



Parc Ynni Calon y Gwynt

ENVIRONMENTAL STATEMENT

Appendix 10B: Geoenvironmental Preliminary
Risk Assessment Desk Study



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Assessment Desk Study

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WSP

Canon Court West
Abbey Lawn
Shrewsbury
SY2 5DE

Phone: +44 1743 342 000

WSP.com



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Prepared by	Rachel Williams Lynne Gemmell Stephanie Sleight	Rachel Williams Lynne Gemmell Stephanie Sleight		
Signature				
Checked by	Lauren Boydell Brennig Davis	Lauren Boydell Brennig Davis		
Signature				
Authorised by	Ross Maguire	Ross Maguire		
Signature				
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1 INTRODUCTION

1.1 BACKGROUND

This Geo-environmental Preliminary Risk Assessment (PRA) Desk Study has been prepared by WSP UK Ltd ('WSP') on behalf of Parc Ynni Calon Y Gwynt ('the Applicant') who is submitting an application for a Development of National Significance (DNS) for the proposed Parc Ynni Calon y Gwynt (Calon y Gwynt Energy Park) ('the Proposed Development').

The Proposed Development Site is located at Lluestuchaf, Caersws, to the north of the village of Clatter, in mid Wales, in the Powys County Council (PCC) boundary. The energy park is centred at coordinates easting (E) 300247, northing (N) 298109, approximate post code SY17 5NS, the Proposed Development also includes an access road running south from the energy park to the A470 road. **Figure 10B.1: Site Location** is included in **Annex 10B.1**.

This report refers either to the site in its entirety, or to the 'Energy Park Site', and the 'site access road', as shown on **Figure 10B.1**.

1.2 DEVELOPMENT PLANS

This PRA has been prepared to accompany the Environmental Statement (ES) and DNS application for the Proposed Development. The Proposed Development is an energy park comprising of the following elements:

- Up to 11 three bladed horizontal axis wind turbines, with an anticipated rotor diameter of 163m and height to blade tip of 180 – 200m (approximate generating capacity of up to 80 MW);
- BESS infrastructure and compound;
- Crane pads (hardstandings) and laydown areas adjacent to each wind turbine;
- Power cables linking the wind turbines to the onsite substation, laid in trenches underground, including cable markers, health and safety and other signage;
- New tracks and upgrading of existing access tracks, passing places and turning heads;
- Construction of a new access road from an existing junction of the A470 with the B4568 to facilitate access onto the Proposed Development Site;
- Grid connection infrastructure, including an onsite substation compound, consisting of a 33kV/132kV switching station, transformer area and control building. There will be welfare facilities at the control building however it is not yet known whether these will have a water supply.
- The creation of temporary borrow pits for the extraction of stone (the potential locations within the Proposed Development Site are currently being reviewed); and
- Temporary construction compound(s).

Prior to the main construction phase commencing, enabling works may be necessary, including:

- Geotechnical investigations: excavation of trial pits and/or boreholes.
- Upgrading of existing access point and tracks and construction of new access tracks and passing places inter-linking the turbine locations and substation; this will require import of suitable roadstone.
- Establishment of site compounds.

- There may also be required upgrades to public roads, including road widening to allow abnormal loads to negotiate corners, protection of any below ground services and the temporary removal or resitting of infrastructure. Such activities do not form part of the Proposed Development DNS application and would therefore be subject to separate consent from the local highway authority.

Imported stone may be needed, however, to minimise the volume of stone imported to the site, suitable stone will be sourced from on-site borrow pits, if feasible. The locations of potential borrow pits are currently being investigated as part of a wider assessment.

1.3 ASSESSMENT AIMS AND OBJECTIVES

The aim of this assessment is to support the planning application for the Proposed Development in relation to ground conditions and land contamination. To address the identified aim, the key objectives include:

- Developing a preliminary Conceptual Site Model (CSM) to assess the status of any potential contamination and identify any potentially significant contaminant linkages that require further consideration in line with current guidance including the Land Contamination Risk Management (LCRM) guidance published by the Environment Agency;
- Evaluate likely contaminated land exposure pathways and their potential significance to identified receptors; and
- Identify potential geohazards and produce a geotechnical risk register.

1.4 SCOPE OF WORKS

To meet the aims and objectives identified in **Section 1.3**, the following scope of works has been undertaken for this PRA:

- A targeted walkover of the Energy Park Site was completed between 21 and 24 April 2026.
- Purchase and review of a Groundsure Insight report.
- Review of historical maps and plans to understand former land uses and potential contaminative activities on, and surrounding, the Proposed Development Site.
- Review of relevant regulatory databases.
- Review of information provided by relevant regulators (Natural Resources Wales, Powys County Council).
- Review of relevant publicly available information relating to hydrological features, hydrogeology, neighbouring land use, ecologically sensitive uses and geology, to establish the environmental setting of the Proposed Development Site.
- Development of a preliminary conceptual site model using the source-pathway-receptor contaminant linkage approach.
- Assessment of the environmental risks associated with the ground, groundwater and ground gas conditions at the Proposed Development Site, in the context of the proposed future use of the Proposed Development Site.
- Provide a Geotechnical Risk Register (GRR).

1.5 LEGISLATIVE CONTEXT

The assessment was undertaken in the legislative context of:

- Part 2A of The Environmental Protection Act 1990 (UK Government, 1990).¹
- Planning Policy Wales Edition 12 (Welsh Government, 2024)².

The PRA has been produced in general accordance with the following industry and statutory guidance for land contamination assessment:

- Land Contamination Risk Management (LCRM) (Environment Agency, 2025)³.
- Contaminated land statutory guidance (Department for Environment, Food & Rural Affairs, 2012)⁴.
- Guidance for the Safe Development of Housing on Land Affected by Contamination (National House Building Council (NHBC), Environment Agency, Chartered Institute of Environmental Health (CIEH), 2008)⁵.
- Development of Land Affected by Contamination: A Guide for Developers (Natural Resources Wales (NRW), 2023).⁶

1.6 UNDERSTANDING RISK

It is important to understand that any risks identified during a preliminary assessment, such as those presented in this document, are perceived risks based on the information reviewed. A more detailed assessment of the actual risks can only be assessed following further intrusive investigations.

The preliminary assessments presented herein are qualitative based on professional judgements following the review of available data and within the context of the existing/proposed use. Those risk categories presented (very low, low, moderate/low, moderate, high and very high) follow guidance presented in Guidance for the Safe Development of Housing on Land Affected by Contamination. The guidance states that the classification of risk should be based on an understanding of both the magnitude of probability (i.e. likelihood) of a risk occurring and the magnitude of the potential consequence (i.e., severity) of a risk.

¹ UK Government (1990) Environmental Protection Act 1990. (Online). Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>. Accessed: 9 June 2026.

² Welsh Government (2024) Planning Policy Wales, Edition 12 | February 2024. (Online). Available at: <https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf>. Accessed: 9 June 2026.

³ Environment Agency (2025) Guidance: Land contamination risk management (LCRM). (Online). Available at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>. Accessed: 9 June 2026.

⁴ Welsh Government (2024) Planning Policy Wales, Edition 12 | February 2024. (Online). Available at: <https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf>. Accessed: 9 June 2026.

⁵ National House Building Council (NHBC), Environment Agency, Chartered Institute of Environmental Health (CIEH) (2008) Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D Publication 66:2008, Volume 1. (Online). Available at: <https://webarchive.nationalarchives.gov.uk/ukgwa/20140328111055/http://www.environment-agency.gov.uk/static/documents/Leisure/SR-DPUB66-e-e.pdf>. Accessed: 9 June 2026.

⁶ National Resources Wales (NRW) (2023) Development of Land Affected by Contamination: A Guide for Developers. (Online). Available at: <https://claire.co.uk/phocadownload/Development%20of%20Land%20Affected%20by%20Contamination%20Developers%20Guide%202023.pdf?%20download=960:developmentoflandaffectedbycontaminationdevelopersguidewlganrwndwelshgovernmentv4september2023>. Accessed: 9 June 2026.

1.7 COMMERCIAL LIMITATIONS

This report is addressed to and may be relied upon by the Applicant. The report may not be relied upon or transferred to any other parties without the express written authorisation of WSP. This report should be read in full. No responsibility will be accepted where this report is used, either in its entirety or in part by any other party.

Third party information used in the production of this report has been taken in good faith as being accurate. WSP cannot and will not accept any liability for errors and/or omissions in data provided by others and WSP cannot warrant the work of others.

General limitations of the assessment are included in **Annex 10B.2**.

2 SITE INFORMATION AND ENVIRONMENTAL SETTING

2.1 INTRODUCTION

This section is informed by information sources detailed below.

- Groundsure Insight report dated 13 March 2026 (Ref. WSP-G6Z-YIV-SZC-JAF), included as **Annex 10B.3**.
- Recent aerial and 'street view' photography available to view on Google Earth pro.
- A site walkover completed by WSP between 21 and 24 April 2026.
- Information available to view on DataMap Wales (<https://datamap.gov.wales/>), including OS mapping and various environmental information.

The report contains British Geological Survey materials ©NERC 2026 and ©Natural Resources Wales database right.

The Proposed Development Site layout is shown on **Figures 10B.2** and **10B.3** in **Annex 10B.1**. Site walkover photos are presented in **Annex 10B.4** of this report. For the purposes of this report, the site is discussed in two parts: 'the Energy Park Site' and the 'site access road'. Where 'the site' is referred to, the comment relates to both areas.

2.2 SITE DETAILS

Table 10B-1 - Site and Surrounding Area Details

Item	Details
Site location	The Proposed Development Site is situated within the administrative area of Powys, in mid Wales. The Energy Park Site is located on hills to the north of the A470 trunk road, approximately 2.7km north of the village of Clatter, 3.5km northeast of the village of Carno, 3.5km north of the village of Pontdolgoch and 12km northwest of the town of Newtown. Its approximate post code is SY17 5NS. The Proposed Development Site access road runs generally southwards from the energy park to reach the A470 to the southeast of Pontdolgoch at an existing junction with the B4568. The Proposed Development Site is located within the local authority area of Powys County Council (PCC).
Grid reference	The central grid reference for the Energy Park Site is: 300247, 298109. The Proposed Development Site access road runs approximately between:301168, 297373 (north) and 301438, 293450 (south).
Land use(s) on the Proposed Development Site	<u>Energy Park Site:</u> The Energy Park Site and surrounding area is largely comprised of agricultural pasture used for livestock grazing, interspersed by hedgerows, existing access roads and pockets of woodland throughout. The agricultural land is typically of poor or very poor quality, based on Agricultural Land Classification of Grade 4 or 5. The Afon Carno is a Main River located approximately 2km to the south. There are two ordinary watercourses within the Energy Park Site, namely the Nant y Llyn Mawr and Nant Cwmgerwyn. A large farm shed is present in the northeast, and access tracks run though the site, including from west to east through the north of the Energy Park Site and from north to south in the southeast. Llyn Mawr Site of Special Scientific Interest (SSSI) is located partly within the southern extent of the Proposed Development Site. The 20.1ha SSSI consists of an

Item	Details				
	upland lake and associated wetland supporting habitat. The designated site is of ornithological importance and is extensively used by waterfowl. The immediate catchment of the lake within the designated site includes some bracken slopes, areas of gorse scrub, acid grassland, wet heath and mesotrophic marshland habitat. In summer typical species are mallard, tufted duck and goosander, whilst in winter species include whooper swan. The surrounding area is also used by wintering Greenland white-fronted geese. There are several scheduled monuments located within the central and north-western extents of the Energy Park Site. These largely comprise cairns of varying sizes and stone rows dating from the Bronze Age. There are a small number of isolated dwellings in proximity to the Proposed Development Site, the closest is located immediately south, approximately 200m north of Llyn Mawr Nature Reserve. <u>Site access road:</u> The Proposed Development Site access road currently comprises a combination of existing minor roads and farm tracks as well as sections of open farmland. The new access road intersects a number of unnamed ordinary watercourses and tributaries of the Afon Carno.				
Site boundaries and surrounding land uses		North	East	South	West
	Energy Park Site	Agricultural land (pasture),	Agricultural land (pasture), access road	Agricultural land (pasture), Llyn-Mawr Farm, access road	Agricultural land (pasture), access roads, active residential dwellings 200m from northwest corner of Energy Park Site, old quarry 180m northwest.
	Site access road	Agricultural land (Energy Park Site)	Agricultural land, forestry.	Pontdolgoch, A489 to the southwest, Afon Carno approximately 200m south	Afon Carno, agricultural land. Railway line 250m west.
Site walkover observations	The Energy Park Site and the onsite agricultural shed are used for sheep farming. Photographs from the site walkover referenced below are included as Annex 10B.4. Buildings and structures on the Energy Park Site are limited, these include a large agricultural shed (still in use for activities such as sheep shearing) in the northeast (see Photo 1), and a derelict house and a static caravan in the central area at Llustuchaf (see Photos 6 and 7). A cairn and rock outcrops are present by a trig point in the south-central area of the Energy Park Site (see Photo 8). Aerial photography (Google Earth Pro) was reviewed in advance of the site walkover and areas of what appeared to be disturbed ground were targeted. Some small quarries were noted and observations from the walkover are below.				

Item	Details
	An onsite quarry in the west of the Energy Park Site was being used for silage storage (see Photo 9), as was an old quarry in the central area, northwest of Lluestuchaf. Two small former quarries were noted in the north central area, west of a larger quarry feature by Y Glonc. A raised cylindrical concrete access chamber (possibly utility related but this is unconfirmed) was present in the southeast of the Energy Park Site and nearby some tipped mainly organic material (soil, stone, and chipped vegetation) was noted (see Photos 14 and 15). The tipped material may relate to excavation for the chamber, but this is unconfirmed. This area corresponds to the location of a recorded on-site pollution incident in 2014, as detailed in Table 2-3. No impact to land was noted in 2014 and the material observed during the walkover appears to be soil/ vegetation/ stone. A watercourse present on the Energy Park Site connects to the Llyn Mawr Site of Special Scientific Interest, which is an upland lake with associated wetland habitat (see further information in Table 2-1). The watercourse (the Nant y Llyn Mawr) was observed during the walkover to be flowing very slowly. The lake is offsite however the SSSI boundary is partly onsite (see Figure 10B.2 in Annex 10B.1). Some storage of materials was noted in an offsite quarry, this comprised some tipped wood, including pallets but mainly rock and felled trees/ branches, also some limited metal, in the quarry ~185m northwest of the Energy Park Site (see Photos 2 and 3). A partly submerged plastic tank (unknown contents – likely to be agricultural in nature, possibly water, fertilizer, or feed, but had no labelling) is located ~35m north of the Energy Park Site at its northwestern corner (Photos 4 and 5). The tank is in a grassed area offsite to the north of the Energy Park Site. The tank looks relatively new with no evidence of spillage of the contents around it. The tank is upgradient of an offsite residential property at Blaen y Cwm and may be related to this property and/ or to farming activity. Based on its location, the absence of warning signage, and the tank being partially buried, it is assumed not to be a fuel tank.

Table 10B-2 - Site Environmental Setting

Item	Details
Ground surface	Energy Park Site The area of the Proposed Development Site is largely covered by grass and used for sheep grazing with rock outcrops and cairns within the south-central site area. Farm tracks are present across the Energy Park Site which are typically formed from compacted soils and gravel. Access tracks extending into the site from the west, east and south are formed from compacted gravel, see Photo 4 and 5 in Annex 10B.4. Site Access Road The Proposed Development Site surface comprises some existing minor roads surfaced in tarmacadam and gravel and areas of grassed agricultural land.
Geology:	
Artificial ground/ made ground	BGS 1:10,000 scale geology mapping is available for the site. This shows no artificial or made ground on the site or within 250m of it. Localised made ground may be present at former quarries/ pits and also where buildings, roads, or tracks are present.

Item	Details
Superficial deposits	Energy Park Site The 1:10,000 superficial geology map shows most of the western Energy Park Site to comprise weathered bedrock at the surface or shallow depths, where superficial soils have not been mapped. In these areas, unmapped superficial soils may be present however are likely of limited thickness and distribution. Glacial Till (diamicton) is mapped in the east of the Energy Park Site with localised areas of Glacial Till deposits present in the west and south of the Energy Park Site. Localised areas of Peat deposits are mapped in the north, west, central and southern areas of the Energy Park Site, and at its southeastern edge. Two localised areas of Head deposits (diamicton – gravel, sand and silt) occur in the northeast and west of the Energy Park Site. Site access road In most of the north section the 1:10,000 superficial geology map indicates no superficial deposits to be mapped, where bedrock is likely at the surface or shallow depths. However, the north section of the Site Access Road partly intercepts the edge of three mapped areas of Peat at approximate grid coordinates 301198, 297023 (shown partly below an existing road), 3001152, 296871, and 301159, 295872 (also partly below existing road), and localised till at 301254, 296455, and, below the existing road, at 301241, 296211. The central and south section is mapped as underlain by Glacial Till, except at the southern extent where the site access road intersects a large area of Alluvial Fan deposits (sand and gravel), which also extend southeast beyond the site. These deposits occur east of an area of Alluvium, shown along the course of the River Carno (Afon Carno).
Bedrock	Energy Park Site According to the 1:10,000 scale BGS map, bedrock beneath most of the Energy Park Site is the <i>Penstrowed Grits Formation</i> sandstone and mudstone (mudstones with greywacke sandstones, medium- to coarse-grained in thick beds). At the site's western edge, there is a geological boundary and bedrock changes to the <i>Nant-Ysgollon Mudstone Formation</i> (mudstones). The geology map shows several inferred faults occurring on the site (displacement unknown), and the axial plane trace of a major syncline (indicating geological folding). The faults are in the north of the Energy Park Site – at its northern boundary on a roughly west to northeast axis, and three run roughly south south-eastwards from this fault, in the northeast of the Energy Park Site. The axial plane runs northeast to southwest through the southeast of the Energy Park Site. Site Access road The north and central areas of the access route is mapped as underlain by the <i>Penstrowed Grits Formation</i> sandstone and mudstone, south of this is the <i>Nant-Ysgollon Mudstone Formation</i>, then the <i>Dolgau Mudstones Formation</i> (mudstone – described as grey, green and locally purple mudstones, with local burrow mottling). The southern central area is mapped as underlain by the <i>Glanyrafon Formation (Upper Tongue)</i> (interbedded mudstone and sandstone), and the southern extent is underlain by the <i>Caerau Mudstones Formation</i> (mudstone - turbidite mudstones). The access route intersects four geological faults at approximate grid coordinates 3001235, 296683 at the existing road, 301163, 295872 at the existing road (east of Bwlch y Garreg), 300938, 294747 east of Llwycoed, and at 301288, 293788 (east of Pontdolgoch).

Item	Details
BGS borehole records	There are no BGS borehole records available on the site. There is one borehole record available within 250m of the site (SO09NW2). This is 227m south of the southern end of the access route ⁷ , at grid coordinates 301490, 293200 and relates to several wells and trial holes 'in the Parc area' (see scan in Annex 10B.7). A trial hole record at Parcpennrys, 'near brook', records clay-bound gravel to 3.05m turning to clay below, with groundwater at 1.83m. A pumping test at the trial hole was recorded as follows: 'yield is erratic, fluctuating with the level of the brook which almost dries up at times'. Various brick wells are recorded at farms, typically at depths of between 2.44m and 8.84m depth, a deeper brick well of 25.6m depth is recorded as being abandoned due to low yield.
Mining and mineral extraction	The Proposed Development Site does not lie within a <i>coal mining reporting area</i> as defined by the Mining Remediation Authority (MRA). Sandstone, sand and gravel were extracted on and around the site from surface mine pits. One was located in the south of the northern section of the Energy Park Site. Additional surface mine pits are recorded to the east and west of both the Energy Park Site and the Site Access Road, ranging from 250m to >1km from the Proposed Development Site. The Groundsure Report (presented with Annex 10B.3) states that The Proposed Development Site is in an area where localised small scale underground mining non-coal minerals is likely to have occurred. The Groundsure report also identified three areas of recorded underground mining in a vein mineral are located directly south of the Energy Park Site.
Natural ground hazards	The risk to the site from natural ground hazards are summarised below: ■ Shrink swell clays – negligible to very low risk. ■ Running sands – negligible to very low risk. ■ Compressible deposits – negligible risk across the majority of the site, small pockets of high risk across the site, coinciding with areas of peat on site. ■ Collapsible deposits – negligible to very low risk. ■ Landslides – very low risk across most of the site, small pockets of moderate to high risk across the site, coinciding with areas of peat on site.
Hydrogeology:	
Superficial aquifer	Superficial aquifer mapping included in the Groundsure report (Annex 10B.3) shows that: ■ The till deposits on the Energy Park Site and more extensively in the south of the access route, and localised head deposits, are classed as a secondary (undifferentiated) aquifer. ■ The peat deposits on the site are shown as unproductive. ■ The alluvial fan deposits (sand and gravel) at the southern end of the access route are classed as a secondary A aquifer – these are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These meet alluvium further west, also a secondary A aquifer. Information in BGS borehole records, included above, indicates that shallow groundwater presence in the alluvial fan deposits is in continuity with local surface watercourses.

⁷ BGS (2026) Borehole record: BGS ID: 20782168, BGS Reference: SO09SW62, Available at: <https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/20782168>.

Item	Details
Bedrock aquifer	Bedrock aquifer mapping in the Groundsure report (Annex 10B.3) shows the mudstone across most of the Proposed Development Site is classed as a secondary B aquifer – these are predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. In the north of the Energy Park Site the aquifer classification is shown as secondary (undifferentiated) – this indicates that it has not been possible to attribute either category A or B to a rock type. In general, these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type. The Glanyrafon Formation (Upper Tongue) (interbedded mudstone and sandstone), encountered in a small area in the south of the access route is a secondary A aquifer – these are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Groundwater vulnerability	Onsite, the Groundsure report (Annex 10B.3) records groundwater vulnerability as generally medium on the Energy Park Site, and generally high or medium-high on the access route.
Groundwater quality	The Groundsure report (Annex 10B.3) indicates the Water Framework Directive (WFD) Groundwater body as belong to the Severn Uplands – Lower Paleozoic, classified as having an overall rating of 'Poor' in 2017.
Groundwater abstractions	The Groundsure report records one groundwater abstraction 226m south of the access route, for general farming and domestic use, and this listed as having 'historical' status
Source Protection Zones (SPZs)	The Proposed Development Site is not within a groundwater Source Protection Zone (SPZ) and there are no SPZs within 500m.
Groundwater flooding	The Groundsure report (Annex 10B.3) records the highest risk of groundwater flooding on site and within 50 m to be 'Low' based on a 1 in 100-year return period.
Hydrology:	
Surface water	Energy Park Site: Two ordinary watercourses are noted within the Energy Park Site, Nant y Llyn Mawr within the central to northeast area, and Nant Cwmgerwyn within the western site area. The Llyn Mawr upland lake is located approximately 85m south of the Proposed Development Site and is connected to the Nant y Llyn Mawr. A second upland lake Llyn Du is approximately 195m south of the Energy Park Site. Site Access Road: The Afon Carno is a main river located approximately 175m southwest of the Proposed Development Site Access Road and approximately 2km south of the Energy Park Site. The Nant yr Amros is intersected by the Access Road south of its central area. A number of unnamed ordinary watercourses and tributaries of the Afon Carno are also noted within the Proposed Development Site Access Road.
Surface water quality	No water quality information is available for Nant y Llyn Mawr and Nan Cwmgerwyn located within the Energy Park Site. The Groundsure report (Annex 10B.3) notes the Afon Carno, last assessed in 2016, to have an overall status of Moderate, chemical rating of Good, and ecological rating of Good.

Item	Details
Surface water abstractions	The Groundsure report (Annex 10B.3) records no surface water abstractions on the site or within 2km of it.
Surface water flooding	The Groundsure report (Annex 10B.3) records that the Proposed Development Site is not affected by surface water flooding, with the exception of a small area in the south of the Proposed Development Site access road which has a 1 in 30 year chance of flooding greater than 1.0m.

Table 10B-3 - Anticipated Geology at Proposed Development Locations

Proposed Turbine Location	Anticipated Superficial Geology	Anticipated Bedrock Geology
T1	No mapped superficial deposits	Sandstone and Mudstone of the Penstrowed Grits Formation
T2	Glacial Till of clay, silt, sand and gravel	
T3	Glacial Till of clay, silt, sand and gravel in the west, unmapped in the east	
T4	No mapped superficial deposits	
T5	No mapped superficial deposits	
T6	No mapped superficial deposits, Peat mapped directly to the west	
T7	No mapped superficial deposits	
T8	No mapped superficial deposits	
T9	No mapped superficial deposits	
T10	No mapped superficial deposits	
T11	Glacial Till of clay, silt, sand and gravel	
Site Access Road	Northern half of the Site Access Road: - Predominantly no mapped superficial deposits with small pockets of Glacial Till and Peat Southern half of the access track: - Glacial Till up to the area where the access track bends towards the existing roads - Alluvial Fan deposits of sand and gravel in the southernmost extent, where the access track meets the existing roads	Northern two thirds of the Site Access Road: - Sandstone and Mudstone of the Penstrowed Grits Formation. Southern third, sequence from north to south: - Mudstone of the Nant-Ysgollon Mudstone Formation - Mudstone of the Dolgau Mudstone Formation - Mudstone of the Nant-Ysgollon Mudstone Formation - Mudstone of the Dolgau Mudstone Formation

Proposed Turbine Location	Anticipated Superficial Geology	Anticipated Bedrock Geology
		■ Mudstone, siltstone and sandstone of the Dolhir Formation ■ Mudstone of the Cerau Mudstone Formation

2.3 REGULATORY DATABASE INFORMATION

This section summarises information from the Groundsure report (**Annex 10B.3**). The search was undertaken for 500m buffer around the Proposed Development Site.

Table 10B-4 - Summary of Regulatory Database Information

Item	Location and Distance from the Proposed Development Site and Date(s)	Additional Comment
Sites determined as Contaminated Land:	None	None
Licensed industrial activities: ■ Environmental Permit – Part A(1), ■ Environmental Permit – Part A(2) B), ■ Integrated Pollution Control (IPC), ■ Control of Major Accident Hazards (COMAH)	None	None
Radioactive Substance Authorisations:	None	None
Historical industrial land uses:	On site – an unspecified quarry dating from 1991 is recorded in the northeast of the Energy Park Site	None
Licensed discharges to controlled waters:	484m SW of the Site Access Road at Erwgoch, Pontdolgoch, Caersws – sewage (final treated effluent) discharge to an unnamed tributary of the Afon Carno	Issued 2023, appears to be active
	484m SW of the Site Access Road at Cefn y Wern, Pontdolgoch, Caersws – sewage (final treated effluent) discharge to an unnamed tributary of the Afon Carno	Issued 1993, appears to be active

Item	Location and Distance from the Proposed Development Site and Date(s)	Additional Comment
Recorded pollution incidents impacting land or water:	On site – in southeast of the Energy Park Site, in January 2014, related to general biodegradable materials and wastes and compostable material, land impact recorded as Category 4 (no impact).	No land impact recorded. Some tipped material – appears to be soil, stone, and vegetation – is present at ground surface at this area (see photos 14 and 15 and Annex 10B.4) and may be related to this incident.
	13m N of the access road (near its southern end) – in March 2010, relates to contaminated water (firefighting run-off), land impact Category 2 (significant), water impact Category 3 (minor).	No further details are provided on the contaminants or extent of the contamination. The location of the incident is to the north of Henblas farm (now a solar farm in a field). Given the location and absence of recorded bulk fuel storage points, it is unlikely that Aqueous Film-Forming Foam (AFFF) containing per- and polyfluoroalkyl substances (PFAS) would have been used by the fire service. Potential for PFAS contamination arising from this incident is therefore not considered further in this report. As the land has been developed as a solar farm it is assumed that contamination is not present at levels posing a significant risk to human health or the environment and this incident is not considered further in the risk assessment.
	368m W of the access road (near its southern end) – in June 2003, relates to general biodegradable materials and wastes and other general biodegradable material or waste, land impact recorded as Category 4 (no impact), water impact Category 3 (minor).	No land impact and not considered further.
Recorded pollution incidents impacting land or water:	401m W of the access road (near its southern end) – in August 2001, general biodegradable materials and wastes and natural organic material, land impact recorded as Category 4 (no impact), water impact Category 3 (minor).	No land impact and not considered further.

Table 10B-5 - Summary of Regulatory Database Information on Landfills and other Waste Sites

Item	Location and Distance from the Proposed Development Site and Date(s)	Additional comment
Active or recent landfill	None	None
Historical landfill (BGS records)	None	None
Historical landfill (local authority records)	None	None
Historical landfill (NRW records)	None	None
Historical waste sites	None	None
Licensed waste sites	None	None
Waste exemptions	93m W of the access road at its southern end at Henblas, Pontdolgoch, Caersws – various including use of waste in construction, spreading waste on agricultural land, deposit of agricultural waste consisting of plant tissue, and burning waste in the open	Waste activities noted (likely to be associated with farming) in surrounding area that could impact land quality (low level – localised or diffuse contamination).
	175m E of the access road at its northern end at Wm Astley & Son, Llyn Mawr, Pontdolgoch, Caersws – various including use of waste in construction, aerobic composting, deposit of waste from dredging of inland waters, cleaning, washing, spraying or coating relevant waste, treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising, burning waste in the open	Waste activities noted in surrounding area (likely to be associated with farming) that could impact land quality – including deposition of dredging waste and burning waste in the open (low level – localised or diffuse contamination).
	186m W of the access road at its northern end at S. L. Orice & Co, Lluest, Llanwnnog, Caersws – various including treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising, and burning of waste as a fuel in a small appliance	None
	476m W of the access road at its northern end at Plasaudon Farm, Clatter, Caersws – various including use of waste in construction, deposit of waste from dredging of inland waters,	Waste activities noted at farm in surrounding area that could impact land quality (low level –

Item	Location and Distance from the Proposed Development Site and Date(s)	Additional comment
	treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising, spreading waste on agricultural land, burning waste in the open	localised or diffuse contamination).

2.4 LOCAL AUTHORITY ENVIRONMENTAL INFORMATION

A request for relevant environmental information and Petroleum Officer information has been made to PCC. This is awaited at the time of writing and will be incorporated to an updated version of the PRA for the Final Environmental Statement for the Proposed Development once available.

PCC was also contacted to confirm whether any private water supplies are present in the study area, however this is also awaited at time of writing.

2.5 MINING/ MINERAL EXTRACTION

The MRA does not record the Proposed Development Site to be within a coal mining reporting area and identifies no risk from historic coal mining.

Sandstone, sand and gravel were extracted on and around the Proposed Development Site in surface mine pits. One was located in the south of the northern section of the Energy Park Site. Additional surface mine pits are recorded to the east and west of both the Energy Park Site and the access route, ranging from 250m to >1km from the Proposed Development Site.

The Proposed Development Site is in an area where localised small scale underground mining of non-coal minerals is likely to have occurred. Three areas of recorded underground mining in a vein mineral are located directly south of the Energy Park Site and are noted to be worked at a significant depth.

2.6 RADON GAS

A radon map at 1:50,000 scale based on the Radon Potential dataset created jointly by the BGS and UK Health Security Agency (UKHSA) is included in the Groundsure report in **Annex 10B.3**. site. In general, the radon potential on the Energy Park Site is between 1-3% of properties affected, the map also shows areas in the east of the energy park with less than 1% of properties affected by radon. As such, radon protection measures are unlikely to be required within any enclosed spaces that are regularly occupied.

At the south of the Site Access Road there is an area with between 3-5% of properties affected. In areas where between 3-5% of properties are affected, basic radon protection measures are recommended by the UKHSA within any enclosed spaces that are regularly occupied. As the 3 – 5 % radon affected area occurs within the southern extent of the Site Access Road where no buildings or other enclosed structures are proposed, the likelihood of receptor exposure is very low.

Radon is not considered further in the environmental risk assessment but should be given consideration in design where enclosed spaces are proposed.

2.7 PREVIOUS INVESTIGATIONS

A Peat Landslide Hazard and Risk Assessment (PLHRA) (**Appendix 10C** of the ES) was prepared by WSP in June 2026 following peat depth surveys in November to December 2023 and October 2025 to April 2026 with soil coring on the Energy Park Site. This report concluded that:

- The Proposed Development Site is predominantly underlain by mineral soils, and in isolated locations by peat of varying depths and shallower peaty soil, with peat thickness of a maximum of 1.5 – 2.0m recorded in only six of 2,129 probing points targeting Proposed Development infrastructure.
- 85.7% of probe locations within 10m of proposed infrastructure within the Energy Park Site recorded peat depths of less than 0.3m. Peat soils greater than 0.3m depth were localised and coincided with mapped areas of peat and bog or mire habitats.
- Peat was generally encountered in isolated pockets within natural depressions and local wet features and the core data indicated that mineral soils are the dominant substrate and that peat is only identified in small pockets, predominantly identified in thin layers.
- Locations where infrastructure is planned with peat soils > 0.3m thickness are limited and include parts of track south of T03 and the T03 crane pad, the upslope track access to T04, a small area west of the crane pad at T06 and T07, plus, short sections of track access between T10 and T09.
- The PLHRA recommends that ground investigation is undertaken during the pre-construction phase of the Proposed Development and that peat stability risk is considered throughout the detailed design process. Mitigation measures such as micro siting and ‘floating’ of tracks may be needed if peat cannot be avoided.

2.8 SENSITIVE LAND USES

ECOLOGY

The Llyn Mawr Site of Special Scientific Interest (SSSI) lies partially within the Site, with its northern extent being within the south of the Energy Park Site, and its eastern extent extending into the north of the Site Access Road.

Four areas of Ancient Semi Natural Woodland (ASNW) are present within the Site Access Road. ASNW are considered to be of national importance, due to the significant amount of time that it would take to restore, recreate or replace them.

ARCHAEOLOGY

There are five scheduled monuments located within the Site. These are listed below and their locations are shown in the Environmental Statement for the Proposed Development (excerpt included as **Annex 10B.8**):

- Nant Cwm Gerwyn Cairns (MG278).
- Lliest Uchaf Cairns and Stone Row (MG276).
- Craig y Llyn Mawr Round Cairn (MG277).
- Round Hut 700m NNE of Garreg Hir (MG338).
- Round Hut 400m NE of Garreg Hir (MG339).

One listed building is located within the Proposed Development Site. This is a Grade II listed milestone (17552) in the south of the Site Access Road. There is one Registered Historic Landscape which intersects the Site Access Road. This is Caersws Basin (HLW (P) 5).

The above features within the Energy Park Site are not coincident with the locations of identified potential contamination sources and they are not considered further in the risk assessment.

2.9 CLIMATE CHANGE

SEA LEVEL RISE/FLOOD RISK

The Proposed Development Site is located approximately 39km from the Irish Sea and is at an elevation of between 134m AOD in the south where the site access road is near Clatter and 485m AOD at the highest point of the Energy Park Site. Under UKCP18 sea level rise projections for the nearest city, Cardiff, shows a sea level rise in a high emissions scenario of 1.13m by 2100⁸ relative to 1981 – 2000 sea level⁹. The Coastal Risk Screening Tool¹⁰ confirms that the site is not at risk of flooding as a result of sea level rise.

Natural Resources Wales Flood Map indicates that the site is generally not at risk of flooding from rivers, small surface water features or the sea, however localised high-risk areas are present where surface water features have been identified. The Groundsure report notes that areas of Flood Zone 2 and 3 are located 31 m southwest of the site, associated with the Afon Carno. Note that climate change may result in changes to the frequency of extreme weather events and associated flooding.

PROJECTED CHANGES TO GROUNDWATER LEVEL

The Proposed Development Site is located within Severn Uplands groundwater catchment which falls under the WFD definition of a groundwater body. The eFLaG project far-future (2050-2079)¹¹ projections for groundwater recharge within this catchment report a median 2.2mm per day increase for the winter months for this groundwater body. In the other seasons lower groundwater recharge is indicated in the median and maximum scenarios. This indicates potential future increases in groundwater level, at least during winter, relative to the current baseline.

⁸ Met Office (2018) UKCP18 Marine Climate Change. (online) Available at: <https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-infographic-headline-findings-marine.pdf>. Accessed 23 March 2026.

⁹ Met Office (2018) UK Climate Projections 2018 (UKCP18)

¹⁰ Climate Central Inc (2021) Coastal Risk Screening Tool. (online) Available at: https://coastal.climatecentral.org/map/8/-4.4985/52.6825/?theme=water_level&map_type=water_level_above_mhhw&basemap=roadmap&contiguous=true&elevation_model=best_available&refresh=true&water_level=1.0&water_unit=m. Accessed 23 March 2026.

¹¹ UK Centre for Ecology and Hydrology (2025) Hydroprojections, eFLaG: Groundwater recharge. (online) Available at: <https://hydroprojections.ceh.ac.uk/eflag/groundwater-recharge>. Accessed 23 March 2026.

3 SITE HISTORICAL DEVELOPMENT

3.1 INTRODUCTION

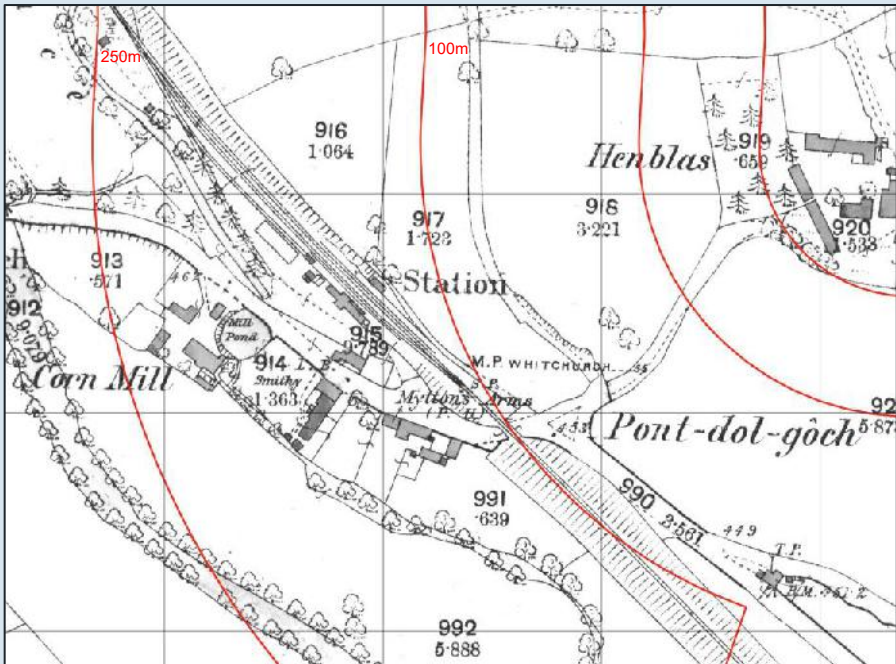
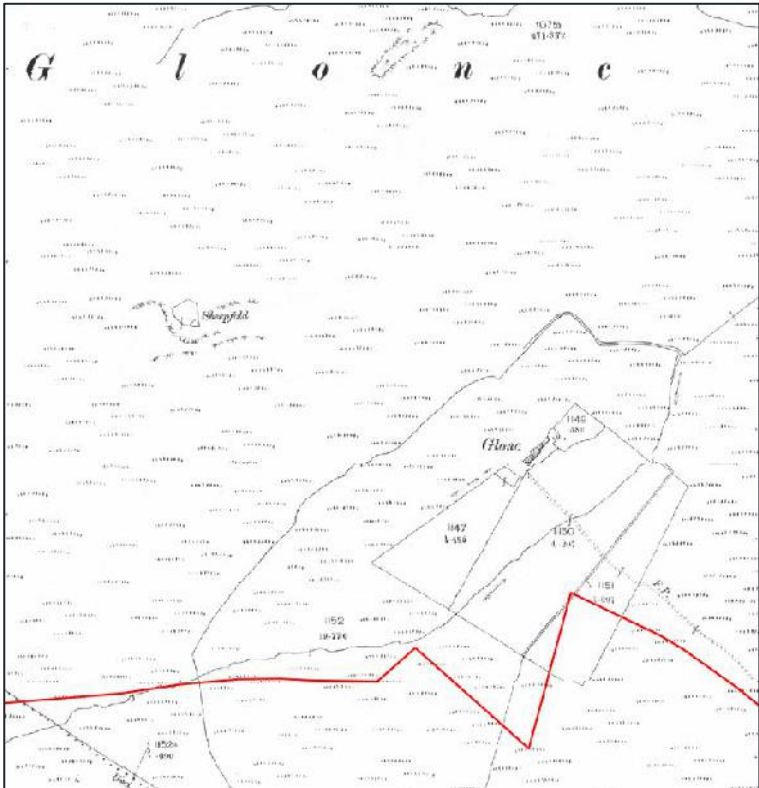
A summary of the Proposed Development Site's historical development is presented below in **Table 10B-6**. This is based on historical Ordnance Survey (OS) mapping in the Groundsure report (See **Annex 10B.3**), supplemented by publicly available aerial imagery on Google Earth Pro.

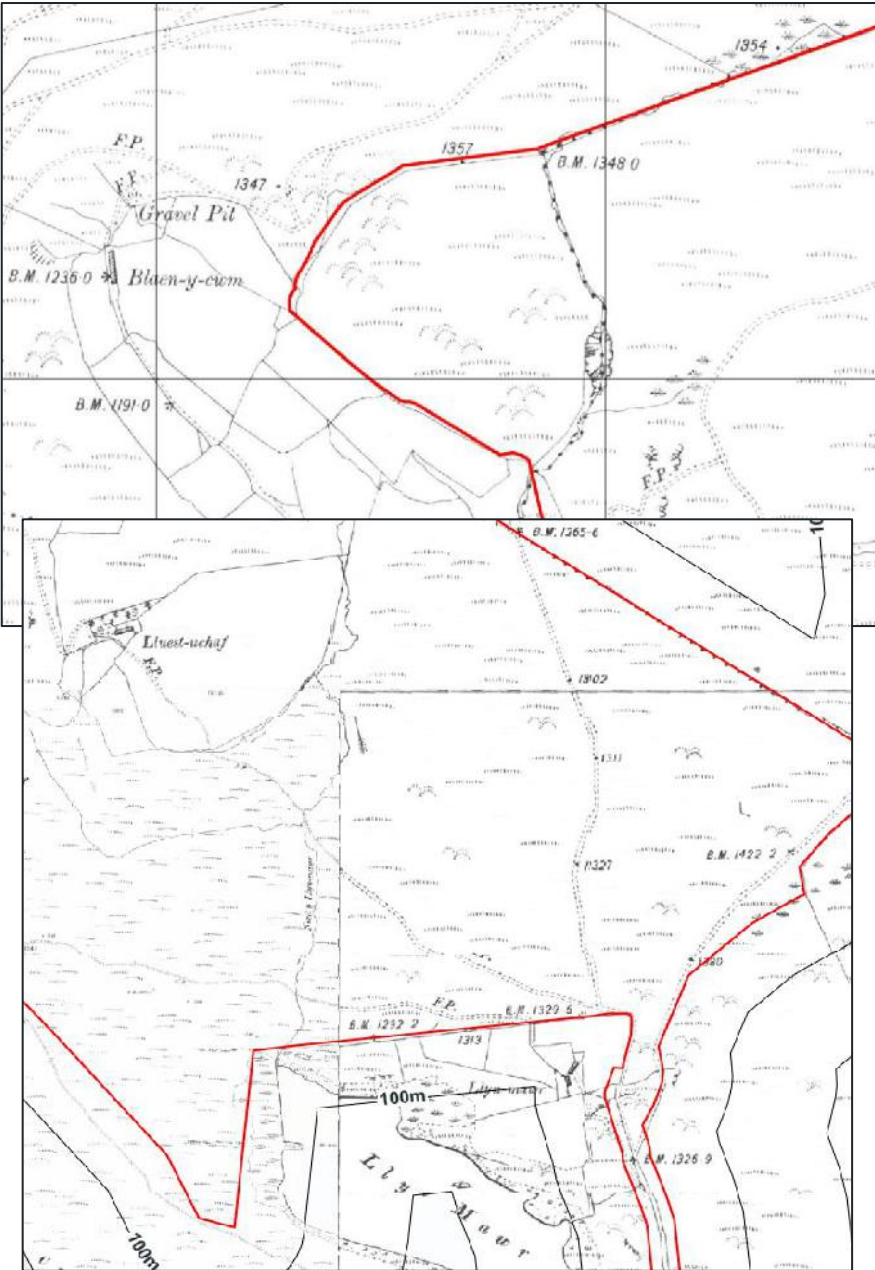
Groundsure data was ordered prior to design freeze, based on a previous design iteration of the Site Access Road, and this means that there is a slight deviation between the site boundary as shown on **Figure 10B.1 (Annex 10B.1)** and the boundary applied in the Groundsure report. This only affects southern and central portions of the site access road, and the discussion below relates to the site boundary as shown on **Figure 10B.1**.

3.2 SITE HISTORICAL DEVELOPMENT

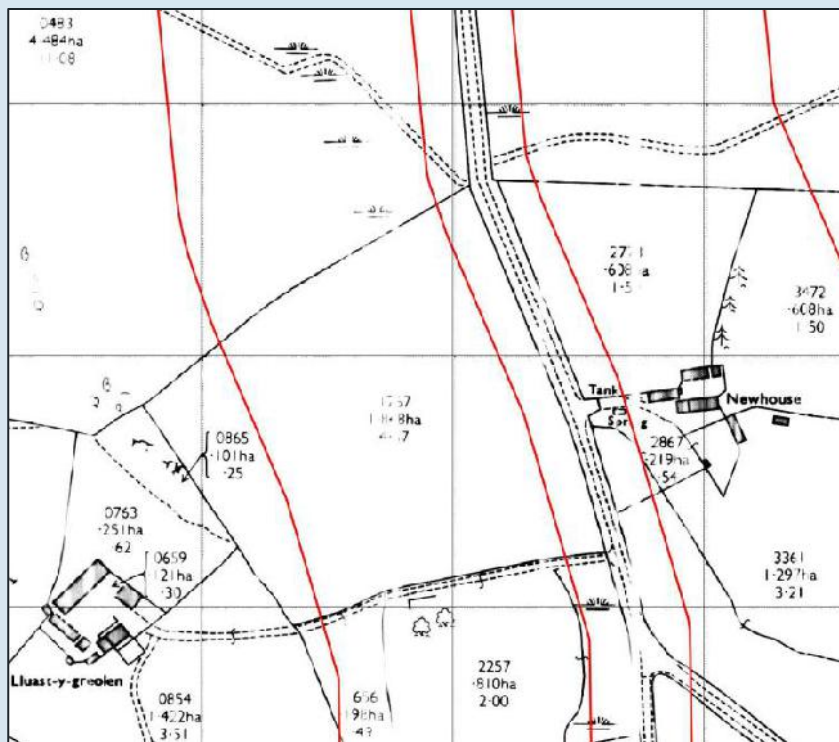
Table 10B-6 - Site Historical Development

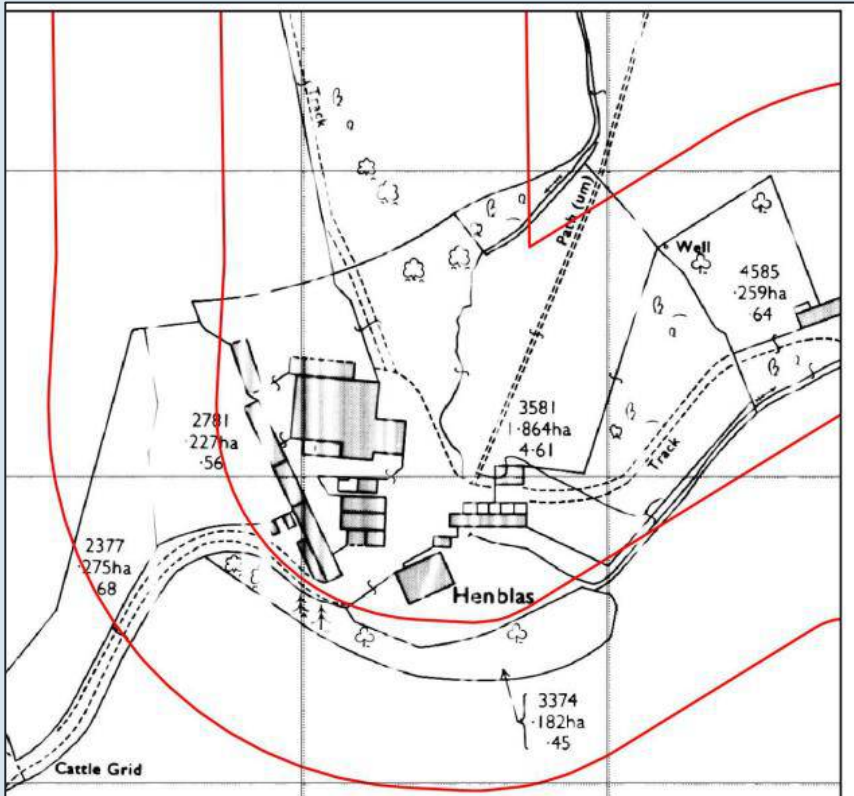
Map and year	Description
1885 - 1887 1:10560 1:2500	Energy Park Site Area comprises agricultural land, including tracks and two small farms (Y Glonc in the northern site area, Lluestuchaf in the central site area, both with buildings present). A number of small streams are noted including Nant Y Llyn Mawr in the east and Nant Cwmgerwyn in the west. Various unnamed watercourses are shown in the west, northeast, and south. Llyn Mawr farm and lake is noted 100m south of the Energy Park Site. Site Access Road Surrounding areas largely comprises agricultural land with farm buildings, houses and tracks. A road is noted through the centre of the site, extending from the north to the central site area. Slate House noted immediately west of the Access Road with a number of Springs noted along the Site Access Road. Coed Neuadd-newydd (forest) partly within central site area. Quarry 340m east of site boundary near the centre of the Site Access Road. Within the northern extent of the Site Access Road, the Proposed Development Site intersects the Newhouse farm. Within the southern extent of the Site Access Road, there is a large farm, Henblas. As shown on the excerpt below a road with a railway station, railway line and cutting are noted immediately west of southern end of access road. A corn mill is noted 250m southwest of the site with a mill pond, mill race (watercourse), and a smithy is adjacent.

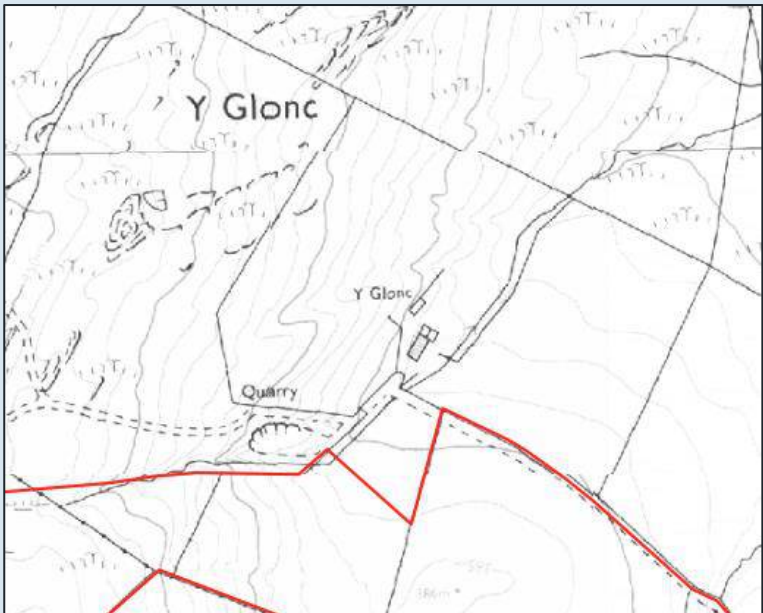
Map and year	Description
	 Excerpt from 1886 scale map (Annex 10B.3)
1901 – 1903 1:10560 1:2500	Energy Park Site No significant changes to site area. A sheepfold is shown in the north, northwest of Y Glonc farm as shown below.  Excerpt from 1902, 1:2,500 scale map (Annex 10B.3)

Map and year	Description
	Gravel Pit is noted 200m northwest of the site. The Nant Y Llyn Mawr is shown connected to the lake and flowing northwards. Land around the lake and extending partly into the site is shown as wetland.  scale map (Annex 10B.3) A gravel pit is shown ~200m offsite to the west at the northwest corner of the Energy Park Site. Site Access Road An old Quarry is located 340m east of the site boundary. Excerpts from 1902, 1:2,500

Map and year	Description
1948 – 1949 1:10560	Energy Park Site No significant changes. Site Access Road Forest clearance is evident within the central area and immediately west.
1960 – 1962 1:10560	Energy Park Site Not included on available mapping. Site Access Road No significant changes.
1974 – 1975 1:2500	Energy Park Site Not included on available mapping. Site Access Road Tank noted associated with 'Newhouse' within the northern extent of the Site Access Road (at approximate grid coordinates 301260, 296675). Depot recorded 200m southwest of the site within Pontdolgoch at the former corn mill. A well is noted at Henblas farm approximately 75m from the southern end of the Site Access Road. Features are shown on excerpts below.



Map and year	Description
	
1980 – 1982 1:10000 1:2500	Energy Park Site No significant changes. Site Access Road Mills no longer noted to the southwest. Railway sidings at Pontdolgoch are no longer shown however the railway is still present. Cemetery noted 400m east of the southern area, at Llanwnnog.
1991 1:10000	Energy Park Site Quarry noted on site within northeastern area, near Y Glonc farm and additional small buildings at the farm as shown on excerpt below.

Map and year	Description
	 Excerpts from 1991, 1:2,500 scale map (Annex 10B.3) Quarry noted approximately 100m east of the site. Expansion to Llyn Mawr farm immediately south of the Energy Park Site. Site Access Road No significant changes.
1994 – 1995 1:2500	Energy Park Site Not included on available mapping. Site Access Road No significant changes.
2006 – 2020 Google Earth	Energy Park Site Site remains in agricultural use. Some tracks and roads are visible within the western site area. The Lluestuchaf farm buildings appear to be overgrown, and the site walkover indicates these are derelict. The Y Glonc farm building appears as a single large shed indicating possible demolition and replacement of older buildings. Site Access Road Site is mainly agricultural land; a road extends from the north of the Access Road where it meets the Energy Park Site to the central site area. The southern extent of the site comprises a small village (Pontdolgoch) and main roads.
2009 Google Earth	Energy Park Site No significant changes. Site Access Road No significant changes.
2011 Google Earth	Energy Park Site No significant changes. Site Access Road No significant changes.

Map and year	Description
2020 Google Earth	Energy Park Site No significant changes. Site Access Road Construction of a warehouse within southern extent of the site. A solar farm has been constructed to the north of Henblas farm, 40m east of the southern extent of the Site Access Road.
2025 Google Earth	Energy Park Site No significant changes. Site Access Road No significant changes.

SUMMARY OF SITE'S HISTORICAL DEVELOPMENT

The earliest available mapping from 1885 to 2025 indicates the Proposed Development Site to be predominantly undeveloped agricultural land. Within the Energy Park Site, footpaths/ tracks and small farms/settlements are present (Y Glonc and Lluestuchaf). A quarry was present within northeastern area, near Y Glonc farm, by 1991.

The Site Access Road is noted to largely comprise undeveloped agricultural land associated with several farms in the surrounding area and has remained largely unchanged since first mapping. The southern extent of the Site Access Road area is noted to include a road by 1885; this is later known as the B4568 connecting to the A470 to the west. Small areas of woodland are noted in the central and southern portions of the Access Road, including at Neuadd-newydd, Coed yr Henblas, and Alltwinnog.

The village of Pontdolgoch is recorded immediately southwest of the southern extent of the Site Access Road, where a station and railway line, with railways sidings 97m southwest of the site, were recorded from 1885, the railway is still present, however the sidings appear to have been removed by the 1980s. Anecdotal information indicates the station closed in the 1960s¹². Various mills including a corn mill were reported from 1885, to the southwest of the Site Access Road, a depot had appeared by the Pontdolgoch Mill southwest of the site by 1974. A smithy was present from the 1800s at Pontdolgoch. The mills were no longer noted on mapping from 1980. The depot is currently an agricultural supplies depot.

The Proposed Development Site has remained largely unchanged from first mapping, except for quarrying within the northern extent of the Energy Park Site (1991), and the presence of a tank at Newhouse farm in the north of the Site Access Road (from 1974). Recent 'Streetview' photography (Google Earth pro) indicates the tank may have been removed. A concrete structure with an access cover is visible, west of the road, positioned close to a spring, however it is not known whether this is the same tank feature. The Lluestuchaf farm property is also noted to be abandoned and derelict.

¹² https://en.wikipedia.org/wiki/Pontdolgoch_railway_station. Accessed June 2026.

4 PRELIMINARY CONCEPTUAL MODEL

4.1 INTRODUCTION

The Conceptual Site Model (CSM) is based upon the environmental conditions of the Proposed Development Site as described in the previous sections. The methods used in this assessment followed a risk-based approach with the potential environmental risk assessed qualitatively using the ‘source-pathway-receptor’ contaminant linkages concept introduced in relevant guidance documents, principally the UK LCRM Guidance (Environment Agency, 2025¹³) on the practical implementation of the Environmental Protection Act 1990¹⁴ and planning policy for developments on land affected by contamination (Welsh Government, 2024¹⁵).

Environmental risk can be defined as the combination of the consequence of a harmful effect and the probability of its occurrence. The existing of a contaminant linkage is primarily dependant on site usage and environmental conditions.

The environmental risk assessment has been carried out identifying and evaluating the significance of the following:

- Potential sources of contamination: these include any actual or activities of concern, located either on or in the vicinity of the Proposed Development Site.
- Potential pathways: these are the routes or mechanisms by which contaminants of concern (CoC) may migrate from the source to the receptor.
- Potential receptors: these could include current or future land users, the water environment (groundwater or surface water) or property (e.g., built infrastructure or grazing livestock) at the Proposed Development Site that could be harmed by CoC.

4.2 BACKGROUND TO THE PRELIMINARY CONCEPTUAL SITE MODEL (CSM)

Table 10B-7 provides a summary of the potential sources of contamination that may be present at the Proposed Development Site, as well as the likely distribution of such sources. These are shown on **Figure 10B.6** in **Annex 10B.1**.

¹³ Environment Agency (2025) Guidance: Land contamination risk management (LCRM). (Online). Available at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>. Accessed: 9 June 2026.

¹⁴ UK Government (1990) Environmental Protection Act 1990. (Online). Available at: <https://www.legislation.gov.uk/ukpga/1990/43/part/IIA>. Accessed: 9 June 2026.

¹⁵ Welsh Government (2024) Planning Policy Wales, Edition 12 | February 2024. (Online). Available at: <https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf>. Accessed: 9 June 2026.

4.3 POTENTIAL SOURCES OF CONTAMINATION

Table 10B-7 – Potential Sources of Contamination

Potential Source	Potential Contaminants of Concern	Likely / Anticipated Distribution on the Proposed Development Site
ON-SITE		
Former pits and quarries, potential for localised unrecorded infilling of voids with wastes	Asbestos, heavy metals, other inorganics polycyclic aromatic hydrocarbons (PAH), hydrocarbons (fuels and oils), ground gas (methane and carbon dioxide) derived from organic wastes	Localised former gravel pits and quarries in central and western areas of the site. From a review of available mapping sources, extensive infilling of these areas is considered unlikely, and waste disposal is likely to be small-scale if present.
Farming activities (mainly associated with sheep farming), use of pesticides, farm vehicles and machinery, potential for ad hoc waste disposal, leaks or spills of fuels, oils or chemicals, waste storage and disposal.	Asbestos, heavy metals, other inorganics, PAHs, TPHCWG, pesticides	Farms located at Y Glonc and Lluestuchaf on the Energy Park Site, Newhouse and Henblas.
Derelict and demolished buildings (derelict property at Lluestuchaf, possible historical building demolition at Y Glonc)	Asbestos, heavy metals, PAHs,	Potential localised impact across the Proposed Development Site, likely to be small-scale or diffuse and low level.
OFF-SITE		
Farm activities in the surrounding area, including some Waste Exemption activities and former tank, possible leaks, spills, ad hoc waste disposal	Asbestos, heavy metals, PAHs, TPHCWG, fertilisers and pesticides	Adjacent or within 250m of the Site Access Road

4.4 POTENTIAL PATHWAYS

In the context of the Proposed Development Site the following potential exposure or migration pathways associated with the identified potential sources have been identified:

Pathways to Human Health receptors:

- Dermal/ direct contact with soils and groundwater;
- Ingestion of dust/ soil/ fibres/ water;
- Inhalation of dust/ fibres; and
- Inhalation of hazardous ground gases/vapours.

Pathways to Water Environment receptors:

- Leaching of contaminants through the unsaturated zone and subsequent impact to groundwater within the underlying aquifers; and
- Lateral migration of contaminants within groundwater and subsequent impact on surface water receptors.

Pathways applicable to site infrastructure:

- Direct contact with contaminants (e.g., sulphates and hydrocarbons) in the soil and groundwater with below ground structures (possible underground potable water pipes and buried concrete); and
- Accumulation of hazardous gases within enclosed above or below ground structures in the future development (explosive risk).

Pathways applicable to site plant life:

- Direct contact with contaminants within soils and shallow groundwater.

4.5 POTENTIAL RECEPTORS

In the context of the future use of the Proposed Development Site, the following potential receptors were identified:

In the context of the future use of the Proposed Development Site, the following potential receptors were identified:

Human Health

- Current site users (the public, agricultural workers); and
- Future site users (the public, agricultural workers, site workers e.g., Energy Park Site workers).

Water Environment

- Groundwater:
 - Unproductive Aquifer – Peat – locally across southern Energy Park Site, potential to be locally present on the Site Access Road central area
 - Secondary A Superficial Aquifer – Alluvial Fan – locally across southern end of Access Road,
 - Secondary Undifferentiated Superficial Aquifer – Till – locally within Energy Park Site area and Site Access Road,
 - Secondary B Bedrock Aquifer – Penstrowed Grits Formation,
 - Secondary A Bedrock Aquifer - Glanrafon Formation – locally within southern extent of Access Road).
- Surface waters –
 - Nant Y Llyn Mawr and Nant Cwmgerwyn within the Energy Park Site,
 - Afon Carnon 175 m southwest of the Proposed Development Site Access Road and a number of associated tributaries.

Services and Built Environment

- Future infrastructure (including proposed BESS and grid connection infrastructure and compounds).
- Possible buried water supply pipes (this is to be confirmed at detailed design).

- Existing buildings and enclosed spaces.
- Future buildings and enclosed spaces.

Flora

- It is expected that localised reinstatement of vegetation will be required and habitat management proposals are set out in the Outline Habitat Management Plan (**Appendix 5P** of the Environmental Statement) for the Proposed Development.

EXCLUSIONS FROM THE RISK ASSESSMENT

The section explains exclusions from the environmental risk assessment.

Small-scale potential contamination sources

The following possible sources have been excluded from the risk assessment due to the low contamination potential associated with them:

- Tipped material in southeast of the Energy Park Site. Comprising soil, stone and possibly chipped vegetation.
- Offsite former pits and quarries, potential for localised infilling of voids with wastes, these are c.170m northwest, c.390m east and c.165m southeast of the Energy Park Site, c.385m east of the Site Access Road. c.170m northwest, c.390m east and c.165m southeast of the Energy Park Site, c.385m east of the Site Access Road. Given the distance of the features from the Proposed Development and no recorded waste disposal, the Proposed Development is unlikely to encounter contaminants associated with these features.
- Offsite industrial/ commercial activities Southwest of Site Access Road between 150m and 250m from the site, may include made ground and leaks/ spills from railway land including former sidings, former smithy and mills, depot (agricultural supplies). Due to their distance from site, there is a low potential for contamination affecting the Proposed Development Site and these sources are not considered further in the risk assessment.
- Offsite agricultural tank with unknown contents, 35m northwest of the Energy park Site. This may contain water or fertilizer/ animal feed and presents a low contamination potential.
- Offsite cemetery at Llanwnnog (possible heavy metals, phosphates, ammoniacal nitrogen, pathogens and formaldehyde). The cemetery is 400m east of the Site Access Road (noted to be within Secondary A superficial aquifer extent), it presents a low contamination potential due to its distance from site.

Onsite SSSI

Most of the SSSI is offsite and it is not in proximity to identified potential sources. The nearest proposed infrastructure for the Proposed Development is access track located approximately 165m northwest of the SSSI. The nearest onsite potential source is over 450m away to the northeast. Land contamination impacts on the SSSI are therefore considered unlikely with the site in its current configuration or with the proposed changes for the Proposed Development.

Redevelopment/ construction workers

The conceptual model does not consider risks to construction/ site maintenance workers on the basis that risks to these workers will be dealt with under the Health and Safety at Work Act (1974) and regulations made under the Act. Site-specific contamination data obtained from all site investigations should be included in the pre-construction information (this is a requirement of the Construction Design and Management Regulations 2015) for the proposed works, to enable any

contractors to address potential risks from contamination, as necessary, in their risk assessments and method statements. Moreover, as the exact details of the methods to be adopted are not currently known, it is not considered appropriate to provide a wide ranging and speculative risk assessment for redevelopment workers. Personal protective equipment (PPE) should always be the last line of defence, with methods selected that avoid or minimise risks to site workers.

Invasive species

Invasive species (including but not limited to Japanese knotweed and giant hogweed) are not considered within the risk assessment for contamination. Invasive non-native plant species (INNS) are covered in the Preliminary Ecological Appraisal (PEA) for the Proposed Development¹⁶.

Unexploded ordnance

Unexploded ordnance (UXO) risks are not assessed in the environmental risk assessment, however A Pre-Desk-Study-Assessment (PDSA) for UXO has been commissioned for the Proposed Development Site and is included in **Annex 10B.5**. This found no records of the site having been bombed in World Wars I or II and no records of military activity on the site. No further UXO assessment was deemed necessary by Zetica.

Aggressive ground conditions

Constraints including sulphate and ammonia attack of concrete are considered in Sections 5 and 6 of this report.

4.6 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

For land contamination risk to be realised, a 'contaminant linkage' must exist. A contaminant linkage requires the presence of a:

- source of contamination.
- receptor capable of being harmed; and
- pathway capable of exposing a receptor to the contaminant.

A preliminary risk assessment has been undertaken for these potential contaminant linkages to identify potentially unacceptable risks on a qualitative basis. Risk is therefore based on a consideration of both:

- The likelihood of an event (probability – considers both the presence of the hazard and receptor and the integrity of the pathway)
- The severity of the potential consequence (considers both the potential severity of the hazard and the sensitivity of the receptor).

Further information on the risk assessment methodology used is given in **Annex 10B.6**. The method of dealing with identified risks and the level of significance of those risks will be a function of site use. The risk assessment is based on the future proposed land use and assumes no control measures to manage the risk (e.g., source removal or capping) have been incorporated in the development.

¹⁶ WSP (2024) Calon Y Gwynt. Preliminary Ecological Appraisal Project. No.: 62282400.

The CSM identifies the potential contamination sources, receptors, and the exposure pathways by which they may be linked. A source-pathway-receptor linkage (SPRL) is present if a viable pathway exists between a potential source and an identified receptor.

The CSM includes potential risks which may exist to the Proposed Development Site during the construction and maintenance. However, it is assumed that mitigation procedures during construction will be implemented in accordance with the Outline Construction Environmental Management Plan.

An explanation of the preliminary CSM and the risk characterisation process is presented in **Annex 10B.6**. The risk assessment of the potential contaminant linkages identified in the preliminary CSM is provided in **Table 10B-8**.

Table 10B-8 - Preliminary Environmental Risk Assessment

SPRL	Potential Source	Contaminants	Pathway	Receptor	Likelihood	Hazard (severity)	Preliminary Risk Rating	Comments
ON-SITE								
1	Former pits and quarries, potential for localised unrecorded infilling of voids with wastes (located within the Energy Park Site only)	Asbestos, heavy metals, other inorganics polycyclic aromatic hydrocarbons (PAH), hydrocarbons (fuels and oils)	Dermal/ direct contact, ingestion, inhalation	Current site users (the public, agricultural workers)	Unlikely	Medium	Low	No evidence observed of waste disposal taking place, most quarried areas visible, however localised unrecorded infilling is possible. Areas unlikely to be accessed frequently.
2			Dermal/ direct contact, ingestion, inhalation	Future site users (the public, agricultural workers, Energy Park Site workers)	Low likelihood	Medium	Moderate/ low	No evidence observed of waste disposal taking place, most quarried areas visible, however localised unrecorded infilling is possible. Areas unlikely to be accessed frequently or for any length of time.
3		Ground gas (methane and carbon dioxide) derived from organic wastes	Inhalation of hazardous gases	Current site users (the public, agricultural workers)	Unlikely	Medium	Low	No evidence observed of waste disposal taking place, most quarried areas visible, however localised unrecorded infilling is possible. Existing buildings/ enclosed spaces are either unoccupied or not in proximity to former quarries.
4			Inhalation of hazardous gases	Future site users (the public, agricultural workers, Energy Park Site workers)	Unlikely	Medium	Low	No evidence observed of waste disposal taking place, most quarried areas visible, however localised unrecorded infilling is possible. Proposed new enclosed spaces (e.g., control room) are not located close to potential sources.
5		Heavy metals, other inorganics polycyclic aromatic hydrocarbons (PAH), hydrocarbons (fuels and oils)	Leaching, migration	Water Environment – superficial aquifers Unproductive Aquifer – Peat Secondary Undifferentiated Superficial Aquifer - Till	Low likelihood	Mild	Low	No evidence observed of waste disposal taking place, most quarried areas visible, however localised unrecorded infilling is possible. Superficial deposits (peat and till) are limited in extent across the Energy Park Site. Where present till deposits will typically be of low permeability. Groundwater in peat deposits could be affected by contamination migrating to these areas from infilling, but further migration would then be limited by the low hydraulic conductivity of the peat.
6		Heavy metals, other inorganics polycyclic aromatic hydrocarbons (PAH), hydrocarbons (fuels and oils)	Leaching, migration	Water Environment – bedrock aquifer Secondary B Bedrock Aquifer – Penstrowed Grits Formation,	Low likelihood	Mild	Low	Where till is present this is likely to limit vertical migration, however the till deposits are limited in extent and thickness across the Energy Park Site.

SPRL	Potential Source	Contaminants	Pathway	Receptor	Likelihood	Hazard (severity)	Preliminary Risk Rating	Comments
								The areas of the site where pits and quarries have been identified are all underlain by the Secondary B Bedrock Aquifer.
7			Migration	Water Environment – surface water Nant Y Llyn Mawr Nant Cwmgerwyn	Low likelihood	Mild	Low	Sources likely to be limited in extent and only limited migration of contaminants in shallow groundwater likely. Former quarries in the north of the Energy Park Site are generally less than 100m from the nearest surface water receptor.
8			Direct Contact	Future infrastructure and possible buried water pipes	Low Likelihood	Mild	Low	Concrete and water pipes will be specified according to relevant guidance.
9	Farming activities (mainly associated with sheep farming), use of pesticides, fertilisers, farm vehicles and machinery, potential for ad hoc waste disposal, leaks or spills of fuels, oils or chemicals, waste storage and disposal.	Asbestos, heavy metals, other inorganics, PAHs, TPHCWG, fertilisers and pesticides/ herbicides	Dermal/ direct contact, ingestion, inhalation	Current site users (the public, agricultural workers)	Unlikely	Medium	Low	No evidence observed of spills, leaks or waste disposal to ground but historical incidences are possible. If present, sources are likely to be localised and small-scale. Areas unlikely to be accessed frequently.
10			Dermal/ direct contact, ingestion, inhalation	Future site users (the public, agricultural workers, Energy Park Site workers)	Low likelihood	Medium	Moderate/ low	No evidence observed of spills, leaks or waste disposal to ground but historical incidences are possible. Access to source areas by future site users will be limited. Proposed Development layout may encounter localised contamination that could be disturbed/ exposed during construction.
11			Leaching, migration	Water Environment – superficial aquifer Unproductive Aquifer – Peat Secondary Undifferentiated Superficial Aquifer - Till	Low likelihood	Mild	Low	No evidence observed of spills, leaks or waste disposal to ground but historical incidences are possible Superficial deposits (peat and till) are limited in extent across the Energy Park Site. Where present till deposits will typically be of low permeability. Groundwater in peat deposits could be affected by contamination migrating to these areas from infilling, but further migration would then be limited by the low hydraulic conductivity of the peat.
12			Leaching, migration	Water Environment – bedrock aquifer Secondary B Bedrock Aquifer – Penstrowed Grits Formation,	Low likelihood	Mild	Low	No evidence observed of spills, leaks or waste disposal to ground but historical incidences are possible Where till is present this is likely to limit vertical migration, however the till deposits are limited in extent and thickness across the Energy Park Site. The areas of the site where farm buildings have been identified are all underlain by the Secondary B Bedrock Aquifer.

SPRL	Potential Source	Contaminants	Pathway	Receptor	Likelihood	Hazard (severity)	Preliminary Risk Rating	Comments
13	Derelict and demolished buildings (derelict property at Lluestuchaf, possible historical building demolition at Y Glonc)	Asbestos, heavy metals, PAHs	Migration	Water Environment – surface water Nant Y Llyn Mawr Nant Cwmgerwyn	Low likelihood	Mild	Low	Sources likely to be limited in extent and only limited migration of contaminants in shallow groundwater likely. Nearest surface water (unnamed) located approximately 70m to the south of the farm at Y Glonc. Nearest surface water (Nant Y Llyn Mawr) located approximately 150m to the west of Lluestuchaf farm.
14			Direct Contact	Future infrastructure and possible buried water pipes	Low Likelihood	Mild	Low	Sources likely to be limited in extent Concrete and water pipes will be specified according to relevant guidance.
15			Dermal/ direct contact, ingestion, inhalation	Current site users (the public, agricultural workers)	Unlikely	Medium	Low	Made ground may be present associated with demolished buildings but will be limited in extent. Areas unlikely to be accessed frequently.
16			Dermal/ direct contact, ingestion, inhalation	Future site users (the public, agricultural workers, Energy Park Site workers)	Low likelihood	Medium	Moderate/ low	Made ground may be present associated with demolished buildings but will be limited in extent. Access to source areas by future site users will be limited.
17			Leaching, migration	Water Environment – superficial aquifers Unproductive Aquifer – Peat Secondary Undifferentiated Superficial Aquifer	Mild	Low likelihood	Low	Made ground may be present associated with demolished buildings but will be limited in extent. Superficial deposits (peat and till) are limited in extent across the Energy Park Site. Where present till deposits will typically be of low permeability. Groundwater in peat deposits could be affected by contamination migrating to these areas from infilling, but further migration would then be limited by the low hydraulic conductivity of the peat.
18			Leaching, migration	Water Environment – bedrock aquifer Secondary B Bedrock Aquifer – Penstrowed Grits Formation,	Low likelihood	Mild	Low	Where till is present this is likely to limit vertical migration, however the till deposits are limited in extent and thickness across the Energy Park Site. The areas of the site where demolished buildings have been identified are all underlain by the Secondary B Bedrock Aquifer.
19			Migration	Water Environment – surface water Nant Y Llyn Mawr Nant Cwmgerwyn	Low likelihood	Mild	Low	Sources likely to be limited in extent and only limited migration of contaminants in shallow groundwater likely.

SPRL	Potential Source	Contaminants	Pathway	Receptor	Likelihood	Hazard (severity)	Preliminary Risk Rating	Comments
								Nearest surface water (unnamed) located approximately 70m to the south of the farm at Y Glonc. Nearest surface water (Nant Y Llyn Mawr) located approximately 150m to the west of Llustuchaf farm.
20			Direct Contact	Future infrastructure and possible buried water pipes	Low Likelihood	Mild	Low	Concrete and water pipes will be specified according to relevant guidance.
OFFSITE								
21	Farm activities in the surrounding area, including some waste exemption activities and former tank, possible leaks, spills, ad hoc waste disposal	Asbestos, heavy metals, PAHs, TPHCWG, fertilisers and pesticides	Dermal/ direct contact, ingestion, inhalation	Future site users (the public, agricultural workers, Energy Park Site workers)	Low Likelihood	Mild	Low	Sources likely to be localised and small-scale or diffuse and low level. Areas unlikely to be accessed frequently or for any length of time.
22			Leaching, migration	Water Environment – superficial aquifer	Low Likelihood	Mild	Low	The till deposits are limited in extent and thickness across the Site Access Road and will typically be of low permeability. Groundwater in peat deposits could be affected by contamination migrating to these areas from infilling, but further migration would then be limited by the low hydraulic conductivity of the peat. Shallow groundwater is most likely at the south end of the Site Access Road (secondary A aquifer).
23				Water Environment – bedrock aquifer Secondary B Bedrock Aquifer – Penstrowed Grits Formation Secondary A Bedrock Aquifer - Glanyrafon Formation	Low Likelihood	Mild	Low	Sources likely to be localised and small-scale or diffuse and low level. Potential for vertical migration of contaminants to the bedrock aquifers however the till deposits present in the south end of the Site Access Road will limit migration.

5 GEOTECHNICAL CONSIDERATIONS

Following a review of the information presented in **Sections 1 to 3**, geotechnical constraints that may have an impact on the Proposed Development have been identified. A summary of these constraints is provided below:

- Localised soft, compressible layers within the superficial deposits: Peat and Glacial Till are recorded in areas across the Proposed Development Site and Alluvium is also recorded near to the site. These deposits have the potential for soft, compressible layers which may not be suitable as a founding stratum for the foundations of the wind turbines, BESS infrastructure and compound, substation compound and temporary construction compound.
- Historical surface mining within the Energy Park Site and possible deep mineral mining in areas across the Proposed Development Site: According to Groundsure information (**Annex 10B.3**) there is potential for localised small scale historical underground mining across the Proposed Development Site. One historical onsite surface sandstone mine is located onsite in the north of the Energy Park Site at Y Glonc, status 'ceased'. Former surface ground workings are indicated at Llyn Mawr lake, extending up to the Energy Park Site's southern boundary. In the surrounding area, the nearest recorded mines are 204m northwest (sand and gravel pit), 299m north and 349m northeast (sandstone surface mines) of the Proposed Development Site.
- Faults: faults have been recorded beneath the Proposed Development Site. These may be reactivated by movement associated with mining subsidence.
- Soil chemistry: any peat is likely to be acidic. This should be assessed to determine the requirements for any buried concrete structures.
- Peat: potential for landslide/instability. It is recommended that the peat thickness at the proposed development locations is proven by intrusive ground investigation.
- Existing utilities: utilities information has not been obtained as part of this study. Any services that may be present in the area of the proposed works, may require specific impact assessments.
- Thermal resistivity: there is potential for thermal build up in soils due to issues with dissipating heat produced from the underground cables. Thermal resistivity tests should be undertaken within a ground investigation to determine the risk to the proposed development.
- UXO: potential for unexploded ordnance beneath the Proposed Development Site. The Proposed Development Site is classified as low risk (less than 15 bombs per 1000 acres or less) so the risk to the development due to UXO is low. UXO briefings should be undertaken by all contractors prior to intrusive works.
- Potential for shallow groundwater: The groundwater profile across the Proposed Development Site is unknown. There is potential for shallow groundwater to be present across the site which could cause potential instability of any excavations.
- Instability of excavations in soft ground: excavations in soft ground may require a form of trench support.

6 GEOTECHNICAL RISK REGISTER

A geotechnical review of the Proposed Development Site has been carried out using the information available from this report. This section highlights the potential geotechnical risks associated with the development. As the Project progresses, and as more information is obtained pertaining to geotechnical properties, design and construction sequences, this register should be updated. This Risk Register does not account for all project risks and only accounts for expected geotechnical risks identified at the date of this report.

Table 10B-10 provides a risk register classification and geotechnical risk register for the Proposed Development Site which has been prepared based on the available information. The scoring system used in this register is presented in Table 10B-9.

Table 10B-9 - Geotechnical Risk Register Scoring System

Probability (P)		Impact/Consequence (I)		Risk P x I = R		Impact/Consequence				
						1	2	3	4	5
Very Likely	5	Very High	5	Probability	1	1	2	3	4	5
Probable	4	High	4		2	2	4	6	8	10
Likely	3	Medium	3		3	3	6	9	12	15
Unlikely	2	Low	2		4	4	8	12	16	20
Negligible	1	Very Low	1		5	5	10	15	20	25

Table 10B-10 - Geotechnical Risk Register

Item	Hazard	Cause	Consequence	P	I	R	Design Control Measure	P	I	R
1	Highly compressible ground.	Peat is recorded to be present across the site.	High magnitude of settlement. Delays to construction.	3	4	12	Detailed design to investigate ground conditions along access route and design out risks associated with peat. Initial investigations nearby suggest peat thickness is <0.40m and may be dealt with locally. Detailed design to set out improvement layers/dig and replace is necessary.	1	4	4
2	Aggressive Ground Conditions	Sulphate attack on buried concrete from sulphate-bearing material.	Structural damage. Cost of repairs. Long term performance of structures compromised.	2	4	8	Undertake ground investigation works and test soil/rock and groundwater samples. Implement all recommendations of BRE Special Digest 1 ¹⁷ .	1	4	4
3	Slope stability	Variability in Site levels. Potential for instability during excavations.	Damage to infrastructure. Delays during construction	2	4	8	Complete Ground Investigation and produce revised ground model and determine geotechnical parameters.	1	4	4
4	Site flooding	Ponds/watercourses located on site may flood during periods of heavy rainfall.	Flooding of access track. Washing away of access track.	3	3	9	Implement suitable drainage design along access road and on site access tracks. Drainage strategy outlined in Appendix 9A.	1	3	3

¹⁷ BRE (2005) Concrete in aggressive ground (SD 1). Available at: <https://bregroup.com/store/bookshop/concrete-in-aggressive-ground-sd-1>.

Item	Hazard	Cause	Consequence	P	I	R	Design Control Measure	P	I	R
5	Variable/weak ground/unfavourable conditions	Localised variation in ground conditions.	Ground failure. Injury/death. Reputational damage. Financial impact.	2	5	10	Undertake detailed Ground Investigation across the main site and along access route to determine ground conditions to allow detailed geotechnical design to be completed.	1	5	5
6	Mass movements caused by loading Pre-existing shear surfaces	Additional load/variation in ground levels and conditions.	Ground failure. Reputational damage. Death/injury.	2	5	10	Detailed design to address risk by Ground Investigation, detailed mapping. Detailed design to confirm suitable foundation approach.	1	5	5
7	Shallow Groundwater	Possibility of shallow or perched groundwater (exhibited by ponds)	Impact on permanent design of foundations.	3	3	9	Undertake Ground Investigation to determine groundwater levels. Detailed design to reflect encountered groundwater levels.	1	3	3
8	Soft or compressible deposits	Alluvium is mapped to the northeast of the site and may extend beneath the site.	High magnitude of settlement. Delays to construction/increased costs.	3	4	12	Detailed design to investigate ground conditions.	1	4	4
9	Landslides	Peat is recorded to be present across the site.	Slight potential for landslides of the peat. Delays to construction. Injury	3	4	12	Detailed design to investigate ground conditions across site and design out risks associated with peat. Initial investigations nearby suggest peat thickness is <0.40m and may be dealt with locally. Detailed design to set out improvement layers/dig and replace is necessary.	1	4	4

7 CONCLUSIONS AND RECOMMENDATIONS

This section presents conclusions and recommendations based on the findings of the Proposed Development Site walkover and the desk-based assessment.

7.1 SUMMARY OF THE LAND CONTAMINATION RISK ASSESSMENT

The Energy Park Site is in an area largely comprising agricultural pasture for sheep grazing, interspersed by hedgerows, existing access roads and limited woodland (Lluestuchaf and a strip of trees in the south). The Site Access Road largely comprises open farmland, existing minor roads and farm tracks and pockets of woodland.

Potential sources of contamination

Identified potential sources of contamination on the Proposed Development Site include areas of historical surface mineral extraction (old pits and quarries) on the Energy Park Site, resulting voids may have been used for unrecorded waste disposal.

In developed areas of the Energy Park Site and the Site Access Road where buildings and farming operations are present there is potential for made ground in yards/ tracks, localised contamination due to accidental spills or leaks of fuels, oils or chemicals, and contamination arising from waste disposal (e.g., burning of waste). If present, sources from these activities are likely to be localised and small-scale.

Wider farming activities (mainly sheep farming) may have resulted in contamination in areas of the proposed Development Site that are currently agricultural fields. The use of pesticides, leaks or spills from farm vehicles and machinery may have resulted in contaminants being present in soils as either diffuse low-level contamination or localised small-scale contamination. An area of tipped material was observed in the southeast of the Energy Park Site however this appeared to be limited to soil, stones and vegetation.

Offsite sources include former pits and quarries (potential unrecorded infilling), industrial and commercial activities southwest of the Site Access Road at Pontdolgoch including current and historical railway land, mills, a former smithy and a depot, and a cemetery at Llanwnnog, east of the south end of the Site Access Road. An offsite partially buried storage tank was identified in a grassed area north of the Energy Park Site. The tank was unlabelled and appears relatively recent and agricultural in nature. Its location and partially buried nature does not suggest fuel storage; it may contain water but could also be used for agricultural purposes (e.g. fertiliser).

Risks to human health

Risks to current site users from the identified onsite potential contamination sources were all assessed to be low or very low.

Moderate/ low risks to future site users have been identified in relation to the former pits and quarries on the site and potential for these to have been used for unrecorded waste disposal, and at farm buildings, including the derelict Lluestuchaf farm. The risks to human health from potential contaminants due to other farming activities is considered to be Low. The risk to future site users associated with possible ground gas from any infilled pits and quarries on the Proposed Development Site is assessed to be low given the likelihood that any source will be limited in extent, and due to the limited enclosed spaces included in the Proposed Development.

The risk assessment considers that future site users, including agricultural workers, members of the public, and Energy Park Site workers are unlikely to disturb soil during normal site usage.

As noted above, risks to construction workers and ground workers are not assessed in the risk table (**Table 4-2**) as their work would be undertaken using a suitable methodology and with the use of suitable PPE following risk assessment in accordance with the Health and Safety at Work Act (1974) and regulations made under the Act. Site-specific contamination data in this report, and as obtained from site investigations should be included in pre-construction information for any ground works relating to the construction of the Proposed Development.

Risks to the Water Environment

Risks to the water environment including groundwater and surface water from the identified sources are generally low to very low, based on mild impacts from the identified sources being possible given the limited potential for shallow groundwater to be present beneath most of the Proposed Development Site.

The risk to groundwater is moderate/ low where the Proposed Development is within a secondary A superficial aquifer at the southern end of the Site Access Road. Groundwater quality in this aquifer may be impacted by historical and ongoing activities in the surrounding area, including the former mills, smithy, railway land (former sidings), a cemetery, and also farming activities. This means that any excavations in this area for the Proposed Development could potentially encounter contaminated groundwater. Future site users are unlikely to come into contact with impacted groundwater given the proposed Site Access Road land use.

Risks to the built environment

The conceptual model considers risks to the future built environment (e.g., the proposed BESS, control room, substation) and buried utilities including potable water supply pipes, as it is possible that the control room welfare facilities will connect to mains water supply. It is assumed that buried concrete and/ or water pipes will be specified according to relevant guidance, with soil and groundwater testing undertaken as needed, and consequently the risk of degradation of these structures/ services due to contaminants in soil or groundwater will be low.

7.2 LAND CONTAMINATION CONCLUSIONS

No moderate or higher risks have been identified, however moderate/ low risks to future Site users have been identified in relation to the former pits and quarries on the site and potential for these to have been used for unrecorded waste disposal, and at farm buildings, including the derelict Lluestuchaf farm. These areas pose a potential constraint to the Proposed Development that will require further assessment as part of the detailed design process prior to construction. It is therefore recommended that intrusive ground investigation is undertaken to inform this assessment.

Shallow groundwater is likely to be limited or absent across the Energy Park Site given the elevation and geological sequence, however at the southern end of the Site Access Road, shallow groundwater is likely and may be impacted by historical and current activities in the surrounding area. Contaminated groundwater is unlikely to be encountered by future site users but may be encountered during excavations for the Proposed Development. Buried concrete and/ or water pipes will need to be specified according to relevant guidance, with soil and groundwater testing undertaken to inform this assessment as needed.

The requirements for landscaping or planting as part of the Proposed Development are not currently known. If made ground or potentially contaminated soils are encountered, it is possible that contaminants, including metals, may be present at concentrations which are phytotoxic. This will require investigation/ suitable chemical testing to confirm that excavated or in situ soils are suitable for planting or the re-establishment of vegetation following construction of the Proposed Development, if this is proposed.

7.3 GEOTECHNICAL CONCLUSIONS

A review of the geotechnical hazards across the Proposed Development Site identified several constraints that require further investigation for the safe and economic design and construction of the proposed development. Notably, there is limited information on the ground and groundwater conditions. BGS mapping does indicate the potential presence of soft glacial/peat/potentially alluvial deposits which are unlikely to provide a competent founding stratum for any foundations. Additionally, these superficial deposits are likely to require trench support for any excavations.

These constraints will require further assessment as part of the detailed design process prior to construction of the Project, and it is recommended that intrusive ground investigation is undertaken to inform this assessment.

7.4 RECOMMENDATIONS: LAND CONTAMINATION

The identified land contamination risks can be mitigated by targeted ground investigation to enable further risk assessment, and remediation if this is required, in accordance with LCRM. It is recommended that a ground investigation is undertaken on the Energy Park Site and on the Site Access Road to provide information on the soil and/ or groundwater conditions in the areas where moderate/ low risks to future site users have been identified, or where potential for shallow groundwater contamination has been identified. The investigation points should target identified sources, particularly where these may be disturbed by ground works for the Proposed Development or where they occur in proximity to proposed infrastructure, including access tracks and any buried infrastructure. The ground investigation is required prior to commencement of construction works.

The investigations should include suitable chemical testing of soils for relevant contaminants; on the Energy Park Site the investigations should include some boreholes to provide information on the groundwater depth and condition. At the Site Access Road, where this intersects the superficial secondary A aquifer at its southern end, groundwater monitoring, sampling and testing should be undertaken as needed.

Limited potential for ground gas has been identified on the Proposed Development Site. In general, the proposed infrastructure on the Energy Park Site will be designed to avoid the identified former quarries and pits (possible infilled ground), however consideration should also be given to the potential for new ground gas migration pathways to be created (e.g., buried cable runs), as this may pose a risk to existing or proposed buildings or to future maintenance workers. Targeted gas monitoring should be considered where development is proposed in proximity to an identified possible ground gas source, however this would only be required if buildings are to be regularly occupied as part of the Proposed Development Site.

Consideration should be given in the design of the Proposed Development to the potential for radon gas protection measures to be needed in areas of 1 to 3% and 3 to 5 % radon. This would apply to any enclosed structures that may be regularly occupied. Consideration should also be given to ensuring that no new gas migration pathways are created that may affect existing or proposed buildings.

Where planting or landscaping is proposed in areas potentially affected by soil contamination, soil sampling and testing should be undertaken for relevant phytotoxic contaminants to confirm that existing vegetation can be reinstated following construction of the proposed development, or to confirm the suitability of soils for new planting if this is proposed.

An unexpected contamination protocol should be developed to be implemented with the Construction Environmental Management Plan (CEMP).

The information in this report, and subsequent investigation reports, should be thoroughly consulted and incorporated into the package of information for the Proposed Development Site for any ground works, to enable any contractors to address as necessary in their risk assessments and working methods.

7.5 RECOMMENDATIONS: GEOTECHNICAL

It is recommended that an intrusive ground investigation with associated testing and monitoring for gas and groundwater should be undertaken across the Proposed Development Site prior to commencement of construction works, to provide insight into the ground and groundwater conditions beneath the Proposed Development Site. This would allow for the safe and economic design of the proposed energy park and access road.

The ground investigation is likely to comprise a combination of both boreholes and trial pits.

It is recommended that in-situ CBR testing is undertaken to allow for the appropriate design of the access road and tracks within the Energy Park Site.

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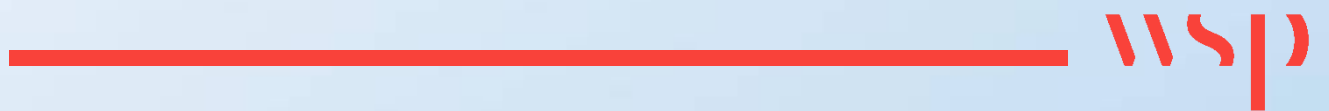
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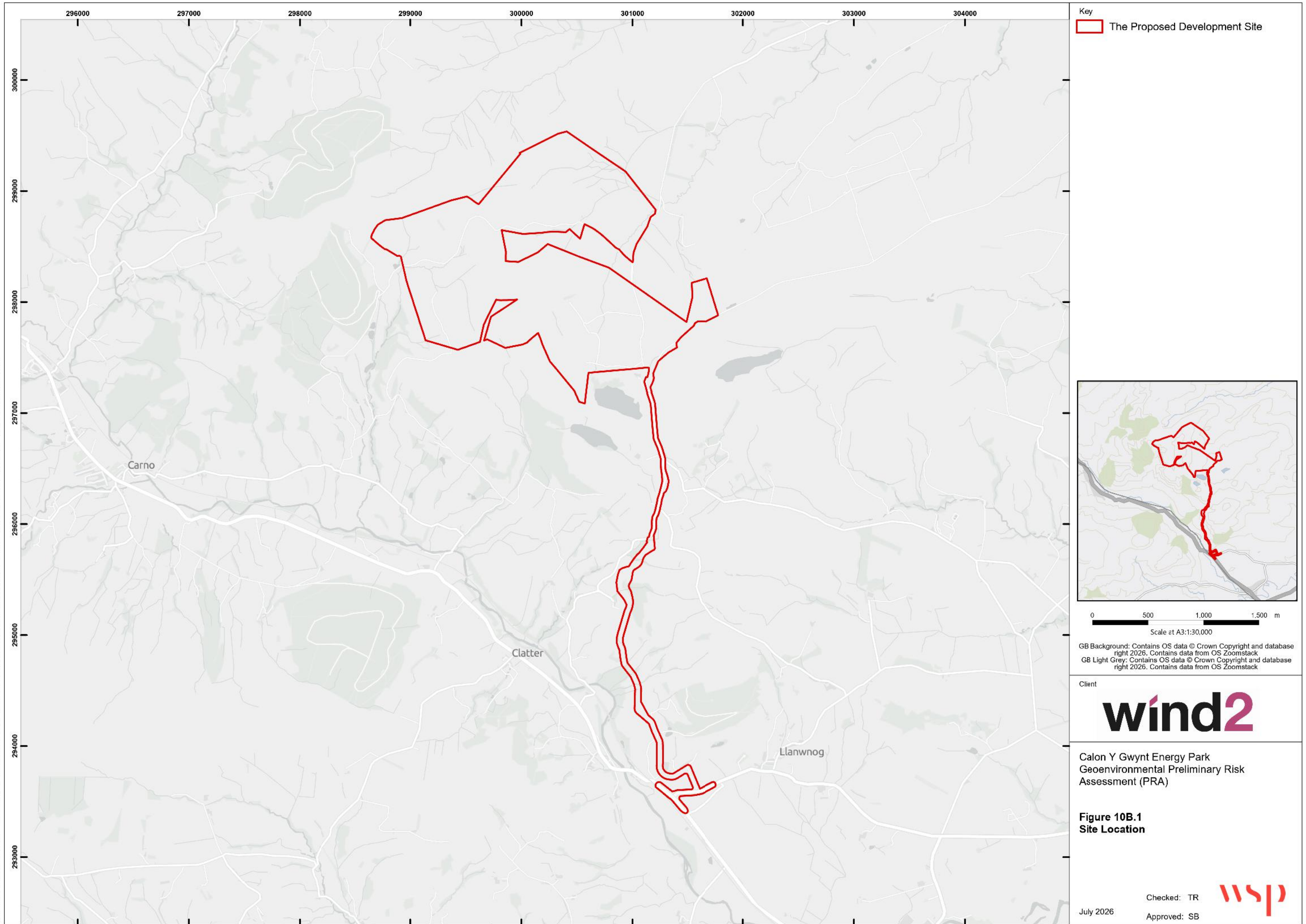
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Annex 10B.1

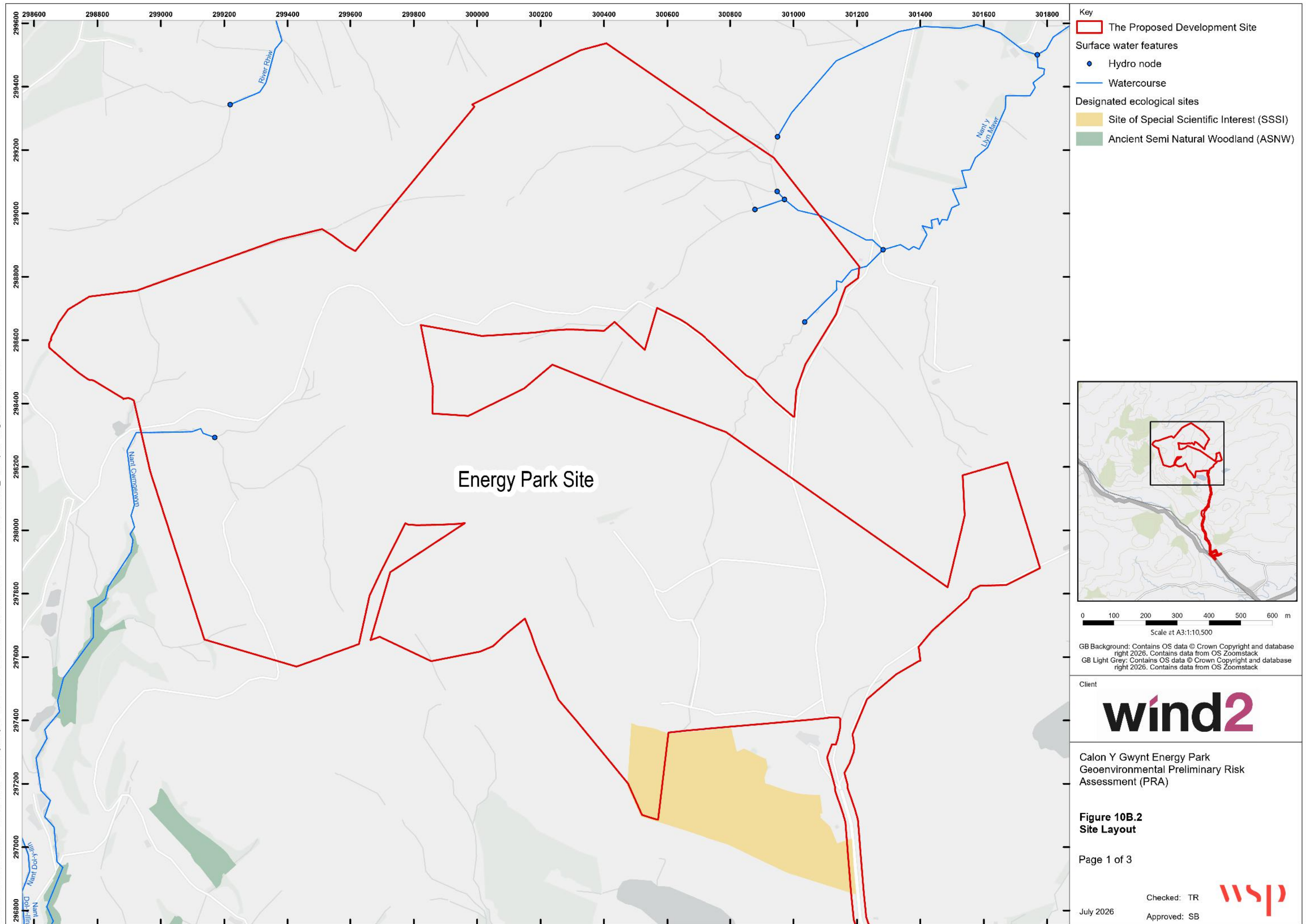
FIGURES



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