

PREPARED BY:	Quantum Geotechnic Ltd	DATE:	03/03/2021
CLIENT:	Afan Valley Bike Shed	AUTHOR:	P Darby
PROJECT TITLE:	Proposed Building, Afan Valley Bike Shed, Afan Argoed	OUR REF:	Q0448
RE:	Mining Investigation Report		

Introduction

Upon the instruction of Afan Valley Bike Shed (hereafter referred to as the Client), Quantum Geotechnic Ltd (QGL) was commissioned to undertake an intrusive mining investigation within the grounds of the Afan Argoed Country Park, Port Talbot. The site is located at approximate co-ordinates E282197, N195106. The location of the site is shown in Figure 1. A proposed plan of the site is presented in Appendix I.

The aim of the intrusive investigation is to assess the ground and determine risks associated with past mining activity, in particular shallow mine workings, to any future development on the site.

Recommendations are offered relating to ground stability and foundation design where appropriate.



Figure 1: Location of the site outlined in red (Not to Scale, © bing).

Details of the geology of the site are provided by British Geological Survey (BGS) Sheet 248 'Pontypridd', Solid and Drift edition at 1:50,000 scale, and BGS's online tool Geology of Britain Viewer.

The Geology of Britain Viewer indicates no superficial deposits underlie the site however the BGS Sheet 248 indicates the site to be directly underlain by Landslip material.

Solid geology beneath the site is mapped as the Rhondda Member (sandstone) of the Upper Coal Measures.

Although the dip of the bedrock is not mapped below the site, the geological mapping notes the solid geology to dip between 10° and 15° to the north and north northwest. The north to south trending Wernddu fault which down throws to the west is mapped approximately 50m to the east of the site.

The No.1 Rhondda Rider seam is mapped to crop around the site, approximately 25m to the north west at its closest point. BGS records indicate the No.1 Rhondda Rider seam to be between thin and up to 2ft in thickness.

Previous Studies

In September 2020, The Coal Authority undertook a Coal Mining Risk Assessment, which is a desk-based mining risk assessment of the site.

The report identified the following site-specific coal mining legacy risks to the site:

- Low risk from underground coal mining (none recorded at shallow depths)
- Medium risk from underground coal mining (probable at shallow depths). Potential for unrecorded shallow mine workings in the No.1 Rhondda Rider seam.
- Low risk from mine entries (shafts & adits) (none recorded)
- Low risk from coal mining geology (faults & fissures) (none recorded)
- Medium risk from mine gas emissions. All mine workings pose a potential gas risk which should be considered in any future investigation and development.
- Low risk from recorded coal mining surface hazard (none recorded)
- Low risk from surface mining (none recorded)

The assessment recommended the following:

“Due to the potential for unrecorded shallow mine workings in the No.1 Rhondda Rider seam, an intrusive site investigation will be required. It would also be prudent for the developer to consider that the site is in an area recorded as being a former landslide, though this is not known to be associated with colliery spoil.”

“Due to difficulties in identifying coal related gas hazards, it may be prudent to consider completing a gas risk assessment for the development site. This may recommend basic gas protection measures within the foundation design, which are resistant to permanent gases (carbon dioxide, methane, carbon monoxide) and comparable to that suggested in BR211, as commonly used to protect against radon in residential properties.”

A copy of the Coal Authority Mining Risk Assessment is presented in Appendix II.

Investigative Fieldworks Undertaken

QGL undertook the ground investigation focused on establishing any risk associated with shallow mine workings below the site between 22nd and 23rd February 2021, with full permissions obtained from the Coal Authority. Part-time on-site supervision and attendance by an Engineering Geologist from QGL was undertaken on all aspects of the site works.

A summary of the completed fieldworks is outlined below:

- 2 no. rotary boreholes (BH01 – BH02)
- Post fieldwork ground gas and water monitoring

The exploratory hole locations were set out by the QGL Engineering Geologist. An exploratory hole location plan is presented in Figure 1, Appendix I.

Rotary Boreholes

A total of 2 no. rotary boreholes were drilled across the site, located to investigate the potential for unrecorded shallow mine workings in the No.1 Rhondda Rider coal seam and any associated workings, at shallow depths below the site. Boreholes were drilled utilising a water-based flush with continuous gas monitoring being undertaken during the drilling. The boreholes were drilled to maximum depths of 35.0mbgl.

The Rotary Borehole Logs are presented within Appendix III.

Continuous gas monitoring at the top of each borehole was undertaken throughout the drilling works. O₂ concentrations ranged between 20.4% and 20.9%, H₂S concentrations were all measured at 0% and CO concentrations were also all measured at 0%.

Post Fieldwork Ground Gas & Water Monitoring

Borehole BH02 was installed with a 50mm Ø HDPE combined land gas and groundwater monitoring standpipe to permit post-fieldwork landgas and groundwater monitoring visits and establish if any risk from mine/ground gas emissions exist.

Groundwater and landgas monitoring standpipes consist of plastic pipework set in filter aggregate (pea gravel) forming a well. The filter is sealed at one or both ends by use of bentonite pellets which swell and become watertight. Parts of the pipe itself are slotted, allowing the infiltration of groundwater which can then be accessed through the pipe from ground level. Slotted sections are covered by 'geo-sock' to reduce the intrusion of silt into the standpipes and the range of depths at which the groundwater is intercepted is known as the 'response zone'.

Table 1 details the installation undertaken.

Table 1: Borehole Installation Detail

Exploratory Hole ID	Installation Standpipe Internal Diameter (mm)	Installation Depth (m.bgl)	Installation Response Zone (m.bgl)
BH02	50	15.0	1.0-15.0

Summary of Ground Conditions

Rotary Borehole Summary

Each rotary borehole was advanced to a depth of 35.0mbgl. Clay and Gravel was encountered within each borehole to depths of between 1.5 and 1.7mbgl. This was underlain by Sand and Gravel which is anticipated to be either completely weathered bedrock or historic landslide material to depths of 9.8 and 10.2mbgl. This was underlain by strata interpreted to be Sandstone of the Rhondda Member, which comprised competent Sandstone with layers of completely weathered Sandstone, proven to depths of 35.0mbgl.

No coal seams or historic mine workings were encountered within either of the boreholes.

Post Fieldwork Ground Gas & Water Monitoring Summary

3 No. post-fieldwork monitoring ground gas visits have been undertaken. Appendix IV presents the monitoring records.

The results show a CH₄ concentrations of between 0.0 and 0.8%v/v and CO₂ concentration of between 0.2 and 3.5%v/v. Maximum measured flow rate was recorded as 1.0l/hr after a period of heavy rain which saw the groundwater level rise and is likely to have resulted in a slight build-up of pressure within the monitoring standpipe. The flow rate measured during the two other monitoring visits ranged between 0.0 and -1.0l/hr. O₂ levels ranged between 19.5 and 20.8%v/v. No H₂S was measured and a maximum Carbon Monoxide (CO) value of 6ppm was recorded on the initial monitoring visit.

Conclusions and Recommendations

Shallow Mine Workings Risk Assessment & Foundation Recommendations

The intrusive investigation did not reveal any unrecorded mine workings below the site. No coal seams were encountered within either of the boreholes.

Based on the above, the defined risk to the proposed development from any shallow mine workings beneath site is negligible.

The risk associated with building on the potential historic landslide deposits mapped across the site and surrounding area is considered to be relatively low given the topography of the site, which is on

a relatively extensive level plateau, the predominately granular nature of the superficial deposits identified below the site and the significant structures already present on site, which do not show any signs of structural stress or damage. However, without undertaking a detailed ground investigation aimed at confirming the associated risk, it is considered prudent to construct the proposed building on a reinforced raft foundation to mitigate against any small magnitudes of ground movement that may occur.

The shallow (natural) superficial deposits are anticipated to provide an allowable bearing capacity in excess of 50kN/m².

Care should be taken to ensure that foundations are placed in natural ground and not in variable fill materials unless adequate treatment of the ground has been carried out. The supervising Engineer should satisfy himself of the adequacy of the foundation level for the intended purpose.

Ground Gas Risk Assessment

The potential risks posed by the presence of potentially harmful gases can be assessed on a semi-quantitative basis by reference to the guidance in documents CIRIA 665 and BS8485. The assessment comprises multiplying the maximum measured steady gas flow rate (expressed as litres per hour) by the maximum steady gas concentration (expressed as percentage-by-volume; divided by 100) to derive a Gas Screening Value (GSV). The GSV can then be used to determine a risk classification and a Characteristic Situation for the site.

Based on the ground gas monitoring, the site is classified as Characteristic Situation 1 and no special precautions against ground gases are required. Confirmation of the assessment will be provided once the monitoring programme is complete.

We trust that the foregoing is of assistance. Should you require any further information or have any queries please do not hesitate to contact us.

Yours faithfully,

For and on behalf of

QUANTUM GEOTECHNIC LTD

Written By:

Phil Darby B.Sc.(Hons), M.Sc, CGeol., FGS
Senior Engineering Geologist

APPENDIX I: Figures

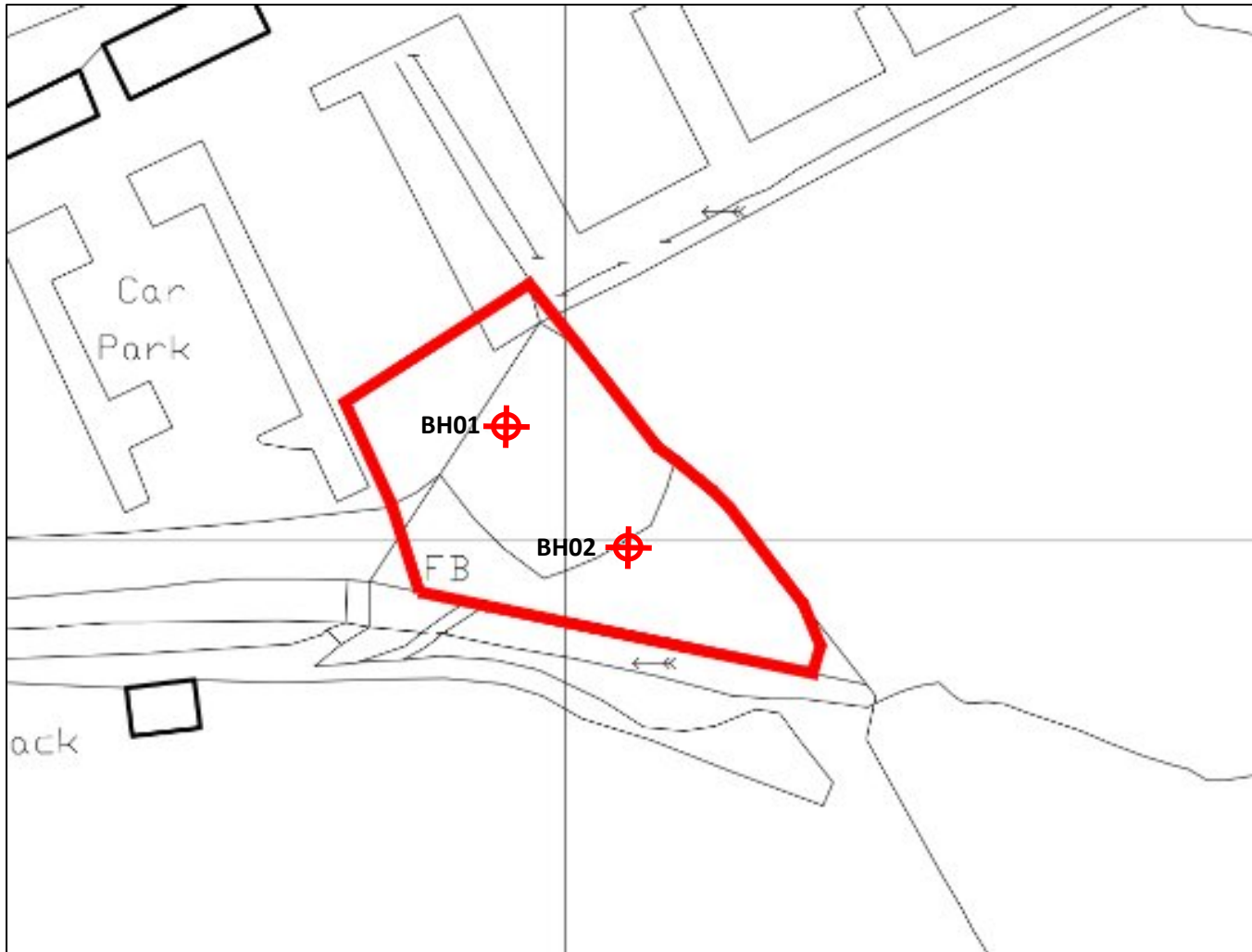


FIGURE 1

Project: Afan Valley Bike Shed

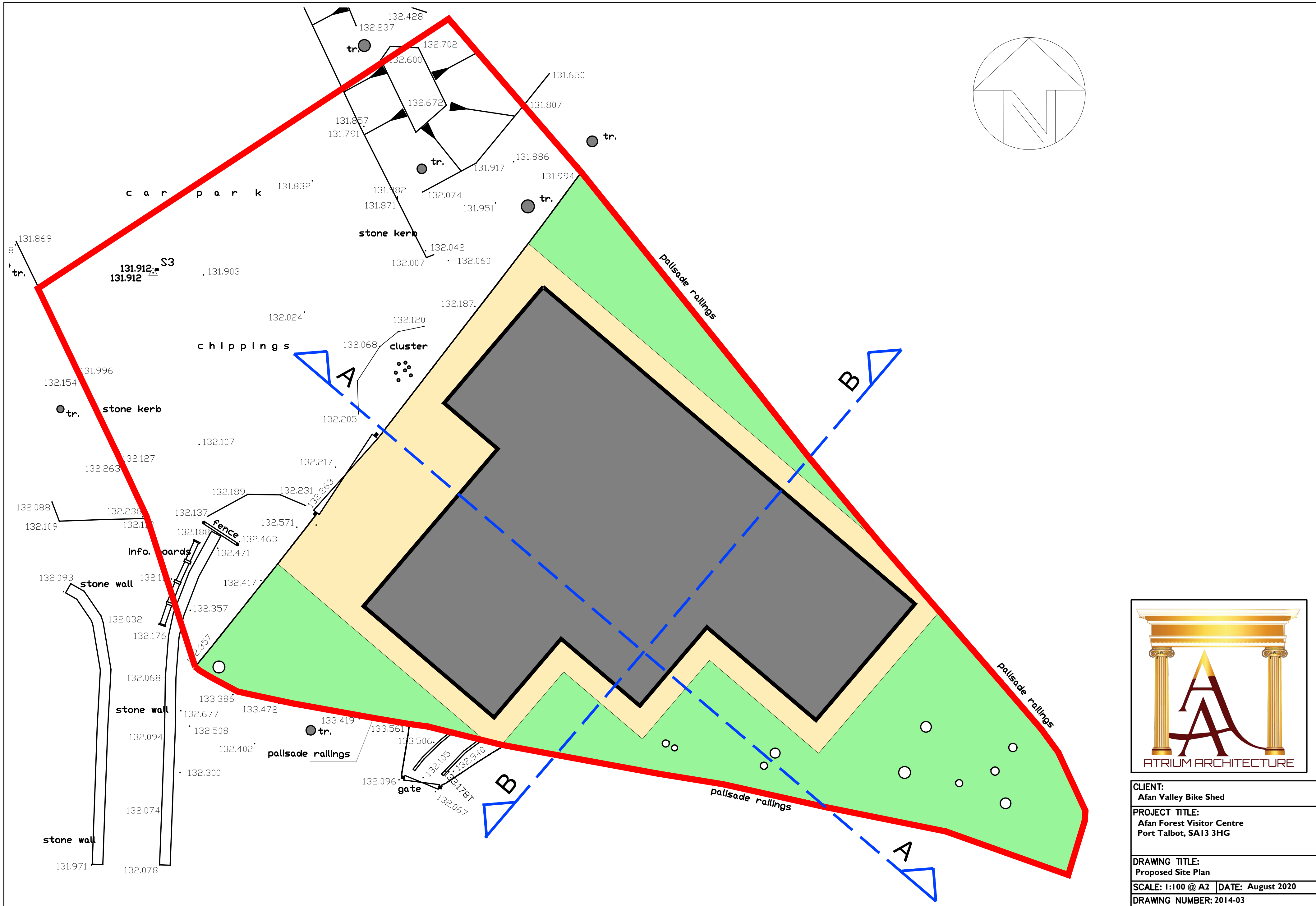
Job No: Q0448

**Drawing Title: Exploratory Hole
Location Plan**

 Windowless Sample Location



Plas Newydd, Llanedi, Pontardulais, Swansea.
SA4 0FQ
Tel: 01554 744880
Fax: 01554 776150
Email: enquiries@quantumgeotech.co.uk



CLIENT: Afan Valley Bike Shed	
PROJECT TITLE: Afan Forest Visitor Centre Port Talbot, SA13 3HG	
DRAWING TITLE: Proposed Site Plan	
SCALE: 1:100 @ A2	DATE: August 2020
DRAWING NUMBER: 2014-03	

APPENDIX II: The Coal Authority (2020), Coal Mining Risk Assessment

Coal Mining Risk Assessment

For development at: Afan Argoed Country Park, Port Talbot,
SA13 3HG

For proposal: Detached building incorporating a bike hire, retail
facility to include office, toilet, workshop and classroom

Assessment Summary

Assessment Result	MEDIUM RISK
Recommended Further Work	INTRUSIVE GROUND INVESTIGATION

The Coal Authority works to resolve the impacts of mining by growing its expertise, innovation, organisational capability and efficiency.

It manages the effects of past coal mining, including subsidence damage claims which are not the responsibility of licensed coal mine operators and is an executive non-departmental public body, sponsored by the Department of Business, Energy and Industrial Strategy. This report is valid for 90 days.

Limit of liability

This report is provided for the applicant and is in respect of the property identified on its face. Any conclusions or recommendations made are those based on information obtained for the report and our current knowledge and practices. The information and data set out in this report is based on information provided by or obtained from third parties which is held by the Coal Authority. Any limitations of the data are identified within the report. The Coal Authority does not accept liability for the accuracy of third party data. Should new data or information become available these results, conclusions and recommendations may require amending. The Authority is not and cannot be liable for any harm, loss or damage of whatever nature, including consequential loss, occasioned to any third party by the inaccuracy of the information set out in this report and any person seeking to rely upon it should if necessary undertake their own investigations and professional advice. The report should only be used in the stated context.

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Any advice provided in this report does not prejudice our position as a statutory consultee.

Version	Compiled	Checked	Date
1.1	HB	PB	03/09/2020

Section 1 – Description of site and proposed development

a) Site location and Description

The Coal Authority has been commissioned to prepare a Coal Mining Risk Assessment Report for a proposed development at Afan Argoed Country Park, Port Talbot, SA13 3HG (see Figure 1), in order to provide the Local Planning Authority with information on coal mining and an assessment of its impact on land stability.

The approximate site centre co-ordinates are E282197, N195106. The proposed development area requires access via Turn right off Afan Valley Road. The site has an approximate elevation of 135m AOD.

Figure 1: Site location plan



b) Description and layout of proposed development

The Coal Authority understands that the developer plans to construct a detached building incorporating a bike hire, retail facility to include office, toilet, workshop and classroom (see Appendix A).

c) Scope of coal mining risk assessment

The purpose of this Coal Mining Risk Assessment Report is to:

- Present a desk-based review of all available information on the coal mining issues which are relevant to the application site.
- Use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues.
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development.
- Demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to development on unstable land.

Any works that intersect coal mine workings, mine entries or coal seams may have implications for mine gas, spontaneous combustion and surface collapse. Coal Authority permission is required prior to any such works taking place. Further detailed advice can be provided upon request.

The Coal Authority's adopted policies regarding building over or close to mine entries and managing gas risks can be viewed at:

www.gov.uk/government/publications/building-on-or-within-the-influencing-distance-of-mine-entries

www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases

Section 2 – Sources of information used to inform this report

Source reviewed	Yes	No	Remarks
Coal mining report	X		Consultants Coal Mining Report (Appendix B)
Other mining records	X		Abandonment plans – SWR3754 'Cynon Colliery', 7590 'Cynon Colliery'
Geological plans	X		County Geological Sheets Glamorgan 25NE (1951) and 16SE (1958)
BGS Boreholes	X		SS89NW4, SS89NW14, SS89NW15
Other	X		BGS GeoIndex, 1877 1:2,500 OS map

The above information sources have been used to provide an assessment of the potential mining risk within the remainder of the report.

Section 3 – Identification and assessment of site specific coal mining related risks

The Coal Authority's search of its detailed coal mining information identifies the following site specific coal mining legacy risks to the site.

Coal mining issue	Reported		Risk assessment	
	Yes	No	Rating	Comment
a) Underground coal mining (recorded at shallow depths)		X	Low risk	Recorded workings beneath site considered to be at sufficient depth
b) Underground coal mining (probable at shallow depths)		X	Medium risk	Potential for unrecorded workings in No.1 Rhondda Rider
c) Mine entries (shafts and adits)		X	Low risk	None recorded
d) Coal mining geology (faults and fissures)		X	Low risk	None recorded
e) Record of past mine gas emissions or potential		X	Medium risk	All mine workings pose a potential gas risk which should be considered in any future investigations and development
f) Recorded coal mining surface hazard		X	Low risk	None recorded
g) Surface mining (opencast workings)		X	Low risk	None recorded

A desk based study of the coal mining information has been used to risk assess the coal mining features above. A summary of the risk posed by these features is summarised after thorough analysis of the information sources. Comment on each specific coal mining issue follows below:

a) Underground Coal Mining (recorded at shallow depths)

Coal mining at depths shallower than 30m beneath ground level can typically pose challenges to ground stability at the surface. The magnitude of this effect depends upon the exact depth of any workings, the thickness of competent rock cover and the extraction thickness of any coal mine workings.

The Coal Authority Consultants Coal Mining Report in Appendix B states that the development site is not in an area of recorded shallow coal mine workings. Four seams of coal are recorded to have been worked beneath or in proximity of the site at depths of

109-687m bgl, last worked in 1966. The shallowest seam recorded to have been worked is the No.2 Rhondda seam, worked to the south of the property at 109m bgl and beneath the property at 198m bgl, with an extraction thickness of 0.70m (south of the property) and 1.80m (beneath the property). The workings at 109m bgl are indicated to be worked from Cynon Colliery.

The workings in the No.2 Rhondda seam are recorded on abandonment plan SWR3754 for Cynon Colliery and are annotated as being in the Wernddu seam. Local levels can be inferred from a shaft located approximately 385m ENE of the development site which is annotated on the abandonment plan with levels of 'Pit Bank 2431.39' and 'Pit Bottom 1828.39'. It is assumed that these are levels in feet and relate to a datum that is 2000ft below ordnance datum (BOD), and therefore would be equivalent to 131.48m AOD and 52.30m BOD (183.78m bgl).

These workings are also recorded on abandonment plan 7590 where an average rate of dip of 1 in 6 (9.4°) NNW is recorded. Based on the pit bottom level recorded above and the relative position of the development site being equivalent to approximately 180m up dip of this point, this would equate to the No.2 Rhondda (Wernddu) seam being 29.7m shallower (22.6m BOD or 157.6m bgl). A seam section is recorded on plan 7590, detailing 2ft 4in (0.71m) coal, 5ft (1.52m) fireclay and 6in (0.15m) coal, (totalling 2.38m), underlain by an unknown quantity of fireclay.

Although the depth estimated for the local workings in the No.2 Rhondda seam and the recorded seam section do not directly correspond with the figures reported in the Consultants Report, there is considered likely to be sufficient competent rock cover above recorded workings beneath the development site and accordingly the risk to the proposed development is considered to be low.

b) Underground coal mining (probable at shallow depths)

Areas of probable shallow coal mine workings are identified as part of the Development High Risk Area for which no recorded plan exists, but where it is likely that workable coal at shallow depths has been mined before records were kept. The data has been estimated from available mining records by qualified mining surveyors. Since 1872 there has been a law that requires all coal mine operators to deposit working plans of the mine with the government following the cessation of operations. Prior to this date the plans were often destroyed or kept in private ownership.

Where the extraction of coal has occurred there is the potential for voids to remain long after mining has ceased. The depth of workings generally dictates the length of time that significant voids may remain, but other factors including the size of mine roof supports and the competency of overlying strata can influence the time for natural consolidation to occur. Waste material produced during mining was sometimes used to backfill abandoned sections of mine workings, therefore reducing the volume of open cavities or voids that remain. The method of backfilling workings is typically not recorded and cannot be relied upon as a satisfactory form of remediation.

The Coal Authority Consultants Coal Mining Report in Appendix B states that the development site is not in an area of probable shallow coal mine workings. The report does however indicate the Tillery Brithdir seam to outcrop 23.0m northwest of the development, orientated northeast-southwest at closest point to site (outcrop is shown to be curvilinear) and indicated to be of workable thickness in the locality. The conjectured outcrop of the No.1 Rhondda Rider seam is recorded at approximately this location on the County Geological Sheet Glamorgan 25NE (1951). The site is also recorded on this sheet as being on a landslip (discussed further in 3d below).

The development site is shown to be at a higher elevation than the surface elevation at the outcrop locally (ranging from 128m AOD north of site to 133m AOD to west of site), therefore the No.1 Rhondda Rider seam is considered likely to be present beneath the site. Based on the distance to outcrop and the local rate of dip of 9.4°NNW discussed in 3a above, the No.1 Rhondda Rider seam can be estimated to be between 4.6-14.8m up dip (shallower than the outcrop position) beneath the development site, however there is limited information as to the depth and variability of superficial deposits in the area and therefore the actual depth of the seam beneath the site is unknown. It must be assumed that it is at or close to rockhead. It is discussed in section 3c below that a 'trial level' is recorded on an early OS map approximately 90m southeast of the site, suggestive of possible workings in the area.

The Generalised Vertical Section (GVS) on the Glamorgan 25NE (1951) sheet indicates the No.1 Rhondda Rider (Graig Isaf) seam to be thin. However, the GVS of the county geological sheet Glamorgan 16SE (1958), which commences from 210m north of the development, records the No.1 Rhondda Rider seam to be 2ft (0.61m) in thickness.

The GVS shows the No.1 Rhondda Rider seam to be underlain by the No.1 Rhondda seam approximately 61m below. Although this seam is also shown to be 'thin' on the GVS, even if this seam has been locally worked it is considered that there would likely exist sufficient competent cover above this seam. The No.1 Rhondda Rider seam is recorded to outcrop at closest approximately 195m northwest of the development, orientated approximately ENE-WSW. There are few mine entries recorded along the outcrop in the area, suggesting that the seam is indeed unlikely to have been worked.

At this time the risk to the proposed development from unrecorded shallow mine workings in the No.1 Rhondda Rider seam is considered to be medium.

c) Mine entries (shafts and adits)

The Coal Authority Consultants Coal Mining Report in Appendix B shows no mine entries are recorded within 100m of the development site. A 'trial level' is recorded on an early OS map for the area, located approximately 90m southeast of the site, suggestive of possible workings in the area, however if this is indeed a mine entry it is not considered likely to pose a risk to the development, over and above the potential for unrecorded shallow workings as discussed in 3b above.

The development site sits within a historical mining area and therefore there is a residual risk of unrecorded mine entries to be present on site. All site operatives should be made aware of this potential risk and a watching brief should be maintained during site works.

d) Coal mining geology (Faults and fissures)

The development site sits upon the Rhondda Member of the Lower Pennant Coal Measures Formation. There is limited evidence for the likely thickness of superficial deposits in the area. The County Geological Sheet Glamorgan 25NE (1951) records 'stony drift 20' (ft; 6.09m) approximately 600m ENE of the proposed development. BGS borehole records SS89NW14 and 15 for Cynonville Tip, located approximately 250m and 390m ENE of the site respectively and south of the River Afan, record 'colliery waste' to depths of 14.8m and 12.0m bgl, respectively. The colliery waste is underlain by further superficial deposits in both boreholes, with rockhead not being proven to a maximum depth of 18.5m bgl in SS89NW14. Unfortunately no further information is given as to the lateral extent of any colliery spoil. BGS borehole record SS89NW4, located approximately 2.1km ENE of the development site and at approximately the same distance south of the River Afan, records 8.68m of peat, clay and boulders overlying rockhead. Local ground conditions at the development site may vary.

The County Geological Sheet does record the development site to fall within an area of landslip, which extends broadly southeast from the area around the development site. It is understood that the site is not known to be at the location of a former colliery spoil tip, with most tipping in the area believed to have taken place to the north between the River Afan and the A4107. Therefore, whilst the 'landslip' recorded on the geological sheet is considered likely to be within natural strata, the developer should still give due consideration to any risk associated with this.

No faults, fissures or break lines are known to affect the development site, the closest being a fault recorded on the County Geological Sheet in the Wernddu (No.2 Rhondda) seam approximately 105m east of the proposed development, orientated northwest-southeast and downthrown to the southwest by 45ft (13.8m).

e) Record of past mine gas emissions or potential

No seam mentioned in this report is recorded as being prone to spontaneous combustion.

There are no recorded past gas emissions recorded in the surrounding area, however, coal seams and coal mine workings pose a potential gas risk which should be considered in any future investigations and development. At development sites with shallow coal workings, probable shallow coal mine workings, or pathway features such as mine entries and geological disturbances on or nearby the site, the Coal Authority recommends that a more detailed gas risk assessment to be undertaken in accordance with relevant guidance.

f) Recorded coal mining surface hazard

None recorded.

g) Surface mining (opencast workings)

None recorded.

Section 4 – Proposed mitigation strategy

a) Site investigation and/or remediation

Due to the potential for unrecorded shallow mine workings in the No.1 Rhondda Rider seam, an intrusive site investigation will be required. It would also be prudent for the developer to consider that the site is in an area recorded as being a former landslip, though this is not known to be associated with colliery spoil.

The site investigations will need to be carried out by a competent contractor, taking into account the findings of this report. The results should be interpreted by a qualified and competent person so that an appropriate remedial strategy can be developed.

Guidance on drilling or piling through coal can be found at:

www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases

Due to the difficulties in identifying coal related gas hazards, it may be prudent to consider completing a gas risk assessment for the development site. This may recommend basic gas protection measures within the foundation design, which are resistant to permanent gases (carbon dioxide, methane, carbon monoxide) and comparable to that suggested in BR211, as commonly used to protect against radon in residential properties.

Where development is proposed over areas of coal or past coal workings at shallow depth, developers should consider wherever possible removing any remnant shallow coal. This will enable the ground to be stabilised and remove a hazard prior to construction of any foundations associated with the development. Prior extraction of surface coal requires an Incidental Coal Agreement from the Coal Authority. Further information can be found at:

www.gov.uk/get-a-licence-for-coal-mining

Concrete, cements and renders may be susceptible to attack from elevated levels of sulfates in the ground. The Building Research Establishment reports that most cases of sulfate attack occur in and adjacent to coal field areas and related industrial centres. It would be prudent for the issue of sulfate attack to be considered during the foundation design to ensure they comply with the Building Regulations 2010.

You may also wish to refer to the Construction Industry Research and Information Association (CIRIA) publication Special Publication 32 “Construction over Abandoned Mine Workings”.

b) Coal Authority permit

Any intrusive activities, including initial site investigation boreholes and any subsequent treatment of coal mine workings/coal mine entries for ground stability purposes require the prior written permission of the Coal Authority. Application forms for Coal Authority permission and further guidance on this matter can be obtained from the Coal Authority's website at:

www.gov.uk/get-a-permit-to-deal-with-a-coal-mine-on-your-property

Follow on services can be requested using the details in the contacts section.

Section 5 – Conclusions

This report has identified that the proposed development site may have been subject to past coal mining activity, namely the potential for unrecorded shallow mine workings in the No.1 Rhondda Rider seam. The risk to the site from legacy mining features is medium.

Nevertheless, subject to the undertaking of appropriate site investigations and any potential necessary remedial measures as outlined in Section 4a of this report, the Coal Authority considers that the site may be made safe and stable for future development and the risk to the development reduced to low. The recorded coal mining legacy issues present within the site do not pose any particular implications for the layout of the proposed development.

The Coal Authority advises the developer undertake a detailed Gas Risk Assessment where proposed development occurs over shallow coal reserves as is the case here.

Section 6 – Contacts

Planning and Local Authority Liaison Service

Tel: 01623 637 119

Email: planningconsultation@coal.gov.uk

Website: www.gov.uk/planning-applications-coal-mining-risk-assessments

Surface Hazards Emergency Service

Tel: 01623 646 333 (open 24 hours a day, 7 days a week)

24-hour number for reporting public safety hazards and incidents associated with coal mining

Mining Reports Service

To purchase site specific coal mining information go to our website;

www.groundstability.com

Licensing and Permitting Service

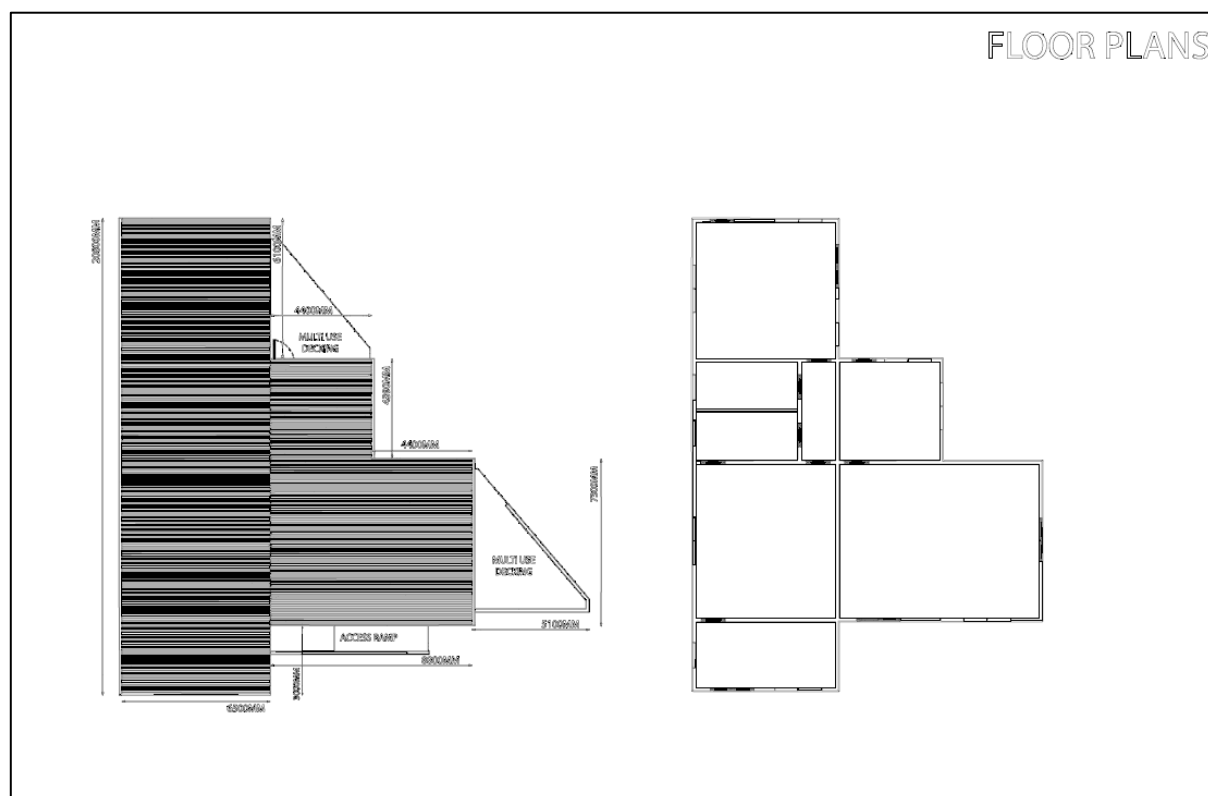
Email: permissions@coal.gov.uk

Tel: 01623 637 320

For permission to enter or disturb coal mine entries and coal seams.

Section 7 – Appendices

Appendix A – Plan showing proposed development layout



Appendix B – Non-Residential Coal Mining Consultants Report



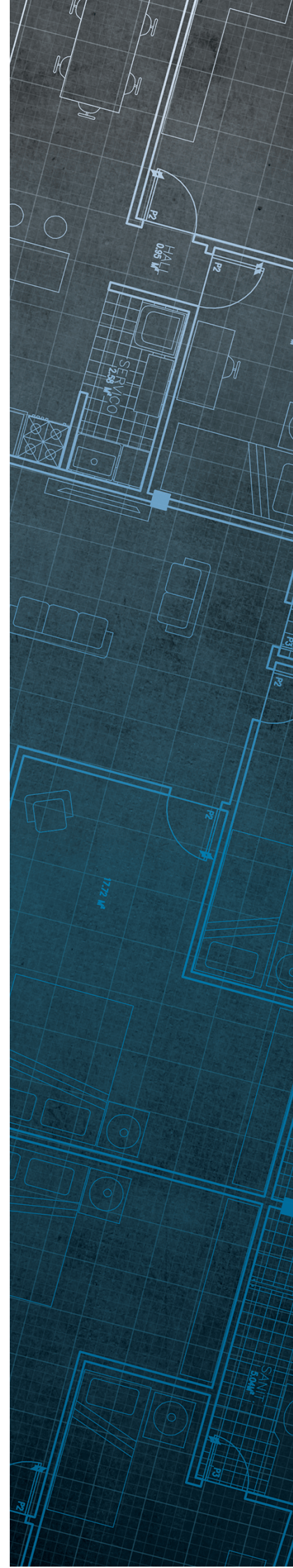
The Coal
Authority

Consultants Coal Mining Report

Afan Argoed Country Park
Afan Valley Road
Cymmer
Neath Port Talbot
SA13 3HG

Date of enquiry:	8 September 2020
Date enquiry received:	8 September 2020
Issue date:	8 September 2020

Our reference:	71006940656001
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

THE COAL AUTHORITY

Enquiry address

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Neath Port Talbot
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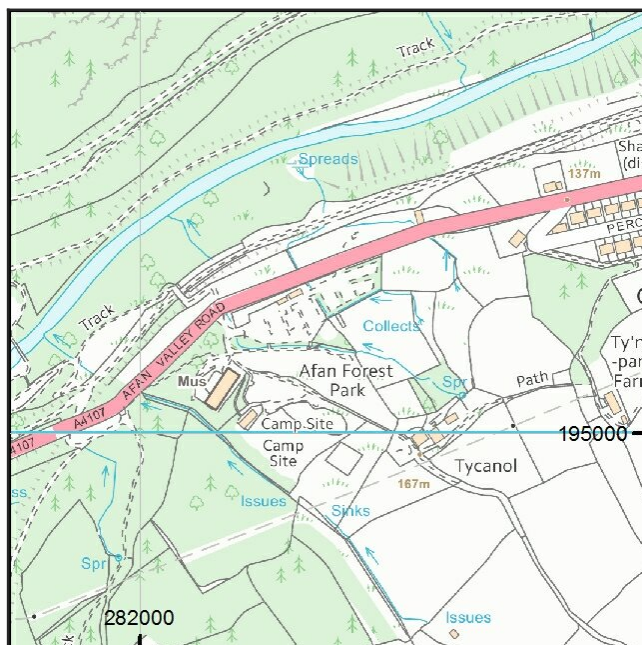
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Approximate position of property



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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
CYNON	NO.2 RHONDDA	Coal	4EB3	109	South	9.5	North	70	1907
unnamed	NO.2 RHONDDA	Coal	4F19	198	Beneath Property	11.1	North-West	180	1911
unnamed	6FT BOTTOM LEAF	Coal	4EBD	631	East	13.2	North	198	1962
unnamed	FOUR FOOT	Coal	4F10	656	North-East	13.5	North	216	1959
unnamed	CAERAU	Coal	4F1I	657	East	14.6	North	183	1966
unnamed	6FT BOTTOM LEAF	Coal	4F1C	687	Beneath Property	12.9	North-West	200	1966

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:

SWA779	7590	SWR3990
SWR3754	PO0	SWA780

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
TILLERY BRITHDIR	Coal	Yes	21.1	North-West	212

Geological faults, fissures and breaklines

No faults, fissures or breaklines 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

Status	Licence type	Distance (m)	Direction
Future	Underground	176.2	South-West

See Section 4 for further information.

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.

Coal mining licensing

The report has highlighted that the site is close to a Coal Authority license area for coal mining operations. Please contact us if you require further information.

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

Key

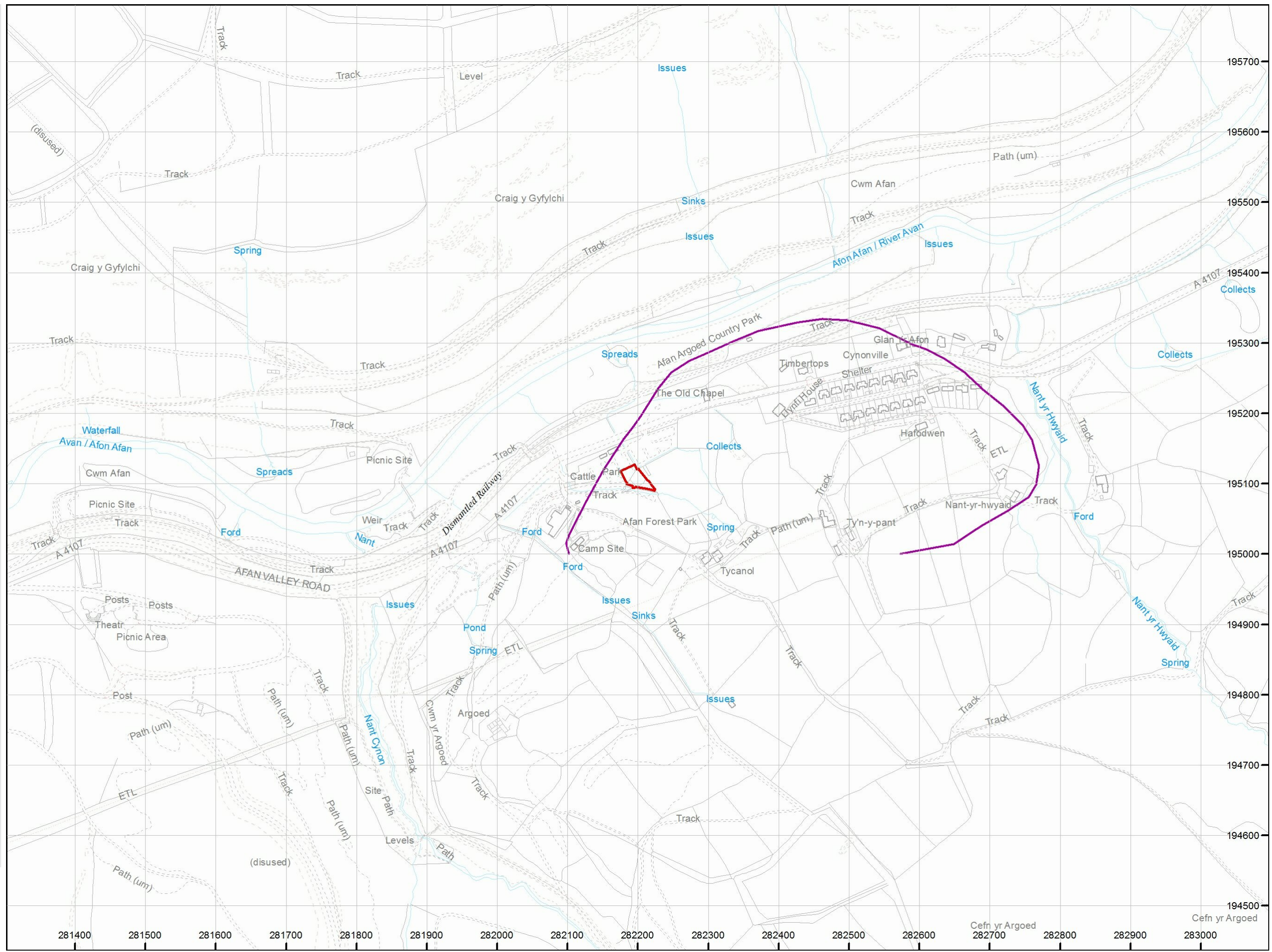
Approximate position of the enquiry boundary shown



Outcrop (Proven)



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



APPENDIX III: Rotary Borehole Logs

Contract : Afan Valley Bike Shed											Borehole No. BH01	
Client : Afan Valley Bike Shed												
Dates : 22/2/21 - 22/2/21						Job Number : Q0448				Ground Level :		
Location :						Engineer :				Coordinates:		

m B.G.L.	Run Details				Fractures		Samples		Strata				Water
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Type No. Blows	Depth (Thick-ness)	Description	Legend	Depth (Thick-ness)	
0													
1									(1.50)	Clay & Gravel (Drillers Description)		(1.50)	
2									1.50	Sandy Gravel (Drillers Description)		1.50	
3													
4													
5													
6									(8.70)			(8.70)	
7													
8													
9													
10									10.20	Boulders & Gravel (Drillers Description). Interpreted to be Weathered sandstone of the Rhondda Member		10.20	
11									(3.90)			(3.90)	
12													
13													
14									14.10	Strong and Weak Sandstone Bands (Drillers Description) Interpreted to be Competent bands of Sandstone the Rhindda Member with weathered zones		14.10	
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25									(20.90)			(20.90)	
26													
27													
28													
29													
30													
31													
32													
33													
34													
35									35.00	Terminated at 35.0mbgl		35.00	
36													
37													
38													
39													

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
				15.00	115.00	2.70		Fast groundwater inflow below 2.7mbgl		0.00 - 35.00	Water	100

Plant: Commachio 205
Remarks:



Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
QGL

Logged By:
MOB

Sheet No.
1 Of 1

m Per Page
40

All measurements in metres unless otherwise stated



Contract : Afan Valley Bike Shed											Borehole No. BH02	
Client : Afan Valley Bike Shed												
Dates : 23/2/21 - 23/2/21						Job Number : Q0448				Ground Level :		
Location :						Engineer :				Coordinates:		

m B.G.L.	Run Details				Fractures		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Type No. Blows	Depth (Thick-ness)	Description	Legend	Depth (Thick-ness)		
0														
1									(1.70)	Clay & Gravel (Drillers Description)		(1.70)		
2									1.70	Sandy Gravel (Drillers Description)		1.70		
3														
4														
5														
6									(8.10)			(8.10)		
7														
8														
9														
10									9.80	Boulders & Gravel (Drillers Description). Interpreted to be Weathered sandstone of the Rhondda Member		9.80		
11									(4.10)			(4.10)		
12														
13														
14									13.90	Strong and Weak Sandstone Bands (Drillers Description) Interpreted to be Competent bands of Sandstone the Rhindda Member with weathered zones		13.90		
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25									(21.10)			(21.10)		
26														
27														
28														
29														
30														
31														
32														
33														
34														
35									35.00	Terminated at 35.0mbgl		35.00		
36														
37														
38														
39														

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
				15.00	115.00	2.00		Fast groundwater inflow 2.0mbgl		0.00 - 35.00	Water	100

Plant: Commachio 205
Remarks:

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		QGL	MOB	1 Of 1	40		

APPENDIX IV: Post Fieldwork Monitoring Records

Page 1 of 1

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
	A	50mm	15.00	1.0-15.0

[illegible]