



Galileo 03 Ltd.

Mynydd Ty-talwyn Energy Park - Environmental Statement Volume III

Appendix 5.1: Preliminary Risk Assessment

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RSK



Galileo 03 Limited

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Appendix 5.1: Preliminary Risk Assessment

Report no. 323220-R01 (02)

RSK GENERAL NOTES

Project No.: 323220-R01 (02)

Title: Preliminary Risk Assessment: Mynydd Ty-talwyn Energy Park

Client: Galileo 03 Limited

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Rev 03	10/11/2025	Change to solar PV area E	FC	JC

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

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EXECUTIVE SUMMARY

Commissioning and purpose of assessment	RSK Environment Limited (RSK) was commissioned by Galileo 03 Limited to carry out a Preliminary Risk Assessment (PRA) of the land at the proposed Mynydd Ty-talwyn Energy Park, near Fordd-Y-Gyfraith, Bridgend, CF32 0BS (national grid reference: SS 86327 86041). The overall aim of the assessment is to assess potential land contamination sources and geotechnical constraints to the Proposed Development.
DESK-BASED ASSESSMENT	
Site description and proposed development	The Site currently comprises a large number of agricultural fields, interspersed with hedgerows, fences and stone walls, small areas of woodland and farm access tracks. The Site area occupies approximately 578 hectares and is being considered for development as an Energy Park comprising wind turbines and ground mounted solar photovoltaic (PV) modules and infrastructure to connect the wind and solar energy farm to the national grid.
History of Site and surrounding area	The Site has largely remained undeveloped throughout its entire history, except for localised construction of minor structures, tracks, paths and access roads. The Site is located in a former coal mining area with mine entries and shallow quarries on and off-site. The PRA has identified a number of historical landfills. The immediate surrounding area is mainly agricultural, with industrial/commercial and residential areas beyond.
Previous Site investigation (SI) reports	There are no previous Site Investigation (SI) reports available.

Geology and environmental setting	Given the agricultural setting of most areas within the boundary, the Site is likely to be primarily covered by a limited thickness of topsoil, with made ground anticipated to be localised to distinct previously developed areas, such as former small structures, roads and paths. The Site is underlain predominately by the Pennant Sandstone Formation comprising sandstone bedrock with siltstone/mudstone and thin coal seams. This formation overlies the South Wales Coal Measures Group, which is present towards the southern boundary of the Site and comprises coal-bearing mudstones/siltstones and sandstones. The Site is underlain by a Secondary A aquifer relating to the sandstone bedrock (with high vulnerability). Depth to groundwater is unconfirmed. The regional direction of groundwater flow is expected to be in line with local topography/ toward surface waters. It is anticipated that groundwater is shallow in areas of low-lying ground and in areas with potential mine water rebound. A Site of Special Scientific Interest (SSSI) is located adjacent to the south of the Site at Cwm Risca Meadow (B11). No surface water or groundwater abstraction points are located on-site.
Site reconnaissance findings	No obvious signs or sources of on-site contamination were identified during the site walkover. Considering the agricultural nature of the Site and the sheer size of the Site area, there may be small volumes of related chemicals and other materials stored on-site which were not directly observed during the reconnaissance survey.
Geotechnical constraints assessment	The following potential geotechnical constraints were identified: • Silt rich and shrinkable clay soils associated with all siltstone and mudstones and topsoil/subsoils; • Potential compressible and low bearing capacity soils associated with topsoil/subsoils; • Potentially waterlogged ground and/or localised high groundwater table across all areas of low-lying ground and potential mine water rebound; • Potential for geological faults within underlying bedrock geology; • Potential infilled ponds, quarries and gravel pits; underground mining including shafts and adits, as well as potential for unrecorded extraction pits, shafts and adits;

	• Adverse ground chemistry associated with Pennant Sandstone Formation; and • Lateral and vertical variation in ground conditions.
Contamination assessment	The PRA has identified no obvious potential sources of on-site contamination, except for possible use of pesticides and herbicides as a result of the Site's agricultural history and contamination associated with mining related operations including colliery waste. The presence of made ground in some areas is likely, although considered to be limited to minor occurrences, located in previously developed areas such as small structures and tracks; paths and access roads; and associated with historical mining operations. There are a number of former stone/gravel pits as well as quarries within the Site boundary, but it is unknown if any have been infilled. These have the potential to be infilled with unknown material, although it is likely that any infill comprised natural and/or inert soils. Multiple on and off-site landfills were licensed to accept inert and non-biodegradable waste, though their proximity and current inactive status means that low risks may exist for affected areas. Based on the results of the PRA the contaminant linkages that have been identified to be potentially complete (relevant contaminant linkages) and to require further action are: • Migration of ground gases from possible shallow coal workings and accumulation in enclosed spaces resulting in asphyxiation and/or explosion.
Recommendations including issues for further assessment	The following recommendations are made for further assessment of the Site to investigate the risks identified above and/or to address remaining uncertainties (this work would be expected to be completed post-consent, with details subject to a planning condition): • Site-wide shallow intrusive works (likely trial pitting and drive-in sampler boreholes) to determine ground and groundwater conditions across Site and target potential areas of made ground within Proposed Development areas; • Gas monitoring may be required in areas of the Site adjacent to any potentially identified shallow coal mining works to assess baseline concentrations of ground gas (the ES Volume III, Appendix 5.2: Coal Mining Risk Assessment should be consulted for additional details relating to this issue);

- Deeper boreholes may be required to either prove depth to bedrock and/or provide information for use required to facilitate design of the Proposed Development (e.g., piled foundation design) and further investigate the identified potential geotechnical constraints; and
- Deeper boreholes to further assess the existence/extent of shallow workings within the Site boundary, to provide information to determine the most appropriate mitigation measures to address the mining issues at the Site and to investigate the recorded mine entries (the **ES Volume III, Appendix 5.2: Coal Mining Risk Assessment** report should be consulted for additional details relating to this issue).

The information given in this summary is provided for initial briefing purposes only. The summary must not be used as a substitute for the full text of the report.

1 INTRODUCTION

1.1 Commissioning

- 1.1.1 This report has been prepared by RSK Environment Limited (RSK) on behalf of Galileo 03 Ltd (part of Galileo Empower UK Ltd) (hereinafter referred to as 'Galileo' or the 'Applicant').
- 1.1.2 RSK was commissioned by the Applicant to carry out a Preliminary Risk Assessment (PRA) of the land at the proposed Mynydd Ty-talwyn Energy Park, near Fordd-Y-Gyfraith, Bridgend, CF32 0BS ('the Site').
- 1.1.3 The Site is being considered for development for an onshore Energy Park comprising wind turbines, ground mounted solar photovoltaic (PV) modules, a project substation and ancillary infrastructure ('the Proposed Development').

1.2 Objectives

- 1.2.1 The objective of the PRA is:
- To identify any land contamination and/or geotechnical constraints to the Proposed Development; and
 - To identify the need for any additional investigation or remediation works to demonstrate that the Site is suitable for its proposed use.

1.3 Scope of Work

- 1.3.1 The scope of this assessment has been developed in accordance with relevant British Standards and authoritative technical guidance as referenced through the report. The assessment of the contamination status of the Site is in line with the technical approach presented in Land Contamination Risk Management (LCRM) (Environment Agency, 2025, which is applicable in Wales) and in general accordance with BS 10175: 2011 + A2 2017 (BSI, 2017). It is also compliant with relevant planning policy and guidance, with particular reference to Land Contamination: a guide for developers (WLGA, 2017) and NRW's groundwater protection advice.
- 1.3.2 The scope of works for the desk-based assessment has included the following:
- Review of the history of development on the Site and surroundings;
 - Assessment of local geology, hydrogeology and hydrology;
 - Assessment of the potential risks from past, present and future coal mining activities;
 - Review of relevant information held by appropriate statutory authorities;
 - Review of any previous site investigation reports made available;
 - Completion of a Site reconnaissance survey to assess the visual condition of the Site;

- Development of an initial Conceptual Site Model (CSM);
- Preliminary consideration of geotechnical constraints and hazards; and
- Identification of the need for further action, e.g., intrusive investigations, if any.

1.4 Existing reports

- 1.4.1 No existing reports relevant to the Site assessment have been provided to RSK.

1.5 Limitations

- 1.5.1 This report is subject to limitations that may be described through this document, where relevant.

2 SITE DETAILS

2.1 Site Location

- 2.1.1 Site location details are presented in **Table 1** and a Site location plan is provided on **Figure 1**.

Table 1 Site location details

Site name	Mynydd Ty-talwyn Energy Park
Full Site address and Post code	Near Fordd-Y-Gyfraith, Bridgend, CF32 0BS
National Grid reference (centre of site)	SS 86327 86041

2.2 Site Description

- 2.2.1 The Site forms an irregular shape, with undulating topography and covers an area of approximately 578 hectares. A Site boundary plan is shown on **Figure 2**.
- 2.2.2 The land within the Site boundary predominantly consists of agricultural fields (mainly used for pasture), with some area of woodland, interspersed with hedgerows, fences, stone walls and farm access tracks.
- 2.2.3 The main C-Class Road that crosses the Site runs from the north-western corner of the Site and heads in a south-easterly direction before entering Fordd-Y-Gyfraith, immediately east of Wiggleys Fun Farm (and joins on to the main road 'New Road'). Another C-Class Road runs north-south though the Site, near the western boundary, joining New Road in the south.
- 2.2.4 There are a small number of farms and associated buildings on the Site. Cefn Parc Motocross Track is located towards the centre of the Site area.
- 2.2.5 The Site is crossed by public footpaths, including the main trail route of the Glamorgan Ridgeway Walk (Ogwr Ridgeway), that runs in a south-easterly direction, from the north-west corner of Site to the eastern boundary.
- 2.2.6 There are operational (small-scale) wind turbines located within the south of Site.
- 2.2.7 The Site is located in a former coal mining area with associated quarries and adits located within the Site boundary and in the vicinity.

2.3 Surrounding Land Uses

- 2.3.1 The Site is located near the town of Bridgend, within a predominantly rural setting. The Site is located approximately 8 km east of Port Talbot and 4 km north-west of Bridgend.

- 2.3.2 The Site is located in a rural area and therefore the surrounding land use is primarily agricultural, with some areas of woodland including ancient woodland and Craig Yr-Aber Woods Country Park located along the Sites western boundary, and built up areas including some industrial and residential areas beyond. Immediate surrounding land uses are described in **Table 2**.

Table 2 Surrounding land uses

North	North of the Site are numerous agricultural fields and blocks of woodland, and further north are the villages of Llangynwyd and Pont Rhyd-y-cyff. Towards the north-east is the A4063 and industrial area of a Paper Mill (Wepa UK) and location of the former Llynfi Power Station, with the Llynfi River beyond.
East	East of the Site there are numerous agricultural fields and blocks of woodland. The A4063 runs north to south, adjacent to the Llynfi River and cuts through the village of Coytrahen.
South	South of the Site there are agricultural fields and blocks of woodland. New Road runs along the southern boundary of Site, with some associated residential properties. Further south is the M4. The village of Tondu is located towards the south-east and is located less than 2 km north of the town of Bridgend. The Margam Opencast Coal mine is located towards the south-west of Site.
West	West of the Site there are numerous agricultural fields and blocks of woodland, including Craig Yr Aber Woods Country Park, that is adjacent to the western boundary of the main area of the Site.

2.4 Proposed Development

- 2.4.1 It is understood that the Site is intended for development as an Energy Park and will comprise six wind turbines, ground mounted solar photovoltaic (PV) modules, with associated infrastructure to connect the wind and solar energy farm to the national grid.
- 2.4.2 **Figure 3** shows the boundary of the Site and the Proposed Development layout. It should be noted that earlier phases of work relating to this Site were completed with a larger boundary. Therefore, the site walkover involved some locations that are no longer within the Site boundary, and datasets for the Envirocheck report (see **Annex A**) and the Consultants Coal Mining Report (see **Annex D**) were obtained for earlier versions of the boundary.

3 DESK-BASED ASSESSMENT

- 3.1.1 The desktop study was designed to meet the objectives of a preliminary (phase 1) investigation, as defined by BS 10175:2011 + A2 2017 (BSI, 2017) and this assessment relates to LCRM Stage 1, Tier 1 preliminary risk assessment. The "vicinity" of the Site, for the purposes of this report, is defined as locations situated within an approximate 250 m radius of the Site, although certain sources and/or sensitive targets further than 250 m may also have been considered. Data is available for up to 1 km from the Site boundary, so the relevance of any information within this range will have been considered.
- 3.1.2 The study aims principally to identify and assess the potential risks and liabilities associated with contamination of the ground, on and in the vicinity of the Site. While this includes consideration of current operations and housekeeping on the Site, the report does not constitute a comprehensive environmental audit of the Site, as covered under ISO 14001.

3.2 Site History

Historical Development Record

- 3.2.1 The development history of the Site and surrounding area, based upon assessment of historical plans and records is detailed in **Table 3**.
- 3.2.2 Due to its size, the Site and its surroundings have been split into areas A to H (slices). This corresponds to the environmental database report (Landmark, 2023), as displayed on **Figure 4** and referenced in the below report sections.
- 3.2.3 The historical maps reviewed, and the area described, are shown within the environmental database report in **Annex A**.
- 3.2.4 Since the earliest available historic mapping (1876), the Site has undergone little change and comprised mainly fields, heathland/grassland and woodland, with a number of roads, streams and farm buildings. Through time, much of the heathland/grassland has been replaced by agricultural fields. Specific details about the different areas of the Site and surrounding area are shown in **Table 3**. **Figure 5** shows relevant environmental features that have been identified by this review.

Table 3 Summary of historical development

Date from	Date to	Historical Land Use (on-site)	Area of Site (Envirocheck Ref.)
1876	2023	Two small 'old gravel pits' were noted on the western boundary in earliest historic mapping adjacent to the road, which follows the western boundary.	D7

Date from	Date to	Historical Land Use (on-site)	Area of Site (Envirocheck Ref.)
		A Roman camp and intrenchments were noted southwest of area E.	E2, E3
		'Old quarry' present in south of area E4.	E4
		A number of old quarries were noted in the north of the Site, which do not appear to have been backfilled.	E9, E10
		Structures labelled 'British Residence' and 'standing stones' were noted in the north of the Site.	E10
1898	1918	Old tramway in northeast corner of the Site.	E15, E11
1918	1964	'Old coal level' located adjacent to Nant Cefnydfa, in the north of E4 and another in the south-west (east of intrenchments).	E4
		Ton Phillip Colliery noted in the southwest of the Site with 2 main shafts and associated tramway. Noted disused by 1964.	B10
		Coal level noted in southwest corner, connected to Ty-talwyn colliery to the south. Noted disused by 1964.	B13
1942	1993	Old level noted in south edge and southeast of Site.	B12, B16
1963	2023	A number of sites of old huts located around the centre of the Site.	E
1964	1993 (latest 1:2,500 map)	'Old coal level' located adjacent to Nant Cefnydfa, in the north of E4 now labelled with 'Springs', 'Sinks' and 'Issues'. 'Issues' labelled in the southwest of E4 and tank noted in the same area.	E4
Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1884	1995	Woollen Mill/Factory with mill race, disused by 1918. Labelled as Brockfield Mill by 1964.	250 m N (E14)

Date from	Date to	Historical Land Use (on-site)	Area of Site (Envirocheck Ref.)
1884	1999	Old Quarry, possibly not backfilled.	500 m N (E14)
1887	1898	Old Coal Shafts, not labelled.	100 m N (E15)
1918	1963	Ty-Talwyn Colliery, labelled disused by 1963.	100 m W (B9, B13)
1921	1964	Aber-baiden Colliery, noted disused from 1964.	750 m W (A16)
1964	2023	Bridgend Paper Mill with associated tanks.	80 m N (E12)
1964	2023	Settling Ponds, likely related to Llynfi Power Station.	500 m N (E8)
1964	2023	Llynfi Power Station (closed in 1977 and subsequently demolished).	680 m E (F9)
Primary information source: Historical OS maps			
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the Site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>			

- 3.2.5 There has been a minimal level of development on-site, with the exception of coal mining, quarries and landfill use. Overall, the Site has not been subject to significant contaminative land use.
- 3.2.6 It is not clear whether just part of the land functioned as arable farmland, as the majority of land observed during the site walkover (report **Section 4**) was used for grazing. However, in arable farmland areas there may be some level of contamination associated with agricultural industry and the use of pesticides, herbicides and fertilisers.
- 3.2.7 Mining related activities can have environmental impacts that include pollution from machinery and generation of hazardous wastes, including heavy metals, asbestos, polycyclic aromatic hydrocarbons (PAHs), ash, solvents, sulphates and acids, etc., with subsequent erosion issues and quality issues for surface water and groundwater.
- 3.2.8 In addition, it is anticipated that fill material (currently unknown) was used for localised historical excavations and potentially used to backfill quarries and pits. Fill material, for example, has the potential to include brick, ash and clinker and could contain toxic and phytotoxic metals, inorganics, PAHs and asbestos. Based on the layout of the

Proposed Development (see **Figure 3**), there is currently no overlap between these locations and areas of infrastructure.

Unexploded ordnance

- 3.2.9 A review of publicly available unexploded ordnance (UXO) risk maps indicates that the Site is located in an area with low potential for wartime bombs to be present (Zetica, 2023).

3.3 Information from Environmental Database Report

- 3.3.1 Relevant environmental permits and incidents detailed within the environmental database report (see **Annex A**) are summarised in **Table 4**.

Table 4 Summary of Environmental Permits, Landfills and Incidents

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
Agency and hydrological				
Environmental permits – incorporating Environmental Permitting Regulations (EPR) and/ or Pollution Prevention and Control (PPC) permits; former Integrated Pollution Controls (IPC), Local Authority Pollution Control (LAPC)	0	E = 4	B = 1 C = 1 E = 12	Off-site <250 m – Pollution Prevention and Control (PPC) Bridgend Paper Mill, Ref. EP3738NG, issued 17/01/22; Ref. EP3238EC - issued 24/02/14; Ref. SP3431CN - issued 19/07/12; and Ref HP3933F - issued [not supplied] (Envirocheck Ref: E12; NGR: 287810, 187140).
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to	E = 2	E = 2	C = 5 E = 2 F = 11	On-site – Pollution Incidents to Controlled Waters

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
controlled waters, Substantiated pollution incident register, Water Industry Act referrals			H = 12	Cattle Beef Farming, located at Bryn-Y-Fro, A4063. Poor Operational Practice, unknown pollutant (category 3 - minor incident). Ref: 25524, incident date 16/08/95 (Envirocheck Ref: E11; NGR: 287200, 187300). Unknown property type, located at Bryn-Y-Fro. Inadequate Design/Capacity for run-off of crude sewage (category 2 – significant incident). Ref: 21793, incident date: 18/11/94 (Envirocheck Ref: E15; NGR: 287100, 187500). Off-site <250 m – Pollution Incidents to Controlled Waters Unknown property type, located at Llangynwyd. Direct introduction of light oil to controlled water (category 3 – minor incident). Ref: 34528, incident date 12/01/98 (Envirocheck Ref: E12; NGR: 287500, 187100). Unknown property type, located at Paper Mill. Unknown pollutant and incident (category 3 – minor

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
				incident). Ref: 21165, incident date 12/09/94 (Envirocheck Ref: E12; NGR: 287500, 187300).
	0	B = 2	B = 11	Prosecutions Relating to Authorised Processes Off-site <250 m – Cefn Parc Stud Farm, located at Cefn Cribbwr, Bridgend, Mid Glamorgan, CF32 0BP. Knowingly permitting controlled waste (wood, bicycles, electric cables & car parts) to be deposited on land where a licence. Ref: Epa90 S33 & S34, hearing May 2002 and Ref: EPA90 s33(1a) (1b), hearing March 1998 (Envirocheck Ref: B10; NGR: 286190, 184416).
	0	0	B = 3 C = 4 F = 4	Substantiated pollution incident register On-site – No entries Off-site <250 m – No entries

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
Discharge consents	E = 2	B = 3 E = 1	A = 6 B = 20 C = 11 E = 7 F = 14 H = 7	On-site – H F J Veysey Esq, wooden containers sewage discharge, Ref. NRA-SW-2065/1, issued 13/09/90 (Envirocheck Ref: E10; NGR: 286240, 187240). Jones G T, Food Production, trade discharges, Ref. Bk0503101, issued 24/05/63 (revoked 31/10/96) (Envirocheck Ref: E10; NGR: 286612, 187100). Off-site <250 m – Domestic Property sewage discharge, Ref. Bp027810101, issued 27/08/99 (Envirocheck Ref: B12; NGR: 287450, 184310). Park Slip Opencast Coal Site, minewater discharge, Ref: Bb4023903, issued 13/10/77 (expired) and Ref: Bb3020003, issued 11/02/91 (expired) (Envirocheck Ref: B11; NGR: 286800, 184200; and Ref: B12; NGR: 287420, 184230). Domestic Property sewage discharge, Ref. BP027430101, issued 08/12/98 (Envirocheck Ref: E14; NGR: 286600, 188000).

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A <i>Local Authority Landfill Coverage: Bridgend County Borough Council and Neath Port Talbot County Borough Council</i>
Historical / closed landfills	B = 1 E = 1	F = 3	0	On-site – Licence Holder: T Anthony and Sons, at Tondu, Bridgend; EA Waste Ref: 0 Specified Waste Type: Inert, Industrial and Household Waste; First input date: 31/12/90 and last input date: 31/12/92 (Envirocheck Ref: B12; NGR: 287829, 184595). Licence Holder: Not Supplied (Llynfi Power Station), Cwn Nant Gwyn; EA Waste Ref: 0 Specified Waste Type: Not Supplied; First input date: 31/12/80 and last input date: Not Supplied (Envirocheck Ref: E11; NGR: 286792, 187176).

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
				Off-site <250 m – Licence Holder: D Morgan, at Tondy, Bridgend; EA Waste Ref: 34041; Specified Waste Type: Inert Waste; First input date: 01/05/92 and last input date: 31/01/96 (Envirocheck Ref: B11; NGR: 287084, 184499). Licence Holder: W Howells, at Baiden Farm, Bridgend; EA Waste Ref: 34028; Specified Waste Type: Inert Waste; First input date: 31/12/90 and last input date: 31/12/94 (Envirocheck Ref: B15; NGR: 287059, 184865). Licence Holder: Davies Brothers (Corelly Limited), at Cefn Cribbwr, Bridgend; EA Waste Ref: 0 Specified Waste Type: Inert, Industrial, Commercial and Household Waste; First input date: 31/12/80 and last input date: 31/12/84 (Envirocheck Ref: B15; NGR: 287098, 184844).

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
Other waste management licences	0	B = 3 F = 1		Licensed Waste Management Facilities (Landfill Boundaries) On-site – No entries Off-site <250 m – Licence Holder: Morgan, at Tondy, Bridgend; Licence number: 34041; Site category: Landfills Taking Non-Biodegradable Wastes (Not Construction); Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year); Licence Status: Inactive (Envirocheck Ref: B11; NGR: 287084, 184499). Licence Holder: W Howells, at Baiden Farm, Bridgend; Licence number: 34028; Site category: Landfills Taking Non-Biodegradable Wastes (Not Construction); Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year); Licence Status: Inactive (Envirocheck Ref: B15; NGR: 287059, 184865). Second entry with no

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
				details specified for Licence number: 34028 (Envirocheck Ref: B15; NGR: 287065, 184844). Licence Holder: Morgan Credit Lt, at Old Lynfi Power Station; Licence number: 34063; Site category: Landfills Taking Non-biodegradable Wastes (Not Construction); Max Input Rate: Not supplied; Licence Status: Inactive (Envirocheck Ref: F5; NGR: 288571, 186766).
	0	B = 3	F=2	Licenced Waste Management Facilities (Locations) On-site – No entries Off-site <250 m – Licence Holder: W Howells, at Baiden Farm, Bridgend; Licence number: 34028; Licence Status: Surrendered, 31/03/06 (Envirocheck Ref: B15; NGR: 287079, 185027) Licence Holder: Morgan, at Ffordd Y Gyfraith, Bridgend; Licence number: PP3698FN; Licence

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
				Status: Expired, 17/09/92 (Envirocheck Ref: B11; NGR: 287200, 184600) Licence Holder: Morgan, at Bridgend; Licence number: 34041; Licence Status: Expired, date not supplied (Envirocheck Ref: B11; NGR: 287200, 184600)
	B = 1	B = 2	F = 1	Local Authority Recorded Landfill Sites On-site – Location: Cwm Risca Farm; Reference: Not supplied; Authority: Bridgend County Borough Council; Type of Waste: Inert; Last report status: Unknown (Envirocheck Ref: B16; NGR: 287800, 184800) Off-site <250 m – Location: Baiden Farm, Cefn Cribbwr; Reference: Not supplied; Authority: Bridgend County Borough Council; Type of Waste: Inert; Last report status: Unknown (Envirocheck Ref: B15; NGR: 287075, 184837)

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
				Location: Ffordd Y Gyfraith; Reference: Not supplied; Authority: Bridgend County Borough Council; Type of Waste: Inert; Last report status: Closed; (Envirocheck Ref: B11; NGR: 287084, 184503)
	B = 1	B = 3	F = 1	Registered Landfill Sites On-site – Licence Holder: Messrs Anthony, at Cwm Risca Farm, Tondy, Bridgend; Licence ref: 20; Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year); Authorised waste: Natural stone, slate, bricks, soil; Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Cancelled (September 1991) (Envirocheck Ref: B12; NGR: 287860, 184620) Off-site <250 m Licence Holder: W Howells, at Baiden Farm, Tondy, Bridgend; Licence ref: 16.; Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year); Authorised waste: Inert

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
				demolition and natural excavation waste; Status: Site closed (December 1990) (Envirocheck Ref: B15; NGR: 287050, 184950) Licence Holder: Davies Brothers, at Baiden Farm, Tondy, Bridgend; Licence ref: 4.; Max Input Rate: Very Small (Less than 10,000 tonnes per year); Authorised waste: Excavated natural materials, hardcore and rubble and scrap rubber; Status: Superseded (December 1980) (Envirocheck Ref: B15; NGR: 287050, 184950) Licence Holder: D Morgan, at Ffordd Y Gyfraith Farm, Tondy, Bridgend; Licence ref: 22; Max Input Rate: Very Small (Less than 10,000 tonnes per year); Authorised waste: Excavated natural materials, hardcore and rubble and scrap rubber; Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Cancelled (June 1992) (Envirocheck Ref: B11; NGR: 287200, 184550)

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
Contemporary trade directory entries	0	B = 2 C = 1	C = 13 E = 2 F = 1 H = 5	On-site – No entries Off-site <250 m – Name (Classification): Celtic Energy Ltd (Coal Mining); Location: Ffordd-y-Gyfraith, Cefn Cribwr, Bridgend, Mid Glamorgan, CF32 0BS; Status: inactive (Envirocheck Ref: B11; NGR: 286884, 184458). Name (Classification): Falconry Services (Pest & Vermin Control); Location: The Old Stables, Cefn Cribwr, Bridgend, Mid Glamorgan, CF32 0BP; Status: inactive (Envirocheck Ref: B9; NGR: 285819, 184717). Name (Classification): J Irving (Garage Services); Location: New Rd, Tondy, Bridgend, Mid Glamorgan, CF32 0EH; Status: inactive (Envirocheck Ref: C9; NGR: 288164, 184372).

Data type	No. entries on-site & Envirocheck Slice Ref.	No. entries <250 m from Site & Envirocheck Slice Ref.	No. entries >250 m from Site of relevance (up to 2000 m) & Envirocheck Slice Ref.	Details*
Fuel station entries	0	0	C = 1 H = 1	N/A
<i>*Note: Entries have only been included within the table where they are located within a 250 m radius of the Site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

- 3.3.2 The environmental database report has identified licensed waste management facilities/landfill areas associated with Baiden Farm (B15), Ffordd Y Gyfraith Farm (B11), Cwm Risca Farm (B12 & B16), and Llynfi Power Station (E11) that are either on-site or close to the Site boundary (refer to **Figure 4** for locations of Envirocheck segments). Of these, the two that are within the Site boundary (Cwm Risca Farm and Llynfi Power Station) are not within areas of proposed infrastructure. The historical facility at Cwm Risca Farm is approximately 190 m from solar PV area O, and the Llynfi Power Station historical facility is located approximately 200 m from solar PV area E.
- 3.3.3 A number of different licences are listed in the environmental database report, presumably associated with different parts or cells of the landfill. The majority of landfills appear to have been licensed to accept inert/non-biodegradable wastes, with these licences having expired.
- 3.3.4 It appears that all landfills identified on-site are inactive, however, the last reported status for local authority recorded landfill site at Baiden Farm (B15) and Cwm Risca Farm (B16) is unknown.

3.4 Site Services

- 3.4.1 Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the Site or to a receptor. They can also represent significant constraints to development.
- 3.4.2 A full set of service plans was obtained to inform the Proposed Development design, with details provided by BT, National Grid Electricity (distribution and transmission), Wales and West Utilities (gas providers) and Welsh Water.
- 3.4.3 Services including gas mains and overhead electricity cables were identified on-site during the walkover and are detailed in **Section 4**.

3.5 Site Geology

Anticipated geological sequence

- 3.5.1 A review of the available geological maps has been made, which includes:
- British Geological Survey (BGS) map 1-63,360 scale, Sheet 248, Pontypridd, 1963 (solid);
 - British Geological Survey (BGS) map 1-10,560 scale, Sheet 34NW, Pontypridd, 1959 (solid); and
 - British Geological Survey (BGS) map 1-10,560 scale, Sheet 34SW, Pontypridd, 1960 (solid).

- 3.5.2 Published records (as listed above) indicate the majority of the Site to have no superficial deposits and that the bedrock that is present comprises sandstone with siltstone/mudstone layers and coal seams. In some limited locations, superficial deposits are present along the route of surface watercourses, including areas of Devensian Till (diamicton) and Alluvium (clay, silt, sand and gravel) close to the Nant Gadlys tributaries.
- 3.5.3 The bedrock geology across the majority of Site comprises the Pennant Sandstone Formation. The sedimentary bedrock of Carboniferous age is described as green-grey, lithic arenites (Pennant sandstones), with thin mudstone/siltstone layers and seatearth interbeds and mainly thin coals.
- 3.5.4 The Pennant Sandstone Formation can be split into the Brithdir, Rhondda and Llynfi Member. The Llynfi Member sandstone (Pennant Sandstone Formation) overlays the South Wales Coal Measures Group, which are visible towards the southern boundary of Site.
- 3.5.5 The South Wales Coal Measures Group are described as grey coal-bearing mudstones/siltstones with seatearths and minor grey, quartz-rich sandstones, coals and ironstones.
- 3.5.6 The Pen-y-Castell fault is located towards the northern boundary of Site.
- 3.5.7 **Figures 6 to 10** display information relating to the Site geology.
- 3.5.8 Made ground is anticipated to be localised to historical structures and roads (on and off-site), and fill material was placed at known landfill locations on-site. Old quarries are also located on-site; however, it appears that these have not been backfilled and this needs to be confirmed as a part of the works associated with an intrusive Site investigation post-consent, which will be subject to a planning condition.
- 3.5.9 The Site would be expected to be directly underlain by a limited thickness of topsoil/subsoil.
- 3.5.10 A selection of publicly available BGS historical borehole logs are presented in **Annex B**.

Radon

- 3.5.11 Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, and is primarily used to determine whether radon protection measures are needed in residential properties, the maps indicate the likely extent of a local radon hazard in all buildings.
- 3.5.12 The environmental database report indicates that the majority of Site, including the locations of proposed infrastructure, is not located within an 'Affected Area'. An 'Affected Area' is one with 1 % or more existing homes above the radon Action Level of 200 Bq m⁻³, and therefore the risk of significant ingress of radon into structures on-site is considered low and protection measures are not necessary in the construction of non-domestic buildings.
- 3.5.13 However, the environmental database report indicates that some parts of Site (B14, C13, E10, E11) are located within an area where more than 1 % to 3 % of existing homes are above the Action Level (termed an 'Affected Area') and indicates that radon protection

measures are required in new residential properties. Within segment E14, located at the northern edge of Site (with only a small section within the Site boundary, as shown on **Figure 4**), 5 % to 10 % of existing homes are estimated to be at or above the Action Level.

- 3.5.14 Based on the information in the database report, and the location of infrastructure for the Proposed Development, it is not expected that radon will pose a hazard to the Proposed Development.

3.6 Mining and Quarrying

- 3.6.1 For details on evidence of mining and quarrying (including minewater), refer to **ES Volume III, Appendix 5.2: Coal Mining Risk Assessment (CMRA)**, dated November 2025.
- 3.6.2 A Consultants Coal Mining Report dated 28 June 2023 has been obtained and is presented in **Annex D** and discussed fully in the CMRA report.
- 3.6.3 The findings of the site reconnaissance visit are provided in report **Section 4**.

3.7 Hydrogeology

- 3.7.1 A summary of the hydrogeological setting of the Site, with respect to the anticipated geological sequence set out in **Section 3.5**, is presented below in **Table 5**.

Table 5 Summary of hydrogeological setting

Condition	Description
Aquifer characteristics	The Site is underlain by a Secondary A aquifer relating to the sandstone bedrock (High vulnerability).
Depth to groundwater and flow	Depth to groundwater is unconfirmed. It is anticipated that the regional direction of groundwater flow is in line with local topography/ towards surface waters. Due to the elevation of the Site, it is anticipated groundwater will be located at depth, but will be shallow in areas of low-lying ground and in areas with potential mine water rebound.
Rising groundwater levels	The Site is located in a former coal mining area and may be associated with rebounding groundwater levels following the end of mining and associated dewatering (see report Section 3.5).
Groundwater recharge/ attenuation	Most of the Site is currently unsurfaced and will therefore drain to ground.
Licensed groundwater abstractions	The environmental database report indicates that there are no groundwater abstractions on-site. The closest licensed groundwater abstraction borehole is located 22 m northwest of the Site.

Condition	Description
Source protection zones	Information available in the Envirocheck report and DataMapWales website indicates that the Site does not lie within a currently designated groundwater Source Protection Zone (SPZ).

3.8 Hydrology

3.8.1 A summary of the hydrology within the Site area is summarised in **Table 6**.

Table 6 Summary of Hydrology in Site Area

Condition	Description
Surface watercourses/features	A number of ponds, brooks, streams and drainage ditches are present on-site, with watercourses shown on Figure 5 . The environmental database identifies watercourses in the area to generally have a River Quality rating of A (very good) to B (Good).
Surface water abstractions	There are no surface water abstractions identified by the environmental database, within the Site boundary.
Site drainage	Site drains to lower elevations and collects in streams/ponds.
Preliminary flood risk assessment	The indicative floodplain map for the area, shows that the Site does not lie within any designated floodplain, however a number of brooks and streams ('Nants') and springs are located within the Site boundary, Nant Gwyn (located towards the north of Site); and Nant Cefnydfa (located towards the north-east of Site). Off-site there are watercourses within Craig Yr Aber Woods Country Park, which is west of the main Site area (including Nant Criag Yr Aber and Nant Fadog). The Llynfi River is located outside the Site boundary towards the north-east. BGS flood susceptibility plans are provided in the environmental database report (Annex A). In addition, on the Flood Risk Assessment Wales map (Natural Resources Wales) it also shows the risk of flooding from rivers, the sea and from surface water and small watercourses. All areas outside the shaded area are categorised as having a very low chance of flooding. Very low means that each year, this area has a chance of flooding of less than 1 in 1000 (0.1 %). This is the majority of Site. Some areas of Site have potential to increase flood risk locally due to proximity to water features.

Condition	Description
	A Flood Consequence Assessment (FCA) is outside the scope of this report but has been prepared and submitted in support of the application (ES Volume III, Appendix 6.2: Flood Consequence Assessment and Surface Water Drainage Statement).

3.9 Sensitive Land Uses

3.9.1 **Table 7** provides a summary of any environmentally sensitive areas identified within 250 m of the Site based on the environmental database report.

Table 7 Environmentally Sensitive Areas

Feature	Present within 250 m of Site?	Details	Likely pathways from Site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	No	N/A	N/A
National designations – Site of Special Scientific Interest (SSSI, National Nature Reserve (NNR), ancient woodland	Yes	SSSI Off-site, adjacent to boundary: Cwm Risca Meadow (Envirocheck Ref: B11; NGR 287258, 184411) Off-site, the next nearest SSSI is approx 1 km to south-east.	Unlikely
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	No	N/A	N/A
Nearest high sensitivity development, e.g., residential	No	N/A	N/A

4 SITE RECONNAISSANCE FINDINGS

- 4.1.1 A site reconnaissance survey was completed on 13 July 2023 by RSK. The characteristics of the Site observed during the walkover and from current Ordnance Survey maps are summarised in **Table 8**.
- 4.1.2 A Site plan with photographic records and site notes are included in **Annex C**, with the main features identified below.
- 4.1.3 While the walkover summary includes consideration of current operations and housekeeping on the Site as potential sources of contamination, it does not constitute a comprehensive environmental audit of the Site, as covered under ISO 14001.

Table 8 Site Reconnaissance Findings

Feature	Description
Physical Characteristics	
Access constraints	The main C-Class Road that crosses the Site runs from the north-western corner of the Site and heads in a south-easterly direction before entering Ffordd-y-Gyfraith, immediately east of Wiggleys Fun Farm (and joins on to the main road 'New Road'). Another C-road runs north-south through Site, near the western boundary, joining New Road in the south. Both C-roads leading off New Road have a steep incline. These rural lanes currently provide access to the Site. Standard motor vehicles can navigate along these lanes.
	Two mine adit locations are mapped as being present in woodland surrounded by a fence with barbed wire. These areas could only be observed at the fence perimeter (it is estimated that one of these adits is within the Site boundary and one is off-site). However, an entrance (and possible tank structure) could be seen in the vicinity of Adit -287185-001 (on-site, over 180 m from the nearest solar PV area, with the closest turbine approximately 600 m away). No associated mine structures were identified within the vicinity of Adit -287185-002 (possibly just off-site, over 500 m from the nearest solar PV area and 700 m from the nearest turbine location), due to dense woodland and the area sitting at a lower elevation (see Annex D for the Consultants Coal Mining Report and refer to ES Volume III, Appendix 5.2: Coal Mining Risk Assessment for further details).

Feature	Description
Site topography	The Site has variable levels, with some sloping gradients across Site, and notable steep gradients in some locations (see Figure 5). It has been considered that the slopes which are vertical or subvertical are considered steep slopes. These areas correspond to a maximum slope angle of 10 degree from vertical.
	Some evidence of slope erosion at some of the lowest parts of field boundaries. Some notable landslides (slumps) that may be associated with mining works around the two adits (see above for details, including distances from the adits to the solar PV areas or turbines). Some gullying with water runoff was present in some fields.
	The Site and adjacent levels have variable levels. The C-Class Road that crosses the Site runs from the north-western corner of the Site and heads in a south-easterly direction generally follows the highest part of the valley. The surrounding land drops and then rises again at various locations.
Surface cover	All indicative turbine locations, solar PV fields and the substation are located on soft cover.
	The ground surface is generally uneven and undulates from use for crops and pasture and from vehicle movements (tractor), causing ruts predominantly near gate accesses.
Vegetation on-site	Site consists of mainly pasture with some blocks of woodland. Some hedges form field boundaries.
	<i>Evidence for vegetation stress:</i> Not identified during walkover.
	<i>Invasive species:</i> Not identified during walkover. (Although it is noted that invasive species have been identified by others in the Project Team (See ES Volume III, Appendix 10.1: Ecological Baseline Report))
	<i>Any mature trees on-site:</i> Blocks of woodland are located in some areas across Site and adjacent to the Site boundary.
Surface water	Some brooks/streams and drainage ditches are located across the Site.

Feature	Description
Site drainage	The Site drains to lower elevations and collects in streams/ponds.
Existing buildings on-site	There are a small number of farm buildings at the Site.
	<i>Evidence of damage to existing building structures on-site:</i> No evidence of damage from geotechnical issues were identified.
Retaining walls and adjacent buildings on or close to site boundary	None identified.
Basements on-site	No evidence of existing or infilled basements was observed.
Buried and overhead services present	Overhead power cables and underground gas routes are present across sections of the Site. Full-service plans have been obtained to inform the design.
Underground structures	Two adits were picked up in a coal mining report (see the CMRA for more details).
Environmental Characteristics	
Underground/ above ground storage tanks and pipework	None identified.
Potentially hazardous materials storage and use	None observed, however, considering the agricultural land use of the Site there are likely to be chemicals and other materials stored on-site which were not directly observed during the reconnaissance survey.
Waste storage	None observed, however, considering the agricultural land use of the Site there are likely to be waste storage facilities. Also, historical mining activities would have resulted in the generation of colliery waste. The mining material would likely have been deposited locally to the mine entries, however no evidence of this was noted during the walkover.
Fly-tipping	In laybys along the C-Class Roads, some evidence of fly tipping was noted.
Electricity sub-stations/ transformers	None identified.

Feature	Description
Asbestos-containing materials	No obvious asbestos construction materials were observed but a detailed survey of the buildings would be required to confirm the presence or otherwise of asbestos-containing materials.
Evidence of possible land contamination on-site	None identified, however potential sources of contamination on-site associated with agricultural farming, and historical quarries and mining activities.
Potential off-site sources of ground contamination	There are historical quarries located adjacent to the Site. These sites represent the most likely off-site sources of contamination due to their industrial activities and their proximity to the Site. Off-site fly-tipping was noted.

- 4.1.4 No potentially significant on-site land contamination or geotechnical issues were identified during the site reconnaissance survey.
- 4.1.5 Considering the agricultural nature of the Site and the size of the Site area, there may be small volumes of potentially contaminative materials stored on-site which were not directly observed during the reconnaissance survey.
- 4.1.6 A number of the entries of the former adits were not directly observed due to access/safety restrictions (see **ES Volume III, Appendix 5.2: Coal Mining Risk Assessment** for further details relating to coal mining features).

5 PRELIMINARY GEOTECHNICAL CONSTRAINTS

5.1 Design Class

5.1.1 BS EN 1997-1 defines three different Geotechnical Categories that structures may fall into, which are summarised as follows:

- Category 1: Small and relatively simple structures for which it is possible to ensure that the fundamental requirements will be satisfied on the basis of experience and qualitative geotechnical investigations, with negligible risk;
- Category 2: Conventional types of structure and foundation with no exceptional risk or difficult ground or loading conditions; or
- Category 3: Structures or part of structures, which fall outside limits of Geotechnical Categories 1 and 2. Examples include very large or unusual structures; structures involving abnormal risks, or unusual or exceptionally difficult ground or loading conditions; structures in highly seismic areas; structures in areas of probable site instability or persistent ground movements that require separate investigation or special measures.

5.1.2 Based on the information provided above on the Proposed Development and in view of the anticipated ground conditions, a Geotechnical Category 3 has been assumed for the purposes of designing the geotechnical investigation. This should be reviewed at all stages of the investigation and revised where necessary.

5.2 Preliminary Geotechnical Hazards Assessment

5.2.1 A summary of commonly occurring geotechnical hazards associated with the anticipated geology outlined in **Section 3.5** is given in **Table 9** together with an assessment of whether the Site may be affected by each of the stated hazards.

Table 9 Summary of preliminary geotechnical risks that may affect site

Hazard category	Hazard status based on desk study findings and proposed development		Notes from desk study findings <i>(inc. Extracted Environmental data base information, with Envirocheck segment ref., where data available)</i>	Engineering considerations if hazard affects site
	Could be present and/or affect site*	Unlikely to be present and/or affect site		
Sudden lateral changes in ground conditions	☒	☐	Could affect Site. <i>Potential for Collapsible Ground Stability Hazards at following site areas (locations of Areas A to H are shown on Figure 4):</i> <i>A = Hazard potential: Very Low</i> <i>B = Hazard potential: No Hazard to Very Low</i> <i>C = Hazard potential: No Hazard to Very Low</i> <i>D = Hazard potential: No Hazard to Very Low</i> <i>E = Hazard potential: No Hazard to Very Low</i> <i>F = Hazard potential: No Hazard to Very Low</i> <i>G = Hazard potential: Very Low</i> <i>H = Hazard potential: No Hazard to Very Low</i>	Likely to affect ground engineering and foundation design and construction

Hazard category	Hazard status based on desk study findings and proposed development		Notes from desk study findings <i>(inc. Extracted Environmental data base information, with Envirocheck segment ref., where data available)</i>	Engineering considerations if hazard affects site
	Could be present and/or affect site*	Unlikely to be present and/or affect site		
Shrinkable clay soils	☒	☐	Few areas of superficial deposits displayed on geological maps, but may relate to silt-rich/cohesive soils. Some clay was noted during peat surveying work undertaken for the Proposed Development. <i>Potential for Shrinking or Swelling Clay Ground Stability Hazards at following site areas:</i> <i>A = Hazard potential: No Hazard to Very Low</i> <i>B = Hazard potential: No Hazard to Very Low</i> <i>C = Hazard potential: No Hazard to Very Low</i> <i>D = Hazard potential: No Hazard to Very Low</i> <i>E = Hazard potential: No Hazard to Very Low</i> <i>F = Hazard potential: No Hazard to Very Low</i> <i>G = Hazard potential: No Hazard</i> <i>H = Hazard potential: No Hazard to Very Low</i>	Could affect ground engineering and foundation design and construction
Highly compressible and low bearing capacity soils, (including peat and soft clay)	☒	☐	No superficial deposits displayed on geological maps, but may relate to silt-rich/cohesive soils. <i>Potential for Compressible Ground Stability Hazards at following site areas:</i> <i>A = Hazard potential: No Hazard</i>	Likely to affect ground engineering and foundation design and construction

Hazard category	Hazard status based on desk study findings and proposed development		Notes from desk study findings <i>(inc. Extracted Environmental data base information, with Envirocheck segment ref., where data available)</i>	Engineering considerations if hazard affects site
	Could be present and/or affect site*	Unlikely to be present and/or affect site		
			<i>B = Hazard potential: No Hazard</i> <i>C = Hazard potential: No Hazard to Moderate</i> <i>D = Hazard potential: No Hazard</i> <i>E = Hazard potential: No Hazard to Moderate</i> <i>F = Hazard potential: No Hazard to Moderate</i> <i>G = Hazard potential: No Hazard</i> <i>H = Hazard potential: No Hazard to Moderate</i>	
Silt-rich soils susceptible to rapid loss of strength in wet conditions	☒	☐	Potentially relates to all strata (namely mudstone/siltstone).	Likely to affect ground engineering and foundation design and construction
Running sand at and below water table	☐	☒	Potentially relates to all saturated granular soils. <i>Potential for Running Sand Ground Stability Hazards at following site areas:</i> <i>A = Hazard potential: No Hazard</i> <i>B = Hazard potential: No Hazard</i> <i>C = Hazard potential: No Hazard to Low</i> <i>D = Hazard potential: No Hazard</i>	N/A

Hazard category	Hazard status based on desk study findings and proposed development		Notes from desk study findings <i>(inc. Extracted Environmental data base information, with Envirocheck segment ref., where data available)</i>	Engineering considerations if hazard affects site
	Could be present and/or affect site*	Unlikely to be present and/or affect site		
			<i>E = Hazard potential: No Hazard to Low</i> <i>F = Hazard potential: No Hazard to Low</i> <i>G = Hazard potential: No Hazard</i> <i>H = Hazard potential: No Hazard to Low</i>	
Karstic dissolution features (including 'swallow holes' in Chalk terrain)	☐	☒	Associated with carbonate rocks, i.e., limestones. Sandstone, mudstone and siltstones present on-site. <i>Potential for Ground Dissolution Stability Hazards at following site areas:</i> <i>A = Hazard potential: No Hazard</i> <i>B = Hazard potential: No Hazard</i> <i>C = Hazard potential: No Hazard</i> <i>D = Hazard potential: No Hazard</i> <i>E = Hazard potential: No Hazard</i> <i>F = Hazard potential: No Hazard</i> <i>G = Hazard potential: No Hazard</i> <i>H = Hazard potential: No Hazard</i>	N/A

Hazard category	Hazard status based on desk study findings and proposed development		Notes from desk study findings <i>(inc. Extracted Environmental data base information, with Envirocheck segment ref., where data available)</i>	Engineering considerations if hazard affects site
	Could be present and/or affect site*	Unlikely to be present and/or affect site		
Evaporite dissolution features and/or subsidence	☐	☒	Unlikely to be present due to anticipated absence of evaporite deposits.	N/A
Ground subject to or at risk from landslides	☐	☒	Unlikely, across most of the Site area, but may be present due to some areas with steep topography (see Figure 5, which displays slopes greater than or equal to 10°). <i>Potential for Landslide Ground Stability Hazards at following site areas:</i> <i>A = Hazard potential: Very Low to Moderate</i> <i>B = Hazard potential: Very Low to Moderate (High at one location – B13)</i> <i>C = Hazard potential: Very Low to Moderate</i> <i>D = Hazard potential: No Hazard</i> <i>E = Hazard potential: Very Low to High</i> <i>F = Hazard potential: No Hazard</i> <i>G = Hazard potential: Very Low</i> <i>H = Hazard potential: Very Low to Low</i>	N/A

Hazard category	Hazard status based on desk study findings and proposed development		Notes from desk study findings <i>(inc. Extracted Environmental data base information, with Envirocheck segment ref., where data available)</i>	Engineering considerations if hazard affects site
	Could be present and/or affect site*	Unlikely to be present and/or affect site		
Ground subject to peri-glacial valley cambering with gulls possibly present	☐	☒	Unlikely, but may be present due to some areas with steep topography.	N/A
Ground subject to or at risk from coastal or river erosion	☐	☒	Unlikely to be present.	N/A
High groundwater table (including waterlogged ground)	☒	☐	Considered likely to be present across all areas of low-lying ground and potential mine water rebound.	May affect temporary and permanent works
Rising groundwater table due to diminishing abstraction in urban area	☐	☒	Unlikely to be present.	N/A
Geological faults, fissures and break lines	☒	☐	Potential exists for all areas.	May affect ground engineering and foundation design and construction

Hazard category	Hazard status based on desk study findings and proposed development		Notes from desk study findings <i>(inc. Extracted Environmental data base information, with Envirocheck segment ref., where data available)</i>	Engineering considerations if hazard affects site
	Could be present and/or affect site*	Unlikely to be present and/or affect site		
Underground mining including shafts and adits (e.g., coal, mineral)	☒	☐	Potential exists for all areas.	Likely to require further assessment including potentially special stabilisation measures
Effects of extreme temperature (e.g., cold stores or brick kilns/furnaces)	☐	☒	Unlikely to be present.	N/A
Existing sub-structures (e.g., tunnels, foundations, basements, and adjacent sub-structures)	☐	☒	Unlikely to be present.	N/A
Filled and made ground (including embankments, infilled ponds and quarries)	☒	☐	Gravel pits and quarries identified in desk study on-site. Landfills identified during desk study but restricted to boundary locations. Based on the current Proposed Development layout, these are not expected to directly affect infrastructure, with the	Could affect ground engineering and foundation design and construction

Hazard category	Hazard status based on desk study findings and proposed development		Notes from desk study findings <i>(inc. Extracted Environmental data base information, with Envirocheck segment ref., where data available)</i>	Engineering considerations if hazard affects site
	Could be present and/or affect site*	Unlikely to be present and/or affect site		
			closest location being the historical landfill at Cwm Risca Farm, which is approximately 190 m from solar PV area O.	
Adverse ground chemistry (including expansive slags and weathering of sulphides to sulphates)	☒	☐	Potentially affected, e.g., pyrite is a common accessory mineral in sedimentary rocks, particularly in limestone, sandstone and carbonaceous siltstones or shales.	May affect ground engineering and foundation design and construction
Site topography	☒	☐	Site topography variable (see Figure 5 , which displays slopes greater than or equal to 10 °).	May affect ground engineering and foundation design and construction
*Preliminary assessment must be confirmed by intrusive ground investigation <i>Note: Seismicity is not included in the above table as this is not normally a design consideration in the UK.</i>				

6 INITIAL CONCEPTUAL SITE MODEL

- 6.1.1 In the UK land contamination is assessed using a risk-based approach, taking account of the magnitude (severity of the hazard) and likelihood (probability) of occurrence. A 'receptor' is something that could be adversely affected by contamination (e.g., people, an ecological system, property or a water body). A 'pathway' is a route or means by which a receptor is or could be exposed to or affected by a contaminant. A 'contaminant source' is a hazard but it can only pose a risk to a receptor where a pathway is present. The relationship between sources, pathways and receptors are referred to as a CSM. A risk can only be realised where a contaminant source, pathway and receptor are all in place, referred to as a 'pollutant or contaminant linkage'.
- 6.1.2 In line with LCRM (Environment Agency, 2025) and BS 10175: 2011 + A2 2017 (BSI, 2017), the information in the preceding sections has been used to identify hazards (sources of contaminants), receptors that may be impacted and plausible linking pathways. Where all three are present this is termed a potentially complete contaminant linkage and a qualitative risk estimation is made.

6.2 Potential Soil, Soil Vapour and Groundwater Linkages

Potential Sources of Contamination

- 6.2.1 Potential sources of soil and groundwater contamination identified from current activities and the history of the Site and surrounding area are presented in **Table 10**. Ground gas sources are addressed in **Section 6.3**.

Table 10 Potential Sources of Soil and Groundwater Contamination

Potential sources	Contaminants of concern	Distance to areas of built development
On-site		
Agricultural land use	Pesticides, herbicides, fertilisers, fuels, and oils.	Potentially present across entire Site.
Made ground (anticipated to be localised to historical structures, roads and localised areas of historical coal mining).	Unknown fill material but potentially including brick, ash and clinker and containing toxic and phytotoxic metals, inorganics, PAHs, asbestos.	Likely to be present close to farm buildings or tracks. Coal mining infrastructure is generally not located in proximity to areas of built development.
Former quarry or pit (c.1876s to 2023)	Unknown fill material but potentially including brick, ash and clinker and containing toxic	These locations (where recorded) are not close to built development features.

Potential sources	Contaminants of concern	Distance to areas of built development
<i>e.g., old gravel pits (D7) and old quarries (E4, E9, E10) which do not appear to be have been backfilled</i>	and phytotoxic metals, inorganics, PAHs, asbestos.	
Former collieries / mine operations (including potential colliery waste and minewater) <i>e.g. Ton Phillip Colliery (E4)</i>	Heavy metals, asbestos, PAHs, ash, solvents, sulphates, and acids.	Ton Phillip Colliery is approximately 200 m to the south of solar PV areas J, L and K. Shafts and adits are 180 m away from built development at the closest point.
Refuse tips / landfills <i>e.g., refuse tip at Baiden Farm (B15); multiple waste management licences recorded within environmental database report</i>	Inert, industrial and household waste. Landfill leachate including ammoniacal nitrogen, chloride, inorganic and organic contaminants, per- and polyfluoroalkyl substances (PFAS) and other persistent organic pollutants (POPs).	The landfill at Cwm Risca Farm is approximately 190 m from solar PV area O, and the Llynfi Power Station historical facility is approximately 200 m from solar PV area E.
Former Tramway <i>e.g., towards northern site boundary (E11, E15) and associated with colliery, southern site boundary (B10)</i>	Fuel oils, lubricating oils, heavy metals, polychlorinated biphenyls (PCBs), PAHs, chlorinated and other organic solvents, sulphates, pesticides and herbicides.	Located to the north of solar PV area E.
Off-site		
Agricultural land use	Pesticides, herbicides, fertilisers, fuels, and oils.	N/A
Made ground (anticipated to be localised to historical structures roads and localised	Unknown fill material but potentially including brick, ash and clinker and containing toxic and phytotoxic metals, inorganics, PAHs and asbestos.	N/A

Potential sources	Contaminants of concern	Distance to areas of built development
areas of historical coal mining).		
Former commercial/industrial facilities: mill / factory & Llynfi Power Station	Petroleum hydrocarbons, chlorinated solvents, toxic and phytotoxic metals and asbestos.	Approximately 250 m from solar PV area E.
Former collieries / mine operations (including potential colliery waste)	Heavy metals, asbestos, PAHs, ash, solvents, sulphates and acids.	Off-site in all directions (further details are provided in ES Volume III, Appendix 5.2: Coal Mining Risk Assessment).
Refuse tips / landfills	Inert, industrial and household waste. Landfill leachate including ammoniacal nitrogen, chloride, inorganic and organic contaminants, PFAS and other POPs.	Three sites within 250 m of Site boundary, located approximately 240 m west of solar PV areas M and O. See Table 4 for further details.

Sensitive Receptors and Linking Exposure/Migration Pathways

6.2.2 Sensitive receptors identified at or in the vicinity of the Site that could be affected by the potential sources identified above comprise the below, with potential linking pathways are show in brackets for each item:

- **Future site users** – construction workers/operational maintenance workers/members of the public [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, inhalation of vapours from ground water];
- **Current site users** – public open space users, residential, commercial/industrial workers [migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation];
- **Adjacent site users** – public open space users, residential, commercial/industrial workers [migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation];
- **Future buildings, structures and services** – [direct contact with contaminated soils or groundwater and chemical attack];
- **Groundwater in Secondary A aquifers within bedrock deposits** – [leaching from soils/percolation to aquifer];
- **Surface water course (e.g., streams/brooks)** – [lateral migration of dissolved phase/ site run-off/ drainage];
- **Existing/future vegetation** – [direct contact with contaminated soils or groundwater and root uptake leading to phytotoxicity] ; and

- **Ecological receptors – SSSI** – (e.g., Cwm Risca Meadow) [lateral migration of dissolved phase/ site run-off/ drainage/ dust deposition].

- 6.2.3 Ecological receptors are only considered within the CSM in the context of statutory protected sites.
- 6.2.4 Construction workers and future maintenance workers have been identified as receptors, and risks relating to them are considered to be managed through health and safety procedures according to the Construction (Design and Management) Regulations.
- 6.2.5 Where there are potential instances that construction methods may result in short term environmental impacts, these will need to be assessed post-consent, within a construction phase environmental management plan and where required, mitigation measures put in place.

6.3 Potential Ground Gas Linkages

Ground Gas Generation Potential

- 6.3.1 Potential ground gas sources identified for the Site and surrounding are shown in Table 11.

Table 11 Potential Ground Gas Sources (Excludes Mine Gas)

Potential sources	Indicative ground gas generation potential (CIEH, 2008)	Additional information
On-site and Off-site		
Made ground with low degradable organic content (e.g., up to 5 % organic material and no easily degradable waste).	Very low	There may be made ground associated with the roads that cross the Site and some of the adjacent buildings, as well as potentially some of the disused pits and quarries.
Natural soil with a high degradable organic content	Low	Soil quality unknown.
Landfill mid-1960s to early 1990s	Low	Majority of landfill licences are for inert waste. None of the landfill facilities are licensed to take biodegradable waste.

- 6.3.2 The assessment has identified potential sources of ground gases, notably a number of potentially infilled quarries and gravel pits, within the top/sub-soil and landfill associated with four main facilities.
- 6.3.3 The on-site former quarries and gravel pits are fairly small, and it is unknown if they have actually been backfilled. If backfilled, it is presumed to have been with inert and/or natural materials. Individually, especially given their distribution across the Site, they are not considered to pose a significant source of ground gases.
- 6.3.4 Waste management/landfill areas area associated with four main facilities:
- Cwm Risca Farm (B12/B16), on-site; Inert (industrial and household waste) e.g., Natural stone, slate, bricks and soil;
 - Tondu, Bridgend (B12), on-site; Inert, industrial and household waste);
 - Llynfi Power Station (E11), on-site: Non-biodegradable wastes (not construction);
 - Baiden Farm (B15), off-site to the west approximately 178 m; Inert waste/non-biodegradable wastes (not construction) e.g., inert demolition and natural excavation waste and excavated natural materials, hardcore and rubble and scrap rubber; and
 - Ffordd Y Gyfraith Farm (B11), off-site to the west approximately 89 m; Inert Waste/Non-biodegradable wastes (not construction), e.g., excavated natural materials, hardcore and rubble and scrap rubber.
- 6.3.5 Inert landfills are shown to have a very low generation potential in BS 8576. Given their location/proximity to Site and to developable areas (on-site, the landfill at Cwm Risca Farm is approximately 190 m from solar PV area O, and the Llynfi Power Station historical facility is approximately 200 m from solar PV area E; off-site, the historical landfills located around Baiden Farm are approximately 240 m from solar PV areas M and O), any impact from such material would be limited, and thus the potential for generation of ground gases would be considered to be low.
- 6.3.6 Low and very low ground gas general potential sources do not pose a risk to the Proposed Development and have not been taken forward to the PRA risk table (see **Table 13**).

Preferential Pathways for Ground Gas Migration

- 6.3.7 Credible preferential pathways potentially connecting the source and receptor through vertical and lateral migration are:
- Geology of the bedrock formation which is likely to be permeable (i.e., site underlain with sandstone with siltstone and mudstone);
 - Faults/fissures/fractures in the underlying geology of the Pennant Sandstone Formation;
 - Building foundations, piled foundations and vibro-stone columns;
 - Construction joints and cracks within building structure;
 - Utility routes and service penetrations into buildings;

- Mine shafts and adits; and
- Mine workings extending laterally.

Sensitive Receptors and Linking Pathways

- 6.3.8 Sensitive receptors identified at or in the vicinity of the Site that could be affected by the potential ground gas sources identified above comprise:
- **Future site users** – construction/operational maintenance workers/members of the public [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation];
 - **Current/adjacent site users** – residential users, commercial/industrial workers [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation]; and
 - **Current/future buildings and services** [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion].
- 6.3.9 The assessment has identified receptors to include building structures and proposed end-users.
- 6.3.10 Construction workers and operational maintenance workers have been identified as receptors, and will be protected by undertaking appropriate risk assessments and managing risks through health and safety procedures and the use of PPE.

6.4 Coal Mining Issues

- 6.4.1 There are abandoned mine shafts and mine adits present on-site, with the potential for areas of shallow workings and the potential for hazardous ground gases.
- 6.4.2 **ES Volume III, Appendix 5.2: Coal Mining Risk Assessment** (November 2025) provides full details on the known mining relating issues at the Site.

6.5 Potential Mine Gas Linkages

Potential Mine Gas Sources

- 6.5.1 The potentially significant sources of mine gas associated with the area of the Site are as follows:
- Desorption of gas from coal and rocks – predominantly methane;
 - Oxidation of coal – carbon dioxide and oxygen depletion, also methane and ethane and carbon monoxide at higher temperatures;
 - Decomposition (aerobic) of old wood (e.g., pit props) – carbon dioxide (likely minor source);
 - Acidic mine water drainage reacting with carbonate in rocks around a seam or shaft or in surface mine backfill – carbon dioxide; and
 - Gases that are naturally present – radon.

Preferential Pathways for Mine Gas Migration to near Surface

- 6.5.2 Credible preferential pathways potentially connecting mine gas sources at depth and near surface are as follows:
- Unsealed shafts or adits connected to unflooded workings;
 - Unsealed site investigation boreholes connected to unflooded workings;
 - Fractured rock above shallow workings;
 - Fault zones connecting to unflooded workings;
 - Vibro-stone column or other deep foundations, e.g., certain pile types;
 - Deep drainage or soakaways (drainage trenches and networks may also allow shallow lateral migration); and
 - Permeable backfill to surface mines and shafts below backfill.
- 6.5.3 The geology and mining history within the vicinity of the Site suggests that a source of mine gas may be present below the Site associated with:
- Geological strata – Pennant Sandstone Formation;
 - Known coal seams and outcrops include the Brither Rider, No.1-No.3 Rhondda, Haford and Five-foot coal seams;
 - Known workings – within the Coal Mining Consultants Report (2023), the shallowest underground mine worked on-site is 246 m below ground level (bgl). A number of coal outcrops are also noted, so possible shallower coal abstraction present on-site; and
 - Known mine entries – within the Coal Mining Consultants Report (2023) (see **Annex D**), two adit locations were identified. These include adit 287185-001 (NGR 287449 185666) which is on-site and adit 287185-002 (287680 185880), which is very close to the site boundary, but just outside the Site (the former is over 180 m from the nearest solar PV area, with the closest turbine approximately 600 m away; the latter is over 500 m from the nearest solar PV area and 700 m from the nearest turbine location). Additional mine entries are present in the wider area (identified on the BGS interactive Mining Remediation Authority [formerly the Coal Authority] map).
- 6.5.4 For details on evidence of mining and quarrying, refer to **ES Volume III, Appendix 5.2: Coal Mining Risk Assessment** (November 2025).
- 6.5.5 Drivers for gas migration that may or may not be present are as follows:
- Changes in barometric pressure causes expansion or contraction of gas in mine workings;
 - Rising groundwater pushing gas out of ground via shafts, faults or fractured rock;
 - Thermal gradient; and
 - Climate change effects.

Sensitive Receptors and Linking Pathways

- 6.5.6 Sensitive receptors identified at or in the vicinity of the Site and linking pathways into building are as **Section 6.2.3**.

Mine Gas Risk Zoning

- 6.5.7 The following initial assessment of potential coal mine gas risk has been informed by a review of information provided in **Section 3.4** and **3.5** and has been undertaken in general accordance with guidance presented in 'Good Practice for Risk Assessment for Coal Mine Gas Emissions' (CL:AIRE, 2021). A summary of the decision support tool for mine gas risk assessment is provided in **Table 12**.

Table 12 Summary of Coal Mine Gas Risk Zoning (CL:AIRE, 2021)

Mine gas risk zone	Site condition			
	Distance between mine entry and nearest built development feature	Workings	Pathways	Shallow workings
Negligible	>50 m from built development feature	>150 m depth	No other faults or potential pathways connecting deeper unflooded workings are identified	Site is outside area of past or probable shallow workings on the Mining Remediation Authority viewer.
Low	Mine entries >50 m from built development feature	Between 30 m and 150 m depth and permanently flooded or covered by at least 10 m of low permeability (1×10^{-6} m/s hydraulic conductivity) deposits		
Moderate	20 m to 50 m from built development feature	Unflooded and between 30 m and 150 m depth		

Mine gas risk zone	Site condition			
	Distance between mine entry and nearest built development feature	Workings	Pathways	Shallow workings
High	Within footprint of built development feature, or closer than 20 m	<30 m depth and unflooded or variable water levels	Faults or other pathways connecting surface to deeper unflooded workings identified	Site is within area of past or probable shallow workings on the Mining Remediation Authority viewer
<i>Note: this table has been adjusted from the CL:AIRE guidance to relate to the nearest built development feature, as opposed to the Site boundary</i>				

- 6.5.8 Based on the evidence collected and in general accordance with the CL:AIRE guidance (2021), at this stage the areas of the Site where built development will be located are identified to be within the **Moderate** risk zone.
- 6.5.9 This is due to the presence of coal workings and adits located within the Site boundary and known faults that have potential to connect surface to deeper workings.
- 6.5.10 However, the Site is only confirmed to have deep underground mining workings (>150 m depth). It is likely that these mine workings are flooded but this is unconfirmed. If mine workings are flooded, they have a very low generation potential, however, no conclusive evidence for this is available.
- 6.5.11 Further data will be collected post-consent, to define what actions and investigation are required in relation to flooding/shallow coal workings, as well as agreeing whether a mine gas risk assessment will be necessary (this will be decided in consultation with the Mining Remediation Authority).

6.6 Preliminary Risk Assessment

- 6.6.1 The preliminary risk assessment findings and potentially complete contaminant linkages are shown in **Table 13**. The risk classification based on the combination of hazard consequence and probability using a risk matrix from CIRIA C552 (Rudland et al., 2001), a summary of which is included in **Annex E**. This relates to Tier 1 preliminary risk assessment in LCRM (Environment Agency, 2025).

Table 13 Risk estimation for Potentially Complete Contaminant Linkages

Risk matrix		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Potential Contaminant	Potential receptor	Possible pathway	Likelihood	Severity	Risk and justification
On-site contamination associated with localised areas of made ground (and fill) or agricultural land use <i>Sources:</i> <i>Agricultural land use</i> <i>Made ground (anticipated to be localised to historical structures, roads and localised areas of historical coal mining)</i> <i>Former quarry or pit (unknown if backfilled)</i> <i>Former collieries / mine operations</i>	Current Site users – public open space users, residential, commercial/ industrial workers <u>AND</u> Future site users – construction/ operational maintenance workers/public	Direct contact, oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, and inhalation of vapours from groundwater	Unlikely	Medium	Low. The future land use will comprise an Energy Park with wind turbines and solar PV panels and ancillary infrastructure throughout the fields, in what is likely to be a largely unmanned site. Any attendance by site workers is thought to be sporadic and most likely associated with the maintenance of the wind turbines and solar panels, or recreational users, thus reducing the potential for direct contact with soil. Additionally, due to the largely undeveloped nature of the Site and the exclusion of areas with any buildings located on them, made ground is not anticipated to be widespread or

Potential Contaminant	Potential receptor	Possible pathway	Likelihood	Severity	Risk and justification
<i>Refuse tips / landfills</i> <i>Former tramway</i>					abundant except in localised areas (normally in proximity to farm buildings or along existing farm tracks, and potentially associated with historical mining features).
	Adjacent Site users – public open space users, residential, commercial/ industrial workers		Unlikely	Medium	Low. Migration of contaminants via wind deposit in sufficient quantities as to be harmful is considered unlikely, especially considering that significant quantities of made ground is not anticipated. Additionally, the depth to groundwater is anticipated to be at depth (unconfirmed). No obvious pathways with Site in current condition. Development work may release dust or airborne fibres, but any adverse effects can be mitigated with dust suppression etc.
	Future buildings, infrastructure and services	Direct contact with contaminated soils or groundwater, and chemical attack	Low likelihood	Mild	Low. Any contamination or made ground is likely to be localised and limited in extent and may be removed as part of future earthworks. The presence of significant made ground is not confirmed. Significant quantities of contaminated material which could affect

Potential Contaminant	Potential receptor	Possible pathway	Likelihood	Severity	Risk and justification
					building fabric of proposed development is considered unlikely.
	Groundwater in Secondary A aquifers within bedrock deposits	Percolation through permeable strata to aquifer	Low likelihood	Mild	Low. The presence of significant made ground is not confirmed. Significant quantities of contaminated material which could leach and adversely affect groundwater is considered unlikely and will only be likely where groundwater levels are higher than 5 m. Across the majority of the Site, groundwater is anticipated to be at greater depths due to elevated topography. The Site does not lie within a groundwater source protection zone.
	Surface water receptors	Lateral migration of groundwater through soils/bedrock and run-off/ field drains	Low likelihood	Medium	Low. Surface watercourses are present, i.e., streams/brooks on-site. Any sources of contamination could migrate to nearby watercourse through lateral migration in surface deposits or surface water flow across possibly saturated ground. Sources of contamination (if any) are thought to be relatively small and localised and therefore possible impact to surface watercourses and downstream receptors would be limited.

Potential Contaminant	Potential receptor	Possible pathway	Likelihood	Severity	Risk and justification
	Existing/ future vegetation	Direct contact - Uptake of contaminants by vegetation	Low likelihood	Mild	Low. No vegetation die-back or discolouration was observed during the Site walkover (inc. field cops and wooded areas). Therefore, the risks to vegetation is considered low. Limited areas of vegetation may come into contact with shallow, potentially contaminated soils. Any contamination or made ground is likely to be localised and limited in extent and may be removed as part of future earthworks.
	Ecological receptors – SSSI	Direct contact and uptake by plants (root uptake)	Low likelihood	Mild	Low. Any contamination or made ground is likely to be localised and limited in extent and may be removed as part of future earthworks. SSSI (located near the Site boundary at Envirocheck segment B11) is at sufficient distance from nearest solar PV area to ensure that the risks to the SSSI area are considered low.
Off-site contamination associated with localised areas of made ground (and fill) or agricultural land use <i>Sources:</i> <i>Agricultural land use</i>	Future Site users – construction/ operational maintenance workers	Lateral migration and oral, dermal and/or inhalation exposure with impacted soil, soil vapour and dust,	Unlikely	Medium	Low. The Site is not anticipated to be a manned facility and therefore prolonged exposure to any potential contaminants is considered unlikely. In addition, the depth to groundwater is anticipated to be in excess of 3 m bgl (unconfirmed), and

Potential Contaminant	Potential receptor	Possible pathway	Likelihood	Severity	Risk and justification
<i>Made ground (anticipated to be localised to historical structures and roads)</i> <i>Former commercial/industrial facilities: Mill / factory / Llynfi Power Station</i> <i>Former collieries / mine operations</i> <i>Refuse tips / landfills</i>		and inhalation of vapours from groundwater.			therefore exposure to impacted vapours is deemed unlikely. Proximity off-site sources and indicative turbine locations is large. Therefore, the risks to future Site users are considered low.
Hazardous ground gases include carbon dioxide and methane, generated in possible shallow coal workings <i>Sources:</i> <i>Former collieries / mine operations (on-site and off-site)</i>	Future Site users – construction/ operational maintenance workers AND proposed structures (future buildings and infrastructure)	Migration and inhalation of soil gas via permeable shallow geology - build up in confined spaces followed by Asphyxiation and possible explosion.	Unlikely (no permanent manned structures)	Severe	Moderate/low. Although considered unlikely, if a pathway exists there is a potential for a risk of asphyxiation (from carbon dioxide) if gas concentrations build up in confined spaces or explosion if there is a build-up of methane. Proposed Development is understood to comprise an unmanned Energy Park.

6.6.2 Potentially complete contaminant linkages with a potential risk of moderate to low or higher identified in **Table 13** comprise:

- Migration of ground gases from possible shallow coal workings and accumulation in enclosed spaces resulting in asphyxiation and/or explosion – this potential linkage will be considered further during post-consent, following intrusive site investigation work, and will require consultation with the Mining Remediation Authority to agree the approach. It may not be necessary to undertake further work relating to this issue if there are no enclosed spaces (requiring entry by personnel) to be located close to areas of possible shallow coal workings. If an intrusive investigation and subsequent gas monitoring does identify a risk, it may be possible to address this using mitigation measures.

6.6.3 The potentially complete contaminant linkage needs to be assessed further through appropriate site investigation post-consent, to target the identified sources of potential contamination and assess the feasibility of identified pathways.

6.7 Data gaps and uncertainties

6.7.1 Key data gaps and uncertainties identified in the CSM at desk study stage include:

- Gaps in available historical OS maps (but overall, not seen as an issue as only minor development has occurred on-site);
- Due to the large nature of the Site, it is highly likely that areas of the Site were not observed by the RSK engineer during the Site reconnaissance survey;
- There are no previous investigations available for the Site, therefore no information on actual concentrations of contaminants in soil and groundwater or ground gas at this stage;
- Groundwater depth and flow direction are conceptual at this stage;
- The condition of mine entries on or near the Site is not known; and
- Mine workings have been identified below the Site but the potential for these to be permanently flooded and for connecting pathways is not known.

6.7.2 It should be noted that the issues noted above are typical for an assessment of this nature and at this stage of the Site development works. Based on the information that has been reviewed as part of this PRA, sufficient information has been available to undertake a robust assessment to allow the requirements of an intrusive Site investigation to be determined, should planning permission be granted.

7 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 Geo-environmental Assessment

- 7.1.1 The PRA has identified no obvious potential sources of on-site contamination, except for the potential use of pesticides and herbicides as a result of the agricultural history of the Site, and contamination associated with mining related operations including colliery waste.
- 7.1.2 The presence of made ground in some areas is likely, although considered to be limited to minor previously developed areas such as small structures and tracks, paths, access roads and localised areas of historical coal mining.
- 7.1.3 There are a number of former stone/gravel pits and quarries, but it is unknown if any have been infilled. These have the potential to be infilled with material that could act as a source of contamination, although infill could comprise natural and/or inert soils, there is also the potential for contaminative materials to be present.
- 7.1.4 Multiple on and off-site landfills were licensed to accept inert and non-biodegradable waste, although their proximity and current unactive status means that low risks may exist for affected areas.
- 7.1.5 The majority of the features noted to be present are not directly within the areas of the built development.
- 7.1.6 Based on the results of the PRA, the contaminant linkages that have been identified to be potentially complete (relevant contaminant linkages) and to potentially require further action post-consent are:
- Migration of ground gases from possible shallow coal workings and accumulation in enclosed spaces resulting in asphyxiation and/or explosion.
- 7.1.7 Data gaps and uncertainties have been considered within the assessment and considered as a part of any recommended next steps.
- 7.1.8 Should unforeseen contamination be encountered during redevelopment then specialist advice should be sought to determine the appropriate course of action.

7.2 Geotechnical assessment

- 7.2.1 The key findings of the initial geotechnical assessment are as follows:
- Silt rich and shrinkable clay soils associated with all siltstone and mudstones and topsoil/subsoils;
 - Potential compressible and low bearing capacity soils associated with topsoil/subsoils;
 - Potentially waterlogged ground and/or localised high groundwater table across all areas of low-lying ground and potential mine water rebound;
 - Potential for geological faults within underlying bedrock geology;

- Potential infilled ponds, quarries and gravel pits;
- Underground mining including shafts and adits and quarries, as well as potential for unrecorded extraction pits, shafts and adits;
- Adverse ground chemistry associated with Pennant Sandstone Formation; and
- Lateral and vertical variation in ground conditions.

7.3 Recommendations

7.3.1 The following recommendations are made for further assessment of the Site to investigate the risks identified above and/or to address remaining uncertainties. This work will be completed post-consent, with details subject to a planning condition:

- Site-wide shallow intrusive works (likely trial pitting and drive-in sampler boreholes) to determine ground and groundwater conditions across Site and target potential areas of made ground within proposed developable area;
- Deeper boreholes may be required to either prove depth to bedrock and/or provide information for use required to facilitate design of the Proposed Development (e.g., piled foundation design) and to further investigate the identified potential geotechnical constraints;
- Deeper boreholes to further assess the existence/extent of shallow workings within the Site boundary, to provide information to determine the most appropriate mitigation measures to address the mining issues at the Site and to investigate the recorded mine entries; and
- Gas monitoring may be required in areas of the Site adjacent to any potentially identified shallow coal mining works to assess baseline concentrations of ground gas.

REFERENCES

Previous SI reports and other Site related information

Coal Mining Risk Assessment (CMRA), Mynydd Ty-talwyn Energy Park, RSK report reference 323220-R02 (01), issued March 2025.

Consultants Coal Mining Report, Mynydd Ty-talwyn Energy Park, CA reference 71009601103001, issued 28 June 2023

Standards and guidance

British Geological Survey (BGS) (2023), Coal Authority Interactive Map, <https://mapapps2.bgs.ac.uk/coalauthority/home.html>, accessed July 2023

BRE (2015). Radon – Guidance on protective measures for new buildings, Chris Scivyer, BRE Report BRE 211. BRE Group, 2015.

British Standards Institution (BSI) (2017), 'BS 10175:2011 + A2:2017. Investigation of potentially contaminated sites: Code of practice'.

CL:AIRE (2021), Good practice for risk assessment for coal mine gas emissions. CL:AIRE, November 2021.

Data Map Wales (2023), <https://data.ap.gov.wales>, accessed July 2023

Defra (2012), Part IIA of the Environmental Protection Act 1990, Contaminated Land Statutory Guidance, April 2012.

Environment Agency (2021a), Land contamination risk management, <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>, June 2025.

Landmark Information Group (2023), Envirocheck report reference 314023019_1_1, dated 11 July 2023.

Natural Resources Wales (2023), <http://naturalresources.wales>, accessed July 2023.

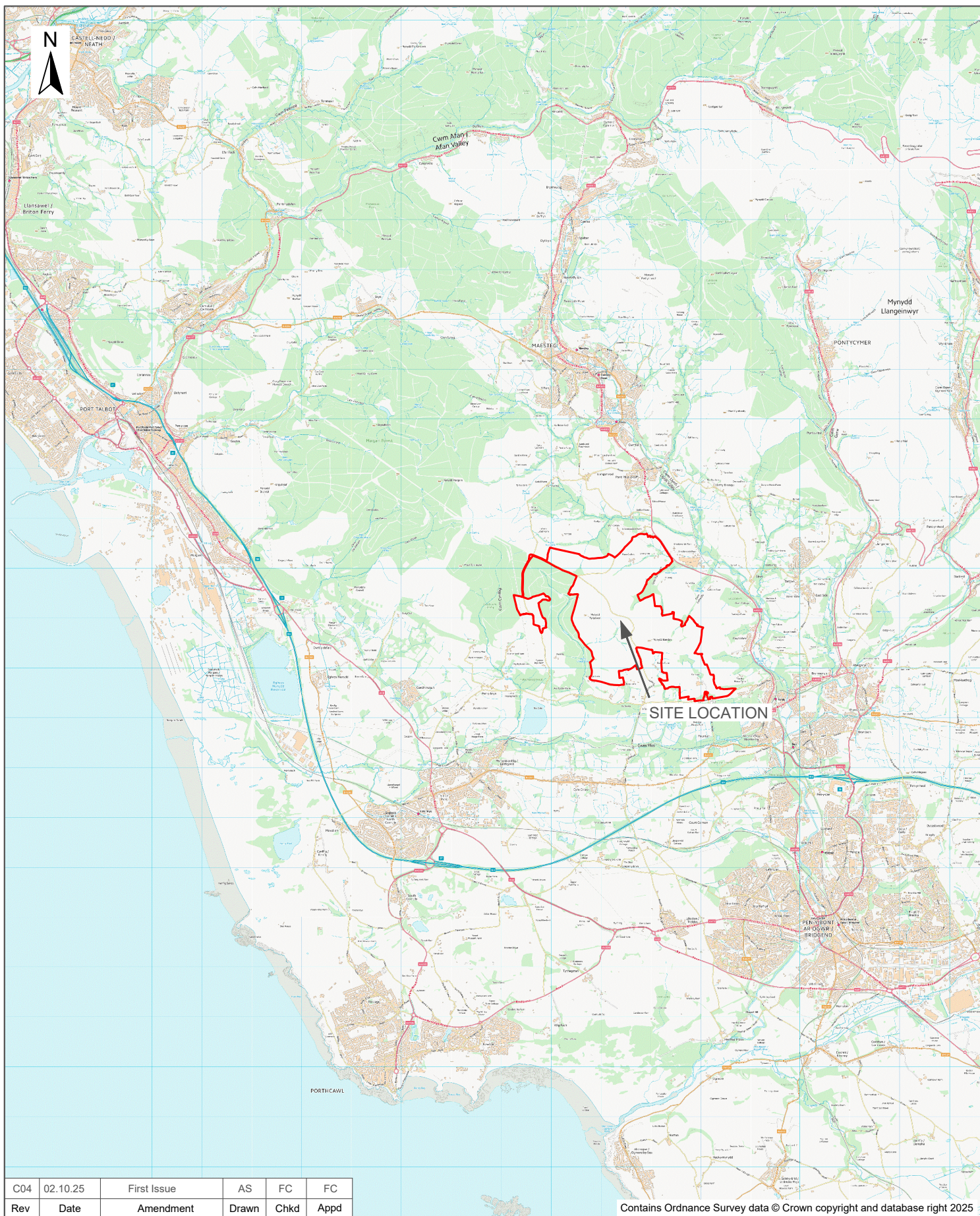
Part IIA of the Environmental Protection Act (Contaminated Land Regulations (England)) 2002.

Rudland, D. J., Lancefield, R. M. and Mayell, P. N. (2001), CIRIA C552. Contaminated Land Risk Assessment: A Guide to Good Practice.

UK Water Industry Research, (2010), UKWIR Report 10/WM/03/21. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites.

Zetica (2023). Unexploded bomb risk map. Reviewed 18 July 2023.

FIGURES



C04	02.10.25	First Issue	AS	FC	FC
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Legend

— Site boundary

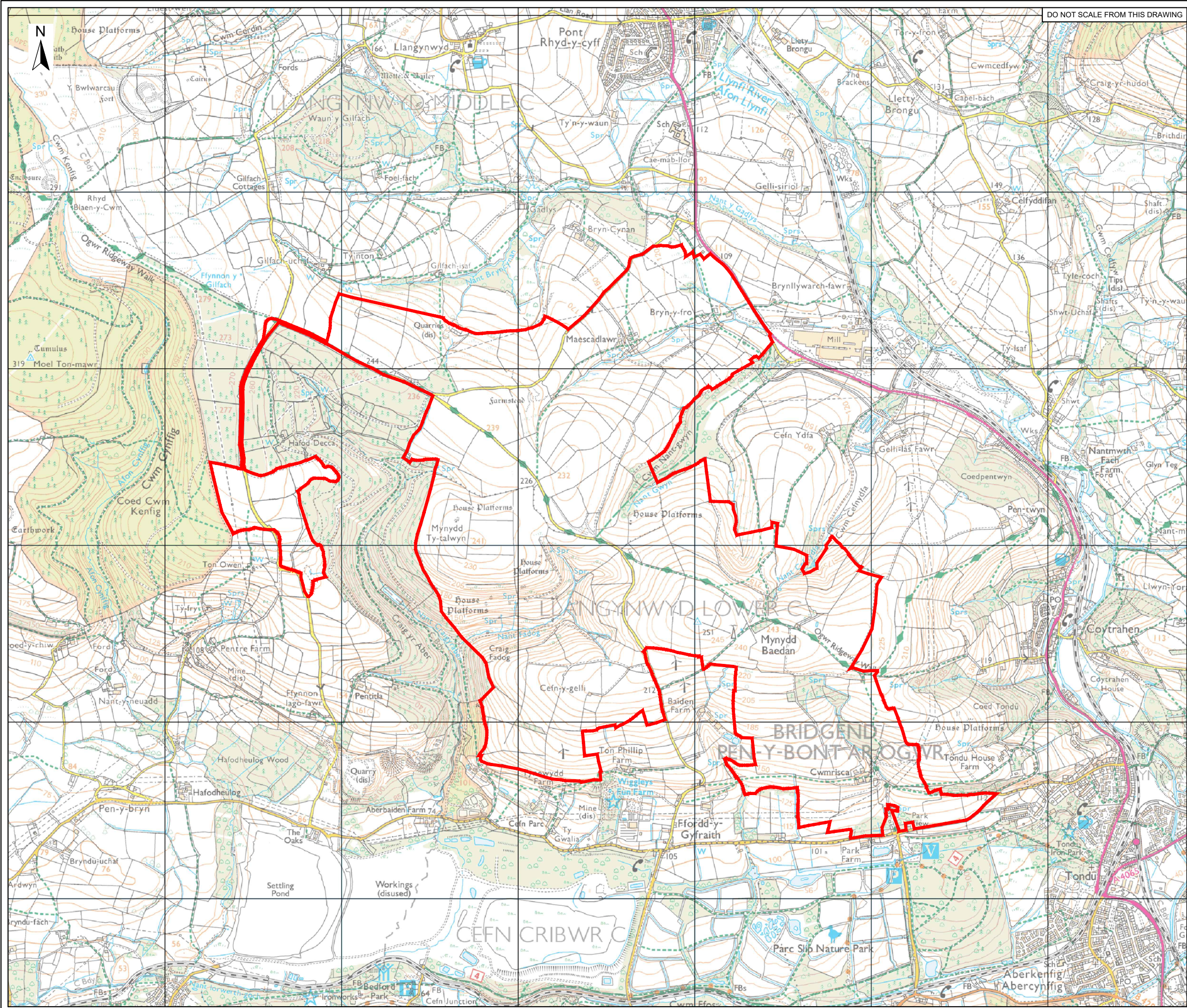
Project Name

Mynydd Ty-talwyn Energy Park

Description

Site Location Plan

Dimension m	Size A4	Scale 1:25,000	Geolocation 286400, 186020	Project ID 323220	Drawing no. 11101	Rev C04	File name 323220-HE-111-SS-D-C-11101-C02
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LEGEND

Site boundary

Notes:

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Project Name
Mynydd Ty-talwyn Energy Park

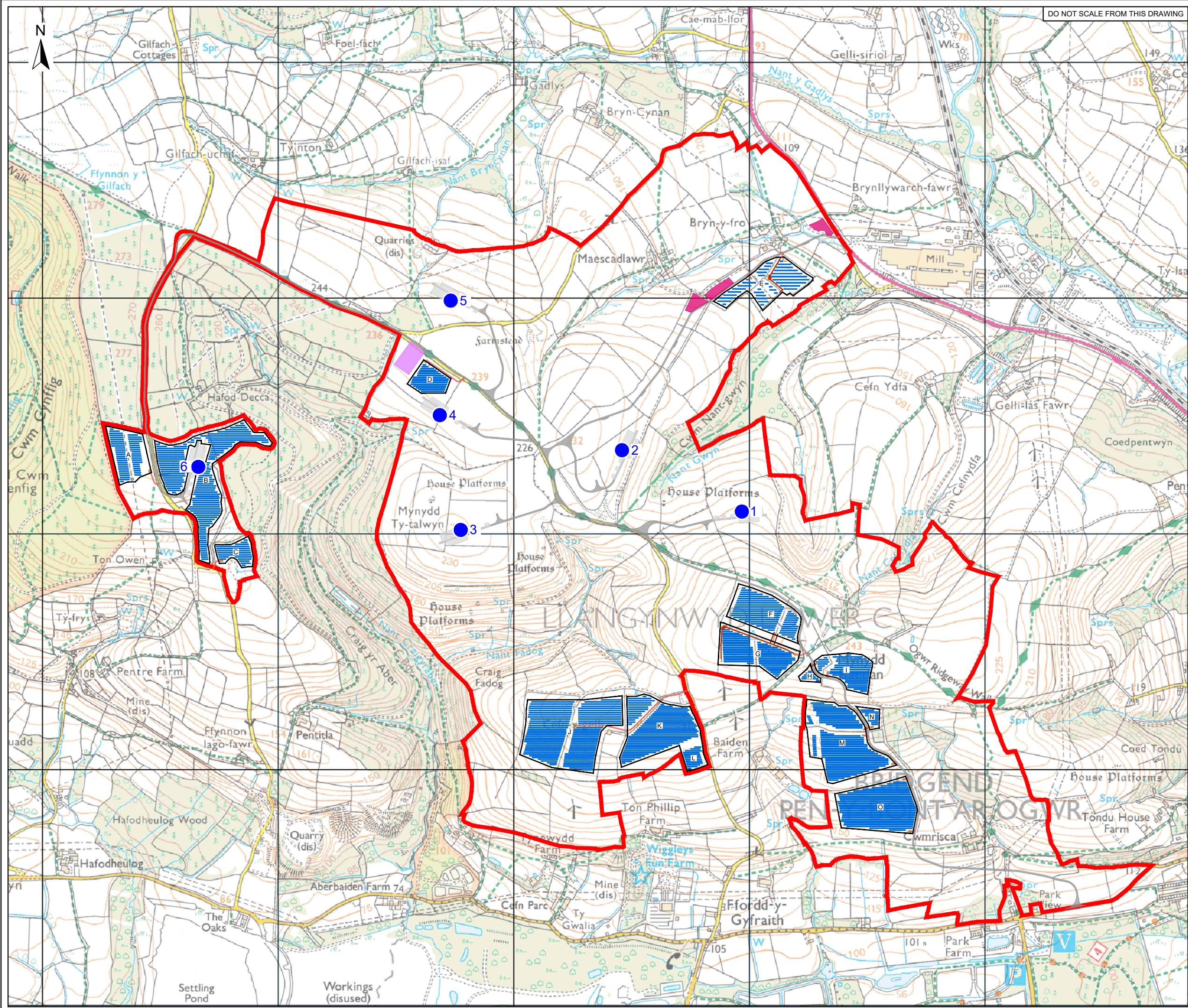
Description
Site Boundary Plan

Project ID	Drawing no.	Revision
323220	11201	C04

File name
323220-HE-112-SS-D-C-11201-C02

Dimensions	Scale	Size
m	1:20000	A3





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LEGEND

- Site boundary
- Turbine locations (1-6)
- Temporary Construction Compounds
- Track Layout and Northern Access Passing Places
- Temporary Track
- Solar Track
- Solar Panels (A-O) Fencing
- Solar Panels
- Inverters / Transformers
- Hardstandings
- Substation Platform

Notes:

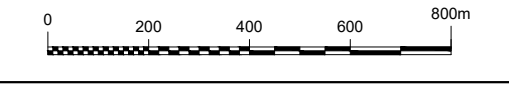
Contains features from MTT_Infrastructure_Export_26-02-2025
Contains Ordnance Survey data © Crown copyright and database right 2013.

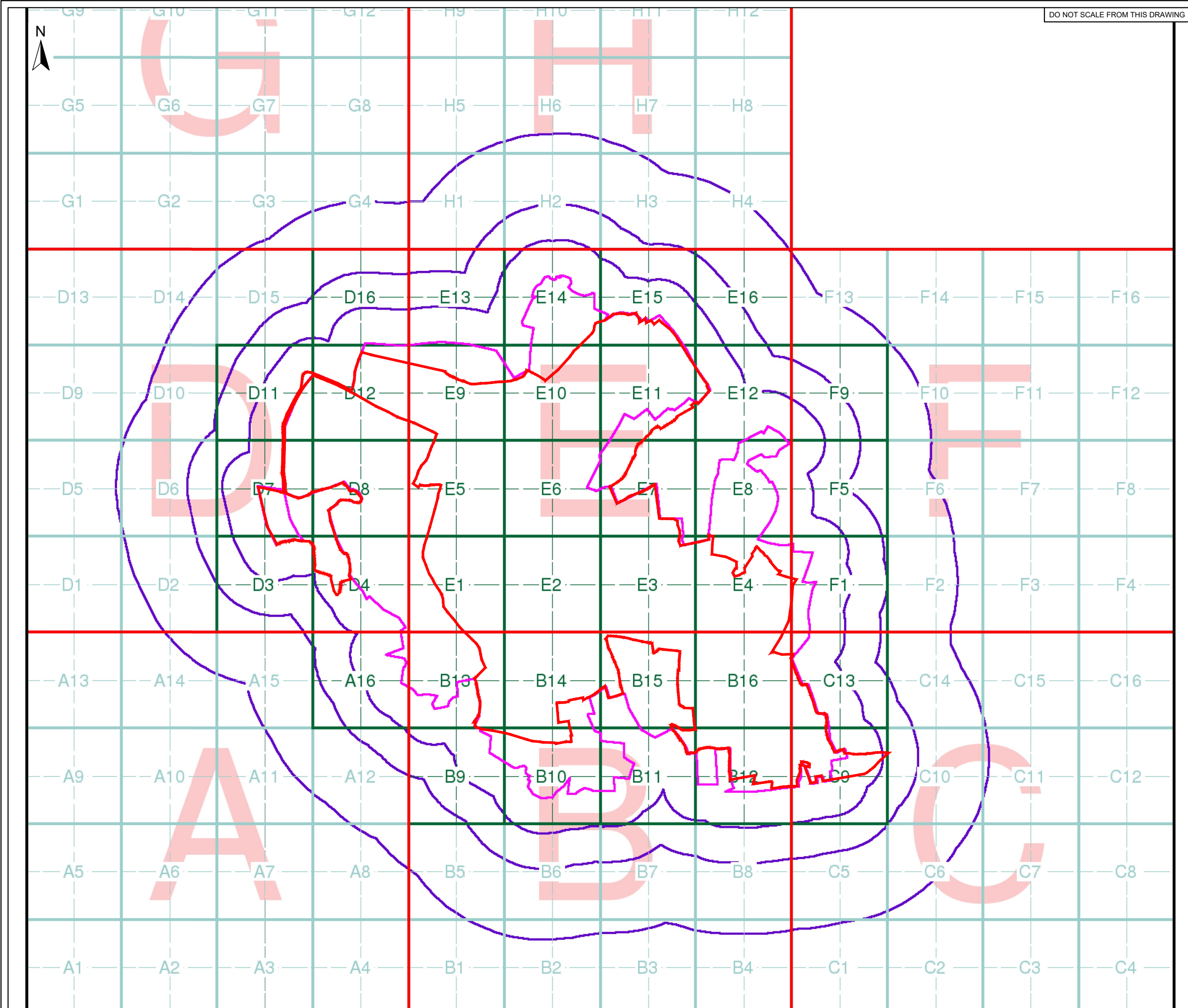
C05	05.11.25	First Issue	EC	FC	FC
Rev	Date	Amendment	Drawn	Chkd	Appd



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Client Galileo 03 Ltd		
Project Name Mynydd Ty-talwyn Energy Park		
Description Site Layout Plan		
Project ID 323220	Drawing no. 32402	Revision C05
File name 323220-HE-324-SS-D-C-32402-C02		
Dimensions m	Scale 1:15000	Size A3
		



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LEGEND

- Site boundary
- Boundary covered by Envirocheck Report

Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice

Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment

A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant

A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

Notes:

The site boundary has been revised since the Environmental Database Request was produced. All areas of the site are covered by the dataset

Baseplan provided by Envirocheck
Drawing ref.: 323220_EC_Index

C04	02.10.25	First Issue	AS	FC	FC
Rev	Date	Amendment	Drawn	Chkd	Appd

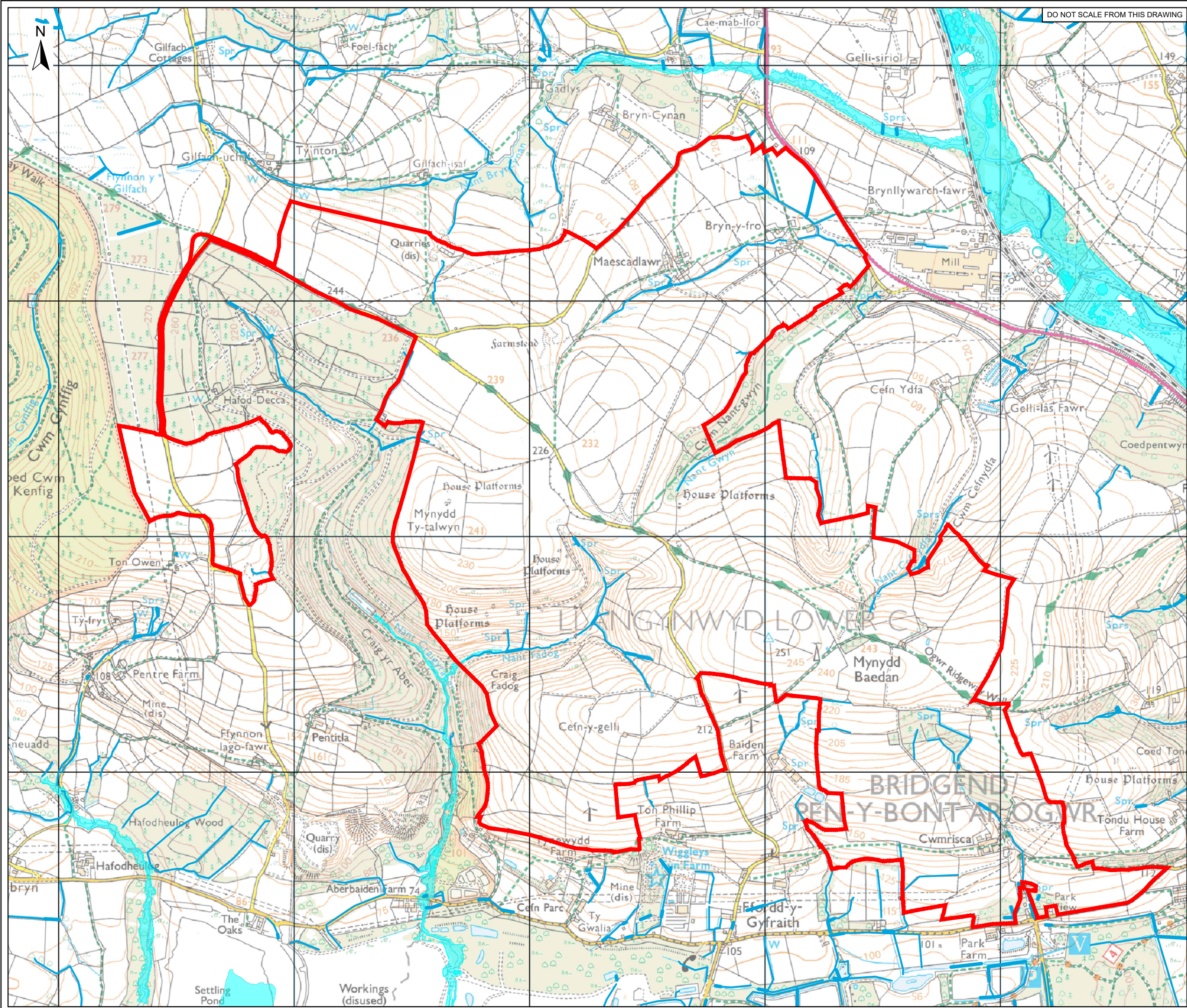


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Galileo 03 Ltd		
Project Name		
Mynydd Ty-talwyn Energy Park		
Description		
Environmental Database Report - Index Map		
Project ID	Drawing no.	Revision
323220	12101	C04
File name		
323220-HE-121-SS-D-C-12101-C02		
Dimensions	Scale	Size
m	NTS	A3



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LEGEND

- Site boundary
- Watercourses
- Flood zones

Notes:

Contains features from:
Flood_Zones.DWG
Slope 10deg or Greater.DWG
Watercourses.DWG

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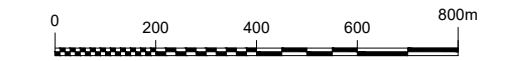
Project Name
Mynydd Ty-talwyn Energy Park

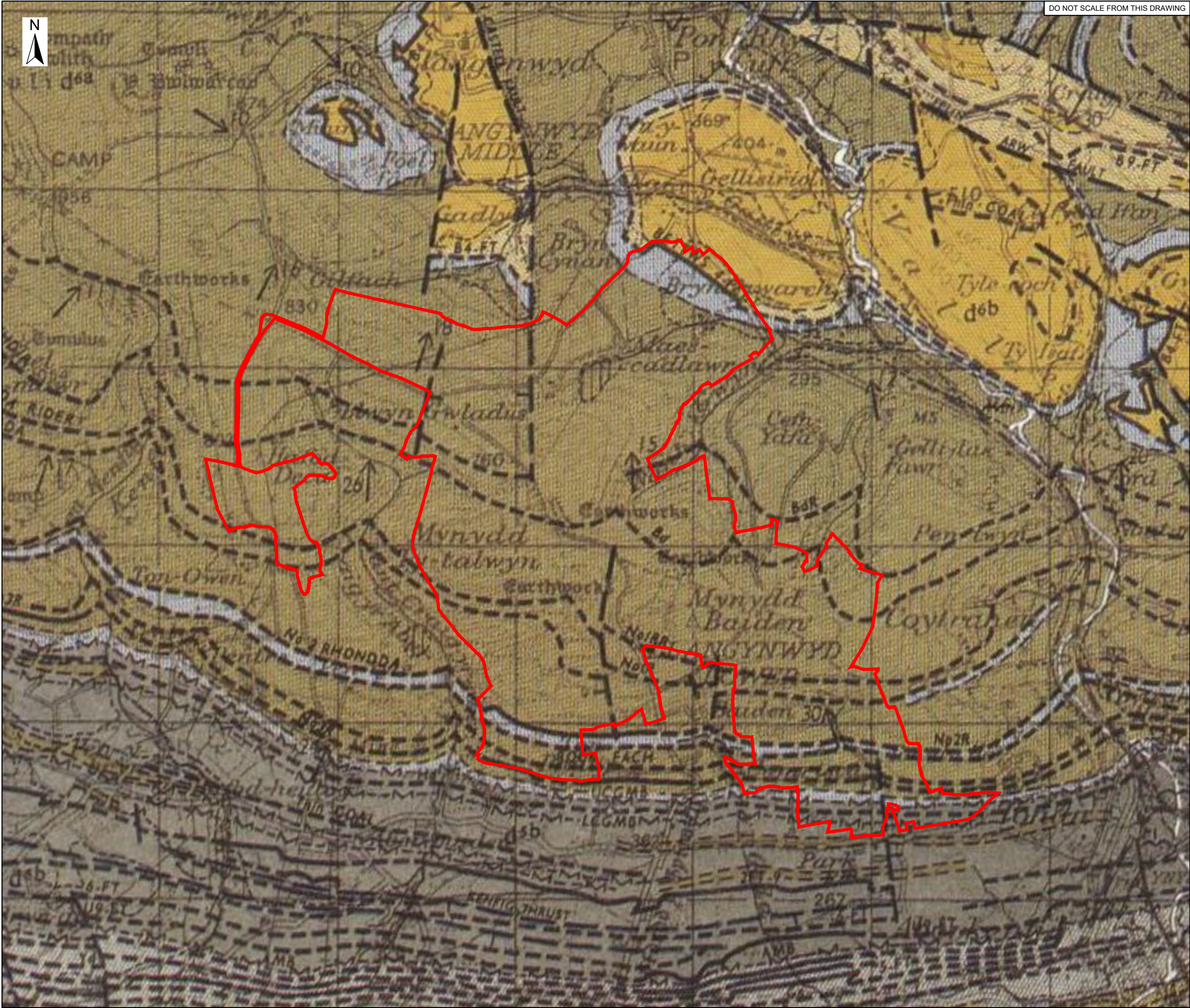
Description
Relevant Environmental Features

Project ID	Drawing no.	Revision
323220	12102	C04

File name
323220-HE-121-SS-D-C-12102-C02

Dimensions	Scale	Size
m	1:15000	A3





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LEGEND

Site boundary

For 'Index, Explanation and Key to Geological Colours' refer to Drawing no. 21202 (File name:323200-HE-212-SS-D-C-21202)

Notes:

Site wide geology extracted from: British Geological Survey (BGS) map 1-63,360 scale, Sheet 248, Pontypridd, 1963 (SOLID).

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Project Name

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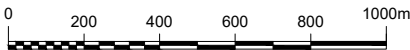
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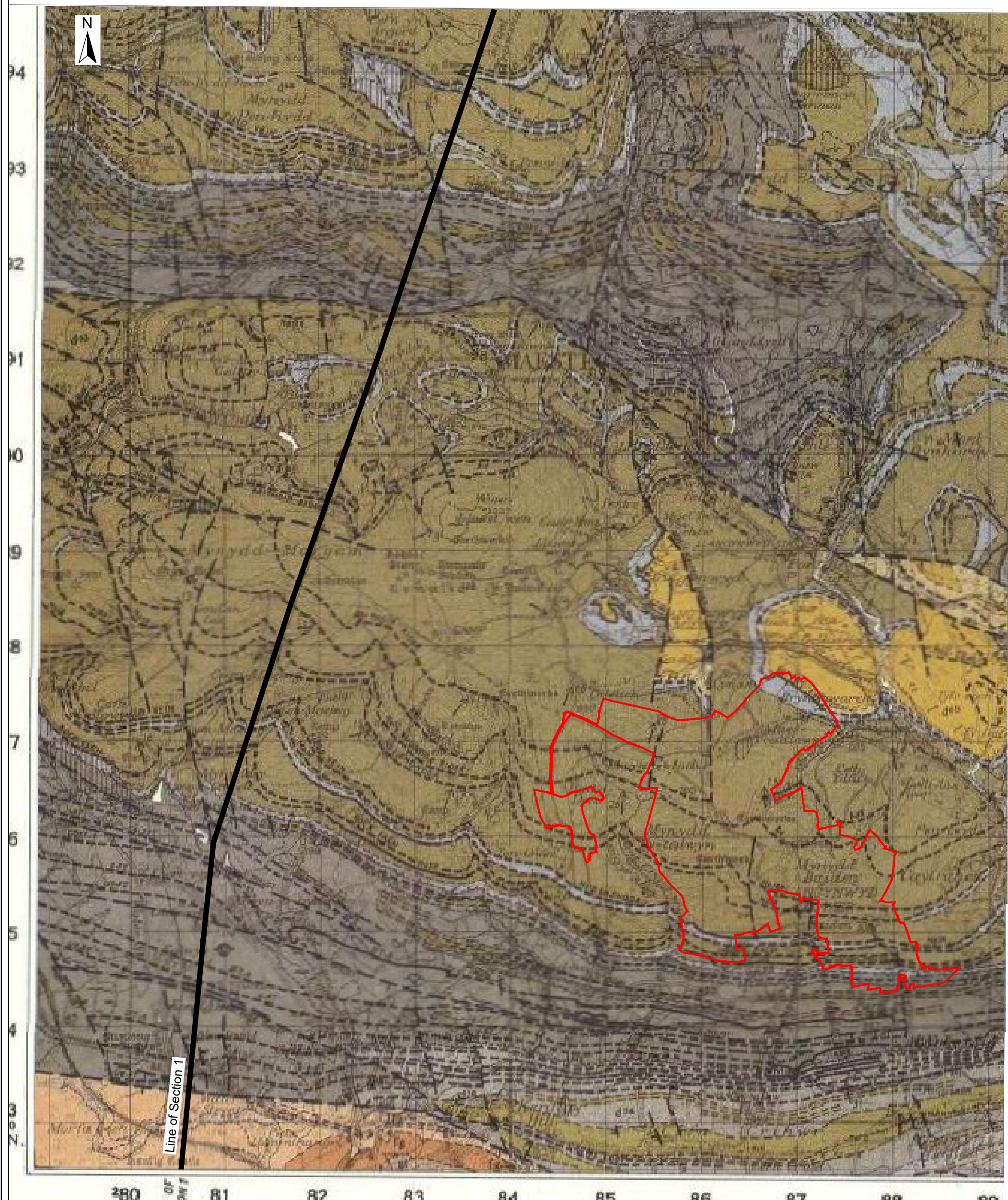
Geology Plan

Project ID	Drawing no.	Revision
323220	21201	C04

File name
323220-HE-212-SS-D-C-21201-C02

Dimensions	Scale	Size
m	1:20000	A3





 Site boundary

For 'Index, Explanation and Key to Geological Colours' refer to Drawing no. 21202
(File name: 323200-HE-212-SS-D-C-21202)

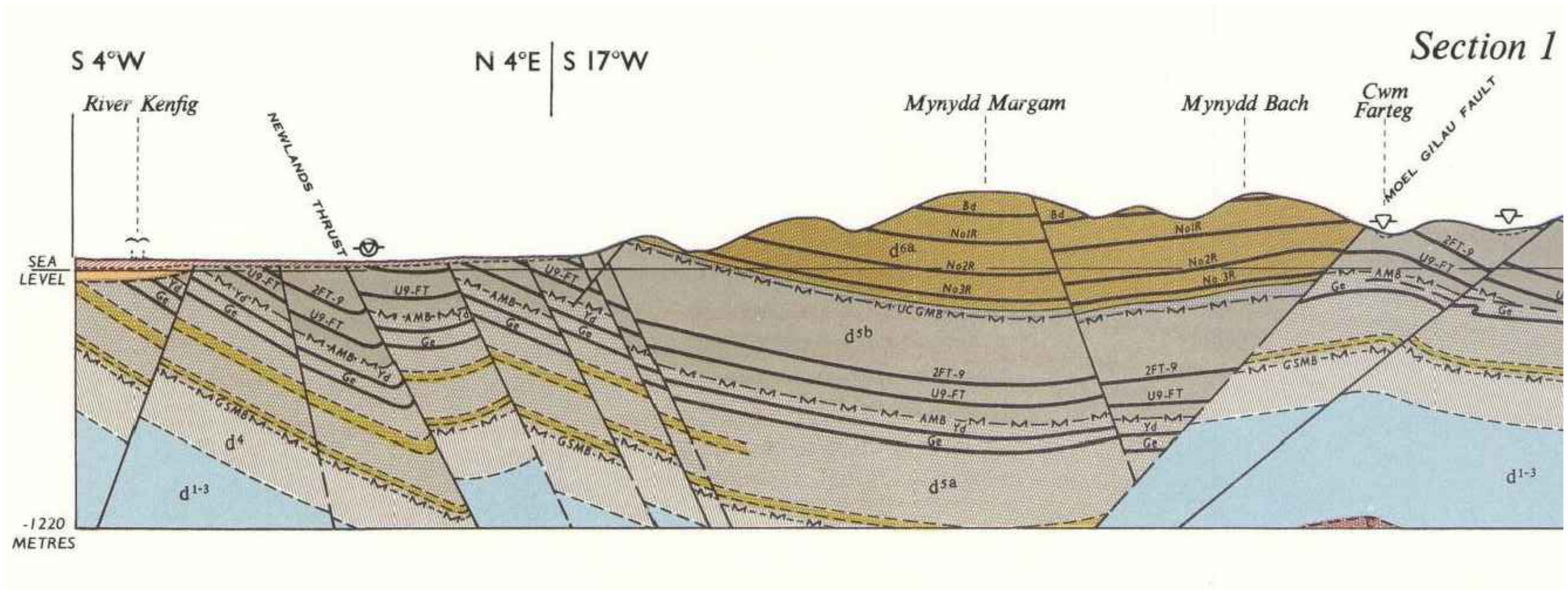
Notes:

Site wide geology extracted from: British Geological Survey (BGS) map 1-63,360 scale, Sheet 248, Pontypridd, 1963 (SOLID)

For 'Line of Section 1 Cross Section Extract', refer to Drawing no. 21203
(File name: 323200-HE-212-SS-D-C-21203)



Client Galileo 03 Ltd									
Project Name Mynydd Ty-talwyn Energy Park				C04	02.10.25	First Issue	AS	FC	FC
				Rev	Date	Amendment	Drawn	Chkd	Appd
Description Geology Plan with Line of Section 1 Location									
Project ID 323220	Drawing no. 21206	Revision C04	File name 323220-HE-212-SS-D-C-21206-C04						



Notes:

Cross section extracted from: British Geological Survey (BGS) map 1-63,360 scale, Sheet 248, Pontypridd, 1963 (SOLID).

For 'Line of Section 1 Cross Section Location', refer to Drawing no. 21206 (File name: 323200-HE-212-SS-D-C-21206).

C03	07.04.25	First Issue	AS	FC	FC
Rev	Date	Amendment	Drawn	Chkd	Appd

LEGEND

For 'Index, Explanation and Key to Geological Colours' refer to Drawing no. 21202 (File name: 323200-HE-212-SS-D-C-21202)



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Dimension	Scale	Size
m	NTS	A3

Client Galileo 03 Ltd			
Project Name Mynydd Ty-talwyn Energy Park			
Description Secion 1 Cross Section (extract)			
Project ID 323220	Drawing no. 21203	Revision C03	File name 323220-HE-212-SS-D-C-21203-C03

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LEGEND

- Site boundary
- - - Outcropping coal seams
- 15 Direction and angle of dip

Notes:

Not all geological features are shown on this summary drawing. Also, refer to:

- Drawing no. 21201 - Site Wide Geology Plan
- Drawing no. 21202 - Vertical Section with Index, Explanation and Key to Geological Colours
- Drawing no. 21203 - Secion 1 Cross Section (extract)

Base drawing extracted from BGS Geology Viewer (online).

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Client		
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Project Name		
Mynydd Ty-talwyn Energy Park		
Description		
Bedrock and Linear Features Summary		
Project ID	Drawing no.	Revision
323220	21204	C04
File name		
323220-HE-212-SS-D-C-21204-C03		
Dimensions	Scale	Size
m	1:20000	A3
