

## Coal Mining Risk Assessment

For the proposed development at

**Plot 4 & 5, Golwg Yr Ynys, Glyn Road, Lower  
Brynamman,**

**SA18 1SJ**

On Behalf of

**Erin McGeough**

## Quality Management

|                                      |                                                                                                                                                    |                                                                                     |
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# 1 Background

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## 1.1 Introduction

Hydrogeo Limited (Hydrogeo) was commissioned by Erin McGeough (The Client) to undertake a Coal Mining Risk Assessment (CMRA) for the proposed development at Plot 4 & 5, Golwg Yr Ynys, Glyn Road, Lower Brynamman (The Site).

The proposed development consists of a single residential dwelling with associated driveway, access and, decking.

All sites located in a Coal Authority “Development High-Risk Area” need to submit a Coal Mining Risk Assessment to the Local Planning Authority (LPA) in support of a planning application.

Coal Authority (CA) records indicate that within the application site and surrounding area there are coal mining features and hazards which need to be considered in relation to the determination of the planning application, with the CA records indicating the presence of underground workings and a coal seam within the planning boundary.

The purpose of this report is to present a desk-based review of all available information on the coal mining legacy relevant to the Site and to determine the level of risk associated with the development. If an unacceptable level of risk is determined, further investigation or mitigation measures may be required to address the coal mining legacy.

This report has been written in general accordance with the Coal Mining Risk Assessment Model Report Template (Version 4, 2017), and intends to demonstrate to the Local Planning Authority (LPA) that the Site is, or can be, made safe and stable.

## 1.2 Scope of Works

The scope of works performed by Hydrogeo for this CMRA report is presented in Table 1-1.

**Table 1-1 Scope of works**

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data Collection</b>                | <ol style="list-style-type: none"> <li>1. Documentary research;             <ul style="list-style-type: none"> <li>– Review site history (location, surroundings, topography);</li> <li>– Review current site use (including adjacent areas);</li> <li>– Review site geology;</li> </ul> </li> <li>2. Review commercially available Coal Authority and regulatory database information;</li> <li>3. Request and review the clients' previous intrusive investigations.</li> </ol> |
| <b>Interpretation &amp; Reporting</b> | <ol style="list-style-type: none"> <li>4. Identification and assessment of site-specific coal mining risk;</li> <li>5. Summary of the identified risks, the need for, and scope of, further investigation and/or remedial measures;</li> <li>6. Proposed mitigation strategy; and,</li> <li>7. Prepare final CMRA report incorporating all of the above.</li> </ol>                                                                                                               |

## 1.3 Data Sources & Third Party Information

In completing this assessment, Hydrogeo has utilised the following information:

- British Geological Survey (BGS) data
- BGS 1:50,000 Series England & Wales Sheet Map 230 Ammanford, Solid Geology (2004)
- BGS 1:50,000 Series England & Wales Sheet Map 230 Ammanford, Drift Geology (2004)
- Coal Authority Online Interactive Map Viewer - (<http://mapapps2.bgs.ac.uk/coalauthority/home.html>);
- Coal Authority CON29M Coal Mining Report, reference: 51003344153001.
- A search of available internet-based historical maps.

- The geology of the South Wales Coalfield Special memoir The Upper Carboniferous and later formations of the Gwendraeth Valley and adjoining areas in parts of the Carmarthen (229) Ammanford (230) and Worms Head (246) sheets. 1968
- Collection of associated planning documents provided to Hydrogeo by the Client Team

## 1.4 Limitations

This report provides an assessment of the potential status of the ground below the Site based upon the available information. It does not provide an Environmental Phase I report in accordance with 'Land Contamination Risk Management (LCRM)'.

Hydrogeo obtained, reviewed, and evaluated information in preparing this report from The Coal Authority (CA), the British Geological Society (BGS), and others. The conclusions, opinions, and recommendations are based upon this data. Hydrogeo does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Hydrogeo has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

## 2 Identification of Site-Specific Risks

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### 2.1 Introduction

Identification and assessment of the Site's coal mining risks have been undertaken from existing available desk-based information.

If an issue associated with the coal mining legacy is identified, a preliminary risk assessment is carried out to assess each possible feature, to determine whether these pose potentially unacceptable risks to the development of the Site, and, if further assessment is required.

The decision on whether a feature related to coal mining poses a potentially unacceptable risk is based upon professional judgement. The significance of a feature associated with the coal mining legacy will also be determined depending on the context of the proposed land use of the Site.

Assessing risks from coal mining is based upon guidance provided by the Coal Authority entitled "Risk Based Approach to Development Management Guidance for Developers" Version 4 2017.

## 2.2 Potential Coal Mining Legacy Issues

Table 2-1 below summarises the potential risks associated with coal mining legacy at the Site, identified from the sources listed in Section 1.3, and detailed in Section 3.

**Table 2-1 Potential coal mining legacy issues**

| Coal Mining Legacy                                   | Yes      | No       | Risk Assessment |
|------------------------------------------------------|----------|----------|-----------------|
| Underground coal mining (recorded at shallow depths) | <b>X</b> |          | Required        |
| Underground coal mining (probable at shallow depths) |          | <b>X</b> | Not Required    |
| Mine entries (shafts and adits)                      |          | <b>X</b> | Not Required    |
| Coal mining geology (fissures)                       |          | <b>X</b> | Not Required    |
| Record of past mine gas emissions or potential       | <b>X</b> |          | Required        |
| Recorded coal mining surface hazard                  |          | <b>X</b> | Not Required    |
| Surface mining (opencast workings)                   |          | <b>X</b> | Not Required    |

For the coal mining issues identified as “Required” a more detailed discussion and assessment of the risks, both individually and cumulatively, to the application site and the proposed development is detailed within the following sections.

### 3 Assessment of Site-Specific Risks

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#### 3.1 Current and Proposed Use

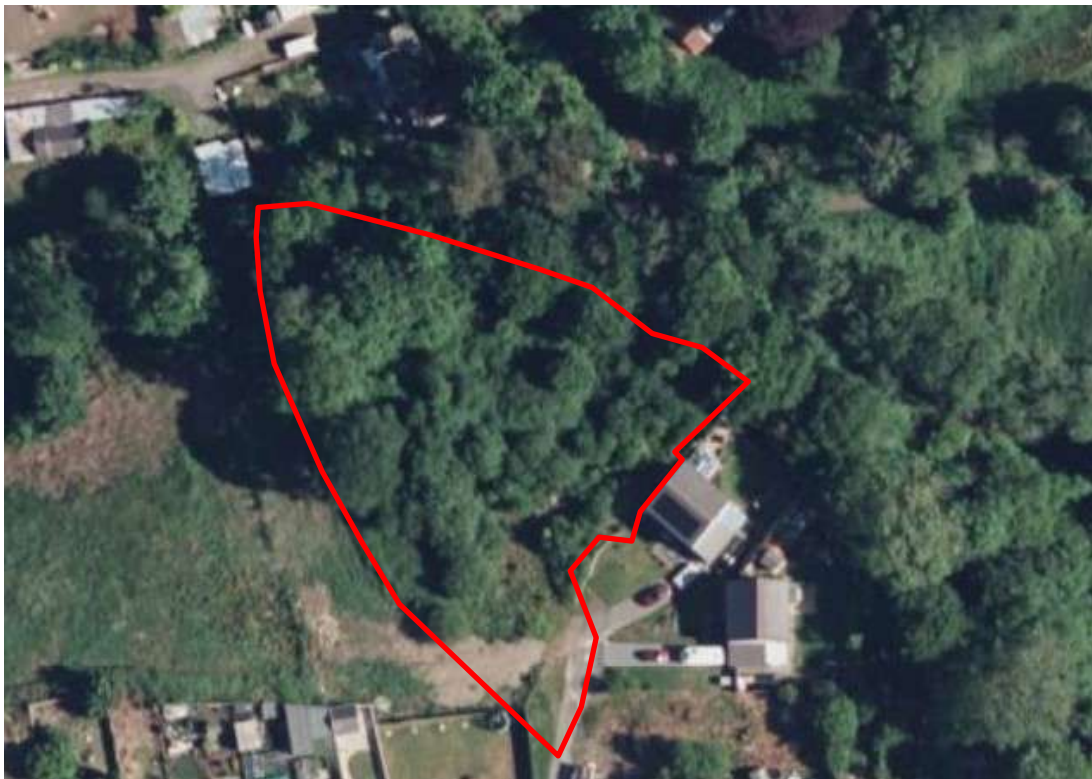
The Site is located on a plot 4 & 5 of 3 Golwg Yr Ynys, Lower Brynamman, SA18 1SJ. National Grid Reference for the Site is 270776, 213740. The Site is located at a topographic elevation of 148mAOD in the south and 146mAOD in the north. The site is currently 2no. undeveloped plots.

The proposal includes adding a single residential dwelling with associated driveway, access, and decking.

Proposed development plans have been included in Appendix A and Figure 3-1 shows the Site locality.

This Coal Mining Risk Assessment specifically addresses the risk from previous mining activities to the area of the proposed development as outlined by the red boundary in Figure 3-1.

**Figure 3-1 - Site Ownership Boundary and Proposed Development Boundary**



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### 3.2 Historical Information

The Site lies within the South Wales Coal field a geologically complex coalfield that extends from Pontypool to Kidwelly. The south Wales coalfield has been mined from the 17<sup>th</sup> and reached its peak in 1913.

During the 17<sup>th</sup> century coal was largely obtained by excavating the outcrops at the surface. Opencast mines exhausted the surface deposits leading to the use of bell pits and eventually short shafts into hillsides. The majority of pits closed in Wales in the 1980s causing widespread unemployment. The South Wales coalfield is still mined today at Aberpergwm Colliery.

In the Ammanford area the Gwendreath seam, correlating with the Yard seam is of high economic value noted by an anthracite band. The Amman valley area contains numerous coal seams extensively mined via unlicensed opencasts associated with Amman colliery.

It should be recognised that it did not become a statutory requirement to maintain and preserve plans of abandoned mines until the Mines (Coal) Regulations Act of 1872, by which date much-unrecorded mining had taken place and of those plans which were made it is likely that not all will have survived. With the extensive coal mining history in the area, unrecorded workings may be found during the development of the Site.

### 3.3 Historical Mapping Features

Available online historic Ordnance Survey (OS) Maps and Satellite Imagery have been examined for evidence of mining features on site and the surrounding area.

Mapping from 1877 shows the Site as undeveloped. The River Amman runs along the northeast boundary separated by a small section of woodland. A couple small buildings are located directly south of the Site and to the west is more undeveloped land. The Great Western Railway Garnant Branch runs west-east adjacent to the north of the site with a small section of woodland between the northern boundary and the track. Aman coal pit is mapped 230m southeast. A large area of coal levels are shown approximately 250m southeast labelled with several air shafts and numerous spoil tips across the area.

Mapping from 1896 shows the Site is part of the newly constructed Glyn-Beudy Tin Plate Works, mapped approximately 150m northwest of the site. Residential development shown south of the site within Glyn-Beudy. An old coal level is mapped approximately 150m north over the river, the coal levels to the south and southeast are now mapped as

old as well as several of the air shafts along the southern border of the opencast area. Large residential developments at Brynamman.

Mapping published in 1908 shows the Site remains as part of the Tin Works. The coal level to the north is no longer labelled and the level to the south is now labelled as old.

Mapping from 1921 shows the Site remains as part of the Tin Plate Works. Further residential development to the south in Lower Brynamman and along the River Amman to the southeast.

Mapping from 1948 shows no significant changes on site. The Tin Plate Works is now labelled as disused. No other significant changes to the surrounding area.

A review or aerial imaging dated 2006-2021 shows 2no. houses constructed adjacent to the eastern boundary between 2006 and 2009. Thick vegetation on-site is allowed to grow from 2015 until its cut back in 2021. No further significant changes on Site.

### 3.4 Geology

The information on the Site's geology and wider context is detailed across the British Geological Survey (BGS) 1:50,000 Series England & Wales map series, Sheet 230, Ammanford (1997) and the online BGS Geoindex.

A bedrock geology map (BGS) for the Site can be seen in Drawing 01.

#### **Artificial Deposits**

Artificial ground consists of areas where the surface geology has been significantly modified by man, through extraction or infilling of the natural geology.

The site is not mapped in an area of artificial deposits. However, due to the coal mining legacy of the surrounding area it is likely that artificial deposits in the form of quarry spoil and wastes may be present underlying the site and immediate surrounding area. The nearest mapped artificial deposits are 500m west consisting of Made Ground (Undivided–Artificial Deposits).

#### **Superficial Deposits**

Superficial deposits consist of loose deposits of geological materials that have not yet formed into competent rocks.

There Site is underlain by Alluvium – Clay, Silt, Sand and Gravel. Alluvium is described by the BGS as:

“Alluvium is a general term for clay, silt, sand and gravel. It is the unconsolidated detrital material deposited by a river, stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a mountain slope. Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel.”

A superficial deposits map (BGS) for the Site can be seen in Drawing 02.

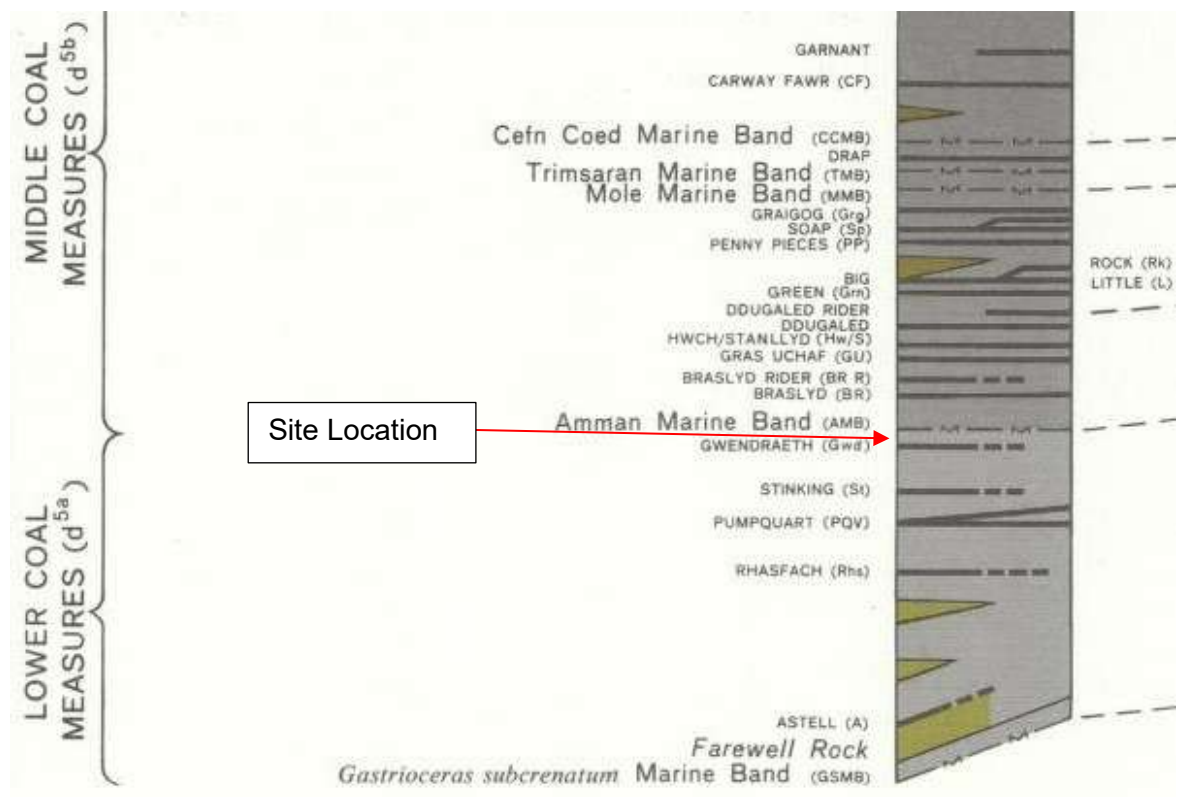
### Bedrock Geology

The Site is underlain by the South Wales Lower Coal Measures Formation – Mudstone, Siltstone and Sandstone, described by the BGS as:

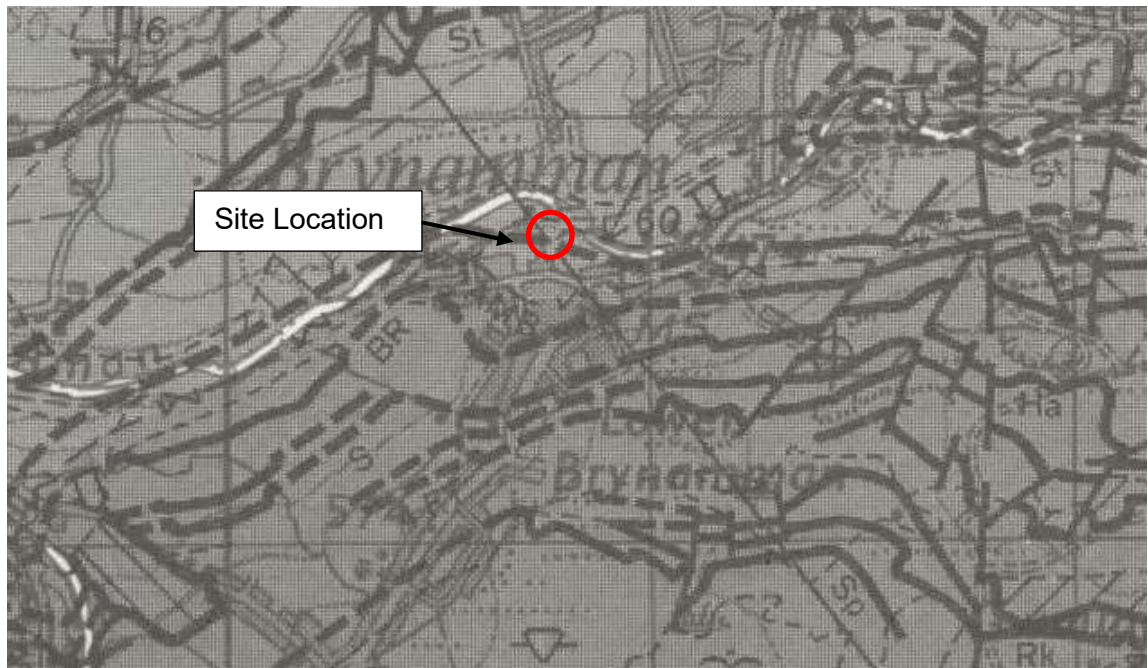
“Grey, (productive) coal-bearing mudstones/siltstones, with seatearths and minor sandstones.”.

The BGS map (Figure 3-3) shows an unnamed inferred coal seam beneath the site trending east west. Based on the generalized section (Figure 3-2) this is the Gwendraeth seam which correlates to the Yard seam of the Aberdare succession.

**Figure 3-2 Site position on BGS vertical section.**



**Figure 3-3 BGS paper map 1:50,000, Solid, 1977, Ammanford, sheet 230**



### **Geological Structure**

The Site is an area of intense folding making the area heavily folded and fractured. This section of the lower coal measures also contains numerous workable coal seams in close proximity. According to the Coal Authority Consultants Report an unnamed fault runs through the middle of the Site trending northeast – southwest, no further details are provided.

### 3.5 BGS Borehole Records

Borehole logs available on the BGS GeoIndex have been reviewed with the most relevant logs summarised in Table 3-1.

**Table 3-1 Borehole logs.**

| Borehole Reference | Description of Strata.                                    |
|--------------------|-----------------------------------------------------------|
| SN61SE46           | Ground level – 0.25mbgl Topsoil                           |
| Amman Colliery     | 0.25mbgl – 4.1mbgl Made Ground- Black gravel              |
| 900m SW            | 4.1mbgl – 4.5mbgl Made Ground- dark grey silty sandy clay |
| SN61SE30           | Ground level – 0.3mbgl Topsoil                            |
| Amman Colliery     | 0.3mbgl – 0.8mbgl Light grey silty sandy Clay             |
| 830m NW            | 0.8mbgl – 1.7mbgl blue grey brown sandy Clay              |
|                    | 1.7mbgl – 3.4mbgl brown blue silty sandy Clay             |
|                    | 3.4mbgl – 4.4mbgl blue grey silty Clay                    |

### 3.6 Coal Authority Interactive Viewer Data

The Coal Authority Interactive Viewer presents data on the potential coal seams underlying the site.

A coal seam is shown outcropping on-site with seam code SW024I also known as the Gwendraeth seam. A second coal seam is shown adjacent to the northern site boundary with seam code SW023I.

A mine entry (shaft) is mapped 160m north of the site on the other side of the River Amman associated with an Old Coal Level. The shaft diameter is assumed to be 3m. Another mine entry is mapped 200m south east of the site called Banwen Level.

### 3.7 Coal Authority Report

The Coal Authority Consultants Coal Mining Report (Ref: 51003344153001) is attached in Appendix B of this report.

Potential coal mining legacy risks to the Site have been identified by the Coal Authority Report as follows:

#### **Past Underground Coal Mining**

The Coal Authority report has no records of past underground mining.

#### **Probable Unrecorded Shallow Workings**

- The Site is not in an area where unrecorded shallow workings are possibly present.

#### **Spine roadways at shallow depth**

- There are no spine roadways recorded at shallow depths below the Site.

#### **Mine Entries**

- There is no record of mine entries within 100m of the Site boundary.

#### **Outcrops**

- There is record of 1no. Coal seam outcrop within the Site boundary. The Yard seam is a workable Coal seam located beneath the site on a bearing of 63. The outcrop is shown in the Coal Authority Consultants Report map in Appendix B.

#### **Present Underground Coal Mining**

- The property is not within a surface area that could be affected by present underground mining.

### **Future Underground Coal Mining**

- The property is not in an area where the Coal Authority has received an application for and, is currently considering whether to grant a licence to remove or work coal by underground methods.
- The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.
- The property is not in an area likely to be affected from any planned future underground coal mining.
- However, reserves of coal exist in the local area which could be worked at some time in the future.
- No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

### **Coal Mining Geology**

- The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

### **Past, Present and Future Opencast Coal Mining**

- The property is not located within 500m of any opencast site.

### **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**

- The Coal Authority has 1 no. record of mine gas remediation 327.3m east.

### **Hazard Related to Coal Mining**

- The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

**Withdrawal of Support**

- 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.

**Working Facilities Order**

- The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

**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

**Site Investigations**

- The Coal Authority hold no records of site investigations within 50m of the site boundary

**3.8 Site Specific Risk Assessment****Outcrops**

The Coal Authority Consultants Report indicates 1no. coal outcrop on-site named the Yard seam, a workable coal seam trending east west across the southernmost point of the Site. This can be seen in the Coal Authority Consultants Report Map shown in Appendix B. There are no records suggesting the Yard seam beneath the site has been worked but the surrounding area has a history of large-scale opencast coal mining. BGS memoirs indicate the Yard seam correlates to the Gwendraeth coal seam, an economically important seam for the area. The general dip of the geology in the area is 16 degrees south according to BGS geology maps. Therefore, the Yard coal seam will not be present to the north of the outcrop location. The position of the outcrop is not beneath the proposed dwelling but a new access road will be constructed over the outcrop. Given an access road is the only section of the development near the outcrop and the seam is dipping south away from the site and the proposed dwelling the outcrop poses a Low risk to development.

There are also 4no. coal seams present between approximately 600 - 800m north of the Site which will be present at depth beneath the site. 3no. of the seams are named as follows: Stinking, Pumpquart and Rhasfach, the final seam appears to be an unnamed branch of one of the other seams. Based on the general dip of 16 degrees and the

distance to the outcrop from site obtained from BGS geology maps the seams are estimated to be 124, 138, 151 and 203mbgl. These seams are at significant depth where they pose negligible risk to the Site.

If coal is encountered on-site an incidental coal management strategy should be created explaining how the coal will be managed. Should coal be encountered at foundation depth, foundations ideally should be deepened through the coal seam to bear upon more competent strata. In addition, any coal encountered that is exposed above founding level should be ideally sealed with clay (or concrete). Any coal seam encountered within 500mm below the underside of the floor slab should be removed and replaced with well compacted granular fill.

Hydrogeo understands that there is no existing evidence of subsidence or structural damage to the site buildings or roadways in the area.

### **Mine Gas**

The Coal Authority consultants report shows 1 no. record of mine gas remediation 327.3m east on the edge of the unlicensed opencast as shown in the Coal Authority Report Map in Appendix B. The Site is surrounded by 3no. large opencasts mines the closest is 200m southeast but none of the recorded mines extended onto the Site. There are no records of mining on-site however, given the intense mining of the surrounding area mine gas is considered to pose a low risk to Site.

## 4 Risk Assessment and Mitigation Strategy

Based on the information obtained in the desk-based study, a risk assessment has been formulated which identifies plausible risks at the Site in the context of the proposed end-use. Mitigation strategies for each targeted risk are proposed and detailed in Table 4-1.

**Table 4-1 Identified risks and mitigation strategy**

| Source    | Assessment of risk significance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Overall Risk | Mitigation Strategy Requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coal Seam | <p>The Coal Authority Consultants Coal Mining Report indicates 1 no. records of a coal seam outcrop on-site. The seam is located at the southernmost point of the site dipping south posing a low risk to development.</p> <p>No shallow mining features have been noted on historical mapping, and Coal Authority records of shafts do not intersect this seam on-site.</p> <p>The Coal Authority Report does not contain any records of recorded mining or probable unrecorded mining within the Yard coal seam on or in the vicinity of the site.</p> <p>Reviewing BGS paper geology map sheet 230 shows 4no. coal seams to the north of the site dipping south. Based on a general dip and distance to outcrop the minimum depth beneath site is 124mbgl. Therefore, there is significant rockhead above the coal seam so they pose a negligible risk to site.</p> | Low          | <p>Coal seams may be present below the southern most area of site at shallow depth. Existing structures and neighbouring structures show no reported sign of settlement or stress.</p> <p>It is recommended that during intrusive site works necessary to inform overall development a watching brief be maintained for any shallow outcropping coal seams. If coal is encountered at shallow depth an incidental coal management strategy will be required.</p> <p>During the enabling and construction works phase it is recommended that a watching brief should be kept in order to determine the presence of any unrecorded near surface disturbed ground or historical mine related workings.</p> <p>If outcropping, but intact coal is encountered during site enabling or foundation excavation works it is recommended to contact the Coal Authority.</p> <p>Any exposed coal will require excavation and replacement with suitable granular fill of lean mix cement.</p> |
| Mine Gas  | <p>The Coal Authority Consultants Report contains 1no. record of mine gas investigation and remediation 327.3m east relating to an adjacent opencast mine. The Site is located between 3no. large opencast sites the closest is approximately 200m southeast and none of them extend below the site. Given the proximity of open cast working and recorded mine gas issues Hydrogeo considers that the potential for mine gas risks should be further considered as part of development proposals. Given the distance (&lt;200m) the risk may be considered Low. However further investigation is recommended.</p>                                                                                                                                                                                                                                                     | Low          | <p>It is recommended that any site investigation works progressed on-site to inform overall site development should include the advancement of shallow ground gas monitoring boreholes and subsequent ground/mine gas monitoring.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## 5 Conclusions & Recommendations

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The southern most boundary of the overall development site is located within an area designated as a Development High Risk Area by the Coal Authority. The Coal Authority Consultants Coal Mining Report, historical OS mapping and the Coal Authority Online Viewer indicate the presence of a coal seam on-site and 4no. coal seams north of the site dipping south.

The 4no. seams to the north of the Site are identified at significant depth (124mbgl) with sufficient rock cover above and therefore pose a negligible risk to the proposed development. The outcrop on-site relates to the Gwendraeth/Yard coal seam, the seam only intercepts a small section in the south of the site approximately 30m from the proposed dwelling and dips south away from the Site. The existing access road is the only section of the development that crosses the estimated position of the coal outcrop. There are no records of the condition of the seam or if it has been worked on-site but there is at least 3.6m of alluvium above the outcrop. It is considered unlikely the seam has been extracted. The Coal Authority contains no records of recorded workings, probable unrecorded workings on-site or mine entries within 100m of the site. Therefore, based upon the review and assessment of all available data, Hydrogeo are of the opinion that there is a low risk posed to the development from the Gwendraeth/Yard seam.

The Coal Authority Consultants Report documents 1 no. record of mine gas remediation 327.3m east adjacent to the large opencast coal mining around the Amman colliery. The site is surrounded by 3no. large opencast mines with the closest being 200m southeast. Given the intense mining history of the surrounding area and restored closest opencast workings being located 200m from site mine gas is considered to pose a potential low risk to the development.

It should be noted that it did not become a statutory requirement to maintain and preserve plans of abandoned mines until the Mines (Coal) Regulations Act 1872, by which date much unrecorded mining had taken place and of those plans which were made it is likely that not all will have survived. The potential for historical unrecorded mine workings prior to the Mines (Coal) Regulations Act of 1872 beneath the proposed development site area therefore cannot be discounted.

## Recommendations

During development it is envisaged that the site will undergo groundworks / investigation to inform foundation design and sustainable urban drainage solutions. It is recommended that trial pits are advanced in the southern area of the Site. These will confirm if the Coal Seam is present / absent and if so the depth and thickness of the coal seam. The risk posed by the Gwendraeth/Yard Seam can be mitigated through measures including a watching brief for disturbed ground during site access construction to determine the presence of any unrecorded near surface disturbed ground. If unforeseen conditions are encountered during investigation or subsequent development the client should contact Hydrogeo in order to advise and further assess the potential for impact and where required detail mitigation measures.

If coal is encountered on-site during routine site investigation works an incidental coal management strategy should be created explaining how the coal will be managed. Should coal be encountered at foundation depth, it would be recommended to contact the Coal Authority. Any foundations ideally should be deepened through the coal seam to bear upon more competent strata. In addition, any coal encountered that is exposed above founding level should be ideally sealed with clay (or concrete). Any coal seam encountered within 500mm below the underside of the floor slab should be removed and replaced with well compacted granular fill.

On the basis of the work to date, we are of the opinion that the mining risk can be mitigated by routinely adopted measures identified and should not preclude the planning permission being registered.

## Limitations to Coal Mining Risk Assessments

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The recommendations contained in this Report represent the professional opinion of Hydrogeo, based upon the information referred to in Section 1 of this Report, exercising the duty of care required of an experienced Geo-Environmental Consultant. Hydrogeo does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

Hydrogeo obtained, reviewed, and evaluated information in preparing this Report from The Coal Authority, the BGS, and others. Hydrogeo conclusions, opinions, and recommendations have been determined using this information. Hydrogeo does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Hydrogeo has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

This report was prepared by Hydrogeo for the sole and exclusive use of the Client and for the specific purpose for which Hydrogeo was instructed as defined in Section 1.1 of this report. Nothing contained in this report shall be construed to give any rights or benefits to anyone other than the Client and Hydrogeo, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Hydrogeo does not intend, without its written consent, for this report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Hydrogeo from and against all claims, losses, and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

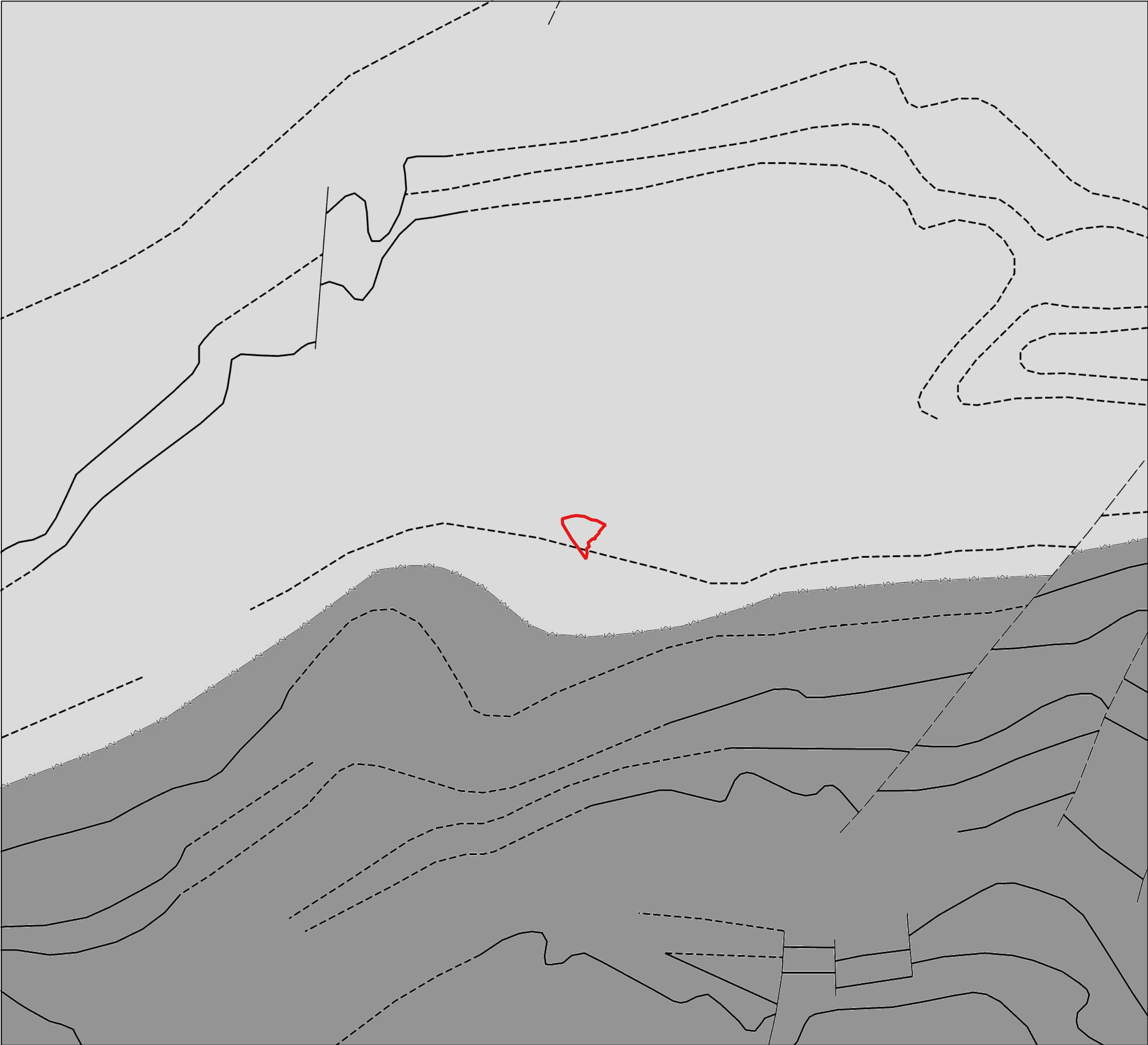
# Drawings

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## Drawing 1

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### Bedrock Geology Map



DRAWING

Drawing 01 Bedrock Geology

KEY

-  Site Boundary
-  Coal Seam Inferred
-  Coal Seam Observed
-  Fault
-  Marine Band
-  South Wales Lower Coal Measures  
-Mudstone, Siltstone and Sandstone
-  South Wales Middle Coal Measures Formation  
- Mudstone Siltstone and Sandstone

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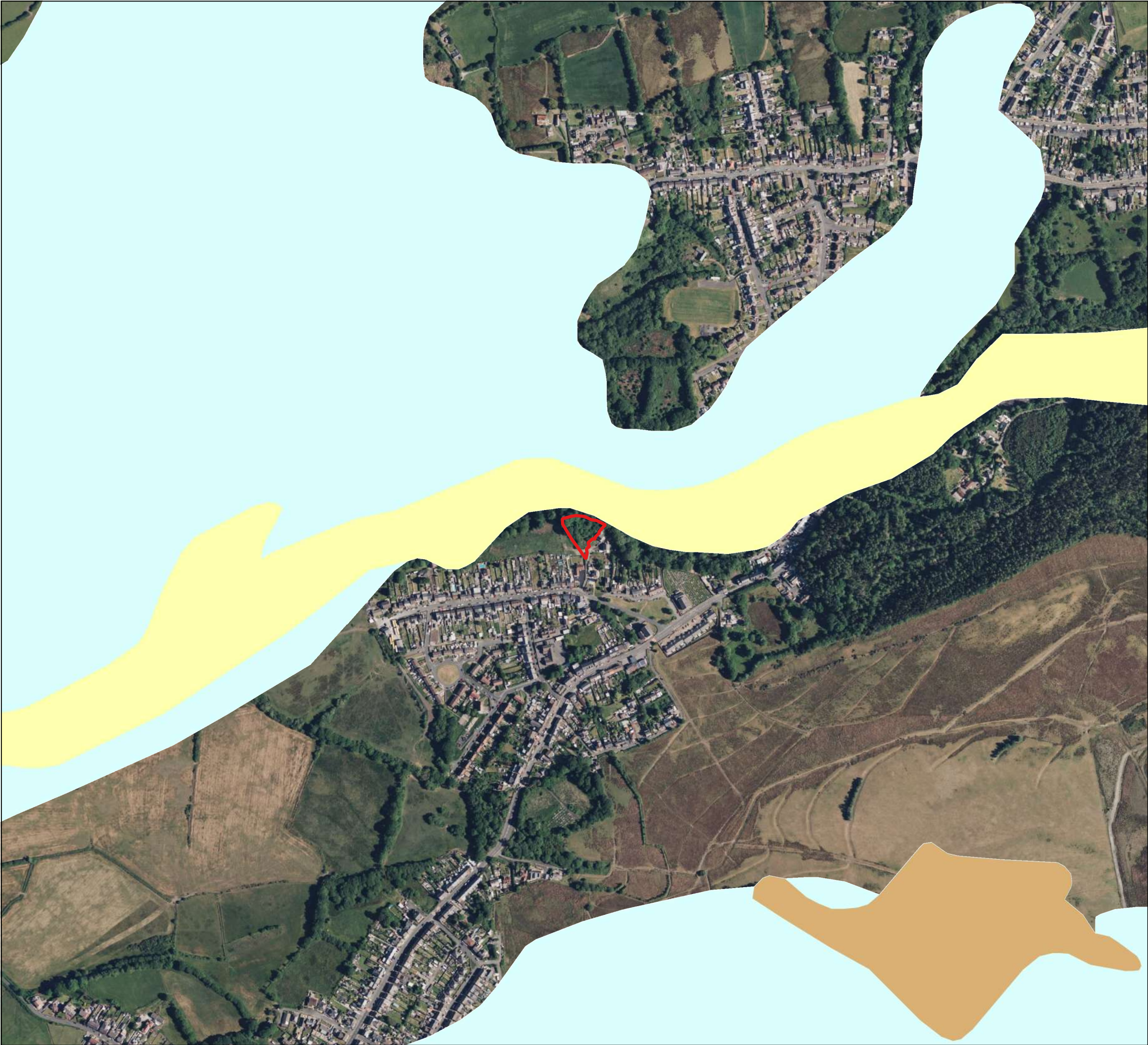


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|------------|----|-------|---------|-----|
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## Drawing 2

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### Superficial Deposits Map



DRAWING

Drawing 02 Superficial Deposits

KEY

-  Site Boundary
-  Alluvium - Clay, Silt, Sand and Gravel
-  Peat
-  Till - Diamicton

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|------------|----|-------|---------|-----|
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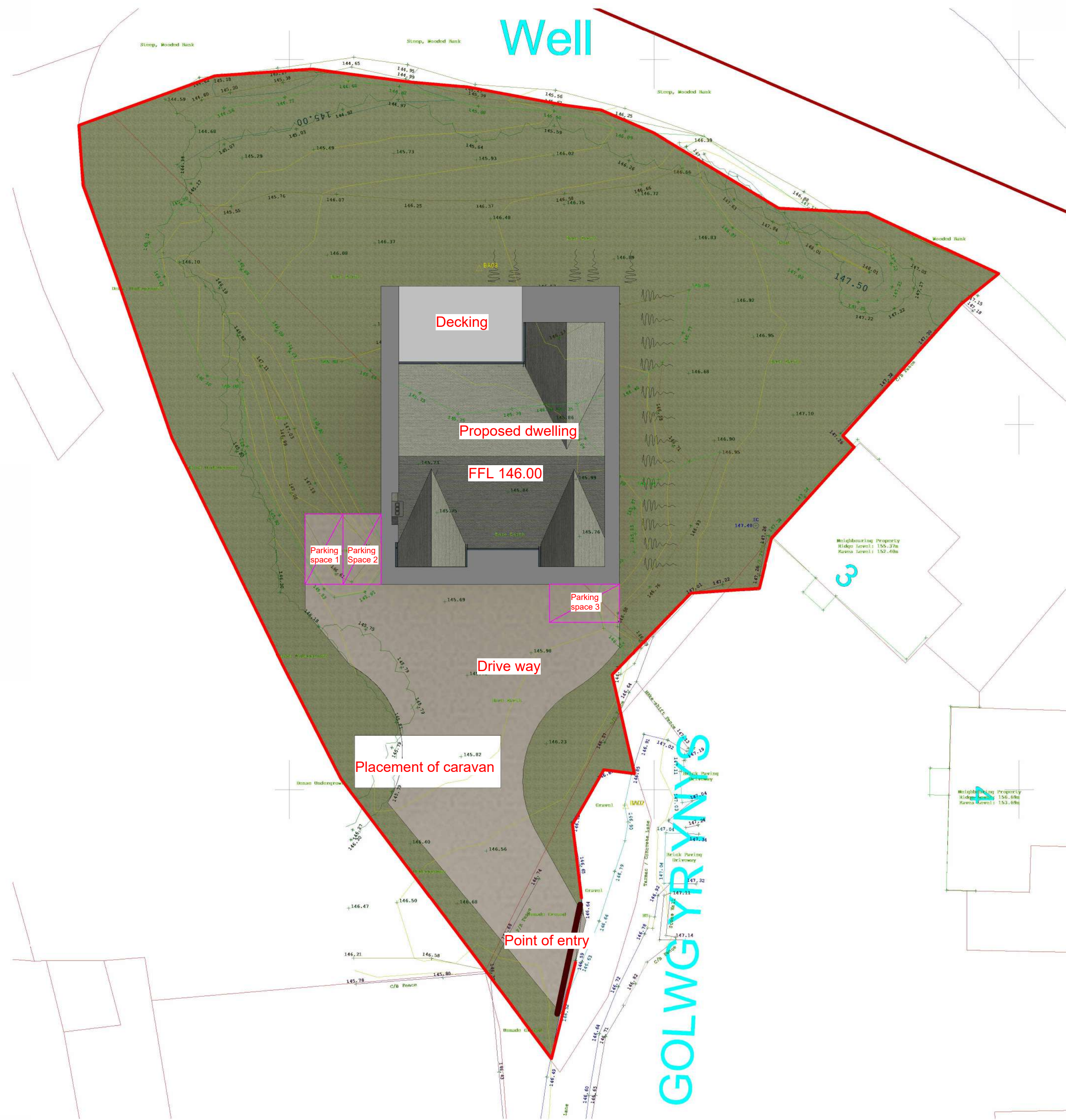
## Appendices

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## Appendix A

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### Proposed Development Plans



## Appendix B

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### Coal Authority Consultants Coal Mining Report



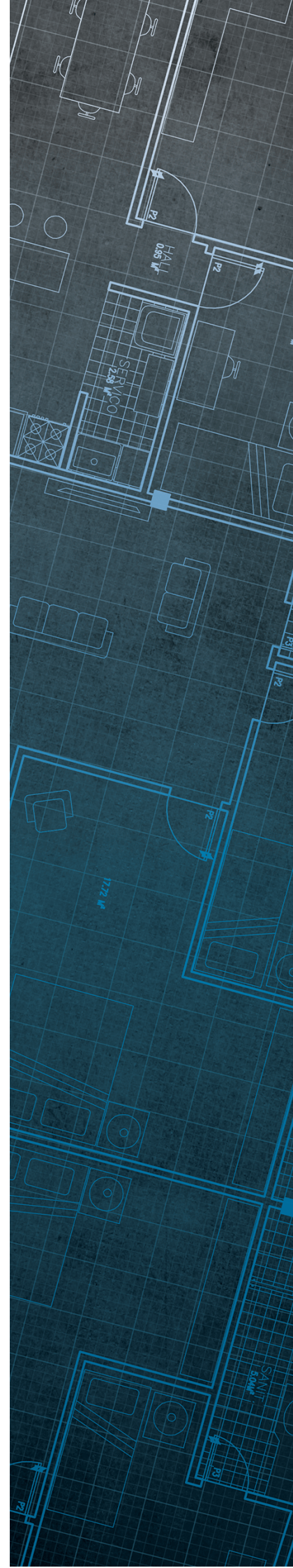
The Coal  
Authority

# Consultants Coal Mining Report

Ynys House  
3 Golwg Yr Ynys  
Lower Brynamman  
Neath Port Talbot  
SA18 1SJ

|                        |               |
|------------------------|---------------|
| Date of enquiry:       | 15 March 2023 |
| Date enquiry received: | 15 March 2023 |
| Issue date:            | 15 March 2023 |

|                 |                |
|-----------------|----------------|
| Our reference:  | 51003344153001 |
| Your reference: | PO-23-010      |



# 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

Hydrogeo Ltd

### Enquiry address

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3 Golwg Yr Ynys  
Lower Brynamman  
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Nottinghamshire  
NG18 4RG

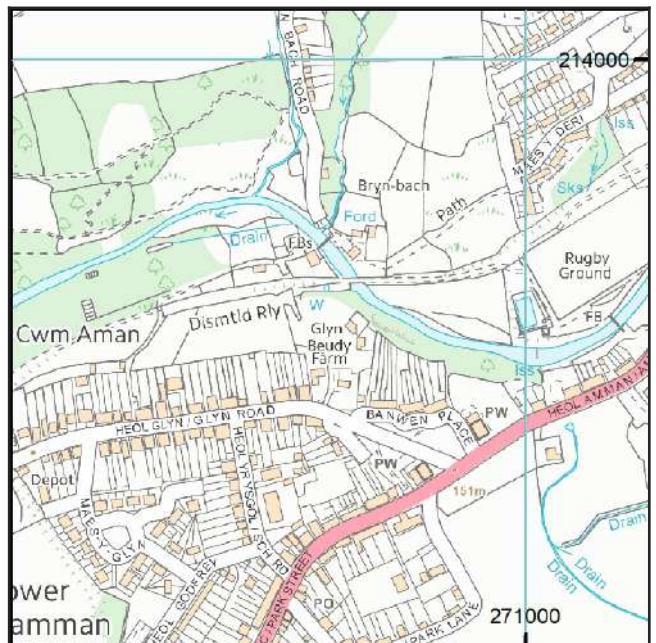
[www.groundstability.com](http://www.groundstability.com)

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 /thecoalauthority



Approximate position of property



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## Section 1 – Mining activity and geology

### Past underground mining

No past mining recorded.

### 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:

|         |         |         |
|---------|---------|---------|
| 11083   | SW1952  | SWR2680 |
| SWR2460 | SWR2624 | 7937    |
| 5904    | 13479   | R10737  |

Our records show we have more plans than those shown above which could affect the enquiry boundary.

**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 |
|-----------|---------|---------------|-------------------------|----------------------|--------------------|
| YARD      | Coal    | Yes           | Within                  | N/A                  | 63                 |

### 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

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

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

| Distance to gas incident/remediation (m) | Direction |
|------------------------------------------|-----------|
| 327.3                                    | East      |

See Section 4 for further information.

### 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.

### Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

**MINE GAS:** Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

### Mine gas remedial works

The site is within an area of previous interest. It is close to where the Coal Authority has investigated and subsequently remediated the effects of mine or ground gas emissions following specific reported hazards.

The site requires further investigation and may influence your risk assessment. We recommend that you order the **Coal Authority Mine Gas Emission Report**, which will include more information about the hazard.

**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](mailto: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](mailto: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. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

### **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.

0345 762 6848 (UK)  
+44 (0)1623 637 000 (International)  
[www.groundstability.com](http://www.groundstability.com)