solar arrays are in place and as such no likely significant lasting adverse effects on the quality of the land is expected.

### Heritage

- 4.20 As mentioned above, a cultural Heritage desk-based assessment has been undertaken by RPS.
- 4.21 Within a 5km radius of the study site, there are 10 Scheduled Monuments, 163 listed buildings, and 5 Conservation Areas. No other asset types are present within 5km of the study site. The nearest designated heritage asset to the study site is 1.8km distant.
- 4.22 The assessment states that there is the potential for a high level of impact on non-designated archaeological heritage assets of low/local to moderate/regional importance that may be present within the study site. It also states that there is the potential for some negligible impacts on the settings of designated heritage assets, but in no case would the proposed development be likely to have an effect on the significance of any designated heritage asset.
- 4.23 Overall, it is not considered that impacts from the proposed development would not have a significant effect on the historic environment as a whole.

### Soil (for example organic matter, erosion, compaction, sealing)

- 4.24 The site comprises mainly grassland agricultural fields, interspersed with blocks of woodland. The National Soils Map (1:250,000) shows the Site comprise entirely of freely draining acid loamy soils over rock.
- 4.25 Given the existing / historical use of the site, it is not envisaged to be any significant sources of potential contaminative concern. Most of the soil will not be physically impacted from the development.
- 4.26 Appropriate construction techniques will be implemented to reduce above and below ground works and to minimise any compaction of soil mitigating any potential impact on the soils structure and ability to infiltrate water.
- 4.27 The site is entirely classified as Subgrade 4 agricultural land, which is poor quality agricultural land. An Agricultural Land Classification survey is not required given the predictive map information for the site and the knowledge that the site does not contain Best and Most Versatile Agricultural Land.

- 4.28 The proposed development is temporary in nature and fully reversible and following decommissioning would ensure that the future quality of the agricultural land is maintained with no likely significant lasting adverse effects on the quality of the soil.
- 4.29 The planning application will be supported by a Soil Management Plan, but it is considered that this matter should be scoped out and not addressed as part of the ES.

### **Water (for example hydromorphological changes, quantity and quality)**

- 4.30 The entire site is located within Development Advice Map (DAM) Zone A (considered to be at little or no risk of fluvial or coastal/tidal flooding).
- 4.31 NRW surface water mapping identifies a number of isolated locations within the site boundary at low to high risk of surface water flooding. Low risk is defined as areas with a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%), with high-risk areas with a chance of flooding of greater than 1 in 30 (3.3%).
- 4.32 A Flood Consequence Assessment supported by a drainage strategy will be prepared in accordance with Planning Policy Wales, Technical Advice Note 15 and latest climate change data to ensure flood risk and hydrological impacts are managed appropriately. From pre-application advice from the Council, we are also aware that through a separate legislative requirement, SuDS consent will be required prior to construction and we have made contact with the SuDS Approval Body to discuss this proposal.
- 4.33 Having considered the potential impacts, hydrology and drainage can be adequately addressed as part of the planning application via a standalone Flood Consequence Assessment and Drainage Strategy and can be scoped out of the ES.

### **Air Quality**

- 4.34 It is not anticipated that there is any potential for significant effects on local receptors, with any potential effects being confined to during the construction and decommissioning of the solar farm. A Construction Traffic Management Plan and Outline Construction and Decommissioning Method Statement will be prepared to outline management measures to limit any effects during the construction and decommissioning stages.
- 4.35 In relation to traffic movement the location of the proposed development is approximately 1.4km from a declared Air Quality Management Area. Typically, there will be circa 20 Heavy Duty Vehicle (HDV) movements per day (10 each way) during the more intense construction periods.
- 4.36 In terms of air quality the number of HDV movements during the construction and installation of the solar panels together with the supporting framework will not fulfil the traffic criteria detailed in the IAQM/EP (UK) Planning Guidance. A change in the volume of traffic on the surrounding road network will not have any significant effect on air quality as experienced by the nearest receptors located in the vicinity of the site.
- 4.37 Due to the nature of the development, once operational there would be no emissions generated by the development. As mentioned above in Human Health, the proposal will have no direct adverse environmental effect on air quality and therefore will have no significant environmental effect in EIA terms. More widely, the electricity the proposed development will produce will potentially displace primary fossil fuel derived electricity that relies on thermal combustion and the consequent release of Green House Gases (GHGs) and other pollutants into the atmosphere consequently, the proposal is considered to have a beneficial effect on air quality.

## Material assets

4.38 The EIA Regulations refer to 'material assets', including architectural and archaeological heritage. The phrase 'material assets' has a broad scope, which may include assets of human or natural origin, valued for socio-economic or heritage reasons. Material assets are in practice considered across a range of topic areas within an ES, in particular the historic environment chapter. This topic is proposed to be included within the ES (see Table 4.1). Therefore, no separate consideration of material assets is considered necessary.

## Risk of major accidents

4.39 Solar photovoltaic technology is a relatively benign form of electricity generation with very low risk of accident or disaster and will not have a significant environmental effect in this regard. The solar park will be enclosed by appropriately designed security fencing and monitored by CCTV, which will lower the risk of unauthorised access and accidents.

4.40 The proposal will be supported by a Battery Safety Management Plan, confirming that the risks are understood, accounted for and mitigated as far as practicable.

## Content of the Environmental Statement

4.41 The scope of the EIA takes into account the pre-liminary environmental information pertinent to the site and formal pre-application consultation with Caerphilly County Borough Council (**See Appendix 1**).

4.42 As a result, the issues set out below are considered appropriate for assessment in an ES. It is considered that the Proposed Development may have the potential to give rise to significant environmental effects in these areas:

- Landscape and Visual
- Biodiversity
- Climate Change

4.43 Table 4.1 identifies the chapters that are proposed for inclusion in the ES. Further details of the approach to the assessment and its scope are provided in Section 5 of this Scoping Report.

**Table 4.1: Structure of the ES**

Structure of ES	
Non-Technical Summary	Summary of the ES using non-technical terminology
<b>Volume 1: Text</b>	
	Glossary
Chapter 1	Introduction
Chapter 2	Project Description
Chapter 3	Need and Alternatives Considered
Chapter 4	Environmental Assessment Methodology
Chapter 5	Landscape and Visual
Chapter 6	Biodiversity
Chapter 7	Climate Change
<b>Volume 2: Figures</b>	
Including all figures and drawings to accompany the text.	
<b>Volume 3: Appendices</b>	
Including specialist reports forming technical appendices to the main text.	

## 5 TECHNICAL ASSESSMENTS

### Chapter 1: Introduction

- 5.1 This chapter will provide the introduction to the ES, including details of the application, need for EIA and the structure of the ES.

### Chapter 2: Project description

- 5.2 The ES will include a description of the project, which will form the basis of the assessment of effects. The EIA Regulations require an ES to include:

*'A description of the development comprising information on the site, design and size and other relevant features of the development.'*

- 5.3 This project description chapter will include details of the site, together with a description of the key components of the proposed development. The description will include the following information, as far as practicable at the time of writing:

- Construction phase - a description of the key works, activities and processes that would be required during the construction phase;
- Operational phase - a description of the completed development and its use;
- Decommissioning phase - a description of the key works, activities and processes that would be required during the decommissioning phase.

- 5.4 Where options remain at the time of the assessment (with regard to construction techniques, for example), the ES will provide a clear explanation of the assumptions made. Where appropriate, the realistic worst-case scenario will be assessed.

- 5.5 Where mitigation measures have been identified and developed through the EIA process and have been incorporated as part of the project, details of these measures will be set out within the project description chapter.

### Chapter 3: Need and alternatives considered

- 5.6 This chapter will briefly set out the need for the proposed development. In addition, the EIA Regulations require the alternatives considered by the applicant to be set out in the ES:

*'A description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment.'*

- 5.7 This chapter will summarise the reasons for the selection of the site and provide an outline of the alternatives considered during the EIA process, including a description of the alternative design and layout options that have been considered.

### Chapter 4: Environmental assessment methodology

- 5.8 Details of the overall approach to EIA will be set out in this chapter, together with details of the scoping process, consultation undertaken and the overall approach to the assessment of significance. Topic specific methodologies, such as survey methods, will be provided in each topic chapter.

## Chapter 5: Landscape and visual

### General

- 5.9 Landscape and / or Visual effects, associated with a solar farm development, are considered to be an important environmental issue. As such, a Landscape and Visual Impact Assessment (LVIA) would form an important part of the wider Environmental Impact Assessment (EIA) process for the project.
- 5.10 Chapter 5: Landscape and Visual Impact Assessment (LVIA), of the Environmental Statement (ES), would consider the potential effects of the proposed Mynydd Maen Solar Farm (Proposed Development) upon the physical landscape elements, features, landscape character, views and visual amenity within a 5 km radius study area (as measured in all directions from the outer edges of the Application Site).
- 5.11 The LVIA would be undertaken with reference to best practice guidance, see 'Assessment of Effects and Scope of Assessment' below, and would be completed by a suitably qualified and experienced Chartered Landscape Architect (CMLI).
- 5.12 A Glint and Glare Assessment would also be completed separately and reviewed as part of the LVIA process. It will be a standalone assessment but included within the Appendices of the LVIA Chapter and referred to within the assessment of effects section of the chapter. The assessment will have regard to proposal's impact on public rights of way, as per the request from the Council's Public Rights of Way officer.

### Baseline Information

- 5.13 The following forms a summary of the baseline data collated, and work undertaken to inform the landscape and visual element of the EIA Scoping Report and the forthcoming LVIA Chapter. This work has included:
- A review of relevant landscape planning designations,
  - A preliminary review of National, Regional and Local Landscape character assessments, and,
  - Preparation of preliminary proposed ZTV.
- 5.14 A preliminary, desk based, landscape and visual appraisal of the Proposed Development area was completed by RPS Group in Summer 2022 (see **Appendix 2**). In addition, a further preliminary landscape and visual assessment was carried out by Galpin Landscape Architecture in May 2023 (see **Appendix 3**).

### Landscape Planning Designations

- 5.15 The Application Site is not within any Areas of Outstanding Natural Beauty (AONB), a designation of national importance for scenic quality, or National Parks; the nearest being the Wye Valley AONB, located approximately 24 km to the east (at its nearest point) and the Bannau Brycheiniog National Park located approximately 7 km to the northeast at its nearest point (reference **Figures 3 and 4**). As such, there would be no direct physical impacts upon the AONB or National Park as a result of the Proposed Development.
- 5.16 Other designations of local importance, which fall partly or wholly within the Application Site, include Ancient Woodlands and a Visually Important Local Landscape. As derived from the Caerphilly County Borough Local Development Plan up to 2021 (adopted November 2010).
- 5.17 Within the wider 5 km study area, there are a number of other landscape planning designations that would be indirectly impacted by the proposed development. These include:
- Listed Buildings;

- Conservation Areas (CA); the nearest being the Upper Cwmbbran, located approximately 3.5 km to the east of the Application Site (at its nearest point);
- Scheduled Monuments;
- Registered Common Land;
- Historic Parks and Gardens; the nearest being Maes Manor Hotel, approximately 5.2 km to the northwest of the Application Site at its nearest point;
- Special Landscape Areas (SLA); the nearest being Mynyddislwyn, approximately 1.6 km to the southwest of the Application Site at its nearest point; and
- Country Parks.

5.18 Other designations within the local landscape, but not within the 5km study area, include:

- Significant Views.

5.19 There are a substantial number of individual trees, hedgerows and blocks of woodland across the Application Site, or immediately adjacent to it. A number of the woodland blocks, to the immediate north and south of the Application Site, are designated as Ancient Woodland.

### National and Local Landscape Character

5.20 The relevant published landscape character assessments have been initially reviewed below. Within the LVIA Chapter, particular attention will be paid to the key landscape characteristics of the relevant aspect areas of the Application Site and the surrounding areas.

5.21 National Landscape Character Areas (NLCAs) are countrywide and form the broad scale landscape character assessment of Wales. The Application Site and majority of the 5 km study area falls within NLCA 37: South Wales Valleys; with the southeasternmost parts of the 5 km study area falling within NLCA 35: Cardiff, Barry and Newport.

5.22 LANDMAP is an “all-Wales Geographical Information System (GIS) based landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated into a nationally consistent dataset” (CCW (now NRW), 2011). It is administered by Natural Resources Wales (NRW) and comprises five spatially related datasets or aspect layers as follows:

- Geological Landscape: “considers the physical, primarily geological, influences that have shaped the contemporary landscape and identifies those landscape qualities which are linked to the control or influence exerted by bedrock, surface processes, landforms and hydrology”;
- Landscape Habitats: “Focuses on recording habitat features, characteristics and their spatial relationships within the context of the wider landscape”;
- Visual and Sensory: “Maps landscape characteristics and qualities as perceived through our senses, primarily visually. The physical attributes of landform and land cover, their visible patterns and their interrelationship”;
- Historic Landscape: “Landscape characteristics that depend on key historic land uses, patterns and features. Identifies only those classes of historic land uses, patterns and features that are prominent and contribute to the overall historic character of the present landscape.”; and
- Cultural Landscape: “Describes the links between landscape and people, from the way in which cultural, or human activity shapes the landscape, to the way in which culture shapes the way we respond to landscape. Focus is on mapping the landscape where it has been, or is being, shaped by a particular cultural activity or process, or where it has been directly represented, depicted or described in art, literature or folklore.”

5.23 The Visual and Sensory Dataset (2021) locates the Application Site predominantly within Aspect Area ‘CYNONVS214: Mynydd Lwyd and Mynydd Maen’. The area is described as:

*“Areas of upland comprising both heath and grassland on the western slopes of both Mynydd Maen and Mynydd Llwyd. These areas are largely flanked by coniferous plantation woodland with more open areas to the east. More westerly areas in valleys have smaller field patterns. Some views to adjacent upland areas and to urban area of Newbridge in the valley to the west.”*

5.24 Overall, Aspect Area ‘CYNONVS214: Mynydd Lwyd and Mynydd Maen’, is evaluated as Moderate.

## Visual Resources

### Zone of theoretical visibility

5.25 In order to further determine the geographical extent of potential visibility, a preliminary computer-generated Zone of Theoretical Visibility (ZTV) was generated (refer to **Figure 5**). The ZTV broadly defines the study area for both the landscape character and visual assessment. A 5 km radius study area is proposed for this assessment due to the overall size and height of the solar panels (a maximum of 3 m above existing ground level (EGL)). It is judged that any potentially significant landscape and / or visual effects would lie within this radius. Following field survey and analysis of existing barriers, the study area radius may be reviewed.

5.26 Currently, the proposed development would consist of static east and west facing PVs (finished height of a maximum 3 m above existing ground level (EGL)). The preliminary ZTV was completed to show the worst-case for this option with the origin points at 3 m above EGL. The ZTV was compiled assuming observer height as 1.6 m at eye level and takes into account screening effects of local settlements at 9 m and existing areas of substantial vegetation (woodland) at a height of 10 m. Thirty Five (35) origin points, from within the Application Site, have been used to establish the likely area from which views to the proposed development may be available. Each of these origin points are within the centre of each of the fields within the Application Site that would contain solar panels and the outer edges of the Application Site.

5.27 OS Terrain 5 data has been used to generate the ground model for the ZTV.

5.28 Furthermore, a ZTV was prepared for 15km which did not include visibility of the proposed development beyond 7km.

## View Ranges

5.29 For the purposes of the LVIA Chapter, views would be classified according to three distance ‘ranges’ as set out in Table 5.1 below.

**Table 5.1: View Ranges**

Range	Distance Threshold	Reasoning Description
Close	Less than 1 km	At close range the project could appear as a ‘prominent’ feature and visual receptors could experience high to medium/low magnitude of change when compared to existing views.
Medium	Between 1 km and 3 km	In medium range views the project could appear as ‘present’ features and visual receptors could experience medium/low to negligible magnitude of change compared to the existing situation.
Long	More than 3 km	In long range views the project would read as part of the landscape and visual receptors would tend to experience a low to negligible or lower magnitude of change compared to the existing situation.



## Candidate Viewpoints

- 5.30 A number of Candidate Viewpoints have been proposed, which are considered representative of key sensitive visual receptors within the 5km study area. An assessment of potential effects upon views from each viewpoint, as a result of the proposed development, would be completed (refer to **Figure 4**). These Candidate Viewpoints would be further refined following field work and will form the Representative Viewpoints to be assessed as part of the LVIA Chapter.
- 5.31 All Candidate Viewpoints are situated in publicly accessible locations within the extent of the ZTV, with a range of distances and orientation to the proposed development. They include a range of receptors of varying sensitivity. Photographs would be taken from each of the chosen Representative Viewpoints and illustrated in accordance with the Landscape Institute Technical Guidance Note 06/19, Visual Representation of Development Proposals (Landscape Institute, September 2019). Any additional photographs, taken during field survey, would be included for contextual purposes and / or alternative viewpoint locations if necessary.
- 5.32 Photographs would be taken during winter, so far as possible should the project programme allow, when vegetation is devoid of its leaf cover to show the worst-case scenario. Any assessment of effects upon summer views would be necessarily made using professional judgement. **Table 5.2** below describes the location of the candidate viewpoints for this assessment.

**Table 5.2: Candidate Viewpoints**

No. / Name	Sensitivity	View Location Description
CV1: PRoW ABEC/FP333/1	Medium	Close distance view from the local public right to the south of Application Site – An inaccessible viewpoint, scoped out of visual assessment (see paragraphs 5.33-5.34 for details).
CV2: PRoW ABEC/BR179/1	Medium	Close distance view from the public right of way to the south of the Application Site.
CV3: PRoW NWBG/RBW172/1	Medium	Close distance view from public right of way to the immediate east of the Application Site.
CV4: PRoW NWBG/RBW172/1	Medium	Close distance view from public right of way to the immediate west of the Application Site – An inaccessible viewpoint, scoped out of visual assessment (see paragraphs 5.33-5.34 for details).
CV5: PRoW NWBG/RBW160/1	Medium	Close distance view from public right of way to the north of the Application Site.
CV6: PRoW NWBG/FP365/1	Medium	Close distance view from public right of way to the northeast of the Application Site at junction with unnamed road / track.
CV7: PRoW CRUM/FP163/1	Medium	Close distance view from public right of way to the northeast of the Application Site.
CV8: PRoW FP 337 36/1	Medium	Long distance view from public right of way to the north of the Application Site.
CV9: PRoW CRUM/BR44/1	Medium	Long distance view from public right of way to the northwest of the Application Site.
CV10: PRoW CRUM/FP92/1	Medium	Medium distance view from public right of way to the northwest of the Application Site, at junction with unnamed road.
CV11: PRoW CRUM/BR104/1	Medium	Medium distance view from public right of way to the northwest of the Application Site, at the junction with Load of Hay Road.
CV12: PRoW CRUM/FP142/1	Medium	Medium distance view from public right of way to the west of the Application Site.
CV13: Local Road / track	Low	Medium distance view from local road adjacent to the Croespenmaen Industrial Estate to the west of the Application Site.
CV 14: PRoW NWBG/FP262/2	Medium	Medium distance view from public right of way to the southwest of the Application Site.

CV 15: PRow ABEC/BR304/1	Medium	Long distance view from public right of way to the southwest of the Application Site.
CV 16: Local Road	Medium	Close distance view from local road at the junction of Linden Court and Old Pant Road to the northwest of the Application Site.

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- 5.33 Following a site visit in July 2023, it is suggested that Candidate Viewpoint 1 and Candidate Viewpoint 4 should be scoped out of the visual assessment due to limited access. Although marked on the OS map as a public right of way, the footpath on which CV1 is located is not marked on the ground with any access points at either end of the route and there is no signage marking the route.
- 5.34 Candidate Viewpoint 4 is located on a route marked on the OS map as a restricted byway. Access to the route from the restricted byway to the west is not signposted and there is no access at the point where the routes meet on the map due to a fence with no stile or gate. From the eastern end, through Cil - Lonydd farm there is access from the farm through a gate to the restricted by-way but it is not clearly signposted and it is not a through-route due to the aforementioned lack of access at the western end of the marked path.
- 5.35 Confirmation of the status of these public rights of ways which are inaccessible should be sought from the Council.

### Further visual assessment

- 5.36 Within 1km of the proposed development, a broad assessment of likely effects upon views for occupants of residential receptor groups, businesses/ places of work, users of roads (including National Cycle Networks) and PRowS, not covered by the Representative Viewpoints, would be completed. In some cases, given access restrictions, the baseline view and / or summary of effects upon these receptors would necessarily be estimated. However, an overview assessment of the likely effects of the operational phase of the proposed development upon views for these visual receptors would be given. This would include an overall assessment of the sequential effects upon views for users of the PRowS and roads within the local vicinity of the Application Site.
- 5.37 Particular attention will be taken to the PRowS which pass through or directly adjacent to the proposed development (NWBG/RBW172 and ABEC/BR179).

### Photomontages

- 5.38 To illustrate the proposed development, and once field work is completed, views from some of the Representative Viewpoint locations would be illustrated with a photomontage, should this be required. The viewpoints would likely be selected through further consultation with the Council.

### Proposed approach

#### Baseline studies

- 5.39 Baseline information on the landscape will be gathered through a combination of desk studies, consultation and field surveys. Documents used in the assessment may include aerial photographs, Ordnance Survey (OS) maps and published landscape character assessments.
- 5.40 Further to the Baseline Information described above, the baseline assessment within the final LVIA Chapter will also include an assessment of the effects of the proposed development upon the landscape character of the Application Site itself and its immediate surrounds. It will also include an assessment of the existing landscape character within the wider study area in terms of its value and its sensitivity to the proposed development. The studies will identify the landscape resources and character of the surrounding area and examine how the proposed development will affect individual landscape features, elements, characteristics and the wider landscape.

5.41 Field work will be undertaken to gain a better understanding of the landscape of the Application Site and surrounding area, to determine its character and condition and to identify visual receptors and the extent of available views. Field work will help to establish those landscape resources which combine to give the area its distinct sense of place. Further consultation would be sought from key statutory organisations/consultees where applicable.

### Assessment of effects

5.42 The Landscape and Visual Impact Assessment (LVIA), undertaken as part of the Landscape and Visual Resources chapter, will identify and assess the likely significant effects that would arise as a result of the proposed development on the landscape (its fabric, character and elements) and upon views as experienced by receptors (people). The full methodology for the LVIA can be viewed within **Appendix A** of this ES Scoping Report. Please note this is written in the present tense as it will be included within the LVIA Chapter.

5.43 The LVIA will be based on the current published guidelines for landscape and visual assessment provided in:

- Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA) (Landscape Institute and Institute of Environmental Management & Assessment, 2013);
- An Approach to Landscape Character Assessment, Natural England (2014);
- Planning Policy Wales LANDMAP Guidance Note 1: LANDMAP and Special Landscape Areas (2016);
- Planning Policy Wales LANDMAP Guidance Note 3: (2013); and
- Technical Guidance Note 06/19, Visual Representation of Development Proposals (Landscape Institute, September 2019).

5.44 The sensitivity of landscape and visual receptors within the 5 km study area would be assessed (through the identification of the landscape resource's susceptibility to the proposed development/susceptibility of the visual receptor to change and value of the landscape resource/view), together with the predicted magnitude of impact on that receptor (through identification of the proposed development's size/scale, geographical extent and the duration and reversibility of effect). When combining sensitivity with magnitude of impact, a judgement will be made as to the significance of effect upon the landscape resource and/or view during the construction phase, the operational and maintenance phase, as well as the decommissioning phase of the proposed development.

5.45 Where appropriate, mitigation measures will be identified to avoid, where possible, or reduce any potential landscape and / or visual effects as a result of the proposed development.

5.46 The LVIA Chapter would include an assessment of cumulative effects within the study area and, within the same LANDMAP areas and from the same Representative Viewpoints where there would be potential inter-visibility between the cumulative site and the proposed development. Cumulative projects would include those with planning permission, but yet to be constructed or within the planning system. It would not include development already constructed, such as the existing Upper Pant-Ysgawen Farm/Crumlin and Penrhiwarwydd Farm solar parks, to the northwest. These existing solar parks would be considered as part of the baseline to the assessment.

5.47 The LVIA chapter will include an assessment of effects of the Proposed Development (as detailed above) during construction, operation and decommission phases. For the assessment of the operational phase, the LVIA Chapter will include an assessment of the proposals during daytime only, at winter year 1, when all construction and mitigation planting is assumed complete, and during summer year 15 once all mitigation planting is assumed to have reached its design and screening intention. Field work would be ideally completed during the winter season of 2022 / 2023 and therefore the assessment of effects at summer would be completed using professional judgement.

## Issues proposed to be scoped out

- 5.48 We do not propose to undertake a Residential Visual Amenity Assessment (RVAA) or an assessment of likely night-time effects.

## Cumulative Assessment

- 5.49 Other developments considered within the cumulative assessment include those that are:
- Under construction;
  - Permitted, but not yet implemented;
  - Submitted, but not yet determined; and
  - Identified in the Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.
- 5.50 The LVIA Chapter would include an assessment of cumulative effects within the study area and, within the same LANDMAP areas and from the same Representative Viewpoints where there would be potential intervisibility between the cumulative site and the proposed development. Cumulative projects would include those with planning permission and pre-application within the planning system.
- 5.51 The cumulative assessment study area is defined as within a 6km radius from the proposed development. This was determined following a preliminary ZTV analysis which showed very limited visibility between 7 to 15km of the proposed development.
- 5.52 Further to this, areas with a visibility of less than 0.25 degrees of vertical angle have been scoped out of the cumulative assessment. While the proposed development may be technically visible (discounting views blocked by vegetation and built form) from these areas, the proposed development would take up a very small portion of the vertical field of view and as such would be barely perceptible to a receptor.
- 5.53 The cumulative assessment will include all energy developments including both solar and wind farms.
- 5.54 The following Solar Farms, within 6km of the proposed development, are to be considered in the cumulative assessment:
- Treowen Solar Farm (W)
  - Pen-y-Fan Solar Farm(NW)
  - Pen-y-Fan Caravan Park Solar Farm (NW)
- 5.55 Wind Farms within 6km of the proposed development to be considered in the cumulative assessment:
- Mynydd Maen Wind Farm – Pre-Application
  - Trecelyn Wind Farm – Pre-Application
  - Llanhilleth Wind Farm – Pre-Application
  - Mynydd Carn-y-cefn Wind Farm – In Planning
  - Coed y Gilfach Wind Turbines – Operational
  - Oakdale Business Park wind Turbines – Operational
  - Pen-y-Fan Industrial Estate Wind Turbine – Operational
  - Pen-y-Fan Leisure Park – Operational
  - Pen-y-Fan Ganol Farm – Operational

- 5.56 Other Solar Farms within 6km of the proposed development which have been scoped out of the cumulative assessment because there would be no or limited intervisibility:
- Mynyddislwyn (SW)
  - Pen-rhiw-arwydd (SW)
  - Near Pant-yr-eos Reservoir (SE)
- 5.57 Other Wind Farms within 10km which have been scoped out of the cumulative assessment include:
- Abertilly Wind Farm – Pre-Application
  - Tyle Crwth Wind Turbine - Operational
  - Bryn Ysgawen Farm Wind Turbine - Operational
  - Tir-y-Ferch-Gryno Farm Wind Turbine - Consented
  - Gelli-wen Farm Wind Turbine - Operational
  - Cruglwyn Wind Turbines - Operational
  - Manmoel Wind Farm (outside 10km) – Pre-Application
- 5.58 As some of the wind farms listed above are in the early stages of planning, the details of the number and locations of the turbines is subject to change.

## Chapter 6: Biodiversity

### Introduction

- 5.59 This section sets out the proposed approach to assessing the potential impacts of Mynydd Maen Solar Farm on Biodiversity. It has been prepared by BSG Ecology.
- 5.60 The Site is an upland site<sup>1</sup> which mainly comprises tightly grazed fields, containing sheep and enclosed by wire stock fencing and trees. There is a small amount of marshy grassland in the east of the Site and an off-site woodland to the north of the Site boundary. There are two off-site ponds, 13 m and 146 m east of the Site boundary respectively.

### Embedded Mitigation

- 5.61 Ecological mitigation is built into the design of the project and includes the retention of field boundary trees and hedgerows. The removal of small sections of hedgerow is anticipated to facilitate access, however any removal will involve widening existing access points as opposed to creating new gaps wherever possible.

### Methods

#### Consultation

- 5.62 No consultation outside the project team has been completed to date.

#### Desk-based review

- 5.63 A desk study has been completed. This has involved reviewing aerial photography and Ordnance Survey mapping, obtaining data on species and designated sites from the South-East Wales

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<sup>1</sup> Informed by the Phase 1 Habitat Survey completed by RPS in September 2022 The report is titled *Mynydd Maen Solar, West of Newbridge, Caerphilly, South Wales, Preliminary Ecology Appraisal* (RPS, 2022)

Biodiversity Records Centre (SEWBRc), and review of the UK Government's Magic<sup>2</sup> website for information relating to the locations of statutory sites of nature conservation interest within

- 5 km for Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites. These sites are of international importance for their species and / or habitats. These can include highly mobile species (i.e. wildfowl / wetland birds, bats and otter)
- 2 km for nationally-designated statutory sites (Sites of Special Scientific Interest (SSSIs)).
- 2 km for local designated sites and Ancient Woodland Sites
- 2 km for protected and notable species<sup>3</sup>.

### Habitat Survey

- 5.64 A Phase 1 Habitat Survey of the site was completed by RPS in September 2022<sup>4</sup> in accordance with industry standard (JNCC, 2010)<sup>5</sup> survey guidance. This involved mapping all broad habitat types present within the Site boundary and the proposed cable route.
- 5.65 An additional area of cable route has been identified and is planned for survey in July 2023.
- 5.66 A Phase 2 survey of the marshy grassland will be undertaken in July 2023, during which plant communities will be assigned to the National Vegetation Classification (NVC) categories as described by Rodwell (1998<sup>6</sup>).

### Protected Species Survey

- 5.67 The following survey work in 2023 will inform the application:
- **Great crested newt** (*Triturus cristatus*) survey. Two ponds have been identified on Site. Great crested newts surveys have been carried out on both ponds in May and June 2023. surveys were completed in line with industry standard guidance (English Nature, 2001<sup>7</sup>, Biggs *et al.* 2004<sup>8</sup>).
  - **Breeding bird surveys.** Four breeding bird surveys have been undertaken between April – June 2023, including one evening visit. The purpose of these surveys has been to investigate the species assemblage present on-site, and particularly if there are ground-nesting birds that could be displaced by the scheme, such as skylark likely to breed within the Site boundary.
  - **Badger** (*Meles meles*) survey. The Phase 1 recorded no evidence of badger. However, there is suitable habitat for the species on Site and immediately adjacent to it. A further

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<sup>2</sup> <https://magic.defra.gov.uk>

<sup>3</sup> Species (or habitats) of principal importance for the conservation of biodiversity listed by the Welsh Government under Section 7 of the Environment (Wales) Act 2016.

<sup>4</sup> The report is titled *Mynydd Maen Solar, West of Newbridge, Caerphilly, South Wales, Preliminary Ecology Appraisal (RPS, 2022)*

<sup>5</sup> JNCC (2010). Handbook for Phase 1 habitat survey. A technique for environmental audit. Joint Nature Conservancy Council. Peterborough.

<sup>6</sup> Rodwell, J. S (1998). *British plant communities*. Cambridge University Press, Cambridge

<sup>7</sup> English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough

<sup>8</sup> Biggs, J. *et al.* (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford

badger survey is planned for November 2023.

### Assessment methods

- 5.68 The desk study and baseline ecological surveys detailed above will inform the EclA for the Site. The assessment will be based on industry standard guidance (CIEEM (2018)<sup>9</sup>.

## Results

### Desk-based review: Designated Sites

- 5.69 There are no SPAs, SACs or Ramsar Sites within 5 km of the Site boundary.
- 5.70 One statutory designated site of national importance is located approximately 2 km north of the Site. Ty'r Hen Forwyn SSSI is notified for species-rich neutral grassland and the large population of wood bitter-vetch *Vicia orobus*, a nationally scarce and declining species, that it supports.
- 5.71 SEWBRc returned a further 27 records of non-statutory designated sites within a 2 km radius of the Site; these are all Sites of Interest for Nature Conservation (SINC).
- 5.72 One of these, Mynydd Maen SINC, falls immediately adjacent to the north-eastern Site boundary. It is a large upland common with extensive areas of acid grassland, bracken and heath.
- 5.73 Three further SINC are adjacent to the Site boundary;.
- Gwydon Valley Woodlands, lying adjacent to the eastern boundary, is a large plantation of conifers on the site of a former ancient woodland and contains semi-natural ground flora indicator species which qualify it as a SINC. Red wood ants (*Formica rufa*) are locally common.
  - Cwm Hafod-Fach woodlands, immediately to the south of the western spur of the Site, comprises semi-natural ancient woodland of the valley-sides surrounding a working quarry. Acid grassland and heath is also present locally in the open areas of the upper valley.
  - Coed Cil-Lonydd is adjacent to the northern Site boundary, following the line of the Nant Gawni stream through a steep-sided valley, containing blocks of former ancient woodland. Red wood ants occur locally throughout the woodland, which supports an assemblage of semi-natural indicator species.
- 5.74 A full list of the SINC within 2 km of the Site boundary can be found in Appendix 1, extracted from the *Mynydd Maen Solar Preliminary Ecological Appraisal Report* (RPS, 2022).
- 5.75 Numerous Ancient Woodland Sites are located within 2 km of the Site boundary, including the Gwydon Valley Woodlands which is immediately adjacent to the eastern Site boundary.

### Desk-based review: Species Data

- 5.76 Data regarding the following European Protected Species and species given protection under Section 7 of the Environment (Wales) Act, 2016, were reviewed.
- 5.77 SEWBRc data included the following:
- **Amphibians.** There are no records of any herpetofauna within the Site boundary. Great crested newt *Triturus cristatus* has been recorded approximately 800 m north-east of the Site boundary. More widespread and common newt species such as palmate newt

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<sup>9</sup> CIEEM, 2018, Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester

*Lissotriton helveticus* and smooth newt *Lissotriton vulgaris* have also been recorded locally. Eight records of common frog *Rana temporaria* and one record of common toad *Bufo bufo* were also returned within 2 km of the Site.

- **Bats.** At least twelve species of bat including brown long-eared *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, greater horseshoe bat *Rhinolophus ferrumequinum*, lesser horseshoe bat *Rhinolophus hipposideros*, Leisler's bat *Nyctalus leisleri*, Natterer's bat *Myotis nattereri*, noctule *Nyctalus noctula*, serotine *Eptesicus serotinus* and soprano pipistrelle *Pipistrellus pygamaeus*. No records were returned for within the Site boundary. The closest record is of a common pipistrelle, approximately 1.1 km west of the Site boundary.
- **Hazel dormouse.** There are no records of hazel dormouse *Muscardinus avellanarius* within the search area.
- **Otter and water vole.** There are two records of otter *Lutra lutra* within the search area, the closest of these is 2 km north-east. There were no records of water vole *Arvicola amphibius* within the search area.
- **Breeding / over wintering birds.** There are records of 36 species of bird; of these 2 are listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended), namely barn owl *Tyto alba*, which is likely to breed locally, and brambling *Fringilla montifringilla*. Brambling was recorded in February, and does not breed in Wales<sup>10</sup>. There are no records of any birds from within the Site boundary. Nearby records include species such as cuckoo *Cuculus canorus*, skylark *Alauda arvensis* and bullfinch *Pyrrhula pyrrhula*; the former two species are likely to be associated with the open moorland close by, and the latter with woodland edge and dense scrub.
- **Invertebrates.** 32 records of invertebrates were returned via the data search, however none of these records were associated with the Site itself. Seven of the records were of three species of butterfly that are listed at Species of Principal Importance on Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006), namely grayling *Hipparchia semele* (280 m east of the Site boundary), small heath *Coenonympha pamphilus* (600 m west of the Site boundary) and wood white *Leptidea sinapis* (1.9 km north-west of the Site boundary).
- **Reptiles.** There are four records of slow worm *Anguis fragilis*, the closest of which is 1.4 km north-west of the Site boundary. No other records of reptiles were returned.
- **Badger.** There are three records of badger *Meles meles* within the study area, the closest of which was from the northern boundary of the Site.
- **Other notable species.** One record of stoat *Mustela erminea* was found within the search area, 1.7 km south of the Site boundary.
- **Plants.** The data search returned records of plants associated with a variety of habitats including bluebell *Hyacinthoides non-scripta*, and other Ancient Woodland indicator species. Japanese knotweed *Reynoutria japonica*, an invasive non-native species, has also been recorded in the wider area; the closest record of this is approximately 1.5 km west of the Site boundary.

## Habitat Survey

- 5.78 The Phase 1 survey, completed in September 2022, found that the proposed solar farm will be located within fields currently used for sheep farming, comprising improved and semi-improved

<sup>10</sup> Schedule 1 status is therefore not relevant in this context and has no bearing on the assessment.



neutral grassland with scattered broadleaved and coniferous trees along the field boundaries. Two areas of ruderal vegetation are present, along with patches of bracken *Pteridium aquilinum* through the semi-improved neutral grassland.

- 5.79 The sward of the improved grassland was tightly-grazed and covers more than two thirds of the Site. Species identified include perennial ryegrass *Lolium perenne*, white clover *Trifolium repens*, red clover *Trifolium pratense*, dandelion *Taraxacum officinale* and sheep's sorrel *Rumex obtusifolius*.
- 5.80 The semi-improved grassland is limited to the eastern side of the Site. Species include soft rush *Juncus effusus*, bracken *Pteridium aquilinum*, common nettle, *Urtica dioica*, false-oat grass *Arrhenatherum elatius*, common bent *Agrostis capillaris* and creeping thistle *Cirsium arvense*.
- 5.81 Further botanical survey is planned for July 2023 comprising a Phase 2 survey of the marshy grassland and a Phase 1 survey of the proposed cable route.
- 5.82 There are two ponds have also been located within 250 m of the main Site, and a further two ponds within 250 m of the proposed cable route.
- Pond 1 (14 m north-east of the Site boundary) is a shallow pond, containing very little aquatic vegetation. There is a small inflow and outflow, however this is not thought to create a strong current through the pond. The pond is approximately 169 m<sup>2</sup> and is surrounded by bracken and soft rush. Several willow trees *Salix sp.* Are present on the north-eastern edge of the pond.
  - Pond 2 (196 m north-east of Site boundary) is shallow, steep on one side and heavily poached on the remaining sides. It contains occasional patches of soft rush and has a small inflow and outflow running through it. The pond is approximately 60 m<sup>2</sup> and has almost no bankside vegetation.
  - Pond 3 and 4 are similar in character and both situated approximately 120 m from the proposed cable route. Both ponds are subject to seasonal drying, although they are sometimes kept artificially wet through a water-pumping system. Both ponds are heavily poached by livestock and contain no aquatic vegetation.

### Protected Species Survey

- 5.83 A summary of the consideration of protected species and survey scope is included below.
- **Amphibians.** An Environmental DNA (eDNA) survey was completed on all four ponds on 19 April 2023. This returned a negative result for Ponds 1 and 2. Additional torching and bottle trapping surveys were completed due to the proximity of the ponds to a known GCN population. No GCN were found during either survey. It is therefore concluded that GCN are absent from the Ponds 1 and 2. Ponds 3 and 4 were both found to contain a small population of GCN during surveys following the positive eDNA result.
  - **Bats.** There are no buildings within the Site boundary. Trees within or immediately bordering the Site have not yet been assessed for their potential to support roosting bats, however no trees are planned for removal on Site as a result of the development. The Site boundaries are assessed to be of moderate suitability for commuting and foraging bats. The nearby woodlands are of high-quality and are well-connected to the Site and wider landscape. The interior of the fields is of low suitability for foraging and commuting bats due to the tight sward and lack of species diversity.
  - **Hazel dormouse.** The hedgerows on Site have grown out into lines of trees and are therefore of limited value to dormice, lacking the diversity of species that are required to support a dormouse population. The development also intends on retaining the trees and boundary hedgerows, and vegetation removal will be limited to widening of existing access points. It is therefore not proposed to complete dormouse work.
  - **Otter and water vole.** There are no watercourses or habitat capable of supporting otter and water vole within the Site. It is therefore not proposed to complete otter and water vole survey work.

- **Breeding birds.** Breeding bird surveys are ongoing in 2023. The purpose of these surveys is to investigate the species assemblage present on-site, and particularly if there are ground-nesting birds, such as skylark, present within the Site boundary.
- **Invertebrates.** There are no habitats on Site suitable for grayling or wood white butterflies. Therefore, they are not considered further in this assessment. Small heath prefer grasslands with a short, sparse sward, heathland, moorland or woodland rides. Plants suitable for supporting small heath caterpillars are present in low density within the semi-improved neutral grassland in the north-eastern part of the Site. They have been scoped out of further assessment due to the sub-optimal quality of the habitat but will be considered in the context of Net Benefit for Biodiversity, when planning the on-site improvements as a result of the Proposed Development.
- **Reptiles.** The majority of the Site is not suitable for reptiles due to the limited habitats available. Reptiles may be present in low numbers in the semi-improved grassland area of the Site where there is a more varied sward. However, given the lack of records and the minimal impact of the proposed development, reptiles are not considered further in this assessment and no further survey work is planned.
- **Badger.** No field signs or evidence of badger was recorded during the Phase 1 Habitat survey, however records adjacent to Site were found in the desk study. The Site and adjacent woodland provide suitable habitat for sett building, together with foraging / commuting resources for badger. A further survey for evidence of badger will be completed along the northern Site boundary.
- **Other notable species.** The Site contains suitable habitats to support sheltering and foraging stoat, however the proposed development is unlikely to have an impact on these, therefore they are not considered further in this assessment.
- **Plants.** No notable, protected or invasive plants were identified on Site during the Site survey. An NVC survey is due to take place in July 2023 to assess if habitats meeting the description of the Mynydd Maen SINC are present in the Site boundary.

## Scope of Assessment

- 5.84 The ecological impact assessment (EclA) will assess the likely effects of construction and operation of a solar farm at Mynydd Maen on ecological receptors.
- 5.85 It is unlikely that there will be significant impacts on the ecological interest of the majority of the designated Sites as a result of the solar farm proposal. This is based on the lack of clear effect pathway with regard to the habitats / species for which the sites have been designated.
- 5.86 It is unlikely that there will be significant impacts on the ecological interest of the non-statutory designated sites, with the potential exception of the Mynydd Maen SINC. The Site falls partially adjacent to the Mynydd Maen SINC, which has been designated for the acid grassland and heath habits. An NVC survey has been recommended to assess if habitats meeting this description are present within the Site boundary.
- 5.87 The key considerations within the ecological assessment within the Site boundary are breeding birds (particularly skylark, which is present on Site) and badger (if present) during construction and operation. The likely scale of impact on these species will be considered during the assessment. Habitats will be considered in terms of enhancement measures within the scheme. Measures will be included to ensure legislative compliance with regard to reptiles. Impacts on dormice, otter and water vole will be scoped out of the assessment.
- 5.88 The disturbance and displacement of great crested newts will also be considered for the off-site infrastructure.
- 5.89 The EclA will be undertaken following the principals set out in the above CIEEM Guidelines, and will include an assessment of cumulative effects, details of appropriate mitigation and enhancement measures and of any residual effects (should any exist following mitigation).

- 5.90 The EclA will be supported by technical survey reports detailing the baseline survey work undertaken and which will likely include the following mitigation / enhancement measures in order to demonstrate biodiversity net benefit via the development process in line with Welsh Planning Policy:
- Following management suggestions discussed in the Mynydd Maen Commons Innovation Plan<sup>11</sup>.
  - Establishment and management of perimeter buffers in association with woodland edge and mature trees.
  - Increase species diversity of retained grassland within buffers and the security fencing (along field boundaries) and of re-seeded grassland between solar arrays with seed mixes of conservation value. Appropriate measures and management prescriptions would be outlined within the EclA.
  - Areas of land within the landownership parcel to be retained for the conservation of skylark (if present).
  - Provision of habitat enhancement for reptiles and amphibians which may include the creation of hibernacula or reduced management of grassland along the boundaries.
  - Fencing with suitable gaps underneath to allow movement of mammals e.g. badger.
  - Sensitive lighting system to be timed / directed away from treelines / hedgerows.

## Chapter 7: Climate Change

- 5.91 This section of the scoping report considers the assessment of potential impacts on and due to climate change. Climate change here is considered in terms of the impact of greenhouse gas emissions (GHGs) caused directly or indirectly by the proposed development, which contribute to climate change. The potential impact of changes in climate to the development, which could affect it directly or could modify its other environmental impacts, are proposed to be scoped out of the assessment, with the exception of the likely changes to cloud cover over its expected lifetime (explained in greater detail in paragraph 5.104).

### Baseline information

- 5.92 The current baseline for land that would be taken by construction of the proposed development is the existing agricultural land-use. However, installing solar panels above ground on agricultural land will not cause any disturbance to significant soil or vegetation carbon stocks.
- 5.93 There is potential for an increase in carbon sequestration in both soils and plants underneath the solar panels due to changes in landscape design (including wildflower planting) and reduction in soil disturbance (for example, there would be no ploughing). However, the magnitude of carbon sequestration through this practice would likely be insignificant compared to the magnitudes of GHGs emitted and avoided during the construction and operational phase of the proposed development (Bai and Cotrufo, 2022). As such, these emissions are proposed to be scoped out of this assessment.
- 5.94 The current baseline for electricity generation in the operational phase of the proposed development, with regard to GHG emissions, is the equivalent level of electricity generation from alternative sources connected to the electricity grid. The current average carbon intensity of electricity generation on the UK National Grid is 0.23963<sup>12</sup> kgCO<sub>2</sub>e/kWh in the present-day baseline, taken from UK Government GHG conversion factors for company reporting (BEIS, 2022a).

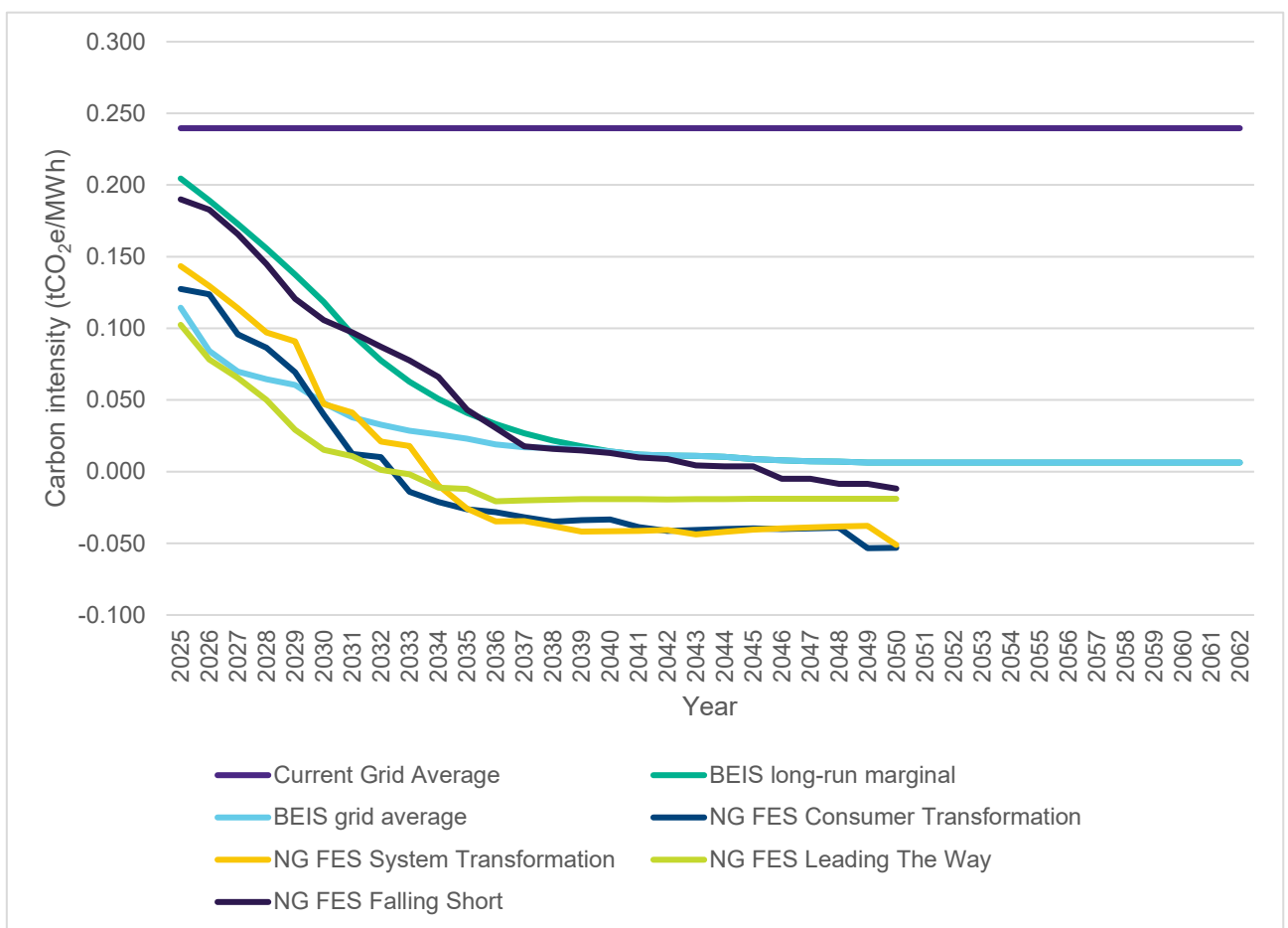
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<sup>11</sup> Torfaen County Borough Council, 2019, Mynydd Maen Commons Innovation Plan

<sup>12</sup> Inclusive of the associated well-to-tank (WTT) emissions associated with extracting, refining and transportation of primary fuels before their use in the generation of electricity.

- 5.95 Potential scenarios for the future baseline of electricity generation are shown in **Figure 6**, which displays the carbon intensity of future marginal electricity generation projected by BEIS (as generated from alternative sources, in the absence of generation capacity provided by the proposed development). For means of comparison, the figure also displays the projected grid-average carbon intensity and the National Grid’s ‘Future Energy Scenarios’ projected grid carbon intensities (National Grid ESO, 2022).
- 5.96 In most of these scenarios a rapid and sustained decarbonisation of baseline electricity generation is projected; in certain scenarios, the negative values are projected in this sector (i.e. from carbon capture and storage) in order to deliver ‘net zero’ for the UK economy as a whole.
- 5.97 The current climatic conditions baseline is established by meteorological records for the area of the proposed development. The potential future climatic baseline can be considered using the ‘UKCP18’ projections published by the Met Office Hadley Centre (MOHC), which encompass the potential climatic outcomes in the UK from a range of potential global emissions and climate change scenarios (MOHC, 2018).

**Figure 6: Projected carbon intensity of electricity generation**



**Proposed approach**

- 5.98 GHG emissions would contribute to the effect of global climate change. Assessment guidance from the Institute of Environmental Management and Assessment (IEMA, 2022) describes five levels of significance for emissions resulting from a development, each based on how the proposed development contributes towards achieving a net zero and 1.5°C-aligned reduction trajectory. To aid in considering whether effects are significant, the guidance recommends that GHG emissions should be contextualised against pre-determined carbon budgets, or policy and performance standards where a budget is not available. It is a matter of professional judgement to integrate these sources of evidence and evaluate them in the context of significance.

- 5.99 The proposed approach for assessing the impacts on climate change from the proposed development will be based on carbon life-cycle analysis for the solar farm, considering the manufacturing-stage emissions and the benefits of renewable energy generation in operation compared to the baseline. The manufacturing-stage emissions will be caused directly and indirectly from sources at a variety of locations, including on-site and from the upstream supply chain of the materials used.
- 5.100 The embodied carbon of the proposed development will be assessed using published literature values from lifecycle assessments (LCAs) and Environmental Product Declarations (EPDs). This is likely to include manufacturing, transport and installation for the photovoltaic (PV) modules and balance of system (BoS) components (primarily inverters, transformers and cabling). GHG emissions associated with maintenance and end of life of the PV modules and BoS components are accounted for in some, but not all LCAs. Where considered they have minimal impact on the overall embodied carbon of the entire LCA (International Energy Agency, 2021). As such, consideration of the GHG effects from these stages is proposed to be scoped out, given their minimal GHG contribution. Mitigation measures will be implemented to minimise GHG impacts during the decommissioning stage, including recycling of the PV modules and BoS components wherever possible.
- 5.101 GHG emission reductions from operation of the PV system will be assessed based on the carbon intensity of the alternative source of generation that is displaced, i.e., the generator that would have been supplying the grid with electricity in the business-as-usual baseline without the proposed development.
- 5.102 Similarly, potential GHG emissions reductions from alternative electricity generation displaced by the use of battery storage (which is likely to be generators that would have operated to meet
- 5.103 Hence, the emissions savings would be compared with appropriate sources, including both present-day average carbon intensity of electricity generation on the UK National Grid at the time of the assessment and future marginal generation intensity predictions, calculated by BEIS (BEIS, 2021). Both are shown in **Figure 6**. Both baselines would be used since, on the one hand, the carbon intensity of electricity generation is expected to decrease in line with government policy, and so the intensity of the marginal generation source that the proposed development would displace would also reduce. However, this reduction in carbon intensity would only be possible through the approval and construction of projects such as the proposed development, and government policy relies on projects such as these to be approved.
- 5.104 As set out below, no significant adverse effects due to climate risks to the proposed development are considered likely, with the potential exception of flooding. Assessment of climate risks is therefore proposed to be scoped out of the assessment. However, the potential effect on power generation from changes in sunlight hours or cloud cover will be considered based on the UKCP18 projections.

### Baseline studies

- 5.105 The sources of data concerning the present and future baseline have been described above, and no baseline surveys will be required.
- 5.106 Other data sources that will be used include the Digest of UK Energy Statistics (DUKES) to provide statistics on UK renewable energy and electricity generation (BEIS, 2022b), and any published national or local carbon budgets against which the GHG emissions of the Proposed Development would be contextualised. These would be taken either from legislation or from published research. The latest edition of all relevant data sources would be used.

### Assessment of effects

- 5.107 The magnitude of impact will be expressed as tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e), using 100-year global warming potential values for non-CO<sub>2</sub> GHGs from the Intergovernmental Panel on Climate Change's Sixth Assessment Report or as otherwise defined in published emissions factors and literature sources used (IPCC, 2021).

- 5.108 The sensitive receptor will be defined as the global atmospheric concentration of GHGs and it will be characterised as having a ‘high’ sensitivity, given the severe consequences of climate change and cumulative contributions of other sources.
- 5.109 The IEMA guidance referenced above (IEMA, 2022) states that a development’s GHG impacts should be contextualised, for example on a sectoral basis, compared to the UK’s national carbon budget or compared to policy requirements and performance standards. These comparisons would be used to determine whether a project’s carbon footprint will support or undermine a 1.5°C compatible trajectory towards net zero.
- 5.110 It is considered that broadly speaking, the significance of the proposed development’s GHG emissions can be contextualised in the following ways:
- with reference to the absolute magnitude of net GHG emissions as a percentage of the UK’s national carbon budget;
  - through considering any increase/reduction in absolute GHG emissions and GHG intensity compared with baseline scenarios, including projections for future changes in those baselines; and/or
  - with reference to whether the proposed development contributes to and is in line with the UK’s national carbon budget sectoral goals for GHG emissions reduction, which are consistent with science-based commitments to limit global climate change to an internationally-agreed level.
- 5.111 Taking these factors into account, effects may be described as: major adverse, moderate adverse, minor adverse, negligible, or beneficial. Minor adverse and negligible effects are considered to be non-significant; the remaining levels of effect (major adverse, moderate adverse and beneficial) are all considered to be significant. The evaluation of significance will be carried out in accordance with the guidance, which will include the application of professional judgement to contextualise and determine levels of significance in a way that makes clear the relationship between the proposed development’s carbon footprint and a reduction trajectory consistent with measures required in the UK to meet our nationally-determined contribution towards the Paris Agreement’s 1.5°C target (HM Government, 2022).

### Scope of the assessment

- 5.112 The scope of the assessment is the impact of life-cycle GHG emissions from the solar farm and battery, relative to the baseline of displaced alternative electricity generation and set within the context of national carbon budgets and other relevant local or national policy requirements. An assessment of the project’s impacts on GHG emissions will be included in the ES.
- 5.113 Potential changes in generating capacity of the PV system due to climatic changes during the proposed development’s operational lifetime (i.e., cloud cover or sunlight hours) will also be considered using UKCP18 projections.

### Issues proposed to be scoped out

- 5.114 Risks to the proposed development from climate change proposed to be scoped out of the ES, as these are not considered likely to be significant during the development’s operating lifetime of 40 years:
- Potential risks that have been evaluated are increased rainfall (and corresponding flood risk), increased likelihood of extreme weather events, and increased ambient temperature (with resulting PV module efficiency losses)
  - Extreme weather events such as storms with high winds are also possible in the existing baseline and the proposed development’s design will need to account for this. It is not considered that the potential for any increase in frequency or severity over the development’s lifetime, due to climate change, could cause significant environmental effects.
  - Flood risk will be assessed, with appropriate climate change allowance, in the Flood Consequences Assessment for the proposed development and no separate assessment is proposed within the climate change chapter.

- The potential for small system efficiency losses due to hotter temperatures during the development's lifetime are not considered to have any potential to significantly affect the lifecycle GHG emissions and thus significantly reduce the environmental effect of the renewable electricity generation.
- GHG emissions resulting from land-use change during construction are likely to be insignificant. This is due to the current agricultural land use and minimal disturbance during installation of solar PV modules and BoS components. Carbon sequestration through biogenic growth during the operational period of the proposed development would also likely be insignificant compared to the magnitudes of GHGs emitted and avoided during the construction and operational phase of the proposed development (Bai and Cotrufo, 2022). As such the impact of land-use changes on the carbon sequestration potential of the land is proposed to be scoped out.
- The GHG emissions associated with the decommissioning of the proposed development are also proposed to be scoped out. This is because the vast majority of emissions associated with solar PV developments arises in the construction stage, from the embodied carbon of the PV modules and BoS components (International Energy Agency, 2021).

### Measures adopted as part of the proposed development

- 5.115 As a renewable energy development, climate change mitigation is an inherent aim of the proposed development, and at the scale of the proposed development it has the opportunity to make a material contribution towards the UK's Net Zero target through the decarbonisation of the UK electricity system.
- 5.116 To minimise GHG emissions during the construction of the proposed development, particularly in the embodied carbon resulting from the manufacture of the PV modules and BoS components, reductions will be sought in transport emissions across the supply chain, as well as prioritising low carbon material selections, where possible. These measures may evolve as the proposed development progresses in design.
- 5.117 GHG emissions during the decommissioning phase of the proposed development will be minimised through recycling of PV modules and BoS components where possible.

### Potential cumulative effects

- 5.118 All developments which emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a cumulative impact on climate change. Consequently, cumulative effects due to other specific local developments are not individually identified but would be taken into account when evaluating the impact of the proposed development by defining the atmospheric mass of GHGs as a high sensitivity receptor.

### Potential inter-related effects

- 5.119 Inter-related effects of climate change will be considered individually within the relevant topic chapters of the ES rather than within the Climate change chapter of the ES.

## 6 SUMMARY

In compiling the above Scoping Report, the requirements of regulation 33(2) of the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 have been considered.

This report clearly identifies the likely significant effects on the environment from the proposed development and provides justification for why these environmental effects should be considered within an Environmental Statement to accompany a DNS application for the proposed solar farm at Mynydd Maen.

It has been prepared with input from pre-application consultation with the Council as well as various topic specialists. The matters that have been scoped in will mean that the most relevant issues to this proposed development will be addressed and their impact further understood through undertaking technical assessments.





**Appendix 4.2**  
EIA Scoping Direction

# DNS: EIA Scoping Direction

## CAS-02446-R8X8W2 - Cil-Lonydd Solar Farm

**Prepared by:**

Marloes Holtkamp MSc

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This Scoping Direction is provided on the basis of the information submitted to Planning and Environment Decisions Wales on 10 August 2023, in addition to consultation responses received. The advice does not prejudice any recommendation made by an Inspector or any decision made by the Welsh Ministers in relation to the development, and does not preclude the Inspector from subsequently requiring further information to be submitted with the submitted DNS application under Regulation 24 of [The Town and Country Planning \(Environmental Impact Assessment\) \(Wales\) Regulations 2017](#) (as amended) (“The 2017 Regulations”).

## 1. Introduction

Planning and Environment Decisions Wales (PEDW) received a request under [Regulation 33](#) of the 2017 Regulations for a Scoping Direction in relation to a proposed development for a proposed solar farm, access and ancillary development by CENIN Renewables Ltd. At the time of receipt the project was still known as Mynydd Maen Solar Farm. However, on 18 October 2023 the Applicant informed PEDW of a change in project name to Cil-Lonydd Solar Farm. Therefore, this Scoping Direction refers to the proposed development as Cil-Lonydd Solar Farm.

The request was accompanied by a Scoping Report (SR) ‘2023-08-10 - EIA Scoping Request - 00 - Scoping Report Mynydd Maen Solar Farm’, along with several Appendices, that outlines the proposed scope of the Environmental Statement (ES) for the proposed development - go to <https://planningcasework.service.gov.wales/> and search **CAS-02446-R8X8W2**

Planning and Environment Decisions Wales (PEDW) is authorised to issue this Scoping Direction on behalf of the Welsh Ministers.

This Direction has been prepared in accordance with the requirements of the 2017 Regulations as well as current best practice towards preparation of an ES. In accordance with the 2017 Regulations PEDW has consulted on the SR and the responses received from the consultation bodies have been duly considered in adopting this Direction.

## 2. Site Description

The site is located at Cil-Onnydd Farm between Newbridge to the west and Cwmbran to the east, within Caerphilly County Borough Council.

Further information is available in section 2 of the SR.

## 3. Proposed Development

The proposal as described in the Scoping Report is for a solar photovoltaic electricity generating station (or ‘solar farm’) with an installed generation capacity of approximately 40 MW and associated ancillary development, including a substation. The point of connection is proposed to be located at an existing 132 kV substation to the southeast on Mynydd Maen Common, which would be connected to the site by a cable route of 3km. The main components of a solar farm are:

- Solar panels and frames;
- Inverters;

- Transformers;
- Cabling;
- Substation; and
- Battery storage is also proposed within the site.

Further information is available in section 2 of the SR.

The scope of the EIA should include all elements of the development as identified in the SR, both permanent and temporary, and this Scoping Direction is written on that basis.

In line with the requirements of [Regulation 17](#) and [Schedule 4](#) to the 2017 Regulations, any reasonable alternatives considered should be presented in the ES. The reasons behind the selection of the chosen option should also be provided in the ES, including where environmental effects have informed the choices made.

#### 4. History

No site history is provided in the SR, and I note that the relevant Local Planning Authority's (LPA) pre-application advice to the applicant confirms there is no relevant planning history. However, the SR notes that land use within the site comprises a series of agricultural fields of varying sizes. They are currently primarily used for pasture grazing, bound by a mixture of mature woodland, trees and hedgerows.

#### 5. Consultation

In line with [Regulation 33\(7\)](#) of the 2017 Regulations, formal consultation was undertaken with the following bodies:

- Caerphilly County Borough Council (CCBC)
- Natural Resources Wales (NRW)
- Cadw
- Health and Safety Executive (HSE)
- Dŵr Cymru
- South Wales Fire and Rescue Service
- Coal Authority

Responses received are included in **Appendix 1**.

## 6. Environmental Impact Assessment Approach

The Applicants should satisfy themselves that the ES includes all the information outlined in [Schedule 4](#) of the 2017 Regulations. In addition, the Applicant should ensure that the Non-Technical Summary includes a summary of all the information included in Schedule 4. Consider a structure that allows the author of the ES and the appointed Inspector and Decision Maker to readily satisfy themselves that the ES contains all the information specified [Regulation 17](#) and Schedule 4 of the 2017 Regulations. Cross refer to the requirements in the relevant sections of the ES, and include a summary after the Contents page that lays out all the requirements from the Regulations and what sections of the ES they are fulfilled by.

As the assessments are made, consideration should be given to whether standalone topic chapters would be necessary for topics that are currently proposed to be considered as part of other chapters, particularly if it is apparent that there are significant effects and a large amount of information for a particular topic.

There may also be topic areas scoped out of the ES where the developer may wish to include application documents that sit outside of the ES and provide information that will support their consultation(s) and the decision-making process. The developer is encouraged to liaise with key consultees regarding non-ES application documents which are not a legislative requirement of the DNS regime. If agreement cannot be reached over non-ES application documentation, then the developer may wish to explore whether PEDW can help provide clarity via its statutory pre-application advice service.

The ES should focus on describing and quantifying significant environmental effects. Policy considerations / arguments relating to those impacts should be addressed in other documentation supporting the application (e.g. a Planning Statement), which cross references the ES where necessary. This does not imply that ES chapters should not be prepared in accordance with relevant advice in policy documents (e.g. Technical Advice Notes), rather that the ES should concentrate on identifying significant effects on the environment rather than dealing with policy arguments or exhaustively listing policies.

### 6.1 Baseline

[Schedule 4](#) of the 2017 Regulations states that the 'baseline scenario' is "A description of the relevant aspects of the **current** state of the environment" (emphasis added). The baseline of the ES should reflect actual current conditions at that time.

### 6.2 Reasonable Alternatives

In line with the requirements of [Regulation 17](#) and [Schedule 4](#) to the 2017 Regulations, any reasonable alternatives studied by the Applicant should be presented in the ES. The reasons behind the selection of the chosen option should also be provided in the ES, including where environmental effects have informed the choices made.

It is worth bearing in mind that under the [Conservation of Habitats and Species Regulations 2017](#) ("the Habitats Regulations") unless it can be clearly shown to the Welsh Ministers that the project would have no adverse effect on the integrity of any designated sites, it would have to be shown that there is no feasible alternative solution (see advice note from [IEMA](#)). Further

advice regarding the Habitats Regulations is provided in the final chapter of this Scoping Direction.

### 6.3 Currency of Environmental Information

For all environmental aspects, the applicant should ensure that any survey data is as up to date as possible and clearly set out in the ES the timing and nature of the data on which the assessment has been based. Any study area applied to the assessments should be clearly defined. The impacts of construction, operation and decommissioning activities should be considered as part of the assessment where these could give rise to significant environmental effects. Consideration should be given to relevant legislation, planning policies, and applicable best practice guidance documents throughout the ES.

The ES should include a chapter setting out the overarching methodology for the assessment, which clearly distinguishes effects that are 'significant' from 'non-significant' effects. Any departure from that methodology should be described in individual aspect assessment chapters. Where professional judgement has been applied this should be clearly stated.

The ES topic chapters should report on any data limitations, key assumptions and difficulties encountered in establishing the baseline environment and undertaking the assessment of environmental effects.

### 6.4 Cumulative Effects

The Planning Inspectorate's guidance for Nationally Significant Infrastructure Projects – [Advice Note 17: Cumulative Effects Assessment](#) sets out a staged process for assessing cumulative impacts which the Applicant should follow when preparing the list of projects for inclusion in the ES; the Applicant should ensure that relevant schemes identified are addressed in the ES using the tiered approach set out in Advice Note 17.

Based on the information set out in the scoping request, the approach to the assessment of cumulative impact is considered largely appropriate. Effects deemed individually not significant from the assessment, could cumulatively be significant, so inclusion criteria based on the most likely significant effects from this type of development may prove helpful when identifying what other developments should be accounted for. The criteria may vary from topic to topic.

Best practice is to include proportionate information relating to projects that are not yet consented, dependent on the level of certainty of them coming forward.

All of the other developments considered should be documented and the reasons for inclusion or exclusion should be clearly stated. Professional judgement should be used to avoid excluding other development that is close to threshold limits but has characteristics likely to give rise to a significant effect; or could give rise to a cumulative effect by virtue of its proximity to the proposed development. Similarly, professional judgement should be applied to other development that exceeds thresholds but may not give rise to discernible effects. The process of refinement should be undertaken in consultation with the LPA, NRW, Cadw and other consultees, where appropriate.

The scope of the cumulative assessment should be fully explained and justified in the ES.



## 6.5 Mitigation

Any mitigation relied upon for the purposes of the assessment should be explained in detail within the ES. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The ES should provide reference to how the delivery of measures proposed to prevent/ minimise adverse effects is secured (through legal requirements or other suitably robust methods) and whether relevant consultees agree on the adequacy of the measures proposed.

## 6.6 Population and Human Health

The Applicant should ensure that the ES addresses any significant effects on population and human health, in light of the EIA Regulations 2017. This could be addressed under the separate topic chapters or within its own specific chapter.

## 6.7 Transboundary Effects

[Schedule 4 Part 5](#) of the EIA Regulations requires a description of the likely significant transboundary effects to be provided in an ES. The ES should address this matter as appropriate.

## 6.8 Topics Scoped In but not subject to a standalone chapter

For such topics it may be helpful to users of the ES if it includes a summary table that signposts the chapters where these matters are addressed.

## **7. Environmental Impact Assessment Aspects**

This section contains PEDW's specific comments on the scope and level of detail of information to be provided in the Applicant's ES. Environmental topics or features are not scoped out unless specifically addressed and justified by the Applicant, and confirmed as being scoped out by PEDW. In accordance with Regulation 17(4)(c) the ES should be based on this Scoping Direction in so far as the Proposed Development remains materially the same as the Proposed Development described in the Applicant's Scoping Report.

PEDW has set out in this Direction where it has / has not agreed to scope out matters on the basis of the information available at this time. PEDW is content that the receipt of a Scoping Direction should not prevent the Applicant from subsequently agreeing with the relevant consultees to scope such matters out of the ES, where further evidence has been provided to justify this approach. However, in order to demonstrate that the matters have been appropriately addressed, the ES should explain the reasoning for scoping them out and justify the approach taken.

### **7.1 Aspects Scoped In**

Subject to the comments provided at Table 1, the following aspects are scoped into the ES:

- Population (not as a standalone chapter)**
- Human Health (not as a standalone chapter)**
- Heritage**
- Risk of Major Accidents and Disasters including Coal Mining Risk**
- Landscape and Visual**
- Biodiversity**

## 8. Table 1: Planning and Environment Decisions Wales Comments

ID	Reference in Scoping Report	Issue	Comment
<b>Description of the Development</b>			
ID.1	Chapter 2	Description of development	<p>The Applicant's attention is drawn to comments from NRW contained at Appendix 1, outlining the description of development should cover construction, operational and decommissioning phases as appropriate and highlighting the elements they expect to be included.</p> <p>The extent of the development to be assessed should include all elements of the development as identified in the SR, both permanent and temporary – including the proposed substation, underground cabling, solar PV and battery storage. PEDW notes that the SR highlights the technical requirements are being clarified and assessed at this stage. As the worst-case scenario that relates to different elements of the project may vary, it is important that the ES is clear as to all elements of the proposal at the time of submission and contains a clear justification for the approach to worst-case scenario adopted for each element of the development in relation to the relevant aspects of the environment / receptors.</p>
ID.2	3.10	Cumulative Effects	<p>The approach to the assessment of cumulative effects is considered largely appropriate. However, while developments that have already been built and are operational will form part of the baseline, this does not mean that they should be excluded when considering cumulative effects. Paragraph 5 of Schedule 4 of the 2017 Regulations makes it clear that consideration of cumulative effects should include existing development.</p>

ID	Reference in Scoping Report	Issue	Comment
			To ensure a comprehensive assessment in the final ES, the Applicant is advised to liaise with the LPA on development proposals that should be included in the cumulative assessment, as they will be aware of developments in their area which will need to be considered, which may extend beyond other renewable energy developments.
ID.3	3.24	Approach to mitigation	PEDW's position is that 'primary mitigation' is better addressed under the 'Reasonable alternatives considered' in the ES.
ID.4		Illustrations	NRW, in their comments contained at Appendix 1, highlight that any maps, drawings and illustrations that are produced to describe the project should be designed in such a way that they can be overlaid with drawings and illustrations produced for other sections of the ES, such as biodiversity.
<b>Applicant's proposed Aspects proposed to be scoped out</b>			
ID.5	4.8	Planning Policy Context	PEDW agrees it is not necessary to include a chapter on Planning Policy Context in the ES and welcomes that a separate Planning Statement will be submitted with the planning application. The Applicant's attention is drawn to comments on this matter from CCBC contained at Appendix 1.
ID.6	4.9	Population	PEDW agrees that a standalone chapter is not required, but Population should be addressed in appropriate chapters of the ES. <b>This topic is therefore scoped in to the ES, but not as a standalone chapter.</b>
ID.7	4.10 – 4.14	Transport	CCBC in their response contained at Appendix 1 agrees Transport can be scoped out, but it must be dealt with through the provision of a

ID	Reference in Scoping Report	Issue	Comment
			<p>separate Transport Assessment / Statement and Construction Traffic Management Plan (CTMP), the requirements for which are outlined in their response.</p> <p>PEDW agrees and welcomes that the SR notes a CTMP will be provided, which should be included as a technical appendix to the ES, as it is likely to outline relevant mitigation measures.</p>
ID.8	4.15	Human Health	<p>PEDW agrees that a standalone chapter is not required, but Human Health should be addressed in appropriate chapters of the ES. <b>This topic is therefore scoped in to the ES, but not as a standalone chapter.</b></p>
ID.9	4.16 – 4.19	Land (for example land take)	<p>CCBC in their response contained at Appendix 1 agrees Land can be scoped out, but a separate Coal Mining Risk Assessment should be provided due to parts of the site being at high risk due to past coal mining activities.</p> <p>The Applicant’s attention is also drawn to comments from the Coal Authority highlighting that coal outcrops are present at the proposed site. The Coal Authority notes that currently no proposed layout is available for the solar farm and its ancillary development. Although the erection of solar panels falls on their published Exemptions List, they do request submission of a Coal Mining Risk Assessment where significant ancillary buildings are proposed within the defined Development High Risk Area (DHRA) and consideration should also be given to the risks posed by past coal mining activity where permanent surfaced access roads are proposed as part of the scheme.</p>

ID	Reference in Scoping Report	Issue	Comment
			<p>The Coal Authority requests that if elements of the scheme are proposed within the DHRA which do not fall on their exemptions list, then a Coal Mining Risk Assessment should be submitted.</p> <p>PEDW recommends the Applicant liaises directly with the Coal Authority on the site layout, to seek agreement on whether a Coal Mining Risk Assessment should be completed. PEDW also recommends the Applicant liaises with the LPA about the Coal Authority's views.</p> <p>Given these comments, <b>Coal Mining Risk is scoped into the ES at this stage, subject to the outcome of discussions with the Coal Authority.</b> If it is agreed a Coal Mining Risk Assessment does not need to be completed, then Coal Mining Risk can be scoped out.</p>
ID.10	4.20 – 4.23	Heritage	<p>Cadw, in their comments contained at Appendix 1, concur that no further assessment of the impact on the settings of designated historic assets is required.</p> <p>The Applicant's attention is drawn to the response from CCBC and the accompanying comments from the Glamorgan Gwent Archaeological Trust's (GGAT) contained at Appendix 1, recommending that the Cultural Heritage Desk-Based Assessment is revised to conform to both Chartered Institute for Archaeologists and Welsh Historic Environment Records deposition requirements.</p> <p>GGAT however does concur with the recommended mitigation of the desk-based assessment. The Applicant's attention is drawn to their recommendation to complete a geophysical survey, the results of which would determine the scope of a subsequent archaeological field</p>

ID	Reference in Scoping Report	Issue	Comment
			<p>evaluation and possible further archaeological work. Cadw, in their response contained at Appendix 1, also supports this recommendation.</p> <p>PEDW agrees with these comments. Given that the additional survey work could identify potential significant effects, it is not possible to scope out Heritage as this stage and <b>as such Heritage is scoped in, subject to the outcome of the additional surveys and any resulting archaeological work.</b></p> <p>PEDW recommends the Applicant liaises directly with Cadw and GGAT to agree survey requirements and liaise on the outcome, to seek agreement on whether Heritage can be scoped out.</p>
ID.11	4.24 – 4.29	Soil (for example organic matter, erosion, compaction, sealing)	<p>NRW in their response contained at Appendix 1 is satisfied that the proposal is unlikely to have significant effects on soils. NRW also adds advice regarding potential permit requirements.</p> <p>PEDW agrees with the statement included in the SR that the site does not contain Best and Most Versatile agricultural land and welcomes a Soil Management Plan will be prepared in support of the planning application.</p> <p>Given these considerations, PEDW is content Soil is scoped out of the ES. However, the statement in the SR that the proposed development is fully reversible is largely unsubstantiated and PEDW recommends this is further addressed in the ES / other relevant application documents.</p>

ID	Reference in Scoping Report	Issue	Comment
ID.12	4.30 – 4.33	Water (for example hydromorphological changes, quantity and quality)	<p>Dŵr Cymru, in their response contained at Appendix, advises that the site does not fall within their drinking water catchment and therefore there are no concerns from a water resources perspective.</p> <p>The Applicant's attention is drawn to comments from NRW contained at Appendix 1 regarding the water environment. They highlight that the site lies over bedrock designated as a Secondary A aquifer and there appear to be drainage ditches / streams in the vicinity of the site, including the cable route. NRW is satisfied that the proposal is unlikely to have significant effects on soils and water, and that these topics are scoped out of the ES.</p> <p>However, NRW outlines the requirements for a preliminary site assessment to be provided and highlights that based on the results, the likely impacts from the development on both quantity and quality of the surface water and groundwater must be assessed. NRW may require identified groundwater features to be monitored during the proposed workings and therefore recommend suitable baseline monitoring prior to the commencement of workings at the site. NRW also adds advice regarding potential licence and permit requirements.</p> <p>Furthermore, the Applicant's attention is drawn to NRW's comments highlighting that it should be confirmed if the proposed cables will be fluid filled, and how this will impact on groundwater in the area. The Applicant is advised to take into account NRW's comments regarding this matter.</p> <p>PEDW recommends the Applicant liaises directly with NRW on the use of cables as well as the requirements for the preliminary site</p>



ID	Reference in Scoping Report	Issue	Comment
			<p>assessment, the outcomes and any required monitoring, to ensure the water environment is appropriately addressed in the ES.</p> <p>Further to comments from South Wales Fire and Rescue Service contained at Appendix 1 regarding flood risk, PEDW welcomes the SR states a Flood Consequence Assessment (FCA) supported by a drainage strategy will be prepared to ensure flood risk and hydrological impacts are managed appropriately.</p> <p>Given these considerations, that significant effects are considered unlikely and potential impacts could be adequately addressed as part of the planning application via a standalone FCA and Drainage Strategy, PEDW is content for Water to be scoped out. However, this may need to be revisited depending on the outcome of discussions with NRW. Furthermore, the draft FCA should be included a technical appendix to the ES where mitigations are identified in the FCA.</p>
ID.13	4.34 – 4.37	Air Quality	<p>The SR notes Air Quality is scoped out as the potential for significant effects on local receptors is not anticipated, with any potential effects being confined to construction and decommissioning phases. A CTMP and Outline Construction and Decommissioning Method Statement will be prepared to outline measures to limit any effects during these phases. PEDW welcomes this approach and as also referred to under Transport above, these documents should be included as technical appendices to the ES.</p>
ID.14	4.38	Material Assets	<p>The SR notes that material assets will be considered across a range of topic areas within an ES, in particular the historic environment chapter. PEDW welcomes this approach and agrees this topic can be scoped out as a separate chapter.</p>

ID	Reference in Scoping Report	Issue	Comment
ID.15	4.39 – 4.40	Risk of Major Accidents and Disasters – battery storage	<p>The SR highlights that the battery storage is also proposed as part of the development. At this stage it is not clear which type of batteries are proposed. PEDW notes that there is a potential fire risk associated with certain types of batteries such as lithium-ion and that safety measures are required in the design to minimise the risk of fire. PEDW considers this to be part of the EIA process in line with Schedule 4 of the EIA Regulations (Wales) 2017.</p> <p>The proposed development should include adequate measures to ensure that an isolated fire would not become widespread and lead to a major incident. The Applicant's attention is drawn to comments from South Wales Fire and Rescue Service contained at Appendix 1 regarding wildfires, solar arrays and battery storage facilities as well as the requirement for adequate water supplies. PEDW welcome that the SR states the proposal will be supported by a Battery Safety Management Plan, confirming that the risks are understood, accounted for and mitigated as far as practicable. As the Battery Safety Management Plan could identify potential significant effects, it is not possible to scope out Risk of Major Accidents at this stage. The Applicant is reminded of the responsibilities set by the Regulatory Reform (Fire Safety) Order 2005. The ES should ensure that risks of accidents are accounted for and mitigated in line with Schedule 4. A proportionate section on this aspect should be included in the ES and as such and as such <b>Risk of Major Accidents and Disasters is scoped in.</b></p>
ID.16	4.39 – 4.40	Risk of Major Accidents and Disasters	<p>The Applicant's attention is drawn to comments from HSE contained at Appendix 1 highlighting that in relation to the cable route, there are areas which fall within HSE public safety consultation zones associated with Major Accident Hazard Pipeline(s). This point is also</p>

ID	Reference in Scoping Report	Issue	Comment
			<p>highlighted in CCBC’s response. The ES should address this in a proportionate manner.</p> <p>The Applicant’s attention is also drawn to the comments highlighted above regarding Coal Mining Risk and if appropriate, this should be proportionately addressed in the ES.</p>
ID.17	4.39 – 4.40	Risk of Major Accidents and Disasters - leaching	<p>The Applicant’s attention is drawn to the fact that some solar panels are coated in PFAS (Per- and polyfluoroalkyl substances) which can leach over time due to wear and tear. Should the panels proposed include this, appropriate measures need to be put in place to ensure that leaching of PFAS into the local environment does not occur and this should be address in a proportionate manner in the ES.</p>
<b>Landscape and Visual</b>			
ID.18	Chapter 5 / Appendix 2	Landscape and Visual Impact Assessment (LVIA)	<p>The Applicant’s attention is drawn to the LPA's comments regarding the LVIA methodology and sensitivity categories. CCBC adds that based on the limited information provided, the preliminary assessment of the potential effects is considered premature. Consequently, CCBC does not currently accept the preliminary assessment.</p> <p>PEDW recommends the Applicant liaises directly with the LPA regarding these matters.</p>
ID.19	5.30 – 5.38	Viewpoints	<p>In their response contained at Appendix 1, CCBC notes that the candidate viewpoints will be further refined. With one exception, CCBC considers the number and locations suggested within the ZTV acceptable. However, CCBC adds that the following details will be required:</p>

ID	Reference in Scoping Report	Issue	Comment
			<ul style="list-style-type: none"> <li>• A more detailed and suitably scaled OS based draft ZTV and viewpoints plan for the 5 km LVIA and 6 km cumulative assessment study areas;</li> <li>• Baseline photographs, wireframes and visualisations / photomontages;</li> <li>• Additional viewpoint from within the site, located on the Public Right of Way (PRoW);</li> <li>• Consideration of the effects on sequential views, within the ZTV, of those experienced by users of the PRoW networks in and close to the site.</li> <li>• Inclusion of key long-distance walking and cycling routes within the study area, including the cumulative effect of constantly seeing views of the proposed arrays.</li> </ul> <p>PEDW welcomes the SR notes that viewpoints requiring photomontages will likely be selected through further consultation with the LPA. PEDW recommends the Applicants liaises directly with the LPA to ensure the points above are appropriately addressed in the ES.</p>
ID.20	Table 5.2	Sensitivity of viewpoints	<p>The Applicant’s attention is drawn to comments from CCBC contained at Appendix 1 stating it does not accept the classification of the sensitivity of viewpoints from PRoW as ‘medium’. The LPA states that users of the PRoW network are primarily engaged in outdoor recreational activities, whose attention is likely to be focused on the landscape and views afforded and should be recognised with a categorisation of ‘high’.</p>

ID	Reference in Scoping Report	Issue	Comment
ID.21	Chapter 5	Public Rights of Way (PRoW)	<p>CCBC's Countryside and Rights of Way Assistant notes that there are several PRoW both crossing and abutting the site. The Applicant's attention is drawn to their comments contained at Appendix 1, including in relation to 3 routes which would be obstructed by the proposed security fence. They highlight that either the proposal will need to accommodate the PRoW, or a diversion must be sought under the Town and Country Planning Act 1990 prior to any development taking place. They add a landscape plan could assist discussions.</p> <p>Their comments also highlight that the proximity of the panels will affect the visual amenity of the PRoW. Furthermore, as they carry rights for public equestrian users, glint and glare is considered a significant issue to users, which needs to be considered in the Visual Assessment. PEDW welcomes that in paragraph 5.12 the SR states a Glint and Glare Assessment will be completed and that this will have regard to the proposed development's impact on PRoW, as requested by the LPA.</p> <p>The relevant consenting strategy is ultimately a matter for the Applicant, but it may be possible to pursue a Highways Order as a Secondary Consent to the DNS application. Should the applicant wish to pursue this option, they should contact the Orders Branch of the Welsh Government's Transport Directorate (<a href="mailto:TransportOrdersBranch@gov.wales">TransportOrdersBranch@gov.wales</a>) to begin liaising over a draft Order to be included in pre-application publicity materials and submitted with the DNS application.</p> <p>PEDW recommends the Applicant liaises directly with CCBC to ensure the issues above are appropriately addressed.</p>

ID	Reference in Scoping Report	Issue	Comment
ID.22	Chapter 5	Landscape Assessment	The Applicant's attention is drawn to comments from CCBC's Landscape Architect contained at Appendix 1, highlighting that the landscape character assessment should include baseline photographs, should be made on the basis of a 5 km radius of the site and should include the Abercarn Visually Important Local Landscape and the Mynyddislwyn Special Landscape Area.
ID.23	5.15	Bannau Brycheiniog National Park (BBNP)	NRW, in their comments contained at Appendix 1, concur the proposed development would not have an impact on the BBNP and impact on BBNP can therefore be scoped out.
ID.24	5.16	Visually Important Local Landscape (VILL)	<p>The Applicant's attention is drawn to comments from CCBC's Landscape Architect contained at Appendix 1, expressing concerns that the solar arrays could be at odds with the VILL and outlining the required detail to be included in plans to be provided. They add that as the site and its perimeters contains many mature and veteran trees, which contribute significantly to the landscape character and visual amenity of the area and VILL, they expect the provision of a separate Tree Constraints Plan. CCBC's Ecologist in their response recommended that all mature trees on site are retained.</p> <p>PEDW recommends the Applicant liaises directly with CCBC to ensure these issues are appropriately addressed.</p>
ID.25	5.46	Cumulative Effects	The Applicant's attention is drawn to comments from CCBC regarding cumulative effects, highlighting that the cumulative assessment should also include all existing identified schemes. PEDW agrees with this and draws the Applicant's attention to the comments above regarding paragraph 3.10.

ID	Reference in Scoping Report	Issue	Comment
			<p>CCBC also welcomes that both wind and solar farms will be included as part of the cumulative assessment and adds that the proposed cumulative assessment study area of 6 km radius is considered reasonable.</p>
ID.26	5.48 / Appendix 2 (1.32 / 1.35)	Residential Visual Amenity Assessment (RVAA)	<p>The SR notes that a RVAA is proposed to be scoped out. The Preliminary LVA confirms that residential visual receptors are to be included in the scope of assessment. PEDW is content that a separate RVAA is therefore not required, provided the appropriate residential receptors are captured within the main LVIA.</p>
<b>Biodiversity</b>			
ID.27	4.5 / 5.75	Protected Sites	<p>NRW, in their response contained at Appendix 1, agrees that there are unlikely to be significant effects on designated sites, given the distance and absence of impact pathways. CCBC’s Ecologist welcomes amendment to the Red Line Boundary to exclude the SINC and to relocate the cable route alongside the existing road to reduce its impact on the SINC.</p> <p>However, NRW notes that there is ancient semi natural woodland close to the site and states the Applicant should consider how any adverse impact to these habitats will be avoided. PEDW recommends the Applicant liaises directly with NRW on this matter, to ensure it is appropriately addressed in the ES.</p>
ID.28	5.78 - 5.83	Surveys	<p>CCBC’s Ecologist, in their comments contained at Appendix 1, welcomes surveys to date and supports all recommendations for further assessment and avoidance / mitigation measures.</p>

ID	Reference in Scoping Report	Issue	Comment
			<p>The Applicant’s attention is drawn to comments from NRW contained at Appendix 1 advising that the site and where necessary land adjacent to the site is subject to assessment to determine the likelihood of protected species being present and affected by the proposals. NRW further outlines the requirements for targeted species surveys to be undertaken for all species scoped in.</p>
ID.29	Appendix 3 / 5.84	Preliminary Ecological Appraisal	<p>The Applicant’s attention is drawn to comments from NRW contained at Appendix 1, highlighting the information which should be included in the ES and as part of the detailed assessment and evaluation of the impacts of the scheme. The response from CCBC’s Ecologist contained at Appendix 1 highlights that the appraisal will need updating following confirmation of final layout.</p> <p>PEDW notes that paragraph 5.84 of the SR states the ecological impact assessment (EcIA) will assess the likely effects of construction and operation on ecological receptors. Particular attention is therefore drawn to NRW’s comments which indicate that <b>evaluation of the impacts of the scheme should also include the decommissioning / post operational phase. PEDW agrees and this is therefore scoped in.</b></p>
ID.30	Chapter 6	Protected Species – Impact Assessment	<p>The Applicant’s attention is drawn to comments from NRW contained at Appendix 1 regarding how the ES should take account of any protected species identified on site and how the long-term mitigation or compensation will be secured. NRW also advises the ES considers significance and conservation status and highlights the ES must demonstrate there will be no detriment to the maintenance of favourable conservation status. Where potential for significant impacts is identified, NRW advocate a Conservation Plan is prepared.</p>



ID	Reference in Scoping Report	Issue	Comment
ID.31	5.83	Great Crested Newts (GCN)	NRW, in their comments contained at Appendix 1, advise that where impacts to GCN are anticipated, a GCN Conservation Plan is prepared, setting out the anticipated impacts and all mitigation and / or compensation measures.
ID.32	5.83	Bats	<p>The Applicant’s attention is drawn to comments from NRW contained at Appendix 1, providing advice on inspections, surveys and resulting actions to be completed should any trees require felling or management works be required to facilitate the development.</p> <p>NRW also advise that where impacts to bats are anticipated, a Bat Conservation Plan is prepared, setting out the anticipated impacts and all mitigation and / or compensation measures.</p>
ID.33	5.83	Dormouse	NRW, in their comments contained at Appendix 1, welcome the intention outlined in the SR to retain trees and boundary hedgerows surrounding the site and that vegetation removal will be limited to widening of existing access points. However, the SR states it is not proposed to complete Dormouse work. NRW notes the presence of habitats potentially suitable to support the species and the potential for dormice to be present in the wider area. NRW therefore advise that a method statement is prepared for any minor works that will impact suitable dormouse habitat. PEDW recommends the Applicant liaises with NRW on the method statement and recommends it is included as a technical appendix to the ES.
ID.34	5.83	Reptiles	The SR notes that given the lack of records and the minimal impact of the proposed development, reptiles are not considered further in the assessment and no further survey work is planned. However, the Applicant’s attention is drawn to comments from CCBC’s Ecologist

ID	Reference in Scoping Report	Issue	Comment
			highlighting the ecological appraisal should include consideration of reptiles. PEDW recommends the Applicant liaises directly with the LPA's Ecologist to ensure impacts on reptiles are appropriately addressed in the ES.
ID.35		Hedgehogs	The Applicant's attention is drawn to comments from CCBC's Ecologist highlighting the appraisal ecological appraisal should include consideration of hedgehog. PEDW recommends the Applicant liaises directly with the LPA's Ecologist to ensure impacts on hedgehogs are appropriately addressed in the ES.
ID.36	5.61	Site access	PEDW notes that the removal of small sections of hedgerow is anticipated to facilitate site access and that this will involve widening existing access points as opposed to creating new gaps where possible. Should this be the case, the ecological assessment and appropriate studies should take account of this and be included within the ES where appropriate.
<b>Climate Change</b>			
ID.37	Chapter 7	Climate Change Risk	PEDW notes Climate Change is scoped in as a chapter to the ES, but agrees that climate change risk can be scoped out.
<b>Other Considerations</b>			
ID.38		Noise	The Applicant's attention is drawn to comments from CCBC's Environmental Health Officer contained at Appendix 1 regarding noise, requiring further information in terms of the assessment of noise impacts from the operational phase of the development. PEDW recommends the Applicant liaises directly with the LPA on this matter. Noise therefore is provisionally scoped out, subject to agreement with

ID	Reference in Scoping Report	Issue	Comment
			the LPA regarding the standalone documents that should be provided at application stage.

## 9. Other Matters

**This section does not constitute part of the Scoping Direction, but addresses other issues related to the proposal.**

### 9.1 Changes to PPW

On 11 October 2023 the Welsh Government introduced changes to Chapter 6 of PPW relating to:

- Green Infrastructure,
- Net Benefit for Biodiversity and the Step-wise Approach,
- Protection for Sites of Special Scientific Interest, and
- Trees and Woodlands.

Details are available in the relevant 'Dear Chief Planning Officer' letter:

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

### 9.2 Updated Guidance from the Design Commission for Wales

On 23 November 2023 the Design Commission for Wales published their updated guidance "Designing for Renewable Energy in Wales". The guidance is available online:

<https://dcfw.org/designing-for-renewable-energy-in-wales/>

### 9.3 Habitats Regulation Assessment

[The Conservation of Habitats and Species Regulations 2017](#) require competent authorities, before granting consent for a plan or project, to carry out an appropriate assessment (AA) in circumstances where the plan or project is likely to have a significant effect on a European site (either alone or in combination with other plans or projects). The competent authority in respect of a DNS application is the relevant Welsh Minister who makes the final decision. It is the Applicant's responsibility to provide sufficient information to the competent authority to enable them to carry out an AA or determine whether an AA is required.

When considering whether or not significant effects are likely, applicants should ensure that their rationale is consistent with the [CJEU finding](#) that mitigation measures (referred to in the judgment as measures which are intended to avoid or reduce effects) should be assessed within the framework of an AA and that it is not permissible to take account of measures intended to avoid or reduce the harmful effects of the plan or project on a European site when determining whether an AA is required ('screening'). The screening stage must be undertaken on a precautionary basis without regard to any proposed integrated or additional avoidance or reduction measures. Where the likelihood of significant effects cannot be excluded, on the basis of objective information the competent authority must proceed to carry out an AA to establish whether the plan or project will affect the integrity of the European site, which can include at that stage consideration of the effectiveness of the proposed avoidance or reduction measures.

Where it is effective to cross refer to sections of the ES in the HRA, a clear and consistent approach should be adopted.

The Planning Inspectorate's guidance for Nationally Significant Infrastructure Projects – [Advice Note 10: Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects](#) may prove useful when considering what information to provide to allow the Welsh Ministers to undertake AA.

#### 9.4 SuDS Consent

Whilst a separate legislative requirement from planning permission, the Applicant's attention is drawn to the statutory SuDS regime that came into force in Wales in January 2019. The requirement to obtain SuDS consent prior to construction may require iterative design changes that influence the scheme that is to be assessed within the ES and taken through to application. As such, it is recommended that the applicant contact the local SuDS Approval Body early on.

# Appendix 1: Consultation Responses

**Tŷ Penallta,**  
Parc Tredomen,  
Ystrad Mynach,  
Hengoed CF82 7PG

**Penallta House,**  
Tredomen Park,  
Ystrad Mynach,  
Hengoed CF82 7PG



**Cyfarwyddwr Corfforaethol - Economi a'r Amgylchedd**  
**Corporate Director - Economy and Environment**

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Marloes Holtkamp  
Crown Buildings  
Cathays Park  
Cardiff  
CF10 3NQ

**Head of  
Regeneration  
and Planning**

Your Ref/Eich Cyf:

Our Ref/Ein Cyf:

Contact/Cysylltwc

Telephone/Ffon:

E Mail/E Bost:

Date/Dyddiad:

**Pennaeth Adfywio a  
Chynllunio**

EIASCO/23/0001

H Winsall

[REDACTED]

[REDACTED]

19.10.2023

Dear Ms Holtkamp

TOWN AND COUNTRY PLANNING ACT 1990  
REFERENCE NO. EIASCO/23/0001

EIA Scoping Opinion for DNS: Proposed solar farm and ancillary development, Land at Land At Grid Ref 323096 197363, Abercarn Mountain Road, Hafodyrynys.

A solar farm with a generating capacity of approximately 40 MW and battery storage is proposed on 28.6 hectares of agricultural land to the east of Newbridge. A cable is also proposed to be routed onto Mynydd Maen and Mynydd Llwyd Common, where it will connect to existing electricity infrastructure. The site includes the cable route. The access to the site is proposed to be from the A472 at Hafodyrynys.

Comments on the scope of the proposed Environmental Impact Assessment are given as follows.

### **Landscape and Visual**

The site is within the designated Abercarn Visually Important Local Landscape (VILL) and is adjacent Sites of Importance for Nature Conservation (SINC), with the cable route crossing the Mynydd Maen SINC. The following comments are provided on the contents of the Landscape and Visual Chapter, based on the Council Landscape Architect's comments (please also see attached comments in full).

Overall judgements on landscape and visual sensitivity should be described as; 'very high', 'high', 'medium', 'low' and 'negligible or no change'.

*Tim Caerffili*  
**Yn Well gyda'n Gilydd**  
*Team Caerphilly*  
**Better Together**

It should be noted that the assessment of the potential effects is somewhat premature, based on the limited information provided and consequently this current preliminary assessment is not currently accepted.

In relation to the current study area radii and draft ZTV (10km), with viewpoint locations identified, this lacks clarity and detail at this scale and consequently a more detailed ZTV for the 5km LVIA and 6km cumulative assessment study areas is required.

The **Landscape Assessment** should also include:

- Baseline landscape character assessment of the site including baseline photographs, along with a plan of their location shown on a suitably scaled OS base;
- A landscape assessment to be made on the basis of a 5km radius of the site in respect of landscape character;
- In addition to LANDMAP character areas, the above should include an assessment of the proposal on the Abercarn VILL and Mynyddislwyn Special Landscape Area within the 5km study area.

In respect of the **Visual Assessment**, it is noted that the candidate viewpoints would be further refined, following field work, and will form the representative viewpoints to be assessed as part of the LVIA Chapter. On balance, with one exception, the number and locations suggested within the ZTV at this stage are considered acceptable. However, the following draft plans and details will be required for further assessment and agreement:

- A more detailed and suitably scaled OS based draft ZTV and viewpoints plan for the 5km LVIA and 6km cumulative assessment study areas. These will assist in assessing whether the viewpoint locations currently selected are sufficient, correctly located and if additional viewpoints are required for a more informed appraisal and judgement to be made;
- The assessment should be supported with baseline photographs, wireframes and visualisations / photomontages;
- The assessment will also need to include a viewpoint from within the site, located on the Public Right of Way (PRoW). Views will be experienced from within the site by highly sensitive users of the PRoW, including close, midrange and sequential views as they slowly pass through the site;
- The assessment should also consider the effects on sequential views, within the ZTV of those experienced by users of the PRoW networks in and close to the site;



- The assessment needs to include key long distance walking and cycling routes within the study area, including the cumulative effect of constantly seeing views of the proposed arrays, which needs to be discussed and addressed;
- In terms of the values attributed to the table in the submitted "Preliminary LVA Notes", this has classified sensitivity of the viewpoints from PRoWs as medium sensitivity, which is not accepted. Users of the PRoW networks should be recognised with a categorisation of high sensitivity, as people using the PRoW network are primarily engaged in outdoor recreational activities, whose attention is likely to be focused on the landscape and views afforded. Consequently, this requires addressing (see below for further discussion on PRoWs, based on the Council Rights of Way Officer's comments).

The addition of the proposed development to a situation where other solar developments, or other infrastructure, are apparent may result in a greater effect than where the Proposed Development is seen by itself. The cumulative assessment should include all existing identified solar and wind energy infrastructure schemes, as well as those that are consented, and those for which planning applications have been submitted. It's welcomed that the assessment will both include wind and solar farms. A study area of 6km radius from the proposed development is proposed, which would be considered reasonable for the cumulative assessment.

In addition to the above, as there are PRoWs affected by this proposal that carry rights for public equestrian users and lie to the south of many of the proposed PV panels, glint and glare is considered as a significant issue to users of these routes, and this should be considered in providing a glint and glare assessment to inform the Landscape and Visual Chapter

The proximity of the panels will also affect the visual amenity of the PRoWs. NWBG/RBW316/1 abuts the northern boundary, and glint and glare are therefore unlikely to affect users of this path. However, the boundary to the south of this path consists of a small number of mature trees, which will provide little in the way of natural screening when looking south towards the proposed development (please see attached plan of the PRoW network within the area). This needs to be considered in the Visual Assessment.

## **Biodiversity**

The following comments are provided on the contents of the Biodiversity Chapter, based on the Council Ecologist's comments (please also see attached comments in full).

The appraisal informing this chapter should include consideration of reptiles and hedgehog. The appraisal will need updating following confirmation of final layout and it is recommended that all mature trees on site are retained.

### **Climate Change**

There are no comments on this proposed chapter.

### **Topics Currently Scoped Out of the Assessment**

Of the listed topics that are scoped out, there are concerns regarding the following:

#### ***Heritage***

There are historic environment records on the site which suggest the site has a high potential for archaeological remains from the early Medieval and Medieval periods. The Cultural Heritage Assessment that has been submitted suggests these records relate to an Early Medieval or Medieval Ecclesiastical Grange. The submitted assessment suggests a geophysical study is required.

Glamorgan Gwent Archaeological Trust (GGAT), as the Council's archaeological advisors, have advised that it is likely they would recommend a geophysical survey in the first instance, followed by an archaeological field evaluation (trenching). The scope of the field evaluation would be determined by the results of the geophysical survey, which should be done in accordance with a Written Scheme of Investigation (WSI) to be first agreed with GGAT. It is also possible that, depending on results, further archaeological work would be required. They have also recommended that the submitted Cultural Heritage Desk-based Assessment be revised to conform to both ClfA and HER deposition requirements.

Given the above, there is considered to be a need for further survey work to fully understand the impact of the proposal on archaeology and consequently whether the development has significant effects in respect of heritage. As such it is considered heritage should be scoped into the Environmental Impact Assessment, and that this chapter should be informed by work as detailed above.

*Tim Caerffili*  
**Yn Well gyda'n Gilydd**  
*Team Caerphilly*  
**Better Together**

### ***Risk of Major Accidents***

Our records show that the cable route in part crosses a Health and Safety Executive Consultation Zone for a gas pipeline. It is therefore recommended that HSE's views are sought on whether this matter should be scoped into the Environmental Impact Assessment.

In respect of other topics that have been scoped out, the following comments are made:

### ***Transport***

It is agreed this can be scoped out but must be dealt with through the provision of a separate Transport Assessment/Statement and Construction Traffic Management Plan as advised (also please see the Council Transport Engineer's attached comments). In addition, separate comments from the Council Rights of Way Officer are attached regarding considering Rights of Way in the design and construction of the scheme.

### ***Land***

It is agreed this can be scoped out, but a separate Coal Mining Risk Assessment should be provided due to parts of the site being at high risk due to past coal mining activities.

### ***Planning Policy Context***

It is accepted this can be addressed in a separate Planning Statement rather than the Environmental Statement. Separate comments have been provided by the Strategic Planning Officer and these should be addressed in that Planning Statement.

It is also accepted that **noise** is not a significant issue for the Environmental Impact Assessment, however noise will need to be considered in any planning application and separate comments from the Environmental Health Officer on this matter are attached.

Yours sincerely

**Helen Winsall**

*Tim Caerffili*  
**Yn Well gyda'n Gilydd**  
*Team Caerphilly*  
**Better Together**

**Tŷ Penallta,**  
Parc Tredomen,  
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**Corporate Director - Economy and Environment**

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Prif Gynllunydd | Principal Planner  
Cyngor Bwrdeistref Sirol Caerffili | Caerphilly County Borough Council

# Consultation Response: Ecology

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To	Planning Service Manager	From	Planning and Regeneration; Ecology
FAO	Ms Helen Winsall		Ms Erica Dixon
Date	02/10/2023	Tel	██████████
Your Ref	EIASCO/23/0001	Email	████████████████████
Location	Land At Grid Ref 323096 197363 Abercarn Mountain Road Hafodyrynys		
Proposal	EIA Scoping Opinion for DNS: Proposed solar farm and ancillary development		
cc	Planning Admin		

## Comments

We make comments on this application, with respect to the documents submitted in support of the application, in particular:

- *Mynydd Maen Solar, West of Newbridge, Caerphilly South Wales; Preliminary Ecology Appraisal, 2022; Version 01; 10/10/2022 by RPS Group.*

We make comments in principle and without prejudice. We have no objections to the proposed development and we welcome the survey to date and support all the recommendations for further assessment and avoidance/mitigation measures. We welcome the proposal to exclude the SINC from the developable area and to site the cable alongside the existing road.

We suggest that the final report and application also include consideration of reptiles and hedgehog.

The report will need updating following confirmation of final layout and we recommend that all mature trees on site are retained.

## Stephenson, Amy

---

**From:** Brown, Abbie  
**Sent:** 19 September 2023 14:57  
**To:** Winsall, Helen  
**Cc:** Planning Administration; Pollution Control  
**Subject:** EIASCO/23/0001 Land At Grid Ref 323096 197363 Mynyddislwyn  
**Attachments:** EIA Scoping Consultation.pdf; 7985558-230810\_L\_JPW2051\_Cover Letter.pdf; 7985666-Figure 1 - Site Location Plan.pdf

**Importance:** High

**Categories:** Amy

Hello Helen,

This Department would require further information in terms of an assessment of noise impacts from the operational phase of the development to contain the following:

- Solar panels and frames;
- Inverters;
- Transformers;
- Cabling;
- Substation.
- And any other noise generating components.

It is acknowledged that air quality and noise have been considered for the construction phase of the development and would be conditioned as such at the application stage.

Kind regards,

Abbie

### Abbie Brown

Swyddog Iechyd yr Amgylchedd Rhanbarth | District Environmental Health Officer  
Cyngor Bwrdeistref Sirol Caerffili | Caerphilly County Borough Council



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Gallwch ohebu mewn unrhyw iaith neu fformat.Ni fydd gohebu yn Gymraeg yn creu unrhyw oedi.  
Correspondence may be in any language or format.Corresponding in Welsh will not lead to any delay.

---

**From:** WWW: Planning <[PLANNING@CAERPHILLY.GOV.UK](mailto:PLANNING@CAERPHILLY.GOV.UK)>

**Sent:** Tuesday, September 5, 2023 2:17 PM

**To:** Highway Development Control <[HIGHWAYDEVCTRL@CAERPHILLY.GOV.UK](mailto:HIGHWAYDEVCTRL@CAERPHILLY.GOV.UK)>; Gilbert, Cath

[REDACTED]; Nott, Jillian [REDACTED]; Godfrey, Maria  
[REDACTED]; Thomas, Peter [REDACTED]; WWW: LDP  
[REDACTED]; WWW: Rights Of Way [REDACTED]; SAB  
[REDACTED]; Iles, Margaret Elizabeth [REDACTED]; Dixon, Erica  
[REDACTED]; Griffiths, Philip [REDACTED]; Bryan, Richard J.  
[REDACTED]; McGlynn, Douglas [REDACTED]; Harris, Paul J.  
[REDACTED]; Browning, Rebekah [REDACTED]; Headington, Mike  
[REDACTED]; Thomas, Dewi [REDACTED]; Davies, Gareth  
[REDACTED]; WWW: Property <[PROPERTY@CAERPHILLY.GOV.UK](mailto:PROPERTY@CAERPHILLY.GOV.UK)>

**Subject:** EIASCO/23/0001 Land At Grid Ref 323096 197363

Good afternoon all

Please find attached EIA Scoping consultation with additional information in the link below.  
Please reply to the case officer (Helen Winsall) and within 14 days

[W:\Planning\EIA Scoping\EIA-23-0001](#)

Regards,

**Christopher Jones**

Swyddog Dilysiad a Monitro | Validation and Monitoring Officer  
Cyngor Bwrdeistref Sirol Caerffili | Caerphilly County Borough Council





Directorate of Technical Services  
Planning Division  
Ty Tredomen  
Parc Tredomen  
Ystrad Mynach  
Hengoed  
CF82 7WF

17th October 2023

Dear Sir,

**EIA Scoping Opinion for a proposed Solar Farm**  
**Mynydd Maen, Newbridge, Caerphilly**  
**App no. EIASCO/0001**

Thank you for your consulting us on this scoping opinion. We have read the accompanying Cultural Heritage Desk-Based assessment (dated 3rd October 2022) produced by RPS with interest.

The assessment does not conform to the Standards and Guidance of the Chartered Institute for Archaeologists (CIfA) or the Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) (2022).

However, it has identified a 'high potential for archaeological remains from the Early-medieval and Medieval periods to be present'. Furthermore, 'most of the extant hedgerows were present on the Tithe mapping and are therefore considered to be of historic importance'. As a result, the assessment recommends an 'initial geophysical survey' in order to 'further characterise the potential Medieval remains'. We also understand it is proposed to scope out cultural heritage.

However, there are potential impacts upon archaeological remains that will need to be addressed within the planning process.

Despite the issues noted above, we concur with recommended mitigation of the desk-based assessment. It is likely we would recommend a geophysical survey in the first instance, followed by an archaeological field evaluation (trenching). The scope of the evaluation would be determined by the results of the geophysical survey. As per PPW and TAN 24, this would need to be carried out prior to the determination of any application and to a Written Scheme of Investigation (WSI) agreed with ourselves. It is also possible that, depending on results, further archaeological work would be required. We would also recommend the submitted Cultural Heritage Desk-based assessment be revised to conform to both CIfA and HER deposition requirements.

Thank you for consulting us on this scoping opinion. If you or the applicants have any questions or require further advice please do not hesitate to contact us.

Yours faithfully,

[Redacted signature]

Rob Dunning BSc MCIfA  
Archaeological Planning Officer

Glamorgan-Gwent  
Archaeological Trust  
Limited  
Ymddiriedolaeth  
Archeolegol  
Morgannwg-Gwent

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**From:** Hobbs, Jacquie

**Sent:** Monday, September 18, 2023 1:25 PM

**To:** Winsall, Helen

**Subject:** EIASCR/23/0001 Land At Grid Ref 323096 197363 Abercarn Mountain Road Hafodyrynys

Helen,

**Application No:** EIASCR/23/0001

**Location:** Land At Grid Ref 323096 197363 Abercarn Mountain Road Hafodyrynys

**Proposal:** EIA Scoping Opinion for DNS: Proposed solar farm and ancillary development

Having reviewed the documentation there appears to be little or no highway / transport details submitted. The following should be submitted going forward to enable the highway authority to fully assess the proposal.

- Transport Statement – should be provided setting out the transport / highway aspects of the proposal this should include associated trip generation and types of vehicles utilising the site on a daily basis during construction, maintenance and decommissioning ..
- Parking provision on the site should be in accordance with LDP5 Parking Standards
- Swept Path Analysis of turning areas within the site to be provided
- CTMP ( Construction Traffic Management Plan will need submitted, this to include haul route, swept path analysis of routes, any proposed temp changes to highway infrastructure, traffic during construction.. numbers and type daily, banksmen etc
- AIL as necessary

I trust the above is helpful but would confirm that the advice given is offered on an informal basis having regard to the information that is at hand at the present time and is wholly without prejudice to the formal consideration given on any planning application submitted for planning permission on the site.

I trust this is of assistance

Kind regards

Jacquie

**Jacquie Hobbs**

Prif Beriannydd | Principal Engineer Cyngor Bwrdeistref Sirol Caerffili | Caerphilly County Borough Council

Comments on;

**Preliminary Landscape and Visual Assessment Notes For Mynydd Maen Solar**

Richard Bryan CMLI  
Landscape Architect

September 2023

**Introduction**

Having studied the information submitted, I would like to offer the following response. This includes observations and recommendations for additional information required within a Landscape and Visual Impact Assessment (LVIA).

**Context**

The site itself extends to approximately 28.6 hectares (70.6 acres) (excluding the cable route) and is located within LDP Abercarn VILL NH 2.3.

**Proposed Assessment Methodology**

In terms of the anticipated Landscape and Visual Impact Assessment (LVIA), I note that the Guidelines for Landscape and Visual Assessment 3 (GLVIA 3) are to be followed. However, prior to an application being made, the LPA would need to view and approve the proposed draft methodology for the LVIA and Cumulative LVIA methodology.

Evaluation of Landscape and Visual Effects

Magnitude of Change and Evaluation of Landscape and Visual Sensitivity.

Five categories ranging from 'very high', 'high', 'medium', 'low' and 'negligible or no change' are required for the landscape and visual assessment.

As advocated in the GLVIA3, professional judgement is used to balance judgements on value and susceptibility in order to determine sensitivity. Each of these aspects of the analysis will vary subject to the scale and detail of the assessment. Overall judgements on landscape and visual sensitivity should be subsequently described as; 'very high', 'high', 'medium', 'low' and 'negligible or no change'. This is commonly recognised five stage breakdown of the continuum of receptor sensitivity that's needed, to sufficient reflect the continuum and nuance.

In terms of the values attributed the table below in the submitted *“Preliminary LVA Notes”*. This has classified sensitivity of the viewpoints from PRow as **medium** sensitivity, which is not accepted. Users of the PRow networks are recognised with a categorisation of **high**, as people using the PRow network are primarily engaged in outdoor recreational activities, who’s attention is likely to be focused on the landscape and views afforded. Consequently this requires addressing.

**Viewpoints – Analysis – Sensitivities of Receptors/Values of Views**

*Visual Receptor Types (using assessment from site photos by Cenin):*

*(Preliminary desktop assessment)*

<b>VP</b>	<b>Receptor</b>	<b>Sensitivity</b>	<b>Mag of Change</b>	<b>Potential Effects</b>
1	Recreational	Medium	Medium	Mod
2	Recreational	Medium	Low / Medium	S/Mod / Mod
3	Recreational	Medium	Medium / High	Mod / Mod/Sub
4	Recreational	Medium	High	Mod/Sub
5	Recreational	Medium	Low	S/Mod
6	Recreational	Medium	Medium	Mod
7	Recreational	Medium	Low	S/Mod
8	Recreational	Medium	Low	S/Mod
9	Recreational	Medium	Low	S/Mod
10	Residential	Medium	Low / Negligible	S/Mod / Neg/S
	Road Users	Low	Low / Negligible	Slight / Neg/S
11	Residential	Medium	Negligible	Neg/S
	Road Users	Low	Negligible	Neg
12	Recreational Users	Medium	Low	Neg/S
	Residential	Medium	Low	Neg/S
12a	Residential	Medium	Low / Negligible	Neg/S
13	Road Users	Low	Neg	Neg
14	Recreational	Medium	Neg	Neg
15	Recreational	Medium	Low	S/Mod
16	Residential	Medium	Low	S/Mod
16a	Residential	Medium	(Negligible)	(Neg/S)

Furthermore, the assessment of the potential effects is somewhat premature, based on the limited information provided and consequently I do not accept this current preliminary assessment.

### **Site location, Size and Scale.**

The proposed development on Mynydd Maen offers several challenges. The below outlines my concerns and areas within the Landscape and Visual scoping report that require expansion.

- The large scale development is intended to be located in a medium scale landscape, within the Visually Important Local Landscape of Abercarn NH. 2.3. This has the high potential that the proposed solar arrays will be at odds with the land pattern in which they are located and VILL.
- Due to the type of development, including size and scale, this will have a direct impact, from the location of arrays, ancillary equipment, access tracks, below ground grid connection and construction / decommissioning compounds and associated haul routes and will need to be detailed and outlined within the overall Environmental Impact Assessment (EIA) if not the LVIA section and include the following.
  - Suitably scaled plans, showing the solar farms layout including location, position, orientation of panels in relation to field boundaries, colour of panels and details of transformers, access roads, compounds, battery storage and other ancillary infrastructure including, CCTV, perimeter fencing, gates, location and design will be required. The plan should also include any existing drystone walling on the site and its perimeters.
  - Scaled detailed plan showing the array footprint and elevation of the proposed panel design including, form, colour and dimensions.
  - The site and its perimeters contains many mature and veteran trees, notably along field boundaries. These contribute significantly to the landscape character and visual amenity of the area and VILL. Consequently, I'd expect a separate Tree Constraints Plan (TCP), to BS 5837:2012 'Trees in relation to construction' and Supplementary Planning Guidance LDP4 'Trees and Development'. This should be accompanied with a Tree Constraints Plan, overlaid on a plan showing the proposed layout.

### **Study Area**

In relation to the current study area radii and draft ZTV (10km) - with viewpoint locations identified showing the site and Zone of Theoretical Visibility (ZTV). This currently lacks clarity and detail at this scale and consequently, a more detailed ZTV for the 5km LVIA and 6km cumulative assessment study areas is required.

## **Landscape Assessment**

This should also include.

- Baseline Landscape Character assessment of the site should include baseline photographs, along with a plan of their location shown on suitably scaled OS base.
- I'd expect the landscape assessment to be made on the 5km radius of the site on Landscape Character.
- In addition to LANDMAP character areas I'd expect this to include an assessment on the Abercarn VILL NH 2.3 and Mynyddislwyn SLA NH 1.6 within the 5km study area.

## **Visual Assessment**

Candidate Viewpoints (refer to Plan 3). It's noted that these Candidate Viewpoints would be further refined, following field work, and will form the Representative Viewpoints to be assessed as part of the LVIA Chapter. On balance, with one exception, from a Caerphilly perspective the number, locations suggested within the ZTV at this stage are acceptable. However, the following draft plans will be required for further assessment and agreement.

- A more detailed and suitably scaled OS base draft ZTV and viewpoints plan for the 5km LVIA and 6km cumulative assessment study areas. This intern will assist to assess if the viewpoints' location currently selected are sufficient, correctly located and if additional viewpoints are required for a more informed appraisal and judgement to be made.
- This should be supported with baseline photographs, wireframes and visualisations / photomontages.
- Should photomontages not be provided for all viewpoints, those to be selected will need to be agreed in advance with the LPA.
- The assessment will also need to include a Viewpoint from within the site, located on the PRoW. Views will be experienced by highly sensitive users, both close and mid-range and sequential views as they slowly pass through the site.
- This should also consider the effects on sequential views, within the ZTV of those experienced by users of the PRoW networks in and close to the site.
- The assessment also needs to including key long distance walking and cycling routes within study area. Including the cumulative effect of constantly seeing views of the proposed arrays, which needs to be discussed and addressed.

The below “*Viewpoints – Analysis – Sensitivity of Receptors / Values and Views*” table within the submitted “*Preliminary LVA Notes*” is not accepted. This has incorrectly classified sensitivity of the viewpoints from PRoW as **medium** sensitivity. The recognised categorisation, for users of PRoW is **high and not medium**. As people using the PRoW network are primarily engaged in outdoor recreational activities, who’s attention is likely to be focused on the landscape and views afforded. This consequently this requires addressing.

**Viewpoints – Analysis – Sensitivities of Receptors/Values of Views**

*Visual Receptor Types (using assessment from site photos by Cenin):*

*(Preliminary desktop assessment)*

<b>VP</b>	<b>Receptor</b>	<b>Sensitivity</b>	<b>Mag of Change</b>	<b>Potential Effects</b>
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3	Recreational	Medium	Medium / High	Mod / Mod/Sub
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6	Recreational	Medium	Medium	Mod
7	Recreational	Medium	Low	S/Mod
8	Recreational	Medium	Low	S/Mod
9	Recreational	Medium	Low	S/Mod
10	Residential	Medium	Low / Negligible	S/Mod / Neg/S
	Road Users	Low	Low / Negligible	Slight / Neg/S
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	Road Users	Low	Negligible	Neg
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	Residential	Medium	Low	Neg/S
12a	Residential	Medium	Low / Negligible	Neg/S
13	Road Users	Low	Neg	Neg
14	Recreational	Medium	Neg	Neg
15	Recreational	Medium	Low	S/Mod
16	Residential	Medium	Low	S/Mod
16a	Residential	Medium	(Negligible)	(Neg/S)

## **Cumulative assessment**

*5.46 The LVIA Chapter would include an assessment of cumulative effects within the study area and, within the same LANDMAP areas and from the same Representative Viewpoints where there would be potential inter-visibility between the cumulative site and the proposed development. Cumulative projects would include those with planning permission, but yet to be constructed or within the planning system. It would not include development already constructed, such as the existing Upper Pant-Ysgawen Farm/Crumlin and Penrhiwarwydd Farm solar parks, to the northwest. These existing solar parks would be considered as part of the baseline to the assessment.*

On balance, cumulative effects arise where the study areas for two or more solar farms or other energy infrastructure, overlap so that the cumulative schemes are experienced within the study areas to greater and lesser effect depending on type and location. This means that the addition of the Proposed Development to a situation where other solar developments, or other infrastructure, are apparent may result in a greater effect than where the Proposed Development is seen by itself. It's therefore, appreciated that existing solar farms are present within the study area, however, the cumulative assessment should, include all existing identified solar and wind energy infrastructure schemes, as well as those that are consented, and those for which planning applications have been submitted.

*5.53 The cumulative assessment will include all energy developments including both solar and wind farms.*

*5.51 The cumulative assessment study area is defined as within a 6km radius from the proposed development. This was determined following a preliminary ZTV analysis which showed very limited visibility between 7 to 15km of the proposed development.*

It's welcomed that the assessment will both include wind and solar farms. A study area of 6km radius from the proposed development is proposed, which looking at the ZTV would be considered reasonable for the cumulative assessment, from a Caerphilly perspective.

**Please note, I reserve the right to request additional information once any subsequent application is received.**

**From:** Denbury, Stefan  
**Sent:** Tuesday, September 12, 2023 9:45 AM  
**To:** Winsall, Helen  
**Cc:** Bryan, Richard J.  
**Subject:** RE: EIASCO/23/0001 Land At Grid Ref 323096 197363

Hi Helen,

Thank you for the advice.

The consultation regarding wind turbines was the one attached to the recent consultation – hence my confusion.

In relation to the Solar scheme I make the following comments:

There are several public rights of way in the area of the proposed both crossing and abutting the site as shown on the attached plan (EIASCO-23-0001-PROW.pdf).

The site is crossed by NWBG/RBW172/2 and NWBG/RBW172/1, as well as ABEC/BR179/3 and is abutted by NWBG/RBW171/1, NWBG/RBW172/3 and NWBG/RBW316/1.

The proposal will be incompatible with the routes of NWBG/RBW172/2, NWBG/RBW172/1 and ABEC/BR179/3 as the proposal is to secure the entire site with a perimeter security fence – thereby obstructing these routes. It is stated in para 1.89 of the Preliminary LVA that ABEC/BR179 “runs along the outside edge of the southern field”. ABEC/BR179 is actually within this field and will need to be accommodated with an appropriate width, and screening, or diverted and screened if appropriate. Either the proposal will need to be accommodate the rights of way, or a diversion of the public paths must be sought under the Town and Country Planning Act 1990 prior to any development taking place. We would expect alternative routes to improve access and provide improved amenity value to users.

Diverting public rights of way is a possibility, however given the legislative processes, we consult statutory consultees as part of the pre-order process to gauge opinion, which in turn forecasts the expected outcome should an Order be made. Our consultees are rigorous and will expect improvements to public access and amenity and we therefore suggest the developer consults the necessary parties at the earliest stage possible. Experience is that developers are preferred to incorporate the PROW without modification where possible. We appreciate this is not always possible, but the perception of ‘sweeping the PROW to the side’ is not looked upon favourably by users and consultees.

Diverting Public Rights of Way would be at the developer’s expense and will also involve a potentially lengthy process which could delay the commencement of the development. If appropriate, we would expect any affected path to be formally diverted, with the alternative path created to our satisfaction before we allowed any development which would affect the availability of an existing Public Right of Way. If



temporary closures are then required for public safety, this can be arranged. We will not temporarily close a path to allow it to be built over even if the path is in the process of being diverted as this would prevent the reinstatement at the end of the closure period. Therefore any proposals for diversions should be submitted as early as possible to prevent delays.

As the public rights of way affected by this proposal carry rights for public equestrian users and lie to the South of many of the proposed PV panels, glint and glare are to be considered as a significant issue to users. The proximity of the panels will also affect the visual amenity of the public rights of way.

NWBG/RBW316/1 abuts the Northern boundary, glint and glare are therefore unlikely to affect path users, however the boundary to the South of this path consists of a small number of mature trees, which will provide little in the way of natural screening when looking South.

We would appreciate a landscape plan, even if in very rough form and this would be discussed with our Landscape Architect (cc'd). Screening of the PV panels with hedgerows creating a corridor for the PROW may be favourable to some, it may not to others, and this is where initial consultations with user group representatives can assist greatly. We believe maintaining the rural aspect to be of high importance. Additional hedgerows will also add to the ecological value of the site if maintained appropriately.

Enc:

EIASCO-23-0001-PROW.pdf

Kind regards,

**Stefan Denbury**

Cynorthwydd Cefn Gwlad a Hawliau Tramwy | Countryside And Rights Of Way  
Assistant

Cyngor Bwrdeistref Sirol Caerffili | Caerphilly County Borough Council

Hawliau Tramwy  
Cyhoeddus /  
Public Rights of Way

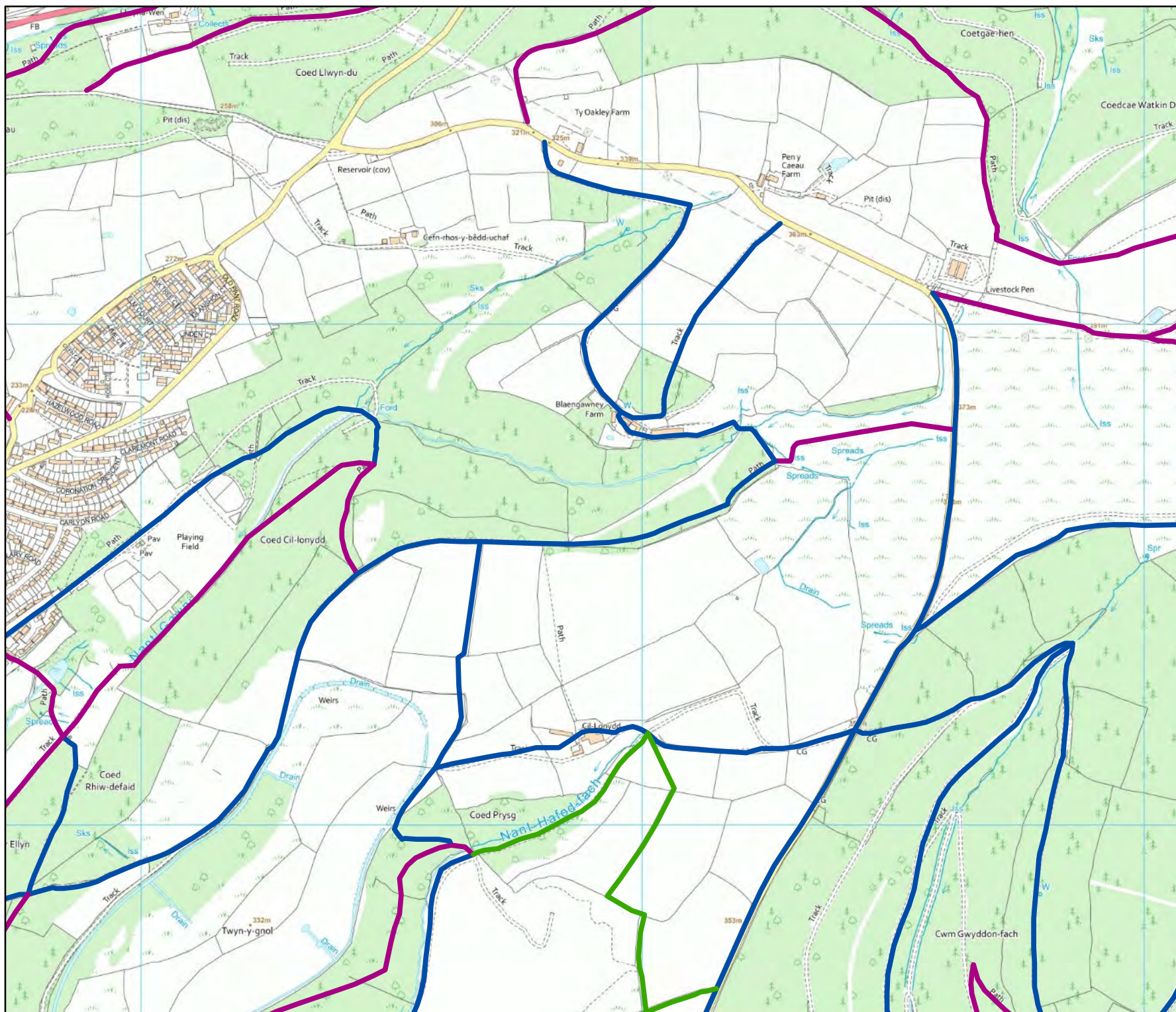
-  Cliffordd  
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-  Llwybr Ceffyl /  
Bridleway
-  Llwybr Troed /  
Footpath

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Mae'r wybodaeth hon ar gyfer arweiniad yn unig ac nid yw'n ffrifio rhan o'r Map Diffiniol. Gallwch chi gael rhagor o gyngor ac arweiniad drwy gysylltu â ni.

This information is for guidance only and does not form part of the Definitive Map. Further advice and guidance can be obtained by contacting us.

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To:	Helen Winsall	Your Ref:	EIA/23/0001
From:	Strategic Planning	My Ref:	FP/08/05/EIASCO
		Please Reply to:	Benjamin Jones
Date:	19 <sup>th</sup> September 2023	Tel. No:	██████████

**Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 for Scoping Direction for a Proposed Solar Farm and Ancillary Development at Mynydd Maen, near Newbridge.**

I refer to your request for scoping opinion regarding the site above.

**National Planning Policy**

The scoping report should be developed in line with national planning policy and technical guidance.

**Planning Policy Wales, Edition 11 (2021)**

National planning policy requires local authorities to deliver sustainable developments that have regard for the economic, social, environmental, and cultural well-being of the local area. The report should address how the development will meet these requirements.

**Future Wales, The National Plan up to 2040 (2021)**

Future Wales is the national development framework for Wales. Development proposals should be prepared in line with this guidance.

Consideration must be given to Policies 17 and 18 of Future Wales which outline the requirements for Renewable and Low Carbon Energy Developments of National Significance and their Associated Infrastructure.

The site is located within an area that has been pre-assessed for wind energy within Future Wales. These areas have been identified as potential locations where renewable energy developments could be accommodated in an acceptable way. However, this is subject to material considerations and the development satisfying all other criteria set out under Policy 18 of Future Wales.

This proposal is for a solar farm and ancillary development. Therefore, the report should identify why this form of renewable energy development has been proposed at this location, given that this area has been pre-assessed for wind energy.

## **Caerphilly County Borough Council – Adopted Local Development Plan 2010**

There are no statutory landscape, nature conservation or cultural heritage designations located within the site. A review of the Caerphilly County Borough Local Development Plan up to 2021 (Adopted November 2010) has, however, identified the following local designations and allocations that fall within the site:

- Visually Important Local Landscape (VILL) – NH2.3 Abercarn;
- Sites of Importance for Nature Conservation (SINC) – Mynydd Maen, East of Newbridge (Cable route only);
- Sandstone Safeguarding Area;
- Mineral Site Buffer Zone – MN1.3 Hafod Fach Quarry; and
- Safeguarded Cycle Routes – TR1.11 Local Links from Crumlin (Cable route only).

In respect of other constraints affecting the site, high-risk coal mining areas are located in the northern and southern parts of the main site area, as well as the eastern part of the cable route. There is a small area in the southern part of the main site that is also covered by a small area of Ancient Semi Natural Woodland. Also, numerous Public Rights of Way (PRoW) both cross the site and run along the site's periphery.

With regard to other constraints within the vicinity of the site, the boundary of the site adjoins the Mynydd Maen, East of Newbridge SINC (NH3.113), Coed Cil-Lonydd, East of Newbridge SINC (NH3.112), Gwyddon Valley Woodlands, Abercarn SINC (NH3.124) and the Cwm Hafod-Fach Woodlands, North of Abercarn SINC (NH3.128). In addition, Ancient Semi Natural Woodlands lie adjacent to the western and northern boundaries of the site. Finally, an area of recreational land protected as informal open space (LE5.11 Pantside, Newbridge) is located approximately 500m to the west of the site.

This list is not exhaustive, the advice of other Council departments should be sought.

If you require any further information, please do not hesitate to contact me.

**Benjamin Jones**  
**Planning Officer, Strategic Planning**

Ein cyf/Our ref: CAS-236213-J9F8  
Eich cyf/Your ref: DNS-CAS-02446-  
R8X8W2

PEDW (Planning and Environment Decisions Wales)  
2nd Floor West  
Crown Buildings  
Cathays Park  
Cardiff  
CF10 3NQ

Dyddiad/Date: 05 October 2023

Annwyl Syr/Madam / Dear Sir/Madam,

**TOWN AND COUNTRY PLANNING ACT 1990 THE DEVELOPMENTS OF NATIONAL SIGNIFICANCE (PROCEDURE) (WALES) ORDER 2016 (AS AMENDED) TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) (WALES) REGULATIONS 2017**

**BWRIAD / PROPOSAL: Proposed solar farm, access and ancillary development**

**LLEOLIAD / LOCATION: Land adjacent to Cil-Onnydd Farm, Newbridge**

Thank you for consulting Cyfoeth Naturiol Cymru / Natural Resources Wales about the above, which we received on 31 August 2023.

We have reviewed the document 'Mynydd Maen Solar Farm. EIA Scoping Report. Request for scoping direction Town and Country Planning (EIA) (Wales) Regulations 2017 On behalf of CENIN Renewables, dated August 2023 by RPS Group Plc and we offer the following comments:

Description of the Project

Within the Environmental Statement (ES), the proposed scheme should be described in detail in its entirety. This description should cover construction, operational and decommissioning phases as appropriate and include detailed, scaled maps and drawings. We would expect the description to include:

- The purpose and physical characteristics of the proposal
- Location, development size and configuration of the development including flexibility of the site layout
- Procedures for good working practices
- Identification of appropriate pollution contingency and emergency measures for watercourses on site
- Timing of all works and contingency plans should slippage in the programme occur
- Maintenance requirements of structures

- Arrangements for maintenance and management of any habitats within the site
- Artificial lighting requirements, including likely intensity and location of light spill on green infrastructure.

#### Illustrations within the Environmental Statement

Any maps, drawings and illustrations that are produced to describe the project should be designed in such a way that they can be overlaid with drawings and illustrations produced for other sections of the ES such as biodiversity.

### **Chapter 5 Landscape and Visual**

Our landscape remit covers statutory designated landscapes. The proposal site is located 7km southwest of Bannau Brycheiniog National Park (BBNP). There is higher ground immediately to the north and northeast of the proposal site which will screen visibility of the development from the closest parts of the BBNP. This is confirmed by the Zone of Theoretical Visibility (ZTV) analysis submitted with the Scoping Request (Plan 3). We agree that the proposed development would not have any impact on the BBNP and therefore, we consider that impacts on the BBNP can be scoped out of the ES.

### **Chapter 6 Biodiversity**

#### Protected Sites

We agree with the conclusion of the ES scoping report that there are unlikely to be significant effects on designated sites as a result of the proposed solar farm, given the distance and absence of impact pathways.

We note that there is ancient semi natural woodland close to the development site. The applicant should consider how any adverse impact to these habitats will be avoided.

#### Protected Species - general

We have also considered the following: Mynydd Maen Solar, West of Newbridge, Caerphilly, South Wales. Preliminary Ecology Appraisal, 2022, dated 10/10/22 by RPS Group Plc.

The ES for this proposed development should include sufficient information to enable the decision maker to determine the extent of any environmental impacts arising from the proposed scheme on legally protected species, including those which may also comprise notified features of designated sites affected by the proposals.

Evaluation of the impacts of the scheme should include direct and indirect; cumulative; short, medium, and long term; permanent and temporary; positive and negative; construction, operational and decommissioning/post operational phases and impacts on long-term site security of the nature conservation resource.

The ES must include a description of all the existing natural resources and wildlife interests within and in the vicinity of the proposed development, together with a detailed assessment of the likely impacts and significance of those impacts.

#### Key Habitats

We note from Section 2.2.2 of the Preliminary Ecological Appraisal Report that Phase 1 surveys were undertaken of the proposed solar development site and cable route on 23 and 24 of September 2023. We further note that, an additional area of cable route was identified and planned for survey in July 2023, and a Phase 2 survey of the marshy grassland was proposed to be undertaken in July 2023.

### Protected Species - surveys

We advise that the site and where necessary land adjacent to the site is subject to assessment to determine the likelihood of protected species being present and affected by the proposals. Targeted species surveys should be undertaken for all species scoped in which:

- i. are undertaken by qualified, experienced, and where necessary, licensed ecologist(s) and,
- ii. comply with current best practice guidelines. If the surveys deviate from published guidance, or there are good reasons for deviation, full justification for this should be included within the ES.

### *Great Crested Newt*

We note from Section 5.83 of the scoping report that, *“An Environmental DNA (eDNA) survey was completed on all four ponds on 19 April 2023. This returned a negative result for Ponds 1 and 2. Additional torching and bottle trapping surveys were completed due to the proximity of the ponds to a known GCN population. No GCN were found during either survey. It is therefore concluded that GCN are absent from the Ponds 1 and 2. Ponds 3 and 4 were both found to contain a small population of GCN during surveys following the positive eDNA result”*.

Where impacts to GCN are anticipated, we advise the application include a Great Crested Newt Conservation Plan setting out the anticipated impacts and all the mitigation and/or compensation measures that will be put in place to offset these for the proposed solar development site and cable route.

### *Bats*

We note from Section 5.83 of the scoping report that, *“there are no buildings within the Site boundary. Trees within or immediately bordering the Site have not yet been assessed for their potential to support roosting bats, however no trees are planned for removal on Site as a result of the development. The Site boundaries are assessed to be of moderate suitability for commuting and foraging bats. The nearby woodlands are of high-quality and are well-connected to the Site and wider landscape. The interior of the fields is of low suitability for foraging and commuting bats due to the tight sward and lack of species diversity”*.

Should any trees require felling or management works to facilitate the development the following advice applies. A preliminary bat roost inspection for trees should be undertaken to assess their potential to support roosting bats. For any trees categorised as having moderate to high potential for supporting bats, further surveys (climbing inspections and/or activity surveys) will be required in accordance with best practice. A detailed plan should be included with the submission which outlines which trees that require felling pruning, and their potential to support roosting bats. Should bat roosts be confirmed, we advise that the applicant also includes an assessment of the impacts of the scheme on these roost sites and proposals to mitigate or compensate for them.

Where impacts to bats are anticipated, we advise the application include a Bat Conservation Plan setting out the anticipated impacts and all the mitigation and/or compensation measures that will be put in place to offset these for the proposed solar development site and cable route.

### *Dormouse*

We note from Section 5.83 of the scoping report that, *“The hedgerows on Site have grown out into lines of trees and are therefore of limited value to dormice, lacking the diversity of*

*species that are required to support a dormouse population. The development also intends on retaining the trees and boundary hedgerows, and vegetation removal will be limited to widening of existing access points. It is therefore not proposed to complete dormouse work”.*

We welcome the intention to retain trees and boundary hedgerows surrounding the site and that vegetation removal will be limited to widening of existing access points. However, although no current records for dormice exist in the immediate area, we note the presence of habitats potentially suitable to support the species including woodland, hedgerows and scrub within and bordering the site, and note the potential for dormice to be present in the wider area. We therefore advise that a method statement is prepared for any minor works that will impact suitable dormouse habitat for the proposed solar development site and cable route.

#### Protected Species - Impact Assessment

Should protected species be confirmed, information must be provided identifying the species-specific impacts in the short, medium, and long term together with any mitigation and compensation measures proposed to offset the impacts identified. We advise comprehensive descriptions of the habitats affected are included to support robust conclusions about their significance for the species.

We advise that the ES considers significance (both alone and in combination) and where applicable conservation status. In respect of conservation status, we advise consideration be given to the current conservation status of the relevant species. The ES must demonstrate that there will be no detriment to maintenance of favourable conservation status (FCS) of the species during construction and operational phases of the scheme.

We advise that the ES sets out how the long-term site security of any mitigation or compensation will be assured, including management and monitoring information and long term financial and management responsibility. Where the potential for significant impacts on protected species is identified, we advocate that a Conservation Plan is prepared for the relevant species.

#### European Protected Species (EPS) Licence

Where a European Protected Species is identified and the development proposal will contravene the legal protection they are afforded, a licence should be sought from NRW. The ES must include consideration of the requirements for a licence and set out how the works will satisfy the three requirements as set out in the Conservation of Habitats and Species Regulations 2017 (as amended).

Where a European Protected Species is present and a development proposal is likely to contravene the legal protection, they are afforded, the development may only proceed under licence issued by Natural Resources Wales, having satisfied the three requirements set out in the legislation. A licence may only be authorised if:

- (a) It satisfies an appropriate derogation or licencing purposes, which in the case of development is most likely to be preserving public health or safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment;
- (b) There is no satisfactory alternative and
- (c) The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in its natural range.



These requirements are also translated into planning policy through Planning Policy Wales (PPW) February 2021, section 6.4.22 and 6.4.23 and Technical Advice Note (TAN) 5, Nature Conservation and Planning (September 2009). The decision-making authority must take them into account where a European Protected Species is present.

#### Legislation and Policy Compliance Review

We advise that the ES includes an audit of compliance in respect of relevant nature conservation legislation (UK and Wales) together with relevant local and national policies including BS 42020:2013.

#### **Water environment**

We note that water and land have been scoped out of the EIA.

The site lies over bedrock designated as a Secondary A aquifer and there appears to be drainage ditches/streams in the vicinity of the site including the route of the cable. While we are satisfied that the proposal is unlikely to have significant effects on soils and water, and that these topics are scoped out of the ES, we are likely to request the following information is provided with an application:

A preliminary site assessment, which should include the following:

- Identification of all water features both surface and groundwater (ponds, springs, ditches, culverts etc.) within a 250m radius along the route of the cable tunnel.
- Use made of any of these water features. This should include the construction details of wells and boreholes and details of the lithology into which they are installed.
- An indication of the flow regime in the spring or surface water feature, for example whether the water feature flows throughout the year or dries up during summer months.
- Accessibility to the spring/well.

This information should be provided on a suitably scaled map (i.e. 1:10,000) and tabulated. It would be useful for the developer to photograph each of the identified water features during the survey.

Based on the results of the survey the applicant must assess the likely impacts from the development on both quantity and quality of the surface water and groundwater. This should take into consideration both the preferred methods of construction and the assumed hydrogeology in the vicinity of the development.

We may require identified groundwater features to be monitored during the proposed workings. We would therefore recommend that the survey be undertaken as soon as possible to enable the developer to carry out suitable baseline monitoring prior to the commencement of workings at the site.

#### **Further advice**

It should be confirmed if the proposed cables will be fluid filled. Should high voltage fluid filled cables be proposed, we refer to position statement C5 in [The Environment Agency's approach to groundwater protection](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/421147/the-environment-agencys-approach-to-groundwater-protection.pdf) (publishing.service.gov.uk).

If dewatering is proposed as part of these works an abstraction licence from NRW may be required. The granting of planning permission does not guarantee an abstraction licence under the Water Resources Act 1991.

A permit under the Environmental Permitting (England and Wales) Regulations may be required if the works involve the use of drilling fluids, foams, or grouts, as well as for any treatment or disposal of contaminated soils and groundwater.

### **Other Matters**

Our comments above only relate specifically to matters included on our checklist, *Development Planning Advisory Service: Consultation Topics* (September 2018), which is published on our [website](#). We have not considered potential effects on other matters and do not rule out the potential for the proposed development to affect other interests.

We advise the applicant that, in addition to planning permission, it is their responsibility to ensure they secure all other permits/consents/licences relevant to their development. Please refer to our [website](#) for further details.

If you have any queries on the above, please do not hesitate to contact us.

Yn gywir / Yours faithfully

### **Claire McCorkindale**

Cynghorydd - Cynllunio Datblygu/Advisor - Development Planning  
Cyfoeth Naturiol Cymru/Natural Resources Wales

E-bost/E-mail: [southeastplanning@cyfoethnaturiolcymru.gov.uk](mailto:southeastplanning@cyfoethnaturiolcymru.gov.uk)

Ffôn/Phone: [REDACTED]

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi./Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

PEDW

By email

Eich cyf/Your ref: DNS CAS-  
02446-R8X8W2

Ein cyf/Our ref:

Dyddiad/Date: 6 October 2023

Dear Sir/Madam

**Mynydd Maen Solar Farm  
Land adjacent to Cil-Onnydd Farm, Newbridge  
Proposed solar farm, access and ancillary development**

Thank you for your letter of 31 August 2023 requesting a scoping direction as to the contents of an Environmental Impact Assessment in respect of the above proposed development of national significance (DNS).

Assessment

Scheduled Monuments

MM141 St Illtyd Castle Mound

MM269 Pen y Fan Canal Reservoir

Listed Buildings

1866 St Illtyd's Church LB II\*

1867 Hafod-arthen LB II

1898 Crumlin Old Farmhouse and abutting barn LB II

21002 Ty Mynydd LB

21259, Gelli Farmhouse and attached farm range, LB II

21260 Barn at Gelli Farm LB II

21263 Llanerch-uchaf Farmhouse and attached farm range LB II

21264 Barn at Llanerch-uchaf LB II

21504 Pentwyn-isaf LB II

21626 New Bethel Chapel LB II

21627 Wall railings and gates at New Bethel Chapel LB II

21632 Monuments to James Thomas and Family LB

21633 Monument to Martha Williams at New Bethel LB II 3

21634 Monument to Margaret Williams at New Bethel LB II

21635 Monument to Elizabeth Jones at New Bethel LB II

21636 Nicholas monument at New Bethel LB II

21637 Monument to Rosser Williams at New Bethel LB II

21638 Monument to Thomas Henry Thomas at New Bethel LB II

22672 Ty-Ilwyd LB II



22673 Swffryd-ganol including front garden wall LB II  
N 22674 Barn range including Cow-House at Swffryd-ganol LB II

This is a scoping opinion as to the contents of an Environmental Impact Assessment (EIA) that will be submitted in support of an application for the Mynydd Maen Solar Farm.

The request for a scoping opinion was accompanied by a desk-based historic environment assessment produced by RPS. This work has considered the impact of the proposed development on the settings of the above designated historic assets located inside 5km of the application boundary following appropriate methodologies and concluded that there will be no significant impacts. In our opinion no further assessment of the impact of the proposed development on the settings of these designated historic assets is required for the preparation of the EIA.

The desk-based historic environment assessment has identified that an Early Medieval/Medieval ecclesiastical grange is recorded within the study site. The evidence therefore suggests that there is a high potential for archaeological remains from the Early Medieval and Medieval periods to be present within the study site, and therefore recommends that a geophysical survey of the application area is required. We concur that this geophysical survey is required to be carried out before the EIA can be completed. It may also be necessary for an archaeological evaluation to be carried out if archaeological features are identified by the geophysical survey in order to determine their extent and significance.

Yours sincerely,

Denise Harris  
Historic Environment Branch

**From:** NSIP Applications <NSIP.Applications@hse.gov.uk>

**Sent:** Tuesday, September 5, 2023 1:55 PM

**To:** PEDW – Seilwaith / Infrastructure <PEDW.Infrastructure@gov.wales>

**Cc:** NSIP Applications [REDACTED]; Pam Shea [REDACTED]; Gill Smart [REDACTED]; Cathy Williams [REDACTED]

**Subject:** EIA Scoping Consultation - DNS CAS-02446-R8X8W2 - Mynydd Maen Solar Farm

Good afternoon

Thank you for your email dated 31 August 2023 consulting HSE on the EIA Scoping Consultation for the proposed Mynydd Maen Solar Farm development of National Significance (DNS). Please find HSE's advice below.

### **CEMHD5 Contribution to Consultation**

1. With reference to the plan **2023-08-15 - EIA Scoping Request - Figure 1 - Site Location Plan**, on which is shown a redlined site boundary, in the easternmost section (cable route) of the proposed development there are areas which fall within HSE public safety consultation zones associated with Major Accident Hazard Pipeline(s) operated by Wales & West Utilities:
  - a. Gilwern to Hafodyrynys [Transco ref: 2731, HSE ref: 4123525] - Wales and West Utilities
  - b. Hafodyrynys / Rhiwderin (VS002) [Transco ref: 1533, HSE ref: 4133461] - Wales and West Utilities
2. The redlined area does not currently fall within the consultation distances of any Major Accident Hazard Installation(s).
3. HSE will not advise against the proposed development, providing the proposed development does not introduce populations, either permanent or temporary, into any of HSE's public safety consultation zones which are assigned to individual Major Accident Hazard Pipeline(s).
4. Please note if at any time a new Major Accident Hazard Pipeline is introduced or existing Pipeline modified prior to the determination of a future application, then the HSE reserves the right to revise its advice.
5. Likewise, if prior to the determination of a future application, a Hazardous Substances Consent is granted for a new Major Hazard Installation or a Hazardous Substances Consent is varied for an existing Major Hazard Installation in the vicinity of the proposed project, then again the HSE reserves the right to revise its advice.

### **Would Hazardous Substances Consent be needed?**

6. The presence of hazardous substances on, over or under land at or above set threshold quantities (Controlled Quantities) may require Hazardous Substances Consent (HSC) under the Planning (Hazardous Substances) Act 1990 as amended. The substances, alone or when aggregated with others, for which HSC is required, and the associated Controlled Quantities, are set out in The Planning (Hazardous Substances) (Wales) Regulations 2015.

7. Hazardous Substances Consent would be required if the proposed development site is intending to store or use any of the Named Hazardous Substances or Categories of Substances and Preparations at or above the controlled quantities set out in schedule 1 of these Regulations.
8. Further information on HSC should be sought from the relevant Hazardous Substances Authority.

**Explosives sites**

HSE has no comment to make on the proposed development.

Please send any future correspondence to [nsip.applications@hse.gov.uk](mailto:nsip.applications@hse.gov.uk)

Kind regards,  
NSIP Team



**NSIP Team | Land Use Planning Team** | Redgrave Court, Merton Road, Bootle, Merseyside, L20 7HS.

PEDW  
Crown Buildings  
Cathays Park  
Cardiff  
CF10 3NQ

**Date: 20/09/2023**  
**Our Ref: PPA0008221**  
**Your Ref: DNS CAS-02446-R8X8W2**

Dear Sir/Madam,

**Grid Ref: 323116 197211**

**Site Address: Mynydd Maen Solar Farm, Land adjacent to Cil-Onnydd Farm, Newbridge**

**Development: Potential DNS Application: Proposed solar farm, access and ancillary development**

We refer to your Scoping Direction, in accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017, for the purposes of an application for Mynydd Maen Solar Farm under The Developments of National Significance (Procedure) (Wales) Order 2016. We welcome the opportunity to comment on the proposal and would offer the following standing advice which should be taken into account within any future application:

### **APPRAISAL**

Firstly, whilst we have no comments on the scoping opinion itself, it appears the application does not propose to connect to the public sewerage system or potable water network, and therefore Dwr Cymru Welsh Water has no objections in principle. However, should circumstances change and a connection to the public sewerage system/public sewage treatment works/potable water network is preferred we must be re-consulted on this application.

As of 7th January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. It is therefore recommended that the developer engage in consultation with Caerphilly County Borough Council, as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. Please note, Dwr Cymru Welsh Water is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation.

The applicant is also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist us in dealing with the proposal the applicant may contact Dwr Cymru Welsh Water on 0800 085 3968 to establish the location and status of the apparatus. Under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

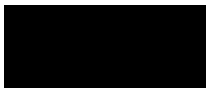
Furthermore, having reviewed the site location and information available to us, we would also advise that the site does not fall within our drinking water catchment and there are no concerns from a water resources perspective.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at [developer.services@dwrwymru.com](mailto:developer.services@dwrwymru.com)

Please quote our reference number in all communications and correspondence.

Yours faithfully,



**Owain George**  
**Planning Liaison Manager**  
**Developer Services**

***Please Note that demands upon the water and sewerage systems change continually; consequently, the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.***





Planning & Environment  
Decisions Wales  
Crown Buildings  
Cathays Park  
Cardiff  
CF10 3NQ  
[PEDW.Infrastructure@gov.wales](mailto:PEDW.Infrastructure@gov.wales)

Our Ref: DJH/30-15187 (BR13)  
Your Ref: DNS CAS-02446-R8X8W2  
Date: 04 October 2023  
Contact: Crew Manager D J Howells  
Tel: [REDACTED]  
E-mail: [REDACTED]

Dear Sir/Madam,

**TOWN AND COUNTRY PLANNING ACT 1990  
PROPOSAL: PROPOSED SOLAR FARM, ACCESS AND ANCILLARY  
DEVELOPMENT  
LOCATION: LAND ADJACENT TO CIL-ONNYDD FARM, NEWBRIDGE**

I acknowledge receipt of the notification to the South Wales Fire and Rescue Authority ("The Authority") in relation to the above application.

The proposed site plan in relation to the above has been examined and The Authority wish the following comments to be brought to the attention of the committee/applicant. It is important that these matters are dealt with in the early stages of any proposed development.

Changes to our climate and weather patterns will have a significant impact on the well-being of both current and future generations. In line with the **Well-being of Future Generations (Wales) Act 2015** and the **Future Wales – the national plan 2040** framework document, the following areas should be considered early in the planning process:

The climate emergency is likely to increase the risk of flooding as a result of sea-level rises, more frequent severe weather systems and more intense rainfall. Planning authorities should adopt a precautionary approach of positive avoidance of building developments in areas of flooding from the sea or from rivers. Surface water flooding will affect the choice of location and the layout and design of schemes and these factors should be considered at an early stage in formulating any development proposals.

Wildfires are a significant potential threat particularly in populated areas adjoining green spaces such as mountains or forestry. Therefore, it is critical that new developments are designed with this in mind. Where a new development is proposed in an area which is at risk of a wildfire, consideration should be given on how to mitigate the spread of wildfires. For example, sustainable land management could assist with prevention measures.

## Large Commercial Solar Arrays, Battery Energy storage Facilities, Electric Vehicle Parking/Charging Facilities:

Fires involving the installations detailed above can be very difficult to extinguish. Conditions can cause a thermal runaway within battery cells, which is a highly exothermic reaction creating toxic, flammable, and/or explosive chemical atmospheres.

The developer of such sites should ensure they have suitable safety measures to contain and restrict the spread of fire, using fire-resistant materials and adequate separation between locations where energy systems may be stored.

Active fire safety systems should be incorporated into the design if necessary and may include, automatic fire detection systems, automatic fire suppression and smoke control systems.

The Authority recognises that the charging of electric vehicles and the use of batteries (including lithium-ion) as Energy Storage Systems (ESS) is a new and emerging practice in the global renewable energy sector. As with all new and emerging practices within UK industry, developers should consider the risks associated with such systems early in the design stage of the project.

### Standing Advice.

The site plan/s of the above proposal has been examined and The Authority would wish the following comments to be brought to the attention of the planning committee/applicant. It is important that these matters are dealt with early on in any proposed development:

- The Fire Authority has no objection to the proposed development and refers the Local Planning Authority to any current standing advice by the Fire Authority about the consultation.

The developer should also consider the need for the provision of:-

- a. adequate water supplies on the site for firefighting purposes; and
- b. access for emergency firefighting appliances

Should the applicant require further information in relation to these matters they should contact the above named fire safety officer.

Yours faithfully,



**Duly signed and authorised by  
for Assistant Chief Fire Officer**

**cc:** A solid black rectangular box used to redact the contact information (likely an email address) associated with the Assistant Chief Fire Officer.

Enc: BR13 Appendix

## Appendix

### 1.0 Access For Fire Appliances

Typical vehicle access route requirements:

Appliance Type	Min Width Road	Min Width Gate	Min Turning Circle between Kerb
Pump	3.7m	3.1m	16.8m
Aerial Appliance	3.7m	3.1m	26.9m

Min Turning between Wall	Min Height Clearance	Min Capacity Tonnes
19.2	3.7m	12.5
29.0	4.0m	23

#### Pedestrian Priority

Pedestrian schemes must take into account the need for permanent and unobstructed access for firefighting appliances. The siting of ornamental structures such as flower beds, must take account, not only of the access requirements of the fire appliances but the need to be able to site them in strategic positions; in particular, account must be taken of the working space requirements for aerial appliances. Consultation must take place with the Fire and Rescue Authority during the earliest planning stages of any development to ensure adequate access for fire appliances, their siting and use.

### 2.0 Water Supplies for Firefighting

The existing output of the statutory water supply network may need to be upgraded in certain parts of the local plan area to cater for firefighting needs of new developments. It is recommended that this provision be a condition of planning consent.

#### Access to Open Water Supplies

Where development of water front sites takes place, the need for permanent and unobstructed access for firefighting appliances to the water should be made a condition of any planning consent.

Consultation must take place with the Fire and Rescue Authority during the earliest planning stages of any development to ensure access for fire pumping appliances is satisfactory.

## 2.1 Housing

Minimum main size 100mm. Housing developments with units of detached or semi-detached houses of not more than two floors should have a water supply capable of delivering a minimum of eight litres per second through any hydrant on the development.

Housing developments with units of more than two floors should have a water supply capable of delivering a minimum of 20 to 35 litres per second through any hydrant on the development.

## 2.2 Transportation

Lorry/Coach Parks - Multi-Storey Car Parks-Service Stations

Minimum main size 100mm. All of these amenities should have a water supply capable of delivering a minimum of 25 litres per second through any hydrant on the development or within a vehicular distance of 90 metres from the complex.

## 2.3 Industry

In order that an adequate supply of water is available for use by the Fire and Rescue Authority in case of fire, it is recommended that the water supply infrastructure to any Industrial estate is as follows:

Light Industrial

Minimum Main Size 100mm  
Up to one hectare, 20 litres per second

Commercial/Industrial

Up to two hectares, 35 litres per second - Minimum Main Size 150mm

High Risk Industrial

Two to three hectares 50 litres per second - Minimum Main Size 150mm.  
Over three hectares, 75 litres per second.

In rural areas it may not be possible to provide sufficient mains water. To overcome this, static or river supplies would be considered on site at the above flow rates for at least one hour.

The Fire and Rescue Authority should be consulted at the outline planning stage of any proposed projects to ascertain the exact requirements, as high risk units may require a greater flow.

## 2.4 Shopping, Health and Community Facilities

### Village Halls

Should have a water supply capable of delivering a minimum of 15 litres per second through any hydrant on the development or within a vehicular distance of 100 metres from the complex.

### Primary Schools and single storey Health Centres

Should have a water supply capable of delivering a minimum of 20 litres per second through any hydrant on the development or within a vehicular distance of 70 metres from the complex.

### Secondary Schools, Colleges, Large Health and Community Facilities

Should have a water supply capable of delivering a minimum of 35 litres per second through any hydrant on the development or within a vehicular distance of 70 metres from the complex.

## 2.6 Distances Between Fire Hydrants

The distance between fire hydrants should not exceed the following:

Residential areas	-	200 metres
Industrial Estates (Subject to operational needs)	-	150 metres
Town centre areas	-	90 metres
Commercial (Offices & Shops)	-	100 metres
Residential Hotels	-	Adjacent to access
Hotels	-	Adjacent to access
Institutional (Hospitals & Old Persons Homes)	-	Adjacent to access
Old Persons Homes	-	Adjacent to access
Educational (Schools & Colleges)	-	Adjacent to access

## 2.7 Conclusion

Developers should hold joint discussion with Dwr Cymru - Welsh Water or the National Rivers Authority and the Fire and Rescue Authority to ensure that adequate water supplies are available in case of fire. The Fire and Rescue Authority reserve the right to ask for static water supplies for firefighting on site as a condition of planning consent, if the supply infrastructure is inadequate for any given risk.



The Coal  
Authority



INVESTOR IN PEOPLE



RTPI  
Learning Partner

200 Lichfield Lane  
Berry Hill  
Mansfield  
Nottinghamshire  
NG18 4RG

Tel: 01623 637 119 (Planning Enquiries)

Email: [planningconsultation@coal.gov.uk](mailto:planningconsultation@coal.gov.uk)

Web: [www.gov.uk/coalauthority](http://www.gov.uk/coalauthority)

For the Attention of: Marloes Holtkamp – Planning Officer  
Planning and Environment Decisions Wales

**[By Email: [PEDW.Infrastructure@gov.wales](mailto:PEDW.Infrastructure@gov.wales)]**

28<sup>th</sup> September 2023

Dear Marloes

**Re: Scoping Request - Proposed solar farm, access and ancillary development;  
Land adjacent to Cil-Onnydd Farm, Newbridge**

Thank you for your notification received on the 31st August 2023 seeking the views of the Coal Authority on the above.

The Coal Authority is a non-departmental public body sponsored by the Department for Energy Security and Net Zero. As a statutory consultee, The Coal Authority has a duty to respond to planning applications and development plans in order to protect the public and the environment in mining areas.

Our records indicate that coal outcrops are present along the northern and south western edges of the site identified, and are also running through what is assumed to be the access route. If these coal outcrops have been subject to shallow workings these may pose a potential risk to surface stability and public safety.

At this scoping stage it is noted that no proposed layout is available for the solar farm and its ancillary development. Solar farms (the erection of solar panels) falls on our published Exemptions List due to the minimal groundworks required to erect these structures and their flexibility to cope with varied ground conditions. We do however request submission of a Coal Mining Risk Assessment where significant ancillary buildings are proposed within the defined Development High Risk Area (DHRA),

consideration should also be given to the risks posed by past coal mining activity where permanent surfaced access roads are proposed as part of the scheme.

Although we have no specific comments to make on the submitted Scoping Report, and do not consider that land instability arising from past coal mining activity should be included in this report, we are of the opinion that if elements of the scheme are proposed within the DHRA which do not fall on our exemptions list then a Coal Mining Risk Assessment should be submitted.

Please do not hesitate to contact me if you would like to discuss this matter further.

Yours sincerely



**Melanie Lindsley** *BA (Hons), DipEH, DipURP, MA, PGCertUD, PGCertSP, MRTPI*

**Principal Planning & Development Manager**

Disclaimer

The above consultation response is provided by The Coal Authority as a Statutory Consultee and is based upon the latest available data on the date of the response, and electronic consultation records held by The Coal Authority since 1 April 2013. The comments made are also based upon only the information provided to The Coal Authority by the Local Planning Authority and/or has been published on the Council's website for consultation purposes in relation to this specific planning application. The views and conclusions contained in this response may be subject to review and amendment by The Coal Authority if additional or new data/information (such as a revised Coal Mining Risk Assessment) is provided by the Local Planning Authority or the Applicant for consultation purposes.





**Appendix 5.1**  
Solar Photovoltaic Glint and Glare  
Study

# Solar Photovoltaic Glint and Glare Study

RPS Group PLC

Cil Lonydd Solar Farm

April 2024



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## ADMINISTRATION PAGE

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Issue	Date	Detail of Changes
1	December 2023	Initial issue
2	February 2024	Administrative revisions
3	April 2024	Updated layout and viewpoint receptors

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## EXECUTIVE SUMMARY

### Report Purpose

Pager Power has been retained to assess the possible effects of glint and glare from a fixed ground-mounted solar photovoltaic development located in Newbridge, Caerphilly, South Wales. This assessment pertains to the potential impacts upon road safety and residential amenity in the surrounding area of the proposed development.

### Overall Conclusions

No significant impacts are predicted upon road safety and residential amenity. Mitigation is not recommended.

### Guidance and Studies

There is no formal planning guidance for the assessment of solar reflections from solar panels towards roads and nearby dwellings. Pager Power has however produced guidance for glint and glare and solar photovoltaic developments, which was published in early 2017, with the fourth edition<sup>1</sup> published in 2022. This methodology defines a comprehensive process for determining the impact upon road safety and residential amenity.

Pager Power's approach is to undertake geometric reflection calculations and, where a solar reflection is predicted, consider the screening (existing and/or proposed) between the receptor and the reflecting solar panels. The scenario in which a solar reflection can occur for all receptors is then identified and discussed, and a comparison is made against the available solar panel reflection studies to determine the overall impact.

The available studies have measured the intensity of reflections from solar panels with respect to other naturally occurring and manmade surfaces. The results show that the reflections produced are of intensity similar to or less than those produced from still water and significantly less than reflections from glass and steel<sup>2</sup>.

### Assessment Conclusions – Road Safety

All roads within 1km of the proposed development are local roads, where traffic densities are likely to be relatively low. Technical modelling is not recommended for local roads; therefore, a low impact is predicted for all road users when considering the worst-case, in accordance with the associated guidance (Appendix D).

---

<sup>1</sup> [Pager Power Glint and Glare Guidance](#), Fourth Edition, September 2022.

<sup>2</sup> SunPower, 2009, SunPower Solar Module Glare and Reflectance (appendix to Solargen Energy, 2010).

### **Assessment Conclusions – Residential Amenity**

Solar reflections are geometrically possible towards all 51 assessed dwelling receptors. Screening in the form of existing vegetation and intervening terrain has been identified for all 51 dwellings to significantly obstruct views of reflecting panels, such that solar reflections will not be experienced by residents in practice. No impact is predicted, and mitigation is not required.

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## ABOUT PAGER POWER

Pager Power is a dedicated consultancy company based in Suffolk, United Kingdom. The company has undertaken projects in 59 countries within Europe, Africa, America, Asia and Australasia.

The company comprises a team of experts to provide technical expertise and guidance on a range of planning issues for large and small developments.

Pager Power was established in 1997. Initially the company focus was on modelling the impact of wind turbines on radar systems. Over the years, the company has expanded into numerous fields including:

- Renewable energy projects;
- Building developments;
- Aviation and telecommunication systems.

Pager Power prides itself on providing comprehensive, understandable and accurate assessments of complex issues in line with national and international standards. This is underpinned by its custom software, longstanding relationships with stakeholders and active role in conferences and research efforts around the world.

Pager Power's assessments withstand legal scrutiny and the company can provide support for a project at any stage.

## 1 INTRODUCTION

### 1.1 Overview

Pager Power has been retained to assess the possible effects of glint and glare from a fixed ground-mounted solar photovoltaic development located in Newbridge, Caerphilly, south Wales. This assessment pertains to the potential impacts upon road safety and residential amenity in the surrounding area of the proposed development.

This report contains the following:

- Solar development details;
- Explanation of glint and glare;
- Overview of relevant guidance and studies;
- Overview of Sun movement;
- Assessment methodology;
- Identification of receptors;
- Glint and glare assessment for identified receptors;
- Results discussion;
- Overall conclusions and recommendations.

### 1.2 Pager Power's Experience

Pager Power has undertaken over 1,200 Glint and Glare assessments in the UK and internationally. The studies have included assessment of civil and military aerodromes, railway infrastructure and other ground-based receptors including roads and dwellings.

### 1.3 Glint and Glare Definition

The definition<sup>3</sup> of glint and glare is as follows:

- Glint – a momentary flash of bright light typically received by moving receptors or from moving reflectors;
- Glare – a continuous source of bright light typically received by static receptors or from large reflective surfaces.

The term 'solar reflection' is used in this report to refer to both reflection types i.e. glint and glare.

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<sup>3</sup> These definitions are aligned with those presented within the Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) – published by the Department for Energy Security and Net Zero in November 2023 and the Federal Aviation Administration in the USA.

## 2 SOLAR DEVELOPMENT LOCATION AND DETAILS

### 2.1 Overview

The following sections present key details pertaining to the proposed development and this assessment.

### 2.2 Proposed Development Site Layout

Figure 1 below shows the site layout<sup>4</sup> for the proposed development.

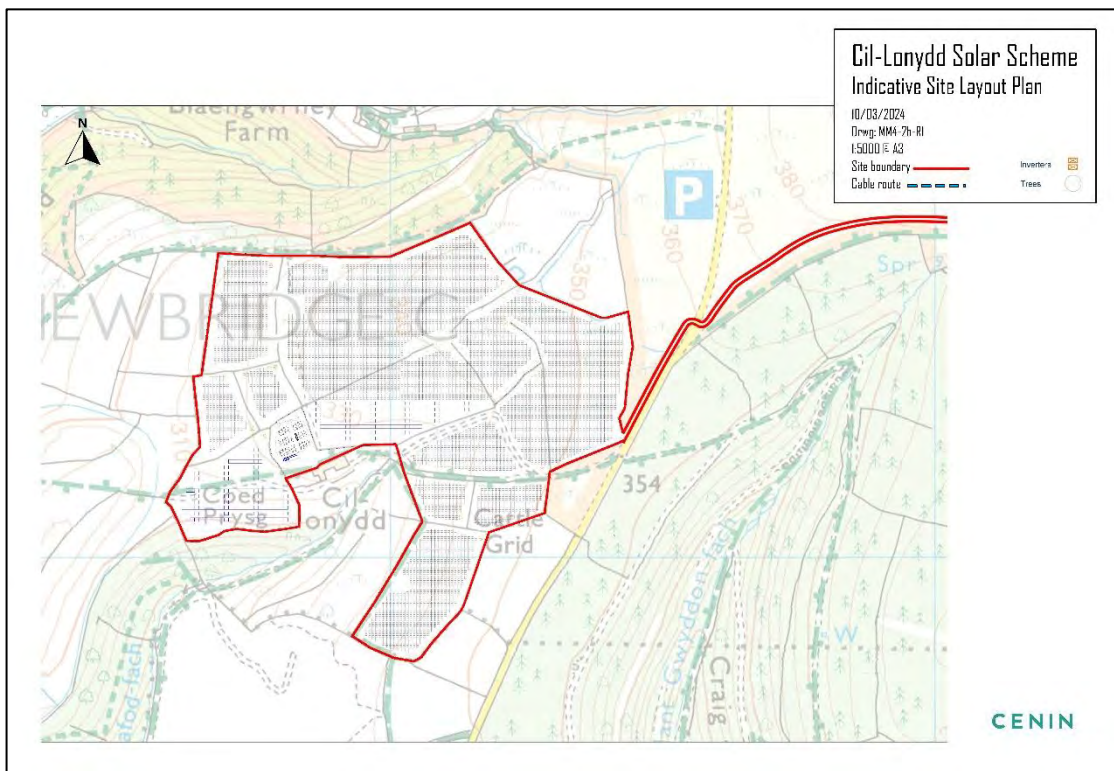


Figure 1 Site layout

### 2.3 Reflector Areas

The bounding coordinates for the proposed development have been extrapolated from the site plans. The data can be found in Appendix G. Figure 2 on the following page shows the assessed reflector areas that have been used for modelling purposes.

<sup>4</sup> Source: 'MM4-2b-R1 - Cil-Lonydd Site layout plan'



Figure 2 Assessed reflector areas

A resolution of 20m has been chosen for this assessment. This means that a geometric calculation is undertaken for each identified receptor every 20m from within the defined areas. This resolution is sufficiently high to maximise the accuracy of the results – increasing the resolution further would not significantly change the modelling output. If a reflection is experienced from an assessed panel location, then it is likely that a reflection will be viewable from similarly located panels within the proposed solar development.

The modelled reflector area is slightly larger than the proposed site layout following an updated layout<sup>5</sup>. Therefore, the modelling results present a worst-case. The overall conclusions of this report remain the same.

## 2.4 Solar Panel Technical Information

The technical information of the modelled solar panels used in this assessment is summarised below:

- Azimuth angles<sup>6</sup>: 90° / 180° (panel areas 1 and 2 only) / 270°;
- Elevation angle<sup>7</sup>: 25°;
- Assessed centre height<sup>8</sup>: 1.65m above ground level.

<sup>5</sup> Panel area 9 has since been omitted

<sup>6</sup> Direction the panels are facing relative to True North (0°)

<sup>7</sup> Pitch above horizontal

<sup>8</sup> Relative to the lowest (0.800m) and highest (2.500m) points above ground level

## 3 GLINT AND GLARE ASSESSMENT METHODOLOGY

### 3.1 Overview

The following sub-sections provide a general overview with respect to the guidance studies and methodology which informs this report. Pager Power has also produced its own Glint and Glare Guidance which draws on assessment experience, consultation and industry expertise.

### 3.2 Guidance and Studies

There is no formal planning guidance for the assessment of solar reflections from solar panels towards roads and nearby dwellings. Pager Power has however produced guidance for glint and glare and solar photovoltaic developments, which was published in early 2017, with the fourth edition<sup>9</sup> published in 2022. This methodology defines a comprehensive process for determining the impact upon road safety and residential amenity.

The Pager Power approach is to identify receptors, undertake geometric reflection calculations and review the scenario under which a solar reflection can occur, whilst comparing the results against available solar reflection studies.

Appendix A and B present a review of relevant guidance and independent studies with regard to glint and glare issues from solar panels and glass. The overall conclusions from the available studies are as follows:

- Specular reflections of the Sun from solar panels and glass are possible;
- The measured intensity of a reflection from solar panels can vary from 2% to 30% depending on the angle of incidence;

Published guidance shows that the intensity of solar reflections from solar panels are equal to or less than those from still water and similar to those from glass. It also shows that reflections from solar panels are significantly less intense than many other reflective surfaces, which are common in an outdoor environment, including steel<sup>10</sup>.

### 3.3 Background

Details of the Sun's movements and solar reflections are presented in Appendix C.

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<sup>9</sup> Pager Power Glint and Glare Guidance, Fourth Edition, September 2022.

<sup>10</sup> SunPower, 2009, SunPower Solar Module Glare and Reflectance (appendix to Solargen Energy,2010).

### 3.4 Methodology

The glint and glare assessment methodology has been derived from the information provided to Pager Power through consultation with stakeholders and by reviewing the available guidance, studies and Pager Power's practical experience. The methodology for this glint and glare assessment is as follows:

- Identify receptors in the area surrounding the proposed development;
- Consider direct solar reflections from the proposed development towards the identified receptors by undertaking geometric calculations;
- Consider the visibility of the reflectors from the receptor's location. If the reflectors are not visible from the receptor then no reflection can occur;
- Based on the results of the geometric calculations, determine whether a reflection can occur, and if so, at what time it will occur;
- Consider both the solar reflection from the proposed development and the location of the direct sunlight with respect to the receptor's position;
- Consider the solar reflection with respect to the published studies and guidance;
- Determine whether a significant detrimental impact is expected in line with Appendix D.

Within the Pager Power model, the reflector area is defined, as well as the relevant receptor locations. The result is a chart that states whether a reflection can occur, the duration and the panels that can produce the solar reflection towards the receptor.

### 3.5 Assessment Methodology and Limitations

Further technical details regarding the methodology of the geometric calculations and limitations are presented in Appendix E and Appendix F.

## 4 IDENTIFICATION OF RECEPTORS

### 4.1 Overview

The following sections present the relevant receptors assessed within this report. Terrain data has been interpolated based on Ordnance Survey (OS) 50 Digital Terrain Model (DTM) data. The receptor details for all receptors are presented in Appendix G.

### 4.2 Ground Based Receptors Overview

There is no formal guidance with regard to the maximum distance at which glint and glare should be assessed. From a technical perspective, there is no maximum distance for potential reflections. The significance of a reflection however decreases with distance because the proportion of an observer's field of vision that is taken up by the reflecting area diminishes as the separation distance increases. Terrain and shielding by vegetation are also more likely to obstruct an observer's view at longer distances.

The above parameters and industry experience over a significant number of glint and glare assessments undertaken, shows that a 1km assessment area from the proposed development is considered appropriate for glint and glare effects on road users and dwellings. The assessment area (white outlined area in the following figures) has been designed accordingly as 1km from the proposed development.

Potential receptors within the associated assessment area are identified based on mapping and aerial photography of the region. The initial judgement is made based on high-level consideration of aerial photography and mapping i.e. receptors are excluded if it is clear from the outset that no visibility would be possible. A more detailed assessment is made if the modelling reveals a reflection would be geometrically possible.

### 4.3 Road Receptors

#### 4.3.1 Road Receptors Overview

Road types can generally be categorised as:

- Major National – Typically a road with a minimum of two carriageways with a maximum speed limit of up to 70mph. These roads typically have fast moving vehicles with busy traffic;
- National – Typically a road with a one or more carriageways with a maximum speed limit 60mph or 70mph. These roads typically have fast moving vehicles with moderate to busy traffic density;
- Regional – Typically a single carriageway with a maximum speed limit of up to 60mph. The speed of vehicles will vary with a typical traffic density of low to moderate;
- Local – Typically roads and lanes with the lowest traffic densities. Speed limits vary.

Technical modelling is not recommended for local roads, where traffic densities are likely to be relatively low. Any solar reflections from the proposed development that are experienced by a



road user along a local road would be considered low impact in the worst-case in accordance with the guidance presented in Appendix D.

The analysis has also considered major national, national, and regional roads that:

- Are within the one-kilometre assessment area;
- Have a potential view of the panels.

#### 4.3.2 Identified Road Receptors

No roads have been identified for assessment within the assessment area, as all roads within the assessment area are local roads, and technical modelling for local roads is not recommended. Therefore, a low impact is predicted upon road users within 1km of the proposed development when considering the worst-case.

The closest regional, national or major national roads to the proposed development are the A467, A742 and B4251, approximately 1.3km, 1.4km and 1.9km west of the proposed development as shown in Figure 3 below.



Figure 3 Closest regional, national and major national roads to proposed development

## 4.4 Dwelling Receptors

### 4.4.1 Dwelling Receptors Overview

The analysis has considered dwellings that:

- Are within the one-kilometre assessment area; and
- Have a potential view of the panels.

In residential areas with multiple layers of dwellings, only the outer dwellings have been considered for assessment. This is because they will mostly obscure views of the solar panels to the dwellings behind them, which will therefore not be impacted by the proposed development because line of sight will be removed, or they will experience comparable effects to the closest assessed dwelling.

Additionally, in some cases, a single receptor point may be used to represent a small number of separate addresses. In such cases, the results for the receptor will be representative of the adjacent observer locations, such that the overall level of effect in each area is captured reliably.

### 4.4.2 Identified Dwelling Receptors

The assessed dwelling receptors are shown in Figures 4 to 8 below and on the following pages. In total, 51 dwellings have been assessed. An additional 1.8m height above ground is used in the modelling to simulate the typical viewing height of an observer on the ground floor<sup>11</sup>.



Figure 4 Overview of all dwelling receptors

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<sup>11</sup> Small changes to this height are not significant, and views above the ground floor considered are considered where appropriate.



Figure 5 Dwellings 1 to 13



Figure 6 Dwellings 14 to 25



Figure 7 Dwellings 26 to 36



Figure 8 Dwellings 37 to 51

## 4.5 Viewpoint Receptors

### 4.5.1 Viewpoint Receptors Overview

Theoretical points of visibility have been considered across the surrounding area of the proposed development. The viewpoints are considered in the context of Public Rights of Way (PRoW).

### 4.5.2 Identified Viewpoint Receptors

The assessed dwelling receptors are shown in Figure 9 below. In total, 16 viewpoint receptors have been assessed. An additional 1.8m height above ground is used in the modelling to simulate the typical viewing height of an observer.

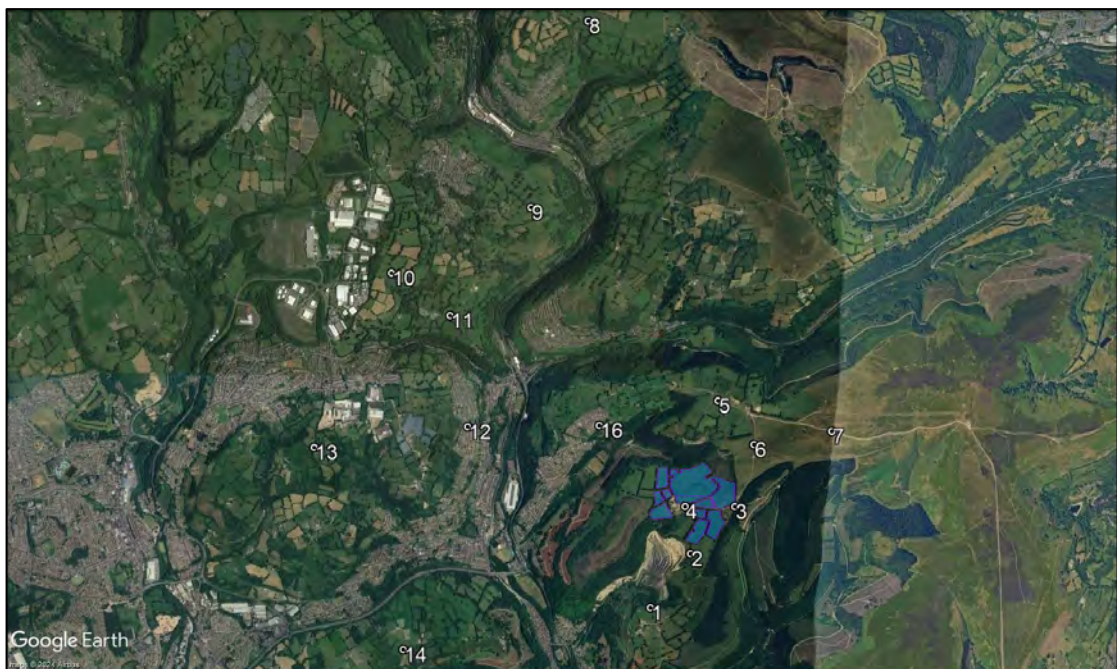


Figure 9 Viewpoint receptors

## 5 GEOMETRIC ASSESSMENT RESULTS AND DISCUSSION

### 5.1 Overview

The following sub-sections summarise the results of the assessment:

- The key considerations for each receptor type. The criteria are determined by the assessment process for each receptor, which are set out in Appendix D;
- Geometric modelling results of the assessment based solely on bare-earth terrain i.e., without consideration of screening in the form of buildings, dwellings, (existing or proposed) vegetation, and/or terrain. The modelling output for receptors, shown in Appendix H, presents the precise predicted times and the reflecting panel areas;
- Whether a reflection will be experienced in practice. When determining the visibility of the reflecting panels for an observer, a conservative review of the available imagery, landscape strategy plan, google earth viewshed (high-level terrain analysis), and/or site photography (if available) is undertaken, whereby it is assumed views of the panels are possible if it cannot be reliably determined that existing and/or proposed screening will remove effects. Detailed screening analysis may be undertaken to determine visibility, where appropriate;
- The impact significance and any mitigation recommendations/requirements;
- The desk-based review of the available imagery, where appropriate.

Appendix H presents the results charts showing specific times and dates.

### 5.2 Assessment Results – Dwelling Receptors

#### 5.2.1 Key Considerations

The key considerations for residential dwellings are:

- Whether a reflection is predicted to be experienced in practice;
- The duration of the predicted effects, relative to thresholds of:
  - Three months per year;
  - 60 minutes on any given day.

Where solar reflections are not geometrically possible, or the reflecting panels are predicted to be significantly obstructed from view, no impact is predicted, and mitigation is not required.

Where effects occur for **less** than three months per year and **less** than 60 minutes on any given day, or the closest reflecting panel is over 1km from the dwelling, the impact significance is low, and mitigation is not recommended.

Where reflections are predicted to be experienced for **more** than three months per year and/or for **more** than 60 minutes on any given day, expert assessment of the following factors is required to determine the impact significance and mitigation requirement:

- The separation distance to the panel area – larger separation distances reduce the proportion of an observer's field of view that is affected by glare;

- The position of the Sun – effects that coincide with direct sunlight appear less prominent than those that do not;
- Whether visibility is likely from all storeys – the ground floor is typically considered the main living space and has a greater significance with respect to residential amenity;
- Whether the dwelling appears to have windows facing the reflecting area – factors that restrict potential views of a reflecting area reduce the level of impact.

Following consideration of these mitigating factors, where the solar reflection is not deemed significant, a low impact is predicted, and mitigation is not recommended. Where the solar reflection is deemed significant, the impact significance is moderate, and mitigation is recommended.

If effects last for **more** than three months per year and for **more** than 60 minutes on any given day, and there are no mitigating factors, the impact significance is high, and mitigation is required.

#### **5.2.2 Geometric Modelling Results and Discussion**

Table 1 on the following page presents the geometric modelling results and predicted impact significance for the assessed dwelling receptors.

Dwelling Receptor	Geometric Modelling Results (screening not considered)	Identified Screening and Predicted Visibility (desk-based review)	Mitigating Factors	Predicted Impact Classification
1 – 46	Solar reflections geometrically possible for <b>more</b> than three months per year but <b>less</b> than 60 minutes on any given day	Existing vegetation and intervening terrain is predicted to significantly obstruct views of reflecting panels	N/A	No impact
47 – 51	Solar reflections geometrically possible for <b>less</b> than three months per year and <b>less</b> than 60 minutes on any given day	Existing vegetation and intervening terrain is predicted to significantly obstruct views of reflecting panels	N/A	No impact

Table 1 Geometric modelling results and predicted impact - dwelling receptors

### 5.2.3 Desk-Based Review of Available Imagery

A desk-based review of the available imagery is presented in Figures 10 to 12 on the following pages. The cumulative reflecting panel areas are indicated by regions of yellow. The identified screening in the form of existing vegetation is outlined in green. High-level zones of theoretical visibility (ZTV<sup>12</sup>) are shown in scattered regions of green.

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<sup>12</sup> Generated by Google Earth viewshed at 5 metres above ground level to account for views above ground level



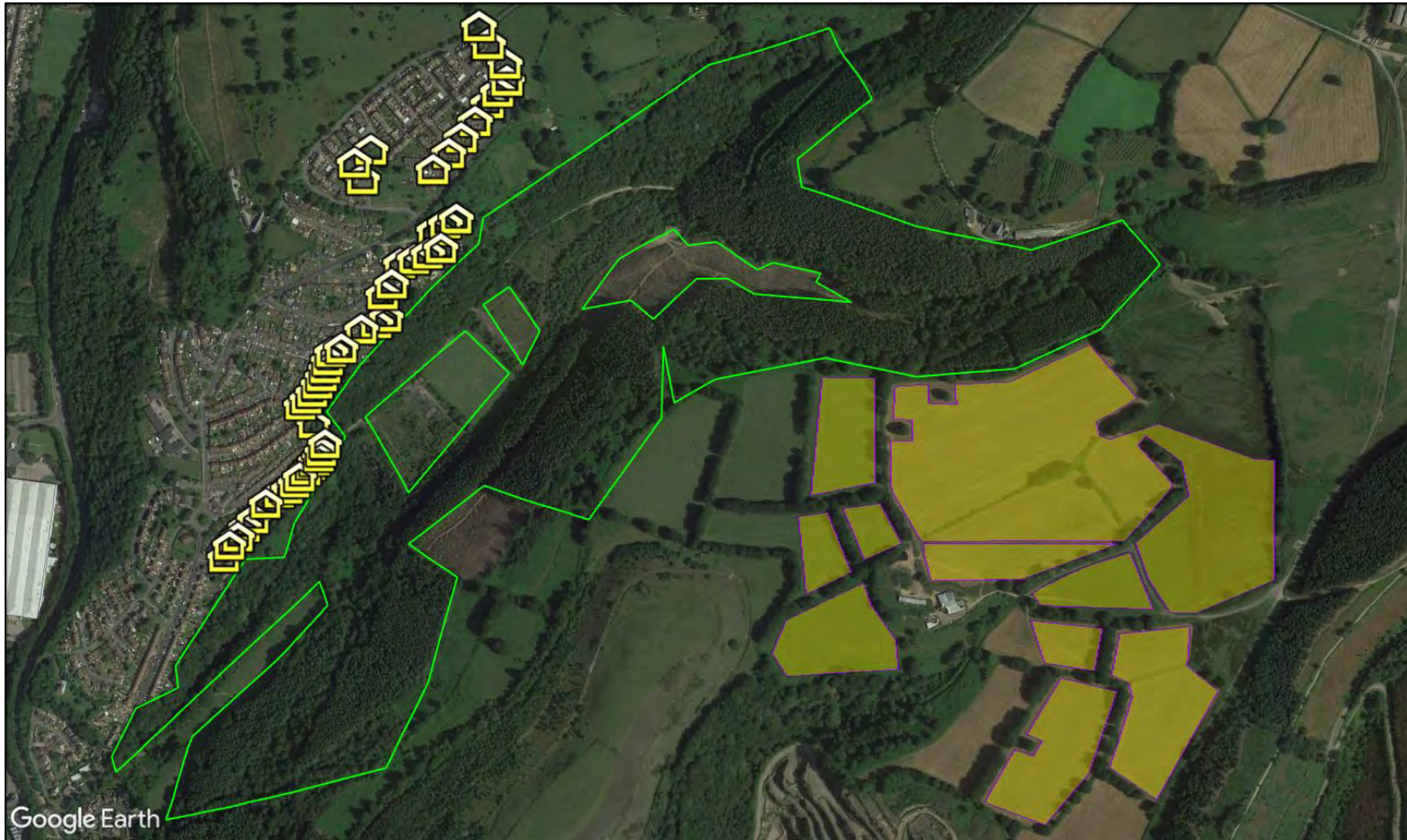


Figure 10 Vegetation screening for dwellings 1 to 51



Figure 11 Intervening terrain between dwellings and proposed development

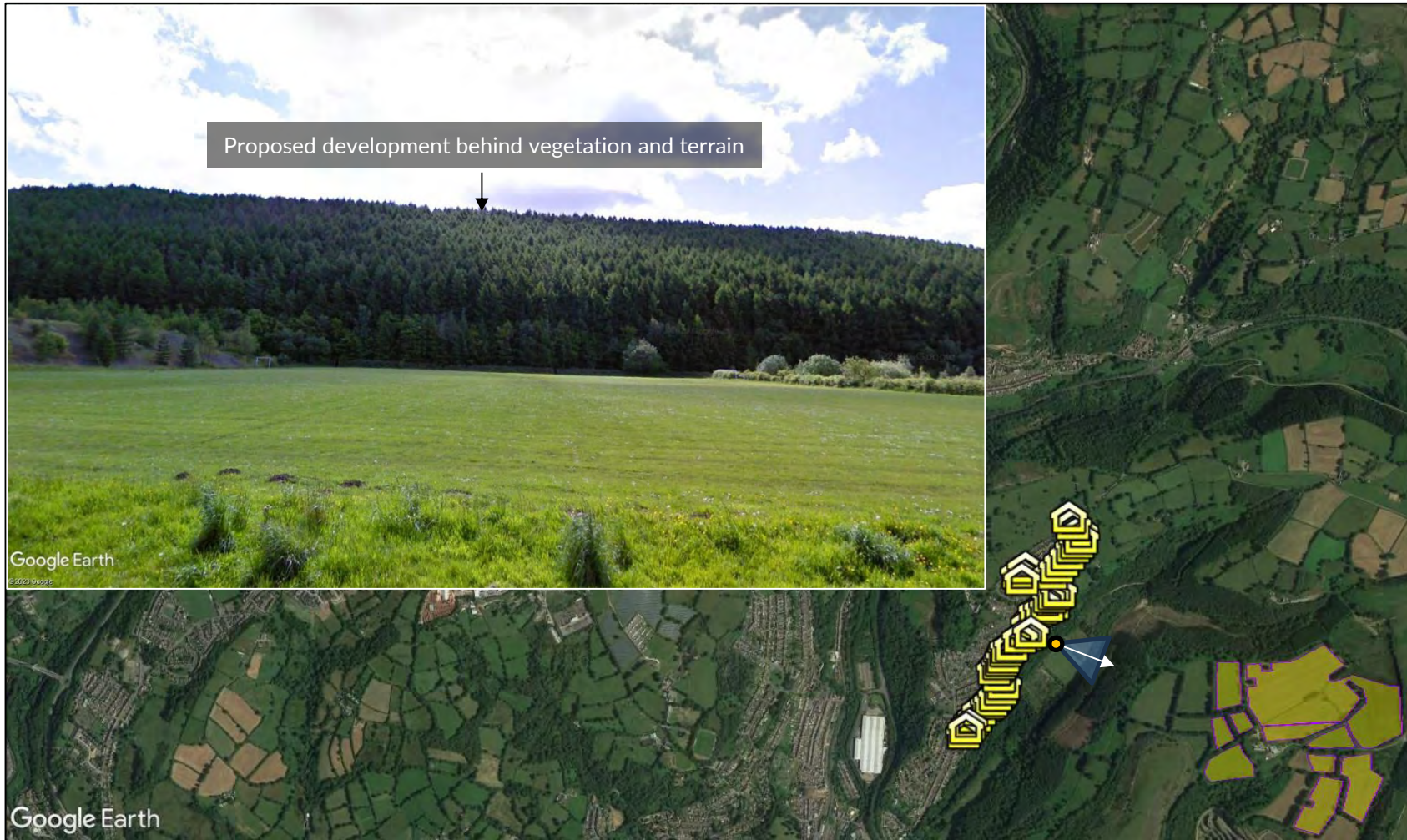


Figure 12 Vegetation between dwellings and proposed development

### 5.3 Assessment Results – Viewpoint Receptors

#### 5.3.1 Geometric Modelling Results

Table 2 below presents the geometric modelling results and predicted impact significance for the assessed viewpoint receptors.

Dwelling Receptor	Geometric Modelling Results (screening not considered)	Identified Screening and Predicted Visibility (desk-based review)	Mitigating Factors	Predicted Impact Classification
1 – 2	Solar reflections are not geometrically possible	N/A	N/A	No impact
3 – 7	Solar reflections geometrically possible for <b>more</b> than three months per year but <b>less</b> than 60 minutes on any given day	Reflecting panels predicted to be visible	See Section 5.3.2	Low impact
8	Solar reflections are not geometrically possible	N/A	N/A	No impact
9	Solar reflections geometrically possible for <b>more</b> than three months per year but <b>less</b> than 60 minutes on any given day	Existing vegetation and terrain is predicted to significantly obstruct views of reflecting panels	N/A	No impact
10 – 11	Solar reflections geometrically possible for <b>less</b> than three months per year and <b>less</b> than 60 minutes on any given day	Existing vegetation and terrain is predicted to significantly obstruct views of reflecting panels	N/A	No impact

Dwelling Receptor	Geometric Modelling Results (screening not considered)	Identified Screening and Predicted Visibility (desk-based review)	Mitigating Factors	Predicted Impact Classification
12	Solar reflections geometrically possible for <b>more</b> than three months per year but <b>less</b> than 60 minutes on any given day	Existing vegetation and terrain is predicted to significantly obstruct views of reflecting panels	N/A	No impact
13 – 15	Solar reflections are not geometrically possible	N/A	N/A	No impact
16	Solar reflections geometrically possible for <b>more</b> than three months per year but <b>less</b> than 60 minutes on any given day	Existing vegetation and terrain is predicted to significantly obstruct views of reflecting panels	N/A	No impact

Table 2 Geometric modelling results and predicted impact – viewpoint receptors

### 5.3.2 Discussion

In Pager Power’s experience, significant impacts from glint and glare are not possible upon pedestrians/observers along PRoW. The reasoning is due to the sensitivity of the receptors (in terms of amenity and safety) being concluded to be of low significance due to:

- The typical density of pedestrians at these locations is usually low;
- Any resultant effect is much less serious and has far lesser consequences than, for example, solar reflections experienced towards a road network whereby the resultant impacts of a solar reflection can be much more serious to safety;
- Glint and glare effects towards receptors are transient, and time and location sensitive whereby a pedestrian could move beyond the solar reflection zone with ease with little impact upon safety or amenity;
- There is no safety hazard associated with reflections towards an observer on a footpath.

Furthermore, any impact will be of a low magnitude when considering the worst case due-to:

- The existing screening is predicted significantly reduce/obstruct the visibility of the proposed development for pedestrian/observers;
- Solar reflections towards observers could therefore be experienced under certain conditions (typically within a few hours of sunrise/sunset i.e. when the Sun is low in the

sky beyond the panels). Therefore, if effects are possible and unscreened, they would typically coincide the Sun, a far more significant source of light;

- The reflection intensity is similar for solar panels and still water (and significantly less than reflections from glass and steel<sup>13</sup>) which is frequently a feature of the outdoor environment. Therefore, the reflections are likely to be comparable to those from common outdoor sources whilst navigating the natural and built environment on a regular basis.

Therefore, no significant impact is predicted upon viewpoint receptors and public rights of way. Mitigation is not recommended.

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<sup>13</sup> SunPower, 2009, SunPower Solar Module Glare and Reflectance (appendix to Solargen Energy, 2010).

## 6 OVERALL CONCLUSIONS

### 6.1 Assessment Conclusions – Road Safety

All roads within 1km of the proposed development are local roads, where traffic densities are likely to be relatively low. Technical modelling is not recommended for local roads; therefore, a low impact is predicted for all road users when considering the worst-case, in accordance with the associated guidance (Appendix D).

### 6.2 Assessment Conclusions – Residential Amenity

Solar reflections are geometrically possible towards all 51 assessed dwelling receptors. Screening in the form of existing vegetation and intervening terrain has been identified for all 51 dwellings to significantly obstruct views of reflecting panels, such that solar reflections will not be experienced by residents in practice. No impact is predicted, and mitigation is not required.

### 6.3 Overall Conclusions

No significant impacts are predicted upon road safety and residential amenity. Mitigation is not recommended.

## APPENDIX A – OVERVIEW OF GLINT AND GLARE GUIDANCE

### Overview

This section presents details regarding the relevant guidance and studies with respect to the considerations and effects of solar reflections from solar panels, known as ‘Glint and Glare’.

This is not a comprehensive review of the data sources, rather it is intended to give an overview of the important parameters and considerations that have informed this assessment.

### UK Planning Policy

#### Renewable and Low Carbon Energy

The National Planning Policy Framework under the planning practice guidance for Renewable and Low Carbon Energy<sup>14</sup> (specifically regarding the consideration of solar farms, paragraph 013) states:

*‘What are the particular planning considerations that relate to large scale ground-mounted solar photovoltaic Farms?’*

*The deployment of large-scale solar farms can have a negative impact on the rural environment, particularly in undulating landscapes. However, the visual impact of a well-planned and well-screened solar farm can be properly addressed within the landscape if planned sensitively.*

*Particular factors a local planning authority will need to consider include:*

...

- *the proposal’s visual impact, the effect on landscape of glint and glare (see guidance on landscape assessment) and on **neighbouring uses and aircraft safety**;*
- *the extent to which there may be additional impacts if solar arrays follow the daily movement of the sun;*

...

*The approach to assessing cumulative landscape and visual impact of large scale solar farms is likely to be the same as assessing the impact of wind turbines. However, in the case of ground-mounted solar panels it should be noted that with effective screening and appropriate land topography the area of a zone of visual influence could be zero.’*

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<sup>14</sup> [Renewable and low carbon energy](#), Ministry of Housing, Communities & Local Government, date: 18 June 2015, accessed on: 01/11/2021



## Draft National Policy Statement for Renewable Energy Infrastructure

The Draft National Policy Statement for Renewable Energy Infrastructure (EN-3)<sup>15</sup> sets out the primary policy for decisions by the Secretary of State for nationally significant renewable energy infrastructure. Sections 3.10.93-97 state:

- '3.10.93 Solar panels are specifically designed to absorb, not reflect, irradiation.<sup>16</sup> However, solar panels may reflect the sun's rays at certain angles, causing glint and glare. Glint is defined as a momentary flash of light that may be produced as a direct reflection of the sun in the solar panel. Glare is a continuous source of excessive brightness experienced by a stationary observer located in the path of reflected sunlight from the face of the panel. The effect occurs when the solar panel is stationed between or at an angle of the sun and the receptor.*
- 3.10.94 Applicants should map receptors to qualitatively identify potential glint and glare issues and determine if a glint and glare assessment is necessary as part of the application.*
- 3.10.95 When a quantitative glint and glare assessment is necessary, applicants are expected to consider the geometric possibility of glint and glare affecting nearby receptors and provide an assessment of potential impact and impairment based on the angle and duration of incidence and the intensity of the reflection.*
- 3.10.96 The extent of reflectivity analysis required to assess potential impacts will depend on the specific project site and design. This may need to account for 'tracking' panels if they are proposed as these may cause differential diurnal and/or seasonal impacts.*
- 3.10.97 When a glint and glare assessment is undertaken, the potential for solar PV panels, frames and supports to have a combined reflective quality may need to be assessed, although the glint and glare of the frames and supports is likely to be significantly less than the panels.'*

The EN-3 does not state which receptors should be considered as part of a quantitative glint and glare assessment. Based on Pager Power's extensive project experience, typical receptors include residential dwellings, road users, aviation infrastructure, and railway infrastructure.

Sections 3.10.125-127 state:

- 3.10.125 Applicants should consider using, and in some cases the Secretary of State may require, solar panels to comprise of (or be covered with) anti-glare/anti-reflective coating with a specified angle of maximum reflection attenuation for the lifetime of the permission.*
- 3.10.126 Applicants may consider using screening between potentially affected receptors and the reflecting panels to mitigate the effects.*
- 3.10.127 Applicants may consider adjusting the azimuth alignment of or changing the elevation tilt angle of a solar panel, within the economically viable range, to alter the angle of incidence.*

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<sup>15</sup> Draft National Policy Statement for Renewable Energy Infrastructure (EN-3), Department for Energy Security & Net Zero, date: March 2023, accessed on: 05/04/2023.

<sup>16</sup> Most commercially available solar panels are designed with anti-reflective glass or are produced with anti-reflective coating and have a reflective capacity that is generally equal to or less hazardous than other objects typically found in the outdoor environment, such as bodies of water or glass buildings.

*In practice this is unlikely to remove the potential impact altogether but in marginal cases may contribute to a mitigation strategy.*

The mitigation strategies listed within the EN-3 are relevant strategies that are frequently utilised to eliminate or reduce glint and glare effects towards surrounding observers. The most common form of mitigation is the implementation of screening along the site boundary.

Sections 3.10.149-150 state:

*3.10.149 Solar PV panels are designed to absorb, not reflect, irradiation. However, the Secretary of State should assess the potential impact of glint and glare on nearby homes, motorists, public rights of way, and aviation infrastructure (including aircraft departure and arrival flight paths).*

*3.10.150 Whilst there is some evidence that glint and glare from solar farms can be experienced by pilots and air traffic controllers in certain conditions, there is no evidence that glint and glare from solar farms results in significant impairment on aircraft safety. Therefore, unless a significant impairment can be demonstrated, the Secretary of State is unlikely to give any more than limited weight to claims of aviation interference because of glint and glare from solar farms.*

The latest version of the draft EN-3 goes some way in referencing that the issue is more complex than presented in the previous issue; though, this is still unlikely to be welcomed by aviation stakeholders, who will still request a glint and glare assessment on the basis that glare may lead to impact upon aviation safety. It is possible that the final issue of the policy will change in light of further consultation responses from aviation stakeholders.

Finally, the EN-3 relates solely to nationally significant renewable energy infrastructure and therefore does not apply to all planning applications for solar farms.

### **Assessment Process – Ground-Based Receptors**

No process for determining and contextualising the effects of glint and glare has been determined when assessing the impact of solar reflections upon surrounding roads and dwellings. Therefore, the Pager Power approach is to determine whether a reflection from the proposed solar development is geometrically possible and then to compare the results against the relevant guidance/studies to determine whether the reflection is significant. The Pager Power approach has been informed by the policy presented above, current studies (presented in Appendix B) and stakeholder consultation. Further information can be found in Pager Power's Glint and Glare Guidance document<sup>17</sup> which was produced due to the absence of existing guidance and a specific standardised assessment methodology.

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<sup>17</sup> Solar Photovoltaic Development Glint and Glare Guidance, Fourth Edition, September 2022. Pager Power.

## APPENDIX B – OVERVIEW OF GLINT AND GLARE STUDIES

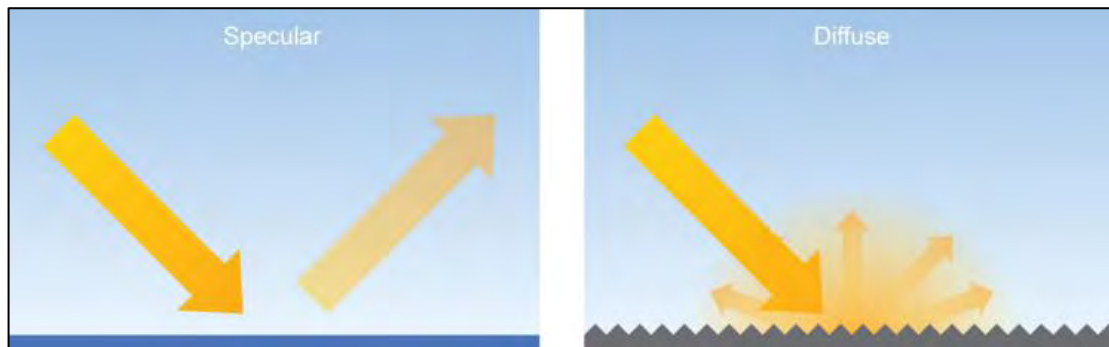
### Overview

Studies have been undertaken assessing the type and intensity of solar reflections from various surfaces including solar panels and glass. An overview of these studies is presented below.

The guidelines presented are related to aviation safety. The results are applicable for the purpose of this analysis.

### Reflection Type from Solar Panels

Based on the surface conditions reflections from light can be specular and diffuse. A specular reflection has a reflection characteristic similar to that of a mirror; a diffuse will reflect the incoming light and scatter it in many directions. The figure below, taken from the FAA guidance<sup>18</sup>, illustrates the difference between the two types of reflections. Because solar panels are flat and have a smooth surface most of the light reflected is specular, which means that incident light from a specific direction is reradiated in a specific direction.



*Specular and diffuse reflections*

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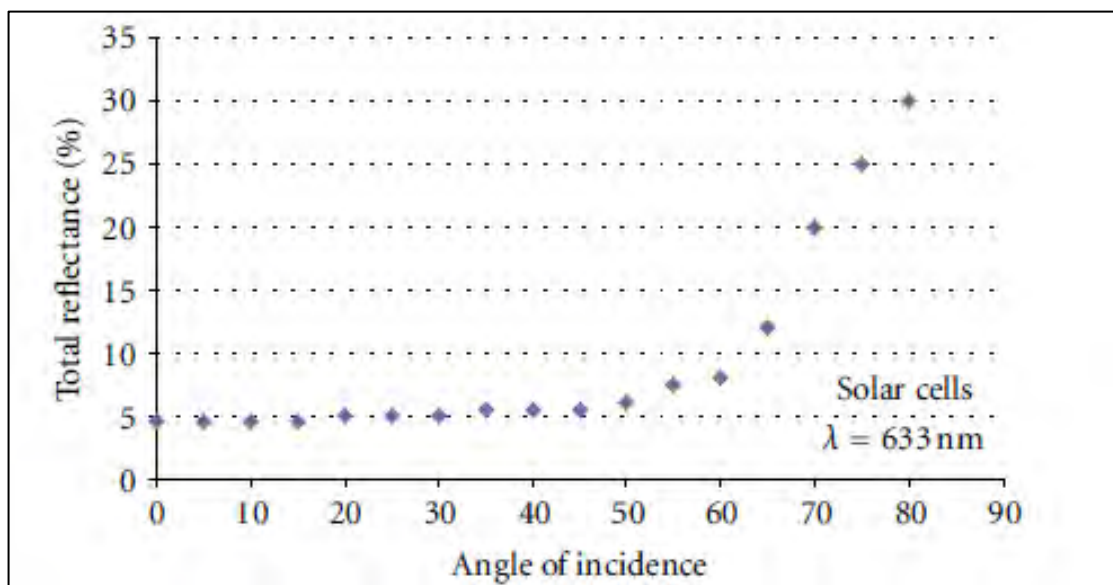
<sup>18</sup>Technical Guidance for Evaluating Selected Solar Technologies on Airports, Federal Aviation Administration (FAA), date: 04/2018, accessed on: 20/03/2019.

## Solar Reflection Studies

An overview of content from identified solar panel reflectivity studies is presented in the subsections below.

### Evan Riley and Scott Olson, “A Study of the Hazardous Glare Potential to Aviators from Utility-Scale Flat-Plate Photovoltaic Systems”

Evan Riley and Scott Olson published in 2011 their study titled: *A Study of the Hazardous Glare Potential to Aviators from Utility-Scale Flat-Plate Photovoltaic Systems*<sup>19</sup>. They researched the potential glare that a pilot could experience from a 25 degree fixed tilt PV system located outside of Las Vegas, Nevada. The theoretical glare was estimated using published ocular safety metrics which quantify the potential for a postflash glare after-image. This was then compared to the postflash glare after-image caused by smooth water. The study demonstrated that the reflectance of the solar cell varied with angle of incidence, with maximum values occurring at angles close to 90 degrees. The reflectance values varied from approximately 5% to 30%. This is shown on the figure below.



Total reflectance % when compared to angle of incidence

The conclusions of the research study were:

- The potential for hazardous glare from flat-plate PV systems is similar to that of smooth water;
- Portland white cement concrete (which is a common concrete for runways), snow, and structural glass all have a reflectivity greater than water and flat plate PV modules.

<sup>19</sup> Evan Riley and Scott Olson, “A Study of the Hazardous Glare Potential to Aviators from Utility-Scale Flat-Plate Photovoltaic Systems,” *ISRN Renewable Energy*, vol. 2011, Article ID 651857, 6 pages, 2011. doi:10.5402/2011/651857

**FAA Guidance – “Technical Guidance for Evaluating Selected Solar Technologies on Airports”<sup>20</sup>**

The 2010 FAA Guidance included a diagram which illustrates the relative reflectance of solar panels compared to other surfaces. The figure shows the relative reflectance of solar panels compared to other surfaces. Surfaces in this figure produce reflections which are specular and diffuse. A specular reflection (those made by most solar panels) has a reflection characteristic similar to that of a mirror. A diffuse reflection will reflect the incoming light and scatter it in many directions. A table of reflectivity values, sourced from the figure within the FAA guidance, is presented below.

Surface	Approximate Percentage of Light Reflected <sup>21</sup>
Snow	80
White Concrete	77
Bare Aluminium	74
Vegetation	50
Bare Soil	30
Wood Shingle	17
Water	5
Solar Panels	5
Black Asphalt	2

*Relative reflectivity of various surfaces*

Note that the data above does not appear to consider the reflection type (specular or diffuse).

An important comparison in this table is the reflectivity compared to water which will produce a reflection of very similar intensity when compared to that from a solar panel. The study by Riley and Olsen study (2011) also concludes that still water has a very similar reflectivity to solar panels.

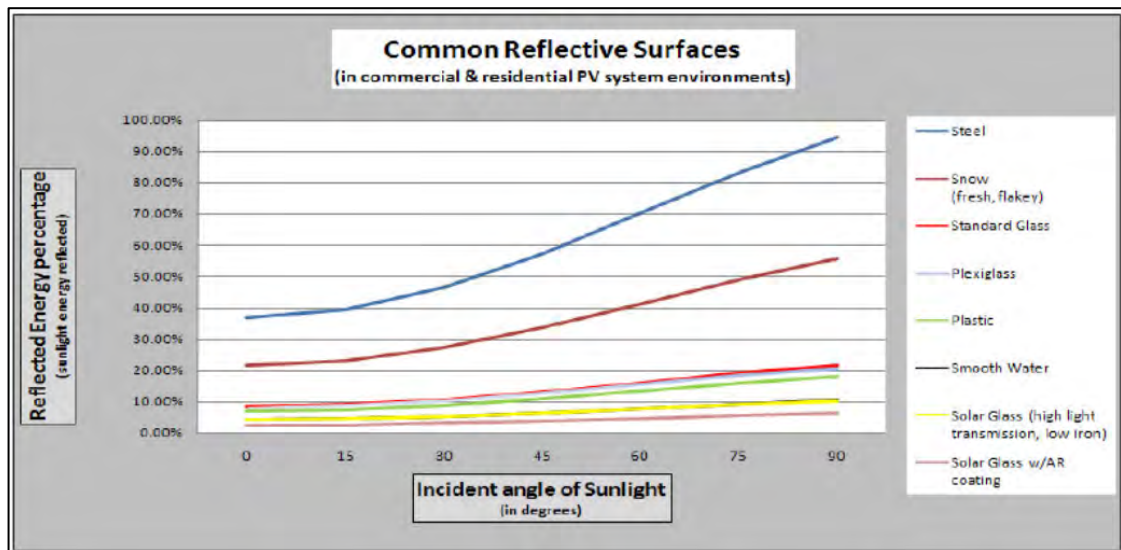
<sup>20</sup> Technical Guidance for Evaluating Selected Solar Technologies on Airports, Federal Aviation Administration (FAA), date: 04/2018, accessed on: 20/03/2019.

<sup>21</sup> Extrapolated data, baseline of 1,000 W/m<sup>2</sup> for incoming sunlight.

### SunPower Technical Notification (2009)

SunPower published a technical notification<sup>22</sup> to 'increase awareness concerning the possible glare and reflectance impact of PV Systems on their surrounding environment'.

The figure presented below shows the relative reflectivity of solar panels compared to other natural and manmade materials including smooth water, standard glass and steel.



Common reflective surfaces

The results, similarly to those from Riley and Olsen study (2011) and the FAA (2010), show that solar panels produce a reflection that is less intense than those of 'standard glass and other common reflective surfaces'.

With respect to aviation and solar reflections observed from the air, SunPower has developed several large installations near airports or on Air Force bases. It is stated that these developments have all passed FAA or Air Force standards with all developments considered "No Hazard to Air Navigation". The note suggests that developers discuss any possible concerns with stakeholders near proposed solar farms.

<sup>22</sup> Source: Technical Support, 2009. SunPower Technical Notification – Solar Module Glare and Reflectance.

## APPENDIX C – OVERVIEW OF SUN MOVEMENTS AND RELATIVE REFLECTIONS

The Sun's position in the sky can be accurately described by its azimuth and elevation. Azimuth is a direction relative to true north (horizontal angle i.e. from left to right) and elevation describes the Sun's angle relative to the horizon (vertical angle i.e. up and down).

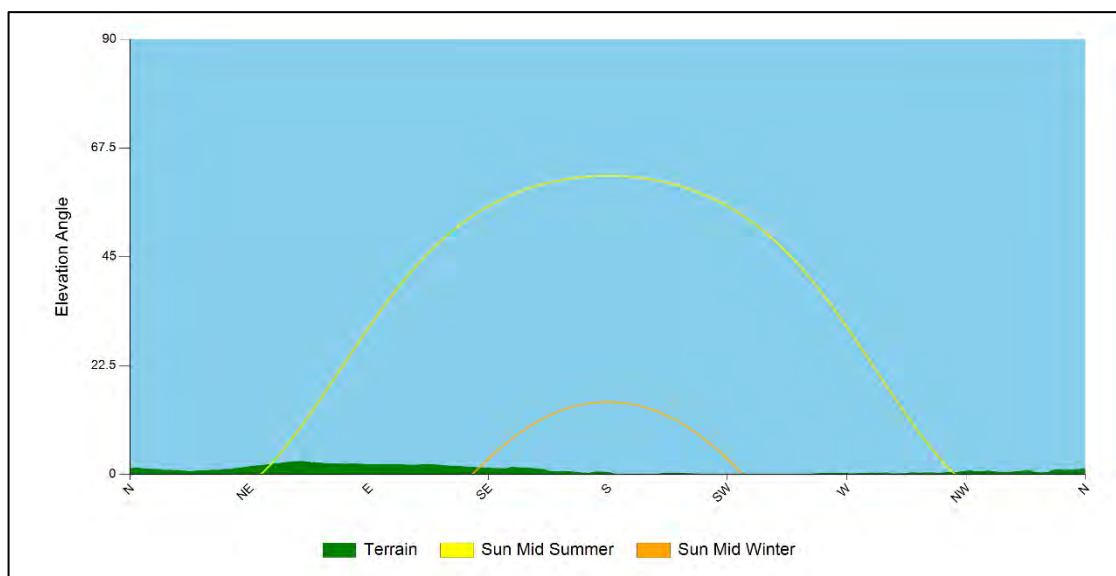
The Sun's position can be accurately calculated for a specific location. The following data being used for the calculation:

- Time;
- Date;
- Latitude;
- Longitude.

The following is true at the location of the solar development:

- The Sun is at its highest around midday and is to the south at this time;
- The Sun rises highest on 21 June (longest day);
- On 21 December, the maximum elevation reached by the Sun is at its lowest (shortest day).

The combination of the Sun's azimuth angle and vertical elevation will affect the direction and angle of the reflection from a reflector. The figure below shows terrain at the horizon as well as the sunrise and sunset curves throughout the year from lon: -3.11483 lat: 51.66867.



*Terrain at the visible horizon and sun paths*

## APPENDIX D – GLINT AND GLARE IMPACT SIGNIFICANCE

### Overview

The significance of glint and glare will vary for different receptors. The following section presents a general overview of the significance criteria with respect to experiencing a solar reflection.

### Impact Significance Definition

The table below presents the recommended definition of ‘impact significance’ in glint and glare terms and the requirement for mitigation under each.

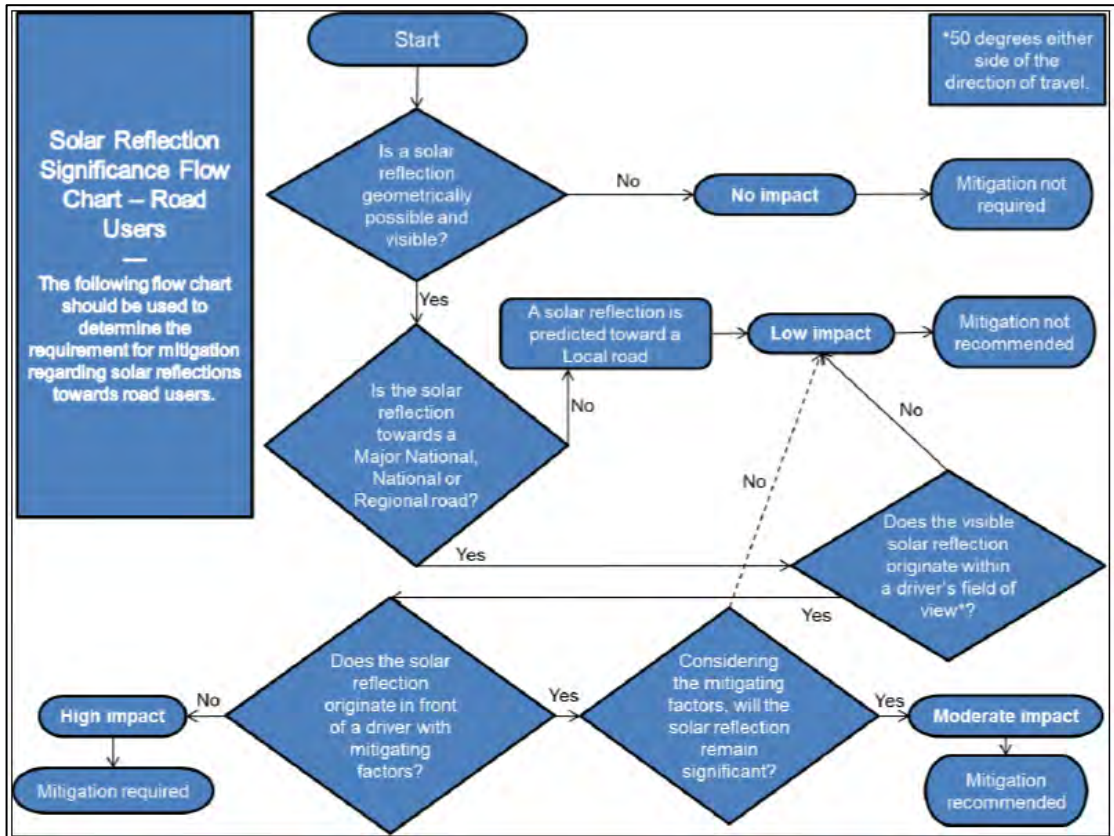
Impact Significance	Definition	Mitigation Requirement
No Impact	A solar reflection is not geometrically possible or will not be visible from the assessed receptor.	No mitigation required.
Low	A solar reflection is geometrically possible however any impact is considered to be small such that mitigation is not required e.g. intervening screening will limit the view of the reflecting solar panels significantly.	No mitigation recommended.
Moderate	A solar reflection is geometrically possible and visible however it occurs under conditions that do not represent a worst-case given individual receptor criteria.	Mitigation recommended.
Major	A solar reflection is geometrically possible and visible under worst-case conditions that will produce a significant impact given individual receptor criteria.	Mitigation will be required if the proposed development is to proceed.

*Impact significance definition*



## Impact Significance Determination for Road Receptors

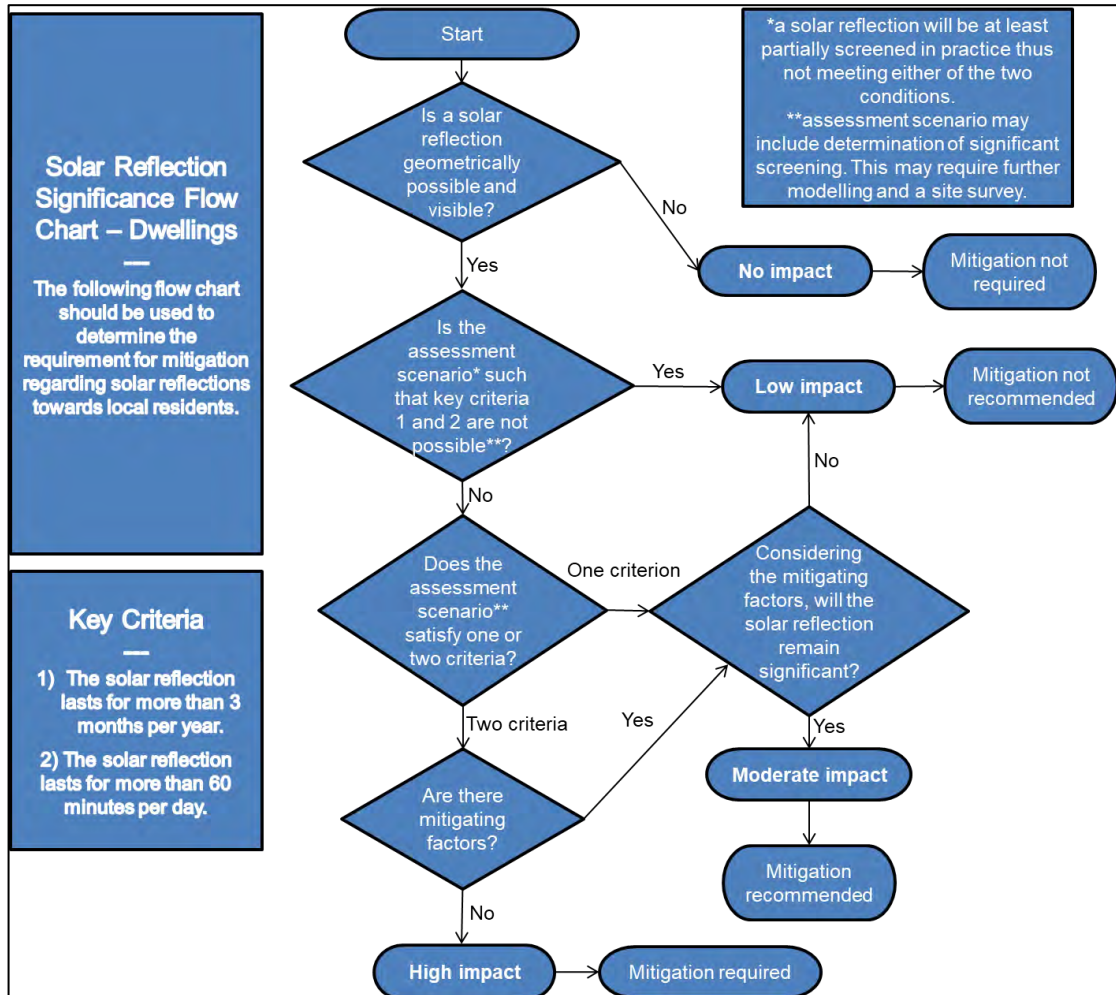
The flow chart presented below has been followed when determining the impact significance for road receptors.



Road receptor impact significance flow chart

## Impact Significance Determination for Dwelling Receptors

The flow chart presented below has been followed when determining the impact significance for dwelling receptors.



Dwelling receptor impact significance flow chart

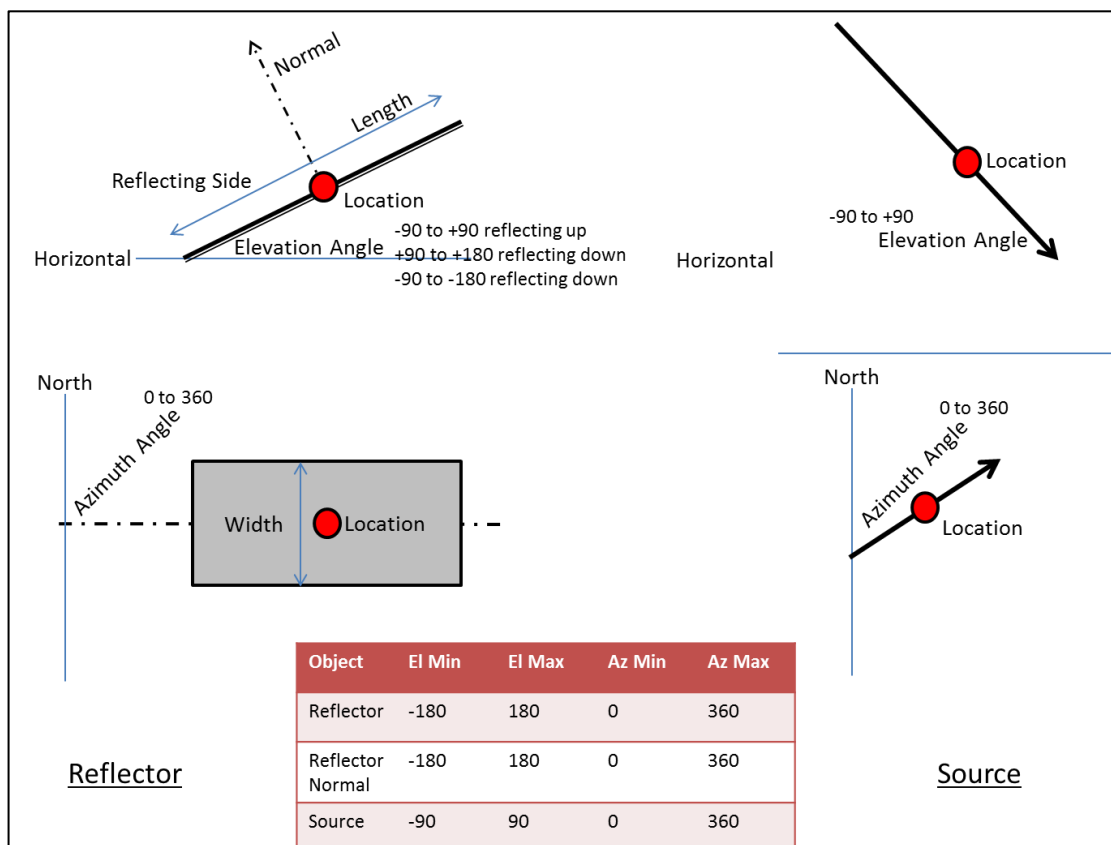
## APPENDIX E – REFLECTION CALCULATIONS METHODOLOGY

### Pager Power Methodology

The calculations are three dimensional and complex, accounting for:

- The Earth’s orbit around the Sun;
- The Earth’s rotation;
- The Earth’s orientation;
- The reflector’s location;
- The reflector’s 3D Orientation.

Reflections from a flat reflector are calculated by considering the normal which is an imaginary line that is perpendicular to the reflective surface and originates from it. The diagram below may be used to aid understanding of the reflection calculation process.



Reflection calculation process

The following process is used to determine the 3D Azimuth and Elevation of a reflection:

- Use the Latitude and Longitude of reflector as the reference for calculation purposes;
- Calculate the Azimuth and Elevation of the normal to the reflector;
- Calculate the 3D angle between the source and the normal;
- If this angle is less than 90 degrees a reflection will occur. If it is greater than 90 degrees no reflection will occur because the source is behind the reflector;
- Calculate the Azimuth and Elevation of the reflection in accordance with the following:
  - The angle between source and normal is equal to angle between normal and reflection;
  - Source, Normal and Reflection are in the same plane.

## APPENDIX F – ASSESSMENT LIMITATIONS AND ASSUMPTIONS

### Pager Power's Model

The model considers 100% sunlight during daylight hours which is highly conservative.

The model does not account for terrain between the reflecting solar panels and the assessed receptor where a solar reflection is geometrically possible.

The model considers terrain between the reflecting solar panels and the visible horizon (where the sun may be obstructed from view of the panels)<sup>23</sup>.

It is assumed that the panel elevation angle assessed represents the elevation angle for all of the panels within each solar panel area defined.

It is assumed that the panel azimuth angle assessed represents the azimuth angle for all of the panels within each solar panel area defined.

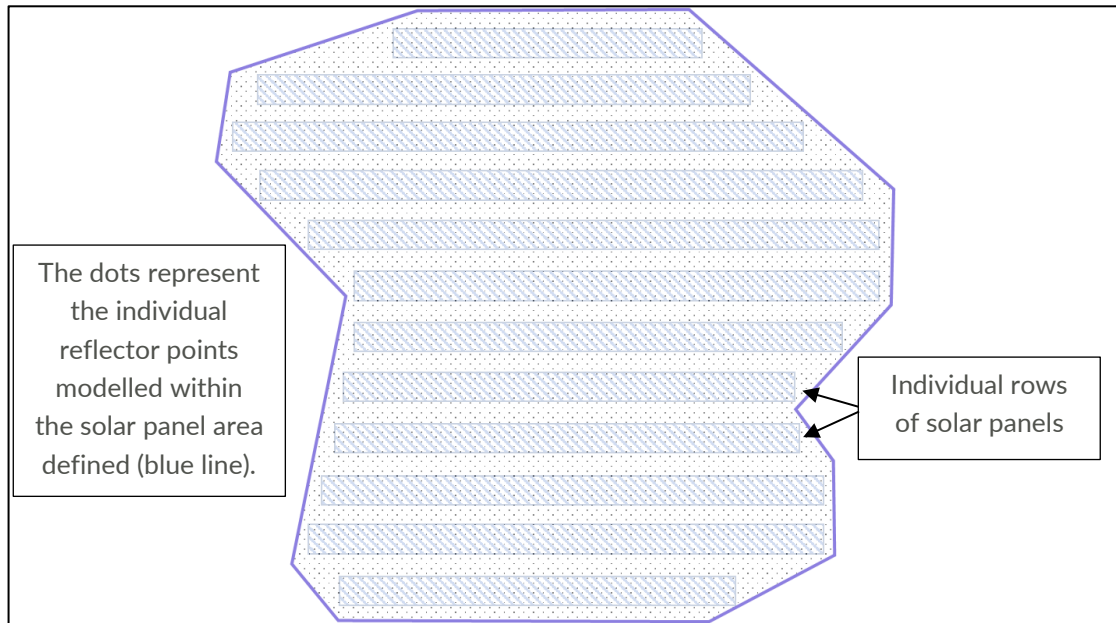
Only a reflection from the face of the panel has been considered. The frame or the reverse or frame of the solar panel has not been considered.

The model assumes that a receptor can view the face of every panel (point, defined in the following paragraph) within the development area whilst in reality this, in the majority of cases, will not occur. Therefore any predicted solar reflection from the face of a solar panel that is not visible to a receptor will not occur in practice.

A finite number of points within each solar panel area defined is chosen based on an assessment resolution so that a comprehensive understanding of the entire development can be formed. This determines whether a solar reflection could ever occur at a chosen receptor. The model does not consider the specific panel rows or the entire face of the solar panel within the development outline, rather a single point is defined every 'x' metres (based on the assessment resolution) with the geometric characteristics of the panel. A panel area is however defined to encapsulate all possible panel locations. See the figure below which illustrates this process.

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<sup>23</sup> UK only.



*Solar panel area modelling overview*

A single reflection point is chosen for the geometric calculations. This suitably determines whether a solar reflection can be experienced at a receptor location and the time of year and duration of the solar reflection. Increased accuracy could be achieved by increasing the number of heights assessed however this would only marginally change the results and is not considered significant.

The available street view imagery, satellite mapping, terrain and any site imagery provided by the developer has been used to assess line of sight from the assessed receptors to the modelled solar panel area, unless stated otherwise. In some cases, this imagery may not be up to date and may not give the full perspective of the installation from the location of the assessed receptor.

Any screening in the form of trees, buildings etc. that may obstruct the Sun from view of the solar panels is not within the modelling unless stated otherwise. The terrain profile at the horizon is considered if stated.

## APPENDIX G – RECEPTOR AND REFLECTOR AREA DETAILS

### Overview

Coordinate data and terrain heights are ascertained from OSGB 36 and 50DTM data.

### Dwelling Receptor Data

The dwelling receptor data is presented in the table below and on the following page. An additional 1.8m height has been added to the elevation to account for the eye-level of an observer at these dwellings.

No.	Longitude (°)	Latitude (°)	Assessed Height (m amsl)	No.	Longitude (°)	Latitude (°)	Assessed Height (m amsl)
1	51.67641	-3.12755	276.61	27	51.67154	-3.13148	199.93
2	51.67614	-3.12733	275.58	28	51.67141	-3.13157	195.93
3	51.67585	-3.12692	273.42	29	51.67128	-3.13165	193.08
4	51.67560	-3.12688	269.28	30	51.67116	-3.13175	189.89
5	51.67543	-3.12711	267.49	31	51.67104	-3.13186	188.19
6	51.67527	-3.12735	265.43	32	51.67091	-3.13201	188.05
7	51.67501	-3.12768	260.98	33	51.67081	-3.13217	185.20
8	51.67477	-3.12803	256.99	34	51.67071	-3.13232	183.95
9	51.67454	-3.12835	252.77	35	51.67042	-3.13204	178.60
10	51.67430	-3.12875	248.68	36	51.67010	-3.13177	167.34
11	51.67460	-3.13027	252.75	37	51.66998	-3.13187	165.95
12	51.67441	-3.13069	248.50	38	51.66989	-3.13193	165.93
13	51.67416	-3.13051	244.96	39	51.66983	-3.13204	166.36
14	51.67358	-3.12824	229.77	40	51.66976	-3.13216	164.20
15	51.67350	-3.12851	231.14	41	51.66967	-3.13228	161.59

No.	Longitude (°)	Latitude (°)	Assessed Height (m amsl)	No.	Longitude (°)	Latitude (°)	Assessed Height (m amsl)
16	51.67340	-3.12880	228.09	42	51.66957	-3.13244	158.84
17	51.67313	-3.12864	220.02	43	51.66948	-3.13257	161.96
18	51.67305	-3.12897	218.99	44	51.66938	-3.13275	162.03
19	51.67297	-3.12931	221.72	45	51.66932	-3.13297	162.30
20	51.67290	-3.12966	219.49	46	51.66915	-3.13332	161.54
21	51.67259	-3.12990	216.33	47	51.66891	-3.13362	160.66
22	51.67243	-3.13013	211.70	48	51.66877	-3.13385	156.98
23	51.67208	-3.13004	203.33	49	51.66862	-3.13403	159.55
24	51.67198	-3.13032	200.81	50	51.66849	-3.13424	161.38
25	51.67189	-3.13070	203.61	51	51.66829	-3.13438	157.47
26	51.67160	-3.13122	198.07				

*Dwelling receptor data*

### Dwelling Receptor Data

The viewpoint receptor data is presented in the table below and on the following page. An additional 1.8m height has been added to the elevation to account for the eye-level of an observer at these locations.

No.	Longitude (°)	Latitude (°)	Assessed Height (m amsl)	No.	Longitude (°)	Latitude (°)	Assessed Height (m amsl)
1	-3.12031	51.65931	304.28	9	-3.13704	51.69409	262.04
2	-3.11476	51.66408	343.80	10	-3.15662	51.68837	281.99
3	-3.10863	51.66817	354.95	11	-3.14848	51.68468	229.72
4	-3.11548	51.66813	321.95	12	-3.14604	51.67492	193.80
5	-3.11098	51.67731	363.01	13	-3.16750	51.67319	271.08



No.	Longitude (°)	Latitude (°)	Assessed Height (m amsl)	No.	Longitude (°)	Latitude (°)	Assessed Height (m amsl)
6	-3.10600	51.67354	373.61	14	-3.15503	51.65551	246.71
7	-3.09536	51.67471	412.66	15	-3.15606	51.63738	351.67
8	-3.12902	51.71016	359.84	16	-3.12744	51.67509	261.70

Viewpoint receptor data

## Modelled Reflector Areas

### Panel Area 1

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.12013	51.66780	5	-3.11752	51.66752
2	-3.12045	51.66730	6	-3.11812	51.66804
3	-3.12009	51.66695	7	-3.11829	51.66837
4	-3.11744	51.66707			

Panel Area 1

### Panel Area 2

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.11688	51.66880	4	-3.11236	51.66895
2	-3.11670	51.66841	5	-3.11687	51.66895
3	-3.11454	51.66843			

Panel Area 2

### Panel Area 3

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.11953	51.66966	3	-3.11801	51.67138
2	-3.11802	51.66985	4	-3.11926	51.67140

Panel Area 3

### Panel Area 4

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.11983	51.66934	3	-3.11859	51.66852
2	-3.11964	51.66819	4	-3.11915	51.66940

Panel Area 4

**Panel Area 5**

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.11828	51.66871	3	-3.11791	51.66954
2	-3.11741	51.66896	4	-3.11878	51.66946

Panel Area 5

**Panel Area 6**

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.11760	51.67079	17	-3.11056	51.66797
2	-3.11714	51.67077	18	-3.10877	51.66844
3	-3.11715	51.67046	19	-3.10875	51.67018
4	-3.11765	51.67046	20	-3.10921	51.67020
5	-3.11764	51.66973	21	-3.11142	51.67070
6	-3.11695	51.66899	22	-3.11256	51.67048
7	-3.11219	51.66900	23	-3.11280	51.67054
8	-3.11115	51.66976	24	-3.11288	51.67074
9	-3.11110	51.66984	25	-3.11192	51.67108
10	-3.11192	51.67040	26	-3.11300	51.67186
11	-3.11173	51.67054	27	-3.11487	51.67133
12	-3.11089	51.67016	28	-3.11614	51.67128
13	-3.11071	51.66967	29	-3.11612	51.67099
14	-3.11193	51.66898	30	-3.11677	51.67101
15	-3.11166	51.66846	31	-3.11678	51.67129

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
16	-3.11116	51.66797	32	-3.11753	51.67126

Panel Area 6

**Panel Area 7**

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.11413	51.66805	4	-3.11304	51.66863
2	-3.11155	51.66802	5	-3.11370	51.66844
3	-3.11206	51.66883	6	-3.11431	51.66822

Panel Area 7

**Panel Area 8**

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.11405	51.66721	3	-3.11273	51.66773
2	-3.11291	51.66711	4	-3.11435	51.66782

Panel Area 8

**Panel Area 9**

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.11251	51.66705	6	-3.11007	51.66684
2	-3.11212	51.66695	7	-3.11078	51.66719
3	-3.11204	51.66674	8	-3.11070	51.66777
4	-3.11257	51.66572	9	-3.11233	51.66765
5	-3.11151	51.66527			

Panel Area 9

**Panel Area 10**

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
1	-3.11446	51.66617	6	-3.11407	51.66487
2	-3.11411	51.66608	7	-3.11305	51.66563
3	-3.11432	51.66585	8	-3.11240	51.66682

No.	Longitude (°)	Latitude (°)	No.	Longitude (°)	Latitude (°)
4	-3.11475	51.66594	9	-3.11367	51.66699
5	-3.11546	51.66518			

*Panel Area 10*

## APPENDIX H – DETAILED MODELLING RESULTS

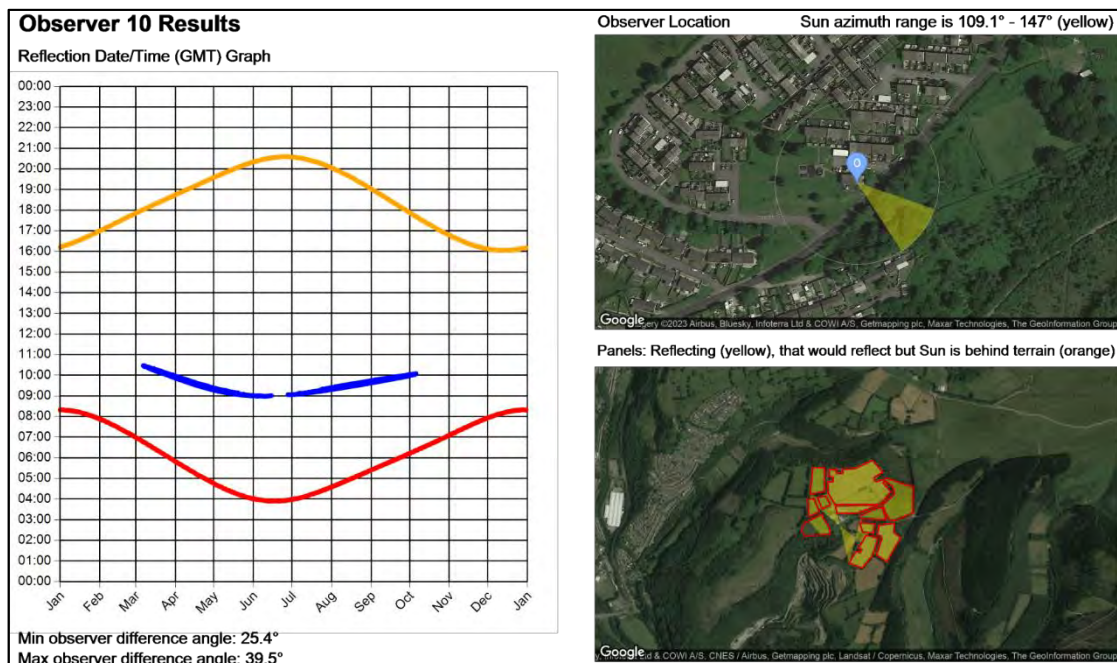
### Overview

The Pager Power charts for selected receptors are shown below and on the following pages. Each chart shows:

- The receptor (observer) location – top right image. This also shows the azimuth range of the Sun itself at times when reflections are possible. If sunlight is experienced from the same direction as the reflecting panels, the overall impact of the reflection is reduced as discussed within the body of the report;
- The reflecting panels – bottom right image. The reflecting area is shown in yellow. If the yellow panels are not visible from the observer location, no issues will occur in practice. Additional obstructions which may obscure the panels from view are considered separately within the analysis;
- The reflection date/time graph – left hand side of the page. The blue line indicates the dates and times at which geometric reflections are possible. This relates to reflections from the yellow areas.
- The sunrise and sunset curves throughout the year (red and yellow lines).

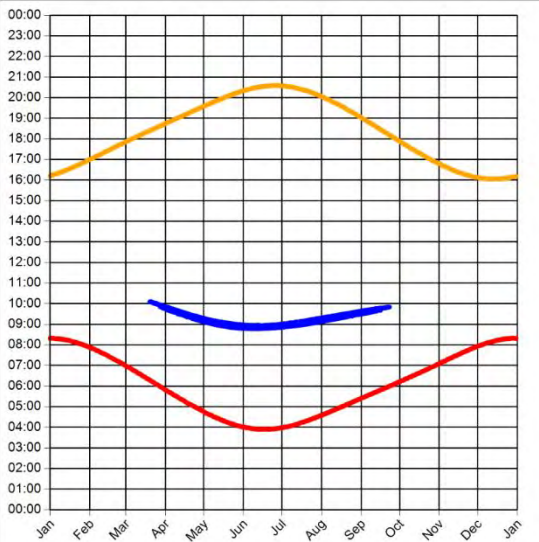
### Dwelling Receptors

Selective modelling results are presented to show a range of results. Full modelling results are available upon request.



## Observer 20 Results

Reflection Date/Time (GMT) Graph



Min observer difference angle: 27.1°  
Max observer difference angle: 38.3°

Observer Location Sun azimuth range is 105.8° - 139.9° (yellow)

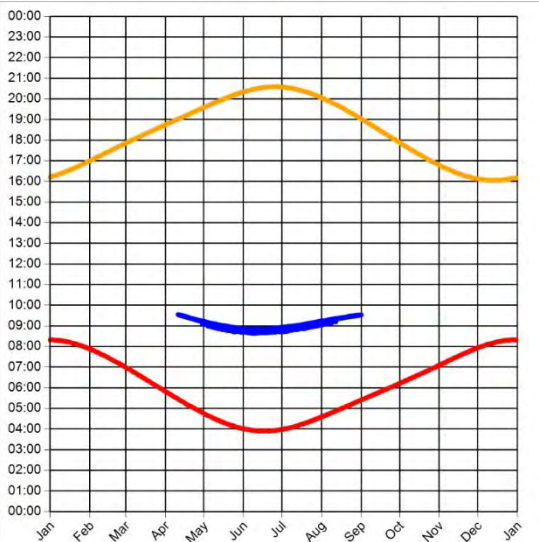


Panels: Reflecting (yellow), that would reflect but Sun is behind terrain (orange)



## Observer 30 Results

Reflection Date/Time (GMT) Graph



Min observer difference angle: 30.1°  
Max observer difference angle: 36.8°

Observer Location Sun azimuth range is 103.9° - 128.3° (yellow)

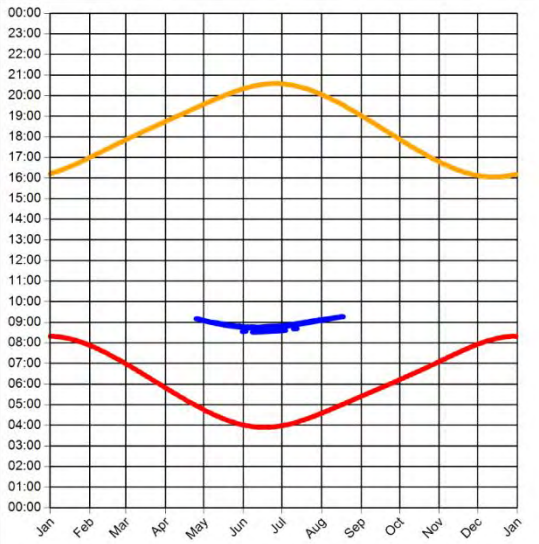


Panels: Reflecting (yellow), that would reflect but Sun is behind terrain (orange)



## Observer 40 Results

Reflection Date/Time (GMT) Graph



Min observer difference angle: 29.5°  
Max observer difference angle: 35°

Observer Location Sun azimuth range is 102.2° - 120.1° (yellow)

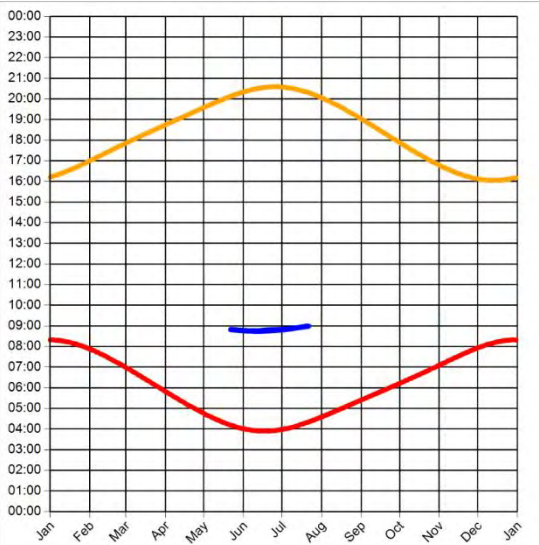


Google  
Panels: Reflecting (yellow), that would reflect but Sun is behind terrain (orange)



## Observer 51 Results

Reflection Date/Time (GMT) Graph



Min observer difference angle: 33.1°  
Max observer difference angle: 35.1°

Observer Location Sun azimuth range is 105° - 109.9° (yellow)

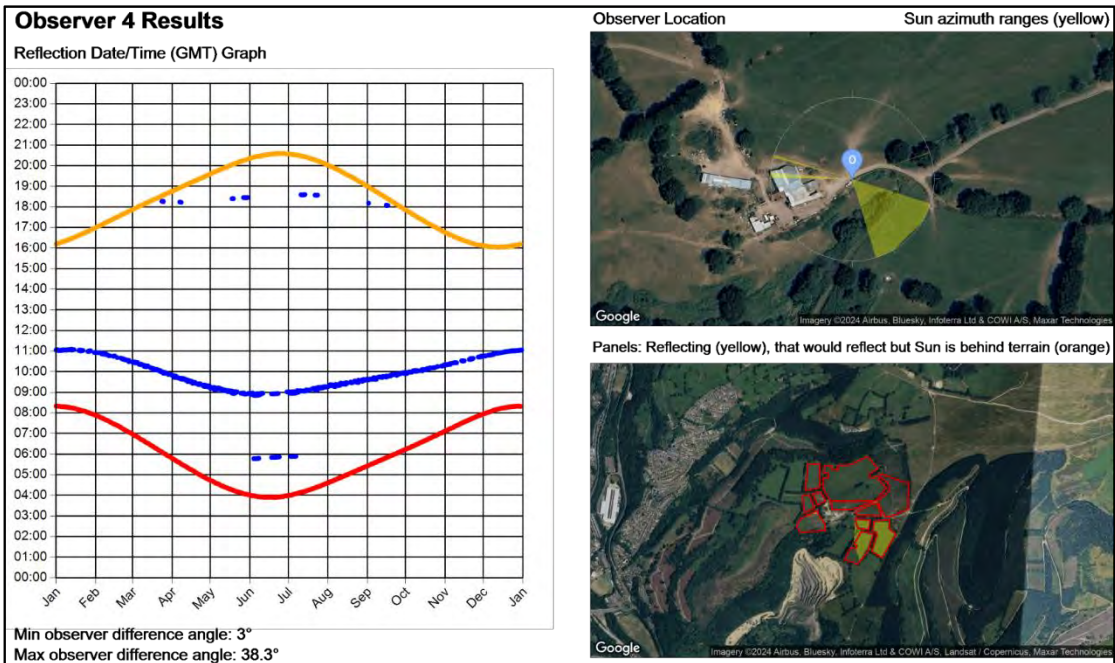
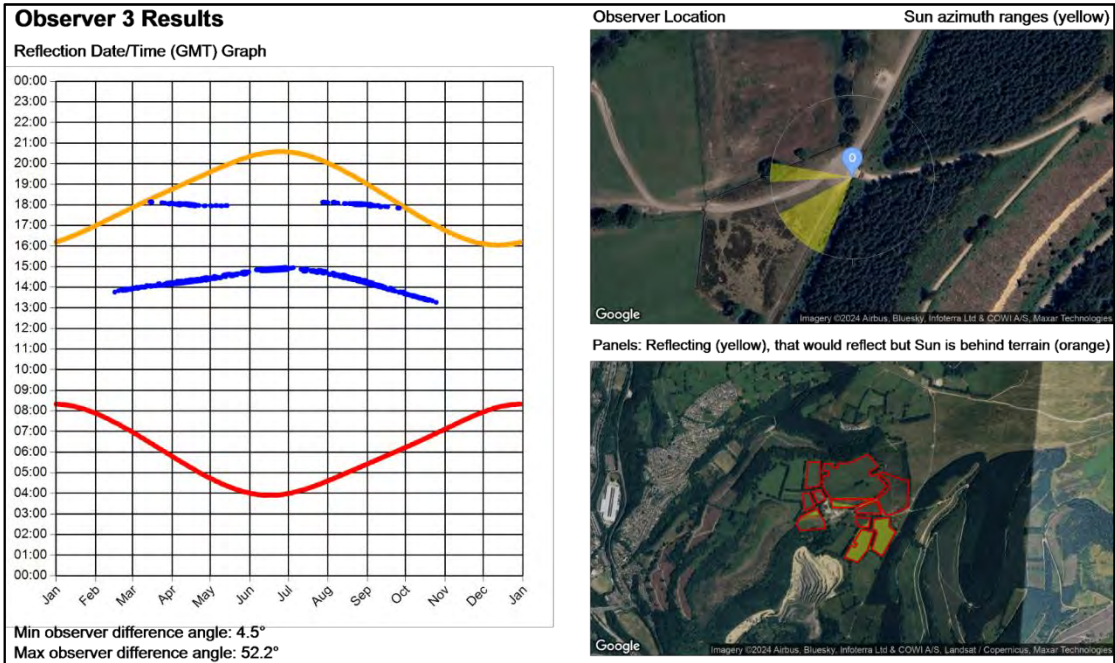


Google  
Panels: Reflecting (yellow), that would reflect but Sun is behind terrain (orange)



## Viewpoint Receptors

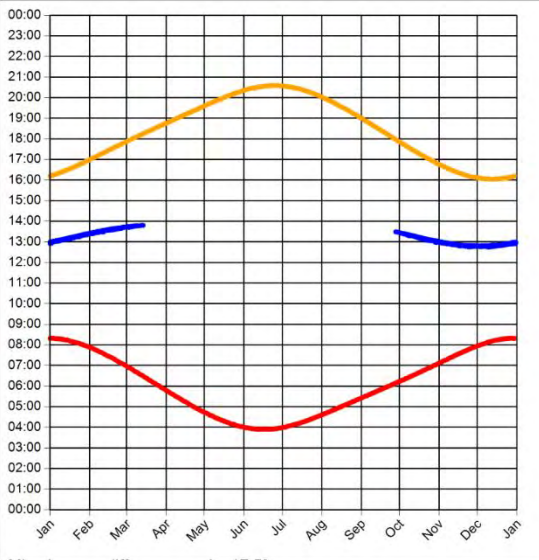
Selective modelling results are presented to show a range of results. Full modelling results are available upon request.





## Observer 5 Results

Reflection Date/Time (GMT) Graph



Min observer difference angle: 17.5°  
Max observer difference angle: 39.3°

Observer Location Sun azimuth range is 189.4° - 206.2° (yellow)

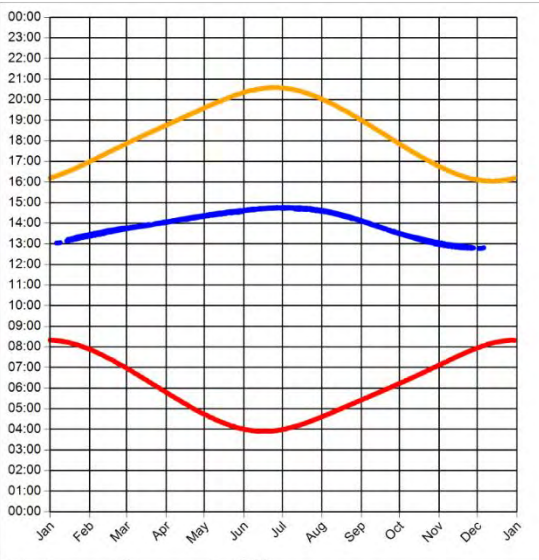


Panels: Reflecting (yellow), that would reflect but Sun is behind terrain (orange)



## Observer 6 Results

Reflection Date/Time (GMT) Graph



Min observer difference angle: 18.7°  
Max observer difference angle: 54.4°

Observer Location Sun azimuth range is 190.6° - 239.9° (yellow)



Panels: Reflecting (yellow), that would reflect but Sun is behind terrain (orange)



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**Appendix 6.1**  
**Baseline Report**

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# 1 Summary

- 1.1 BSG Ecology was commissioned by Cenin Renewables in March 2023 to complete an Ecological Appraisal of land at Cil-lonydd, Newbridge, to inform the development of a proposed solar farm. The solar farm will be linked to a substation associated with the proposed Mynydd Maen wind farm (in planning) via an underground cable.
- 1.2 The Site comprises an area of upland enclosed farmland / grazing pasture (> 300 m from sea level), adjacent to unenclosed acid grassland and acid grassland / heath mosaic, associated with the western part of Mynydd Maen Common. To the north and south are bands of ancient semi-natural woodland and to the west is Hafod Quarry, with the town of Newbridge beyond. There are several ponds within the wider surrounding area
- 1.3 Surveys were completed on Site during 2023/24, consisting of a Phase 1 survey (with NVC of adjacent marshy grassland), great crested newt, badger and breeding bird surveys. Additionally, ecology desk study information was sourced from South-east Wales Biodiversity Record Centre (SEWBRc).
- 1.4 The study found several non-statutory designated sites within the search radius. One falls within the Site boundary (Mynydd Maen Site of Interest for Nature Conservation (SINC)), and four others border the Site. Several priority habitats were identified on Site, including Annex 1 (dry heath), Section 7 priority habitat (acid flushes and broadleaved woodland) and acid grassland associated with Mynydd Maen SINC. Additionally mature trees demarking historic field boundaries have ecological value by virtue of their age and value to protected / notable species.
- 1.5 Protected species surveys found a small population of great crested newt within the wider area, and breeding birds. There is also potential for badger, hazel dormouse, bat roosts, foraging and commuting bats, reptiles, and other protected / notable species on Site.

## 2 Introduction

### Background to commission

- 2.1 BSG Ecology was commissioned by Cenin Renewables in March 2023 to collect baseline ecological information to inform the development of a solar farm near Newbridge in Caerphilly County Borough. The solar farm comprises approximately 39 hectares of farmland which will link to the local grid via a 3 km cable route.

### Site Description

- 2.2 The proposed solar farm is located in upland<sup>1</sup> enclosed farmland / grazing pasture (sheep, cattle and horse grazed), with stock proof fencing and mature trees lining field boundaries. The cable route, extends east from the Site entrance, following the edge of a conifer plantation across upland heathland within Mynydd Maen common, before terminating at a substation associated with the proposed wind farm development (Mynydd Maen windfarm – ref. DNS/3276725, PEDW 2022). collectively these are referred to as ‘the Site’. The Site’s approximate central point is at Ordnance Survey Grid Reference (OSGR) ST 22856 97352. The Site boundary are shown on **Figure 2a - c**. Areas of woodland border the northern and part of the southern Site boundaries, and acid grassland associated with Mynydd Maen Common extends off-Site to the east.
- 2.3 The surrounding landscape comprises the acid grassland / dry heathland expanse of common land to the east, and enclosed farmland pasture to the west. Areas of mature conifer plantation woodland are present to the north and south, and Hafod Quarry (asphalt and aggregates) is immediately south of the Site. There are several ponds within the wider surrounding area, the majority of which are located within Mynydd Maen Common. The closest urban / sub-urban area is Newbridge town, located approximately 850 m from the Site.

### Description of project

- 2.4 Cenin Renewables Ltd proposes to develop a solar photovoltaic electricity generating station (or ‘solar farm’) with an installed generation capacity of approximately 40 MW and associated ancillary development, including a substation. The point of connection to the grid is proposed to be located at an existing 132 kV substation to the southeast on Mynydd Maen Common, which would be connected to the Site by an underground cable route of 3km.

### Scope of Study

- 2.5 This report presents the results of the ecology surveys carried out during 2023/24, as well as ecology desk study information.
- 2.6 The overall purpose of the surveys and desk study work is to provide the baseline ecological information necessary to support the Ecological Impact Assessment of the Proposed Development at the Site. The impact assessment is set out in the Ecology chapter of the Environmental Statement, of which this report forms an appendix.
- 2.7 The aim of this Ecological Assessment is to identify ecological constraints that will need to be considered during the different stages of the development, and to make recommendations for any further ecological surveys required and associated mitigation measures. In addition, the Ecological Assessment makes initial recommendations on how to achieve biodiversity enhancements within the scheme in line with the requirements of the Environment (Wales) Act 2016 and Planning Policy Wales version 12 (February 2024).

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<sup>1</sup> Approximately 350 m above sea level.

### 3 Methods

#### Extended Phase 1 habitat survey

##### *Desk study*

- 3.1 A data search request was made to the South East Wales Biodiversity Records Centre (SEWBRc) for records within 2 km of the Site boundary. The data search included a request for records of designated sites (statutory and non-statutory / locally designated and Ancient Woodland Sites), habitats and species (including priority species, species of conservation concern, locally important species, and invasive non-native species). The data search was received on 27 March 2024.
- 3.2 Publicly available aerial photography and mapping including the UK Government's MAGIC website<sup>2</sup>, Ordnance Survey maps<sup>3</sup> and Google Earth Pro<sup>4</sup> was also reviewed, to provide landscape context, connectivity and obtain recent and historical aerial photography of the local area. Designation / notification information associated with each site was searched for using the Natural Resources Wales (NRW) website<sup>5</sup>.

##### *Field survey*

- 3.3 A Phase 1 survey of the Site was completed on 26 July 2023, and the cable route (including a 25 m buffer either side of the route) was completed on 27 March 2024. Collectively the Site and buffer area are referred to as the 'Survey Area'. Both surveys were completed by Kirsty Rogers ACIEEM under suitable weather conditions.
- 3.4 The survey method was based on industry standard guidance (JNCC, 2010). Habitats present within the Survey Area were identified and mapped, with any features of ecological interest recorded as 'target notes'. The survey was 'extended' to include an assessment of the potential of the Survey Area to support protected or otherwise notable species (IEA, 1995) e.g., badger *Meles meles* and hazel dormouse *Muscardinus avellanarius*.
- 3.5 To provide more detailed habitat information and determine the quality of marshy grassland habitats within the Site (associated with adjacent locally designated sites<sup>6</sup>) surveyors assigned the habitat to plant communities within the National Vegetation Classification (Rodwell 1991) with reference to the Domin scale of cover / abundance (Rodwell, 2006). Plant communities were assigned based on the experience of the surveyors, and with reference to the community descriptions and keys provided. Where habitat differed from or fell between such communities, the vegetation was described with reference to the plant communities of the NVC.

##### *Limitations to methods*

- 3.6 The Phase 1 survey of the cable route was completed outside the optimal window for habitat surveys (April to October, inclusive) and may have missed some later flowering species. However, the information gathered is considered sufficient to determine the broad habitat types and for the purposes of this assessment and is consistent with the detailed habitat survey of the adjacent Mynydd Maen common (PEDW, 2022).

#### Great Crested Newt survey

- 3.7 Aerial imagery and local surveyor knowledge resulted in the identification of 8 ponds within 250m of the Survey Area. Several of these ponds were known to surveyors from surveys completed by BSG

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<sup>2</sup> Available at [www.magic.defra.gov.uk/magicmap.aspx](http://www.magic.defra.gov.uk/magicmap.aspx).

<sup>3</sup> Available at <https://explore.osmaps.com/>

<sup>4</sup> Google Earth Pro 7.3.4.8248 (64-bit)

<sup>5</sup> Available at <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en>. Accessed on 28 November 2023.

<sup>6</sup> This area is on the western fringe of Mynydd Maen Common and is similar to that area in terms of general character.

Ecology to inform the planning application for the neighbouring windfarm development (Mynydd Maen Windfarm - DNS/3276725), and permission has been granted to use the data collated to inform this assessment. Where relevant this data has been referenced in **Section 4**.

- 3.8 The methods outlined below relate to the 2 ponds studied in relation to the solar farm development only, these are SF 1 (OSGR ST 23236 97520) and SF 2 (ST 23353 97628), shown on **Figure 4**.

#### ***Pond Habitat Suitability Index (HSI)***

- 3.9 Both ponds were assessed for their suitability to support great crested newt using the Habitat Suitability Index (HSI) assessment method (Oldham *et al.*, 2000) on 17 April 2023. A HSI is a quantitative means of evaluating habitat quality for great crested newt and provides an overall numerical index to indicate the level of suitability (ARG UK, 2010).
- 3.10 Ten indices were scored for each pond<sup>7</sup> and the resulting 'scores' for each pond were entered into a great crested newt HSI Calculator<sup>8</sup> to convert to the HSI, a numerical index, between 0 and 1. Lower values are less suitable and higher values indicate a greater suitability to support breeding great crested newt, see **Table 1**.

**Table 1:** Categorisation of HSI scores

HSI Score	Pond Suitability
<0.5	Poor
0.5 – 0.59	Below Average
0.6- 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

#### ***Environmental DNA sampling***

- 3.11 To ascertain presence or likely absence of great crested newt from the 2 ponds, an environmental DNA (eDNA) survey was conducted, with reference to industry standard guidance for survey and analysis outlined in English Nature (2011) and Biggs *et al.* (2014).
- 3.12 The survey involved a licenced great crested newt ecologist collecting water samples from 20 locations around the perimeter of the respective waterbodies. The samples were collected on the 17 April 2023. Samples were then sent for analysis by a certified laboratory (Surescreen Scientifics Ltd) to identify the presence or absence of great crested newt DNA. The laboratory test results were returned on 2 May 2023.

#### ***Great crested newt presence / likely absence survey***

- 3.13 To provide further confidence in the result of the eDNA survey supplementary presence / likely absence surveys were carried out on ponds SF 1 and 2. Two survey visits were undertaken in April and May 2023.
- 3.14 Waterbodies were surveyed using the following survey methods (where possible, see **limitation to method**):
- **Egg Search (ES):** Submerged and floating vegetation and leaf litter was inspected for newt eggs at both waterbodies.

<sup>7</sup> Location, surface area, desiccation rate, water quality, percentage shade, waterfowl & fish presence, surrounding terrestrial habitat, other ponds within 1 km, and macrophyte cover (Oldham *et al.*, 2000)

<sup>8</sup> Available at <https://www.arguk.org/get-involved/projects-surveys/great-crested-newt-habitat-suitability-index>.



- **Torching (T):** A torch survey was carried out on both of the two visits. This consisted of a systematic search made by walking the perimeter of the ponds once using a 1,000,000-candlepower torch searching for amphibians. All amphibians recorded were identified to species, counted, and sexed where possible.
- **Bottle Trap (BT):** Bottle traps were placed around the pond margins overnight. Traps were placed in and amongst vegetation as well as in open water. An air bubble was left in each trap to maintain oxygen levels. The bottles were then checked early the following morning for the presence of newts. Where possible bottle traps were arranged around the margins of the pond at approximately one trap every 2 m.

3.15 The dates and weather conditions during each visit are presented in **Table 2**.

**Table 2: 2023 Great crested newt survey visit details**

Visit No.	Date	Surveyors <sup>9</sup>	Survey Methods	Weather Conditions <sup>10</sup>
1	17 – 18 April	<b>RS &amp; CW</b>	T, ES	Temp 7°C, dry, 6/8 cloud cover. Bft 3 (W).
2	11- 12 May	<b>TF &amp; EE</b>	BT, T, ES	Temp 11°C (overnight low 6°C). Dry, 4/8 cloud cover. Bft 4 (SW).

RS – Rosie Sparks, CW – Callum Waldy, TF – Trevor Fletcher, EE – Ethan Edwards.

#### **Limitations to method**

3.16 Due to the potential for low overnight temperatures in April, bottle traps were not deployed during the supplementary survey. However, surveyors were still able to complete other survey methods and deploy the traps during the second visit in May. This, combined with the eDNA sampling methods, is considered sufficient to provide confidence in survey result, and is not considered to be a significant limitation to this survey or subsequent assessment.

#### **Breeding Bird Survey**

3.17 Breeding bird surveys were conducted during spring and summer 2023 of the Site. Four survey visits were completed<sup>11</sup>, one of which was undertaken at dusk to determine whether there was evidence of use of the Site by barn owl *Tyto alba* or other nocturnal and crepuscular species.

3.18 Breeding birds were surveyed by walking at a slow pace along a predetermined transect route. All habitat features on the Solar Site were approached to within approximately 50 m. The start point and direction of travel were varied between visits. Frequent stops were made to listen and scan for singing and calling birds.

3.19 Bird locations and behaviour were mapped using standard BTO species and activity codes.

3.20 Behaviours and other observations considered to be evidence of breeding were:

- Birds in song / displaying.
- Distraction display or injury feigning.
- Used nests or eggshells found (occupied or laid within the survey period).
- Recently fledged young or downy young.

<sup>9</sup> Natural Resources Wales (NRW) great crested newt survey licence holders are indicated in bold.

<sup>10</sup> Bft - Beaufort wind force scale.

<sup>11</sup> The Bird Survey Guidelines (2022), recommend that six visits are completed to characterise the breeding bird community of an area unless a lower level of effort can be justified; in this case we consider that the fact that the development will principally impact on the interior of the fields (and not affect nesting along field boundaries – which will be enhanced) provides this justification for four visits. The interior of the fields have no sward structure, and were therefore considered unlikely to support ground nesting birds.

- Adults entering or leaving a nest site in circumstances indicating an occupied nest or an adult sitting on a nest.
- Adults carrying food for young or faecal sacs.
- Nest containing eggs.
- Nest with young seen or heard.

3.21 The survey date, time, and weather conditions at the time of survey are provided in **Table 3**.

**Table 3: Details of breeding bird survey**

Date	Surveyor	Time	Weather			
			Wind (Beaufort)	Precipitation	Cloud (Oktas)	Temperature (°C)
04/04/2023	JC	07:16 – 10:59	0-1 N	Nil	1-3	6-12
28/04/2023	GJJ	06:21 – 08:26	1-2 NE	Nil	8-8	8-12
15/05/2023	JAG	19:45 – 22:00	1-2 N	Nil	2-4	14-16
15/06/2023	JAG	05:45 – 08:12	1-3 ENE	Nil	3-1	12-15

JC – Joanne Conway, GJJ – Gethin Jenkins-Jones, JAG – James Garside.

3.22 The results of the breeding bird survey visits were combined to create maps showing all breeding territories recorded in, or within close proximity, of the Site (**Figures 6.3a - c**). BTO codes are used to indicate species on each Figure.

3.23 Where a bird was recorded in the same area during more than one survey visit in a year, and it was judged to be the same individual bird, one registration of that bird was recorded on the Figure(s). Where more than one individual of the same species is shown in close proximity on the Figure, it represents individual birds seen simultaneously during one or more surveys. Note the locations of presumed territories do not represent nest locations.

3.24 For species where definitive evidence of breeding was not obtained, professional judgement (based on a range of factors including knowledge of habitat requirements, local status and / or repeat sightings) was used to conclude whether breeding was likely. A precautionary approach was taken in the interpretation of the data, with species considered likely to have bred being shown.

#### ***BoCC status of birds recorded***

3.25 The colour of the registration of each species shown on **Figures 6.3a - c** reflects its 'Welsh Birds of Conservation Concern (BoCC)' status (Bladwell et al., 2018). The Welsh BoCC listing assesses bird species on the basis of their population status, reflecting changes in their abundance and range. Criteria are listed below.

3.26 Red-listed species are of high nature conservation concern and are those that:

- are Globally Threatened according to international (IUCN) criteria,
- whose population or range has declined rapidly in recent years, or
- have declined historically and not shown a substantial recent recovery.

3.27 Amber-listed species are of medium conservation concern, and are those:

- with an unfavourable conservation status in Europe,
- whose population or range has declined moderately in recent years,
- whose population has declined historically but made a substantial recent recovery,
- that are rare breeders, or
- occur in internationally important numbers within the area or have localised populations.

**Limitations to method**

- 3.28 The BBS were undertaken ahead of the final design freeze and before the cable route had been fixed. As such, the cable route was not included within the breeding bird survey areas. Information regarding the presence of these species within habitats on the cable route is as a result of local knowledge of surveyors and survey information available for Mynydd Maen wind farm (DNS/3276725). Given the extent of up-to-date data available, this is to be considered to be a significant limitation to this assessment.

**Badger**

- 3.29 A badger survey was completed on 24 November 2023 by Becky Gibbs to search for evidence of badger (including setts, feeding remains, dung pits, hairs, and tracks), within the Site and suitable areas within 30 m (where access permitted, see **Limitations**). In the event badger field signs were noted, they were to be mapped and recorded using a GPS device. Any setts recorded were also to be classified in accordance with industry criteria (as necessary).

**Limitations to method**

- 3.30 The survey was undertaken from within the clients' land ownership or publicly accessible areas surrounding it. Third-party land was not accessed. Whilst visibility into third-party land / adjacent habitats was largely good, assisted by binoculars, some areas of woodland along the northern boundary were limited by vegetation coverage. This is taken into consideration within the assessment.
- 3.31 The badger survey was undertaken ahead of the final design freeze and before the cable route had been fixed. As such, the cable route was not included within the badger survey area. Information regarding the presence of these badger within habitats on the cable route is as a result of local knowledge of surveyors and survey information available for Mynydd Maen wind farm (DNS/3276725). Given the extent of up-to-date data available, this is to be considered to be a significant limitation to this assessment.

**Personnel**

- 3.32 Summaries of the qualifications and experience of personnel involved in the work, and their role in delivering it, are outlined below.
- Kirsty Rogers ACIEEM (Senior Ecologist), undertook the updated Phase 1 habitat survey in 2023 and is co-author of this report. Kirsty has worked as a professional ecologist since 2013 and has experience in numerous ecological assessments including extended Phase 1 habitat surveys for small- and large-scale projects. Kirsty has a particular interest in botany and has a Field Identification Skills Certificate (FISC)<sup>12</sup> level 4.
  - Rosie Sparks ACIEEM (Senior Ecologist) undertook the ground truthing of offsite ponds, coordinated the survey work, assisted with the great crested newt survey and is co-author of this report. Rosie has over five years of ecological consultancy experience and holds a licence for great crested newt, bats and barn owl. She has a BSc (Hons) degree in Conservation Biology and an MSc in Ecology and Conservation from Lancaster University.
  - Trevor Fletcher ACIEEM, Senior Ecologist at BSG Ecology. Trevor has been a Consultant Ecologist for over 5 years and has considerable experience in completing extended Phase 1 Habitat Surveys and associated reports. Trevor holds survey licenses for dormouse, great crested newt and barn owl in Wales and lead with great crested newt surveys.
  - James Garside ACIEEM (Senior Ecologist), has worked on wind farms throughout Wales, including various sites in Powys, and schemes in Pembrokeshire, Conwy, Neath Port Talbot, Bridgend, Blaenau Gwent, Carmarthenshire, and Torfaen. James also undertakes annual breeding bird surveys for the BTO in the Welsh uplands and conducts a range of ornithological

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<sup>12</sup> Awarded by the Botanical Institute of Britain and Ireland (BSBI).

survey for Natural Resources Wales at their Newport Wetlands reserve. James assisted with the breeding bird surveys.

- Joanne Conway ACIEEM (Senior Ecologist) BSc, PG Cert, has undertaken post-construction monitoring at Welsh wind farms including Brechfa Forest West and Garreg Lwyd Hill, and pre-construction survey work at several other sites (including Alwen Forest and Brechfa North). She has a keen interest in ornithology and is a bird ringer (she holds a British Trust for Ornithology C permit). Jo assisted with assisted with the breeding bird surveys.
- Gethin Jenkins-Jones worked as a field ecologist for BSG Ecology during 2023. He has worked as a field ecologist under contract with the British Trust for Ornithology (BTO), as well as being an assistant warden in 2021 at Spurn Bird Observatory in Yorkshire. He is an ornithologist with many years of voluntary survey experience for the BTO in a range of techniques, undertaking regular breeding bird, wintering bird and wetland bird surveys. Gethin assisted with the breeding bird surveys.
- Becky Gibbs BSc, MSc, Consultant Ecologist, has worked as an ecological consultant since April 2020, prior to which she was a research assistant at Cardiff University. Becky is an experienced field surveyor and has undertaken protected species surveys for a range of projects. Becky completed the badger survey for this project.
- This report has been reviewed by Owain Gabb CEnv., MIEEM. He has worked as a professional ecologist since 1999 and as an ecological consultant since 2003. Owain has technically directed or managed the ecological inputs for a range of projects including renewable energy solutions, grid connection projects, power stations (new nuclear and decommissioning schemes), energy from waste plants, parkland restoration schemes, residential and mixed-use developments, and provided support to local planning authorities in evaluating the ecological evidence base for large planning applications.

3.33 A summary of each BSG staff member's experience and competence as a professional ecologist is provided at <http://www.bsg-ecology.com/people/>.

## 4 Results and Evaluation

### Desk study

#### **Statutory Designated Sites**

- 4.1 One statutory designated site of national importance is located approximately 2 km north of the Site. Ty'r Hen Forwyn Site of Special Scientific Interest (SSSI) is notified for species-rich neutral grassland and the large population of wood bitter-vetch *Vicia orobus*, a nationally scarce and declining species, that it supports.

#### **Non-statutory Designated Sites**

- 4.2 SEWBRc returned 39 records of non-statutory designated sites within a 2 km radius of the Survey Area; these are all Sites of Interest for Nature Conservation (SINC), these are shown on **Figure 6.1**.
- 4.3 Of these one, Mynydd Maen SINC, falls within the Survey Area, specifically the cable route, which passes through the SINC. This SINC is a large upland common, designated for extensive areas of acid grassland, bracken, and heath, and for locally significant bryophyte species (the latter located in woodland outside the Survey Area).
- 4.4 A further four SINC are located immediately adjacent to the Survey Area:
- Gwydon Valley Woodlands - situated to the south of the cable route. The SINC is a large conifer plantation on former ancient woodland and contains semi-natural ground flora indicator species which qualify it as a SINC. Red wood ants *Formica rufa* are locally common.
  - Cwm Hafod-Fach Woodlands - immediately to the south of the western spur of the Site, comprises semi-natural ancient woodland of the valley-sides surrounding a working quarry. Acid grassland and heath is also present locally in the open areas of the upper valley.
  - Coed Cil-Lonydd - is adjacent to the northern boundary of the Site, following the line of the Nant Gawni stream through a steep-sided valley, containing blocks of former ancient woodland. Red wood ants occur locally throughout the woodland, which supports an assemblage of semi-natural indicator species.
  - Edlogan Common – is located to the east of the furthest edge of the cable route and is designated for common land.
- 4.5 Magna Porta Common SINC and Mynydd Maen and Mynydd Llwyd Common SINC are located 5 m south and 238 m northeast of the of the cable route, respectively. Both are designated for common land.
- 4.6 The remaining SINC are >500 m from the Site boundary. Given the distance and / or separation by existing development and road infrastructure, these sites are unlikely to be affected by the proposals and are not considered further in this report.

#### **Ancient Woodland Sites**

- 4.7 SEWBRc returned records of 56 Ancient Semi-Natural Woodland (ASNW), 23 Restored Ancient Woodland Sites (RAWS) and 40 Plantation on Ancient Woodland Sites (PAWS) within the search area. The closer of these are Coed Prysg immediately south of the Site, and an area of Coed Cil-lonydd immediately to the north.

### Field Survey

#### **Habitats**

- 4.8 Descriptions of the habitats present within the Survey Area are provided below, with referenced JNCC habitat codes (i.e., C1.1 – bracken - continuous) the referenced habitats are shown on **Figure**

**6.2a - c**, alongside the location of target notes (TN). Target note descriptions are presented in **Appendix 1** and referenced photographs are included within **Section 8**.

#### **A1.1.1 - Broadleaved woodland - semi-natural**

- 4.9 Broadleaved woodland is present on-Site along the southern edge (extending off-Site to the south), and in an isolated patch within coniferous plantation to the south of the cable route. The woodland to the south is mature, established over the steep valley bordering Nant Hafod-fach (identified as ASNW, above). The canopy comprises abundant beech *Fagus sylvatica*, with occasional hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, ash *Fraxinus excelsior*, and sessile oak *Quercus petraea*. The understory is generally open, with a band of dense bracken *Pteridium aquilinum* bordering the woodland edge (photo 1).
- 4.10 The woodland to the south of the cable route comprises mature to over-mature beech trees which precede the surrounding coniferous planting.
- 4.11 Broadleaved woodland corresponds to the Section 7 Habitat of Principal Importance (HPI) for lowland mixed deciduous woodland (Maddock, 2011) (as '*altitude is not a defining feature*'), and local designation criteria for semi-natural upland woodlands (Gwent Wildlife Trust, 2004).

#### **A1.2.2 - Coniferous woodland – plantation**

- 4.12 Mature conifer plantation is present along the southern edge of the cable route. The plantation is predominantly Sitka spruce *Picea sitchensis* with occasional larch *Larix* spp. present within the Survey Area above Nant Gwyddon-fach. The woodland is heavily shaded with no understorey layer other than occasional bilberry and bramble *Rubus fruticosus* agg. at the edges (photo 2). Ground flora is sparse, including occasional wood sorrel *Oxalis acetosella* and wood sage *Teucrium scorodonia* or absent, suppressed by a thick layer of litter.
- 4.13 This habitat does not correspond to any HPI or local designation definitions.

#### **A3.1 – Broadleaved scattered trees and A3.2 – Coniferous scattered trees**

- 4.14 Broadleaved scattered trees are frequent across the Site, being present along the majority of field margins. The trees are situated on low raised banks and are likely remnant of historic hedgerows (as evidenced by the presence of vegetated field margins shown on OS maps dated 1881<sup>13</sup>) with the shrubby understory having been lost over time.
- 4.15 Scattered trees largely comprise mature beech stands (photo 11) with occasional scrubby hawthorn also present. The understory is primarily vegetated with semi-improved grassland species (see below) including occasional harebell *Campanula rotundiflora*, eyebright *Euphorbia* sp. and fox glove *Digitalis purpurea*.
- 4.16 Coniferous scattered trees are present as a wind break along the western edge of the Solar Site, comprising dominant larch with occasional Sitka spruce.
- 4.17 This habitat does not correspond to any HPI or local designation definitions currently, however target restoration of field hedgerows would result in a creation of priority habitat – hedgerows and is a clear area available to deliver biodiversity enhancement within the scheme.

#### **B1.1 - Acid grassland – unimproved**

- 4.18 Unimproved acid grassland is present along the cable route though Mynydd Maen Common (photo 3). The sward is grazed (sheep and cattle) with sheltered and flatter patches tightly so, in areas preferred by livestock and a longer denser structure elsewhere. The sward is typically dominated by mat grass *Nardus stricta* with abundant common bent *Agrostis capillaris* and heath bedstraw *Galium saxatile*. Sheep's fescue *Festuca ovina*, and the mosses *Rhytidiadelphus squarrosus* and

<sup>13</sup> Historic OS maps courtesy of National Library of Scotland - <https://maps.nls.uk/view/102346049>. Accessed 4 January 2024.

*Pleurozium schreberi* are frequent, and heath rush *Juncus squarrosus*, sweet vernal grass *Anthoxanthum odoratum*, wavy hair-grass *Deschampsia flexuosa*, and the mosses *Pseudoscleropodium purum* and *Polytrichum commune* occasional. Small patches of soft rush *Juncus effusus* indicate impeded drainage in places.

- 4.19 The acid grassland on Site does not conform to any priority habitat descriptions, however, does contain several indicator species for acid grassland which are listed within local designation guidelines (Gwent Wildlife Trust, 2004) and a feature of Mynydd Maen SINC.

#### **B2.2 - Neutral grassland - semi-improved**

- 4.20 Semi-improved neutral grassland is present across most of the enclosed fields within the Site. The sward was fairly long across all fields on Site but even, following consistent grazing from cattle and sheep (photo 4).
- 4.21 The grassland sward is reasonably diverse and comprises frequent common bent *Agrostis capillaris*, Yorkshire fog *Holcus lanatus*, perennial rye-grass *Lolium perenne*, creeping buttercup *Ranunculus repens* and white clover *Trifolium repens* with occasional crested dog's-tail *Cynosurus cristatus*, sweet vernal *Anthoxanthum odoratum*, red fescue *Festuca rubra*, rough meadow grass *Poa trivialis*, red clover *Trifolium pratense*, yellow rattle *Rhinanthus minor*, bird's-foot trefoil *Lotus corniculatus*, autumn hawkbit *Leontodon autumnalis*, and yarrow *Achillea millefolium*.
- 4.22 Small areas with impeded drainage contain occasional soft rush and compact rush *Juncus conglomeratus*. Patches of common nettle *Urtica dioica* and creeping thistle *Cirsium arvense* are present in areas used for shelter by livestock and indicate enriched soils.
- 4.23 The western fields contained a longer sward a higher proportion of herbaceous species. Further west acid indicators are increasingly present (although in small numbers) including tormentil *Potentilla erecta* and sheep's sorrel *Rumex acetosella*.
- 4.24 This habitat does not correspond to any priority habitat description.

#### **B5 - Marsh/marshy grassland**

- 4.25 Marshy grassland is infrequent across the Site, located within the easternmost field within the Site and as localised stands associated with areas of disturbance or wetter soils along the cable route, such as the edges of trackways and ditches along plantation woodland (photo 6).
- 4.26 The vegetation within the Solar Site, is heavily cattle and sheep poached, periodically grazed, and has ground disturbance from large vehicles leaving bands of unvegetated soil throughout (photo 5). The species composition is indicative of damp and acid soils with increased herb diversity than elsewhere within the Survey Area. Soft rush dominates the sward with occasional compact and sharp-flowered rush *Juncus acutiflorus* and Yorkshire fog and creeping bent *Agrostis stolonifera* frequently present. Sheep's sorrel, tormentil, marsh bedstraw *Galium palustre*, cuckoo flower *Cardamine pratensis*, greater bird's-foot trefoil *Lotus pedunculatus* and fox-glove occur occasionally. Ivy-leaved bell flower *Wahlenbergia hederacea*, oval sedge *Carex leporina*, heath woodrush *Luzula multiflora* and lesser spearwort *Ranunculus flammula* are present in wetter areas to the south of the enclosure.
- 4.27 Areas of disturbed / bare ground are frequent and where sparsely vegetated contain species commonly found in disturbed or periodically inundated areas including marsh cudweed *Gnaphalium uliginosum*, knotgrass *Polygonum aviculare*, toad rush *Juncus bufonius*, floating sweet-grass *Glyceria fluitans* and water-purslane *Lythrium portula*.
- 4.28 This habitat corresponds to the definition for M23 *Juncus effusus* / *acutiflorus* – *Galium palustre* rush-pasture, *Juncus effusus* sub-community, with soft rush dominating the sward and sharp-flowered rush less frequent. Yorkshire fog, greater bird's-foot trefoil and marsh bedstraw are other constant species present within this community.

4.29 The vegetation along the cable route is dominated by rank growth of soft rush and is species-poor with occasional marsh bedstraw *Galium palustre*, willowherbs *Epilobium* spp., marsh thistle *Cirsium palustre* and infrequent broad buckler fern *Dryopteris dilatata*.

4.30 This habitat does not correspond to any priority habitat description.

#### **B6 – Poor semi-improved grassland**

4.31 This habitat type occurs in the enclosed cattle grazed pastures in the west of the Site (photo 7). The grassland has been subject to some level of agricultural improvement and is characterised by species poor vegetation dominated by a mixture of Yorkshire fog, common bent and a higher frequency of perennial rye-grass than elsewhere on Site. Herb diversity is low but includes frequent white clover, creeping thistle, locally frequent soft rush, and small amounts of chickweed *Stellaria media*. Areas where stock have congregated are heavily poached and support occasional broad-leaved dock *Rumex obtusifolius*, common nettle and small amounts of sheep's sorrel.

4.32 This habitat does not correspond to any priority habitat description.

#### **C1.1 / C1.2 - Bracken – continuous / scattered**

4.33 Bracken occurs as extensive stands with a thick layer of litter on sloping ground at the edges of the cable route. Bracken also occurs in isolated patches along field margins within the Site, or as scattered stands encroaching along field edges.

#### **D1.1 - Acidic dry dwarf shrub heath**

4.34 This habitat is frequent along the cable route, occurring on much of the high ground and is characterised by dense cover of ericoid shrubs (25 % or more) (photo 8). The vegetation composition and condition vary along the route, due to a combination of previous management and current grazing levels.

4.35 The vegetation is low growing, and heather is rare, indicating high grazing pressure and potentially previous burning. Bilberry is the dominant species with frequent heath bedstraw and occasional tormentil and heath rush *Juncus squarrosus*. Low growing patches of Western gorse *Ulex gallii* are frequent throughout. Grasses are an important component of the vegetation, in similar composition to unimproved acid grassland (above). Bryophytes are also prominent, again similar to acid grassland (above) but with frequent *Hypnum jutlandicum* and occasional *Dicranum scoparium*.

4.36 Dry heath on Site meets the definition of upland heathland HPI (Maddock 2011) and Annex 1 priority habitat 4030 European dry heaths. Additionally, heath meets the definition within the guidance for local designation (Gwent Wildlife Trust, 2004) and is a feature of Mynydd Maen SINC.

#### **D5 - Dry heath/acidic grassland mosaic**

4.37 This habitat is frequent across the cable route. The vegetation is a complex mosaic of the two habitat types grassland described above, characterised by patchy cover of heather and / or bilberry shrubs growing amongst acid grassland (photo 9).

#### **E2.1 – Flush and spring - acid flush**

4.38 A small acid flush was noted to the east of the cable route (TN 5). The vegetation is similar to that described above for marshy grassland, being typically species poor and dominated by soft rush but includes some *Sphagnum fallax* which allows referral to acid flush (photo 10).

4.39 This habitat corresponds to the Section 7 HPI 'Upland Flushes, Fens, and Swamps'.



**G1 – standing water**

- 4.40 Two areas of ephemeral pools / standing water are present on the eastern edge of the cable route (TN 6 and 7). Whilst likely to be holding more water than normal (following an extremely wet winter period), several contained species indicative of water-logged soils, suggesting they are persistently damp. The majority of the pools were unvegetated, with bare substrate bases, however where present, species included floating sweet-grass, soft and hard rush *Juncus inflexus*.

**G2 – Running water**

- 4.41 A narrow gully close to the mast along the cable route contains a small section of fast flowing rocky stream, which passes underneath the existing access track and flows off-site to the south.

**J2.5 - Walls**

- 4.42 Drystone walls demarcate the boundaries of the enclosed fields in the western edge of the Site, and the plantation woodland along the cable route. The walls are generally intact and unvegetated (photo 6).

**J2.6 Dry ditches**

- 4.43 Several dry ditches are present across the Survey Area (including TN 2). These are largely unvegetated, with bare substrate at their base and bordered by terrestrial plant species typical of surrounding habitat types, including, most frequently, soft rush.

**J4 - Bare ground**

- 4.44 Bare ground is infrequent across the Site and is mainly associated with tracks and disturbed ground at the base of field gates. Vegetation is sparse but where it is present is indicative of this habitat type, including broad-leaved plantain *Plantago major*, annual meadow grass *Poa annua*, pineapple-weed *Matricaria discoidea* and knotgrass.

## Protected species

- 4.45 SEWBRc returned 3978 records of 219 different species from within the search radius. The results are summarised in **Table 3**; consideration is given to these records and to the habitats present within the Survey Area when determining the potential for the Site to support protected species. Further legislative information is presented in **Appendix 6.2**.

**Table 3:** Summary of protected species and habitat suitability

Species	Data search results <sup>14</sup>	Habitat suitability
<p><b>Badger</b></p> <p>Badgers <i>Meles meles</i> are protected under the Protection of Badgers Act (1992) and Schedule 6 of the WCA 1981 (as amended).</p>	<p>SEWBRc returned 5 records of badger within the search radius, the closest of which is 38 m from the northern boundary of the Site (dated 2013). The remaining records are &gt; 1 km from the Survey Area.</p>	<p>No setts or evidence of badger was recorded during the badger survey (or any other field survey visits).</p> <p>However, the Site and adjacent woodland provide suitable habitat for sett building, together with the on-Site fields offering foraging / commuting resources for badger.</p>
<p><b>Bats</b></p> <p>Bats are protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and under Schedules 5 &amp; 6 of the W&amp;CA 1981 (as amended).</p> <p>Eight species of bat are also listed as priority species in Section 7 of Environment (Wales) Act 2016.</p>	<p>SEWBRc returned at least twelve species of bat including brown long-eared <i>Plecotus auritus</i>, common pipistrelle <i>Pipistrellus pipistrellus</i>, Daubenton's bat <i>Myotis daubentonii</i>, greater horseshoe bat <i>Rhinolophus ferrumequinum</i>, lesser horseshoe bat <i>Rhinolophus hipposideros</i>, Leisler's bat <i>Nyctalus leisleri</i>, Natterer's bat <i>Myotis nattereri</i>, noctule <i>Nyctalus noctula</i>, serotine <i>Eptesicus serotinus</i> and soprano pipistrelle <i>Pipistrellus pygamaeus</i> from within the search radius.</p> <p>No records were returned from within the Survey Area boundary. The closest records are of small roosts (&lt; 10 individuals) of brown long-eared, Natterer's and pipistrelle species at Blaengawney Farm, dated 2003, 157 m north of the Site.</p> <p>The remaining records are largely associated with the residential areas of Newbridge and Crumlin &gt; 1 km away.</p>	<p>There is one small building / structure within the Site (TN 4), a small, simple red brick structure with a flat concrete roof. The structure is low, with a large opening on the north-western aspect but with no obvious cracks or crevices to offer potential roosting features for bats.</p> <p>The field boundaries are bordered by mature trees which are a suitable size and age to offer potential roosting features (PRFs) for bats.</p> <p>The exposed higher ground within the cable route is likely to be of limited value for bats. On-Site, mature trees and nearby woodlands bordering are of high-quality and are well-connected to the wider landscape, whilst interior fields are of lower suitability due to the even sward and lack of species diversity. The Survey Area overall is assessed as of moderate suitability for foraging and commuting bats.</p>
<p><b>Birds</b></p> <p>All nesting birds are protected under Section 1 of the W&amp;CA 1981 (as amended). Greater</p>	<p>SEWBRc returned &gt; 800 records of 78 bird species within the search radius. Of these, records of 4 species including brambling <i>Fringilla montifringilla</i> and fieldfare <i>Turdus pilaris</i> (listed under Section 1 of the W&amp;CA) and skylark <i>Alauda</i></p>	<p>Breeding bird surveys completed on Site in 2023 recorded 48 bird species, 32 of which were considered to be breeding on or within close proximity to the Site. Of those recorded breeding, one is listed on Schedule 1; goshawk which was</p>

<sup>14</sup> All distances are provided are approximate and taken from their closest point to the Route unless otherwise stated.

Species	Data search results <sup>14</sup>	Habitat suitability
<p>protection is afforded to species listed on Schedule 1 of the W&amp;CA 1981 (as amended).</p> <p>Fifty-one bird species are also listed as priority species in Section 7 of Environment (Wales) Act 2016.</p>	<p><i>arvensis</i>, starling <i>Turdus vulgaris</i> and song thrush <i>T. philomelos</i> (listed as priority species under Section 7) were returned from within the Survey Area.</p> <p>The remaining records include 18 species of bird listed on Schedule 1 of the Wildlife &amp; Countryside Act 1981 (as amended), including brambling, fieldfare, crossbill <i>Loxia curvirostra</i>, goshawk <i>Accipiter gentilis</i>, hobby <i>Falco subbuteo</i>, merlin <i>Falco columbarius</i>, osprey <i>Pandion haliaetus</i>, peregrine <i>Falco peregrinus</i>, red kite <i>Milvus milvus</i> and redwing <i>Turdus iliacus</i> all recorded within 500 m of the Survey Area.</p> <p>Other records include 27 species listed on Section 7 with the majority associated with areas of woodland and open moorland surrounding the cable route.</p>	<p>recorded holding territory in woodland off-Site. A further 3 SPI species, dunnock <i>Prunella modularis</i>, bullfinch <i>Pyrrhula pyrrhula</i> and song thrush <i>Turdus philomelos</i>, were recorded holding territory within field boundary trees or woodland bordering the Site.</p> <p>Additionally, 3 red-listed Birds of Conservation Concern (BOCC) in Wales (cuckoo <i>Cuculus canorus</i>, meadow pipit <i>Anthus pratensis</i> and willow warbler <i>Phylloscopus trochilus</i>) and 4 amber listed species (goldcrest <i>Regulus regulus</i>, green woodpecker <i>Picus viridis</i>, mistle thrush <i>Turdus viscivorus</i> and skylark <i>Alauda arvensis</i>) were also recorded.</p> <p>The highest density of territorial birds was located along field boundary features and in the adjacent woodland, with a smaller number of ground nesting birds present within the tussocky marshy grassland pasture within the eastern part of the Site including skylark and meadow pipit. Detailed results of the breeding bird surveys are presented in <b>Appendix 6.3</b> and territory locations are shown on <b>Figure 6.3a – c</b>.</p>
<p><b>Great crested newt (and other amphibians)</b></p> <p>Great crested newt (GCN) <i>Triturus cristatus</i> are protected under Conservation of Habitats and Species Regulations 2017 (as amended) and under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (WCA).</p> <p>Common toad <i>Bufo bufo</i>, is listed as a species of principal importance (a priority species) under Section 7 of the Environment (Wales) Act 2016.</p>	<p>SEWBREC returned 53 amphibians records within the search radius. None of these were from within the Survey Area.</p> <p>Of these, 10 records of great crested newt were returned, these include records for known populations within ponds surveyed to inform the Mynydd Maen windfarm development (see below). Other records were grouped approximately 400 m south of the Site and one record approximately 780 m to the north.</p> <p>Common newt species such as palmate newt <i>Lissotriton helveticus</i> and smooth newt <i>Lissotriton vulgaris</i> were also recorded in the same locations.</p> <p>One record of common toad <i>Bufo bufo</i> was also returned approximately 250 m north of the cable route.</p>	<p>There are 8 ponds within 250 m of the Survey Area, their location and position in relation to the Site is shown on <b>Figure 6.4</b>.</p> <p>HSI result for the ponds found 4 scored as 'average' and 4 scored 'below average' suitability to support great crested newt. Detailed HSI results are presented in <b>Appendix 6.4</b>.</p> <p>eDNA surveys for the two solar farm ponds (referenced SF) were negative. eDNA results are presented in <b>Appendix 6.5</b>. Supplementary surveys were completed in Ponds SF 1 &amp; SF 2. Great crested newt were absent, however a small population of smooth newts were found in SF1, and palmate newts in SF2. Detailed results are presented in <b>Appendix 6.6</b>.</p> <p>Rougher areas of grassland (i.e., marshy grassland and acid grassland), woodland and bracken provide the most suitable terrestrial habitat for great crested newt within the Survey Area (open grassland fields within the Site provide</p>

Species	Data search results <sup>14</sup>	Habitat suitability
	<p>The proposed Mynydd Maen Wind Farm development (DNS/3276725), adjacent to the Site has undergone extensive survey for great crested newt <sup>15</sup>. The locations of these ponds (within 250 of the Survey Area) are presented on <b>Figure 4</b> referenced (MM). Of these ponds, MM 2 and MM 3 have a small population of great crested newt (confirmed by eDNA and supplementary survey methods).</p>	<p>less cover and are less suitable to support great crested newt during their terrestrial life phase).</p>
<p><b>Hazel dormouse</b></p> <p>Hazel dormouse <i>Muscardinus avellanarius</i> is protected under the Conservation of Habitats and Species Regulations 2017, under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and listed as priority species in Section 7 of Environment (Wales) Act 2016.</p>	<p>SEWBRc returned 2 records for hazel dormouse within the search radius, these are both located &gt; 1 km from the Survey Area to the north and south of the Site.</p>	<p>The hedgerows on Site have grown out into lines of trees with no functional understories / shrub layers and are of limited value to dormice. Woodland habitat at the fringes of the Survey Area are suitable habitat for this species (albeit plantation woodland is suboptimal) and has connectivity to similar habitat in the wider landscape.</p>
<p><b>Invertebrates</b></p> <p>Protection is afforded to species listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).</p> <p>One hundred and eighty-eight species of invertebrate are listed as priority species under Section 7 of the Environment (Wales) Act 2016.</p>	<p>SEWBRc returned 279 records of 67 invertebrate species within the search radius. One record was returned from within the Survey Area, small heath <i>Coenonympha pamphilus</i> recorded in heathland within the cable route.</p> <p>Records include 4 species listed on Schedule 5 of the W&amp;CA, high brown fritillary <i>Fabriciana adippe</i>, marsh fritillary <i>Euphydryas aurinia</i>, pearl-bordered fritillary <i>Boloria euphrosyne</i>, wood white <i>Leptidea sinapis</i> all recorded &gt; 1 km from the Survey Area.</p> <p>The remaining records include 26 species of butterfly and moth that are listed as priority species (Section 7), including grayling <i>Hipparchia semele</i>, located 26 m west of the Site.</p>	<p>Dry heathland habitat (and their associated grass species) and woodland are present within the Survey Area, which may offer suitable habitat for small heath. There is no suitable habitat on Site to support grayling<sup>16</sup></p> <p>Habitats present on the Site are common throughout the wider landscape and are unlikely to support a diverse assemblage or significant number of notable invertebrate species. Upland heathland habitats associated with the cable route, however, offer potential habitat for a range of invertebrate species.</p>

<sup>15</sup> Surveyed during the 2021 and 2023 seasons.

<sup>16</sup> Grayling are associated with brownfield and rocky sites where they bask. They are rare away for substantial former opencast sites and costal strips.

Species	Data search results <sup>14</sup>	Habitat suitability
<p><b>Otter</b></p> <p>Otter <i>Lutra lutra</i> is protected under the Conservation of Habitats and Species Regulations 2017, Schedules 5 &amp; 6 of the Wildlife and Countryside Act 1981 (as amended) and a as priority species under Section 7 of the Environment (Wales) Act 2016.</p>	<p>SEWBRc returned 14 records of otter within the search radius, the closest of these is &gt;1.3 km from the Survey Area.</p>	<p>A small stream originates close to the cable route. This is steep and fast flowing, therefore unlikely to offer prey species and with no onward connectivity to attract otter.</p> <p>There are no other watercourses or habitat capable of supporting otter within the Survey Area. Otter is considered likely absent and are not considered further.</p>
<p><b>Reptiles</b></p> <p>All reptiles are afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).</p> <p>Five reptile species are priority species under Section 7 of the Environment (Wales) Act 2016.</p>	<p>SEWBRc returned 21 records of slow worm <i>Anguis fragilis</i> and common lizard <i>Zootoca vivipara</i>, the closest of which is 782 m from the Survey Area.</p> <p>Records are largely associated with residential areas in the wider landscape.</p>	<p>Vegetation on Site is heavily managed and uniform and is largely unsuitable for supporting reptiles. Reptiles may be present in low numbers in the western half of the Site towards the common land where the sward is locally longer. The mosaic of habitats along the Cable Route however, are likely to support common species of reptile including slow worm, common lizard, and adder <i>Vipera berus</i>, particularly where vegetation or ground is less homogeneous in structure, for example along track edges and the interfaces between habitats e.g., rough grassland or heath and bracken.</p>
<p><b>Water vole</b></p> <p>Water vole <i>Arvicola amphibius</i> is afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and as priority species under Section 7 of the Environment (Wales) Act 2016.</p>	<p>SEWBRc returned no records of water vole within the search radius.</p>	<p>A small stream originates close to the cable route. This is steep, rocky, and fast flowing, and unsuitable to support water vole.</p> <p>There are no other watercourses or habitat capable of supporting otter within the Survey Area. Water vole is considered likely absent and are not considered further.</p>
<p><b>Other protected / notable species</b></p> <p>Not included within other sections but listed on Schedule 5 of the WCA 1981 (as amended) or on Section 7 of Environment (Wales) Act 2016.</p>	<p>SEWBRc returned records of stoat <i>Mustela erminea</i>, polecat <i>Mustela putoris</i> and hedgehog <i>Erinaceus europaeus</i> from within in the search radius. The closest record is of a hedgehog 850 m from the Survey Area</p>	<p>A stoat was seen close to the farm a buildings within immediately off-Site during the Phase 1 survey. The Site contains suitable habitats to support all three species.</p>
<p><b>Invasive non-native, (INNS) plants</b></p>	<p>SEWBRc returned records for 9 invasive plant species within the search radius including Japanese knotweed</p>	<p>No invasive non-native plant species were recorded during the survey work. Invasive plants are not considered further.</p>

Species	Data search results <sup>14</sup>	Habitat suitability
Listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) or Schedule 2 of the Invasive Alien Species (Enforcement and Permitting) Order 2019.	<i>Fallopia japonica</i> , Himalayan cotoneaster <i>Cotoneaster simonsii</i> , and wall cotoneaster <i>Cotoneaster horizontalis</i> , recorded 154 m west of the Survey Area.	
<b>Protected / notable plants</b> Listed in Section 7 of Environment (Wales) Act 2016.	SEWBRc returned records for 6 protected / notable plant species, including English sticky or glandular eyebright <i>Euphrasia officinalis</i> subsp. <i>anglica</i> recorded 537 m from the Survey Area.	<i>Euphrasia</i> sp. was recorded on within the field margins in the Solar Area. Six species of eyebright are listed on the Section 7, and it was not possible to identify <sup>17</sup> specimens to species level.

<sup>17</sup> Eyebrights *Euphorbia* spp. are generally difficult to identify to species level within the field, which is further hindered by frequent hybridisation.

## 5 Conclusion

5.1 Based on the ecological survey information above the following are key considerations:

- There are five SINC's on or within the Survey Area, namely Mynydd Maen SINC which the cable route crosses, and which borders the eastern Site boundary. Habitats associated with the SINC (a range of upland habitats including heath and acid grassland) are of biodiversity value in their own right and provide suitable conditions for several protected and priority species / groups.
- Priority Habitats present on Site habitats include those associated with Mynydd Maen SINC (heathland and acid flush, above), broadleaved woodland priority habitat (and ASNW) bordering the Site.
- Additional habitats on Site have value in their own right or offer habitat to support a range of protected species, including mature scattered trees and marshy grassland.
- A small population of great crested newt are present within the wider habitat surrounding the cable route.
- Breeding bird surveys found a range of species (including Schedule 1 and Section 7 listed) breeding with field boundaries or woodland adjacent to the Site. A small number of ground nesting species were also recorded including one skylark (Welsh red listed) and one meadow pipit (Welsh amber listed) within marshy grassland within the eastern part of the Site.
- Badger surveys did not record any setts or evidence of badger on Site, however badger are highly mobile and are known to be present within the wider surrounding area.
- The Site has potential to support hazel dormouse, other notable mammal species, bats, reptiles, and other amphibian species.
- There are no suitable habitats to support otter or water vole.

## 6 References

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## 7 Photographs

(overleaf)



**Photo 1** – Semi-natural broadleaved woodland on the southern edge of the Site.



**Photo 2** – Mature conifer plantation to the south of the cable route above Nant Gwyddon-fach.



**Photo 3** – Acid grassland on Mynydd Maen Common along the cable route.



**Photo 4** – Semi-improved neutral grassland through central fields within the Site.



**Photo 5** – Marshy grassland within the western-most field of the Site.



**Photo 6** – Marshy grassland bordering the coniferous woodland within the open common land along the cable route and dry stone walls.



**Photo 7** – Cattle grazed poor semi-improved grassland.



**Photo 8** – Dry heath along the cable route.



**Photo 9** – Dry heath / acid grassland mosaic along the cable route.



**Photo 10** - Acid flush to the east of the cable route.



**Photo 11** – View of mature trees and field boundaries



**Photo 12** – View of the proposed cable route across Mynydd Maen common / SINC.







**Photo 13** – View of the proposed cable route (centre left) across Mynydd Maen common / SINC.

## 8 Appendices




(overleaf)



## Appendix 1: Target Notes


Target Note	Feature / description	Photograph
1	<p><b>Hardstanding</b></p> <p>Remnants of an old track with low earth banks on either side, with a line of mature beech trees along the southern edge.</p> <p>Vegetation is patchy and where present comprises species poor grassland and annual colonisers of disturbed ground / poor soils.</p>	
2	<p><b>Dry Ditch</b></p> <p>A dry ditch which follows the central field margins from east to west. There is little vegetation within, and where present, it comprises terrestrial species associated with wetter soils including hard rush <i>Juncus inflexus</i> and creeping bent <i>Agrostis stolonifera</i>.</p>	

<p>3</p>	<p><b>Standing water</b></p> <p>An off-site pond close to the Solar Area. The pond is artificially created and fenced from surrounding livestock. Submerged aquatic vegetation is limited, but marginal species include floating sweet-grass <i>Glyceria fluitans</i>, flag iris <i>Iris pseudacorus</i>, and hard rush <i>Juncus inflexus</i> which was recorded along the pond boundaries. Goat willow <i>Salix caprea</i> scrub was establishing along the southern edge.</p>	
<p>4</p>	<p><b>Building / Structure</b></p> <p>A small red brick bunker / storage building is present towards the eastern edge of the Solar Site. The structure had a solid concrete roof, unrendered external walls and was partially rendered inside with some parts falling away and no cavity wall.</p>	



		
5	<p><b>Acid flush</b></p> <p>Small area of acid flush was recorded along the existing track to the east of the cable route.</p> <p>The vegetation surrounding is similar to areas of marshy grassland elsewhere on Site (principally soft rush <i>Juncus effusus</i>) but with <i>Sphagnum fallax</i> which allows referral to acid flush.</p>	 

<p>6</p>	<p><b>Ephemeral pools</b></p> <p>Close to the area of acid flush are several shallow ephemeral pools, whilst likely to be holding more water than normal (following an extremely we winter period), several contained species indicative of water-logged soil were present, suggesting they are relatively persistent.</p>	
<p>7</p>	<p><b>Ephemeral pools</b></p> <p>Similar to above, another small area of ephemeral pools within the acid grassland / dry heath mosaic.</p>	



**Appendix 6.2**  
Summaries of Relevant Policy,  
Legislation and Other Instruments

## Appendix 6.2: Summaries of Relevant Policy, Legislation and Other Instruments

8.1 This section briefly summarises the legislation, policy and related issues that are relevant to the main text of the report. The following text does not constitute legal or planning advice.

### Environment (Wales) Act 2016

8.2 The Environment (Wales) Act 2016 passed into law in March 2016. Part 1 of the Act sets out Wales' approach to planning and managing natural resources at a national and local level with a general purpose linked to statutory 'principles of sustainable management of natural resources' defined within the Act.

8.3 Section 6 of the Act places a duty on public authorities to '*seek to maintain and enhance biodiversity*' so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to '*promote the resilience of ecosystems*'. The duty replaces the section 40 duty in the Natural Environment and Rural Communities Act 2006 in relation to Wales, and applies to those authorities that fell within the previous duty.

8.4 Public authorities will be required to report on the actions they are taking to improve biodiversity and promote ecosystem resilience. This is expanded on in sub-section (2):

8.5 In complying with subsection (1), a public authority must take account of the resilience of ecosystems, in particular the following aspects—

- diversity between and within ecosystems;
- the connections between and within ecosystems;
- the scale of ecosystems;
- the condition of ecosystems (including their structure and functioning);
- the adaptability of ecosystems.

8.6 Section 7 concerns biodiversity lists and the duty to take steps to maintain and enhance biodiversity. It replaces the duty in section 42 of the NERC Act 2006. The Welsh Ministers will publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales.

8.7 The Welsh Ministers must also take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section, and encourage others to take such steps.

### Planning Policy Wales 12

8.8 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is periodically revised. The latest iteration is PPW version 12 (February 2024). Chapter 6 (Distinctive and Natural Places) sets out how the planning system in Wales meets the challenges set out in the Global Biodiversity Framework<sup>18</sup>, the Biodiversity Deep Dive recommendations developed in response to this (Welsh Government, 2022), and the Duty, under Section 6 of the Environment (Wales) Act 2016, to maintain and enhance biodiversity and ecosystem resilience in Wales.

8.9 The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation and resultant duties.

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<sup>18</sup> See: <https://www.cbd.int/gbf/>

### ***Biodiversity and Ecological Networks***

- 8.10 PPW sets out to outline the planning system's role in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement. The following are key principles:
- Biodiversity and resilience considerations should be taken into account at an early stage in both development plan preparation and when proposing or considering development proposals.
  - All reasonable steps must be taken to maintain and enhance biodiversity and promote the resilience of ecosystems and these should be balanced with the wider economic and social needs of business and local communities. Where adverse effects on biodiversity and ecosystem resilience cannot be avoided, minimised or mitigated/restored and, as a last resort, compensated for, it will be necessary to refuse planning permission.
  - Development plan strategies, policies and development proposals must consider the need to:
    - support the maintenance and enhancement of biodiversity and the resilience of ecosystems;
    - ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats, including the most recent targets set out in the 2022 UN Global Biodiversity Framework;
    - ensure statutorily and non-statutorily designated sites and habitats are properly protected and managed and their role at the heart of resilient ecological networks is safeguarded;
    - safeguard protected species and species of principal importance and existing biodiversity assets from direct, indirect or cumulative adverse impacts that affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water, air and soil, including peat; and
    - secure the maintenance and enhancement of ecosystem resilience and resilient ecological networks by improving diversity, extent, condition, and connectivity.

### ***The Section 6 Duty***

- 8.11 PPW further sets out that planning authorities must demonstrate that they have sought to fulfil the duties and requirements of Section 6 of the Environment Act by taking all reasonable steps to maintain and enhance biodiversity in the exercise of their functions. PPW set out that this means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity.
- 8.12 In doing so planning authorities must also take account of and promote the resilience of ecosystems, in particular the following aspects:
- diversity between and within ecosystems
  - the extent and scale of ecosystems
  - the condition of ecosystems including their structure and functioning;
  - the connections between and within ecosystems, and
  - the adaptability of ecosystems.
- 8.13 In fulfilling this duty, planning authorities must have regard to:
- the list of habitats and species of principal importance for Wales, published under Section 7 of the Environment (Wales) Act 2016;
  - the SoNaRR, published by NRW;
  - any Area Statement that covers all or part of the area in which the authority exercises its functions; and,

- guidance given to public authorities by Welsh Ministers under Section 6 of the Environment (Wales) Act.

### ***Designated Sites***

- 8.14 PPW states that planning authorities must have regard to the relative significance of international, national and local designations in considering the weight to be attached to nature conservation interests. PPW sets out:
- That statutorily and non-statutorily designated sites and habitats should be properly protected and managed and their role at the heart of resilient ecological networks is safeguarded.
  - Both statutorily and non-statutorily designated sites make a vital contribution to protecting biodiversity, maintaining the resilience of ecosystems and are important in providing opportunities for achieving wider well-being objectives.
  - All designated sites must be able to continue to protect the biodiversity and features for which they were designated and contribute to the resilience of ecosystems at the appropriate scale. This ability should not be compromised by inappropriate development or other activity.
  - Special Areas of Conservation, Special Protection Areas, RAMSAR sites, Sites of Special Scientific Interests, and National Nature Reserves comprising statutory designations carry greatest weight, and there is a presumption against all forms of development within such designated sites (that are not necessary for the management of the site) as a matter of principle. This presumption should be appropriately reflected in development plans and development management decisions.
  - Non-statutory designated sites should be given adequate protection in development plans and the development management process and should be considered in line with a 'step-wise' approach. Before authorising development likely to damage a local wildlife designation, planning authorities should give notice of the proposed operation to the County Ecologist and third sector environmental organisations. Policies for non-statutory sites should make it clear that such designations do not preclude appropriate developments, where there are no adverse impacts on the features for which a site is designated.

### ***Green Infrastructure***

- 8.15 PPW states that a Green Infrastructure Statement should be submitted with all planning applications. The Green Infrastructure Statement should be proportionate to the scale and nature of the proposed development and describe how green infrastructure has been incorporated into the proposal. PPW envisages the Green Infrastructure Statement as being an effective way of demonstrating positive multi-functional outcomes which are appropriate to the Site, and also demonstrate how the step-wise approach has been applied.
- 8.16 PPW notes that the Green Infrastructure Statement should highlight any baseline data considered and surveys and assessments undertaken, including habitats and species surveys, arboricultural surveys and assessments, and landscape and ecological management plans. Development proposals should be informed by the priorities identified in green infrastructure assessments and locally based planning guidance.

### ***Maintaining and Enhancing Biodiversity***

- 8.17 PPW states that development should not cause any significant loss of habitats or populations of species, locally or nationally and, must working alongside nature and it must provide a net benefit for biodiversity and improve, or enable the improvement of, the resilience of ecosystems.
- 8.18 A step-wise approach should be worked through iteratively, with the result being a scheme of enhancement secured through the Proposed Development to provide a net benefit for biodiversity, with the improvement of ecosystem resilience, particularly improving the connectivity to the immediate surroundings, being a key contribution to on-site avoidance, minimisation, and mitigation strategies and enhancement

- 8.19 A net benefit for biodiversity is the concept that development should leave biodiversity and the resilience of ecosystems in a significantly better state than before, through securing immediate and long-term, measurable and demonstrable benefit, primarily on or immediately adjacent to the Site. The step-wise approach is the means of demonstrating the steps which have been taken towards securing a net benefit for biodiversity.
- 8.20 In doing so, regard must also be given to promoting the resilience of ecosystems, through the DECCA framework, which is framed as such:
- Diversity between and within ecosystems;
  - The extent or scale of ecosystems;
  - The condition of ecosystems including their structure and functioning;
  - The connections between and within ecosystems; and
  - Adaptability of ecosystems including their ability to adapt to, resist and recover from a range of pressures likely to be placed on them through climate change, for example.
- 8.21 PPW notes that a proactive and creative approach facilitating the delivery of biodiversity and ecosystem resilience outcomes must be taken by all those participating in the planning process, as all interventions contribute to a national scale resilience. The step-wise approach will help in securing a net benefit for biodiversity, with the onus on applicants to bring forward proposals in a way which will achieve a net benefit for biodiversity and demonstrate how they have used the step-wise approach.
- 8.22 Furthermore, PPW notes that *'all development must deliver a net benefit for biodiversity and ecosystem resilience from the baseline state (proportionate to the scale and nature of the development proposed). Even if the biodiversity value has been maintained, there must still be a proactive process to look for and secure enhancement through the design and implementation of the development'*.

### **Protected Species**

- 8.23 With regard to protected species PPW states:
- A species protected under European or UK legislation, or under Section 7 of the Environment (Wales) Act 2016 is a material consideration when a planning authority is considering a development proposal which, if carried out, would be likely to result in disturbance or harm to the species or its habitat and to ensure that the range and population of the species is sustained.
  - Planning authorities should advise anyone submitting a planning application that they must conform with any statutory species protection provisions affecting the site, and potentially the surrounding area, concerned.
  - An ecological survey to confirm whether a protected species is present and an assessment of the likely impact of the development on a protected species may be required in order to inform the development management process. It is considered best practice that screening to determine the presence of protected species should be carried out by a competent ecologist on the basis of data provided by the relevant Local Environmental Record Centre.
- 8.24 Developments are always subject to the legislation covering European protected species. Proposals for which development works would contravene the protection afforded to European protected species require derogations from the provisions of the Habitats Directive. A derogation may only be authorised if there is no satisfactory alternative and if the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in its natural range.

### **Trees, Woodland and Hedgerow**

- 8.25 PPW sets out:

- Planning authorities must promote the planting of new trees, hedgerows, groups of trees and areas of woodland as part of new development, and should have regard to local authority tree strategies or SPG and the Green Infrastructure Assessment.
- Permanent removal of woodland should only be permitted where it would achieve significant and clearly defined public benefits. Where woodland or trees are removed as part of a proposed scheme, developers will be expected to provide compensatory planting.
- Replacement planting shall be at a ratio equivalent to the quality, environmental and ecological importance of the tree(s) lost and this must be preferably onsite, or immediately adjacent to the site, and at a minimum ratio of at least 3 trees of a similar type and compensatory size planted for every 1 lost.
- Where a woodland or a shelterbelt area is lost as part of a proposed scheme, the compensation planting must be at a scale, design and species mix reflective of that area lost. In such circumstances, the planting rate must be at a minimum of 1600 trees per hectare for broadleaves, and 2500 trees per hectare for conifers.
- Ancient woodland and semi-natural woodlands and individual ancient, veteran and heritage trees are irreplaceable natural resources, and have significant landscape, biodiversity and cultural value. Such trees and woodlands should be afforded protection from development which would result in their loss or deterioration unless there are significant and clearly defined public benefits; this protection should prevent potentially damaging operations and their unnecessary loss.
- In the case of a site recorded on the Ancient Woodland Inventory, authorities should consider the advice of NRW.

#### **TAN 5 Nature Conservation and Planning**

- 8.26 Technical Advice Note (TAN) 5 supplements Planning Policy Wales and provides advice about how the land use planning system in Wales ‘should contribute to protecting and enhancing biodiversity and geological conservation.’
- 8.27 The TAN provides guidance to local planning authorities on: ‘the key principles of positive planning for nature conservation; nature conservation and Local Development Plans; nature conservation in development management procedures; development affecting protected internationally and nationally designated sites and habitats; and, development affecting protected and priority habitats and species.’
- 8.28 In section 2.4 when deciding planning applications that may affect nature conservation, ‘local authorities should:
- contribute to the protection and improvement of the environment...seeking to avoid irreversible harmful effects on the natural environment;
  - ensure that appropriate weight is attached to designated sites of international, national and local importance;
  - protect wildlife and natural features in the wider environment, with appropriate weight attached to priority habitats and species in Biodiversity Action Plans;
  - ensure that all material considerations are taken into account and decisions are informed by adequate information about the potential effects of a development on nature conservation;
  - ensure that the range and population of protected species is sustained;
  - adopt a stepwise approach to avoid harm to nature conservation, minimise unavoidable harm by mitigation measures, offset residual harm by compensation measures and look for new opportunities to enhance nature conservation; where there may be significant harmful effects local planning authorities will need to be satisfied that any reasonable alternative sites that would result in less or no harm have been fully considered.’
- 8.29 At section 3.3.2 regarding Local Development Plans policies the guidance states that a policy should be included in respect of the application of the precautionary principle.



- 8.30 Section 4 includes specific and detailed guidance, expanding on the principles set out in 2.4, in respect of the development control process including pre-application discussions, preparing planning applications, requests for further information and ecology in respect of Environmental Impact Assessment (EIA). The broad principles of development control requirements are set out as follows:
- ‘adopting the five-point approach to decision-making – information, avoidance, mitigation, compensation and new benefits;
  - ensuring that planning applications are submitted with adequate information, using early negotiation, checklists, requiring ecological surveys and appropriate consultation;
  - securing necessary measures to protect, enhance, mitigate and compensate through planning conditions and obligation;
  - carrying out effective planning enforcement; and
  - identifying ways to build nature conservation into the design of new development.’

#### **European protected species (Animals)**

- 8.31 The Conservation of Habitats and Species Regulations 2017 (as amended) consolidates various amendments that have been made to the original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.
- 8.32 “European protected species” (EPS) of animal are those which are shown on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). They are subject to the provisions of Regulation 43 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:
- a. Intentionally or deliberately capture, injure or kill any wild animal included amongst these species
  - b. Possess or control any live or dead specimens or any part of, or anything derived from a these species
  - c. deliberately disturb wild animals of any such species
  - d. deliberately take or destroy the eggs of such an animal, or
  - e. intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place
- 8.33 For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—
- a. to impair their ability—
    - i. to survive, to breed or reproduce, or to rear or nurture their young, or
    - ii. in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
  - b. to affect significantly the local distribution or abundance of the species to which they belong.
- 8.34 Although the law provides strict protection to these species, it also allows this protection to be set aside (derogated) through the issuing of licences. The licences in England are currently determined by Natural England (NE) for development works and by Natural Resources Wales in Wales. In accordance with the requirements of the Regulations (2017, as amended), a licence can only be issued where the following requirements are satisfied:
- a. The proposal is necessary ‘to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment’
  - b. ‘There is no satisfactory alternative’

- c. The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.'

### **Definition of breeding sites and resting places**

- 8.35 Guidance for all European Protected Species of animal, including bats and great crested newt, regarding the definition of breeding and of breeding and resting places is provided by The European Council (EC) which has prepared specific guidance in respect of the interpretation of various Articles of the EC Habitats Directive.<sup>19</sup> Section II.3.4.b) provides definitions and examples of both breeding and resting places at paragraphs 57 and 59 respectively. This guidance states that 'The provision in Article 12(1)(d) [of the EC Habitats Directive] should therefore be understood as aiming to safeguard the ecological functionality of breeding sites and resting places.' Further the guidance states: 'It thus follows from Article 12(1)(d) that such breeding sites and resting places also need to be protected when they are not being used, but where there is a reasonably high probability that the species concerned will return to these sites and places. If for example a certain cave is used every year by a number of bats for hibernation (because the species has the habit of returning to the same winter roost every year), the functionality of this cave as a hibernating site should be protected in summer as well so that the bats can re-use it in winter. On the other hand, if a certain cave is used only occasionally for breeding or resting purposes, it is very likely that the site does not qualify as a breeding site or resting place.'

### **European protected species (Plants)**

- 8.36 The Conservation of Habitats and Species Regulations 2017 (as amended) consolidates various amendments that have been made to the original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.
- 8.37 "European protected species" (EPS) of plant are those which are present on Schedule 5 of the Conservation of Habitats and Species Regulations 2017 (as amended). They are subject to the provisions of Regulation 46 of those Regulations.
- 8.38 Regulation 47 makes it an offence to deliberately pick, collect, cut, uproot or destroy a wild plant of an EPS. It also makes it an offence to have in possession or control any live or dead plant or part of plant which has been taken in the wild and which is an EPS (or listed in Annexe II(b) or IV(b) of the Habitats Directive).

### **Competent authorities**

- 8.39 Under Regulation 7 of the Conservation of Habitats and Species Regulations 2017 (as amended) a "competent authority" includes "any Minister of the Crown..., government department, statutory undertaker, public body of any description or person holding a public office."
- 8.40 In accordance with Regulation 9, "a competent authority must exercise their functions which are relevant to nature conservation, including marine conservation, so as to secure compliance with the requirements of the [Habitats and Birds] Directives. This means for instance that when considering development proposals a competent authority should consider whether EPS or European Protected Sites are to be affected by those works and, if so, must show that they have given consideration as to whether derogation requirements can be met."

### **Birds**

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

<sup>19</sup> Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC. (February 2007), EC.

- 8.42 The Conservation of Habitats and Species Regulations 2017 (as amended) places duties on competent authorities (including Local Authorities and National Park Authorities) in relation to wild bird habitat. These provisions relate back to Articles 1, 2 and 3 of the EC Directive on the conservation of wild birds (2009/147/EC, 'Birds Directive'<sup>20</sup>) (Regulation 10 (3)) requires that the objective is the 'preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat, as appropriate, having regard to the requirements of Article 2 of the new Wild Birds Directive...' Regulation 10 (7) states: 'In considering which measures may be appropriate for the purpose of security or contributing to the objective in [Regulation 10 (3)] Paragraph 3, appropriate account must be taken of economic and recreational requirements'.
- 8.43 In relation to the duties placed on competent authorities under the 2017 Regulations, Regulation 10 (8) states: 'So far as lies within their powers, a competent authority in exercising any function [including in relation to town and country planning] in or in relation to the United Kingdom must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds (except habitats beyond the outer limits of the area to which the new Wild Birds Directive applies).'

### Badger

- 8.44 Badger is protected under the Protection of Badgers Act 1992. It is not permitted to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as "a structure or place, which displays signs indicating current use by a badger".
- 8.45 ODPM Circular 06/2005<sup>21</sup> provides further guidance on statutory obligations towards badger within the planning system. Of particular note is paragraph 124, which states that "The likelihood of disturbing a badger sett, or adversely affecting badgers' foraging territory, or links between them, or significantly increasing the likelihood of road or rail casualties amongst badger populations, are capable of being material considerations in planning decisions."
- 8.46 Natural England provides Standing Advice<sup>22</sup>, which is capable of being a material consideration in planning decisions. Natural England recommends mitigation to avoid impacts on badger setts, which includes maintaining or creating new foraging areas and maintaining or creating access (commuting routes) between setts and foraging/watering areas.

### Reptiles

- 8.47 All native reptile species receive legal protection in Great Britain under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Viviparous lizard, slow-worm, grass snake and adder are protected against killing, injuring and unlicensed trade only. Sand lizard and smooth snake receive additional protection as "European Protected species" under the provisions of the Conservation of Habitats and Species Regulations 2017 (as amended) and are fully protected under the Wildlife and Countryside Act 1981 (as amended).
- 8.48 All six native species of reptile are included as 'species of principal importance' for the purpose of conserving biodiversity under Section 41 (England) of the NERC Act 2006 and Section 7 of the Environment (Wales) Act 2016.
- 8.49 Current Natural England Guidelines for Developers<sup>23</sup> states that 'where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring.' Further the guidance states: 'Normally prohibited activities may not be illegal if 'the act was the incidental result of a lawful operation and could not reasonably have been

<sup>20</sup> 2009/147/EC Birds Directive (30 November 2009. European Parliament and the Council of the European Union.

<sup>21</sup> ODPM Circular 06/2005. *Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.

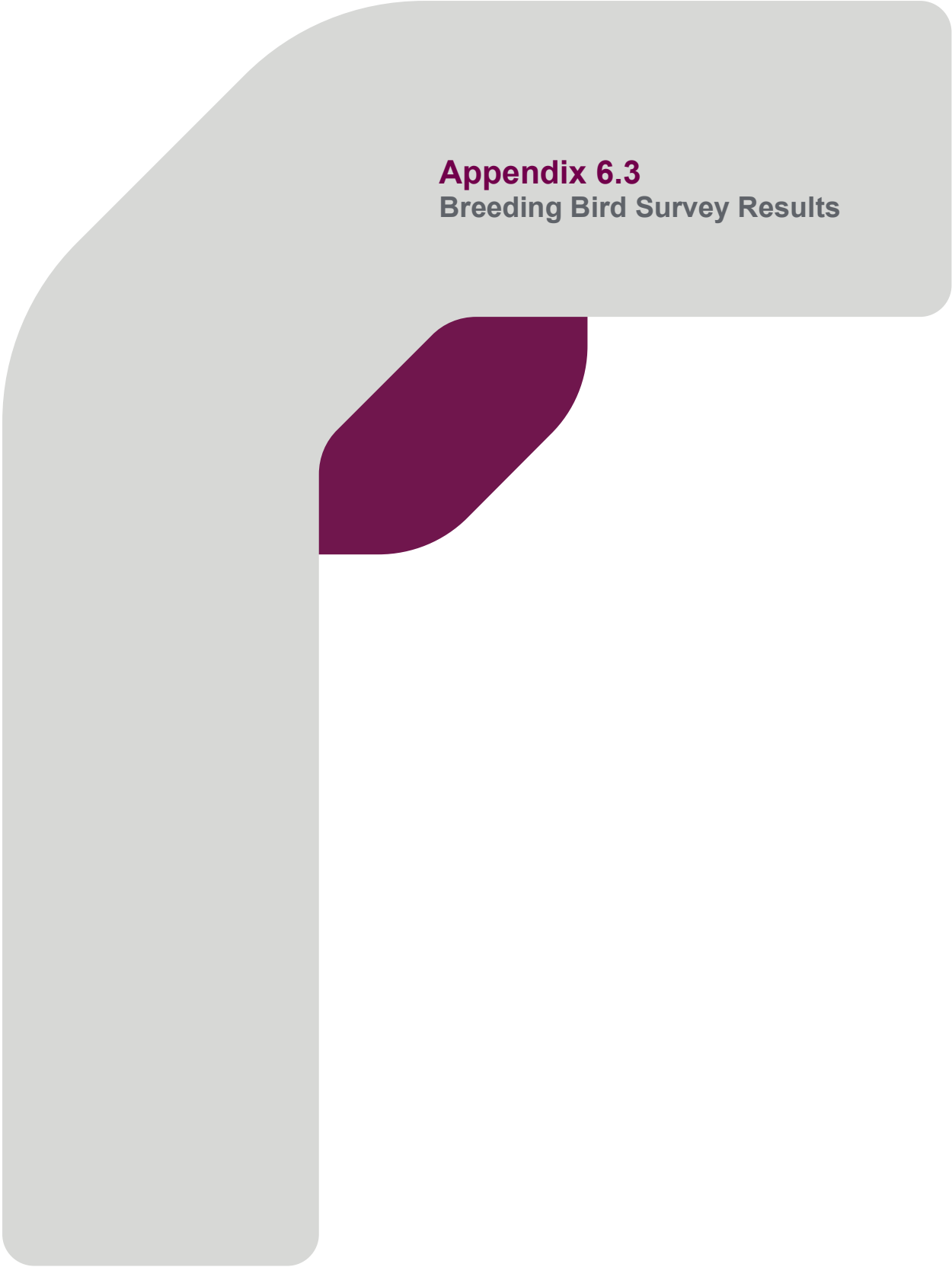
<sup>22</sup> <http://www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/specieslinks.aspx>

<sup>23</sup> English Nature, 2004. *Reptiles: guidelines for developers*. English Nature, Peterborough. <https://webarchive.nationalarchives.gov.uk/20150303064706/http://publications.naturalengland.org.uk/publication/76006>

avoided'. Natural England 'would expect reasonable avoidance to include measures such as altering development layouts to avoid key areas, as well as capture and exclusion of reptiles.'

8.50 The Natural England Guidelines for Developers state that 'planning must incorporate two aims where reptiles are present:

- To protect reptiles from any harm that might arise during development work;
- To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.'



## Appendix 6.3 Breeding Bird Survey Results

## Appendix 6.3: Breeding bird survey

- 8.51 A total of forty-eight species were recorded during the breeding bird surveys, 32 of which were considered to be breeding on, or within close proximity to the Site. The highest density of territorial birds was located along field boundary features and in the adjacent woodland, with a smaller number of ground nesting birds present within the tussocky marshy grassland pasture along the eastern edge of the Site.
- 8.52 Table 3.1 below, lists all species recorded during the surveys and gives information on their conservation status and the indicative number of territories recorded. The locations of territories are shown on Figure 3a - c

**Table 3.1:** Number of territories and conservation status for all species recorded as breeding.

Species			Conservation Status		Number of Territories
Common Name	Scientific Name	BTO Species Code	Protected / priority species?	Welsh BOCC Status*	
Barn Swallow	<i>Hirundo rustica</i>	SL		Green	1
Blackbird	<i>Turdus merula</i>	B.		Green	11
Blackcap	<i>Sylvia atricapilla</i>	BC		Green	1
Blue Tit	<i>Cyanistes caeruleus</i>	BT		Green	8
Bullfinch	<i>Pyrrhula pyrrhula</i>	BF	S7	Amber	1
Carrion Crow	<i>Corvus corone</i>	C.		Green	3
Chaffinch	<i>Fringilla coelebs</i>	CH		Green	8
Chiffchaff	<i>Phylloscopus collybita</i>	CC		Green	3
Coal Tit	<i>Parus ater</i>	CT		Green	10
Common Redstart	<i>Phoenicurus phoenicurus</i>	RT		Green* (Amber)	8
Cuckoo	<i>Cuculus canorus</i>	CK		Red	1
Dunnock	<i>Prunella modularis</i>	D.	S7	Green* (Amber)	1
Goldcrest	<i>Regulus regulus</i>	GC		Amber* (Green)	3
Goldfinch	<i>Carduelis carduelis</i>	GO		Green	3
Goshawk	<i>Accipiter gentilis</i>	GI	Sch. 1	Green	1
Great Spotted Woodpecker	<i>Dendrocopos major</i>	GS		Green	1
Great Tit	<i>Parus major</i>	GT		Green	6
Green Woodpecker	<i>Picus viridis</i>	G.		Amber* (Green)	3
Jay	<i>Garrulus glandarius</i>	J.		Green	1
Meadow Pipit	<i>Anthus pratensis</i>	MP		Red* (Amber)	1
Mistle Thrush	<i>Turdus viscivorus</i>	M.		Amber* (Red)	1
Nuthatch	<i>Sitta europaea</i>	NH		Green	4
Pheasant	<i>Phasianus colchicus</i>	PH		No Status	1
Robin	<i>Erithacus rubecula</i>	R.		Green	9
Siskin	<i>Spinus spinus</i>	SK		Green	3
Skylark	<i>Alauda arvensis</i>	S.	S7	Amber* (Red)	4
Song Thrush	<i>Turdus philomelos</i>	ST	Y	Amber	15
Stonechat	<i>Saxicola torquata</i>	SC		Green	1
Tawny Owl	<i>Strix aluco</i>	TO		Green* (Amber)	1

Species			Conservation Status		Number of Territories
Common Name	Scientific Name	BTO Species Code	Protected / priority species?	Welsh BOCC Status*	
Willow Warbler	<i>Phylloscopus trochilus</i>	WW		Red* (Amber)	1
Woodpigeon	<i>Columba palumbus</i>	WP		Green* (Amber)	4
Wren	<i>Troglodytes troglodytes</i>	WR		Green* (Amber)	22

\* For these species, the Welsh BoCC status differs from the recently published 'Birds of Conservation Concern 5', which applies to the UK as a whole. For each, the UK BoCC 5 status is also given (in brackets).

## Breeding species

### Highly Protected and Priority Species

- 8.53 None of the species recorded as breeding on Site are listed on Schedule 1 of the Wildlife and Countryside Act (1981) (as amended).
- 8.54 However, one agitated adult goshawk was recorded during the first visit, within suitable breeding habitat (woodland) beyond the northern Site boundary (off-Site). There were no other sightings during the surveys. Whilst this has been included as a notable sighting (as a Schedule 1 bird in suitable breeding habitat), no confirmed evidence of breeding was recorded, however the bird was likely holding territory in the area. Habitats within the Site are not suitable to support breeding goshawk (mature woodland).
- 8.55 Four of the species recorded during the survey are species of principal importance for the conservation of biodiversity in Wales (priority species) listed under Section 7 of the Environment Wales Act (2016). Of these three are considered to be holding territory on or within close proximity of the Site during the 2023 breeding season: bullfinch, dunnock and song thrush (starling was not recorded breeding and is covered in the relevant section below).
- One bullfinch territory which involved an agitated adult within trees to the south of the Site (approximately 65 m off-Site) on the fourth survey visit.
  - One dunnock territory was recorded within trees to the south of the Site (approximately 75 m off-Site), which involved a male singing on visit one and juveniles present during visit four.
  - Fifteen song thrush territories were recorded, with five in mature field boundary trees within the southern and eastern parts of the Site and ten in woodland bordering (on and adjacent to Site). The majority of records are of singing males associated with suitable nesting habitat, recorded across all survey visits.

### Welsh Red Listed Species BOCC

- 8.56 Three Welsh red listed species were recorded breeding in or adjacent to the Site boundary, cuckoo, meadow pipit, and willow warbler.
- One cuckoo territory was recorded, which involved singing male on visit four, within forestry plantation to the east of the Site (200 m off-Site). Breeding dunnock (above) and meadow pipit (below) are present on Site (alongside other small common passerine species) which are commonly parasitised by breeding cuckoo.
  - Meadow pipit territory was recorded, which involved a singing male and agitated behaviour on visits three and four. Territories were recorded within the suitable breeding habitat (marshy grassland) in the eastern part of the Site.
  - Willow warbler was recorded off the eastern boundary of the Site (10 m off-Site) within scrub habitat bordering the plantation woodland. The record involved a singing male over multiple visits and within suitable breeding habitat.

**Welsh Amber Listed Species BOCC**

- 8.57 Six Welsh amber listed species were recorded breeding in or adjacent to the Site boundary, bullfinch (above), goldcrest, green woodpecker, mistle thrush, skylark and song thrush (above).
- Three goldcrest territories were recorded adjacent to the Site boundary, only two were within suitable nesting habitat (plantation woodland) to the north-east and east of the Site (190m and 5 m respectively), the third was within a mature field boundary tree to the south of the Site (60 m off-Site). All involved singing males, recorded on individual visits (visits one or four).
  - Three green woodpecker territories were recorded all within suitable nesting habitat adjacent to the north, west and east Site boundaries (immediately off-Site). These involved single males or agitated behaviour.
  - One mistle thrush territory was recorded within mature field boundary trees in the west of the Site. The records involved agitated behaviour during visit four.
  - Four skylark territories were recorded. One of these are within the Site boundary, within suitable nesting habitat (marshy grassland / rough sward) in the eastern part of the Site. The record was of a singing male recorded during at least two survey visits (one and four). The three other territories recorded, are associated with the marshy grassland 140 m to the north (off-Site but within the same field enclosure), acid grassland on the adjacent common (240 m to the east) and Hafod Quarry (167 m to the west). These records involved singing males recorded over multiple visits.


**Welsh Green Listed Species BOCC**

- 8.58 A total of twenty-two Welsh green listed species were considered to be breeding on or adjacent to the Site during the survey period. These are relatively widespread and / or common species in Wales and are not of particular conservation concern.

**Non-breeding species**

- 8.59 The following records are considered to be notable, but were not recorded breeding on-Site:
- A brambling pair were recorded signing during the first visit. Given that the Site falls outside of the typical breeding range of this species, and that no evidence of the territory was recorded during the prior or subsequent visits, it is most likely that this bird was on passage and the record is not considered as a territory within the survey results.
  - Two tree pipits were recorded within the marshy grassland in the eastern part of the Site, one within the Site boundary, and the second 110 m off-Site to the north (but within the same field enclosure). No evidence of the territory was recorded during the prior or subsequent visits, it is most likely that this bird was on passage and the record is not considered as a territory within the survey results.
  - One starling was also recorded during the third visit, over flying the Site. No other starling observations were made during the survey and no confirmed evidence of breeding was recorded.
  - Lapwing were recorded during the first survey visit exhibiting agitated behaviour in suitable nesting habitat (marshy grassland) in the eastern of the Site. No other observations of lapwing or evidence of a breeding attempt were recorded in subsequent survey visits.



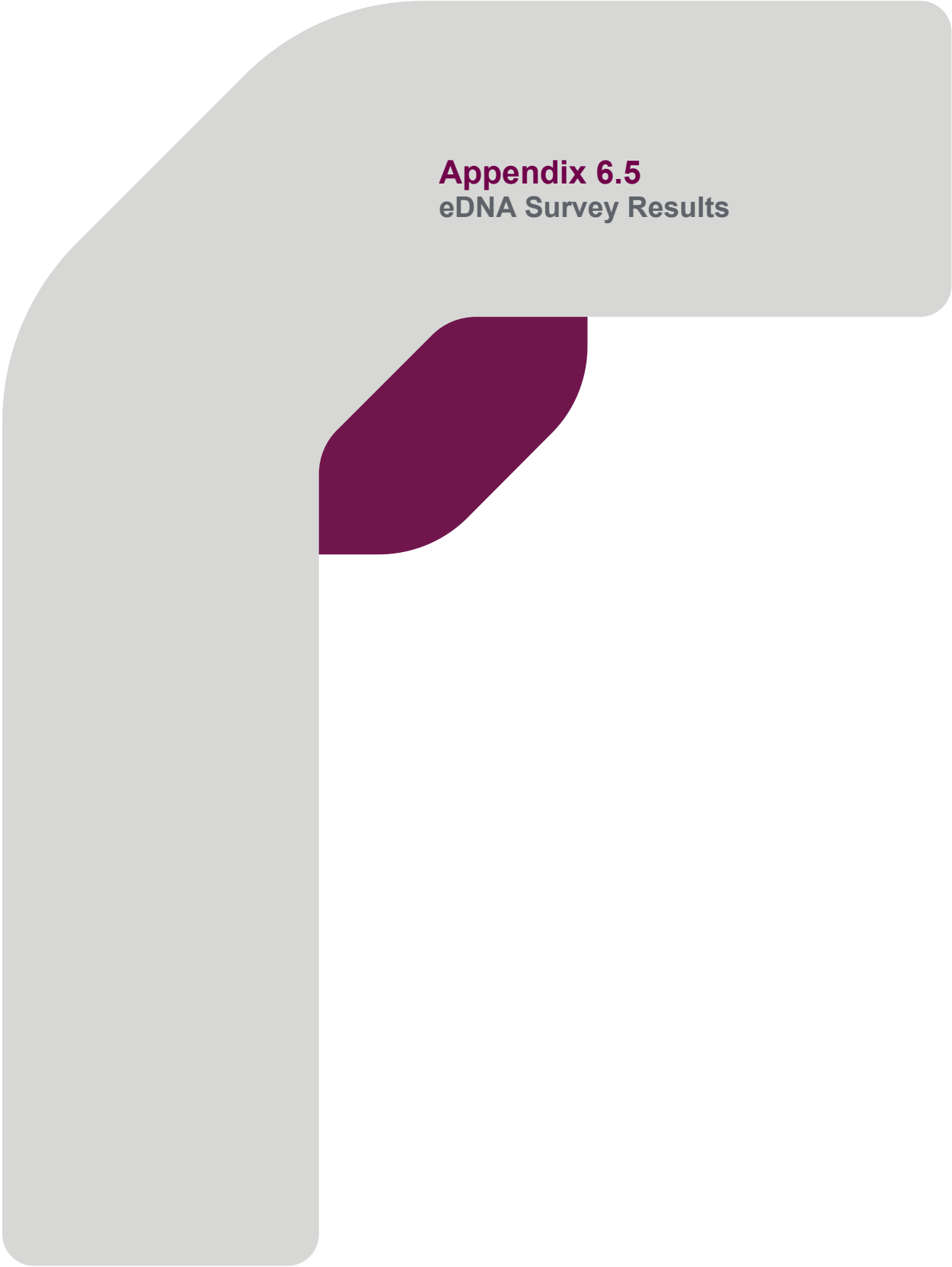


**Appendix 6.4**  
**Habitat Suitability Index Results**

## Appendix 6.4: Habitat Suitability Index Results

**Table 4.1:** Habitat Suitability Index Results for all ponds within 250 m of the Site.

Pond Ref.	SF1		SF2		MM2		MM3		MM4		MM6		MM7		MM8	
Map location	B	0.50	B	0.50	B	0.50	B	0.50	B	0.50	B	0.50	B	0.50	B	0.50
Surface area	irregular		irregular		irregular		irregular		irregular		irregular		irregular		irregular	
Pond area (m <sup>2</sup> )	270	0.50	105	0.20	650	1.00	700	1.00	270	0.50	190	0.35	25	0.05	20	0.05
Dessication rate	never	0.90	sometimes	0.50	frequently	0.10	frequently	0.10	frequently	0.10	sometimes	0.50	frequently	0.10	frequently	0.10
Water quality	moderate	0.67	moderate	0.67	poor	0.33	poor	0.33	moderate	0.67	poor	0.33	moderate	0.67	moderate	0.67
Shade (% of margin shaded 1m from bank)	60	1.00	60	1.00	0	1.00	0	1.00	85	0.50	0	1.00	0	1.00	0	1.00
Waterfowl	absent	1.00	absent	1.00	minor	0.67	minor	0.67	absent	1.00	minor	0.67	absent	1.00	absent	1.00
Fish population	absent	1.00	absent	1.00	absent	1.00	absent	1.00	absent	1.00	absent	1.00	absent	1.00	absent	1.00
Number of ponds within 1km	4	0.72	4	0.72	5	0.75	6	0.84	4	0.72	5	0.75	6	0.84	6	0.84
Terrestrial habitat	moderate	0.67	moderate	0.67	good	1.00	good	1.00	good	1.00	good	1.00	good	1.00	good	1.00
Macrophyte cover (%)	0	0.31	5	0.36	10	0.41	30	0.61	90	0.90	10	0.41	95	0.85	95	0.85
<b>HSI score =</b>	<b>0.68</b>		<b>0.60</b>		<b>0.57</b>		<b>0.60</b>		<b>0.59</b>		<b>0.60</b>		<b>0.51</b>		<b>0.51</b>	
<b>Pond suitability =</b>	<b>average</b>		<b>average</b>		<b>below average</b>		<b>average</b>		<b>below average</b>		<b>average</b>		<b>below average</b>		<b>below average</b>	



## Appendix 6.5 eDNA Survey Results

Folio No: E16618  
Report No: 1  
Purchase Order: P23-247 CW  
Client: BSG ECOLOGY LTD  
Contact: James Garside

## TECHNICAL REPORT

### ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

#### SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

#### RESULTS

**Date sample received at Laboratory:** 20/04/2023  
**Date Reported:** 02/05/2023  
**Matters Affecting Results:** None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1408	Sf2 Myndd Maen Solar Farm		Pass	Pass	Pass	Negative	0
1410	Sf1 Myndd Maen		Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: [ForensicEcology@surescreen.com](mailto:ForensicEcology@surescreen.com)

**Reported by:** Chris Troth

**Approved by:** Jennifer Higginbottom



## **METHODOLOGY**

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

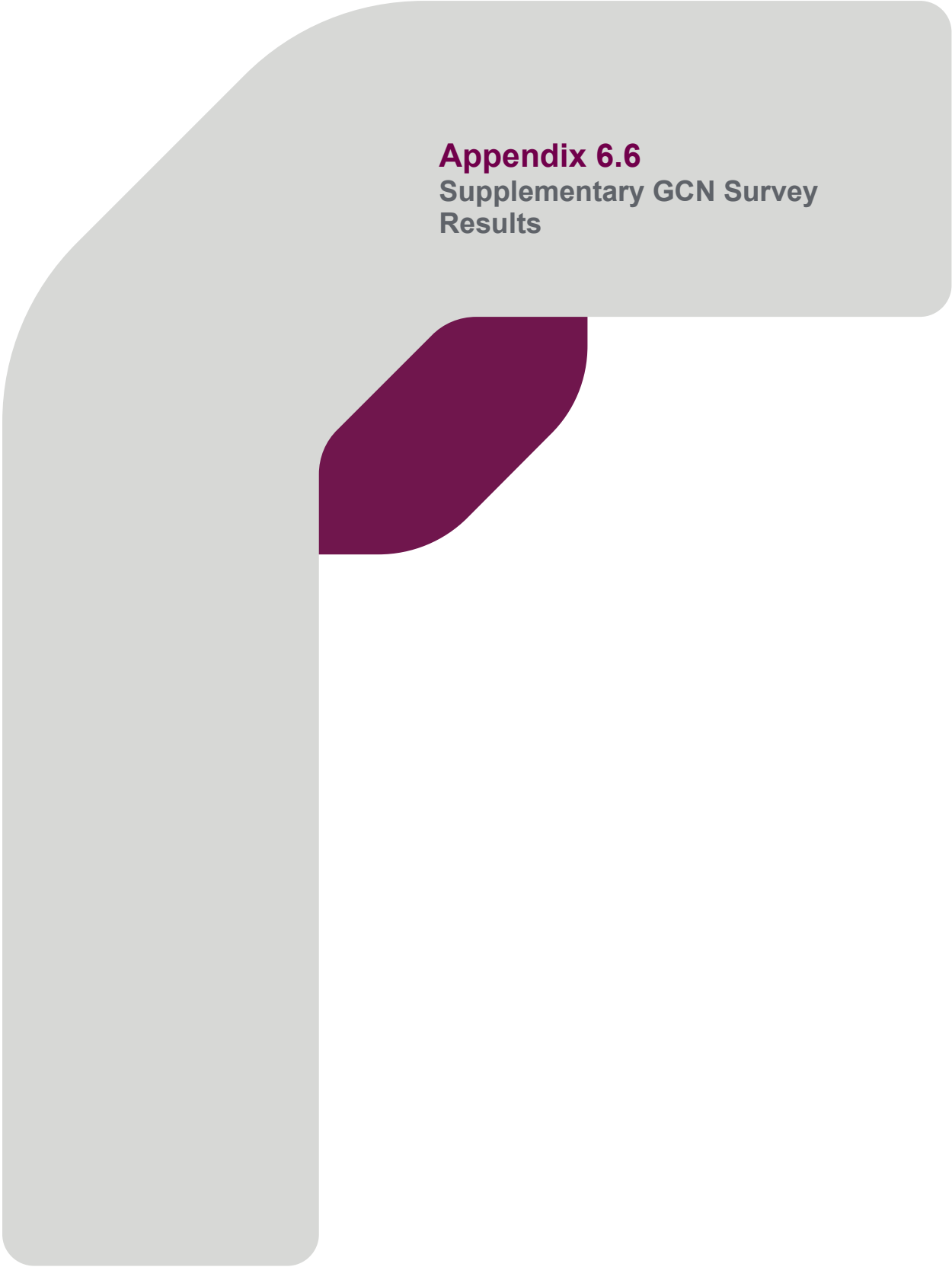
Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

## **INTERPRETATION OF RESULTS**

- SIC:**           **Sample Integrity Check** [Pass/Fail]  
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.
- DC:**           **Degradation Check** [Pass/Fail]  
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.
- IC:**           **Inhibition Check** [Pass/Fail]  
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.
- Result:**       **Presence of GCN eDNA** [Positive/Negative/Inconclusive]  
**Positive:** GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.  
**Positive Replicates:** Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.  
**Negative:** GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.






**Appendix 6.6**  
Supplementary GCN Survey  
Results

## Appendix 6.6: Supplementary Great Crested Newt Survey Results

Table 6.1: Supplementary great crested newt survey results

Pond and date of survey	Bottle Trap				Torchlight				Egg Search	Vegetation (/5)	Turbidity (/5)	Comments
	GCN	SN	PN	SN/PN	GCN	SN	PN	SN/PN	GCN			
<b>Pond 1</b>												
17-18/04/2023	0	0	0	0	0	12	0	0	None	1	2	
11-12/05/2023	0	0	0	0	0	0	0	0	None	2	4	
<b>Pond 2</b>												
17-18/04/2023	0	0	0	0	0	0	0	0	None	2	2	
11-12/05/2023	0	0	1x ♀	0	0	0	0	0	None	2	4	



**Appendix 6.7**  
Biodiversity Enhancement  
Measures



## Appendix 6.7: Biodiversity Enhancement Measures to be applied as part of the Proposed Development

### Policy Requirements

- 8.60 Chapter 6 (Distinctive and Natural Places) of Planning Policy Wales 12 (PPW 12) was updated in February 2024 with the aim of ensuring the planning system in Wales meets the challenges set out in the Global Biodiversity Framework<sup>24</sup>, the Biodiversity Deep Dive recommendations developed in response to this (Welsh Government, 2022), and the Duty, under Section 6 of the Environment (Wales) Act 2016, to maintain and enhance biodiversity and ecosystem resilience in Wales.
- 8.61 The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental, and cultural well-being of Wales, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation and resultant duties.

### *Maintaining and Enhancing Biodiversity*

- 8.62 PPW states that development should not cause any significant loss of habitats or populations of species, locally or nationally and, must working alongside nature and it must provide a net benefit for biodiversity and improve, or enable the improvement of, the resilience of ecosystems.
- 8.63 A step-wise approach should be worked through iteratively, with the result being a scheme of enhancement secured through the Proposed Development to provide a net benefit for biodiversity, with the improvement of ecosystem resilience, particularly improving the connectivity to the immediate surroundings, being a key contribution to on-site avoidance, minimisation, and mitigation strategies and enhancement.
- 8.64 A net benefit for biodiversity is the concept that development should leave biodiversity and the resilience of ecosystems in a significantly better state than before, through securing immediate and long-term, measurable, and demonstrable benefit, primarily on or immediately adjacent to the Site. The step-wise approach is the means of demonstrating the steps which have been taken towards securing a net benefit for biodiversity.
- 8.65 In doing so, regard must also be given to promoting the resilience of ecosystems, through the DECCA framework, which is framed as such:
- Diversity between and within ecosystems,
  - The extent or scale of ecosystems,
  - The condition of ecosystems including their structure and functioning,
  - The connections between and within ecosystems, and
  - Adaptability of ecosystems including their ability to adapt to, resist and recover from a range of pressures likely to be placed on them through climate change, for example.
- 8.66 Furthermore, PPW notes that *'all development must deliver a net benefit for biodiversity and ecosystem resilience from the baseline state (proportionate to the scale and nature of the development proposed). Even if the biodiversity value has been maintained, there must still be a proactive process to look for and secure enhancement through the design and implementation of the development'*.

---

<sup>24</sup> See: <https://www.cbd.int/gbf/>

**Biodiversity Net Benefit Commitments**

- 8.67 The development will have no impact on SSSIs and will not result in any significant loss of habitats or species populations (including of trees or woodland). The key aspects of achieving policy compliance are therefore illustrating how biodiversity has been considered in the design of the scheme and how biodiversity net benefit and increased ecosystem resilience will be achieved through the application.
- 8.68 To demonstrate how biodiversity net benefit has been considered and will be achieved, it is necessary to demonstrate:
- How the stepwise approach to securing a net benefit for biodiversity has been applied.
  - How ecosystem resilience will be demonstrably achieved through the development process.

**Stepwise Approach to Biodiversity Enhancement****Baseline**

- 8.69 The approach taken was to survey for the presence of important habitats, assess whether there was potential for protected species to occur, and to complete surveys for these species.
- 8.70 Survey concluded that the Proposed Development Site, and / or land immediately adjacent to, was characterised by / provided opportunities for the following:
- Non-statutory designated sites (primarily designated for upland / heath communities and / or common land),
  - Priority habitats (associated with designated sites, including dry heath and acid flush) and Ancient Woodland Sites,
  - Common and widespread habitats including semi-improved grassland and mature trees.
  - Common and widespread breeding passerine birds (including a small number of ground nesting species),
  - A small population of great crested newt within the wider surrounding habitat,
  - Common amphibians and reptile species,
  - Potential for hazel dormouse, badger, and other common / notable mammal species (i.e., stoat and hedgehog),
  - Foraging and commuting bats, and
  - Common invertebrate species.

**Site Design**

- 8.71 The Site design was informed by survey results and a review of potential impacts to ensure key ecological features were considered and avoided at the design stage. The design of the Proposed Development has sought to avoid any direct impacts on SINCs, ancient woodland sites, priority habitats and trees in accordance with policy recommendations for ancient woodland and project-specific arboricultural advice. This has been achieved by:
- Placing the construction area within grassland pasture, avoiding boundary features of greater ecological value and which had the potential to support / were known to support protected / notable species.
  - Retention of boundary features (i.e., scattered trees surrounding field enclosures) as far as practicable, with a limited amount of vegetation removal required to facilitate the construction process, to maintain ecological connectivity across the Site.

- Buffering the construction area to avoid residual impacts to key boundary features including Ancient Woodland Sites, priority habitat (broadleaved semi-natural woodland) and boundary features.
- The Cable Route following existing footpaths (i.e., frequently disturbed / poorer areas of habitat) to avoid impacts to priority habitat and / or higher quality upland habitat associated with Mynydd Maen SINC.

#### Avoidance and mitigation measures

- 8.72 Following the Site design phase and a review of residual impacts, the following recommendations for avoidance / mitigation measures have been made. This includes root protection areas, reducing the working footprint (Cable Route) and applying controls to avoid damage and / or degradation of retained habitats (i.e., control accidental physical damage, lighting, pollution, soil compaction and sediment mobilisation) during all phases. Residual impacts will be mitigated for by following sensitive working practices for protected and notable species.

#### Compensation measures

- 8.73 The scheme will result in the temporary short impact of priority habitat (upland heathland) and loss / modification to semi-improved and marshy grassland on Site. The latter will be compensated for by the reinstated following construction, though supplementary oversewing (where appropriate) and appropriate management actions applied to areas of retained habitat on Site to improve overall condition.
- 8.74 In turn this will result in the loss of a limited amount of foraging / commuting / sheltering resource for protected species including common amphibians, foraging bats, badger, breeding birds, invertebrate species, reptiles, and other small mammals. Habitat enhancement for protected species (outlined below) will mitigate the short-term habitat loss and would provide overall enhancement to protected species.
- 8.75 The proposed development will result in the loss of nesting habitat available to ground nesting bird species (specifically one meadow pipit and one skylark territory) within marshy grassland at the eastern edge of the Site. Given the availability of suitable habitat for both species in wider surrounding area (i.e., Mynydd Maen common) it is proposed to compensate for the loss of habitat through enhancement of retained features on Site. This will include appropriate management within buffer areas (see below) to improve species and structural diversity to provide an increase in foraging resource to support for a range of breeding bird species (including skylark and meadow pipit) in the wider surrounding area.

#### Enhancement opportunities

- 8.76 The Proposed Development will deliver the following enhancement measures:
- Creation / enhancement of approximately 400 m of new hedgerow canopy along historic field margins / fence lines between mature trees and planting of 400 new hedgerow trees. The hedgerows will be planted with mixture of native species of local provenance and include a various fruiting species to provide a long-term food resource, and overall resilience. The recreation of hedgerows will improve ecological connectivity and resource across the Site for a range of protected species, including reptiles, amphibians' birds and bats and terrestrial mammals. The hedgerows will be appropriately managed, with rotational cutting to create a robust and to create a robust and functional structure.
  - Management of 5 m -15 m perimeter grassland strips to improve species (floristic) diversity over time, and the creation of habitat that will support small mammals and a wide variety of invertebrates. This will initially be achieved through cutting the vegetation down, scarifying it to open up patches of soil, and seeding. These will then be managed on a rotation so that half of the grassland margins are cut once each year in late August. This will create a tussocky grassland habitat which will support more invertebrates, reptiles, small mammals and provide

cover and food for farmland birds. The arising will be gathered and piled to form small habitat piles within the buffer areas.

- Management prescriptions for the enhanced areas of species-rich semi-improved neutral grassland. These include the seeding / plug planting of native wildflower and grass seed mixes and yellow rattle following scarification / harrowing (to provide some bare area for seed germination) in early spring. Following this, annual cutting using appropriate machinery will be implemented, and aftermath grazing to ensure the sward remains similar in character over time.
- The creation of habitat piles and hibernacula within field margins and close to off-Site ponds, which would provide habitat for invertebrates, amphibians, and reptiles.
- The erection, maintenance, and periodic replacement (as necessary) of owl nest boxes in suitable locations on the woodland edge in the northern part of the Site of the Proposed Development.
- The erection, maintenance, and periodic replacement (as necessary) of bird boxes in suitable locations within field boundaries and on mature trees on Site.
- The erection, maintenance, and periodic replacement (as necessary) of bat boxes on suitable trees within / bordering the Site of the Proposed Development.
- The potential for low intensity grazing of areas between and beneath solar panels by sheep.

8.77 The enhancement measures for ecology receptors and wider biodiversity interest features will be detailed within a LEMP. The LEMP will also include an appropriate monitoring scheme to ensure the enhancement measures are delivered in accordance with the principles above.

### ***Ecosystem resilience***

8.78 Ecosystem resilience is defined as “*the capacity of ecosystems to deal with disturbances, either by resisting them, recovering from them, or adapting to them, whilst retaining their ability to deliver services and benefits now and in the future*” (NRW, 2016). The opportunities outlined above seek to retain and enhance habitats in line with this definition. Once implemented, the enhancements will help increase resilience in the local area, by providing connections between existing resources, an increase in condition / extent of priority habitats locally, the biodiversity of habitats to provide resilience to potential disease or changes in climate, and a long-term commitment to management. This is evidenced in **Table 7.1** below.

**Table 7.1** Description of how biodiversity enhancement features satisfy biodiversity/ ecosystem enhancement according to the DECCA framework

Receptor	Enhancement description	Resilience of biodiversity/ ecosystems enhancement using DECCA framework				
		Diversity between and within ecosystems	Extent or scale of ecosystems	Condition of ecosystems and structure/ function	Connection between and within ecosystems	Adaptability
Field boundary trees	Restored hedgerow with trees	Species-rich planting improves species diversity.	Extent of functioning habitat increased by restoration.	Condition, structure and function of habitat restored by hedgerow creation.	Connection across the Site and into wider landscape for mobile species increased.	Adaptability of habitat improved by increasing diversity and extent.
Field boundary trees	New hedgerow management	Structural diversity of hedgerow and diversity of associated mobile species increased.	Extent of functional habitat increased with management.	Condition and structure and function improved through management.	Connection across the Site and into wider landscape for mobile species increased with management.	Adaptability of hedgerows increased with improved condition.
Trees, mobile species	In-hedgerow standard trees	Structural diversity of hedgerow increased with provision of in-hedgerow trees through management	n/a	Condition, structure and function of habitat improved with in-hedgerow standard trees.	Connection between ecosystems for mobile species improved by provision of habitat niche.	Adaptability of mobile species increased with increased diversity of structure of hedgerows.
Rough grassland margins	Management of 5 m -15 m perimeter grassland	Diverse ecotone created between field boundary and grassland	n/a	Provision of field boundary buffer improves structure and function of habitats by increasing niches.	Connection between habitat features improved.	Adaptability of habitat increased with improved condition.

Grassland, mobile species	Management of 5 m -15 m perimeter grassland	Diverse ecotone created between field boundary and grassland	n/a	Condition, structure and function of existing grassland improved through management	n/a	Adaptability of habitats increased with improved condition.
Grasslands, mobile species	Semi-improved grassland enhancement	n/a	n/a	Condition, structure and function of existing grassland improved through management	n/a	Adaptability of habitats increased with improved condition.
Reptiles and amphibians	Creation of habitat piles and hibernacula	n/a	n/a	n/a	Connection between ecosystems for mobile species improved by provision of habitat niche.	Adaptability increased with increased connectivity.
Owls and birds	Bird boxes	n/a	n/a	n/a	n/a	n/a
Bats	Bat boxes	n/a	n/a	n/a	n/a	n/a



**Appendix 7.1**  
Cultural Heritage Desk Based  
Assessment

# CIL-LONYDD SOLAR FARM, NEWBRIDGE, CAERPHILLY

Cultural Heritage Desk-Based assessment

Cil-Lonydd Solar,  
Newbridge, Caerphilly  
Cultural Heritage Desk-  
Based Assessment  
2.0  
4<sup>th</sup> March 2024



## REPORT

### Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1.0	Draft	Philip Bethell	Richard Smalley	Richard Smalley	4 <sup>th</sup> October 2022
2.0	Revision to comply with GGAT HER requirements	Philip Bethell	Nick Cooke	Nick Cooke	4 <sup>th</sup> March 2024

### Approval for issue

Nick Cooke

4 March 2024

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# CRYNODEB GWEITHREDOL

Mae cynnig i ddatblygu tir yn Fferm Cil-lonydd, Trecelyn, Caerffili, sydd hefyd yn cael ei adnabod fel Mynydd Maen, fel fferm solar.

Mae safle'r astudiaeth wedi cael ei hasesu am ei photensial archaeolegol o dan y ddaear, a'r effeithiau posibl ar lleoliadau asedau archaeolegol a threftadaeth adeiledig dynodedig yn yr ardal gyfagos.

O fewn radiws o 5km i safle'r astudiaeth, mae 10 Heneb Gofrestredig, 163 o adeiladau rhestredig, a 5 Ardal Gadwraeth. Nid oes unrhyw fathau eraill o asedau dynodedig o fewn 5km i safle'r astudiaeth. Mae'r ased treftadaeth dynodedig agosaf at safle'r astudiaeth 1.8km i ffwrdd.

Gan ddefnyddio model Parth Gwelededd Damcaniaethol, nodwyd 23 o asedau treftadaeth dynodedig y gallai gwaith datblygu effeithio arnynt h.y. y rhai sydd o fewn y Parth ac o fewn 5km i safle'r astudiaeth. Yn dilyn asesiad cychwynnol o'r cyfanswm hwn, ystyriwyd bod tri ased neu grwpiau o asedau o bosibl yn destun effaith ar eu lleoliadau yn sgil y datblygiad arfaethedig, fel a ganlyn:

Rhif yr Ased	Enw/Disgrifiad	Math/Gradd	Pellter o safle'r astudiaeth
MM141	Twyn Motte	Heneb Gofrestredig	4.5km Gog
1867	Hafod-arthen	Adeilad Rhestredig II	4.3km Gog
21263, 21264	Ffermdy Llanerch-uchaf a'r adeiladau fferm cysylltiedig, a'r ysgubor yn Llanerch-uchaf	Adeilad Rhestredig II	3.0km NW

SM = Heneb Gofrestredig; LB = adeiladau rhestredig;

Fel y nodwyd gan waith desg, mae potensial archaeolegol yn ôl cyfnod ac arwyddocâd tebygol unrhyw olion archaeolegol nas dynodwyd a all fod yn bresennol wedi'u crynhoi ar ffurf tabl isod:

Cyfnod:	Potensial Archaeolegol a Nodwyd	Arwyddocâd Archaeolegol a Nodwyd
Cynhanesyddol	Yn ôl y dystiolaeth nid oes fawr ddim gweithgarwch Cynhanesyddol o amgylch safle'r astudiaeth. Ystyrir bod y posibilrwydd o ganfod mwy o nodweddion o'r cyfnodau hyn o fewn safle'r astudiaeth yn isel. Mae unrhyw olion o'r fath yn debygol o fod yn ganfyddiadau unigol isel o ran eu gwerth.	Isel/Lleol
Rhufeinig	Gan fod tystiolaeth yn brin ger safle'r astudiaeth, nodwyd mai posibilrwydd isel a geir o ganfod olion o'r cyfnod Rhufeinig. Mae unrhyw olion o'r fath yn debygol o fod yn ganfyddiadau unigol isel o ran eu gwerth.	Isel/Lleol
Cyfnod Canoloesol Cynnar/Cyfnod Canoloesol	Caiff presenoldeb maenor eglwysig canoloesol, sy'n tarddu o'r Oesoedd Cynnar o bosibl, ei gofnodi o fewn safle'r astudiaeth. Mae'r dystiolaeth yn awgrymu bod potensial mawr bod gweddillion archaeolegol o'r cyfnod canoloesol yn bresennol o	Cymedrol/Rhanbarthol

	fewn safle'r astudiaeth, ac y gallai fod gwerth rhanbarthol i'r rhain.	
Cyfnod ôl-Ganoloesol i'r Cyfnod Modern	Nodwyd posibilrwydd isel o olion archaeolegol eraill o'r cyfnod ôl-Ganoloesol a'r cyfnod Modern o fewn safle'r astudiaeth, heblaw am nodweddion sy'n gysylltiedig â'r defnydd amaethyddol o safle'r astudiaeth	Isel/Lleol

Mae rhai o'r perthi sy'n ffurfio ffiniau mewnol o fewn safle'r astudiaeth yn debygol o gael eu hystyried yn 'bwysig' o dan y Rheoliadau Perthi (1997), gan eu bod yn bresennol adeg mapio'r Degwm yn 1839.

Mae effeithiau posibl y datblygiad ar yr amgylchedd hanesyddol yn cynnwys effeithiau uniongyrchol ar olion archaeolegol claddedig o fewn safle'r astudiaeth ac effeithiau ar leoliadau asedau treftadaeth archaeolegol dynodedig y tu hwnt i safle'r astudiaeth o fewn 5km i'w ffiniau.

Penderfynodd yr asesiad bod potensial am rai effeithiau andwyol dibwys ar leoliadau asedau treftadaeth dynodedig, ond ni fyddai'r datblygiad arfaethedig yn debygol o gael effaith o gwbl ar arwyddocâd unrhyw ased treftadaeth dynodedig.

Mae posibilrwydd o effaith fawr ar asedau treftadaeth archaeolegol nas dynodwyd sydd o bwys isel/lleol i gymedrol/rhanbarthol a all fod yn bresennol o fewn safle'r astudiaeth.

Mae potensial am effeithiau andwyol ar berthi hanesyddol.

Byddai angen rhagor o waith, ar ffurf arolwg geoffisegol cychwynnol, er mwyn nodweddu'r gweddillion Canoloesol potensial a nodir o fewn safle'r astudiaeth ymhellach.

Paratowyd fersiwn gynharach o'r Asesiad Desg hwn ym mis Hydref 2022, ac fe'i cyflwynwyd fel rhan o Adroddiad Cwmpasu'r Asesiad o'r Effaith Amgylcheddol. Awgrymwyd, ar sail canlyniadau'r Asesiad Desg cychwynnol, y gallai'r dreftadaeth honno gael ei diystyru o'r Datganiad Amgylcheddol. Gwnaeth PCAC gynnwys ymatebion ymgynghori gan Cadw ac Ymddiriedolaeth Archaeolegol Morgannwg-Gwent yn eu Cyfarwyddyd Cwmpasu.

I grynhoi, roedd Cadw yn fodlon bod asesiad digonol o effeithiau posibl ar leoliadau asedau treftadaeth dynodedig o fewn 5km i'r Safle wedi'i gynnal. Nododd Cadw hefyd fod angen ymchwiliad a gwerthusiad pellach o safle eglwysig Canoloesol Cynnar/Canoloesol o fewn y Safle ar y cofnod CAH.

Roedd sylwadau Ymddiriedolaeth Archeolegol Morgannwg-Gwent yn canolbwyntio ar archaeoleg o dan y ddaear, a chytunwyd ar broses liniaru arfaethedig o effaith y Safle drwy raglen waith archaeolegol, gan gynnwys arolwg geoffisegol a chloddio ffosydd (os oes angen), a gwaith maes pellach os oes angen, os bydd canlyniadau geoffisegol a chloddio ffosydd yn cyfiawnhau hyn.

Mae'r Asesiad Desg diwygiedig hwn wedi mynd i'r afael â sylwadau eraill gan Ymddiriedolaeth Archaeolegol Morgannwg-Gwent ar strwythur a chynnwys yr adroddiad.

Yn unol â Pholisi 18 Cymru'r Dyfodol, ystyrir y gellir bwrw ymlaen â'r datblygiad gan na fyddai unrhyw effeithiau andwyol annerbyniol ar asedau treftadaeth adeiledig a warchodir yn statudol.

## EXECUTIVE SUMMARY

Land at Cil-lonydd Farm, Newbridge, Caerphilly, also known as Mynedd Maen, is being proposed for development as a solar farm.

The study site has been assessed for its below ground archaeological potential, and potential effects on the settings of designated archaeological and built heritage assets in the surrounding area.

Within a 5km radius of the study site, there are 10 Scheduled Monuments, 163 listed buildings, and 5 Conservation Areas. No other designated asset types are present within 5km of the study site. The nearest designated heritage asset to the study site is 1.8km distant.

Using a Zone of Theoretical Visibility (ZTV) model, twenty-three designated heritage assets have been identified that could be subject to an impact from the development, i.e., those lying within the ZTV and within 5km of the study site. Following initial assessment of this total, three assets or asset groups were considered as potentially subject to an impact on their settings from the Proposed Development, as follows:

Asset no	Name/Description	Type/Grade	Distance from study site
MM141	St Illtyd's Castle Mound	SM	4.5km N
1867	Hafod-arthen	LB II	4.3km N
21263, 21264	Llanerch-uchaf farmhouse and attached farm range, and barn at Llanerch-uchaf	LB II	3.0km NW

SM = Scheduled Monument; LB = listed building;

As identified by desk based work, archaeological potential by period and the likely significance of any non-designated archaeological remains which may be present is summarised in table form below:

Period:	Identified Archaeological Potential	Identified Archaeological Significance
Prehistoric	The evidence indicates a paucity of Prehistoric activity around the study site. The potential for further finds and features from these periods to be present within the study site is considered to be low. Any such remains are likely to be isolated finds with low value.	Low/Local
Roman	Due to the paucity of evidence within proximity of the study site a low potential has been established for the Roman period. Any such remains are likely to be isolated finds with low value.	Low/Local
Early Medieval/ Medieval	The presence of a Medieval ecclesiastical grange, of possible Early Medieval origin, is recorded within the study site. The evidence suggests that there is a high potential for archaeological remains from the Medieval period to be present within the study site, and these could be of up to regional value.	Moderate/Regional
Post Medieval to Modern	There is an identified low potential for archaeological remains from the Post Medieval and Modern periods to be present within the study site, other than features related to the agricultural use of the study site	Low/Local

Some of the hedgerows forming internal boundaries within the study site are likely to be considered 'important' under the Hedgerow Regulations (1997), as they were present at the time of the Tithe mapping in 1839.

The potential development impacts on the historic environment consist of direct impacts on buried archaeological remains within the study site, and impacts on the settings of designated archaeological heritage assets beyond the study site within 5km of its boundaries.

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The assessment determined that there is the potential for some negligible adverse impacts on the settings of designated heritage assets, but in no case would the Proposed Development be likely to have an effect on the significance of any designated heritage asset.

There is the potential for a high level of impact on non-designated archaeological heritage assets of low/local to moderate/regional importance that may be present within the study site.

There is the potential for adverse impacts on the historic hedgerows.

Further work, in the form of an initial geophysical survey, would be required to further characterise the potential Medieval remains identified within the study site.

An earlier version of this DBA was prepared in October 2022, and submitted as part of the EIA Scoping Report. It was suggested, based on the results of the initial DBA, that heritage could be scoped out of the ES. PEDW included consultation responses from Cadw and Glamorgan-Gwent Archaeological Trust (GGAT) in their Scoping Direction.

In summary, Cadw were satisfied that sufficient assessment of potential impacts on the settings of designated heritage assets within 5km of the Site had been undertaken. Cadw also noted that the HER record of an Early-Medieval/Medieval ecclesiastical site within the Site required further investigation and evaluation.

GGAT's comments focussed on the below-ground archaeology, and agreed with the proposed mitigation of the Site's impact through a programme of archaeological works, including geophysical survey and trial trenching (if required), and further fieldwork if needed, if the results of the geophysics and trenching justify this.

This revised DBA has addressed other comments from GGAT on the structure and content of the report.

In line with Policy 18 of Future Wales, it is considered that the development could proceed as no unacceptable adverse impacts on statutorily protected built heritage assets would arise.

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# 1 INTRODUCTION AND SCOPE OF STUDY

- 1.1 This cultural heritage desk-based assessment has been prepared by Philip Bethell and Nick Cooke of RPS Consulting Services Ltd on behalf of Cenin Renewables.
- 1.2 The subject of this assessment comprises land at Cil-Lonydd Farm (previously known as Mynedd Maen), Newbridge, Caerphilly, Wales (hereafter, 'the study site'). The study site is centred at ST 23141 97344 within the Caerphilly County Borough area (see Figure 1). The study site is bounded on all sides by woodland and agricultural land. Overall, the study site measures 37.5ha in size, although the Proposed Development of solar panels would not occupy the whole study site area.
- 1.3 The Proposed Development has been deemed a Development of National Significance (DNS) due to its scale, and has been the subject of a Scoping Report submitted to PEDW in 2023. PEDW issued an EIA Scoping Direction in November 2023 (PEDW ref DNS CAS-02446-R8X8W2).
- 1.4 An earlier version of the DBA was prepared in October 2022, and submitted as part of the EIA Scoping Report. It was suggested, based on the results of the initial DBA, that heritage could be scoped out of the ES. PEDW included consultation responses from Cadw and Glamorgan-Gwent Archaeological Trust (GGAT) in their Scoping Direction.
- 1.5 GGAT also identified minor issues with the original DBA that mean it does not confirm to the standards required for accession to the GGAT Historic Environment Record (GGAT 2022). A Specification/WSI has since been agreed with GGAT (RPS, January 2024), and this revised DBA addresses the issues identified to ensure that it is HER compliant, in line with the agreed Specification.
- Scope of Study**
- 1.6 This desk-based assessment is designed to provide the baseline information to enable informed decisions about managing any impacts that may potentially arise on any significant archaeological assets in the Site. This report discusses the potential for encountering below-ground archaeology during the course of the development within the study site, using data from a study area radius of 1km.
- 1.7 Further consideration is given to, and an initial assessment made of, potential impacts on the settings of designated heritage assets, including built heritage assets, within 5km of the study site boundary. A 5km radius for potential settings impacts has been selected as a common standard. Based on the initial results of a Zone of Theoretical Visibility (ZTV) model (Figure 2c), it can be seen that there are no designated assets in close proximity to the study site and within the ZTV. The topography of the study site limits the intervisibility with the surrounding landscape, and there is limited extension of the ZTV to the north west and south west. As a result, very few designated heritage assets are considered to lie within the ZTV.
- 1.8 This desk-based assessment uses evidence from the Glamorgan-Gwent Historic Environment Record (GGAT HER), the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) and other sources, including the results of a comprehensive map regression exercise. A site visit was undertaken as part of the assessment in September 2022.
- 1.9 In accordance with government policy (Planning Policy Wales and associated guidance), this assessment draws together the available archaeological, historic, topographic and land-use information in order to clarify the heritage significance and archaeological potential of the study site.
- 1.10 Additionally, the ClfA "Standard and guidance for historic environment desk-based assessment" (Chartered Institute for Archaeologists 2020) has been used.
- 1.11 As a result, the assessment enables relevant planning decision makers to make a suitably informed decision, in relation to the historic environment on an application for the study site's

development. Specifically, this would include assessment of the significance of archaeological heritage assets on and close to the study site and assesses the potential for hitherto undiscovered archaeological heritage assets. In addition, impacts on the settings of any designated heritage assets within a 5km radius of the Site are assessed. This enables potential impacts on all such assets to be identified along with the need for design, civil engineering or archaeological impact mitigation solutions.

## 2 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK

### Legislation

- 2.1 National (UK-wide) legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002, and updated in April 2014.
- 2.2 The Well-being of Future Generation (Wales) Act 2015 places duties on public bodies requiring them to act in accordance with the 'sustainable development principle'. The Act also establishes well-being goals which include achieving 'a Wales of vibrant culture and Welsh language', described as 'a society that promotes and protects culture, heritage and the Welsh language'. The Act lays down the principle that a properly protected, conserved and enhanced historic environment can improve the quality of life and well-being for everyone.
- 2.3 The Historic Environment (Wales) Act 2016 was given Royal Assent in March 2016. This Act provides the legislative framework for managing the historic environment in Wales. Accompanying the Act was new policy and guidance in the form of a Technical Advice Note (TAN) specific to the Historic Environment (TAN24, see below), and changes to Planning Policy Wales (PPW). This legislation and guidance supersedes the previous Welsh Office Circulars which formed the basis of historic environment policy in Wales.
- 2.4 A new Historic Environment (Wales) Act has been given Royal Assent on June 14<sup>th</sup> 2023. The purpose of this Act is to consolidate existing Welsh and UK-wide legislation in one place. The 2023 Act consolidates enactments in or made under the following:
- the Historic Buildings and Ancient Monuments Act 1953;
  - Parts 1 and 3 of the Ancient Monuments and Archaeological Areas Act 1979;
  - Parts 14 and 15 of the Town and Country Planning Act 1990;
  - the Planning (Listed Buildings and Conservation Areas) Act 1990;
  - Part 5 of the Planning and Compulsory Purchase Act 2004;
  - the Historic Environment (Wales) Act 2016

### National Planning Policy

#### *Future Wales –the National Plan 2040 (February 2021)*

- 2.5 Future Wales is the national development framework, setting the direction for development in Wales to 2040. It addresses key national priorities, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of communities.
- 2.6 Policy 18 of Future Wales – 'Renewable and Low Carbon Energy Developments of National Significance' – makes reference to the historic environment, with clause 6 stating that renewable developments will be permitted as long as 'there are no unacceptable adverse impacts on statutorily protected built heritage assets'

### ***Planning Policy Wales (PPW)***

- 2.7 The Welsh Government has published Planning Policy Wales (PPW), recently updated to Version 12 in February 2024 (PPW12). This sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs). Procedural advice is given in circulars and policy clarification letters.
- 2.8 Chapter 6 of PPW12 was updated via a Welsh Government letter to Heads of Planning and an accompanying Annex in October 2023. While these changes will be incorporated into version 12 of PPW when it is published, currently they make no material alteration to the policies on the historic environment.
- 2.9 Chapter 6 of PPW12, entitled ‘Distinctive and Natural Places’, has a section entitled ‘The Historic Environment’ (section 6.1 – pp. 129-135) which provides policy for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 6.1 (6.1.6) in relation to the historic environment can be summarised as seeking 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.
- 2.10 Section 6.1 of PPW12 (6.1.1) describes the historic environment as comprising all the surviving physical elements of previous human activity and illustrates how past generations have shaped the world around us. The historic environment is made up of individual historic features, archaeological sites, historic buildings and historic parks, gardens, townscapes and landscapes, collectively known as historic assets.
- 2.11 Paragraphs 6.1.7 and 6.1.8 of PPW12 state the following: “It is important that the planning system looks to protect, conserve and enhance the significance of historic assets. This will include consideration of the setting of an historic asset which might extend beyond its curtilage. Any change that impacts on an historic asset or its setting should be managed in a sensitive and sustainable way. It is the responsibility of all those with an interest in the planning system, including planning authorities, applicants, developers and communities, to appropriately care for the historic environment in their area. The protection, conservation and enhancement of historic assets is most effective when it is considered at the earliest stage of plan preparation or when designing proposals new proposals”.
- 2.12 Welsh planning legislation and policy guidance outlines that the conservation of archaeological remains and their settings is a material consideration in the determination of a planning application, whether those remains are scheduled or not (PPW12 Para. 6.1.23). In order to take account of archaeological considerations and deal with them from the beginning of the development control process, Local Planning Authorities in Wales need to be fully informed about the nature and importance of archaeological remains, and their setting, and the likely impact of any Proposed Development upon them.
- 2.13 Paragraphs 6.1.26 of PPW12 states that where archaeological remains are known to exist or there is a potential for them to survive, an application should 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. The needs of archaeology and development may be reconciled, and potential conflict very much reduced, through early discussion and assessment.

- 2.14 Paragraph 6.1.27 of PPW12 states that if the planning authority is minded to approve an application and 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 in an approved repository. On occasions, unforeseen archaeological remains may still be discovered during the course of a development. A written scheme of investigation should consider how to react to such circumstances or it can be covered through an appropriate condition for a watching brief.
- 2.15 PPW is additionally supported by guidance published by Cadw. This includes Heritage Impact Assessment in Wales (2017), and Setting of Historic Assets in Wales (2017).
- 2.16 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

## Hedgerow Regulations

- 2.17 Under the Hedgerow Regulations 1997, hedgerows are deemed to be historically Important if they are more than 20m long and over 30 years old and if they meet at least one of these criteria:
- they mark all or part of a parish boundary that existed before 1850;
  - they mark an archaeological feature of a site that is a scheduled monument or noted on the Historic Environment Record;
  - they mark the boundary of an estate or manor or looks to be related to any building or other feature that's part of the estate or manor that existed before 1600;
  - they are part of a field system or looks to be related to any building or other feature associated with the field system that existed before the Inclosure Acts (that is before 1845);
- 2.18 In practice (and following case law) hedgerows are deemed Important under the above regulations if they can be demonstrated to exist on the appropriate pre-1845 parish tithe or enclosure map

## Local Planning Policy

- 2.19 The Caerphilly Borough Council Adopted Local Development Plan (LDP) was adopted in November 2010.
- 2.20 The LDP has the following key objective:
- 24: Protect and enhance the overall quality of the historic natural and built environment of the County Borough.**
- 2.21 The following policy is relevant to heritage assets associated with the Site:
- POLICY SP6 – PLACE MAKING**
- Development proposals should contribute to creating sustainable places by having full regard to the context of the local, natural historic and built environment and its special features.**

## Definitions and Guidance

2.22 The ‘*Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment in Wales*’ published by Cadw in March 2011 provides the basic principles under which all subsequent guidance has evolved. The six principles expressed are:

- Historic assets will be managed to sustain their values.
- Understanding the significance of historic assets is vital.
- The historic environment is a shared resource.
- Everyone will be able to participate in sustaining the historic environment.
- Decisions about change must be reasonable, transparent and consistent.
- Documenting and learning from decisions is essential.

### **Definition of the historic environment**

2.23 The historic environment is defined in TAN 24 (at para. 1.7) as:

*“All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and deliberately planted or managed.”*

### **Definition of Heritage Assets**

2.24 Heritage assets are defined by Cadw (March 2011) and TAN 24 (2017) as:

*“An identifiable component of the historic environment. It may consist or be a combination of an archaeological site, an historic building or area, historic park and garden or a parcel of historic landscape. Nationally important historic assets will normally be designated.”*

2.25 A Designated Heritage Asset is considered to be a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area. In Wales areas of landscape have been designated and included in the non-statutory Register of Landscapes of Historic Interest in Wales.

### **Significance**

2.26 Significance in relation to heritage policy considerations is defined as:

- The sum of the cultural heritage values (Cadw 2011).

### **Setting**

2.27 Guidance on the assessments of impact on the settings of heritage assets is provided by Cadw in ‘*Setting of Historic Assets in Wales*’ (May 2017). This provides a 4-stage process for determining if any impact on the settings of historic assets would arise from a Proposed Development, and how it could be mitigated if impacts are identified.

## 3 GEOLOGY AND TOPOGRAPHY

### Geology

- 3.1 The study site is underlain by Carboniferous Sandstone of the Hughes Member (BGS 2022).

### Topography

- 3.2 The study site is located within agricultural land to the east of Newbridge, which lies in the Ebbw valley. The study site is on locally high ground, with a small valley (the Nant Gawni) running beyond its northern boundary and to the west. A stream (Nant Hafod-fach) rises at Cil-Lonydd Farm in the southern part of the study site, flowing south west. The valley of the Nant Gwyddon-fach lies to the east of the study site.
- 3.3 The highest point of the study site is its north eastern boundary, at 346m above Ordnance Datum (aOD). The whole study site slopes gently to the south and has a height of 343m aOD at its south-eastern edge. There is also a slope south westwards with a height of 320m aOD on the western boundary.

## 4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND WITH ASSESSMENT OF SIGNIFICANCE

### Timescales used in this report

#### Prehistoric

Palaeolithic	c. 800,000 -	10,000 BC
Mesolithic	c. 10,000 -	4,000 BC
Neolithic	c. 4,000 -	2,500 BC
Bronze Age	c. 2,500 -	700 BC
Iron Age	c. 700 -	AD 43

#### Historic

Roman	AD 43 -	410
Post-Roman/Early Medieval	AD 410 -	1066
Medieval	AD 1066 -	1536
Post Medieval	AD 1536 -	1750
Industrial	AD 1750 -	1899
Modern	AD 1900	Present day

### Introduction

- 4.1 This chapter reviews the available archaeological evidence for the study site and the archaeological/historical background of the general area, and, in accordance with national and local policy, considers both the potential for any as yet to be discovered archaeological evidence on the study site, and the potential for impacts on the settings of designated heritage assets.
- 4.2 What follows comprises a review of known heritage assets within a 1km radius of the study site boundary (Figs. 2a, Appendix 2), also referred to as the study area. This assessment is based on a consideration of evidence in the Vale of Glamorgan Historic Environment Record (HER) (Enquiry reference 6908) held by GGAT for the study site and for a 1km radius around the study site centre (the study area).
- 4.3 Data held by The National Monuments Record (NMR), part of the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) was also consulted together with a historic map regression exercise charting the development of the study area from the late nineteenth century onwards until the present day.
- 4.4 Readily available digital historic maps were used.
- 4.5 The Gwent Archives in Ebbw Vale were also visited (February 2024) to look for relevant historic maps, documents and books as available.
- 4.6 Aerial photographs from the Central Register for Aerial Photography Wales in Cardiff (see appendix 3) were examined.
- 4.7 Aerial photographs from the RCAHMW in Aberystwyth were examined in February 2024 (ref. RC24-0031, see Appendix 3).



- 4.8 LiDAR data on the online Data Map Wales LiDAR viewer was examined.
- 4.9 No hitherto unknown archaeological features were identified from the aerial photographs or the LiDAR data that was examined in the course of this assessment.
- 4.10 Chapter 5 subsequently considers the Site conditions and whether the Proposed Development would impact the theoretical archaeological potential identified below.

## Previous Archaeological Work

- 4.11 No previous archaeological fieldwork has taken place within the study site.
- 4.12 Desk-based assessments, building recording, and a watching brief were carried out in Hafod Fach Quarry, immediately to the south west of the study site (GGAT E002992, E002993, E004132, E002660). No archaeologically significant deposits were identified during soil-stripping operations at the quarry.

## Prehistoric

- 4.13 There are no Prehistoric finds or features recorded within the study site.
- 4.14 The only Prehistoric evidence recorded in the 1km study area is a Bronze Age axe findspot located 850m north west of the study site (GGAT 00091g).
- 4.15 There is a lack of any Prehistoric evidence in the area around the study site, and as a result it is considered that there is a low potential for hitherto unknown Prehistoric finds or features to be present within the study site. Any such remains are likely to be isolated finds, of no more than low/local significance.

## Roman

- 4.16 There are no Roman period finds or features recorded in the HER within the study site or within the 1km study area.
- 4.17 There is a lack of any Roman evidence in the area around the study site, and as a result it is considered that there is a low potential for hitherto unknown Roman finds or features to be present within the study site. Any such remains are likely to be isolated finds, of no more than low/local significance.

## Early Medieval/Later Medieval

- 4.18 The archaeological interest of the study site is focussed in this period, with the site of a monastic grange being recorded at Cil-Lonydd (Rees 1933, Williams 1976, Williams 2001) (GGAT 00095g, 08327g, 00094g). The grange was attached to Llantarnam Abbey (Williams 2001; Evans 2003).
- 4.19 Cil-Lonydd Farm is assumed to be the site of the grange farmstead itself (GGAT 08327g). It later became the site of a Post-Medieval farmhouse (GGAT 05035g), and was remodelled in the 19<sup>th</sup> century. No evidence of Medieval or Post-Medieval fabric survives in the extant farm buildings (GGAT 00096g).
- 4.20 Williams (2001) believed that the 'Cil' place-name element had 'eremitical connotations', indicating that the earliest religious settlement at the site was that of a hermitage, and that this would have been in the Early Medieval period.
- 4.21 The field name Cae Eglwys or Cae Capel further suggested the presence of an ecclesiastical site – assumed to be of pre-Norman date (Williams 1976) (GGAT 00094g). The HER entry reports that W. Rees marked a site in the area as probably a chapel attached to a monastic grange, on his

1932 map of 14<sup>th</sup> century Wales (SE sheet) (see Rees 1933). This is given as a definite location by Williams (2001).

- 4.22 Llantarnam Abbey was founded in 1179, as the Cistercian order expanded their land-holdings and focussed on sheep farming in upland areas in the late 12<sup>th</sup> century (Griffiths ed. 2008). Documentary evidence refers to the grange system as well established in 1291 (Griffiths ed. 2008). Other documentary evidence around the time of the dissolution of the monasteries records Cil-Lonydd as part of the Llantarnam Abbey lands in 1535, although by this time most of the lands were leased out and not managed directly by monks (Griffiths ed. 2008). This leasing model had begun in the 13<sup>th</sup> century, so the possible chapel on the study site may have ceased to be used around this time if the study site was no longer directly managed by the Cistercians.
- 4.23 Study of documentary evidence of tithes (Williams 1976) has enabled the extent of the Cil-Lonydd grange to be mapped (Griffiths ed. 2008, p203). Williams concludes that the tithe-free status of the land implies it was in fact arable land rather than a sheep farm. Coflein (NPRN 421324) records ridge and furrow earthworks at Blaengawney 250m north of the study site.
- 4.24 Regarding the physical evidence for the ecclesiastical site, an area in the centre of the study site, just north of Cil-Lonydd farm, has revealed fragments of lime-mortared masonry during ploughing (GGAT 00094g, 00095g), although no actual walling or foundations were seen. To the north west of this area a small rectangular enclosure is recorded (GGAT 03289g), interpreted as a church and churchyard. The HER (GGAT 00094g) describes 'faint traces of a mound which may cover vestiges of a small building', although this was not clear on the recent site visit. The HER also records a pile of stones in which a fragment of moulded stone window or door jamb was visible.
- 4.25 Finally, the HER records 'cropmarks of the enclosure boundary' and two rectangular features near the centre of the enclosure - it is assumed this refers to the feature to the north west of the potential chapel/church site (GGAT 03289). These are recorded as visible on two aerial photographs from the mid-20<sup>th</sup> century. Re-examination of available aerial photographs at the RCHAMW collection and CRAPW in February 2024 has not confirmed the presence of the cropmarks.
- 4.26 There are no other HER records from the Medieval periods within the 1km study area, apart from a trackway of possible Medieval origin 800m east of the study site (GGAT 07201g).
- 4.27 The evidence recorded in the HER identifies that the study site was part of a monastic grange in the Medieval period, and demonstrates a high potential for remains of an ecclesiastical site to be present within the study site. This is likely to be originally of Early Medieval foundation and includes evidence of (presumably Medieval) stone buildings. Any such remains, if present, could potentially be of medium/regional significance.

## Post Medieval to Modern (including map regression exercise)

- 4.28 One Post Medieval HER entry is located within the study site, a small brick structure towards the northern boundary (GGAT 05036g). This has been interpreted as possibly military, or else a more recent (Modern) structure.
- 4.29 Cil-Lonydd farm itself is of Post Medieval date (GGAT 00096g), and no traces of Medieval work have been found in the house or outbuildings. HER entry GGAT 05035g reports that there is no evidence of any buildings older than the 19<sup>th</sup> century.
- 4.30 Other HER entries within the 1km study area are either records of farms, isolated farm buildings that are no longer extant, or quarrying activity.
- 4.31 Historic maps from the mid 19<sup>th</sup> century onwards help to characterise the study site in modern times. The earliest map seen for this study is the 1813 Ordnance Survey drawing (Figure 3). This

shows a rural landscape with dispersed farms, including Cylonydd (Cyl-Lonydd). Some of the field boundaries are shown on this map, some of which are reflected in the modern farm layout.

- 4.32 The 1823 Henry and Price map of Monmouthshire (Figure 4) shows a similar picture, but with a clearer depiction of the woodland to the north and west of the study site, which was established to its current extent. Cil-Lonydd farm is shown as 'Cid Llonach'.
- 4.33 On the 1839 Tithe map for Mynyddysllwyn parish (Figure 5), most of the current field boundaries are shown. The accompanying apportionment tells us that land was primarily used as pasture, with a small amount of arable cultivation. All of the study site was in a single ownership, occupied by one tenant.
- 4.34 On the 1<sup>st</sup> edition Ordnance Survey map of 1879-81 (Figure 6), the 'site of Cae Eglwys' label is in the centre of the study site, reflecting the suspected presence of the earlier ecclesiastical site. The field pattern remained unchanged from the Tithe map.
- 4.35 The study site and the surrounding area remained essentially unchanged until the mid-20<sup>th</sup> century. The Ordnance Survey map of 1965 (Figure 7) shows the same field pattern, with some housing development present at the limit of the study area to the west. The quarrying activity to the south west of the study site is shown. This landscape has not perceptibly altered up to the present (Figures 8, 9, 10) apart from the quarrying activity to the south west of the study site.
- 4.36 Cil-Lonydd Farm was established in its current position by 1813, and the extant field pattern was in place at the time of the Tithe mapping, if not earlier. Most of the extant field boundaries contain very large mature/veteran trees, which suggests that the farm was laid out in its current form at least 200 years ago. Apart from in the farmyard itself (not within the proposed red line area), and a small Modern brick structure towards the northern end of the study site (GGAT 05035g, Plate 20), no development has taken place within the study site during that time.
- 4.37 Based on current evidence, there is an identified low potential for archaeological remains from the Post Medieval to Modern periods to be present within the study site, other than features related to the agricultural use of the study site. If present, these are unlikely to be of more than low/local significance.

## Undated

- 4.38 One undated find is recorded within the study site, namely a metal object identified as a corroded sword blade (GGAT 03288g). Nothing else is known about this find.

## Historic Landscape

- 4.39 While no specialist Historic Landscape Characterisation data has been viewed for the study site, it lies within the Landmap Aspect Area Nant Gawni and Hafod Fach CYNONNHL724 (GGAT 2003). Landmap is a Wales-wide landscape characterisation tool developed by the Countryside Council for Wales, and describes the Aspect Area as follows:

'A large enclosed agricultural landscape interspersed with derelict and relict industrial works. The aspect area boundary limits are defined by the extent of the enclosed fieldscape to the east and south, with Cwm Ebbw providing the boundary to the west and north.

Material remains within the landscape are predominantly Post-Medieval or later.'

- 4.40 The implication of this assessment is that the arrangement of the current landscape containing the study site had its origins in Post Medieval enclosures.
- 4.41 As noted above, there are land divisions within the study site date from at least the time of the Tithe map compilation, published in 1839.

## Assessment of Significance (Designated Assets)

- 4.42 Existing national policy and guidance for archaeology (PPW11 and Cadw 2011, as referenced in section 2), defines significance of heritage assets as “The sum of the cultural heritage values” (Cadw 2011).
- 4.43 In terms of designated heritage assets, as defined above and as shown on Figure 2b, no designated Registered Parks and Gardens, World Heritage Sites, Landscapes of Outstanding Historic Interest or Historic Battlefields lie within the 1km study area, or within 5km of the study site.
- 4.44 The designated heritage assets within a 5km radius of the study site (see Appendix 2) include the following:
- 10 Scheduled Monuments of national significance
  - 163 Listed Buildings of national significance
  - 5 Conservation areas of local/regional significance

### **Zone of Theoretical Visibility**

- 4.45 This assessment has been informed by a model Zone of Theoretical Visibility (ZTV) for the surrounding area (Figure 2c). The ZTV analysis was carried out to create a Digital Surface Model to illustrate the theoretical extent of where the development would be visible from, assuming 100% visibility, and includes the screening effect from vegetation and buildings, based on the following assumptions:
- Observer height eye-level set at 1.5m;
  - Indicative woodland/screening vegetation and building heights are modelled at 12m and 9m respectively;
  - 19 origin points from within the study site have been used to illustrate the full parameters of the Proposed Development set at 3.2m above existing ground level within the centre of each of the fields of the Site proposed to contain solar panels;
  - OS Terrain 5 data has been used for generating the ground model.

### **Designated heritage assets within the Zone of Theoretical Visibility**

- 4.46 The following table lists those assets which are considered to be within the ZTV and therefore potentially affected by the Proposed Development:

Asset no	Name/Description	Type/Grade	Distance from study site
MM141	St Illtyd Castle Mound	SM	4.5km N
MM269	Pen y Fan Canal Reservoir	SM	4.5km NW
1866	St Illtyd's Church	LB II*	4.5km N
1867	Hafod-arthen	LB II	4.3 km N
1898	Crumlin Old Farmhouse and abutting barn	LB II	3.0km NW
21002	Ty Mynydd	LB II	3.7km SW
21259,	Gelli Farmhouse and attached farm range, and	LB II	4km NW
21260	Barn at Gelli Farm	LB II	4km NW
21263	Llanerch-uchaf Farmhouse and attached farm range	LB II	3km NW
21264	Barn at Llanerch-uchaf	LB II	3km NW
21504	Pentwyn-isaf	LB II	2.7km W
21626	New Bethel Chapel	LB II	3.7km SW
21627	Wall railings and gates at New Bethel Chapel	LB II	3.7km SW

21632	Monuments to James Thomas and Family	LB II	3.7km SW
21633	Monument to Martha Williams at New Bethel	LB II	3.7km SW
21634	Monument to Margaret Williams at New Bethel	LB II	3.7km SW
21635	Monument to Elizabeth Jones at New Bethel	LB II	3.7km SW
21636	Nicholas monument at New Bethel	LB II	3.7km SW
21637	Monument to Rosser Williams at New Bethel	LB II	3.7km SW
21638	Monument to Thomas Henry Thomas at New Bethel	LB II	3.7km SW
22672	Ty-llwyd	LB II	4.2km N
22673	Swffryd-ganol including front garden wall	LB II	1.8km N
22674	Barn range including Cow-House at Swffryd-ganol	LB II	1.8km N

SM = Scheduled Monument; LB = listed building;

4.47 An initial examination, including by field visit to some assets, has resulted in the following assets being considered as not likely to be subject to any impact on their settings from the Proposed Development, and thus excluded from further assessment.

Asset number	Asset name	Reason for no further assessment
MM269	Pen y Fan Canal Reservoir (Plate 26)	The ZTV projection (Figure 2c) shows that the eastern fringe of the reservoir lies within the ZTV. A site visit demonstrated that all views towards the study site from the monument are blocked by a tree belt enclosing the reservoir on the south side. It is therefore considered that the study site does not form part of the setting of the monument.
1866	St Illtyd's Church (Plates 22 and 23)	Contained within the immediate setting of its churchyard, any views towards the study site are curtailed by houses and vegetation. Added to the distance from the study site, it is considered that the study site does not form part of the setting of the church.
1898	Crumlin Old Farmhouse and abutting barn	The main façade of the house faces north east and does not have views towards the study site. In addition, there is a tree belt and denser woodland beyond in the direction of the study site. Added to the distance from the study site, it is considered that the study site does not form part of the setting of the house and barn.
21002	Ty Mynydd	The farmhouse is completely surrounded by trees, which enclose its setting on all sides, including towards the study site. Added to the distance from the study site, it is considered that the study site does not form part of the setting of the building.
21259, 21260	Gelli Farmhouse and attached farm range, and Barn at Gelli Farm	The listed buildings are set within a modern farmyard and camp site. There are large trees immediately to the south-east of the farmhouse, blocking views towards the study site. Added to the distance from the study site, it is considered that the study site does not form part of the setting of the farm and barn.
21504	Pentwyn-isaf	The farmhouse is orientated such that its main facades face south west and north east, and not towards the study site. There are woods immediately to the east which block views towards the study site. As a result, it is considered that the study site does not form a part of the setting of the house.

21627, 21632, 21633, 21634, 21635, 21636, 21637, 21638	<p>Wall railings and gates at New Bethel Chapel,</p> <p>Monuments to James Thomas and Family,</p> <p>Monument to Martha Williams at New Bethel,</p> <p>Monument to Margaret Williams at New Bethel,</p> <p>Monument to Elizabeth , Jones at New Bethel,</p> <p>Nicholas monument at New Bethel,</p> <p>Monument to Rosser Williams at New Bethel,</p> <p>Monument to Thomas Henry Thomas at New Bethel</p>	<p>The wall railings and gates, and all of the listed monuments, are confined within the walled churchyard, and are clustered around the chapel. As a result, their settings are limited to their immediate surroundings of the chapel and churchyard. Therefore, it is considered that the study site does not form a part of the setting of this group of monuments.</p>
21626	New Bethel Chapel	<p>The Chapel is set below the road level in its churchyard and is open to the landscape to the west. The views towards the study site to the north east, are completely enclosed by a large house and outbuildings raised above the modern road level. As a result, it is considered that the study site forms no part of the setting of the chapel.</p>
22672	Ty-llwyd	<p>The house is completely enclosed by trees and has very little outward visual connection to the surrounding countryside. As a result, it is considered that the study site forms no part of the setting of the house.</p>
22673, 22674	Swffryd-ganol including front garden wall and Barn range including Cow-House at Swffryd-ganol	<p>The farmhouse and barn form a group at the northern end of the farmstead. A series of large, modern farm buildings lie immediately to the south, and cut off all views from the listed buildings towards the study site. As a result, it is considered that the study site forms no part of the setting of the house and barn range.</p>

4.48 Designated assets considered to have potential for impacts on their settings are as follows.

**St Illtyd Castle Mound (MM141)**

4.49 *Description:* The monument comprises the remains of a motte and ditch dating to the Medieval period (c. 1066 -1540 AD). It consists of a steep-sided mound some 35m in diameter at its base with a flat summit 17m across (Plate 24). On the south side the mound is 3.5m high with a ditch or quarry hole, 2m wide and 1.5m deep, towards the west end. The west side is 5m high and very steep. At its base is a flat-bottomed ditch 4m wide and 1m deep which stops halfway along the north side. On the north east side there is a hollow 8m long and 0.6m deep. A retaining wall has been built along the base of the motte on the east side. A path leads up the mound from the north side to the summit, but it is heavily overgrown, making access to the summit very difficult.

- 4.50 *Significance:* The monument is of national importance for its potential to enhance our knowledge of Medieval timber castles and of the Norman invasion of the south Wales uplands. It is well-preserved and an important relic of the Medieval landscape and shares group value with the adjacent church and later masonry castle site to the north. It forms one of a series of undocumented and similarly located early castles across the uplands of the former Welsh lands of Gwynllwg and Senghenydd that could equally be interpreted as Norman or Welsh. It retains significant archaeological potential, with a strong probability of the presence of both structural evidence and intact associated deposits.
- 4.51 *Setting:* The monument occupies a ridge-top location high above the eastern flank of the Ebbw with wide views in all directions but the east. There is large modern barn/cowshed built immediately to the east of the monument. There are houses across the road to the south which serve to prevent views towards the study site at ground level (Plate 25). From the top of the mound, there are panoramic views which could include the study site.
- 4.52 The setting makes an important contribution to the significance of the monument, which was deliberately constructed to see and be seen within the landscape. The study site, however, can only form a very small part of this very wide setting, especially as it is more than 4km distant. As a result, it is considered that the study site makes a negligible contribution to the monument's setting and to its significance.

### **Hafod-arthen (1867)**

- 4.53 *Description:* Hafod-arthen consists of a pair of 'unit' farmhouses set at right angles to one another. The western house is earliest, possibly with 16<sup>th</sup>-century origins as a hall house. This house was remodelled to form a chimney-passage plan with unheated inner room and downslope byre in c1600, most probably when the eastern house was built. The eastern house had chimney entry plan, with heated inner parlour. Both houses were eventually connected via a small lobby. They were renovated after 1984, when partly derelict.
- 4.54 *Significance:* Listed as an unusual survival of two 'unit' farmhouses in one farmstead, with substantial early remains to interiors. Its significance is primarily evidential, resting in the form and fabric of the buildings themselves.
- 4.55 *Setting:* The house sits on a south-facing slope, with a wide, open setting with views to the south and south east, which includes towards the study site. The setting contributes to the significance of the house as it maintains its isolated rural location; although the significance of the house is vested in its architectural remains. The study site, however, can only form a very small part of this wide setting, especially as it is more than 4km distant. As a result, it is considered that the study site makes a negligible contribution to the monument's significance.

### **Llanerch-uchaf farmhouse and attached farm range, and barn at Llanerch-uchaf (21263, 21264).**

- 4.56 *Description:* T-shaped farmhouse and attached farm range of limewashed stone rubble with Welsh slate roof to farm range, corrugated to house with brick end stacks. There is a small rectangular barn of limewashed rubble with corrugated roof which extends to form a hood over the small doorway. This barn has a deep gabled porch and double doors to the farmyard side. The farmhouse has two storeys, with an attached lower farm range, not a continuous build, has a single low slit ventilator and two small 3-pane square windows with timber lintels and sills.
- 4.57 *Significance:* The house and barn are listed with as an example of a regional farmstead retaining much of its historic character. Its significance is primarily evidential, resting in the form and fabric of the buildings themselves.
- 4.58 *Setting:* The house is enclosed within a farmyard including several other large modern buildings, which serve to reduce and mask views into the surrounding landscape from the listed buildings.

The setting of the farmstead as a whole is relatively open to the south east, in the direction of the study site, but this is a wide setting of which the study site forms a small part. The setting contributes to the significance of the listed buildings as it places them in their rural context, but it is not the main reason why the buildings are listed. As a result, it is considered that the study site makes a negligible contribution to the monument’s significance.

## Assessment of Significance (Non-Designated Assets)

4.59 As identified by desk based work, archaeological potential by period and the likely significance of any archaeological remains which may be present is summarised in table form below:

Period:	Identified Archaeological Potential	Identified Archaeological Significance
Prehistoric	The evidence indicates a paucity of Prehistoric activity around the study site. The potential for further finds and features from these periods to be present within the study site is considered to be low. Any such remains are likely to be isolated finds with low value.	Low/Local
Roman	Due to the paucity of evidence within proximity of the study site a low potential has been established for the Roman period. Any such remains are likely to be isolated finds with low value.	Low/Local
Early Medieval/ Medieval	The presence of a Medieval ecclesiastical grange, of possible Early Medieval origin, is recorded within the study site. The evidence suggests that there is a high potential for archaeological remains from the Medieval period to be present within the study site, and these could be of up to regional value.	Moderate/Regional
Post Medieval to Modern	There is an identified low potential for archaeological remains from the Post-Medieval and Modern periods to be present within the study site, other than features related to the agricultural use of the study site	Low/Local

4.60 The archaeological potential of the study site is focussed in the Medieval period.

4.61 Most of the extant hedgerows were present on the Tithe mapping and are therefore considered to be of historic importance under the Hedgerow Regulations.



## 5 SITE CONDITIONS, THE PROPOSED DEVELOPMENT & REVIEW OF POTENTIAL DEVELOPMENT IMPACTS ON ARCHAEOLOGICAL ASSETS

### Site Conditions

- 5.1 The study site was visited in September 2022 (Plates 1-20). It is agricultural land, with a series of fields of varying size, divided by well-established hedgerows containing large mature and veteran trees. No previously unknown finds or features of archaeological interest were identified on the study site during the visit. There were no visible earthworks at the locations where the HER records Medieval features.

### Proposed Development

- 5.2 The Proposed Development is for an approximately 35MW solar farm, battery energy storage system and ancillary development. The point of connection is proposed to be located at an existing 132 kV substation to the southeast on Mynydd Maen Common, which would be connected to the Site by a cable route of 3km. The main components of a solar farm are:

- Solar panels and frames;
- Inverters;
- Transformers;
- Cabling;
- Substation; and
- Battery storage is also proposed within the Site.

- 5.3 The solar panels would be fixed into the ground by means of metal piles. The development would also include the construction of access roads and protective fencing. Other parts of the study site would be left undeveloped or landscaped. The area proposed for development with solar panels is smaller than the overall application area, and the ZTV has been based on the proposed extent of the solar generating capacity.

### Review of Potential Development Impacts on Designated Archaeological Assets

- 5.4 The Proposed Development has the potential for effects on the settings of designated archaeological heritage assets in the wider area. The preliminary assessment below has used the 4-step process outlined in Cadw's settings guidance (Cadw 2017).

### Impacts other than visual

- 5.5 There would be no direct physical impacts on the fabric of any designated archaeological assets. While impacts other than visual (e.g., noise, dust) may occur during the construction phase of the development, it is considered that these would not be significant during the operational phase of the development. There are no designated heritage assets closer than 1.8km from the study site.

- 5.1 At distances further than 1km from the study site, it is considered that the solar farm would not produce noise or light pollution, or generate increased traffic, which could adversely affect these assets in a way unrelated to visibility. Any effects on designated archaeological heritage assets would be confined to the settings of any assets affected.

### Potential visual impacts on settings

- 5.2 The ZTV identified three designated heritage assets or asset groups, that may be subject to impacts on their settings, as follows.

#### **St Illtyd Castle Mound (MM141)**

- 5.3 The mound has no visual interaction with the study site at ground level. Any views could only be from the mound summit. From this vantage point, the monument has a panoramic setting across the surrounding landscape, of which the study site forms a very small part.

- 5.4 It is considered, therefore, that the study site makes no more than a minimal contribution to the setting of the monument and can therefore have no more than a negligible adverse impact on its setting.. As a result, it is further considered that the Proposed Development would have no more than a negligible impact on the setting of the monument, and no effect on its significance.

#### **Hafod-arthen (1867)**

- 5.5 It is considered that the study site makes only a partial contribution to the setting, which takes in a wide area of the surrounding landscape of which the study site forms a small part. It is considered that the setting makes a limited contribution to the significance of the monument. It is considered the development would have no effect on the significance of the listed building.

#### **Llanerch-uchaf farmhouse and attached farm range, and barn at Llanerch-uchaf (21263, 21264)**

- 5.6 It is considered that the study site makes only a partial contribution to the setting, which takes in a wide area of the surrounding landscape of which the study forms a small part. It is considered that the setting makes a limited contribution to the significance of the monument and that the development would have no effect on the significance of the listed building.

### Review of Potential Development Impacts on Non-Designated Assets

- 5.7 The proposed new build could potentially have a below-ground impact on any buried archaeological remains if any are present. The potential for hitherto unknown archaeological remains from the Early Medieval and Medieval periods is considered high. The potential is considered to be low for remains from all other periods.
- 5.8 Any such impact could be destructive of any buried remains. It is considered that any archaeological remains present in the study site are unlikely to be of more than local to regional significance. The Proposed Development is therefore not considered likely to have any significant effect on the buried archaeological element of the historic environment.
- 5.9 Any removal of hedgerows within the Site could have an adverse impact on important historic hedgerows. It is understood that existing hedgerows are to be retained within the Proposed Development.

## 6 SUMMARY AND CONCLUSIONS

- 6.1 The study site has been assessed for its below ground archaeological potential, and potential effects on the settings of designated archaeological and built heritage assets in the surrounding area.
- 6.2 Within a 5km radius of the study site, there are 10 Scheduled Monuments, 163 listed buildings, and 5 Conservation Areas. No other asset types are present within 5km of the study site. The nearest designated heritage asset to the study site is 1.8km distant.
- 6.3 Using a Zone of Theoretical Visibility (ZTV) model, twenty-three designated heritage assets have been identified that could be subject to an impact from the development, i.e. those lying within the ZTV and within 5km of the study site. Following initial assessment of this total, three assets or asset groups were considered as potentially subject to an impact on their settings from the Proposed Development, as follows:

Asset no	Name/Description	Type/Grade	Distance from study site
MM141	St Illtyd's Castle Mound	SM	4.5km N
1867	Hafod-arthen	LB II	4.3km N
21263, 21264	Llanerch-uchaf farmhouse and attached farm range, and barn at Llanerch-uchaf	LB II	3.0km NW

SM = Scheduled Monument; LB = listed building;

- 6.4 As identified by desk based work, archaeological potential by period and the likely significance of any non-designated archaeological remains which may be present is summarised in table form below:

Period:	Identified Archaeological Potential	Identified Archaeological Significance
Prehistoric	The evidence indicates a paucity of Prehistoric activity around the study site. The potential for further finds and features from these periods to be present within the study site is considered to be low. Any such remains are likely to be isolated finds with low value.	Low/Local
Roman	Due to the paucity of evidence within proximity of the study site a low potential has been established for the Roman period. Any such remains are likely to be isolated finds with low value.	Low/Local
Early Medieval/ Medieval	The presence of a Medieval ecclesiastical grange, of possible Early Medieval origin, is recorded within the study site. The evidence suggests that there is a high potential for archaeological remains from the Medieval period to be present within the study site, and these could be of up to regional value.	Moderate/Regional
Post Medieval to Modern	There is an identified low potential for archaeological remains from the Post Medieval and Modern periods to be present within the study site, other than features related to the agricultural use of the study site	Low/Local

- 6.5 The potential development impacts on the historic environment consist of direct impacts on buried archaeological remains within the study site, and impacts on the settings of designated archaeological heritage assets beyond the study site within 5km of its boundaries.
- 6.6 The assessment determined there is the potential for some negligible adverse impacts on the settings of designated heritage assets, but in no case would the Proposed Development be likely to have an effect on the significance of any designated heritage asset.

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- 6.7 There is the potential for a high level of impact on non-designated archaeological heritage assets of low/local to moderate/regional importance that may be present within the study site.
- 6.8 Most of the extant hedgerows were present on the 1839 Tithe map, and consequently are considered important under the Hedgerow Regulations. There is the potential for adverse impacts on these hedgerows.
- 6.9 An earlier version of the proposed DBA was prepared in October 2022, and submitted as part of the EIA Scoping Report. It was suggested, based on the results of the initial DBA, that heritage could be scoped out of the ES. PEDW included consultation responses from Cadw and Glamorgan-Gwent Archaeological Trust (GGAT) in their Scoping Direction.
- 6.10 In summary, Cadw were satisfied that sufficient assessment of potential impacts on the settings of designated heritage assets within 5km of the Site had been undertaken. Cadw also noted that the HER record of an Early-Medieval/Medieval ecclesiastical site within the Site required further investigation and evaluation.
- 6.11 GGAT's comments focussed on the below-ground archaeology, and agreed with the proposed mitigation of the Site's impact through a programme of archaeological works, including geophysical survey and trial trenching (if required), and further fieldwork if needed, if the results of the geophysics and trenching justify this.
- 6.12 This revised DBA has addressed other comments from GGAT on the structure and content of the report.

## Sources Consulted

### General

Glamorgan-Gwent Historic Environment Record

RCAHMW

### Internet

British Geological Survey – <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/>

British History Online – <http://www.british-history.ac.uk/>

Data Map Wales – <https://datamap.gov.wales/maps/lidar-viewer/view#/>

### Bibliographic

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Rees, W (1933) *South Wales and the Border in the Fourteenth Century*. Cardiff: Western Mail, 1933

RPS (2024) *Cil-Lonydd Farm Solar, Bridgend. Specification for an Archaeological Desk-Based Assessment*. Unpublished report ref. JAC28443).

Williams, D. H. (1976) *White Monks in Gwent and the Border*. Pontypool: Hughes and Son Ltd, The Griffin Press.

Williams, D.H. (2001) *The Welsh Cistercians*. Gracewing. 2 Volumes.

### Cartographic

1813 Ordnance Survey drawing

1823 Henry and Price map of Monmouthshire

1839 Mynyddysllwyn parish Tithe map

1932 Rees's map of South Wales and the Border in the 14<sup>th</sup> Century

## REPORT

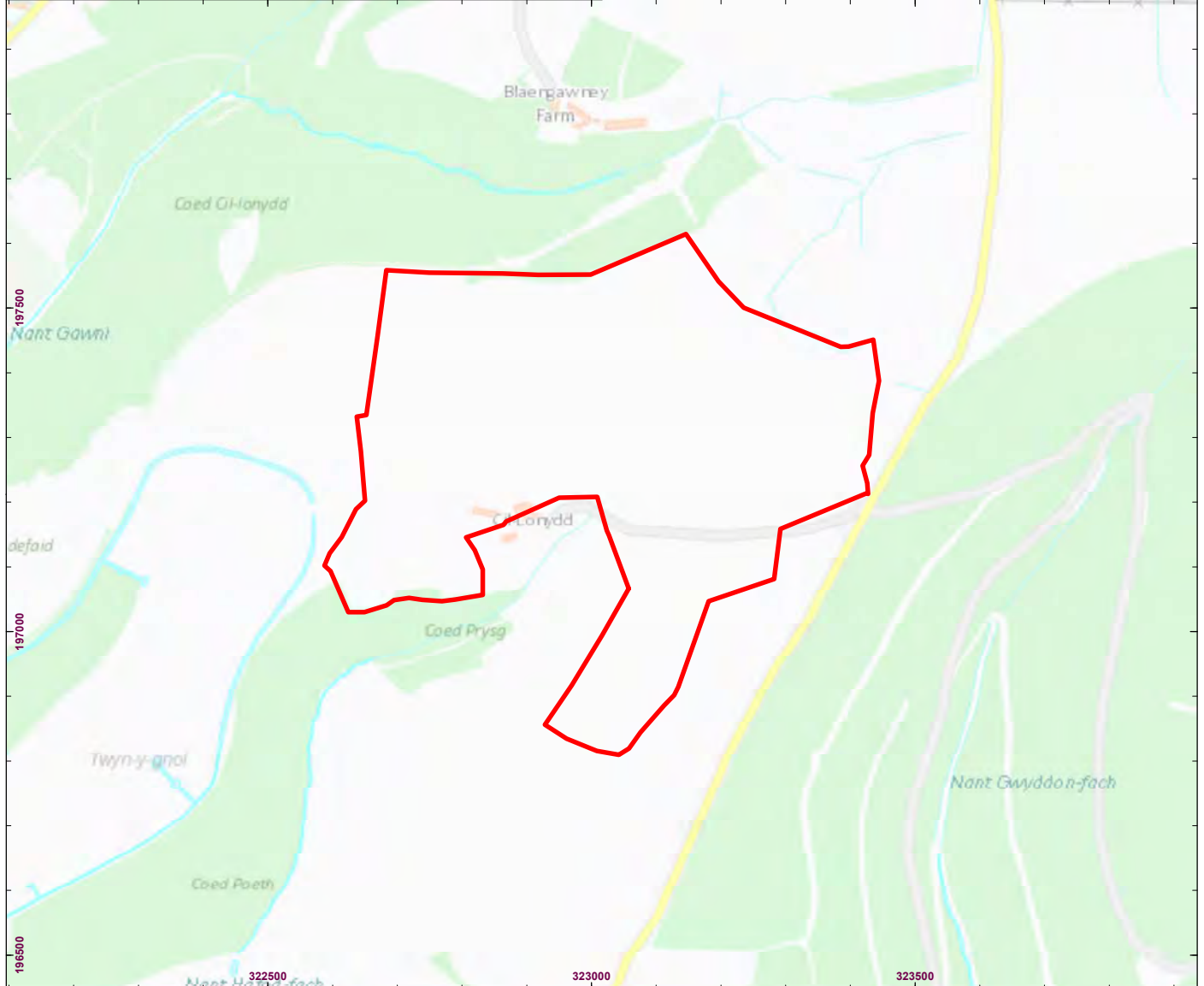
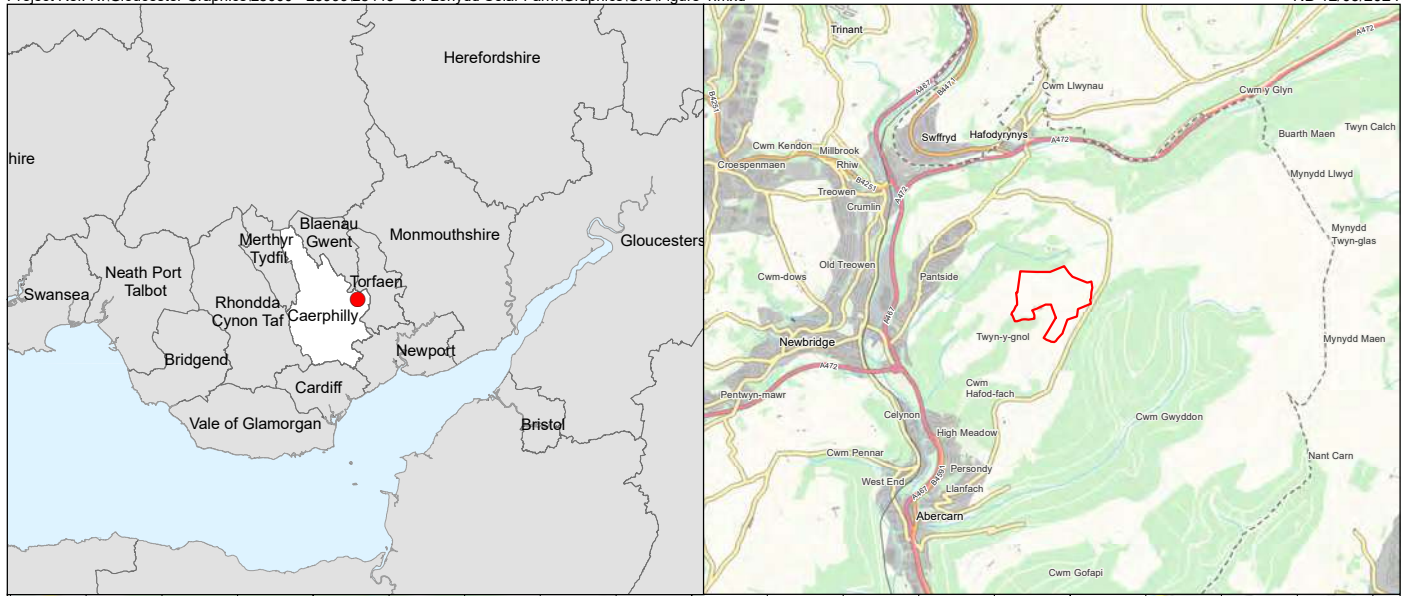
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Ordnance Survey 1:10,560 and 1:10,000: 1881, 1899, 1916, 1917, 1922, 1938, 1948, 1949, 1965, 1981, 1989, 2001, 2010, 2022

Ordnance Survey 1:2,500: 1879, 1901, 1920, 1962, 1989, 1993



**FIGURES**



 Site Boundary

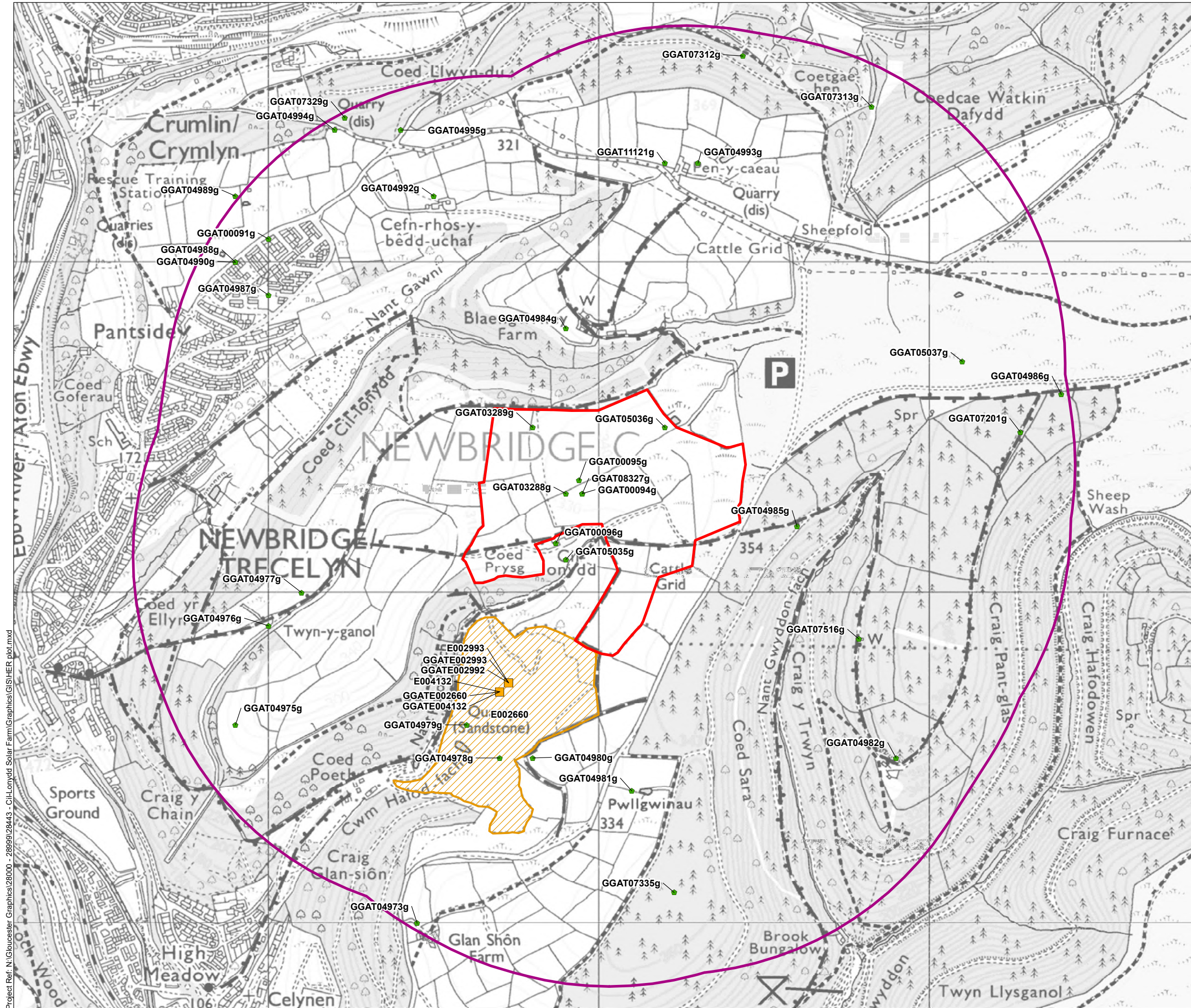


0 100 200m  
Scale at A4: 1:10,000



Figure 1  
Site Location





**Legend**

- Site Boundary
- 1km search radius

Non-designated Heritage Assets:

- HER Records Points

Previous Archaeological Work:

- HER Events Points
- HER Events Polygons

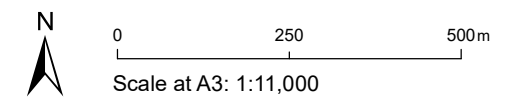
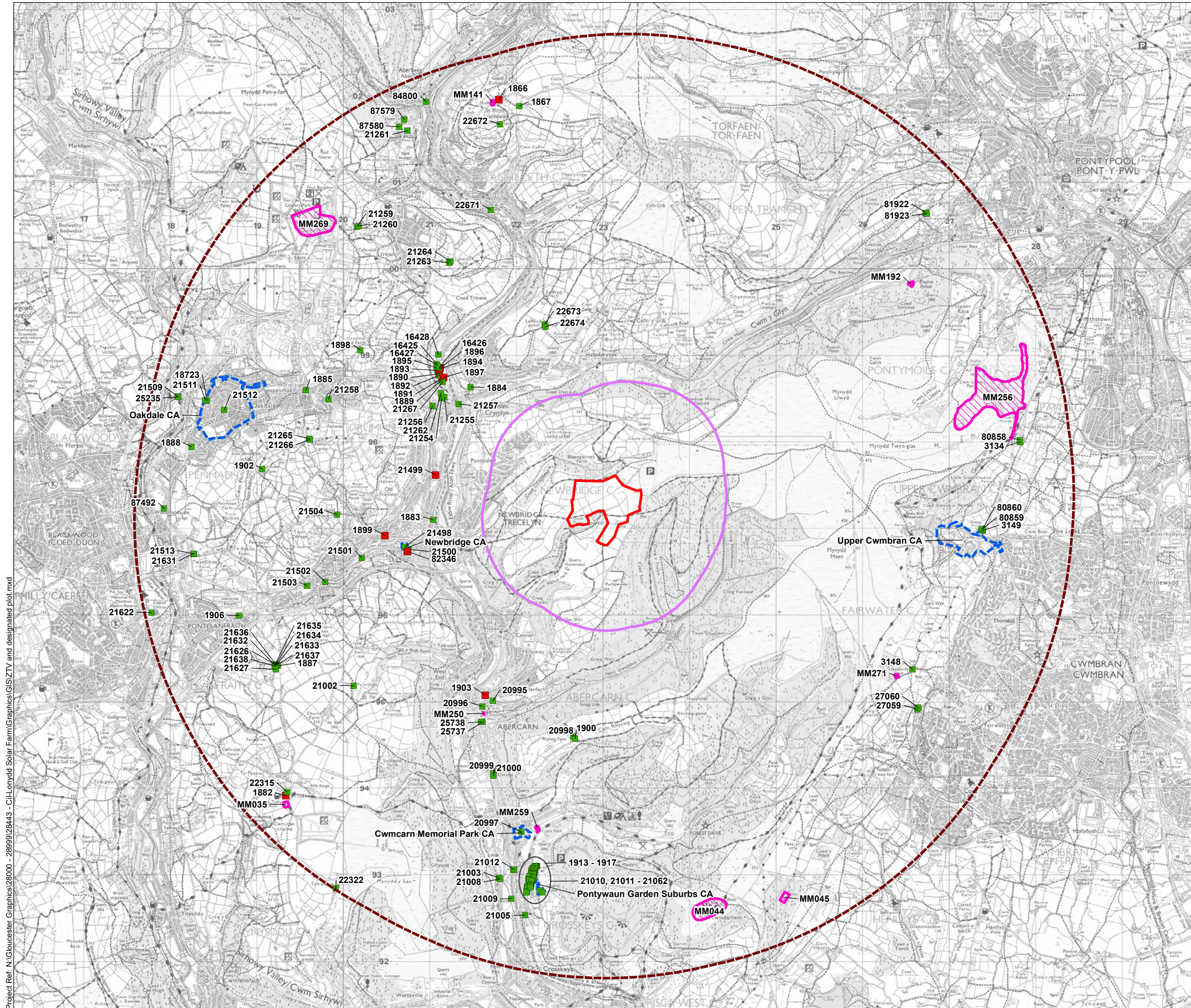


Figure 2a

Historic Environment Record data plot, 1km radius

Project Ref: N:\Goucester Graphics\28000 - 28999\28443 - Cil-lonydd Solar Farm\Graphics\GIS\HER plot.mxd



Legend

Site Boundary

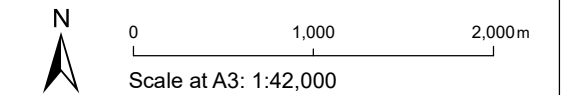
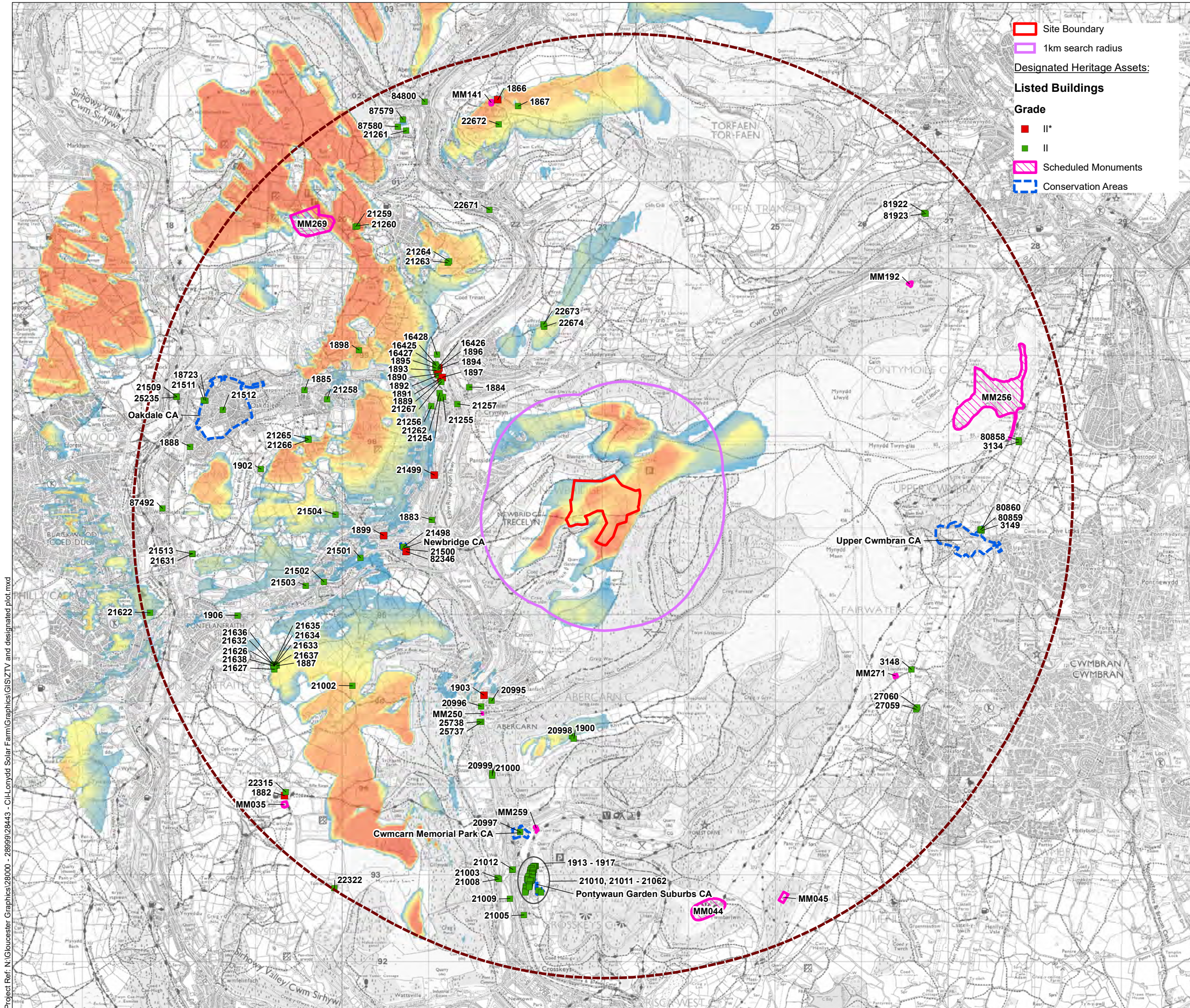


Figure 2b

Designated heritage assets within 5km of the study site



- Site Boundary
- 1km search radius
- Designated Heritage Assets:**
- Listed Buildings**
- Grade**
- II\*
- II
- Scheduled Monuments
- Conservation Areas

**Legend**

ZTV (theoretical extent of the surrounding landscape from where the Proposed Development would be visible)

- Low Visibility (up to one ZTV origin point)
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- High visibility (up to 32 ZTV origin points)

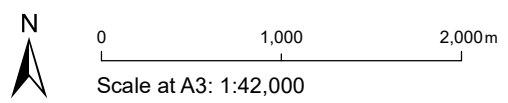


Figure 2c  
Zone of Theoretical Visibility (ZTV) projection

Project Ref: N:\Goucester Graphics\28000 - 28999\28443 - C:\Lloyd Solar Farm\Graphics\GIS\ZTV and designated plot.mxd



 Approximate site location

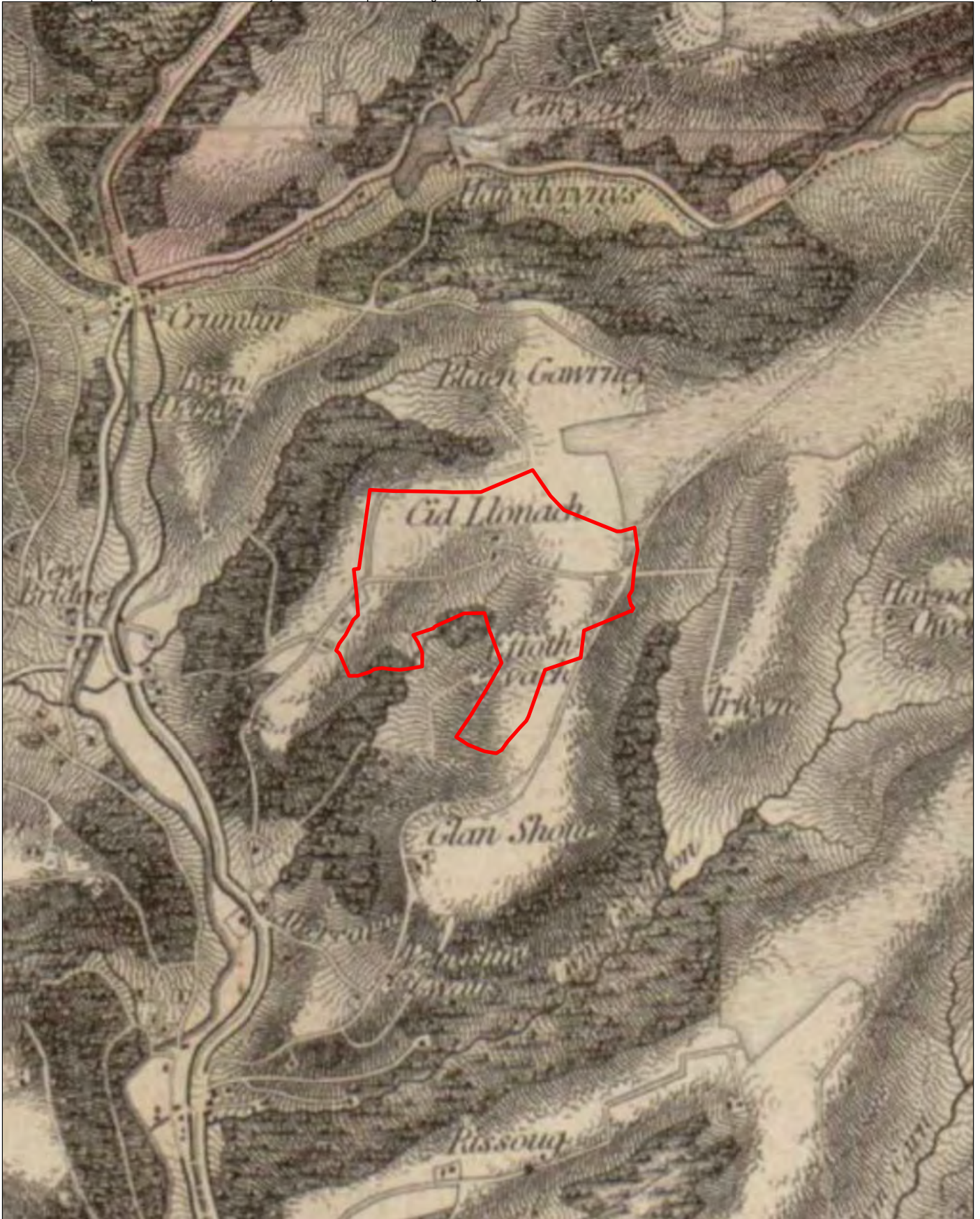



Not to Scale  
Illustrative Only



Figure 3

1813 Ordnance Survey Drawing



 Site Boundary (approximate)



0 50 100m  
Scale at A4: 1:10,000  
(approximate)



Figure 4

1823 Henry and Price Map of Monmouthshire



 Site Boundary

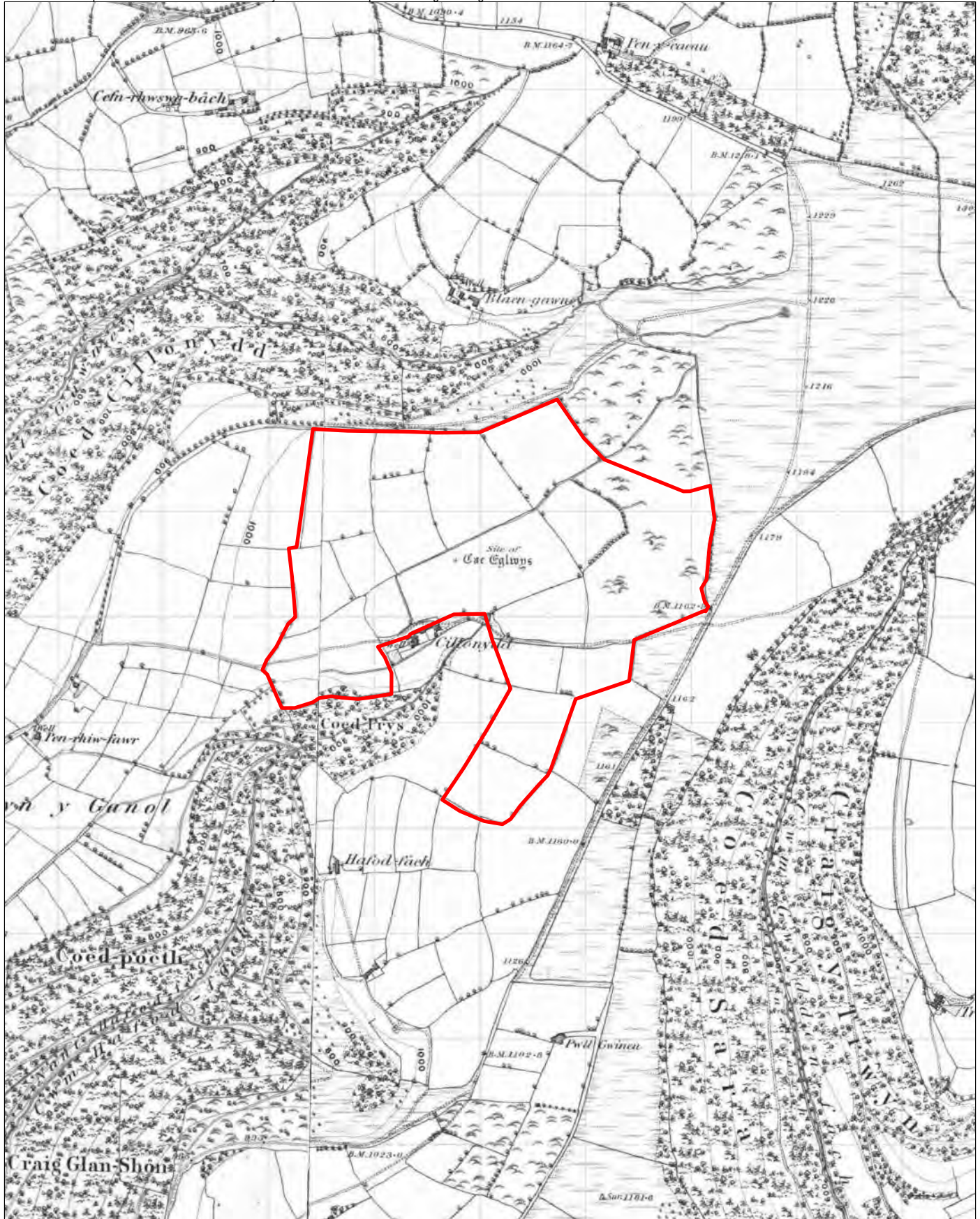


0 50 100m  
Scale at A4: 1:5,000



Figure 5

1839 Mynddyisllwyn Parish Tithe Map



 Site Boundary

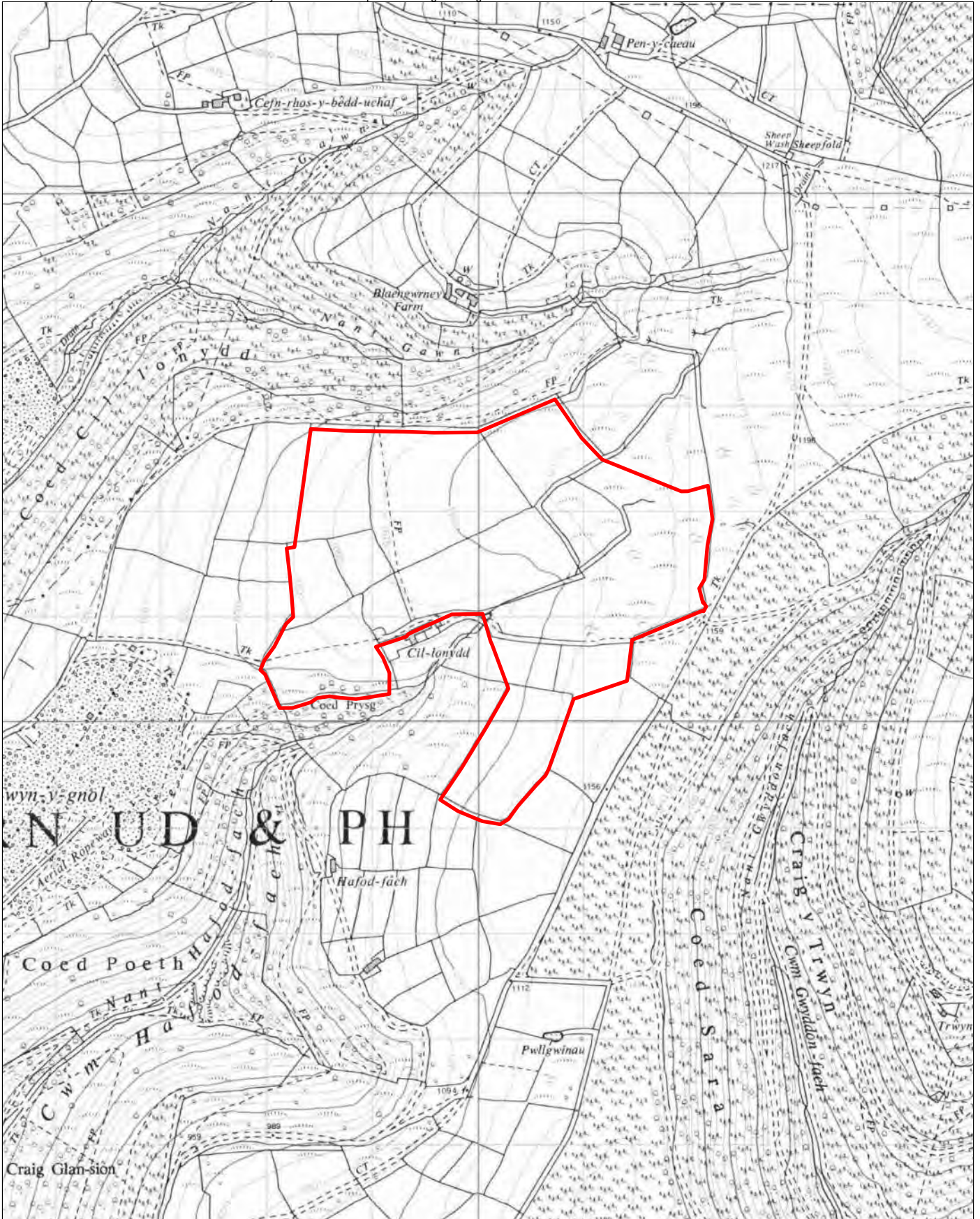


0 100 200m  
Scale at A4: 1:10,000



Figure 6

1879-1881 Ordnance Survey Map



 Site Boundary



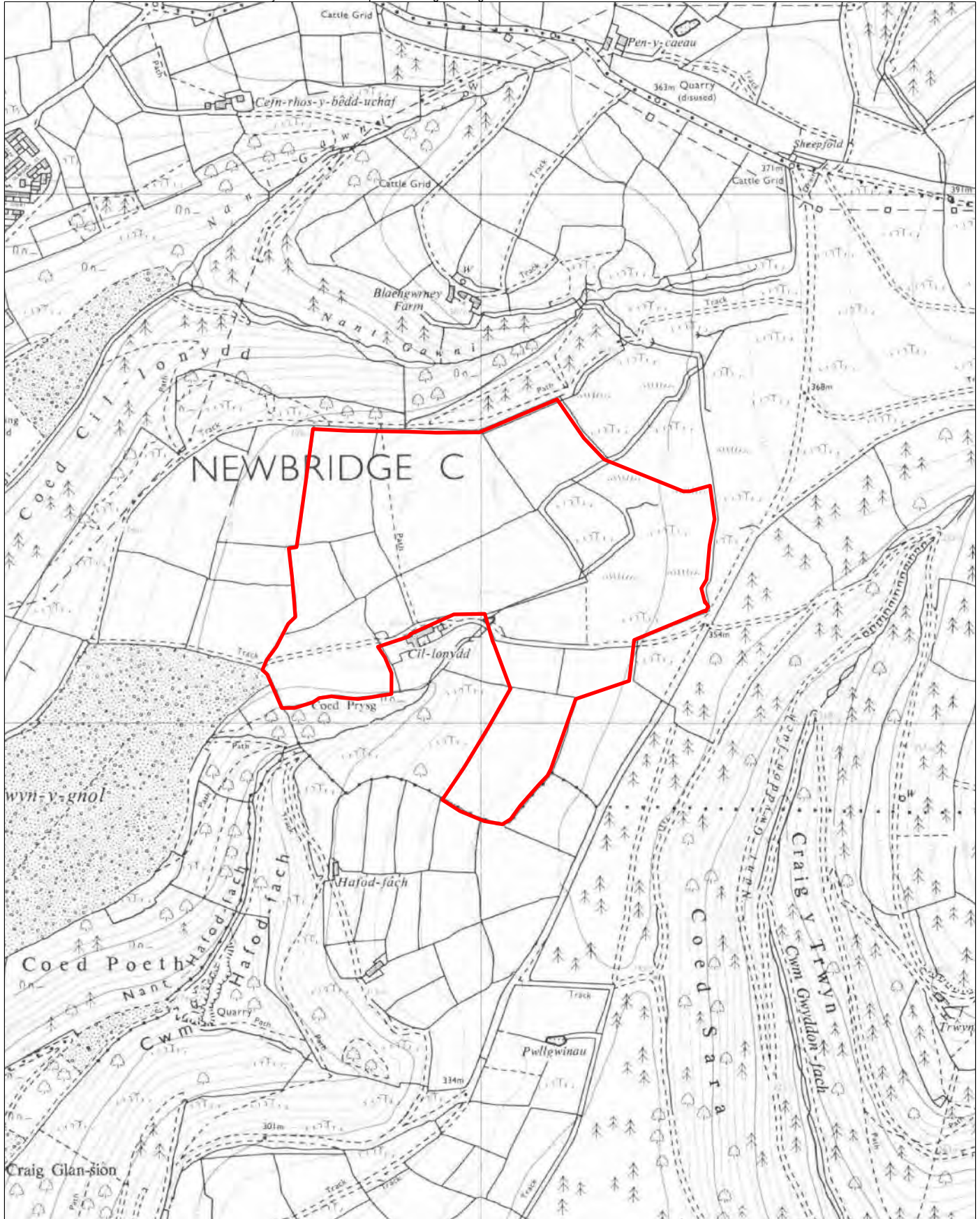
0 100 200m  
Scale at A4: 1:10,000



Figure 7

1965 Ordnance Survey Map





 Site Boundary

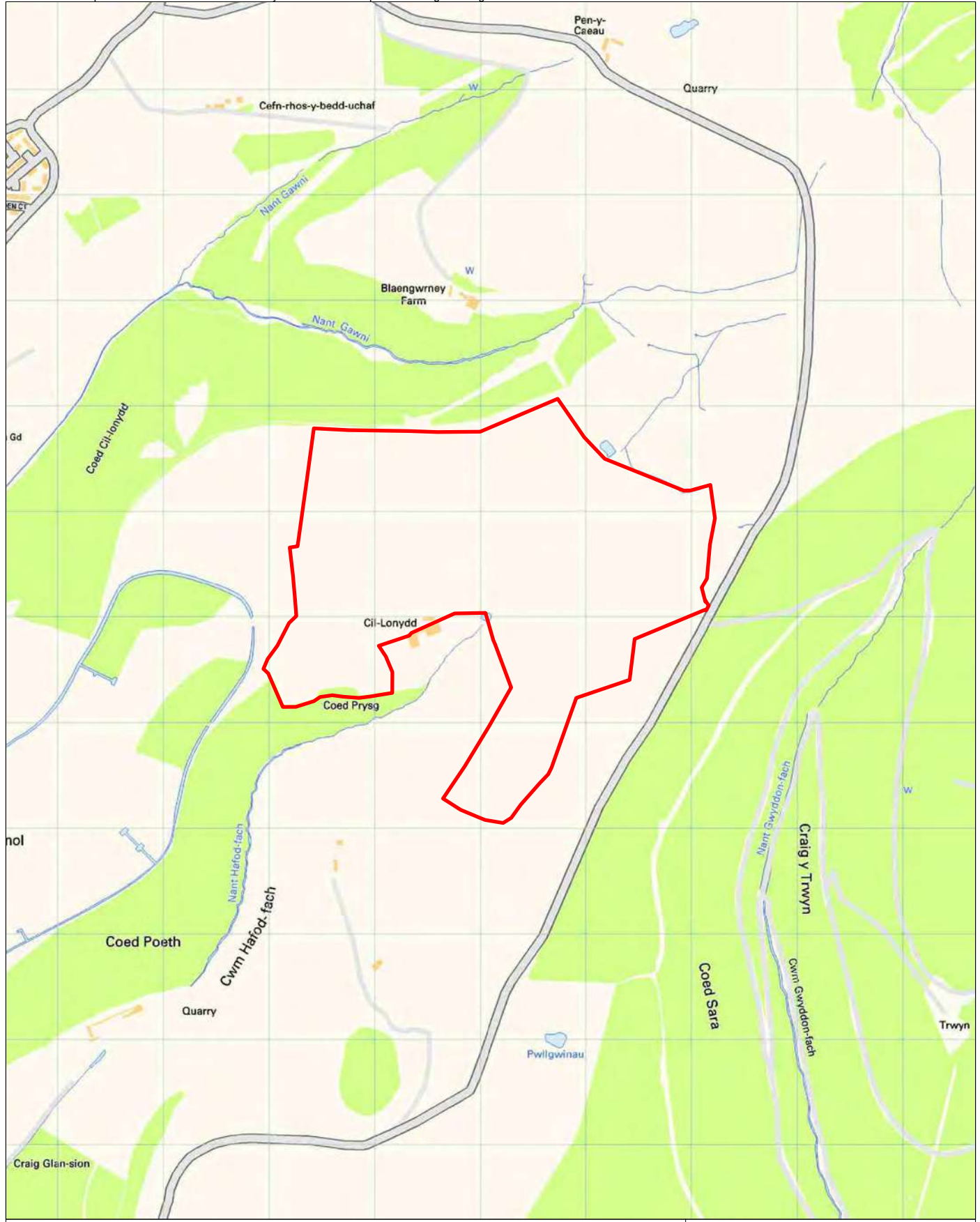


0 100 200m  
Scale at A4: 1:10,000



Figure 8

1989 Ordnance Survey Map



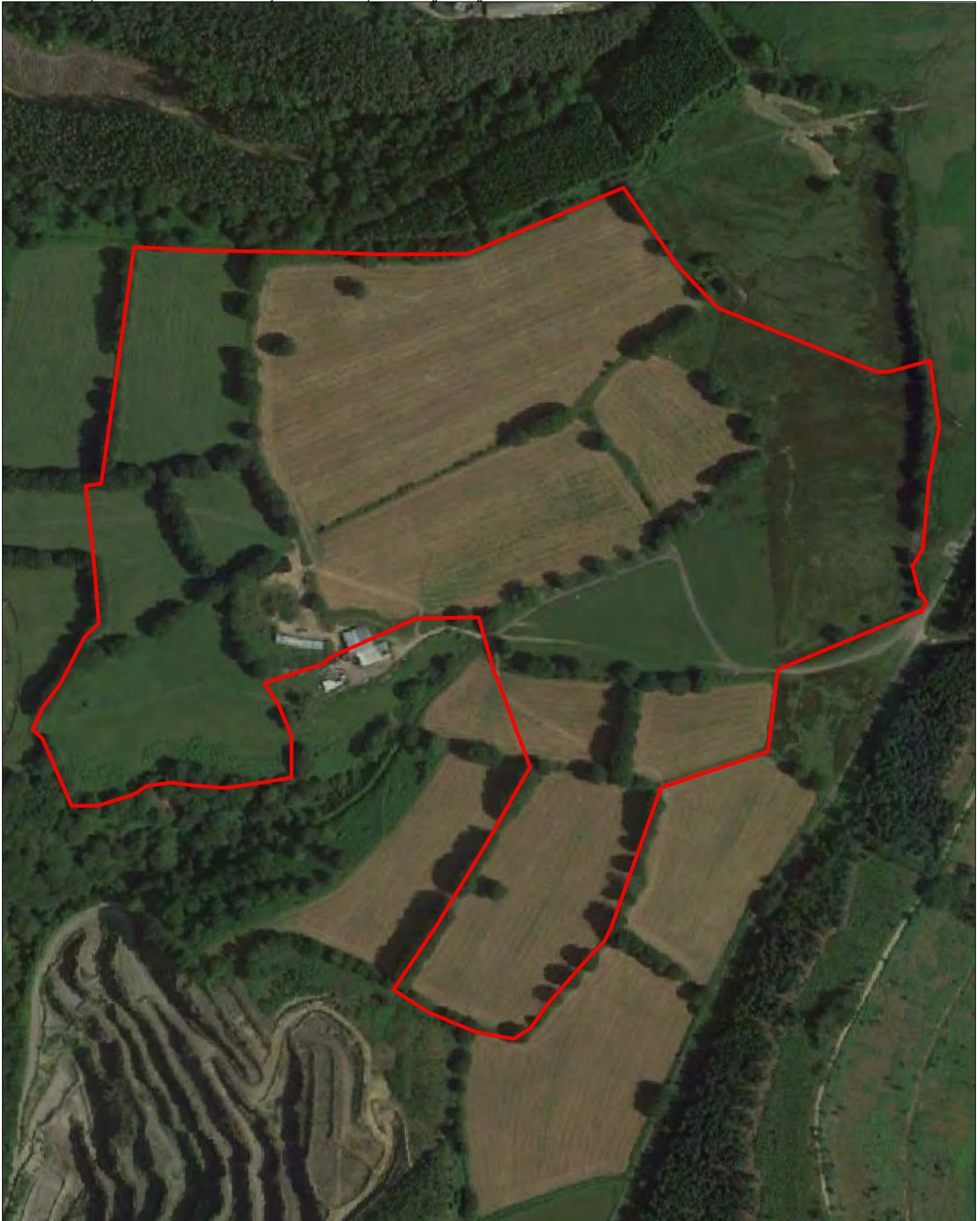
 Site Boundary



0 100 200m  
Scale at A4: 1:10,000



Figure 9  
2001 Ordnance Survey Map



 Site Boundary



0 50 100m  
Scale at A4: 1:5,000



Figure 10  
2021 Aerial Photograph



**PLATES**



Plate 1: View west across the south west corner of the study site



Plate 2: View east across the southern part of the study site



Plate 3: View west from south east corner of site, showing hill which shields the Site from views in this direction



Plate 4: View east from western boundary of study site, showing typical hedgerow with mature/veteran trees



Plate 5: View east across the study site from the central western part



Plate 6: View south east across the study site from north eastern boundary



Plate 7: View east across the study site from the centre



Plate 8: View south east across the study site from the centre





Plate 9: View south across the study site from the centre



Plate 10: View south across the study site from the centre



Plate 11: View east from the north west corner



Plate 12: View north across the northern part of the study site, from centre of northern part



Plate 13: View north east across the northern part of the study site, from centre of northern part



Plate 14: View east across the northern part of the study site, from centre of northern part



Plate 15: View south across the study site from the centre of the northern part



Plate 16: View south west across the study site from the centre of the northern part



Plate 17: View north across the northern part of the study site



Plate 18: View across the eastern part of the study site



Plate 19: View south across the south eastern part of the study site



Plate 20: Small modern brick structure at northern end of study site



Plate 21: Older masonry in farmyard



Plate 22: St Illtyd's church from the south



Plate 23: View towards study site from St Illtyd's church



Plate 24: St Illtyd, castle mound from the south





Plate 25: St Illtyd, view towards study site from castle mound at ground level



Plate 26: View towards study site across eastern part of Pen y Fan Canal Reservoir



**APPENDICES**

## Appendix 1

### Gazetteer of HER data entries

## HER Records

PRN	Name	Period
GGAT00091g	FINDSPOT NEAR NEWBRIDGE	Bronze Age
GGAT00094g	Cae Eglwys, Cil-lonydd Grange Chapel	Medieval
GGAT00095g	Masonry fragments	Medieval
GGAT00096g	CIL-LONYDD	POST MEDIEVAL
GGAT03288g	CAE EGLEYS	Unknown
GGAT03289g	ENCLOSURE AT CAERPHILLY	Medieval
GGAT04973g	GLAN-SHON	POST MEDIEVAL
GGAT04975g	TWYN-Y-GNOLL	POST MEDIEVAL
GGAT04976g	Small Building, Newbridge	POST MEDIEVAL
GGAT04977g	PENRHIW FAWR	POST MEDIEVAL
GGAT04978g	HAFOD FACH	Unknown
GGAT04979g	Quarry	POST MEDIEVAL
GGAT04980g	Traces of house, Abercarn	POST MEDIEVAL
GGAT04981g	PWLLGWINAE	POST MEDIEVAL
GGAT04982g	TRWYN	Unknown
GGAT04984g	BLAENGWRNEY FARM	POST MEDIEVAL
GGAT04985g	Quarry, Newbridge	POST MEDIEVAL
GGAT04986g	YSGUBOR WEN	POST MEDIEVAL
GGAT04987g	Small buildings, Newbridge	POST MEDIEVAL
GGAT04988g	Pool, Newbridge	POST MEDIEVAL
GGAT04989g	Pool, Newbridge	POST MEDIEVAL
GGAT04990g	Pool, Newbridge	POST MEDIEVAL
GGAT04992g	CEFN-RHOS-Y-BEDD-UCHAF	POST MEDIEVAL
GGAT04993g	PEN-Y-CAEAU	POST MEDIEVAL
GGAT04994g	Quarry, Newbridge	POST MEDIEVAL
GGAT04995g	Quarry, Crumlin	POST MEDIEVAL
GGAT05035g	CIL LONYDD	POST MEDIEVAL
GGAT05036g	Square Structure, Newbridge	POST MEDIEVAL
GGAT05037g	Mound, Newbridge	Unknown
GGAT07201g	Trackway, Newbridge	Medieval
GGAT07312g	Rectangular structure, Crumlin, Caerphilly	POST MEDIEVAL
GGAT07313g	Un-roofed Structure, Crumlin, Caerphilly	POST MEDIEVAL
GGAT07329g	Quarry, Crumlin, Caerphilly	Modern
GGAT07335g	Former Trig point, Abercarn, Caerphilly	Modern
GGAT07516g	CRAIG Y TRWYN WELL	POST MEDIEVAL
GGAT08327g	Cil-lonydd/cilonydd Grange	Medieval
GGAT1121g	Bee Bole, Penycacau Farm, Crumlin	POST MEDIEVAL

## HER Events

PRN	Name	Organisati
GGATE002660	Hafod Fach Quarry, Abercarn. DBA	Glamorgan-Gwent Archaeological Trust (GGAT)
GGATE002992	Hafod Fach Quarry, Abercarn SUR	Glamorgan-Gwent Archaeological Trust (GGAT)
GGATE002993	Hafod Fach Quarry Abercarn, WB	Glamorgan-Gwent Archaeological Trust (GGAT)
GGATE004132	Hafod Fach Quarry, Abercarn DBA	Glamorgan-Gwent Archaeological Trust (GGAT)
E002660	Hafod Fach Quarry, Abercarn DBA	GGAT

E002993	Hafod Fach Quarry Abercarn, WB	Glamorgan-Gwent Archaeological Trust (GGAT)
E004132	Hafod Fach Quarry, Abercarn DBA	Glamorgan-Gwent Archaeological Trust (GGAT)

## Appendix 2

### Gazetteer of designated heritage assets within 5km of the study site

## Listed Buildings

RecordNumb	Name	Grade
1866	St Illtyd's Church	II*
1867	Hafod-arthen	II
1882	Church of St Tudor Mynyddislwyn	II*
1883	Beulah Baptist Church and attached wing and gateway	II
1884	Crumlin Viaduct E Abutment Ebbw Valley	II
1885	Former Barn at Croespenmaen	II
1887	Former School Room, New Bethel, and attached wall	II
1888	Penmaen House	II
1889	Former Navigation Colliery Offices	II
1890	Former Navigation Colliery Chimney	II*
1891	Former Navigation Colliery South Winding Engine House	II*
1892	Former Navigation Colliery Lamp Room	II
1893	Former Navigation Colliery Workshops and Stores	II
1894	Former Navigation Colliery North Winding Engine House	II*
1895	Former Navigation Colliery Electrical Outbuilding	II
1896	Former Navigation Colliery Power House and Pump House	II*
1897	Former Navigation Colliery Fan House and Fan Drift	II*
1898	Crumlin Old Farmhouse and abutting barn	II
1899	Cwmdows Farmhouse	II*
1900	Rhyswg Fawr Farmhouse and walled forecourt	II
1902	Cyncoed Farm Cottage	II
1903	Church of St Luke	II*
1906	Cwmbrynar aka Cwmbraenar Cottage	II
1908	No 2 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,GWENT,	II
1909	No 6 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,GWENT,	II
1910	No 10 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,GWENT,	II
1911	No 22 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,GWENT,	II
1912	No 30 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,GWENT,	II
1913	No 38 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,GWENT,	II
1914	No 41 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,GWENT,	II
1915	No 49 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,GWENT,	II
1916	No 57 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,GWENT,	II

1917	No 65 Garden Suburbs,,Pont-y-Waun Garden Suburb,,GWENT,	II
3134	Capel-Ilwyd	II
3148	Llanderfel Farmhouse	II
3149	Glyn Bran Farmhouse	II
16425	Former Navigation Colliery Powder Store and adjoining N Rear Revetment Wall	II
16426	Former Navigation Colliery Heapstead and Main Revetment Wall	II
16427	Former Navigation Colliery Middle Revetment Wall	II
16428	Former Navigation Colliery Baths	II
18723	Oakdale Hospital	II
20995	Welsh Presbyterian Church	II
20996	Abercarn War Memorial	II
20997	Cwmcarn War Memorial and surrounding railings	II
20998	Barn at Rhyswg Fawr	II
20999	English Baptist Church and walled forecourt	II
21000	English Baptist Church Sunday School	II
21001	Abercarn Aqueduct and bridge (partly in Crosskeys Community)	II
21002	Ty Mynydd	II
21003	Hall's Bridge, Railway Viaduct over River Ebbw and Western Valleys Railway Line	II
21005	Trinity Congregational Church and attached Sunday School	II
21008	Hall's Bridge, Railway Viaduct over River Ebbw and Western Valleys Railway Line	II
21009	Former Railway bridge over canal outfall	II
21010	Homestead	II
21011	Generator Tower	II
21012	Abercarn Aqueduct and Bridge	II
21013	No 1 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21014	No 13 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21015	No 21 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21016	No 29 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21017	No 3 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21018	No 5 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21019	No 7 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21020	No 9 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21021	No 11 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21022	No 15 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II



21023	No 17 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21024	No 19 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21025	No 23 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21026	No 25 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21027	No 27 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21028	No 31 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21029	No 33 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21030	No 35 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21031	No 37 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21032	No 39 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21033	No 4 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21034	No 8 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21035	No 12 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21036	No 14 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21037	No 16 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21038	No 18 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21039	No 20 Garden Suburbs,,Pont-y-Waun Garden Suburb,,	II
21040	No 43 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,	II
21041	No 45 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,	II
21042	No 47 Garden Suburbs, Circus	II
21043	No 24 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,	II
21044	No 26 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,	II
21045	No 28 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,	II
21046	No 51 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,	II
21047	No 53 Garden Suburbs, Circus	II
21048	No 55 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,	II
21049	No 32 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,	II

21050	,34 Garden Suburbs, Circus,Pont-y-Waun Garden Suburb,,	II
21051	No 36 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II
21052	No 59 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21053	No 61 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21054	No 63 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21055	No 67 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21056	No 69 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21057	No 71 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21058	No 40 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21059	No 42 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21060	No 44 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21061	No 46 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21062	No 48 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II
21254	Crumlin Viaduct W Abutment Ebbw Valley	II
21255	Crumlin Viaduct NE Abutment Cwm Kendon	II
21256	Crumlin Viaduct SW Abutment Cwm Kendon	II
21257	Crumlin Old Bridge over River Ebbw	II
21258	Penrhiwlas	II
21259	Gelli farmhouse and attached farm range	II
21260	Barn at Gelli	II
21261	Church of Christ Church Aberbeeg	II
21262	Viaduct Cottage	II
21263	Llanerch-uchaf farmhouse and attached farm range	II
21264	Barn at Llanerch-uchaf	II
21265	Pentref-y-Groes	II
21266	Barn and byre range at Pen-y-groes 3	II
21267	Rear Revetment Wall S	II
21498	Church of St Paul	II
21499	Church of Our Lady of Peace and attached Presbytery	II*
21500	Celynen Collieries Workmen's Institute	II
21501	Preswylfa	II
21502	Former Hall's tramroad and railway tunnel E portal	II
21503	Former Hall's tramroad and railway tunnel W portal	II
21504	Pentwyn-isaf	II
21509	Pont Syr Dafydd	II
21511	Wall, railings and gates at Oakdale Hospital	II

21512	The Oakdale Public House	II
21513	Former Tramroad Bridge (partly in Pontllanfraith Community)	II
21622	War Memorial	II
21626	New Bethel Chapel	II
21627	Wall, railings and gates at New Bethel Chapel graveyard	II
21631	Former Tramroad Bridge (partly in Penmaen Community)	II
21632	Monuments to James Thomas and family at New Bethel	II
21633	Monument to Martha Williams at New Bethel	II
21634	Monument to Margaret Williams at New Bethel	II
21635	Monument to Elizabeth Jones at New Bethel	II
21636	Nicholas monument at New Bethel	II
21637	Monument to Rosser Williams at New Bethel	II
21638	Monument to Thomas Henry Thomas at New Bethel	II
22315	Lychgate at St Tudor's Church Mynyddislwyn	II
22322	Ton-eithin	II
22671	Former Colliery Workmen's Institute	II
22672	Ty-Ilwyd	II
22673	Swffryd-ganol including front garden wall	II
22674	Barn Range including cow-house at Swffryd-ganol	II
25235	Pont Syr Dafydd (partly in Penmaen Community)	II
25737	The Gables	II
25738	Terraced steps at The Gables	II
27059	Ty'r Ywen Farmhouse	II
27060	Barn at Ty'r Ywen Farm	II
80858	Barn at Capel-Ilwyd	II
80859	Barn at Glyn Bran Farm	II
80860	Outside kitchen at Glyn Bran Farm	II
81922	Gellipistyll	II
81923	Outbuilding to SE of Gellipistyll	II
82346	Celynyn Collieries Workmen's Memorial Hall, including forecourt wall and gates	II*
84800	Aberbeeg 'Packhorse' Bridge	II
87492	Iron Bridge in grounds of Woodfield Park	II
87579	Abertillery and District Hospital (original ranges only)	II
87580	Memorial Gates to Abertillery and District Hospital	II

### Scheduled Monuments

SAMNumber	Name	Period
MM250	Charcoal Blast Furnace at Abercarn	Post Medieval/Modern
MM271	Llanderfel Church	Medieval
MM044	Twm-Barlwm Mound and Bailey Castle	Medieval
MM141	St Illtyd Castle Mound	Medieval

MM045	Cairns West of Craig y Dyffryn	Prehistoric
MM035	Twyn Tudor	Medieval
MM192	Old Beam Pump & Winding Engine, Glyn Pits	Post Medieval/Modern
MM256	Iron Ore Scours at Upper Race, Pontypool	Post Medieval/Modern
MM259	Former Dam of Cwmcarn Canal Reservoir	Post Medieval/Modern
MM269	Pen y Fan Canal Reservoir	Post Medieval/Modern

### Conservation Areas

sitename
Oakdale
Upper Cwmbran
Cwmcarn Memorial Park
Pontywaun Garden Suburbs
Newbridge

## Aerial photographs viewed

### CRAPW, Cardiff:

1945 4561 RAF3GTUD\_T19 5094  
1949 4901 RAF540\_205 5050  
1951 5112 RAF58\_676 3247  
1951 5112 RAF58\_676 4248  
1963 6310 OS 63\_074 037  
1972 7223 MAL 11\_72 019  
1972 7223 MAL 11\_72 020  
1979 7940 OS79\_129 009  
1984 8402 ADAS 210 171  
1985 8501 JAS 0985 073  
1992 92264 CUCAP RC8MP 011  
1946 4635 RAF106GUK1502 3225  
1946 4635 RAF106GUK1502 3226  
1946 4635 RAF106GUK1502 3227  
1946 4635 RAF106GUK1502 3228  
1946 4635 RAF106GUK1502 4224  
1946 4635 RAF106GUK1502 4225  
1946 4635 RAF106GUK1502 4226  
1947 4709 RAF CPEUK1997 2223 North half  
1947 4709 RAF CPEUK1997 2224 North half  
1947 4709 RAF CPEUK1997 2225 North half  
1947 4709 RAF CPEUK1997 4224 South half  
1947 4709 RAF CPEUK1997 4225 South half  
1947 4709 RAF CPEUK1997 4226 South half

### RCAHMW, Cardiff:

#### RAF Verticals

385; 106G/UK/1502; 3225 & 4280; 13/5/46  
589; CPE/UK/1997; 4224; 13/4/47  
1059; CPE/UK/2509; 5029 & 5048; 13/3/48  
1039; 540/205; 5050; 10/5/49  
1172; 58/676; 4248; 12/5/51  
1338; 58/1452 F22; 0166; 31/5/54  
1520; 540/1295 F22; 0133; 22/4/54  
1893; 58/2777 F21; 0288; 30/4/59  
0290; 58/5154; 0031 & 0042; 1/6/62

#### Ordnance Survey Verticals


03-627; 093 & 143; 12/7/03  
03-528; 065; 077 & 144; 30/3/03  
99-956; 81 & 104; 23/7/99  
96-669; 8997 & 9040; 18/11/96  
94-190; --3 & 051; 16/6/94  
91-187; 021, 046 & 048; 26/8/91

## REPORT

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RCAHMW Obliques  
AP\_2006\_1368 & 1369





**Appendix 7.2**  
Geophysical Survey Report





**magnitude  
surveys**

**Geophysical Survey Report  
Cil Lonydd PV  
Newbridge**

**For  
RPS**

**On Behalf of  
Cenin Renewables Ltd**

**Magnitude Surveys Ref: MSST1678**

**April 2024**



## magnitude surveys

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**Issue Date:**

12 April 2024

### **Abstract**

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of c. 44ha area of land at Cil Lonydd Solar Farm, Newbridge. A fluxgate gradiometer survey was successfully completed across the survey area, with c. 13.5ha unable to be surveyed due to cattle present in field, overgrown vegetation, and unsuitable ground conditions. The survey has identified anomalies of possible archaeological, agricultural, natural and undetermined origin. A possible archaeological enclosure has been identified in the centre of the survey area, which may be linked to a recorded monastic grange in the historical record. Former field boundaries and historical agriculture have been identified across the survey area in the form of ridge and furrow. A track mapping to a modern farm road was also detected, as well as further modern agricultural trends. Natural anomalies are present throughout the survey area, caused by changes in the superficial geology. Additional linear anomalies, which lack corroborative evidence have been classed as undetermined, although an archaeological origin for these cannot be excluded. Modern interference is predominantly limited to field boundaries and buried services.

## Crynodeb

Comisiynwyd Magnitude Surveys i asesu potensial archaeolegol o dan yr wyneb tua 44ha o dir yn Fferm Solar Cil Lonydd, Trecelyn. Cafodd arolwg â theclyn mesur fflwcs magnetig ei gynnal yn llwyddiannus ar draws ardal yr arolwg ond nid oedd modd arolygu tua 13.5ha oherwydd bod gwartheg yn y cae, bod llystyfiant wedi tyfu'n wyllt, a bod yr amodau tir anaddas. Mae'r arolwg wedi canfod anghysondebau sydd o bosibl o darddiad archeolegol, naturiol ac amhendant. Mae clostir archaeolegol posibl wedi cael ei ganfod yng nghanol ardal yr arolwg, a allai fod yn gysylltiedig â maenor fynachaidd a gofnodir yn y cofnod hanesyddol. Mae terfynau caeau blaenorol ac amaethyddiaeth hanesyddol wedi cael eu nodi ar draws ardal yr arolwg ar ffurf cefnen a rych. Daethpwyd o hyd i lwybr yn cyfateb i lôn fferm fodern hefyd, yn ogystal â rhagor o dueddiadau amaethyddol modern. Mae anghysondebau i'w gweld drwy ardal yr arolwg, wedi'u hachosi gan newidiadau yn y ddaear arwynebol. Mae anghysondebau llinellol ychwanegol, nad oes tystiolaeth ategol ar eu cyfer, wedi cael eu dosbarthu fel rhai amhendant, er na ellir diystyru'r posibilrwydd eu bod o darddiad archaeolegol. Mae ymyrraeth fodern wedi'i chyfyngu'n bennaf i ffiniau caeau a chyfleustodau wedi'u claddu.



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## 1. Introduction

- 1.1. Magnitude Surveys Ltd (MS) was commissioned by RPS Consulting to undertake a geophysical survey over a c. 44ha area of land northeast of Trecceln, Wales, NP11 5AY (ST 22975 97371). 13.5ha was unable to be surveyed due to cattle in field, overgrown vegetation, and unsuitable ground condition.
- 1.2. The geophysical survey comprised quad-towed, and hand-carried GNSS-positioned fluxgate gradiometer survey. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK due to its ability to detect a range of different features. The technique is particularly suited for detecting fired or magnetically enhanced features, such as ditches, pits, kilns, sunken featured buildings (SFBs) and industrial activity (David *et al.*, 2008).
- 1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David *et al.*, 2008), the Chartered Institute for Archaeologists (CIfA, 2020) and the European Archaeological Council (Schmidt *et al.*, 2015).
- 1.4. It was conducted in line with a WSI produced by MS and approved by the archaeological planning officer at GGAT (Garst, 2023).
- 1.5. The survey commenced on 13/11/2023 and took 5 days to complete.

## 2. Quality Assurance

- 2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society for Archaeological Prospection).
- 2.2. The directors of MS are involved in cutting edge research and the development of guidance/policy. Specifically, Dr Chrys Harris has a PhD in archaeological geophysics from the University of Bradford, is a Member of CIfA and is the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter has an MSc in archaeological geophysics and is a Fellow of the London Geological Society, as well as a member of GeoSIG (CIfA Geophysics Special Interest Group); Dr Paul Johnson has a PhD in archaeology from the University of Southampton, is a Fellow of the Society of Antiquaries of London and a Member of CIfA, has been a member of the ISAP Management Committee since 2015, and is currently the nominated representative for the EAA Archaeological Prospection Community to the board of the European Archaeological Association.
- 2.3. All MS managers, field and office staff have degree qualifications relevant to archaeology or geophysics and/or field experience.

## 3. Objectives

- 3.1. The objective of this geophysical survey is to assess the subsurface archaeological potential of the survey area.

## 4. Geographic Background

4.1. The survey area was located c. 888m east of Panside (Figure 1). Gradiometer survey was undertaken across 12 fields under pasture. The survey area was located to the south of Coed Cil-lonydd forest, with Cil-lonydd farm in the centre of the survey area. Further pasture fields were located to the west, east, and south (Figure 2).

4.2. Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	The survey area consisted of a flat pasture.	The survey area was bordered to the south and west by a fence. To the north, east, and south there was also a hedge and tree border. A telegraph pole stood in the west of the survey area, with overhead wires running south to north northeast.
2	The survey area consisted of a pasture, gently sloping northwest to southeast.	The survey area was bordered to the north, east, and south with hedges and trees, as well as a fence to the east and south. To the west there was no boundary.
3	The survey area consisted of a pasture, gently sloping from the centre to both east and west.	The survey area was bordered to the west, north, east, and the eastern half of the south by trees and hedges. A fence ran along the west, north and east boundaries. There was no border to the southwest. Telegraph poles ran from the middle of the northern border to the southwest, and two trees were situated in the northwest corner.
4	The survey consisted of a flat pasture.	The survey area was bordered on all sides by trees and hedges, with a fence to the east and south also.
5	The survey area consisted of a pasture, sloping north and east.	The survey area was bordered to the north, east, south, and half of the west by trees and hedges. A fence also ran along the south border. There was no boundary in the northwest.
6	The survey area consisted of a pasture sloping from south to north.	The survey area was bordered on all sides by trees and hedges. Fallen branches were present along the western boundary.
7	The survey area consisted of a pasture sloping west to east.	The survey area was bordered to the south by trees and hedges and on all other sides by an access road.
8	The survey area consisted of a pasture sloping east to west.	The survey area was bordered to the north by a fence and had no other borders.
9	The survey area consisted of a pasture sloping east to west.	The survey area was bordered to the north by a fence, and on all sides by trees and hedges. There was a metal horse feeder near the centre, and large mole hills to the south.
10	The survey area consisted of a flat pasture.	The survey area was bordered on all sides by trees and hedges. A tree was present in the west of the survey area.

11	The survey area consisted of a flat pasture.	The survey area was bordered to the north and east by a fence, and to the west by trees and hedges. There was no southern boundary.
12	The survey area consisted of a flat pasture.	The survey area was bordered to the north and east by a fence, and the south and west by an access road. There was waterlogged ground to the north, and a wooden paddock in the southern tip.

4.3. The underlying geology comprises of Hughes member Sandstone. Information on the superficial deposits is not available (British Geological Survey, 2024).

4.4. The soils consist of freely draining acid loamy soils over rock (Soilscapes, 2024).

## 5. Archaeological Background

5.1. The following archaeological background is a summary of a Historic Environment desk-based assessment produced and provided by RPS (2024).

5.2. No previous archaeological fieldwork has taken place within the survey area. A watching brief was carried out in Hafod Fach Quarry, immediately to the southwest of the survey area. No archaeologically significant deposits were identified.

5.3. There are no Prehistoric finds or features recorded within the study site. The only Prehistoric evidence recorded in the 1km study area is a Bronze Age axe findspot located 850m north-west of the survey area.

5.4. There are no Roman period finds or features recorded in the HER within the study site or within a c.1km radius.

5.5. The site of a monastic grange has been recorded in the central part of the survey area. A field located within the survey area under the name of Cae Eglwys or Cae Capel suggests the presence of an ecclesiastical site assumed to be of Pre-Norman date. An area in the centre of the study site, just north of Cil-Lonydd farm has revealed fragments of lime-mortared masonry during ploughing. To the north-west of this area a small rectangular enclosure is interpreted as a church and churchyard. Cil-lonydd farm itself is thought to be the possible Medieval monastic grange of Llantarnam Abbey.

## 6. Methodology

### 6.1. Data Collection

6.1.1. Magnetometer surveys are generally the most cost effective and suitable geophysical technique for the detection of archaeology in England. Therefore, a magnetometer survey should be the preferred geophysical technique unless its use is precluded by any specific survey objectives or the site environment. For this site, no factors precluded the recommendation of a standard magnetometer survey. Geophysical survey therefore comprised the magnetic method as described in the following section.

6.1.2. Geophysical prospection comprised the magnetic method as described in the following table.



6.1.3. Table of survey strategies:

Method	Instrument	Traverse Interval	Sample Interval
Magnetic	Bartington Instruments Grad-13 Digital Three-Axis Gradiometer	1m	200Hz reprojected to 0.125m

6.1.4. The magnetic data were collected using MS' bespoke quad-towed cart system and hand-carried GNSS-positioned system.

6.1.4.1. MS' cart and hand-carried system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a multi-channel, multi-constellation GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The RTK GPS is accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

6.1.4.2. Magnetic and GPS data were stored on an SD card within MS' bespoke datalogger. The datalogger was continuously synced, via an in-field Wi-Fi unit, to servers within MS' offices. This allowed for data collection, processing and visualisation to be monitored in real-time as fieldwork was ongoing.

6.1.4.3. A navigation system was integrated with the RTK GPS, which was used to guide the surveyor. Data were collected by traversing the survey area along the longest possible lines, ensuring efficient collection and processing.

## 6.2. Data Processing

6.2.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to the EAC and Historic England guidelines for 'minimally enhanced data' (see Section 3.8 in Schmidt *et al.*, 2015: 33 and Section IV.2 in David *et al.*, 2008: 11).

Sensor Calibration – The sensors were calibrated using a bespoke in-house algorithm, which conforms to Olsen *et al.* (2003).

Zero Median Traverse – The median of each sensor traverse is calculated within a specified range and subtracted from the collected data. This removes striping effects caused by small variations in sensor electronics.

Projection to a Regular Grid – Data collected using RTK GPS positioning requires a uniform grid projection to visualise data. Data are rotated to best fit an orthogonal grid projection and are resampled onto the grid using an inverse distance-weighting algorithm.

Interpolation to Square Pixels – Data are interpolated using a bicubic algorithm to increase the pixel density between sensor traverses. This produces images with square pixels for ease of visualisation.

### 6.3.Data Visualisation and Interpretation

- 6.3.1. This report presents the gradient of the sensors' total field data as greyscale images. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images of the gradient and total field at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plot (Figures 9, 12, 15). XY trace plots visualise the magnitude and form of the geophysical response, aiding anomaly interpretation.
- 6.3.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historical maps, LiDAR data, and soil and geology maps. Google Earth (2024) was also consulted, to compare the results with recent land use.
- 6.3.3. Geodetic position of results – All vector and raster data have been projected into OSGB36 (ESPG27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively. Figures are provided with raster and vector data projected against OS Open Data.

## 7. Results

### 7.1. Qualification

7.1.1. Geophysical results are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is inherently subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency, it is often not possible to classify all anomaly sources. Where possible, an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of comparing excavated results with the geophysical reports. MS actively seek feedback on their reports, as well as reports from further work, in order to constantly improve our knowledge and service.

### 7.2. Discussion

7.2.1. The geophysical results are presented in combination with satellite imagery and historical maps (Figures 4 & 6).

7.2.2. A fluxgate gradiometer survey was successfully completed across the survey area and identified anomalies of possible archaeological, agricultural, natural, modern, and undetermined origin. Modern magnetic disturbance has been detected along the boundaries all areas, as well as surrounding a buried service, which may have obscured further, weaker anomalies, if present.

7.2.3. A number of linear and rectilinear anomalies were identified in Areas and 3 (Figures 4 & 6). These anomalies, which appear to form a possible rectilinear appear to be located in close proximity to the location of a possible monastic grange (See section 5.5). However, due to the weak magnetic signal of the anomalies and the enhanced geological background a possible rather than probable archaeological origin has been assigned.

7.2.4. Anomalies related to agricultural activity have been identified in the survey area in the form of pre-modern agricultural trends in modern pasture field, along with mapped and unmapped former field boundaries (Figures 4 & 6).

7.2.5. Historical agriculture in the form of ridge and furrow has been identified across the survey area (Figures 4 & 6). The magnetic response takes several forms, In the northeast of Area 3, the anomalies have a straight linear morphology and wider spacing, which might suggest a later post-medieval origin. While in Areas, 8, 9, 10, 11 and 12, the survey has identified more tightly space curvilinear anomalies which might suggest an earlier origin and a possible association with the site former utilisation as an agricultural hinterland for the monastic grange.

- 7.2.6. Across the centre and northwest of the survey area, amorphous anomalies have been identified (Figures 4 & 6). These are likely caused by topographical changes across parts of the survey area.
- 7.2.7. A sinuous anomaly was identified in the southwest of the survey area (Figure 6). This maps to a modern farm track running through this area and has been designated as modern.
- 7.2.8. Linear and rectilinear anomalies have been identified across the survey area (Figures 4 & 6). These anomalies do not appear to correspond with any features on historical mapping or satellite imagery, and have been classified as undetermined, although an archaeological or agricultural origin cannot be ruled out.

## 7.3. Interpretation

### 7.3.1. General Statements

- 7.3.1.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.
- 7.3.1.2. **Ferrous (Spike)** – Discrete dipolar anomalies are likely to be the result of isolated pieces of modern ferrous debris on or near the ground surface.
- 7.3.1.3. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentration of multiple discrete, dipolar anomalies usually resulting from highly magnetic material such as rubble containing ceramic building materials and ferrous rubbish.
- 7.3.1.4. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures, typically including fencing, pylons, vehicles and service pipes, have been classified as ‘Magnetic Disturbance’. These magnetic ‘haloes’ will obscure weaker anomalies relating to nearby features, should they be present, often over a greater footprint than the structure causing them.
- 7.3.1.5. **Undetermined** – Anomalies are classified as Undetermined when the origin of the geophysical anomaly is ambiguous and there is no supporting contextual evidence to justify a more certain classification. These anomalies are likely to be the result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally distinct from those caused by ferrous sources.

### 7.3.2. Magnetic Results - Specific Anomalies

- 7.3.2.1. **Possible Archaeology (Weak)** - In Areas 1 and 3, linear and rectilinear anomalies have been identified. Running north to south through the boundary of these survey areas, these anomalies have a weak magnetic signal that is most evident in the Total Field plots (Figure 4). The possible location of a cropmark in the vicinity and the recorded presence of a possible medieval monastic grange has led to these anomalies being identified as a possible enclosure with adjacent ditch-like feature. Historical OS maps name this field as “Cae Elgwys” (see 5.5)

(Figure 4), translating to Church Field, however, due to the lack of clear morphology and the weak magnetic signal, a more definite designation cannot be given.

- 7.3.2.2. **Agricultural (Weak & Spread)** – In Areas 2, 3, 9, 10, 11, linear anomalies have been identified, the morphology and signal of which suggests an agricultural origin as former field boundaries (Figures 8, 11, 14). The anomalies in Areas 2 and 11 do not match with historically mapped field boundaries unlike the others but share a strong negative signal similar to the mapped anomaly in Area 3, leading to a similar classification.
- 7.3.2.3. **Agricultural (Trend)** – Linear anomalies were identified in Area 4 (Figure 8) . These run southeast to northwest, with a differing magnetic signal to the historical agricultural regimes present across other areas in the survey area. These have been designated as ploughing trend and considered to be of modern agricultural origin.
- 7.3.2.4. **Ridge-and-Furrow (Linear)** – Across the survey area historical agricultural regimes in the form of ridge-and-furrow has been identified. The anomalies largely respect historically mapped field boundaries.
- 7.3.2.5. **Natural (Spread)** – Across Areas 1, 2, and 3, several sinuous anomalies and a wider zone of linear and amorphous anomalies have been detected (Figures 8 & 11). These are likely caused by changes in the geology, largely aligning themselves with contours of the rising ground in these areas. Due to this these anomalies have been interpreted as possible colluvial deposits likely formed by the accumulation of enhanced materials at the bottom of the topographical slopes.
- 7.3.2.6. **Modern (Weak & Spread)** – A modern farm track and debris present in Area 9 caused a strong magnetic response (Figures 11 & 12). These may have masked weaker, more ephemeral anomalies in this area.
- 7.3.2.7. **Service (Linear)** – In Areas 5 and 9 linear anomalies with a strong dipolar magnetic signal were detected (Figures 9 & 10). These are indicative of buried modern services, possibly related to the modern structures to the east of Area 9.
- 7.3.2.8. **Undetermined (Strong)** – In Area 4, a single discrete anomaly with a strong magnetic signal was detected (Figures 9 & 10). The morphology and signal of this anomaly may be representative of burning. Without corroborating evidence this anomaly has been classed as undetermined, although an archaeological origin cannot be excluded.
- 7.3.2.9. **Undetermined (Weak)** – Across the survey area anomalies of weak magnetic signal were detected. Linear forms were identified in Areas 3, 8, and 10 (Figures 8 & 11). These do not correspond with recorded historical field boundaries or the modern or historical agricultural regimes. Whilst an agricultural origin may be possible, a natural or archaeological origin cannot be excluded.

## 8. Conclusions

- 8.1.** A fluxgate gradiometer survey was successfully completed over a c. 44ha area, and the technique responded well to the local environment. 13.5ha were unable to be surveyed due to cattle in field, overgrown vegetation, and unsuitable ground conditions. Modern interference is primarily confined to field boundaries and a buried service. Interpretation of the geophysical results has identified anomalies representative of possible archaeological origin, historical agriculture, natural processes, and modern development.
- 8.2.** Anomalies of a possible archaeological origin have been identified within the survey area. These may correlate to historical records of a monastic grange within the survey area.
- 8.3.** Prolonged agricultural use of the landscape is evidenced by the detection of historically mapped field boundaries and extensive weak parallel linear anomalies which are consistent with ridge and furrow cultivation and ploughing trends.
- 8.4.** Natural variations in the form of amorphous anomalies have been detected across the survey area.
- 8.5.** Anomalies classed as undetermined have been detected. These lack a distinctive morphology, signal or context to enable a more robust interpretation. Although they may be the result of agricultural, natural or modern processes, an archaeological origin cannot be excluded.

## 9. Archiving

- 9.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.
- 9.2. MS will follow the National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales (National Panel of Archives in Wales, 2017) and digital archiving guidance of the Royal Commission on the Ancient and Historical Monuments Wales (Edwards, 2015).
- 9.3. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to any dictated time embargoes.

## 10. Copyright

- 10.1. Copyright and intellectual property pertaining to all reports, figures and datasets produced by Magnitude Services Ltd is retained by MS. The client is given full licence to use such material for their own purposes. Permission must be sought by any third party wishing to use or reproduce any IP owned by MS.

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## 12. Project Metadata

MS Job Code	MSST1678
Project Name	Cil Lonydd PV Archaeological Survey
Client	RPS
Grid Reference	ST 22975 97371
Survey Techniques	Magnetometry
Survey Size (ha)	44ha (Magnetometry)
Survey Dates	2023/11/20 to 2023/11/24
Project Lead	Krasimir Dzulgerski BA MRes
Project Officer	N/A
HER Event No	TBC
OASIS No	TBC
S42 Licence No	N/A
Report Version	1.0

## 13. Document History

Version	Comments	Author	Checked By	Date
0.1	Initial draft for Project Lead to Review	HR	KD	13 February 2024
0.2	Second draft following review from Project Lead	HR	KD	14 February 2024
0.3	Draft Report for Director Sign Off	KD	FPC	19 February 2024
0.4	Client Correctios	HM	KD	12 March 2024
1.0	Report Issued as Final	KD	FPC	12 April 2024

## 14. Data Management Plan

MS Job Code	MSST1678
Project Name	Cil Lonydd PL Archaeological Survey
Client	RPS
Grid Reference	ST 22975 97371
Survey Techniques	Magnetometer
Survey Size (ha)	44ha
Survey Dates	2023/11/20 to 2023/11/24
Project Lead	Krasimir Dzulgerski BA MRes
Project Officer	Sacha O'Connor BA
Section 42	N/A
HER Event No	TBC
Planning Application	TBC

Author	Krasimir Dyulgerski BA MRes	Revisor:	Krasimir Dyulgerski BA MRes
Initiation Date	12/03/24	Last Date of Revision:	12.04.24
Version	0.2		
Status	Draft		
Summary of Changes	Reference to OASIS removed. Reference to RCAHMW is added.		
File Name/Location			
<b>Data Collection and Generation</b>			
<ul style="list-style-type: none"> <li>• GNSS-positioned fluxgate gradiometer data will be collected and stored in digital format by Magnitude Surveys Ltd. (MS) for the purposes of archaeological applications.</li> <li>• Data collected in the field will be stored on MS servers as CSV files (raw data) and GeoTiffs (processed data). Other data collected and generated in the field such as site photos (.JPEG), SSRAs (MS Word), site diaries (MS Word) and site notes (.PNG).</li> <li>• Data will be collected to a high quality as ensured by on site processing, allowing for real-time data QA and trouble shooting. Duplicate traverses will be collected to provide evidence for the repeatability of the survey method.</li> <li>• Analysis of the data includes the generation of topography contours and XY traces (.SHP) Interpretation of the data is carried out in QGIS through the creation of polygons, polylines and points. This data is stored on a PostGres GIS database on MS servers.</li> <li>• Deliverables, including the WSI and final report (MS Word) will be available to clients as PDF files.</li> </ul>			
<b>Metadata and Documentation</b>			
<ul style="list-style-type: none"> <li>• Sufficient metadata is stored by MS to allow for other users of the data to be able to repeat both collection and processing methods if desired, as well as understand the generation and evolution of the data collected in the field.</li> <li>• Any changes to standard practice will be clearly recorded in the metadata documentation.</li> </ul>			
<b>Data Storage, Access and Preservation</b>			
<ul style="list-style-type: none"> <li>• All data produced by MS for this project will be stored on MS network which is backed up daily.</li> <li>• Data is accessible to MS staff through the company's network, and deliverables and any other data requested will be provided to the client upon the completion of the project.</li> <li>• MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.</li> <li>• Copyright and intellectual property pertaining to all reports, figures and datasets produced by Magnitude Services Ltd is retained by MS. The client is given full licence to use such material for their own purposes. Permission must be sought by any third party wishing to use or reproduce any IP owned by MS.</li> </ul>			
<b>Long Term Curation of Archive</b>			

- A copy of the digital archive will also be deposited with the Historic Environment Record Data Deposit Online System and the RCAHMW.

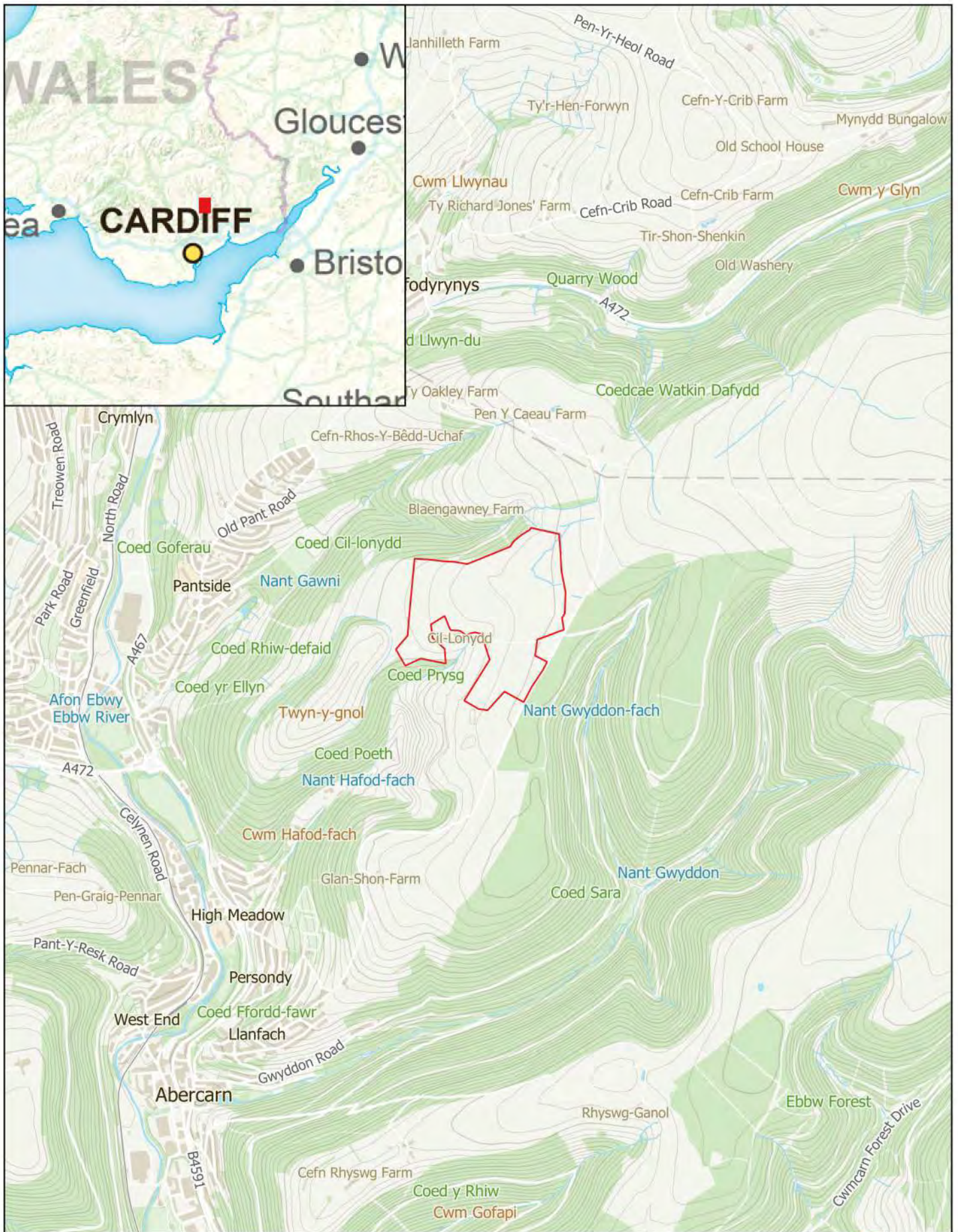
#### Resources and Responsibilities

- The project lead is responsible for ensuring that this data management plan is adhered to.

#### References

Schmidt, A. and Ernenwein, E., 2013. Guide to good practice: geophysical data in archaeology. (2<sup>nd</sup> edition). Oxbow Books: Oxford.





MSST1678: Cyl Lonydd PV Archaeological Survey

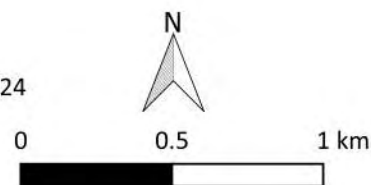
Figure 1 - Site Location

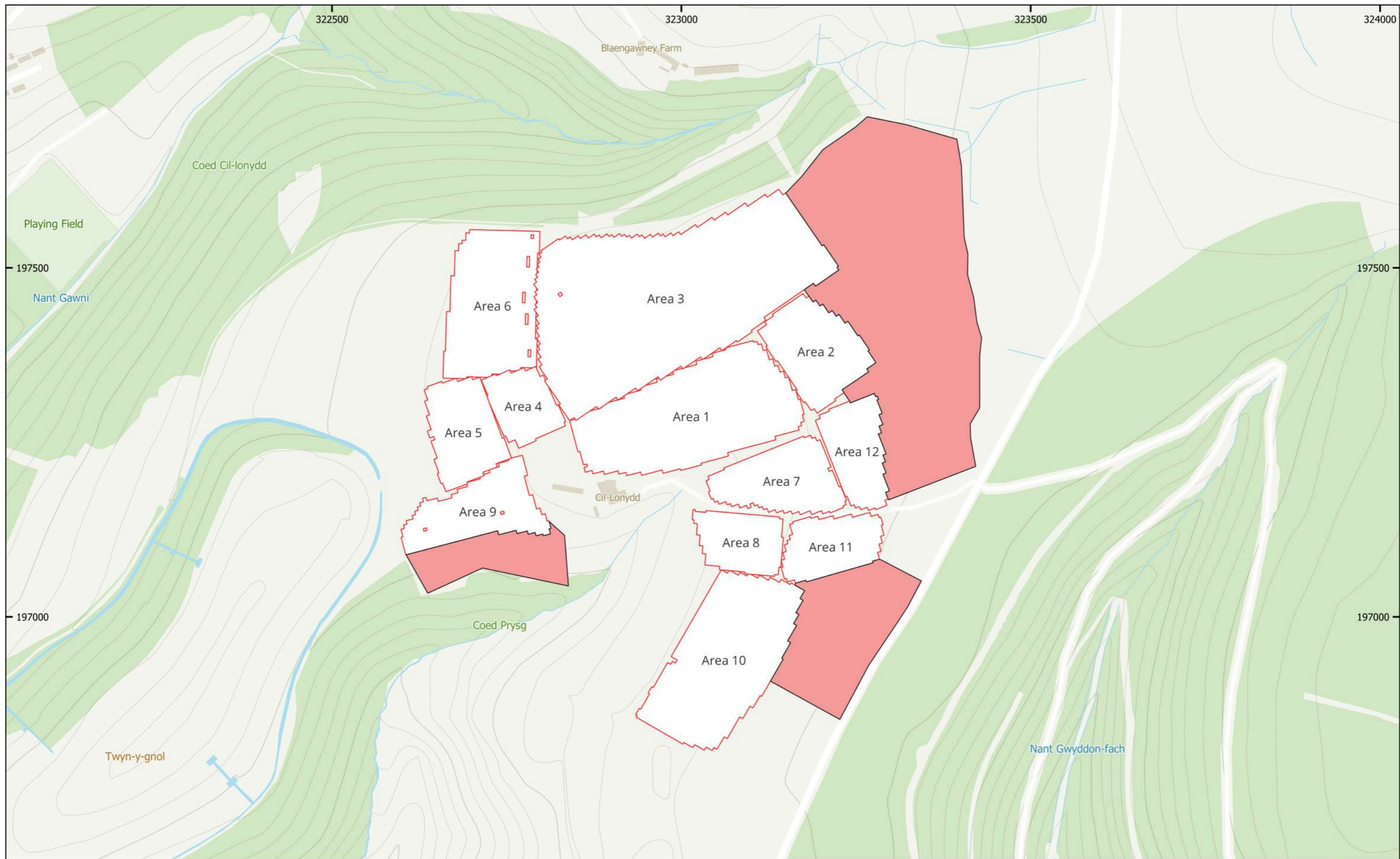
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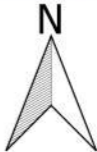
Site Boundary

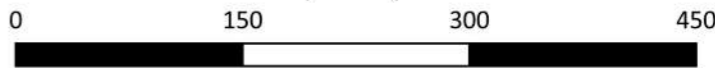





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 Figure 2 - Location of Survey Areas  
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- Survey Extent
- Unable to be Surveyed



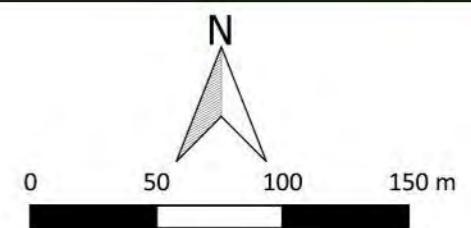
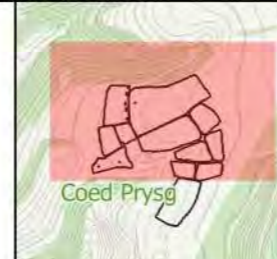
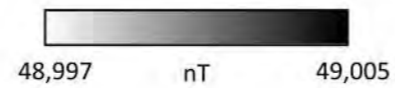




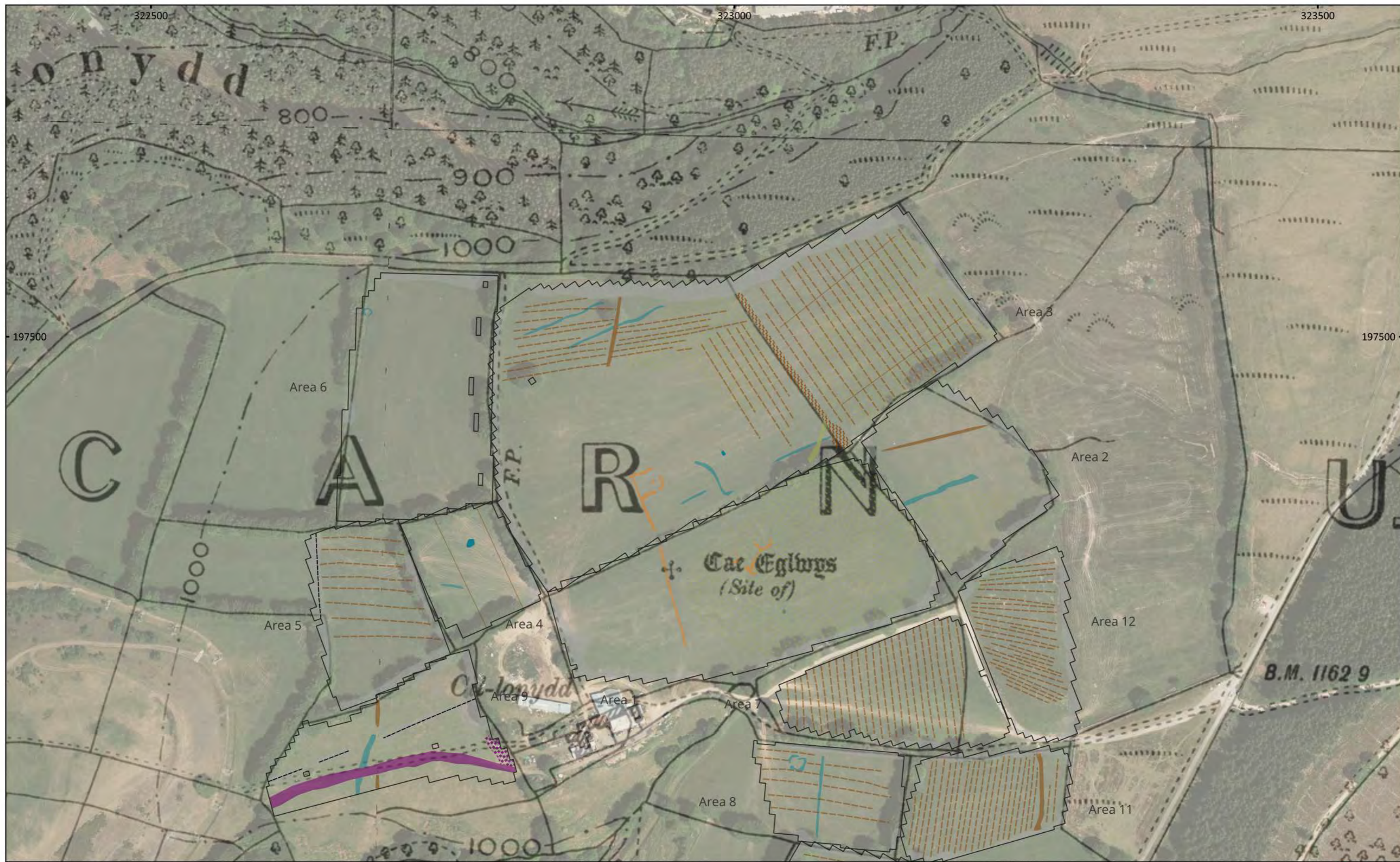
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 Figure 3 - Magnetic Total Field (Lower Sensor) (Overview) (North Areas)  
 1:3,000 @ A3  
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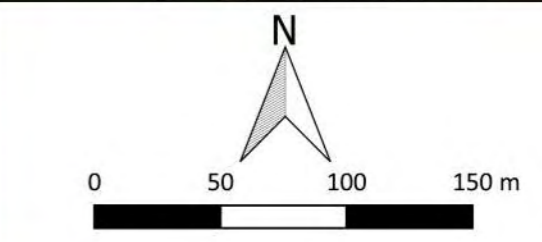


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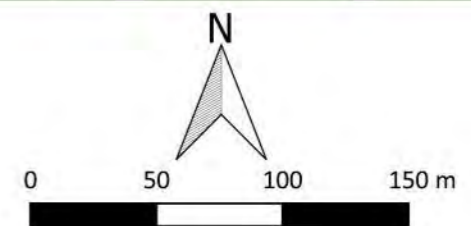
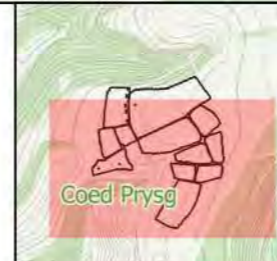
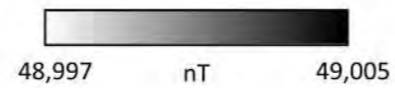
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 Figure 4 - Magnetic Interpretation Over Combined Satellite Imagery and  
 Historic Mapping (Overview) (North Areas)  
 1:3,000 @ A3  
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 edition c. 1882-1913

	Agricultural (Spread)		Natural (Spread)		Industrial/Modern
	Agricultural (Weak)		Natural (Weak)		Agricultural (Trend)
	Archaeology Possible (Weak)		Undetermined (Strong)		Service
	Magnetic Disturbance		Undetermined (Weak)		Ridge and Furrow (Trend)
	Ferrous/Debris (Spread)		Industrial/Modern (Spread)		Ferrous (Spike)

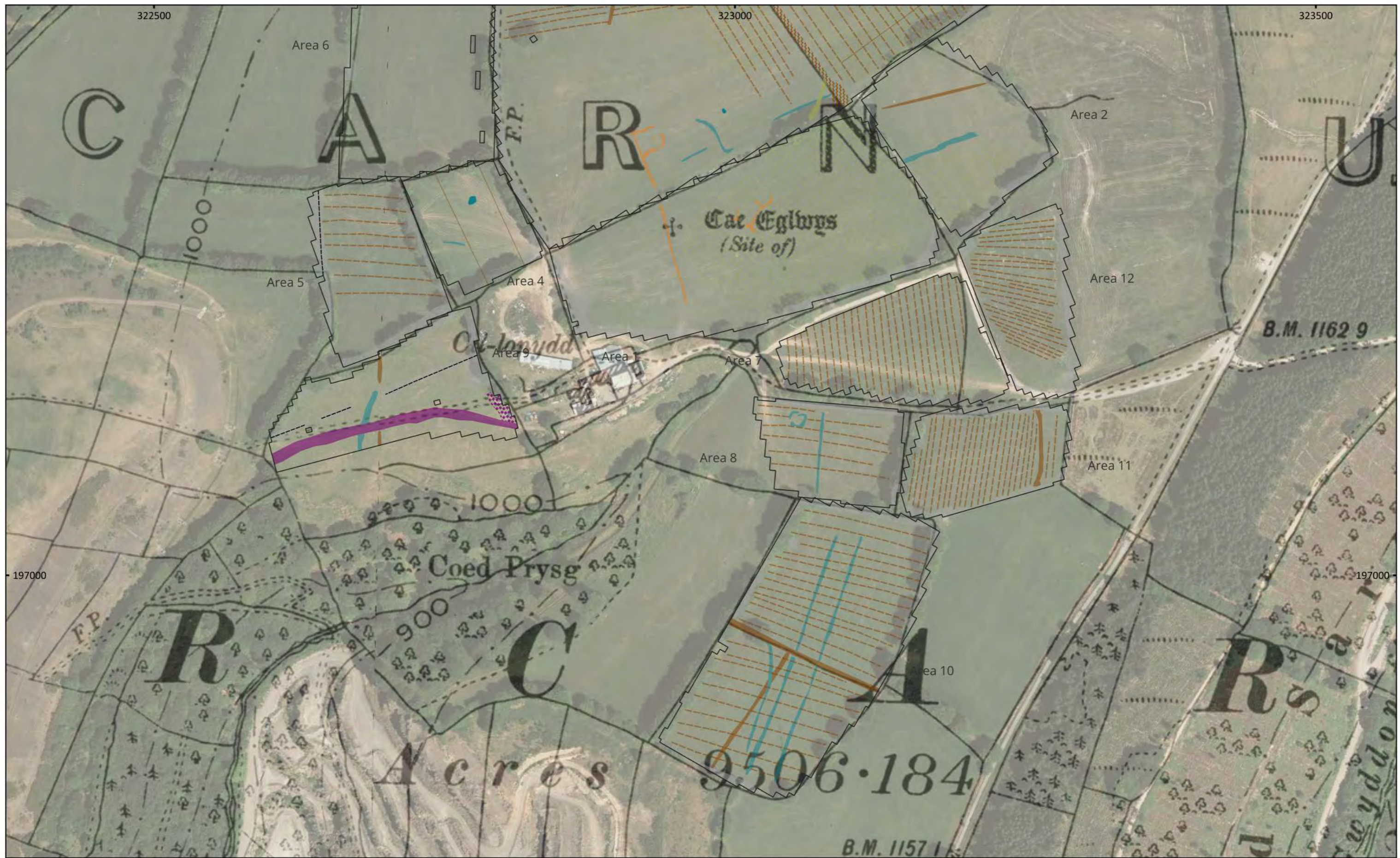




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 Figure 5 - Magnetic Total Field (Lower Sensor) (Overview) (South Areas)  
 1:3,000 @ A3  
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 Figure 6 - Magnetic Interpretation Over Combined Satellite Imagery and Historic Mapping (Overview) (South Areas)  
 1:3,000 @ A3  
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 Contains historical mapping © CLS Data 2024: Ordnance Survey, 6" 2nd edition c. 1882-1913

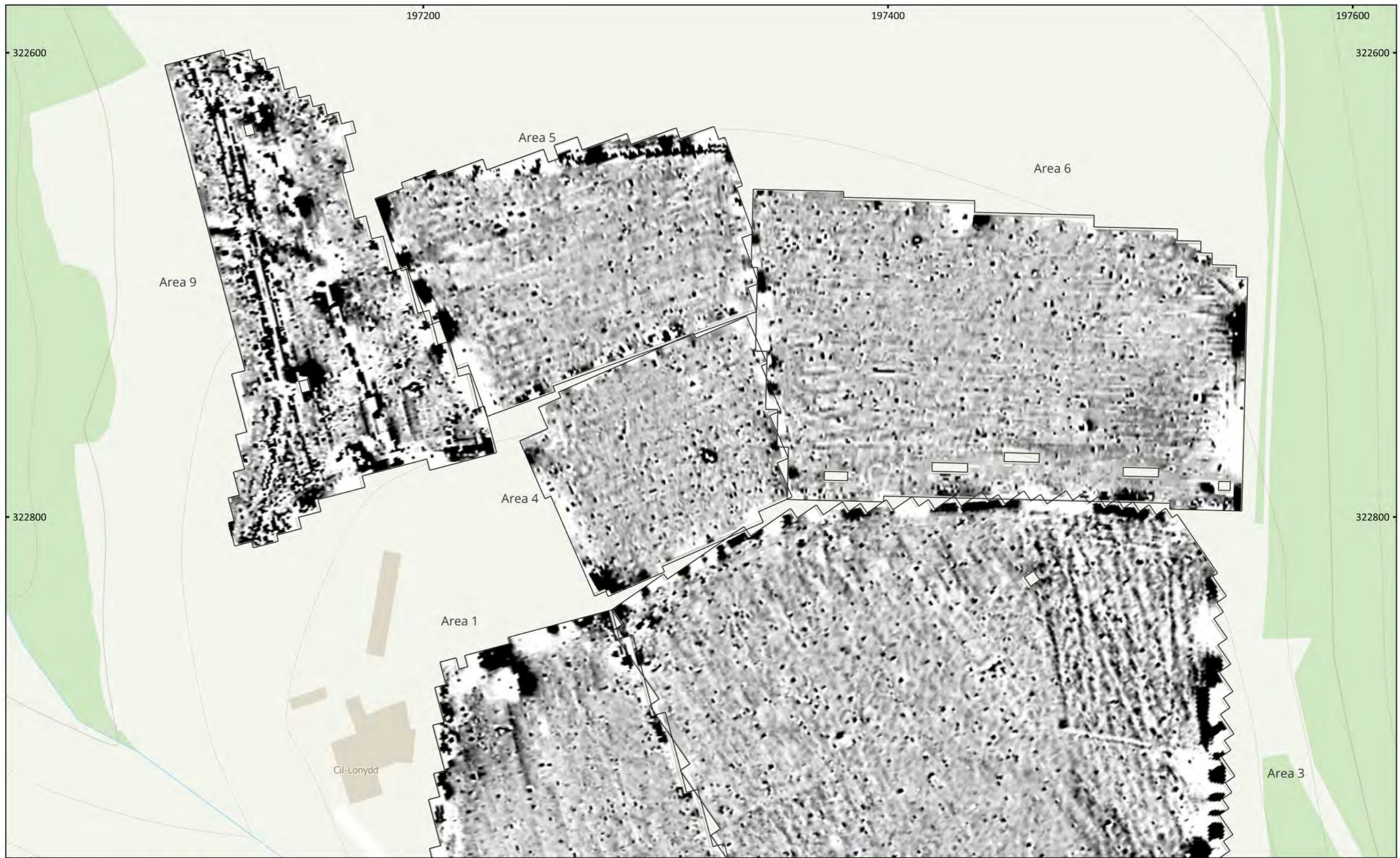
Agricultural (Spread)	Natural (Spread)	Industrial/Modern
Agricultural (Weak)	Natural (Weak)	Agricultural (Trend)
Archaeology Possible (Weak)	Undetermined (Strong)	Service
Magnetic Disturbance	Undetermined (Weak)	Ridge and Furrow (Trend)
Ferrous/Debris (Spread)	Industrial/Modern (Spread)	Ferrous (Spike)

Coed Prysg

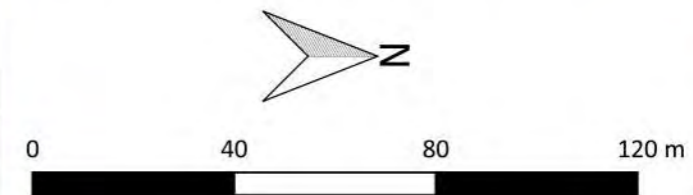
N

0 50 100 150 m

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 Figure 7 - Magnetic Gradient (Areas 1, 3 - 6 & 9)  
 1:1,500 @ A3  
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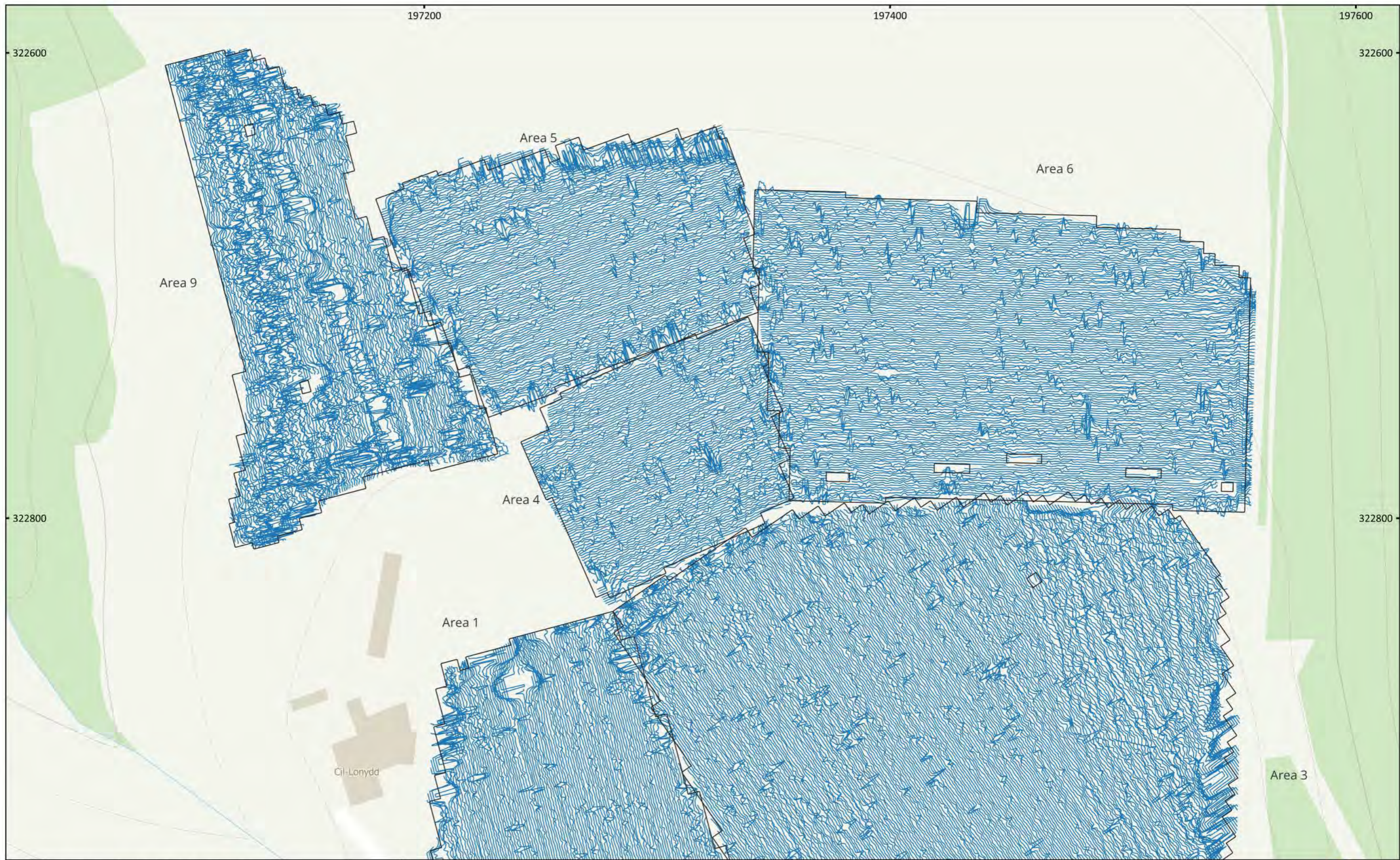
MSST1678: Cyl Lonydd PV Archaeological Survey  
 Figure 8 - Magnetic Interpretation (Areas 1, 3 - 6 & 9)  
 1:1,500 @ A3  
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- |                             |                            |                          |
|-----------------------------|----------------------------|--------------------------|
| Agricultural (Weak)         | Undetermined (Strong)      | Service                  |
| Archaeology Possible (Weak) | Undetermined (Weak)        | Ridge and Furrow (Trend) |
| Magnetic Disturbance        | Industrial/Modern (Spread) | Ferrous (Spike)          |
| Ferrous/Debris (Spread)     | Industrial/Modern          |                          |
| Natural (Spread)            | Agricultural (Trend)       |                          |



0 40 80 120 m

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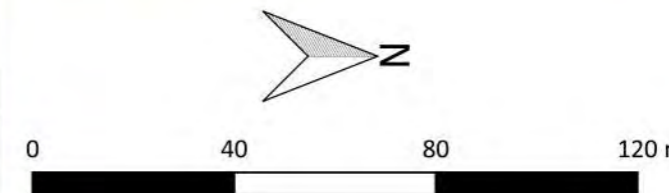
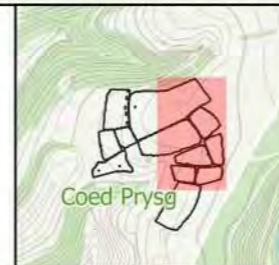


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 Figure 9 - XY Trace Plot (Areas 1, 3 - 6 & 9)  
 30nT/cm at 1:1,500 @ A3  
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 Figure 10 - Magnetic Gradient (Areas 1 - 3, 7, 8, 10 (North) & 11 - 12)  
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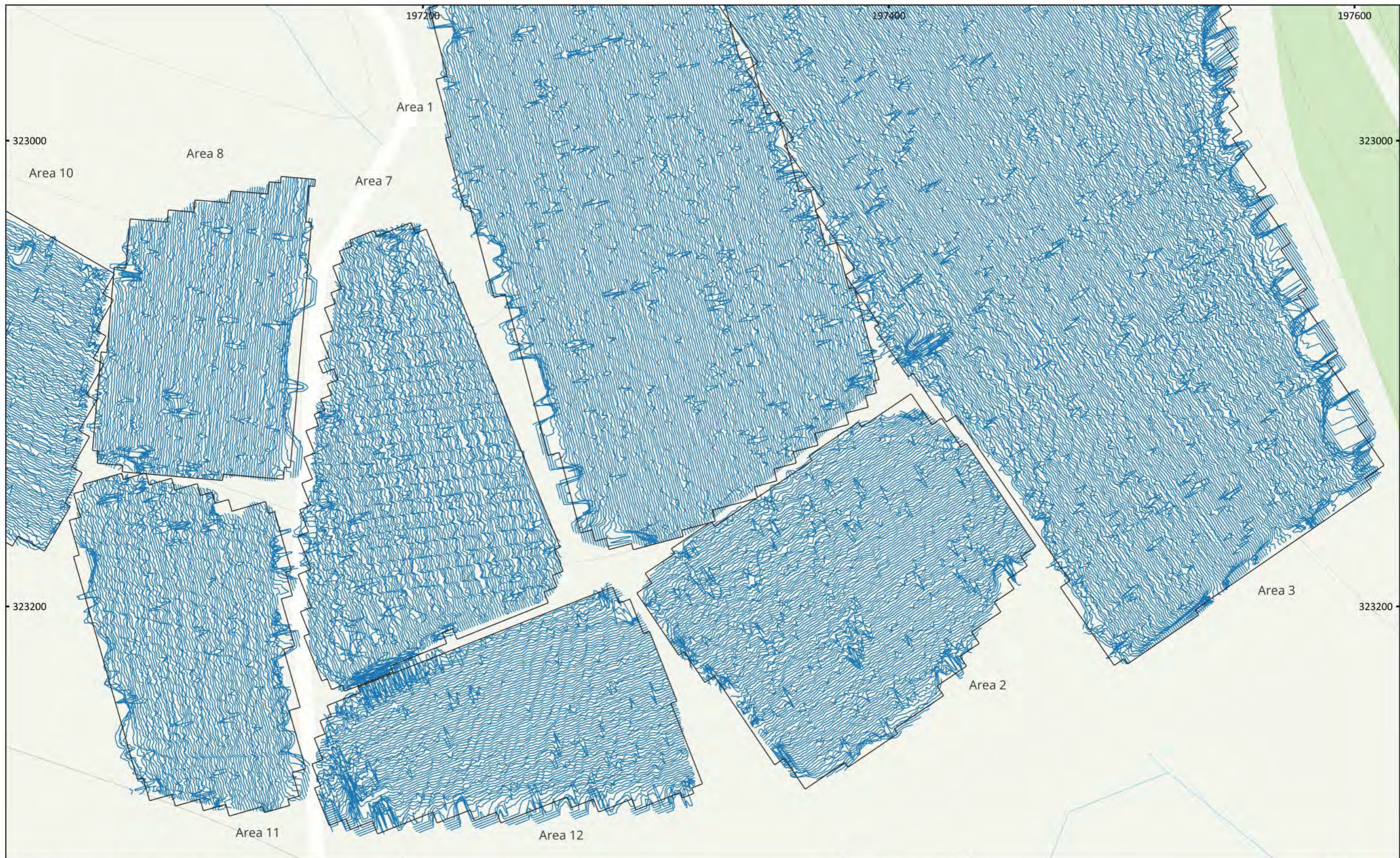


MSST1678: Cyl Lonydd PV Archaeological Survey  
 Figure 11 - Magnetic Interpretation (Areas 1 - 3, 7, 8, 10 (North) & 11 - 12)  
 1:1,500 @ A3  
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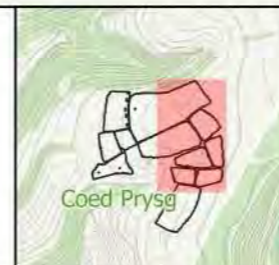
	Agricultural (Spread)		Ferrous/Debris (Spread)		Undetermined (Weak)
	Agricultural (Weak)		Natural (Spread)		Agricultural (Trend)
	Archaeology Possible (Weak)		Natural (Weak)		Ridge and Furrow (Trend)
	Magnetic Disturbance		Undetermined (Strong)		Ferrous (Spike)



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 Figure 12 - XY Trace Plot (Areas 1 - 3, 7, 8, 10 (North) & 11 - 12)  
 30nT/cm at 1:1,500 @ A3  
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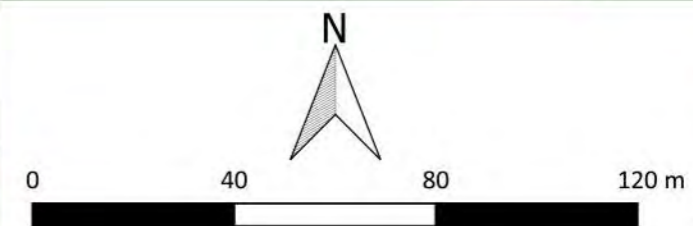
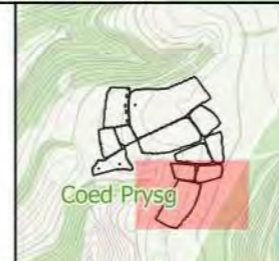


A north arrow pointing upwards, labeled with 'N'. Below it is a scale bar with markings at 0, 40, 80, and 120 meters.

The logo for 'magnitude surveys', featuring a stylized globe icon with red and black dots and the company name in a bold, sans-serif font.



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Figure 13 - Magnetic Gradient (Areas 7, 8, 10 - 12)  
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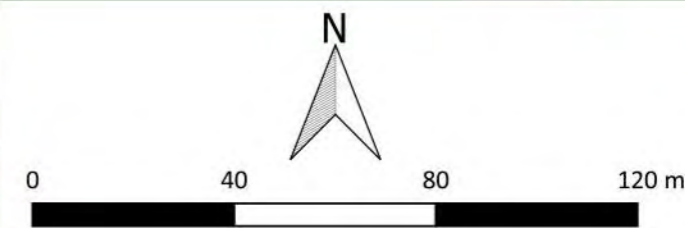
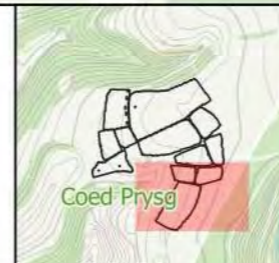


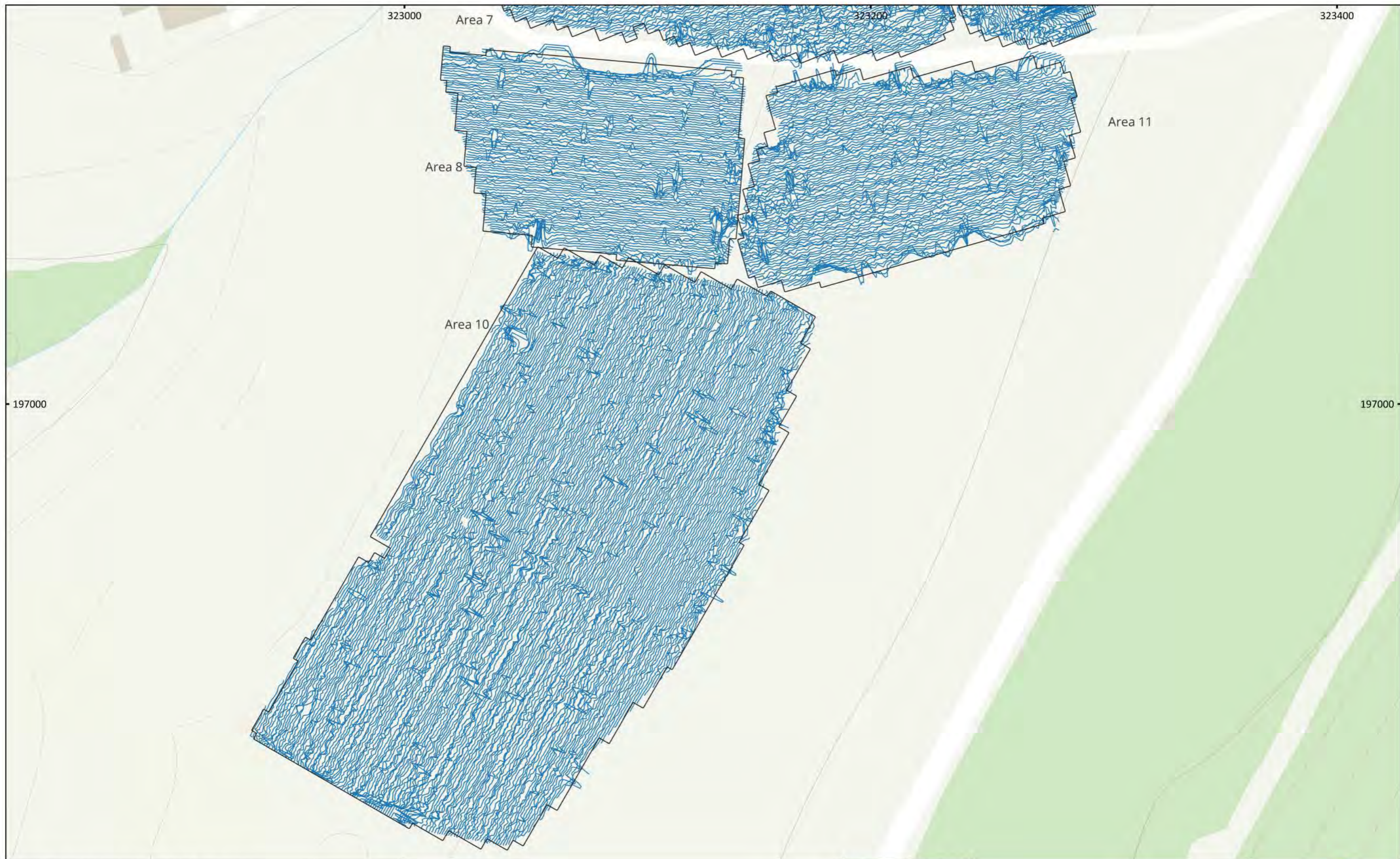




MSST1678: Cyl Lonydd PV Archaeological Survey  
 Figure 14 - Magnetic Interpretation (Areas 7, 8, 10 - 12)  
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- Agricultural (Weak)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Weak)
- Ridge and Furrow (Trend)
- Ferrous (Spike)





MSST1678: Cyl Lonydd PV Archaeological Survey  
Figure 15 - XY Trace Plot (Areas 7, 8, 10 - 12)  
30nT/cm at 1:1,500 @ A3  
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