PRELIMINARY COAL MINING RISK ASSESSMENT

Green Hydrogen Project, Bridgend

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1 INTRODUCTION

1.1.1 RPS Consulting Services Ltd (RPS) was commissioned on behalf of RPS (Planning Services) by Marubeni Europower Ltd to undertake a Coal Mining Risk Assessment (CMRA) of the proposed 'Green Hydrogen Project' in Bridgend as part of the non-statutory pre-application advice.

1.1.2 The project site comprises the following four areas:

- Bryncethin site (solar array);
- Brynmenyn site (hydrogen plant);
- Private wire route (between solar array and hydrogen plant); and
- Hydrogen pipeline route (between hydrogen plant and proposed refuelling station dispensers near current Collage Primary School).

1.1.3 The objectives of this Coal Mining Risk Assessment are to:

- Undertake a desk-based review of available information on the coal mining history at the four areas and in their immediate vicinity;
- Assess the risk to the proposed development from the coal mining legacy in the vicinity of the four areas; and
- Provide recommendations for further intrusive investigation and or mitigation measures, as appropriate.

1.2 Proposed Development

1.2.1 The proposed development (Green Hydrogen Project) comprises a hydrogen production electrolysis plant, together with PV solar array and associated private wire connection and pipeline off-take. For the purpose of this report the development has been constrained into four areas referred to herein as the Brynmenyn site (for hydrogen production), the Bryncethin site (site solar array), private wire route (between solar array and hydrogen plant) and hydrogen pipeline route (between hydrogen plant and proposed refuelling station dispensers.

Figure 1: Site Boundary / Proposed Development (note Paragraph 1.2.3)

1.2.2 The four areas, proposed development boundaries and access points are summarised in Figure 1 and are detailed within the figures in the pre-application supporting document, presented in Appendix A.

1.2.3 At the time of writing the proposed development layouts are to be finalised following appraisal of the development constraints. It is understood that the proposed Hydrogen Plant will be located

within the northern section of the site adjacent to the existing infrastructure as detailed in the Hydrogen Site Layout (Ref: 106856-MMD-BRGR-XX-PLN-C-0002) drawing in the Drawings Section of this Report. Presently two options are under consideration for the private wire route (between solar array and hydrogen plant). The two options are presented in Drawings section of this report (Ref: Brynmenyn Phase 2: Option 1 and Brynmenyn Phase 2: Option 2).

1.2.4 For the avoidance of doubt the hydrogen pipeline connection is expected to use the same construction as for natural gas pipelines i.e. approx. 90mm polyethylene plastic piping in a trench, operating at medium pressure (below 2 bar). The pipeline would be laid in a trench at typically 1.5 m depth and trenchless construction techniques are available for crossings where required. Once the pipe is laid, the land would be restored.

1.3 Planning

1.3.1 It is understood at the time of writing the development is in the pre application stage and a Request for Screening Opinion has been submitted[1]. As such no direct planning consents or conditions exist for the site. A consultation response exists from the Coal Authority however this is unavailable at the time of writing.

1.3.2 RPS (Planning Services) have attended a meeting on the 16th August 2022 with Bridgend Borough County Council regarding the scheme. Subsequently the council submitted a response to the screening opinion[2], and the response details the following in relation to mining;

1.3.3 Green Hydrogen Production Facility – Brynmenyn

1.3.4 'Records indicate former tanks in the north-west of the site. The site is within the coalfield consultation area and seams and mine workings are recorded to the south of the site but the extent of the effect of mining legacy issues on the site itself is not known.'

1.3.5 *'Understanding the site conditions to ensure that contamination, Coal Mining Legacy etc. have been fully considered in the design of the scheme and that remedial works will not have any significant impact on the surrounding land uses'* and

1.3.6 'No coal mining risk has been identified (located in Low-Risk Area) but site investigations should be undertaken to identify any possible contamination'.

1.3.7 Solar Array – Bryncethin

1.3.8 'The site is within the coalfield consultation area and seams and mine workings are recorded across the site, with a former colliery and associated infrastructure (shafts, reservoir) in the south. The extent of the effect of mining legacy issues is not known.'

1.3.9 'Again, understanding the site conditions to ensure that contamination, Coal Mining Legacy etc. have been fully considered in the design of the scheme is important, albeit it is noted that solar arrays generally less intrusive with limited foundations.' and

1.3.10 'Parts of the site are classified as High-Risk Areas associated with Coal Mining Legacy – see plan below. A Coal Mining Risk Assessment and Ground Investigation Report will be required. Comments have also been provided by the Environment Team in SRS as to the possibility of contamination on site.'

1.3.11 No comments are observed for the pipeline or cable routes and the Local Authority's position on these is unknown.

[1]Application Ref: P/2/572/SOR (http://planning.bridgend.gov.uk/Search/Results)

[2] Bridgend Borough County Council. Letter Title: Marubeni Europower, Brynmenyn (Hydrogen Plant) & Bryncethin (Solar Array Land At Brynmenyn and Bryncethin. Dated 26th August 2022. Ref: ref: PE/192/2022

1.3.12 It is anticipated that where consented any development proposals will be subject to planning Conditions (where present in the Coal Authority 'Development High Risk Area' and are not under the Exemptions List[3]).

1.4 Legislation and Guidance

1.4.1 This report has been produced in general accordance with the CIRIA C758D Abandoned Mine Workings Manuel. 2019.

[3] https://www.gov.uk/guidance/planning-applications-coal-mining-risk-assessments accessed September 2022

2 SITE DESCRIPTION AND DESK STUDY SUMMARY

2.1 Site Location

The Green Hydrogen Project spans the Brncethin and Brynmenyn villages located in the northern ward of Bridgend, South Wales, see Figure 2.

Figure 2: Site Location

2.2 Site Description

2.2.1 The following site descriptions are based on a review of the information provided in the Mott MacDonald Desk Study reports (see Section 2.3) and a review of publicly available aerial imagery. RPS have not visited site as part of this scope of works.

Bryncethin Site (Solar Array)

2.2.2 The site is roughly rectangular in shape and covers an area of approximately 18 ha. The site is currently agricultural fields used for arable land. An overhead powerline crosses the eastern extents of the site in a northwest to southeast direction.

2.2.3 Land use in the vicinity of the site is generally arable land with a Bridgend Borough Council Depot located adjacent to the western site boundary.

2.2.4 The large central area of the site is generally flat and level, potentially with a very slight dome encouraging water to run off towards the perimeter drain. This area was heavily vegetated with reeds, and a representative of Marubeni indicated that the area floods during the winter months.

2.2.5 The banks to the north, east and south all rise away from the central area with sporadic gorse growth on the bank with it being more extensive along the northern bank.

2.2.6 A concrete slab lined drainage channel runs around the central area and drains towards a surface water feature to the west. A significant drain/spring is located in the northeast, next to a

spring/boggy area and may potentially be associated with a form of mine drainage. The drain contains an abundance of orange/rust-coloured sediments at source that become browner and vegetated with distance from the outflow source.

2.2.7 There are two areas in the eastern extents of the site that have been covered in limestone gravel. There are no signs of this being a historic adit mine entrance, and therefore the purpose of the gravel is unknown. Two stockpiles of unknown material and origin are located in the northwest area which were heavily vegetated.

2.2.8 There are two historical mine shafts that could be seen in the south area of the site that have a visible concrete cap. There are two redundant brick structures present to the south-west of the site of unknown use.

Brynmenyn Site (Hydrogen Production)

2.2.9 The site is triangular in shape and covers an area of approximately 8.16ha. The site is currently an area of green space comprising woodland, fields and shrubbery, with the proposed development area situated in the northern part of the site.

2.2.10 The site is bounded by an industrial estate to the northwest, the A4065 with residential properties to the east and residential properties to the south and west.

2.2.11 The site was found to rise in a gradual slope from west to east with an elevation change of 10m and more steeply from north to south with mature trees bounding the development area to the north, east and south. The western boundary comprised a former wood pellet distribution facility which showed little to no sign of use or occupation.

2.2.12 The review of aerial imagery indicates that the site had previously been partially covered in woodland or dense shrubbery until approximately January 2022 when it appeared to have been cleared. This was apparent on site by evidence of tree stumps and significant deposits of freshly deposited woody debris across the site with little to no sign of decay and small-scale regrowth of tree and shrub species. The western half of the site was relatively free of new vegetation with only occasional patches of tall weeds and grasses while the east of the site was heavily vegetated by rapidly growing annuals.

2.2.13 Within the trees forming the southern boundary of the development area a temporary camp was identified formed using scrap wood and plastic sheeting, with a number of garden tools, broken glass, and general detritus in the vicinity.

2.2.14 During the walkover by Mott MacDonald (see Section 2.3) two potential Invasive Non-Native Species (INNS) were identified. The first was Himalayan Balsam (impatiens glandulifera) which was noted to be widespread across the site and the majority of the plants were noted to be in full bloom with some plants noted to be developing seed heads.

Private Wire Route

2.2.15 The Solar Array (Bryncethin Site) will be connected electrically via a private wire to the hydrogen production facility (Brynmenyn Site). As mentioned in Section 1.2, presently two options exist for the proposed Hydrogen Pipeline Route. Both routes run through a mix of greenfield and built-up areas and cross a number of roads. Depending on the proposed route the wire may be above ground (overhead lines) or underground.

Hydrogen Pipeline Route

2.2.16 The hydrogen pipeline route extends c 1km, from the Hydrogen Production Sites' west portion running c along Chilcott Avenue, crossing over to Ffordd Maendy. From Ffordd Maendy the

pipeline crosses the Ogmore River and onto the present day Coleg Cymunedol Y Dderwen School. As such the route comprises a mixture of commercial and residential use.

2.3 Previous Investigations

2.3.1 Desk-based and intrusive investigation have been undertaken across the 'Green Hydrogen Project' area.

2.3.2 As part of the existing pre application processes Mott MacDonald have produced two Phase 1 Desk Studies for the Bryncethin Solar Farm[4] and Brynmenyn Hydrogen Plant[5]. RPS have reviewed these reports as part of this CMRA and salient points are summarised in the below sections. The reports do not discuss either the Hydrogen Pipeline or Private Wire Routes. Coal Authority Consultant Mining Reports are appended to these reports and for ease of reference these have been reproduced in Appendix B and Appendix C for the Brynmenyn Site and Bryncethin Site respectively.

2.3.3 As part of this CMRA, RPS has identified that two other reports exist for the Bryncethin Site as summarised below;

- Forkers Limited 2013, West Bromwich under the supervision of Johnson Poole & Bloomer. Unit 5, Neptune Court, Vanguard Way, Cardiff CF24 5PJ on behalf of Bridgend CBC, Civic Offices, Angel Street, Bridgend CF31 4WB, dated 03/10/2013
- Johnson Poole & Bloomer 2013 on behalf of Bridgend CBC, Civic Offices, Angel Street, Bridgend CF31 4WB dated 14/06/2013

2.3.4 RPS has sought under the Freedom Information Acct to obtain these reports (or permission to obtain) from the Bridgend Country Borough Council, no response has been received to date.

2.3.5 RPS cannot vouch for the accuracy or validity of the information provided within third party reports and the following opinion is based solely upon the reports. Legal reliance should be sought from the original authors of these reports where their content is considered material to the characterisation of the site.

Site History

Bryncethin Site

2.3.6 From the earliest mapping (c.1875) mine workings associated with Bryncethin Colliey are evident on site with two shafts in the south and a building in the centre, tramways associated with the mine shafts are also shown crossing the site in an east to west direction. A ford (Nant Bryncethin) is located in the southern extents and many small streams appear to be located in the south and east. A reservoir is marked in the centre of the site from c.1899.

2.3.7 Brick works and clay pits are present to the west of the site, which is extended within the site boundary from the early 1900s. By the 1940s the brick works clay pit occupies much of the northern part of the site. By this time the reservoir and shafts are all annotated as 'old' or 'disused'.

[4] Mott Mcdonald 2022. Brynmenyn Hydrogen Plant. Phase 1 Desk Study. Dated 20th July 2022, Ref 100108938 | 108939-T-RP-0001/2 | P01 |

[5] Mott Mcdonald 2022. Bryncethin Solar Farm. Phase 1 Desk Study. Dated 20th July 2022, Ref Phase I Desk Study | 108939-T-RP-0002 | P01 |

2.3.8 By 1964 there are a number of ponds marked, and all railways and mines are marked as disused. A new clay pit is shown in the north.

2.3.9 The clay pits are disused by c.1980 and the pond is no longer mapped. The north east of the site is shown on a number of plans as marshland.

2.3.10 By c.2000 drainage ditches and drains are mapped, the overhead power lines are mapped and the caps at the location of the old shafts are mapped.

Brynmenyn Site

2.3.11 From the earliest mapping (c.1875) the site is shown as agricultural fields with some trees along the hedgerows. The south boundary is marked by a railway (labelled as Great Western Railway from 1884). From 1964 a mineral railway is shown in the south of the site. The railways are labelled as dismantled c.1980. Tanks are shown in the north of the site from c.1918 until c1980. From 2005 until 2021 a building is shown in the eastern extent of the site.

Geology and Hydrogeology

2.3.12 Based on previous reports, British Geological Survey (BGS) mapping[6] (1:50,000-scale) and the Environment Agency (EA) Groundwater Vulnerability mapping (1:100,000-scale), the stratigraphic sequence and aquifer classifications beneath the site are detailed below.

Bryncethin Site

2.3.13 Made Ground is not mapped as being present beneath the site, however, given the site history which includes mine workings, clay pits and a pond it is consisted likely that Made Ground is present across much of the site. Locally Made Ground has the potential to be present to significant thicknesses. In addition, during the walkover undertaken by Mott MacDonald evidence of limestone gravel, redundant and relic brick structures, vegetated stockpiles and capped mine shafts were seen.

Table 2-1 – Descriptions of Geological Strata – Bryncethin Site

Strata	Description & approximate thickness	Aquifer Classification
South Wales Middle Coal Measures Formation Underlying the southern part of the site	Grey coal-bearing mudstones and siltstones with seatearths and minor sandstones	Secondary A Aquifer
Llnfi Member Underlying the northern part of the site	Green-grey and blue-grey, feldspathic, micaceous lithic arenites ("Pennant sandstone") with thin mudstone/siltstone and seatearth interbeds and mainly thin coals	Secondary A Aquifer
Rhondda Member Underlying the most northern extent of the site	Green-grey, lithic arenites ("Pennant sandstones") with thin mudstone/siltstone and seatearth interbeds and mainly thin coals	Secondary A Aquifer

2.3.14 The BGS mapping shows that there are no superficial deposits present across the site, however Glaciofluvial Sand and Gravel is mapped immediately adjacent to the west of the site.

[6] https://mapapps2.bgs.ac.uk/geoindex/home.html webpage accessed Sept 2022

2.3.15 There are four coal seams mapped as outcropping beneath the site, three within the South Wales Middle Coal Measures and one within the Rhondda Member. The seams cross the site orientated east to west.

2.3.16 BGS mapping indicate that the bedrock beneath the site is dipping towards the north at approximately 40°. The Coal Authority Coal Mining Report also indicates that coal seams beneath the site dip to the north at between 18.3˚ and 46.3°.

2.3.17 The BGS mapping does not record any faults within the vicinity of the site, however, the Coal Mining Report indicates that there are five faults which cross the site, two east to west trending faults in the south, one east to west trending fault in the north and two northwest to southeast trending faults in the centre and east of the site. The displacement and downthrow along the faults is unknown.

2.3.18 The BGS indicates that there are records of six boreholes either on site or in close proximity of the site. A portion of these may comprise the Johnson Poole and Bloomer records however the boreholes scans are not available at the time of writing.

Brynmenyn Site

2.3.19 Made Ground is not mapped as being present beneath the site, however, anecdotal evidence indicates that there may be Made Ground present originating from the foundation of the industrial units forming Brynmenyn Industrial Estate. There is also potential for Made Ground to be present in and around the location of the historical tanks in the north of the site. Made Ground may also be present associated to the unknown building in the eastern extent of the site, see Paragraph 2.3.11).

Table 2-2 – Descriptions of Geological Strata – Brynmenyn Site

Strata	Description & approximate thickness	Aquifer Classification
Glacial Till	Heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape.	Secondary A Aquifer
Glaciofluvial Deposits South-east corner of the site only	Glaciofluvial deposits were deposited by meltwater streams. Includes mostly coarse-grained sediments (i.e. sand and gravel) with some finer-grained layers (i.e. clay and silt). Sand and gravel, locally with lenses of silt, clay or organic material	Secondary A Aquifer
South Wales Middle Coal Measures Formation	Grey coal-bearing mudstones and siltstones with seatearths and minor sandstones	Secondary A Aquifer

2.3.20 The BGS mapping does not record any faults within the vicinity of the site, however, the Coal Mining Report (see Appendix C) indicates that there is an east to west trending fault in the southeast corner of the site.

2.3.21 There are two coal seams mapped as outcropping beneath the site, these are the two feet and the nine feet.

2.3.22 BGS mapping indicate that the bedrock beneath the site is dipping towards the north at approximately 40°. The Coal Authority Coal Mining Report also indicates that coal seams beneath the site dip to the north at between 39.8˚ and 45°.

2.3.23 There are records of four boreholes held within the BGS archives, presented within the Mott MacDonald report. These indicate that ground conditions within the vicinity of the site are:

- Made Ground to a depth of 0.5m; over
- Glacial Till to a depth of 4.00m bgl, typically comprising a grey, brown and orange silty clay with varying proportions of sand, gravel and cobbles; over

- South Wales Coal Measures strata, typically weathered to a depth of 8.0m and comprises interbedded mudstones (grey, fine to medium grained, slightly silty, moderately strong to very strong, thinly bedded with occasional plant remains, these become moderately weak with ironstone bands from 30m) and sandstones (brown to grey, fine to medium grained, strong to very strong, with carbonaceous bands, an abundance of mica and faintly to moderately weathered).
- Coal seams were encountered within the boreholes, including:
  - Hafod Seam encountered between
    - 4.2 and 4.7 bgl (in SS98SW127)
    - 12.1 and 12.6m bgl (in SS98SW126)
  - Upper Blackband Seam between
    - 32 and 32.4m bgl (in SS98SW128)
    - 33.9 and 34.4m bgl (in SS98SW127)
    - 43.1 and 43.5m bgl in (in SS98SW126)
  - An unnamed seam in at depth of 58.0 – 58.5 m bgl (in SS98SW126).

2.4 Mining and Quarrying

Coal Authority Interactive Map Viewer

2.4.1 The Coal Authority (CA) Interactive Map[7] has been reviewed to inform upon the presence and distribution of mine workings and geology. The summary observations are presented in the following sections.

Bryncethin Site

2.4.2 Information from the Coal Authority Interactive Map Viewer suggests the following in relation to the site:

- The site is located in a Coal Mining Reporting Area;
- The majority of the site is located within a Development High Risk Area;
- A small area in the north of the site is shown as being an area of Past Shallow Coal Mine Workings;
- There are several coal outcrops mapped across the site;
- There are records of approximately six mine entries on site;
- Land in the south and north is shown as being in an area of known underground workings; and
- Land to the immediate north of the site is within an area of unlicenced opencast.

Brynmenyn Site

2.4.3 Information from the Coal Authority Interactive Map Viewer suggests the following in relation to the site:

[7] https://mapapps2.bgs.ac.uk/coalauthority/home.html webpage accessed September 2022

- The site is located in a Coal Mining Reporting Area;
- The southern extent of the site is within a Development High Risk Area;
- A small area in the south western corner of the site is shown as being an area of Past Shallow Coal Mine Workings;
- Coal outcrops are present in the south of the site; and
- The southern extent of the site is in an area of known underground workings.

Private Wire Route

2.4.4 Information from the Coal Authority Interactive Map Viewer suggests the following in relation to the site:

- The site is located in a Coal Mining Reporting Area;
- The majority of the route is located within the Development High Risk Area;
- The northern most part of the route is located in an area of surface mining (past and current);
- Several coal seams outcrop beneath sections of the route.

Hydrogen Pipeline Route

2.4.5 Information from the Coal Authority Interactive Map Viewer suggests the following in relation to the site:

- The site is located in a Coal Mining Reporting Area;
- The majority of the route is located within the Development High Risk Area;
- Several coal seams outcrop beneath sections of the route;
- Part of the site is in an area of known underground workings.

Consultant Coal Mining Report

Bryncethin Site

2.4.6 The Coal Authority Consultant Coal Mining report reference 51003223712002 (Appendix B) dated 1st July 2022 provides the following information:

- There are records of past underground mining in seven named seams of coal and three unnamed seams of coal beneath the site. Workings are recorded in the following seams (presented in depth order):
  - Pentre Rider (4JN1 and 4Z43), approximate depth to seam is recorded as 5m and 7m and the extraction thickness is recorded as 60cm with the last year of workings given as 1916;
  - Spotted Pins (4JMV, 4JMU and 4Z40), approximate depth to seam is recorded as 80m, 189m and 219m and the extraction thickness is recorded as 170cm, with the last year of working given as 1915;
  - Bute (4JMT), approximate depth to seam is recorded as 148m and the extraction thickness is recorded as 190cm with the last year of workings given as 1913;
  - Lower Nine Foot (Top Leaf) (4JMX), approximate depth to seam is recorded as 150m and the extraction thickness is recorded as 100cm, with the last year of working given as 1915;

- Five Foot Gelldeg (4Z42 and 4JMX) approximate depth to seam is recorded as 162m and 164m and the extraction thickness is recorded as 100cm, with the last year of working given as 1913 and 1915;
- Six Foot (4Z40) approximate depth to seam is recorded as 269m and the extraction thickness is recorded as 60cm, with the last year of working given as 1915;
- Four Foot (4JMO) approximate depth to seam is recorded as 281m and the extraction thickness is recorded as 120cm, with the last year of working given as 1914;
- Unnamed seam (4JMQ); approximate depth to seam is recorded as 217m and the extraction thickness is recorded as 100cm, with the last year of working given as 1913;
- Unnamed seam (4Z41), approximate depth to seam is recorded as 261m and the extraction thickness is recorded as 100cm, with the last year of working given as 1913;
- Unnamed seam (4JMR), approximate depth to seam is recorded as 269m and the extraction thickness is recorded as 100cm, with the last year of working given as 1913;

There is potential that the three unnamed seams are the same seam which is worked at different depths across the site rather than three separate seams. Further evidence to support this is the dip direction, extraction thickness and worked date.

- The site is not considered to be in an area of probable unrecorded shallow workings;
- There are records of two spine roadways at shallow depth beneath the site. No information regarding the depth of the spine roads or the seams which they are associated to is given or the location on site;
- There are records of two adits (Ref; 291184-005 and 291184-006), both located in the north of the site, no treatment details are provided. There are two additional adits to the north of the site.
- There are records of four mine shafts within the site, one in the north adjacent to the adits and four within the central part of the site. There is a shaft on the north western site boundary which may potentially be within the site boundary. In addition there are a further two shafts to the south west of the site.
  - Shaft reference 291184-007 (in the north) no treatment details.
  - Shaft reference 291184-008 (in the centre), this shaft was filled with foundry slag by the Nation Coal Board in April 1978 and capped in December 1980.
  - Shaft reference 291184-009 (in the centre), this shaft was filled with foundry slag by the Nation Coal Board in April 1978 and capped in December 1980.
  - Shaft reference 291184-014 (in the centre), no treatment details.
  - Shaft reference 291184-016 (north west boundary), under permit 6886 in June 2013. Johnson Poole and Bloomer investigated the mineshaft and recorded no evidence of mining related anomaly. They concluded a high degree of uncertainty over the existence of the mine shaft.
- The Coal Authority records of a number of coal seams which outcrop beneath the site. These included:
  - 15 named workable seams of coal which outcrop across the site;
  - One named non workable seam; and
  - 13 unnamed seams of which only four are considered workable. It should be noted that due to the faulting on site it is considered likely a number of the unnamed seams are duplicate records.

- There are records of five faults which cross the site, two east to west trending faults in the south, one east to west trending fault in the north and two northwest to south east trending faults in the centre and east of the site. The displacement along the faults is unknown;
- There is an area of opencast to the north of the site, which is not shown to encroach the site boundary;
- There are no recorded Coal Authority managed tips within 500m of the site;
- The Coal Authority has records of site investigation in the western part of the site, however further details on these investigations is not available at this time;
- The Coal Authority has not received a damage notice or claim for the site or any properties within 50m of the site, since October 1994;
- The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991;
- There are no recorded instances of mine gas or mine water treatments schemes within 500m of the site;
- The are no coal mining licenses recorded within 200m of the site.

Brynmenyn Site

2.4.7 The Coal Authority Consultant Coal Mining report reference 51003223712001 (Appendix C) dated 1st July 2022 provides the following information:

- There are records of past underground mining in six seams of coal beneath the site and one immediately to the south. Works are recorded in the following seams (presented in depth order):
  - Middle 9ft Top Leaf (4JN2), approximate depth to seam is recorded as 48m and the extraction thickness is recorded as 100cm with the last year of workings as 1912. The seam dips 45˚ to the north.
  - Upper Nine Feet (4JMS), approximate depth to seam is recorded as 49m and the extraction thickness is recorded as 100cm, with the last year of working as 1923. The seam dips 41.8° to the north.
  - Lower Nine Feet (4JN4), approximate depth to seam is recorded as 63m and the extraction thickness is recorded as 130cm, with the last year of working as 1922. The seam dips 44.2˚ to the north.
  - Bute (4JMT), approximate depth to seam is recorded as 139m and the extraction thickness is recorded as 190cm, with the last year of working as 1913. The seam dips 39.8° to the north.
  - Lower Nine Feet (Top Leaf) (4JMW), approximate depth to seam is recorded as 168m, and the extraction thickness is recorded as 100cm, with the last year of working as 1913. The seam dips 44.7˚ to the north.
  - Five Feet Gellideg (4JMXand 4JMZ), approximate depth to seam is recorded as 172m and 203m and the extraction thickness is recorded as 100cm, with the last year of working as 1911. The seam dips 43.8° to 43.9˚ to the north.
- The site is not considered to be in an area of probably unrecorded shallow workings;
- There are no spines roads recorded at shallow depth;
- There are no mine entries recorded on site or within 100m of the site boundaries;

- There are records of three coal seam outcrops within the site boundary. The Two Foot Nine and two unnamed seams. All of which are considered to be workable;
- There is a recorded fault shown as present in the southeastern corner of the site, the fault is a north east to southwest trending fault;
- There are no records of any opencast mines within the site boundary or within 500m of the site boundaries;
- There are no recorded Coal Authority managed tips within 500m of the site;
- The Coal Authority has no records of any site investigations or remediated sites within 50m of the site;
- The Coal Authority has not received a damage notice or claim for the site or any properties within 50m of the site, since October 1994;
- The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991;
- There are no recorded instances of mine gas or mine water treatments schemes within 500m of the site;
- The are no coal mining licenses recorded within 200m of the site.

Coal Authority Abandonment Records

2.4.8 Following the completion of the Desk Based assessments search of abonnement plans from the Coal Authority (within 30 m of surface level) has been requested. The returned plans are presented in Appendix D and Appendix E for the Bryncethin and Brynmenyn sites respectively, and are discussed further below.

Bryncethin Site

2.4.9 The Coal Authority was contacted regarding obtaining abandonment plans for the site. The Coal Authority hold a number of abandonment plan for the site, however, only those that relate to mining at shallow depth (less than 30m deep) were obtained at this time.

2.4.10 Two plans were obtained for the site as detailed below:

- Catalogue number: 6730 sheet 99 9999 (see Appendix D), from Bryncethin Brickworks, for workings in the Lantern Rider Seam. The seam was abandoned January 1917 and the plan was submitted in March 1918.

2.4.11 The plan shows the location of two adits. A ‘mouth of level’ (adit 291184-016) was advanced from the east section of the former clay pit and the mouth of slant’ (adit 291184-007) has been advanced due southeast of the clay pit. There is a further slant indicating a possible adit immediately east of the ‘Mouth of Slant’, however this is unclear and not indicated in the other Coal Authority records. The plan indicates workings are mapped running from the adits, in a southeast direction across most of the central north section of the site under the former reservoir (following the seams marked in the Coal Authority report). The plan indicates the coal dips between 5^{o} to 12^{o} in the east direction. Apparent elevations indicate workings between 53 to 83.4 m AOD in the west, with workings and dropping to 74 m AOD in the east.

- Catalogue number 6538 (see Appendix D) sheet 1 of 3 from Brycethin colliery for workings in seams Drydydd and Slatog. The seams were abandoned in January 1915 and the plan submitted in March 1916.

2.4.12 This abandonment plan shows two pits No2 Pit and No3 pit which correspond to shafts 291184-008 and 291184-009. And shows cross levels (potential spine roads / workings) running north to

south from the pits with further east to west workings in the central and northern part of the site. The elevation of the workings in No2 Pit is given as c. -90 m AOD. The elevation of the workings in the No3 Pit are indicated as c. -90 m AOD in the north landing and c -130 m AOD in the south landing. Surface level is indicated at c 80 m AOD. Spot markers of the coal depths below the site do no indicate coal above -82 m AOD within the site footprint.

2.4.13 The abandonment plans obtained indicate that there is the potential for voids to be presence at shallow depth beneath the site associated to the Lantern Rider Seam in the north area of the site. It is uncertain how the further mining of the clay pit interacted with the mine workings following 1917.

Brynmenyn Site

2.4.14 The Coal Authority was contacted regarding obtaining abandonment plans for the site. The Coal Authority hold a number of abandonment plan for the site, however, only those that relate to mining at shallow depth (less than 30m deep) were obtained at this time.

2.4.15 One plan was obtained for the site, as detailed below:

- Catalogue number 9095 (see Appendix E) sheet number 99 9999, from Maendy Colliery Nos 1, 2 & 3 for workings in seams Drydydd, North Fawr, Ail, South Fawr and Slatog. The shafts were abandoned in January 1927 and the plan was submitted in December 1927.

2.4.16 The plan shows workings largely to the south of the site, however, a small working is shown running west to east from across the southwestern corner of the site, indicated as the North Fawr, with a datum of c. -110 m BGL. Further small areas of workings are marked in the southern extent/boundary of the site, albeit not connected to the main workings to the south. The seam of the workings is the Air and it is anticipated these are not present at shallow depth below the site

2.4.17 The abandonment plans obtained indicate that there is the potential for voids to be presence at depth beneath the southern extent of the site, however the depths observed are likely in excess of 100 m.

Non-Coal Mining

Brynmenyn Site

2.4.18 There are no records of any active or closed surface and underground mineral workings held by the BGS as part of the British Pits records for site within 250m of the site.

Bryncethin Site

2.4.19 There are no records of any active or closed surface and underground mineral workings held by the BGS as part of the British Pits records for site within 250m of the site.

3 PRELIMINARY COAL MINING RISK ASSESSMENT

3.1 Introduction

3.1.1 The aim of this preliminary CMRA is to establish the likely presence and depth of any coal workings that may lead to instability at the surface or impact on the foundations of the proposed development and establish where possible whether there are significant risks posed resulting from historical shallow and deep mining, mine entries, fissures, mine gas and surface (opencast) mining. The following assessment is based upon desk based data reviews and available records only, as such a degree of uncertainty exists. The CMRA should be revised following receipt of ground investigation data.

3.2 Risk Assessment

Overview

3.2.1 The Table 3-1 summarises the potential issues identified by this desk-based study for the Bryncethin and Brynmenyn Sites. The Private Wire and Hydrogen Pipeline Routes potential risks are not tabulated however further discussion is made upon the risks in the following sections.

Table 3-1 - Summary of Potential Mining Risks

Potential Issues	Potential Risks	
	Yes	No
Bryncethin Site		
Underground coal mining (recorded at shallow depths)	✓	
Underground coal mining (probable at shallow depths)	✓	
Mine entries (shafts and adits)	✓	
Coal mining geology (fissures)		x
Record of past mine gas emissions		x
Recorded coal mining surface hazard		x
Surface mining (opencast workings)		x
Coal outcrop beneath the site	✓	
Unrecorded shallow coal mining	✓	
Brynmenyn Site		
Underground coal mining (recorded at shallow depths)	✓	
Underground coal mining (probable at shallow depths)	✓	
Mine entries (shafts and adits)		x
Coal mining geology (fissures)		x
Record of past mine gas emissions		x
Recorded coal mining surface hazard		x
Surface mining (opencast workings)		x
Coal outcrop beneath the site	✓	
Unrecorded shallow coal mining	✓	

Potential for Subsidence Issues

3.2.2 The risk of subsidence associated with historical underground mining workings is based on a number of factors. These include but are not limited to the depth of the coal seam, the thickness of the seam extracted, the method and extent of the extraction, the date of the mining, the nature of the overlying cover materials including any additional worked seams and superficial deposits. Instability at the surface can arise following collapse of any voids within worked seams which may migrate to the surface, these can be as crown holes or a wider area of subsidence.

3.2.3 As a basic rule of thumb, where thickness cover of solid rock is less than ten times the seam thickness there is a potential for void to migrate to the surface. The presence of significant superficial deposits and Made Ground may help prevent the migration of a crown hole at surface but for initial assessment the potential thicknesses have been discounted.

Bryncethin Site Solar Array

3.2.4 The Coal Authority has records of known coal mining beneath the site in seven named seams of coal and potentially three unnamed seams, with the shallowest recorded workings being the Pentre Rider seam recorded at a depth of 5 to 7m, the next worked seam is the Spotted Pins at depths of 80, 189 and 219m.

3.2.5 The shallowest recorded worked seams are at 5 and 7m, with an extraction thickness of 0.6m. Based on the abandonment plans it is likely that there is either no or limited solid cover above these seams, particularly in the area of the former clay pit. Therefore, there is considered insufficient rock cover to prevent the risk of void migration to surface. In addition in the north of the site the presence of a clay pit could indicate that these seams may also have been extracted by opencast methods. It should be noted there are no available exploratory hole records for this site and as such the degree of uncertainty is high.

3.2.6 The next worked seam according to Coal Authority records is the Spotted Pins Seam at depths of 80m, 189m and 219m, this seam has an extraction thickness of 1.7m. Therefore using the rule of thumb 17m of solid rock would be required to prevent migration of the void to the surface. On this basis assuming there are no worked seams in the stratigraphical sequence above these seams there is sufficient rock cover and surface subsidence associated with collapse in these seams is considered unlikely.

3.2.7 There are coal seams stratigraphically present between the Pentre Rider seam and the Spotten Seam, some of which are considered to be workable seams. Any voids within the seams may have the potential to influence surface subsidence due to either the absence of sufficient rock cover or due to the cumulative effect of voids in multiple seams.

3.2.8 The abandonment plans acquired following the desk-based study indicate workings within the Drydydd and Slatog seams from the Brycethin colliery have a maximum elevation of c -90 m AOD and as such have a significant cover of bedrock. Abandonment plans for the Lantern Rider Seam from the Bryncethin Brickworks indicate significant workings in the north section of the site, extending from the former clay pit. The elevations suggest workings have occurred in close proximity to the surface and this likely reflects the Coal Authority records in the Pentre Ryder. It is likely a portion of the workings presented within the abandonment plans have been excavated following advancement of the clay pit.

3.2.9 A clay pit was present in the north of the site and based on the abandonment plans it appears that the adits in the north were excavated and coal extracted during the quarrying works for the associated brick works to the north. Therefore in addition to settlement posed by any voids in the worked seams there is the potential for settlement of any backfill materials in this area.

3.2.10 There are records of four mine entries on site and two adits with a further shaft potentially on the sites west boundary. Two of the shafts in the centre of site (291184-008 & 291184-009) have

records of treatment, this includes the filling of the shafts with foundry slag by the National Coal Board in April 1978 and capped in December 1980. The shaft (291184-014) immediately north of these has no records of treatment. The shaft located on the sites west boundary (291184-016) could not be located during previous investigations, therefore this shaft might be an anomalous record from historical mapping records. The shaft in the north of the site, adjacent to the adits (291184-007) has no records of treatment however this may have been fully or partially removed as the clay pit was advanced.

3.2.11 There are several faults mapped across this, the effects of which are apparent in the significant depth changes of the coal seams across the site.

3.2.12 The Coal Authority has confirmed that they have not received a damage notice or claim for properties on the site, or within 50 m of the site and no obvious signs of subsidence have been identified on site during inspection.

3.2.13 Based on the available information the potential for ground subsidence issues associated with shallow coal workings, including underground working and potential opencast extraction (associated with the clay pit in the north) is considered to be **high**. As such intrusive investigation is considered necessary to further assess the risks associated with ground instability for the proposed development. The site risk in the south portion of the site is considered to be of a lesser magnitude however conformationally works to determine the absence of shallow workable coal should be considered.

Brynmenyn Site for Hydrogen Production

3.2.14 The Coal Authority has records of known coal mining beneath the site in six coal seams, the shallowest been the Middle 9ft Top Leaf at depth of 48m bgl. However, abandonment plans obtained indicate workings in only the Drydydd, North Fawr, Ail, South Fawr and Slatog seams, in the south portion of the site, at depth.

3.2.15 The shallowest recorded worked seam is at a depth of 48m (in the Middle 9' Top leaf), with a recorded extraction thickness of 1.00m. Based on boreholes to the south of the site, it can be assumed that the depth to bedrock is 5.00m, therefore assuming there are no shallower worked seams there is sufficient rock cover over this seam to present the risk of void migration to surface. Notwithstanding given the proposed developments sensitivity and size consideration will need to be given to the foundation design. Adopting a piled foundation solution will result in a reduced cover ratio (due to the foundation depth) and tolerances of the structures are presently unknown.

3.2.16 There are seams of coal stratigraphically above the Middle 9ft Top Leaf which are present beneath the site. The two feet nine is shown to outcrop beneath the southern extent of the site, given the dip of the strata (approximately 40° to 45˚ to the north) this seam is therefore likely to be present at shallow depth beneath the site. The two feet nine is known to be a potentially workable seam. Other seams which may be present at shallow depth beneath the site are the four feet and six feet seams. If present these seams would be present at shallow depth beneath the site.

3.2.17 The Coal Authority do not consider the site to be in an area of probable unrecorded shallow workings however it should be noted that it did not become a statutory requirement to record mine workings until 1872, by which time much shallow coal extraction had already taken place. Therefore, there is the potential, albeit limited, that the shallow seams beneath the site have been worked beneath the site by opencast methods or shallow underground mining methods, including bell pits, and have not been recorded, in particular in the southern part of the site.

3.2.18 There are no records of mine entries on site or within 100m of the site.

3.2.19 The Coal Authority has confirmed that they have not received a damage notice or claim for properties on the site, or within 50 m of the site and no obvious signs of subsidence have been identified on site during inspection.

3.2.20 Based on the available information the potential for ground subsidence issues associated with shallow coal working beneath the site is considered to be **moderate** in the south of the site and **low** for the central and northern parts of the site. As such, and reflecting the Bridgend Borough County Councils comments, intrusive investigation is considered necessary to confirm the ground conditions in the vicinity of the proposed hydrogen plant buildings. Considering the anticipated depths of the seams it is recommended that drilling is taken to depths of 40m in the bedrock to confirm there is adequate solid rock cover above the worked middle nine feet coal seam.

Private Wire Route

3.2.21 The exact route and surface or subsurface construction of the Private Wire is unknown (see Section 1.2). The Private Wire is not anticipated to change ground loadings and as such is not considered a mechanism to introduce additional settlement in regards to legacy coal mining workings.

3.2.22 Segments of the proposed routes are located within a High-Risk Development Area, with known underground mine workings. Coal seams are known to outcrop beneath the extent of the routes which may have historically been mined. The northern extent of the route is within an area where coal had been removed by surface extraction. Therefore, any collapse in the works has the potential to migrate to the surface beneath the extent of the pipeline route.

3.2.23 Where the Private Wire is to be mounted above ground (on pylons) the location of the pylon footings should be placed so as to avoid adits, shafts and areas of elevated risk.

Hydrogen Pipeline Route

3.2.24 The Hydrogen Pipeline is not anticipated to change ground loading conditions and as such is not considered a mechanism to introduce additional settlement in regards to legacy coal mining workings.

3.2.25 The route is located within a High-Risk Development Area, with known underground mine workings. Coal seams are known to outcrop beneath the extent of the route, which may have been mined. Therefore, any collapse in the works has the potential to migrate to the surface beneath the extent of the pipeline route.

Potential for Mine Gas Issues

Bryncethin Site Solar Array

3.2.26 Coal Authority data does not identify any known mine gas sites on or in the vicinity of the site.

3.2.27 There are records of four mine shafts and two adits on site which could act as preferential pathways for any gas generating within the working present beneath the site.

3.2.28 In addition, there are no recorded mine entries within the proximity of the site, which may act as preferential pathways.

3.2.29 There are no superficial deposits mapped as being present across the site, however, there is the potential for significant thickness of weathered mudstone to be present between the worked seams and ground level which may limit the migration to the surface.

3.2.30 Based on the available information, the potential risk associated with mine gas is considered to be **moderate** and gas monitoring is recommended for any buildings that are to be occupied either temporally or permanently.

Brynmenyn Site for Hydrogen Production

3.2.31 Coal Authority data does not identify any known mine gas sites on or in the vicinity of the site. In addition, there are no recorded mine entries on or within the proximity of the site, which may act as preferential pathways.

3.2.32 The presence of cohesive superficial deposits across the site may limit the pathway for migration to the surface from any potential workings beneath the Assessment Site and in the vicinity. Based on the available information, the potential risk associated with mine gas is considered to be **low** in the north are of the site.

Private Wire Route

3.2.33 Based upon the end use the Private Wire Route is not considered to be at risk of mine gas however any construction works undertaken should consider the potential risk from ground gasses.

Hydrogen Pipeline Route

3.2.34 Based upon the end use the Private Wire Route is not considered to be at risk of mine gas however any construction works undertaken should consider the potential risk from ground gasses.

Potential for Spontaneous Combustion Issues

3.2.35 The sites are not situated in an area where coal seams are known to give rise to spontaneous combustion issues.

3.2.36 The risk associated with spontaneous combustion of coal seams at both sites is therefore considered to be **low**.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1.1 A review of the available data as part of the preliminary Coal Mining Risk Assessment indicates that both the Brynmenyn Site and the Bryncethin Site are underlain by coal workings and the potential for ground subsidence issues associated with shallow coal workings, including underground working and potential opencast extraction (associated with the clay pit in the north of the Solar Array site) is considered to be moderate to high.

4.1.2 The Solar Array at the Bryncethin Site is understood to comprise a number of solar panels, access roads, switch gear unit and control building. Solar arrays are not considered consented developments and as such the requirement for treatment works is indistinct. It is recommended in advance of development intrusive works are undertaken to better characterise the potential risks; particularly given the complexity of the geology across the site, the potential for backfilled clay pit, shallow workings and mine shafts across the site. This should be accompanied with general ground investigations to establish the stability in regards to potential backfill of the former clay pit. The two (onsite) mineshafts which have been treated should be located and geophysics is recommended to better ascertain the presence of the remaining three potential shafts. The geophysics is considered viable to determine varying density of fill materials. As the majority of the development on the site will be lightweight solar panels (and where underlying risk is considered acceptable) consideration can be given to not undertaking stabilisation works where shallow workings are observed in the north of the site. Where the switchgear and control rooms are to be built, it is recommended, depending on the proposed locations and ground conditions encountered that treatment works are considered. Targeted ground investigation should be undertaken in these locations to establish the risks from mine workings including ground gas assessments.

4.1.3 The Brynmenyn Site is understood to be larger than the actual proposed development footprint. Based on the plans provided the proposed development is located in the north of the site. This development footprint is outside the development high risk area and away from the location of the coal seam outcrops. Notwithstanding there still remains the potential for shallow workings to be present. Therefore, it is recommended that site investigation to confirm a suitable thickness of bedrock and/or depth to shallow mine workings is undertaken. The depth of ground investigation works will be partially dependent upon the final foundation depth. Should evidence of mineworks be encountered stabilisation treatment would be required prior to development.

4.1.4 There is potential for shallow workings to be present beneath the hydrogen pipeline and private wire route. Given the nature of the hydrogen pipeline route and the private wire route, it is not anticipated that the risk associated with the potential underground works are significant. There are no mine shafts on the routes or within close proximity. The hydrogen pipeline route also follows existing infrastructure. Therefore, no further consideration is considered necessary for these parts of the development bar footings for overhead lines.

4.1.5 Following ground investigation works and the receipt of the Forkers and JPB reports the risk ratings within his report should be revised accordingly.

Drawing 1 Brynmenyn Phase 2: Option 1

Drawing 2 Brynmenyn Phase 2: Option 2

Drawing 3 Hydrogen Site Layout (Ref: 106856-MMD-BRGR-XX-PLN-C-0002)

Appendix A
GREEN HYDROGEN PROJECT: PRE APPLICATION SUPPORT DOCUMENT

GREEN HYDROGEN PROJECT

Request for non statutory pre-application advice

June 2022

Marubeni

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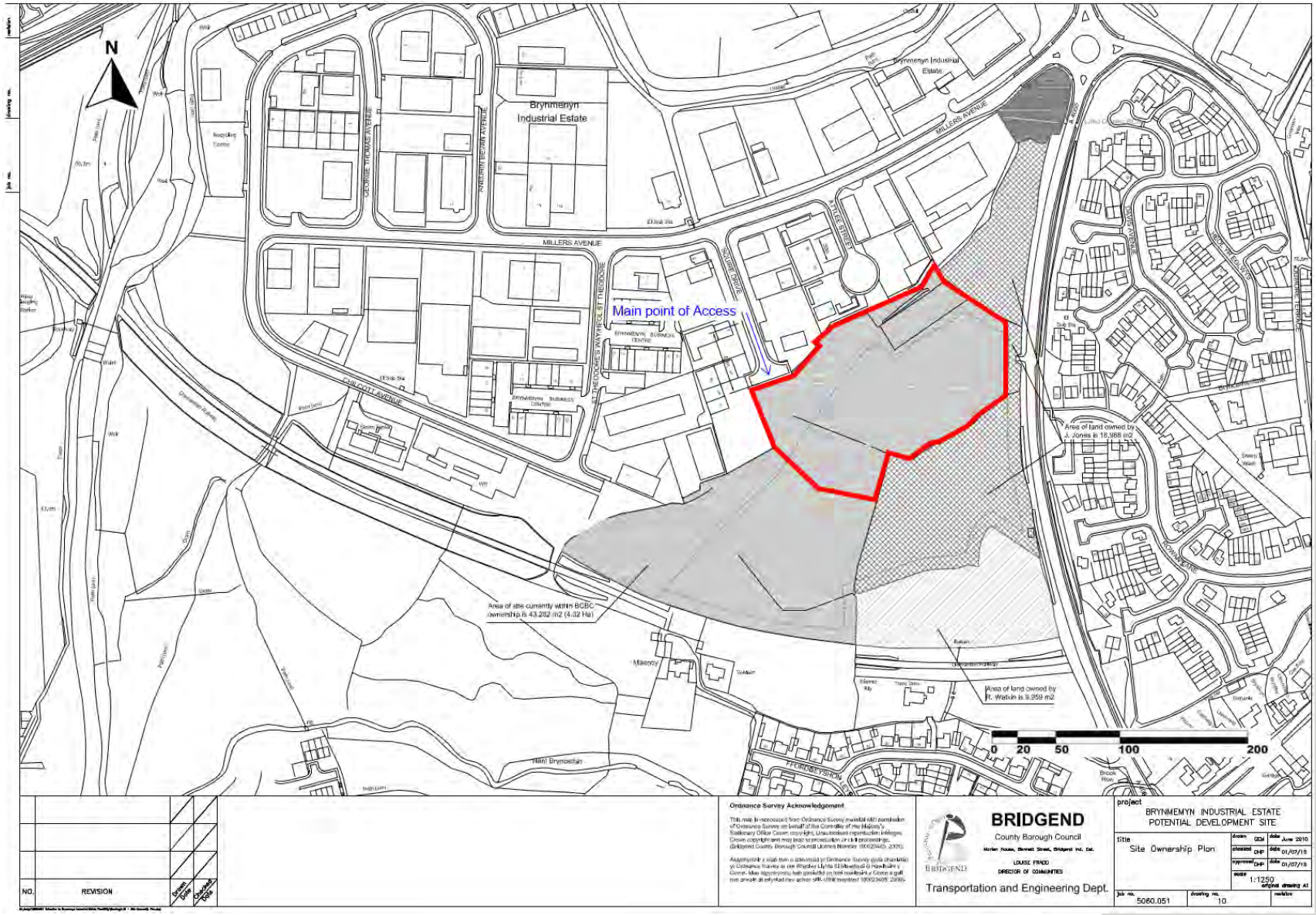
rpsgroup.com

THE SITES

Brynmenyn site for hydrogen production



Brynmenyn site context

Brynmenyn site context

Bryncethin site solar array

Bryncethin site context

Bryncethin site context

Scheme spatial context

THE PROPOSAL

The Hydrogen Production Facility

- The proposed project at Brynmenyn, Bridgend, CF32 9TX (Grid Ref SS910843) comprises a hydrogen production facility with electrolysers that generate hydrogen from electrical power by splitting water, hydrogen storage, and a hydrogen refuelling station. The site is owned by BCBC and is currently cleared land allocated for employment uses in the Bridgend LDP. The hydrogen production facility site will be approximately 1 hectare in size, of which a large proportion will be used for roads and paving to allow adequate access for re-fuelling of heavy vehicles including an outer perimeter road, and the remainder for an 'island' of hydrogen production, storage, and re-fuelling equipment.
- The proposed hydrogen production facility would have a rated capacity of up to 5 MW of electrolysis, consisting of two 2.5 MW electrolyser units, and up to 2.5 tonnes of hydrogen storage. The hydrogen supply of 300 tonnes per year would be expected to indicatively fuel 6 of BCBCs Refuse Collection Vehicles, 15 buses, and the Sarn Cluster's heating demands.
- The facility is intended to operate within a compound with controlled access. The components include the electrolyser, compression, and re-fuelling station units which are intended to be 'modularised' in typically 30ft or 40ft ISO containers, with hydrogen storage as above-ground cylindrical tanks, and electrical equipment housed in a substation. A small administration building will facilitate the monitoring and control of site operations. The majority of equipment and buildings would be expected to be less than 4m in height, with the tallest structure e.g. atmospheric vents typically being less than 10m in height.
- The power supply for the hydrogen production is intended to be supplied from renewable wind and solar generation; wind power via the grid, and solar power through directly connected Solar PV Array at St Bride's Minor via a ~1km private wire connection. Hydrogen is intended to be supplied for transport users (Refuse collection vehicles, buses and light vehicles) at the Brynmenyn site refuelling station dispensers and for heat users at the Sarn cluster (college, primary school, and leisure centre) through a ~1km hydrogen pipeline. The hydrogen pipeline is expected to use the same construction as for natural gas pipelines i.e. approx. 90mm polyethylene plastic piping in a trench, operating at medium pressure (below 2 bar).
- Access: The site benefits from good access from the adjacent Industrial Estate and will be accessed from the north of the site boundary, via Squire Drive.

Solar PV Array at St Bride's Minor

- The proposed solar array at St Bride's Minor, Bryncethin, Bridgend, CF32 9YP (Grid Ref SS919844), includes an array of ground-mounted solar panels and ancillary infrastructure including inverters (likely to be mounted behind the panels), transformer units, electrical infrastructure, switch gear and substation, and temporary construction compounds. It is anticipated that the useful life of the proposed development would be 25 - 30 years.
- The St Bride's Minor site is owned by BCBC and is in use for recreation and grazing . A grazing licence has been granted for the site, however, the current tenancy agreement does not prevent a solar PV development at the site and grazing could potentially continue with the solar PV in situ. The total land area at the site is 22 Hectares and of this area, the solar farm is expected to use approximately 8 hectares.
- The proposed solar farm would have a rated capacity of up to 5.0MW, consisting of approximately 14,700 PV panels. The panels would be ground-mounted to a maximum height above ground of approximately 3m. The panels would be oriented towards south and pitched at 20-30 degrees.
- It is predicted that the solar farm would have a potential annual yield of approximately 5,700 MWh (based on the average solar irradiation figure for the site as taken from the Solar Radiation Database, and typical number of panels and dimensions).
- The solar farm will be connected electrically via a private wire to the hydrogen production facility electrolyser located at the Brynmenyn Industrial Estate. Power generated by the solar farm will be delivered to the electrolyser load and meet approximately a quarter of the total annual electricity needs.
- Access: The site benefits from good access due to its proximity to a main road and access from the Bryncethin Depot, west of the site boundary.

Appendix B
CONSULTANTS COAL MINING REPORT – BRYNCETHIN (REF: 51003223712002)

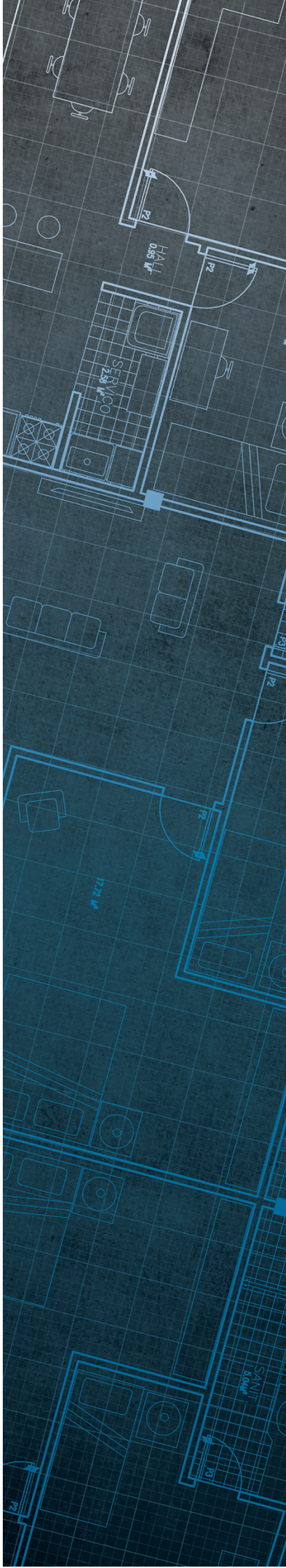
The Coal Authority

Consultants

Coal Mining Report

100108938 - Bryncethin
Near Bryncethin Depot
51°32'53.0"n 3°33'36.0"w
Bryncethin
Bridgend
NEARCF32

Date of enquiry:	**1 July 2022**
Date enquiry received:	**1 July 2022**
Issue date:	**1 July 2022**
Our reference:	**51003223712002**
Your reference:	



Consultants
Coal Mining Report

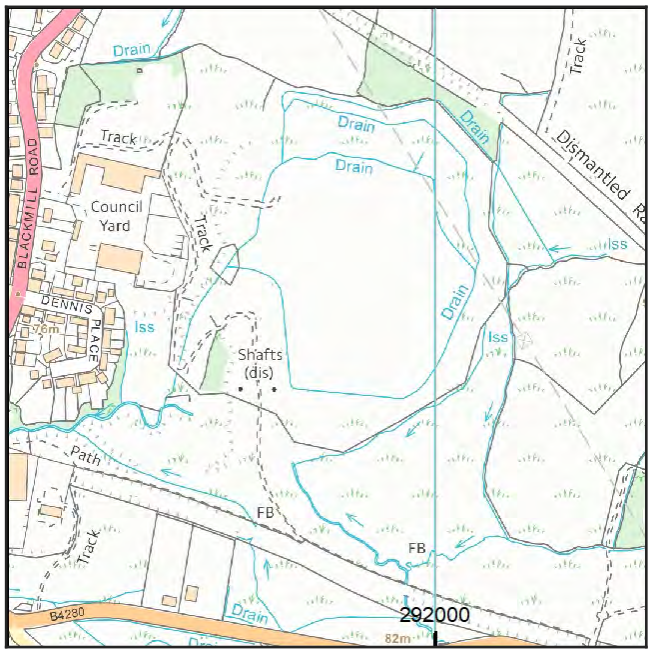
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

MOTT MACDONALD

Enquiry address

100108938 - Bryncethin
Near Bryncethin Depot
51°32'53.0"n 3°33'36.0"w
Bryncethin
Bridgend
NEARCF32



Approximate position of property

How to contact us

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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
BRYNCETHIN	PENTRE RIDER	Coal	4JN1	5	Beneath Property	18.3	North	60	1916
unnamed	PENTRE RIDER	Coal	4Z43	7	Beneath Property	23.9	North	60	1916
BRYNCETHIN	SPOTTED PINS	Coal	4JMV	80	Beneath Property	40.1	North	170	1915
unnamed	BUTE	Coal	4JMT	148	Beneath Property	39.8	North	190	1913
unnamed	LOWER NINE FOOT (TOP LEAF)	Coal	4JMX	150	Beneath Property	46.3	North	100	1915
unnamed	FIVE FOOT GELLIDEG	Coal	4Z42	162	Beneath Property	45.0	North	100	1913
BRYNCETHIN	FIVE FOOT GELLIDEG	Coal	4JMX	164	Beneath Property	43.9	North	100	1915
BRYNCETHIN	SPOTTED PINS	Coal	4JMU	189	West	36.1	North	170	1915
unnamed	UNNAMED	Coal	4JMQ	217	Beneath Property	45.0	North	100	1913
unnamed	SPOTTED PINS	Coal	4Z40	219	Beneath Property	45.0	North	170	1915
unnamed	UNNAMED	Coal	4Z41	261	Beneath Property	0.0	East	100	1913
unnamed	SIX FOOT	Coal	5JMP	269	Beneath Property	45.0	North	60	1915
unnamed	UNNAMED	Coal	4JMR	269	Beneath Property	45.0	North	100	1913
unnamed	FOUR FOOT	Coal	4JMO	281	Beneath Property	45.0	North	120	1914

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

Distance to spine roadway (m)	Direction to spine roadway
Within	N/A
Within	N/A

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	291184-005	291785 184528		Coal	
Adit	291184-006	291833 184488		Coal	
Shaft	291184-007	291847 184511		Coal	
Shaft	291184-008	291792 184299	This shaft was filled with foundry slag by the National Coal Board (NCB) in April 1978. The shaft was then capped by the NCB in December 1980. There are no details on the construction of the shaft cap.	Coal	
Shaft	291184-009	291829 184300	This shaft was filled with foundry slag by the National Coal Board (NCB) in April 1978. The shaftwas then capped by the NCB in December 1980. There are no details on the construction of the shaft cap.	Coal	
Shaft	291184-010	291514 184261		Coal	
Shaft	291184-011	291545 184198	This shaft was filled with old masonry hardcore at some time in the past A concrete raft was laid by the occupier of the land. There are no details on the construction of the raft.	Coal	
Shaft	291184-014	291839 184328		Coal	
Shaft	291184-016	291714 184496	Under Permit 6886, June 2013, Johnson Poole & Bloomer had a total of 34 rotary probe holes drilled extending to a maximum depth of 5m below ground level which resulted in no obvious evidence of any mining related anomaly. They concluded that taking into account both the archival research undertaken and the intrusive investigation that a high degree of uncertainty must exist as to whether there was a mine shaft at all.	Fireclay	
Adit	292184-005	292036 184670		Coal	
Adit	292184-006	292002 184677		Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

6538	SW3780	SWR2811
6730	PO0	16957
SW3781		

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
6FT BOTTOM LEAF	Coal	Yes	Within	N/A	125
ABERGORCHI	Coal	Yes	Within	N/A	112
ABERGORCHI	Coal	Yes	Within	N/A	113
ABERGORCHI	Coal	Yes	Within	N/A	118
EIGHTEEN INCH	Coal	Yes	Within	N/A	115
FOUR FOOT	Coal	Yes	15.2	East	104
FOUR FOOT	Coal	Yes	Within	N/A	112
FOUR FOOT	Coal	Yes	Within	N/A	114
FOUR FOOT	Coal	Yes	Within	N/A	122
GORLLWYN	Coal	Yes	Within	N/A	115
HAFOD	Coal	Yes	Within	N/A	105
HAFOD	Coal	Yes	Within	N/A	110
LOWER PINCHIN	Coal	No	Within	N/A	104
LOWER PINCHIN	Coal	No	Within	N/A	105
MIDDLE 9FT TOP LEAF	Coal	Yes	Within	N/A	116
NO.3 RHONDDA	Coal	Yes	Within	N/A	106
NO.3 RHONDDA	Coal	Yes	Within	N/A	112
PENTRE RIDER	Coal	Yes	Within	N/A	102
SIX FOOT	Coal	Yes	Within	N/A	116
TORMYNDD	Coal	Yes	Within	N/A	101
TORMYNDD	Coal	Yes	Within	N/A	109
TWO FOOT NINE	Coal	Yes	Within	N/A	110
TWO FOOT NINE	Coal	Yes	Within	N/A	118
TWO FOOT NINE	Coal	Yes	Within	N/A	138
TWO FOOT NINE (B.L.)	Coal	Yes	Within	N/A	113
UNNAMED	Coal	No	Within	N/A	112

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
UNNAMED	Coal	Yes	Within	N/A	112
UNNAMED	Coal	No	Within	N/A	115
UNNAMED	Coal	No	Within	N/A	115
UNNAMED	Coal	Yes	Within	N/A	117
UNNAMED	Coal	Yes	Within	N/A	120
UNNAMED	Coal	Yes	Within	N/A	121
UNNAMED	Coal	No	Within	N/A	121
UNNAMED	Coal	No	Within	N/A	124
UNNAMED	Coal	No	Within	N/A	125
UNNAMED	Coal	No	Within	N/A	128
UNNAMED	Coal	No	Within	N/A	129
UNNAMED	Coal	No	Within	N/A	129
UPPER 6FT RIDER	Coal	Yes	Within	N/A	113
UPPER 6FT RIDER	Coal	Yes	22.1	South-East	114
UPPER FOUR FOOT	Coal	Yes	Within	N/A	114
UPPER PENTRE	Coal	Yes	Within	N/A	105
UPPER PENTRE	Coal	Yes	Within	N/A	112
UPPER PENTRE	Coal	Yes	Within	N/A	120

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Faults under or close to the property recorded.

Opencast mines

Please refer to the “Summary of findings” map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

Distance to site investigation (m)	Direction
Within	N/A
Within	N/A

See Section 4 for further information.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining
None recorded.

Coal mining licensing
None recorded within 200 metres of the enquiry boundary.

Court orders
None recorded.

Section 46 notices
No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices
The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land
The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

Site investigations

The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations.

The site requires further investigation and may influence how you approach your risk assessment.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk.**

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines
Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips
Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations
Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites
Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence
Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas
Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes
Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining
Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing
Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders
Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices
Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

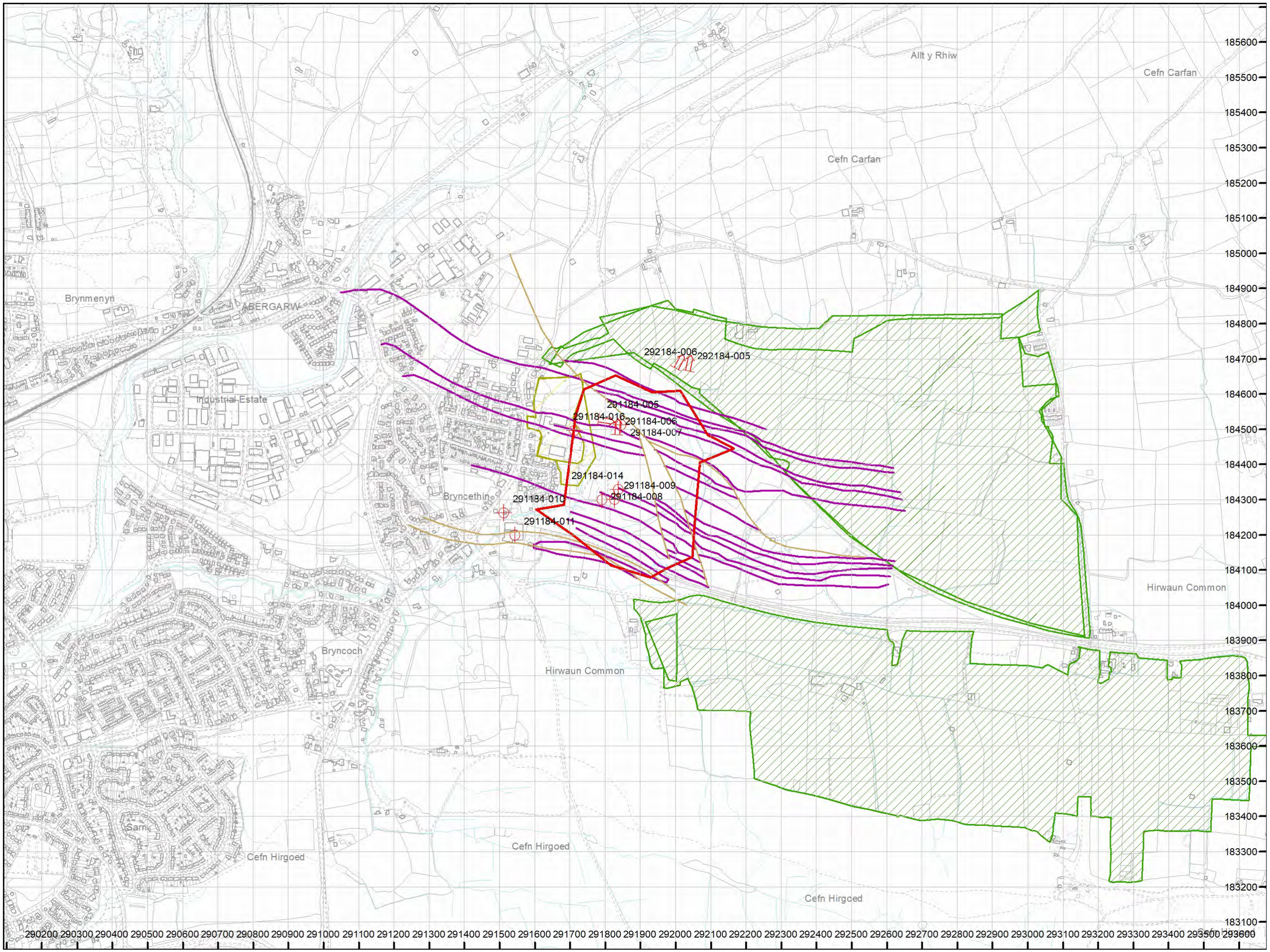
The Coal Authority

Summary of findings

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Disused adit
- Outcrop (Proven)
- Geological faults
- Unlicensed opencast site
- Site investigations



How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com

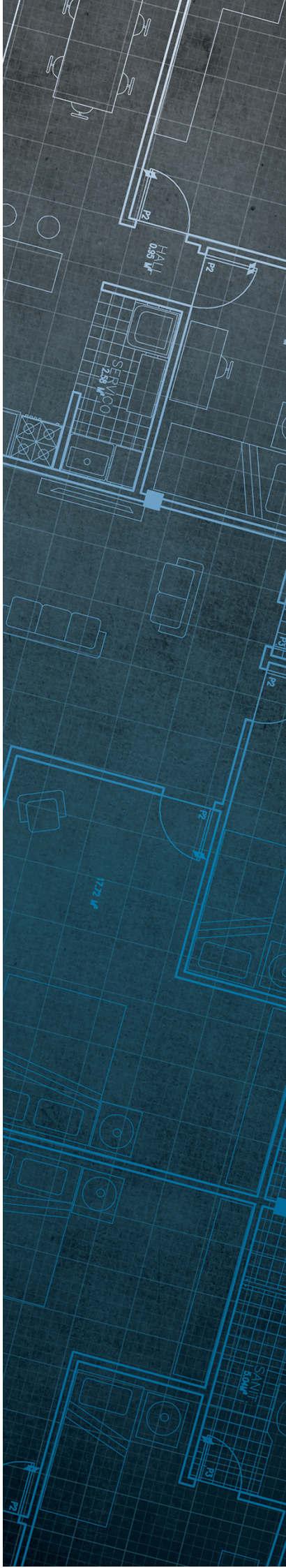
Appendix C
CONSULTANTS COAL MINING REPORT – BRYNMENYN (REF: 51003223712001)

The Coal Authority

Consultants

Coal Mining Report

100108938 - Brynmenyn
Near Brynmenyn Industrial Estate
51°3248n , 003°3425w
Brynmenyn
Bridgend
NEARCF32



Date of enquiry:	**1 July 2022**
Date enquiry received:	**1 July 2022**
Issue date:	**1 July 2022**
Our reference:	**51003223712001**
Your reference:	**Brynmenyn**

Consultants

Coal Mining Report

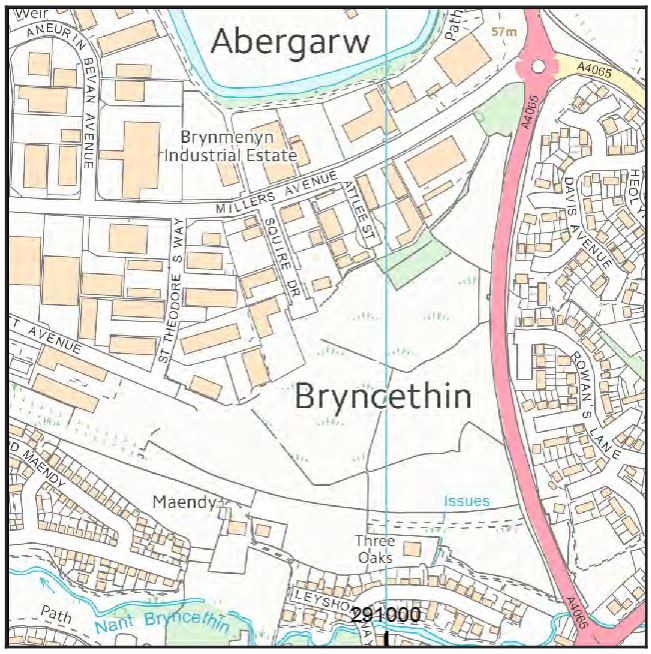
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

MOTT MACDONALD

Enquiry address

100108938 - Brynmenyn
Near Brynmenyn Industrial Estate
51°3248n , 003°3425w
Brynmenyn
Bridgend
NEARCF32



Approximate position of property

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

@coalauthority
/company/the-coal-authority
/thecoalauthority
/thecoalauthority

Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	MIDDLE 9FT TOP LEAF	Coal	4JN2	48	Beneath Property	45.0	North	100	1912
unnamed	UPPER NINE FOOT	Coal	4JMS	49	Beneath Property	41.8	North	100	1923
unnamed	LOWER NINE FOOT	Coal	4JN4	63	South	44.2	North	130	1922
unnamed	BUTE	Coal	4JMT	139	Beneath Property	39.8	North	190	1913
unnamed	LOWER NINE FOOT (TOP LEAF)	Coal	4JMW	168	Beneath Property	44.7	North	100	1913
BRYNCETHIN	FIVE FOOT GELLIDEG	Coal	4JMX	172	Beneath Property	43.9	North	100	1911
BRYNCETHIN	FIVE FOOT GELLIDEG	Coal	4JMZ	203	Beneath Property	43.8	North	100	1911

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

6538	9095	SW3780
SW3781		

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
6FT BOTTOM LEAF	Coal	Yes	44.3	South	78
6FT BOTTOM LEAF	Coal	Yes	28.7	South	336
RED VEIN	Coal	Yes	44.2	South	90
SIX FOOT	Coal	Yes	23.7	South	83
SIX FOOT	Coal	Yes	22.6	South	89
TWO FOOT NINE	Coal	Yes	Within	N/A	149
UNNAMED	Coal	Yes	Within	N/A	88
UNNAMED	Coal	Yes	Within	N/A	163
UPPER 6FT RIDER	Coal	Yes	6.7	South	78
UPPER 6FT RIDER	Coal	Yes	7.3	South	104

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Fault under or close to the property recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining
None recorded.

Coal mining licensing
None recorded within 200 metres of the enquiry boundary.

Court orders
None recorded.

Section 46 notices
No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices
The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land
The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk.**

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines
Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips
Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations
Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites
Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence
Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas
Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes
Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining
Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing
Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders
Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices
Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The Coal Authority

Summary of findings

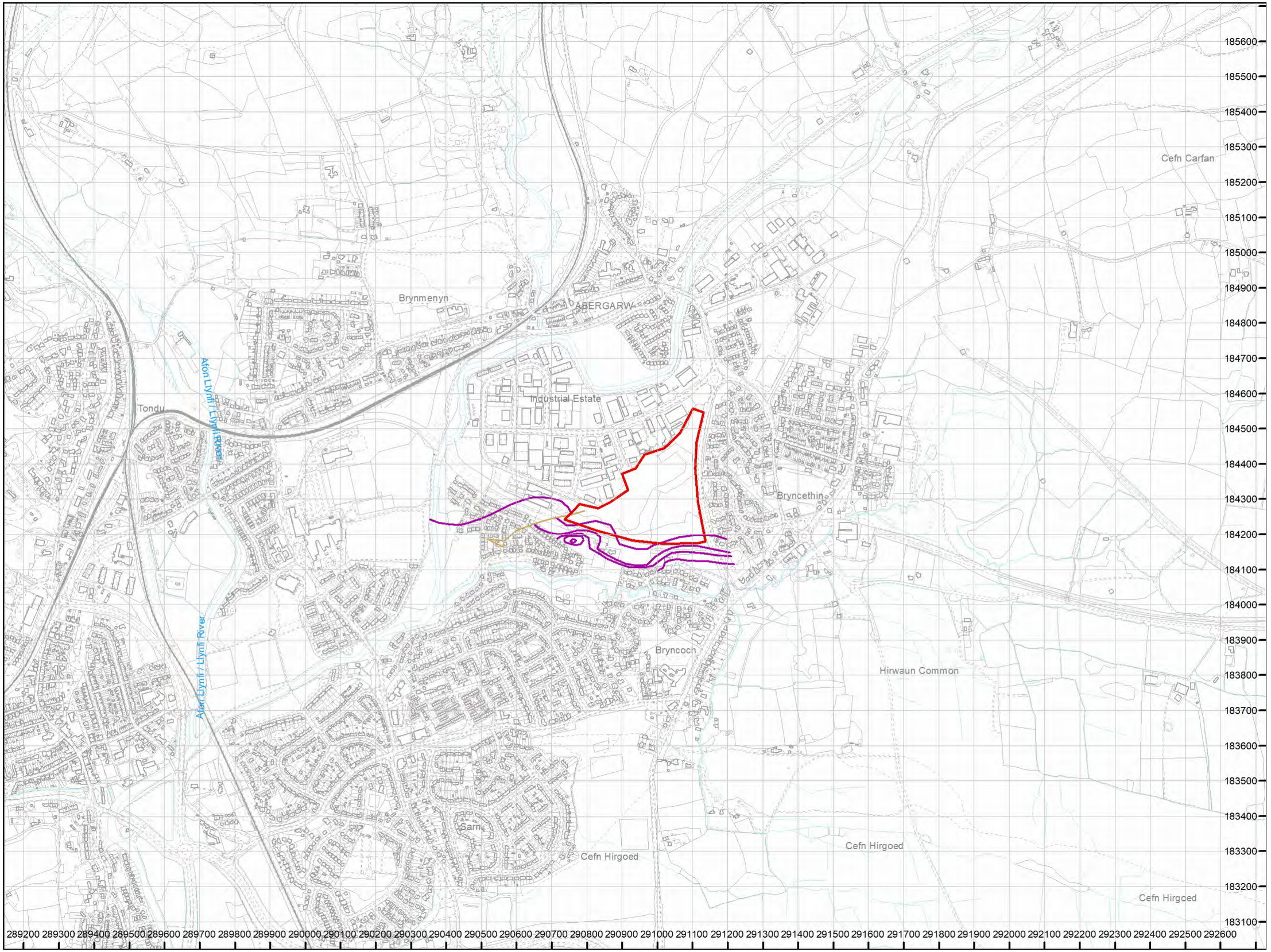
The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

Approximate position of the enquiry boundary shown

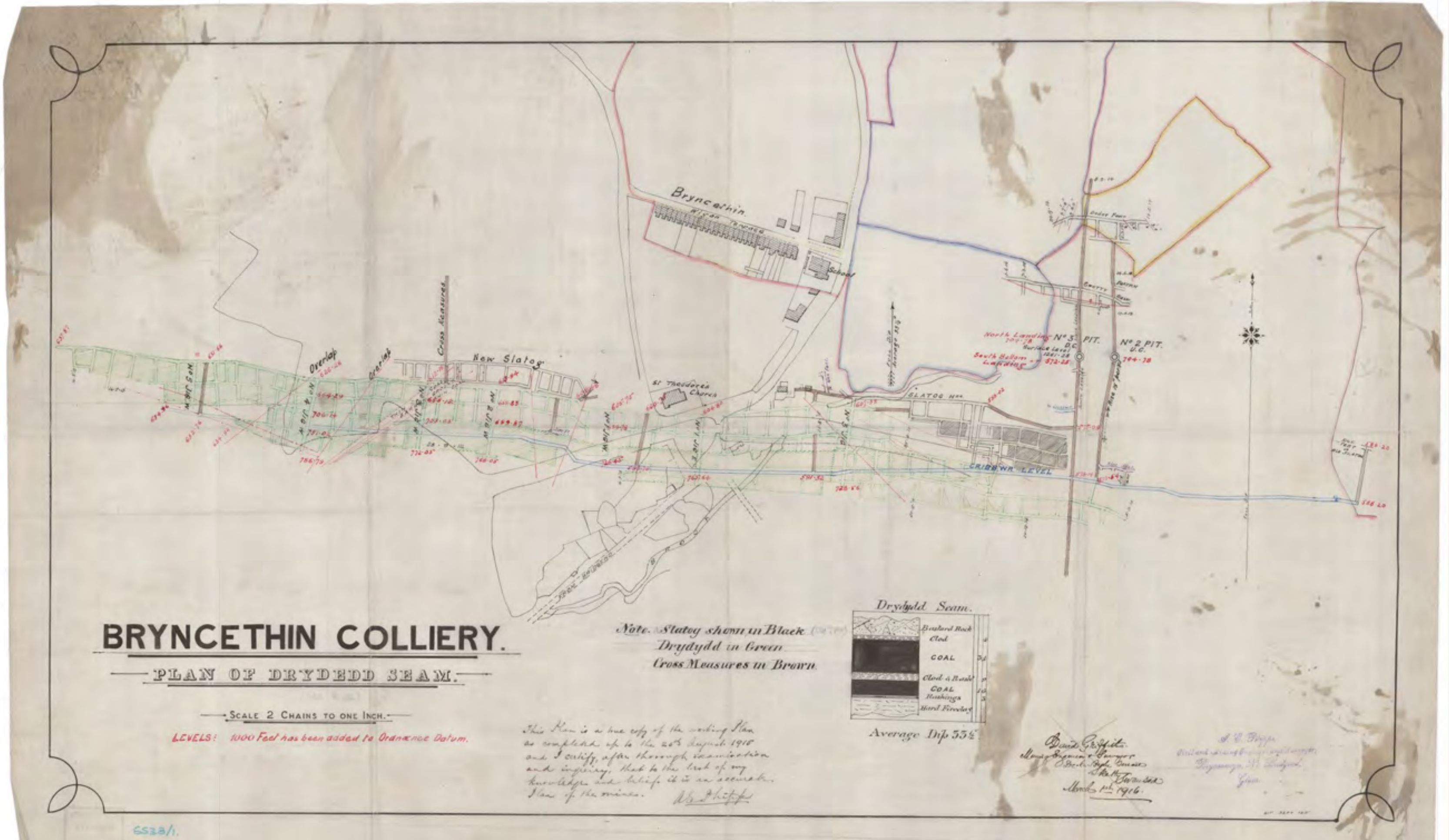
Outcrop (Proven)

Geological faults



How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com

Appendix D
BRYNCETHIN COAL AUTHORITY MINE ABANDOMENT PLANS (REF: 6538 & 6730)


BRYNCETHIN COLLIERY.
PLAN OF DRYDEDD SEAM.
SCALE 2 CHAINS TO ONE INCH.
LEVELS: 1000 Feet has been added to Ordnance Datum.
Note. Slatog shown in Black
Drydydd in Green
Cross Measures in Brown
Drydydd Seam.
Bastard Rock
Clod
COAL
Clod & Rashes
COAL
Rashings
Hard Fireclay
Average Dip 5½
This Plan is a true copy of the working Plan as completed up to the 20th August 1915 and I certify, after thorough examination and inquiry, that to the best of my knowledge and belief it is an accurate Plan of the mines.
March 1st 1916.
Bryncethin
School
St Theodore's Church
New Slatog
Overlap
Cross Measures
SLATOG Hse
No 3 PIT
No 2 PIT
North Landing
South Bottom Landing
CRIBBWR LEVEL
6528/1.

—BRYNCETHIN BRICK WORKS Ltd —

—SCALE— ONE CHAIN TO ONE INCH —

—VENTILATION PLAN—

— SEAM — LANTERN RIDER —

Appendix E
BRYNMENYN COAL AUTHORITY MINE ABANDOMENT PLANS (REF: 9095)


MAERDY COLLIERY.
PLAN

PRELIMINARY COAL MINING RISK ASSESSMENT

Green Hydrogen Project, Bridgend

2022-09-27

JER9769

01

01

Contact

5 New York Street
Manchester, M1 4JB
+44 161 786 8550