The Coal Authority

Provided by the Mining Remediation Authority

Coal Mining Risk Assessment

Report Ref:
71009813318001

For development at:
Land at Treherbert, Treorchy, CF42 5HA

For proposal:
Construction of surface water managed slope

Assessment result	HIGH RISK
Recommended further work	AMENDMENTS TO DEVELOPMENT LAYOUT AND INTRUSIVE SITE INVESTIGATION BEFORE FINALISING LAYOUT

The Mining Remediation Authority makes a better future for people and the environment in mining areas.

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 for Energy Security and Net Zero.

The Mining Remediation Authority is the trading name of the Coal Authority ('TCA') established pursuant to Section 1 of the Coal Industry Act 1994, of 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG. The Coal Authority remains the legal name of the Authority.

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

Version	Compiled	Title	Checked	Date
1	PB	BEng CEng MIMMM	HB	

Section 1 – Description of site and proposed development

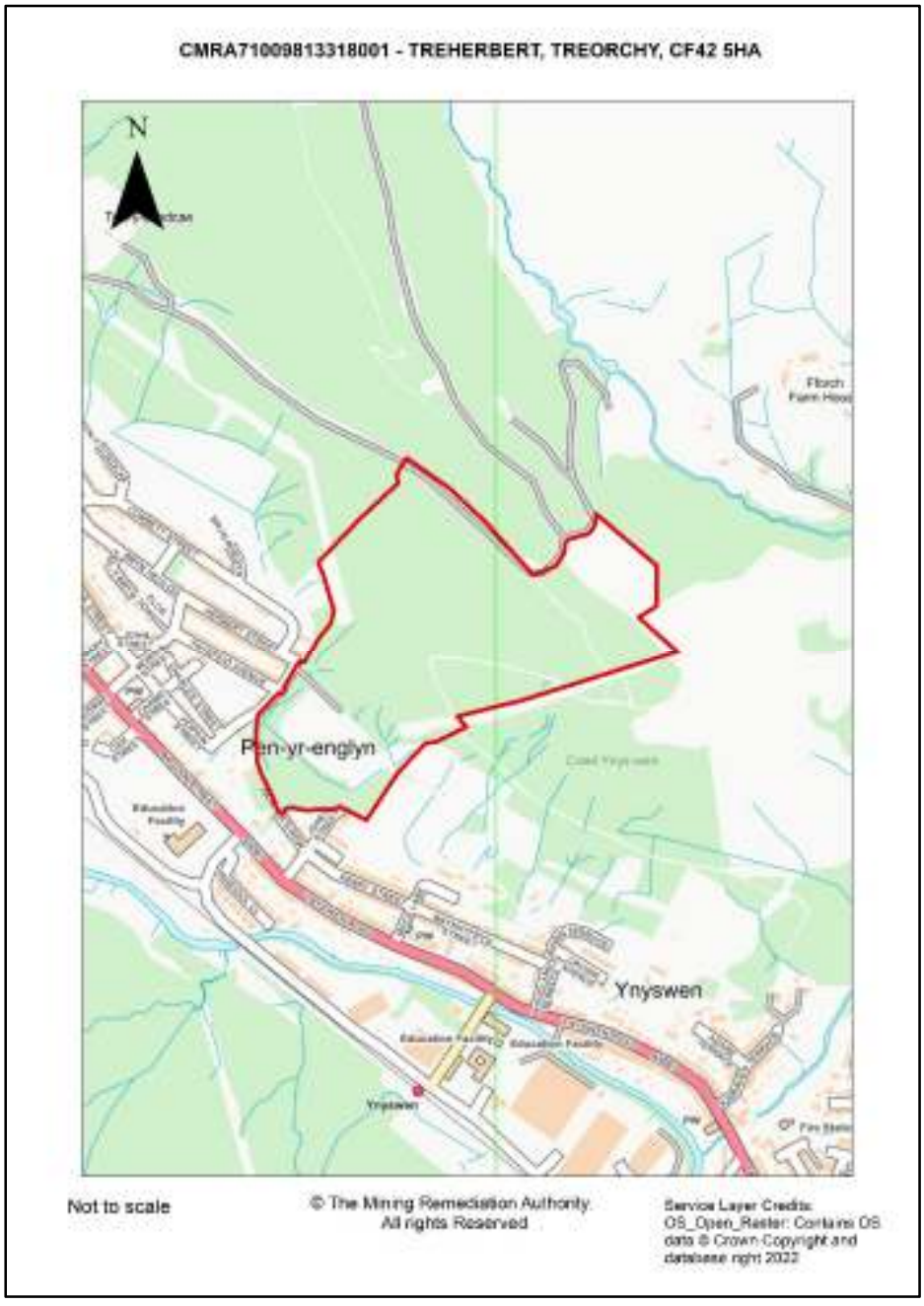
a) Site location and Description

The Mining Remediation Authority has been commissioned to prepare a Coal Mining Risk Assessment Report for a proposed development at land at Treherbert, Treorchy, CF42 5HA (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 E294881, N198074. The proposed development area requires access via Herbert Street. The site has an approximate elevation of between 185m AOD to the west to 355m AOD to the east.

Figure 1: Site location plan

b)



Description and layout of proposed development

The Mining Remediation Authority understands that the developer plans to construct a surface water managed slope including the installation of catch pits, drainage channels and outfall structures (see appendix A). The installation is to be installed on to the Pen Yr Englyn Spoil Tip.

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. Mining Remediation Authority permission is required prior to any such works taking place. Further detailed advice can be provided upon request.

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

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

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

https://www.gov.uk/government/publications/coal-seams-with-a-history-of-spontaneous-combustion

Section 2 – Sources 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 6295,12797
Geological Plans	X		County Geological sheet Glamorgan 18SW (1960), County Geological sheet Glamorgan 18NW (1952)
BGS Boreholes	X		SS99NW24
Other	X		Norwest Holst Ground Investigation Report – Pen-Yr-Englyn Tip 100 Treherbert, Walters UK/Halcrow Group Limited – Pen-Yr-Englyn Tip – Site Investigation Factual report, BGS GeoIndex

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

Based on all source information reviewed, the following site specific coal mining legacy risks are considered to affect the site:

Coal mining feature	Risk assessment	
	Rating	Comment
Recorded underground coal mining	Medium risk	Shallow recorded workings in the Abergorchi seam, No.3 Rhondda and Tormynydd seams
Probable underground coal mining	Medium risk	Probable underground mining in seams between the No.3 Rhondda and the Abergorchi seam
Mine entries (shafts and adits)	High risk	Thirty two recorded within or within 100m, of which mine entries 294197-061, 295198-014, 295198-015, 295198-016, 295198-017, 295198-018, 295198-019 and 295198-063 considered to influence the proposed development
Coal mining geology, faults and fissures	Medium risk	In-seam faulting present within recorded workings within the development site boundary
Reported or potential mine gas emission	Medium risk	Gas remedial site located 325m southwest of the site. All mine workings pose a potential gas risk which should be considered in any future investigations and development
Recorded coal mining surface hazards and historical claims	Low risk	None recorded
Surface mining (opencast workings)	Low risk	None recorded

Comment on each specific coal mining feature, based on a desk based review of sources listed in Section 2, are provided below:

a) Recorded and probable underground coal mining

Underground coal mining can pose challenges to ground stability. A widely regarded 'rule of thumb' of 10 times the extraction thickness of the seam(s) in competent rock cover is commonly considered appropriate, however a site-specific consideration of the risk must be adopted.

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.

It must be considered possible that where seams have been worked by underground methods, roadways may exist that could extend to greater than the height of the worked seam in order to facilitate access. A nominal roadway height of 1.5m is considered, where a seam is of a lesser thickness than this.

Where areas of probable shallow coal mine workings have been identified as part of the Development High Risk Area, it is likely that workable coal exists at shallow depths, however no records for workings exist. 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.

The Consultants Report in Appendix B states that the development site is not in an area of recorded shallow coal mine workings and that it is not in an area of probable shallow coal mine workings. The Consultants Report indicates that the site is underlain by, or is in proximity to, workings in fourteen seams of coal at depths of 52-418m bgl. The shallowest of these workings is in the No.3 Rhondda seam, recorded worked at shallowest 52m bgl beneath the site, with an extraction thicknesses of 0.5m and last worked locally in 1937.

In addition to the recorded workings, the Consultants Coal Mining Report also records a spine roadway at shallow depth within an unnamed seam within the south of the site boundary and the outcrops of the Abergorchi and the Tormynydd seam within the development site boundary, both locally orientated approximately northwest-southeast.

The County Geological sheet Glamorgan 19SW (1960) records the outcrops of the Tormynydd and Abergorchi seams as shown within the Consultants Coal Mining Report, with the sheet showing old crop workings present along the Tormynydd outcrop, likely worked from the numerous adits shown along the seam outcrop. Given the nature of these adits, it is likely these workings were relatively primitive and limited, however may be more extensive with the presence of further unrecorded mine adits likely.

The recorded workings within the No.3 Rhondda seam are shown on abandonment plan 12797, with the plan showing the seam to have been worked from mine entries 295197-042 and 295197-043. The plan shows the seam to be 1ft 8in (0.51m) in thickness including a 2in (0.05m) stone band, with the seam underlain by a fireclay floor of unspecified thickness. The plan shows the seam to be 'flat' (presumably with no dip). Although shown to be worked from adits recorded at a level below the stratigraphically underlying Tormynydd seam outcrop, it is considered likely that the roadways emanating from the adit access the seam higher in the hillside, likely to enable easier drainage of the seam, although this cannot be confirmed due to the lack of seam levels recorded on the abandonment plan. Due to this it is considered that the roadways from these mine entries may pass beneath the site at shallow depth. In addition to the recorded workings, it is considered that where not recorded worked, the seam is likely to have been subject to unrecorded workings. As the No.3 Rhondda seam outcrop is not recorded, the limit of these workings cannot be confirmed.

Abandonment plan 6295 records the Abergorchi seam to be worked beneath the southwest of the development site boundary, with the plan showing a seam depth of 24yds (21.95m) at mine entry 294197-015. A dip of 1 in 12 (4.8°) southeast is recorded on the sheet. A section of seam is included showing bands of coal and clod 1.37m in thickness underlain by a fireclay pavement of unspecified thickness. The plan shows open roadways and old levels adjacent to the site and therefore it is considered that the seam is likely to be worked to outcrop. Whilst the Consultants Coal Mining Report records the Abergorchi seam at 125m beneath the site, the actual seam depth is likely to range from outcrop workings, to extraction at depths up to and possibly in excess of the 175m figure recorded within the Consultants Coal Mining Report.

The generalised vertical section (GVS) from the County Geological sheet Glamorgan 18SW (1960) records the following section of seams in the area:

Seam	Thickness	Separation
No.3 Rhondda	0-3ft (0-0.91m)	NA
Tormynydd	Thin	24m
Unnamed coal	Thin	22m
Hafod	Thin	8m
Unnamed coal	Thin	29m
Abergorchi (two leaves)	3ft (0.91m)	16m
Pentre Rider	Thin	17m
Pentre	2ft 6in (0.76m)	8-11m
Lower Pentre	2ft (0.61m)	6m
Unnamed coal	Thin	10m

The outcrops of the seams between the Tormynydd and the Abergorchi and below the Abergorchi are not shown to locally outcrop. It is considered that the seams may however be locally workable and may be worked from outcrop where present. It is noted that the County Geological sheet Glamorgan 18NW (1952) shows extensive crop workings in the thin coals between the Tormynydd and overlying No.2 Rhondda seams.

Borehole 8 within the Norwest Holst Ground Investigation Report - Pen Yr Englyn Tip 100 Treherbert, located at E294882.6, N198000.6 (between the Abergorchi and Tormynydd outcrops and approximately in the centre of the site) records a coal seam 0.35m thick at 18.1m depth but does not suggest which seam this could be. A 0.5m thickness coal seam (shown as blown away) is recorded at 7.1m depth within the integral Geotechnique borehole PEN1 at E295000.9, N198235.7.

Due to the location of mine entries 295198-014, 295198-015, 295198-016, 295198-017, 295198-018, 295198-019 and 295198-063 on the Tormynydd outcrop it is considered unlikely that the roadway(s) from these mine entries remain in superficial deposits as they pass through the site with it being considered likely that these have been driven in coal. It would be prudent to identify the presence and condition of any roadways passing through the site and to remediate and avoid building in immediate proximity to the roadways where possible, however any layout considerations should be concluded following ground investigations being undertaken.

Due to the location of the proposed works, together with the position of the Abergorchi outcrop and the lack of any further seam outcrops to the south, it is considered that the seams underlying the Abergorchi will not be of influence to the proposed development.

It is noted that the development site is recorded to have historically been used for quarrying activities. It is considered possible that the depth to rockhead may vary across the site with areas of backfill possibly present, which may be at risk of differential settlement. The risk posed from the extraction of other minerals should be considered. Further to this, due to the former use of the site as a spoil tip it is likely that varying thicknesses of made ground will be present across the site relating to this former use.

The risk to the proposed development from recorded underground coal mining in the Abergorchi seam and probable underground mining in seams between the No.3 Rhondda and the Abergorchi seam is considered to be medium. In addition to this, roadways emanating from both recorded and unrecorded adits may be present at shallow depths with insufficient overlying competent cover.

b) Mine entries (shafts and adits)

The Consultants Report in Appendix B shows 32 mine entries are recorded within, or within 100m of, the development site. The best-plot positions for those entries within 50m of the development boundary have been reviewed as part of this coal mining risk assessment. The results of this exercise are recorded in the table below:

Reference	Adit orientation	Original easting	Original northing	Amended easting	Amended northing	Distance from site	Source
294197-003	NA	294585	197804	294585	197804	1m SW	OS 1:2500 Glamorgan 18/9 (1877);
294197-004	42°	294767	197814	294767	197814	Within	OS 1:2500 Glamorgan 18/9 (1877, 1900); Ab plans 6295 SWR1364
294197-012	NA	294741	197882	294741	197882	Within	OS 1:2500 Glamorgan 18/9 (1920); Ab plans 11374 11894 13618 SWR1375 1365 1366 1367 1346 1344 1345 1243 Geological Sheet Glam 18:SW Prov Ed
294197-013	NA	294763	197859	294763	197859	Within	OS 1:2500 Glamorgan 18/9 (1920); Ab plans13618 11594 11374 9969 SWR1344 1345 7346 1243 1363 1365 1366 367 Geological Sheet Glam 18:SW Prov Ed
294197-014	NA	294815	197876	294811	197880	Within	1/2500 O.S Sheet Glam 18:9 1870 Ed Ab plan 6295
294197-015	NA	294913	197853	294913	197853	56m SE	OS 1:2500 Glamorgan 18/9 (1920); Ab plan 6295 Geological Sheet Glam 18:SW Prov Ed

Reference	Adit orientation	Original easting	Original northing	Amended easting	Amended northing	Distance from site	Source
294197-016	NA	294562	197812	294562	197812	22m SW	Ab plans SWR1364 SWR1365 SWR1366 SWR1367
294197-017	49°	294588	197811	294588	197811	Within	Ab plans 1369 9969 SWR1363
294197-027	NA	294564	197797	294564	197797	23m SW	OS 1:2500 Glamorgan 18/9 (1877); Ab plans SWR1364 SWR1365 SWR1366 SWR1367 Geological Sheet Glam 18:SW Prov Ed
294197-061[1]	NA	#N/A	#N/A	294823	198000	Within	SWR1366
295197-010	41°	295053	197993	295053	197993	Within	1/2500O.S Sheet SS9597 N.G Ed
295197-030	30°	295065	197982	295065	197982	Within	1/2500 O.S Sheet SS9597 N.G Ed Geological Sheet Glam 18:SE Prov Ed - site of
295197-031	73°	295070	197981	295070	197981	Within	1/2500 O.S Sheet SS9597 N.G Ed Geological Sheet Glam 18:SE Prov Ed - site of
295197-032	73°	295070	197981	295070	197973	4m S	1/2500 O.S Sheet SS9597 N.G Ed Geological Sheet Glam 18:SE Prov Ed - site of

Reference	Adit orientation	Original easting	Original northing	Amended easting	Amended northing	Distance from site	Source
295197-033	36°	295077	197965	295077	197965	16m SE	1/2500 O.S Sheet SS9597 N.G Ed Geological Sheet Glam 18:SE Prov Ed - site of
295197-034	45°	295081	197962	295081	197962	20m SE	1/2500 O.S Sheet SS9597 N.G Ed Geological Sheet Glam 18:SE Prov Ed - site of
295197-035	26°	295096	197952	295096	197952	34m SE	Former British Coal Records
295197-036	40°	295103	197943	295103	197943	45m SE	Former British Coal Records
295197-037	41°	295107	197940	295107	197940	50m SE	Former British Coal Records
295197-038	33°	295129	197920	295129	197920	73m SE	Former British Coal Records
295197-039	31°	295136	197913	295136	197913	83m SE	Former British Coal Records
295197-040	63°	295143	197912	295143	197912	88m SE	Former British Coal Records
295197-041	41°	295151	197904	295151	197904	98m SE	Former British Coal Records
295197-063	14°	295048	197999	295048	197999	Within	Former British Coal Records
295198-014	41°	295012	198030	295012	198030	Within	Other: Former British Coal Corporation Records
295198-015	45°	295016	198027	295016	198027	Within	Former British Coal Records
295198-016	37°	295020	198025	295020	198025	Within	Former British Coal Records
295198-017	32°	295025	198018	295025	198018	Within	Former British Coal Records
295198-018	30°	295033	198015	295033	198015	Within	Former British Coal Records
295198-019	19°	295039	198007	295039	198007	Within	Former British Coal Records

Reference	Adit orientation	Original easting	Original northing	Amended easting	Amended northing	Distance from site	Source
295198-020	21°	295043	198005	295043	198005	Within	Former British Coal Records
295198-044	225°	295164	198368	295164	198368	92m N	Other: Coal Authority File H3833

[1]Mine entry added after review of abandonment plans when producing this CMRA

The Consultants Coal Mining Report records treatment records for six mine entries, summarised below:

Reference	Treatment description
294197-012	This shaft is reported to have been filled prior to 1970. There are no details on the fill material used.
294197-013	This shaft is reported to have been filled prior to 1970. There are no details on the fill material used.
294197-015	Apparently located during a search of the area in 1977. This shaft is understood to have been filled in February 1949. There are no details on the fill material used.
294197-016	Apparently located during a search of the area in 1977. This shaft is understood to have been filled and capped sometime prior to 1970. Subsequent works undertaken by the Local Authority have obscured this shaft There are no details on the fill material or cap construction.
294197-017	This adit was apparently located during a search of the area undertaken in 1977. The entrance was sealed and the area above the seal backfilled
294197-027	Apparently located during a search of the area in 1977. This shaft is understood to have been filled and capped sometime prior to 1970. Subsequent works undertaken by the Local Authority have obscured this shaft

The Mining Remediation Authority seeks to ensure that development is avoided above, or within the zone of influence of, all mine entries where possible. The zone of influence can be calculated as the sum of the departure value (up to 10m to account for discrepancies in source material), plus the local depth to rockhead (discussed in 3c below as likely to be approximately 16.69m), plus the entry radius (nominally assumed to be 1.25m unless proven otherwise). On the basis of the above the zone of influence for these entries can be assumed to be a distance of 27.94m from the recorded positions detailed above.

Based on the layout plan provided, only mine entries 294197-061, 295198-014, 295198-015, 295198-016, 295198-017, 295198-018, 295198-019 and 295198-063 are considered to be of influence to the proposed development. The risk from other mine entries should be reassessed if the development layout is amended.

No treatment details are recorded for the mine entries considered to be of influence to the development.

Where possible the development layout should be amended to avoid the position of known mine entry locations and their associated zones of influence. If this is not possible, it may be necessary to locate and consider the treatment of mine entries where applicable.

If the entries cannot be located within the area which can be accessed, a worst case zone of influence should be assumed from the edge of the available search area and an appropriate stand-off accommodated accordingly. If the zone of influence cannot be avoided as part of the development layout then an assessment should be made as to whether the risk from these entries can be mitigated through a design solution.

It is possible that the roadway(s) extending from the above adits (and discussed further in 3a) remain in superficial deposits as they pass through the site. Consequently it would be prudent to identify the presence and condition of any roadways passing through the site and to remediate and avoid building in immediate proximity to the roadways where possible, however any layout considerations should be concluded following ground investigations being undertaken. It is considered likely that further unrecorded mine entries and associated roadways are possible along the seam outcrops and this should be considered when planning works in these areas.

The risk to the development from recorded mine entries is considered to be high.

Where workable coal exists very close to surface, the possibility of bell pits (very old, unlined mine entries) cannot be discounted.

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. Caution should be applied to any works/loading/vehicle movements in the zone of influence of mine entries.

c) Coal mining geology, faults and fissures

The development site sits upon the South Wales Upper and Middle Coal Measures formations and the Llynfi and Rhondda Member sandstone formations. The closest available BGS borehole to the site, SS99NW24 located within the development site boundary and recording a section of Ynysfeio Colliery, No.3 Pit records surficial deposits to consist of gravel and clay to 16.69m. Boreholes within the Norwest Holst Ground Investigation Report - Pen Yr Englyn Tip 100 Treherbert records rockhead to have been encountered at depths of between 10-14m with surficial deposits consisting of made ground, clay and gravel. Ground conditions across the remainder of the development site may vary. Due to the former colliery and quarrying activities that have been undertaken on the site it is likely that the thickness of made ground deposits are likely to vary with areas of unconsolidated colliery spoil present within the site.

The mining Remediation Authority are aware of inspections to the spoil tip have been undertaken but the records of which have not been made available for review. Guidance on coal tip safety can be viewed at: https://www.gov.wales/coal-tip-safety.

No faults, fissures or break lines are known to affect the development site.

Faults are recorded to be present approximately 190m southwest and 400m west of site, orientated approximately NW-SE and downthrown to northeast, locally displacing coal seams. In-seam faulting is present in the recorded workings within the development site boundary. Abandonment plan SWR136 records a fault at surface orientated approximately NW-SE 520m southeast of the site shown to throw up 20yds (18.29m).

Faults can act as pathways for gas and water, cause surface instability and result in dissimilar coal conditions/hazards due to their relative displacement of strata.

Fissures are lines of weakness at surface which may have been caused by coal mining, usually by aerial subsidence associated with deep mining. No fissures are known to affect the development site.

d) Reported or potential mine gas emission

The Consultants Coal Mining Report records a gas remedial site to be located 341m southwest of the site. The Mining Remediation Authority's Gas Team have confirmed that no elevated gas levels are known to have been encountered at this site.

All 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 Mining Remediation Authority recommends that a more detailed gas risk assessment to be undertaken in accordance with relevant guidance.

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

Coal seams which are considered prone to spontaneous combustion can be seen at:

www.gov.uk/government/publications/coal-seams-with-a-history-of-spontaneous-combustion

Seams excluded from the list should not be regarded as free from risk of spontaneous combustion as the majority of coal seams could suffer from spontaneous combustion depending upon the method of them being entered, worked or disturbed.

e) Recorded coal mining surface hazard and historical claims

The Consultants Report in Appendix B shows no surface hazards or historical claims to exist in proximity to the development site.

f) Surface mining (opencast workings)

The Consultants Report in Appendix B shows no former surface mining to exist in proximity of the site.

It is noted that the development site is recorded to have historically been used for quarrying activities. It is considered possible that the depth to rockhead may vary across the site with areas of backfill possibly present, which may be at risk of differential settlement. The risk posed from the extraction of other minerals should be considered.

Section 4 – Proposed mitigation strategy

a) Site investigation and/or remediation

Due to the presence of recorded shallow mine workings in the Abergorchi seam, probable underground mining in seams between the No.3 Rhondda and the Abergorchi seam and the presence of mine entries 294197-061, 295198-014, 295198-015, 295198-016, 295198-017, 295198-018, 295198-019 and 295198-063 within the site boundary, an intrusive site investigation will be required.

It is understood from the Consultants Coal Mining Report in Appendix B that previous site investigations have been undertaken in the vicinity of the site. It may be prudent to attempt to obtain their findings for review as part of the further site investigations for this proposed development.

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 Mining Remediation Authority. Further information can be found at:

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

Extensive coalfields exist across Great Britain and it is estimated that 25% of homes and businesses in the UK are located above former coal mines.

To understand the potential for mine water heat, and the Mining Remediation Authority and the British Geological Survey (BGS) released an interactive map showing estimated mine water temperatures within British Coalfields in 2020.

www.gov.uk/government/news/new-maps-reveal-heat-stored-in-britains-abandoned-coal-mines

The occurrence of unrecorded mine entries across the whole of the site cannot be discounted and consequently in areas of new build development a watching brief should be maintained throughout the site works to identify this risk. As a result all site operatives should be made aware of this potential

risk. Where mine entries exist close to the boundary the developer should be aware that this could complicate treatment if they straddle the boundary or works needed to treat them require access to land owned by third parties.

Should coal seams be found, at or near the depth of the development's foundations, they may pose a risk of spontaneous combustion if exposed to air or may act as pathways for ground gases to reach the development. A competent engineer should be consulted if coal is encountered in, or adjacent to, the foundations of the proposed development.

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 C758 "Abandoned Mine Workings Manual".

b) Mining Remediation 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 Mining Remediation Authority. Application forms for Mining Remediation Authority permission and further guidance on this matter can be obtained from the Mining Remediation 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.

c) Implications for development layout

The coal mining legacy issues outlined in this report, particularly the presence of recorded and possible unrecorded mine entries will have implications for the layout of the proposed development outlined in Appendix A.

Where possible the development layout should be amended to avoid the position of known mine entry locations and their associated zones of influence. If this is not possible, it may be necessary to locate and consider the treatment of mine entries where applicable.

If the entries cannot be located within the area which can be accessed, a worst case zone of influence should be assumed from the edge of the available search area and an appropriate stand-off accommodated accordingly. If the zone of influence cannot be avoided as part of the development layout then an assessment should be made as to whether the risk from these entries can be mitigated through a design solution.

It is possible that the roadway(s) extending from the above adits (and discussed further in 3a) remain in superficial deposits as they pass through the site. Consequently it would be prudent to identify the

presence and condition of any roadways passing through the site and to remediate and avoid building in immediate proximity to the roadways where possible, however any layout considerations should be concluded following ground investigations being undertaken. It is considered likely that further unrecorded mine entries and associated roadways are possible along the seam outcrops and this should be considered when planning works in these areas.

Caution should be applied to any works/loading/vehicle movements in the zone of influence of mine entries.

Section 5 – Conclusions

This report has identified that the proposed development site has been subject to past coal mining activity that will affect the proposal, namely the presence of recorded shallow mine workings in the Abergorchi seam, probable underground mining in seams between the No.3 Rhondda and the Abergorchi seam and the presence of roadways and mine entries 294197-061, 295198-014, 295198-015, 295198-016, 295198-017, 295198-018, 295198-019 and 295198-063 within the site boundary. The risk to the site from legacy mining features is high.

Consideration to amendments to the development layout and the intrusive investigations recommended in Section 4a of this report should be undertaken prior to the layout of the development being confirmed.

The Mining Remediation 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 – Mining Remediation Authority Contacts

Planning and Local Authority Liaison Service
Tel: 01623 637 119
Email: planningconsultation@miningremediation.gov.uk
Website: www.gov.uk/planning-applications-coal-mining-risk-assessments

Surface Hazards Emergency Service
Tel: 0800 288 4242 (open 24 hours a day, 7 days a week)
24-hour number for reporting public safety hazards and incidents associated with coal mining

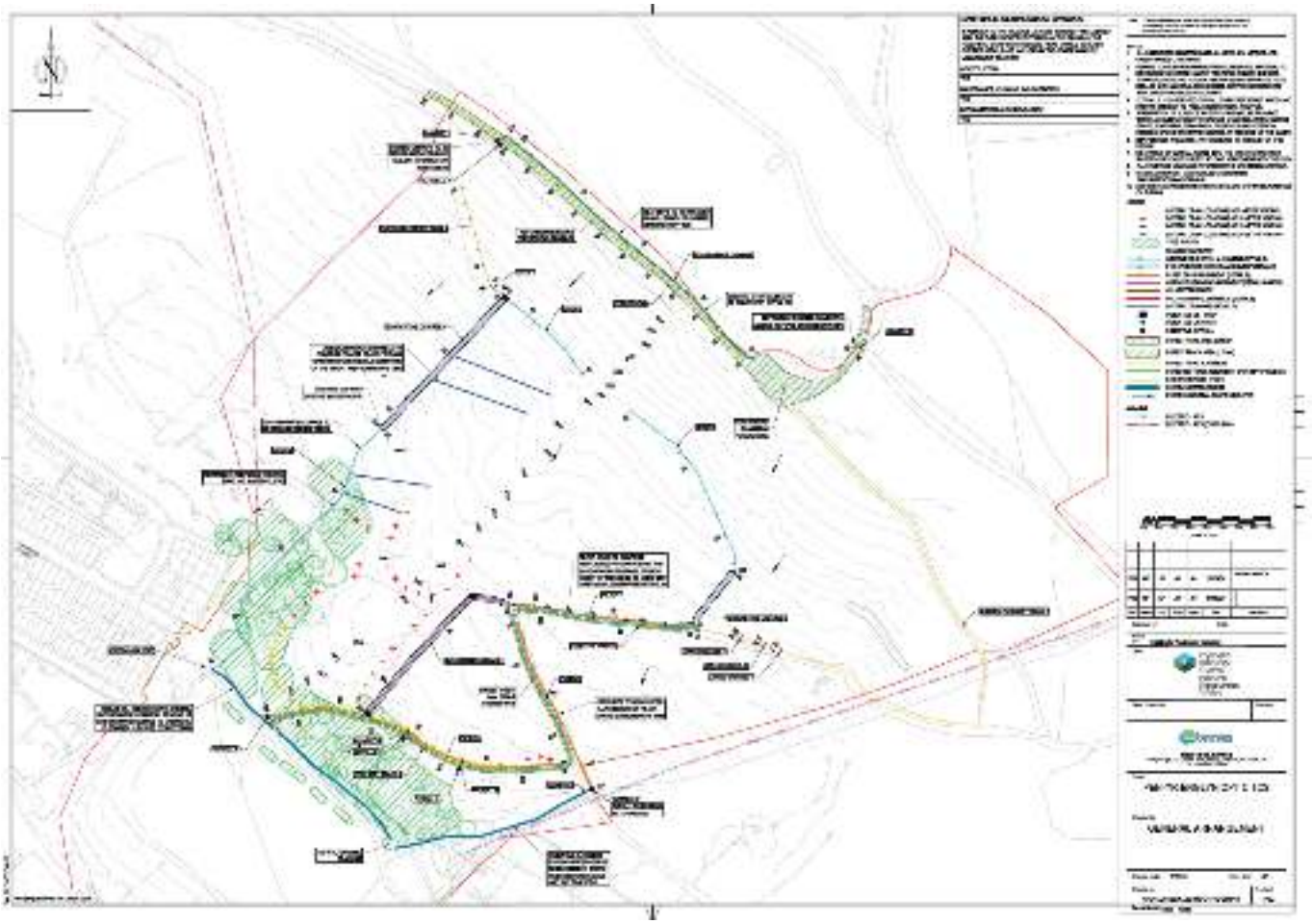
Mining Reports Service
To purchase site specific coal mining information go to our website;
Website: www.groundstability.com

Licensing and Permitting Service
Tel: 01623 637 320
Email: permissions@miningremediation.gov.uk
For permission to enter or disturb coal mine entries and coal seams

Heat and By-Product Innovation Team
Tel: 0300 3300 140
Email: minewaterheat@miningremediation.gov.uk
Please contact us to find out more about opportunities in your area

Section 7 – Appendices

Appendix A – Plan showing proposed development layout



Appendix B –Consultants Coal Mining Report

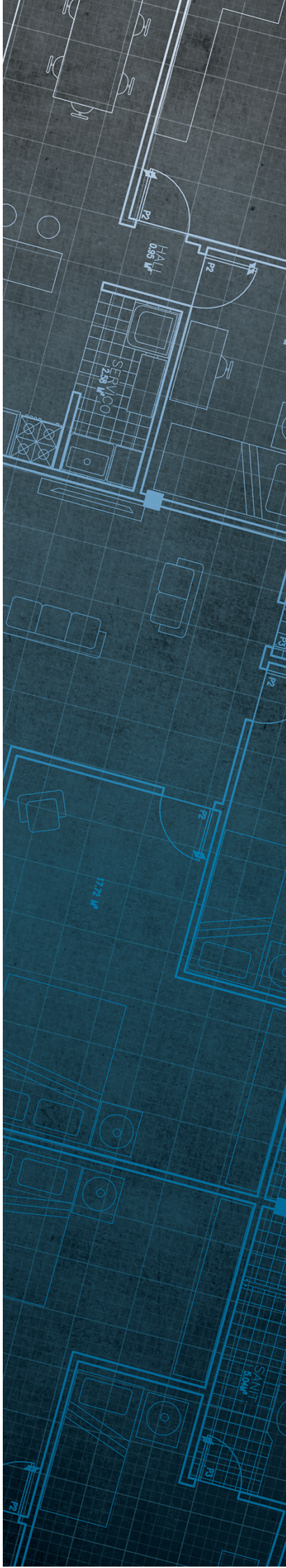
The Coal Authority

Consultants

Coal Mining Report

Treherbert
Treorchy
CF42 5HA

Date of enquiry:	**5 February 2025**
Date enquiry received:	**5 February 2025**
Issue date:	**5 February 2025**
Our reference:	**71009816479001**
Your reference:	



Consultants

Coal Mining Report

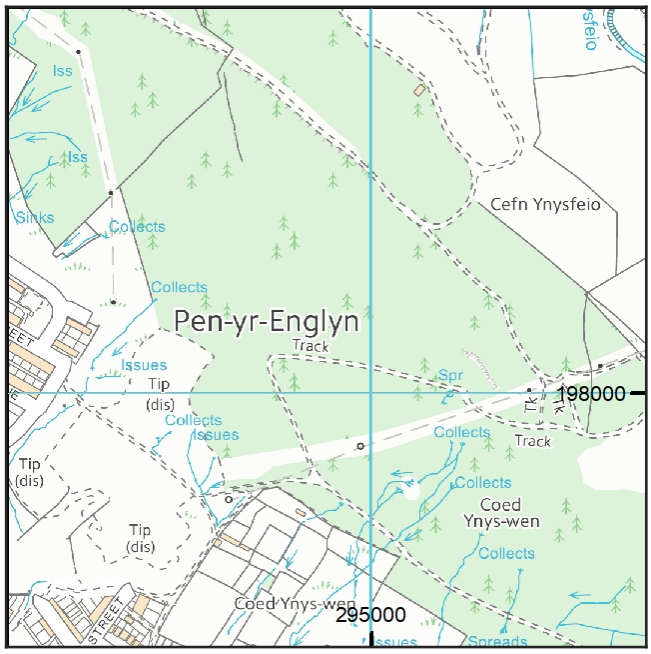
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

CMRA THE COAL AUTHORITY

Enquiry address

Treherbert
Treorchy
CF42 5HA



Approximate position of property

Map data

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

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

Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	NO.3 RHONDDA	Coal	4AP8	53	Beneath Property	10.0	South	50	1937
unnamed	NO.3 RHONDDA	Coal	49UB	55	South	0.0	East	50	1936
unnamed	GORLLWYN	Coal	49UX	94	Beneath Property	7.8	South	90	1905
unnamed	UNNAMED	Coal	49V0	104	Beneath Property	3.6	South-West	70	1919
unnamed	ABERGORCHI	Coal	49UC	125	Beneath Property	5.5	South-East	120	1913
unnamed	ABERGORCHI	Coal	4AP5	159	Beneath Property	3.6	South	160	1888
YNYSFELO	TWO FOOT NINE	Coal	4AOV	167	North-West	2.5	North-East	100	1899
ABERGORKI	ABERGORCHI	Coal	4AP7	173	South-East	4.6	South-West	160	1863
unnamed	ABERGORCHI	Coal	4AP6	175	Beneath Property	6.6	South	160	1888
unnamed	GORLLWYN	Coal	49UW	185	Beneath Property	7.3	South	90	1905
unnamed	UNNAMED	Coal	4AP2	188	Beneath Property	1.6	South	70	1912
unnamed	GORLLWYN	Coal	4AOX	191	Beneath Property	1.4	East	80	1894
YNYSFELO	GORLLWYN	Coal	4AOY	191	North-East	7.3	South-West	80	1894
ABERGORKI	UNNAMED	Coal	4AP3	198	East	12.1	South	70	1922
unnamed	FOUR FOOT	Coal	49UH	200	Beneath Property	7.4	South	165	1894
unnamed	UPPER SIX FEET	Coal	49UR	217	Beneath Property	8.1	South	170	1878
ABERGORKI	GORLLWYN	Coal	4AP0	217	East	4.7	West	80	1898
unnamed	GORLLWYN	Coal	4AOZ	221	Beneath Property	3.8	West	80	1905
YNYSFELO	FIVE FOOT GELLIDEG	Coal	4ANJ	258	Beneath Property	0.0	East	90	1935
YNYSFELO	UPPER SIX FEET	Coal	4AOI	262	Beneath Property	4.4	North	180	1913
YNYSFELO	FOUR FOOT	Coal	4AON	262	Beneath Property	3.0	North	180	1901
unnamed	FOUR FOOT	Coal	49UI	273	Beneath Property	7.4	South	165	1894

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
YNYSFELO	FOUR FOOT	Coal	4AOR	274	North-East	1.6	South-West	180	1916
YNYSFELO	UPPER SIX FEET	Coal	4AOK	276	North-East	3.7	West	140	1885
YNYSFELO	UPPER NINE FOOT	Coal	4AOB	276	North-East	0.0	East	200	1888
unnamed	FIVE FOOT	Coal	49TT	295	Beneath Property	9.2	South	119	1926
ABERGORKI	FOUR FOOT	Coal	4AOO	300	Beneath Property	0.0	East	180	1882
YNYSFELO	YARD	Coal	4ANX	300	North-West	0.0	East	120	1913
unnamed	UPPER SIX FEET	Coal	49UQ	303	Beneath Property	14.4	South-West	170	1897
ABERGORKI	UPPER NINE FOOT	Coal	4AOC	307	Beneath Property	5.2	North	210	1899
unnamed	UPPER SIX FEET	Coal	4AOJ	325	Beneath Property	0.0	East	180	1879
YNYSFELO	BUTE	Coal	4AO9	335	Beneath Property	7.3	South	150	1902
YNYSFELO	BUTE	Coal	4AOA	337	Beneath Property	1.3	South-West	150	1924
unnamed	BUTE	Coal	49UU	350	Beneath Property	10.1	South	140	1905
YNYSFELO	YARD	Coal	4ANY	355	North	0.0	East	120	1917
YNYSFELO	YARD	Coal	4ANZ	360	Beneath Property	4.5	East	120	1913
ABERGORKI	BUTE	Coal	4AO6	360	East	3.7	South	150	1901
unnamed	LOWER NINE FOOT	Coal	49U4	361	Beneath Property	3.0	South	100	1929
YNYSFELO	YARD	Coal	4AO0	370	Beneath Property	3.4	South-East	120	1918
unnamed	YARD	Coal	49U0	373	Beneath Property	5.1	South-East	165	1923
unnamed	YARD	Coal	4AO1	375	Beneath Property	3.1	North	120	1929
unnamed	YARD	Coal	49U1	377	Beneath Property	7.5	South	165	1923
unnamed	BUTE	Coal	49UT	377	Beneath Property	0.9	North-East	140	1905
unnamed	UPPER NINE FOOT	Coal	49U7	382	Beneath Property	12.8	South-West	180	1897
unnamed	YARD	Coal	4AO2	382	East	1.9	North	120	1928
unnamed	FIVE FOOT	Coal	4ANO	386	North-East	0.8	South	90	1920
unnamed	FIVE FOOT	Coal	49TQ	393	East	1.6	East	210	1920

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	UPPER SEVEN FOOT	Coal	49TV	394	Beneath Property	7.2	South-East	94	1910
unnamed	UPPER SEVEN FOOT	Coal	4ANT	397	East	0.0	East	100	1910
unnamed	FIVE FOOT	Coal	4ANN	398	Beneath Property	1.9	East	90	1929
unnamed	UPPER SEVEN FOOT	Coal	49TX	398	East	5.4	South-West	94	1910
unnamed	UPPER SEVEN FOOT	Coal	49TW	405	South	5.6	South	94	1910
unnamed	FIVE FOOT	Coal	49TS	407	Beneath Property	9.3	South	119	1926
unnamed	UPPER SEVEN FOOT	Coal	4ANQ	410	Beneath Property	0.0	East	100	1910
unnamed	UPPER SEVEN FOOT	Coal	4ANR	410	Beneath Property	0.0	East	100	1910
ABERGORKI	FIVE FOOT	Coal	4ANP	412	North-East	3.4	West	90	1915
unnamed	UPPER SEVEN FOOT	Coal	4ANS	415	Beneath Property	0.0	East	100	1910
ABERGORKI	FIVE FOOT GELLIDEG	Coal	4ANK	415	East	4.9	South-West	90	1935
unnamed	FIVE FOOT GELLIDEG	Coal	4CVJ	418	Beneath Property	2.9	North-East	120	1935

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

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

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	294197-003	294585 197804		Coal	Rhondda Borough Council 03/05/1985
Adit	294197-004	294767 197814		Coal	Rhondda Borough Council 03/05/1985
Shaft	294197-012	294741 197882	This shaft is reported to have been filled prior to 1970. There are no details on the fill material used.	Coal	Rhondda Borough Council 03/05/1985
Shaft	294197-013	294763 197859	This shaft is reported to have been filled prior to 1970. There are no details on the fill material used.	Coal	Rhondda Borough Council 03/05/1985
Shaft	294197-014	294811 197880		Coal	Rhondda Borough Council 03/05/1985
Shaft	294197-015	294913 197853	Apparently located during a search of the area in 1977. This shaft is understood to have been filled in February 1949. There are no details on the fill material used.	Coal	
Shaft	294197-016	294562 197812	Apparently located during a search of the area in 1977. This shaft is understood to have been filled and capped sometime prior to 1970. Subse quent works undertaken by the Local Authority have obscurred this shaft There are no details on the fill material or cap construction.	Coal	Rhondda Borough Council 03/05/1985
Adit	294197-017	294588 197811	This adit was apparently located during a search of the area undertaken in 1977. The entrance was sealed and the area above the seal backfilled	Coal	Rhondda Borough Council 03/05/1985
Shaft	294197-027	294564 197797	Apparently located during a search of the area in 1977. This shaft is understood to have been filled and capped sometime prior to 1970. Subse quent works undertaken by the Local Authority have obscurred this shaft	Coal	Rhondda Borough Council 03/05/1985
Shaft	294197-061	294823 198000		Coal	
Adit	295197-010	295053 197993		Coal	
Adit	295197-030	295065 197982		Coal	
Adit	295197-031	295070 197981		Coal	
Adit	295197-032	295070 197973		Coal	
Adit	295197-033	295077 197965		Coal	
Adit	295197-034	295081 197962		Coal	
Adit	295197-035	295096 197952		Coal	
Adit	295197-036	295103 197943		Coal	
Adit	295197-037	295107 197940		Coal	

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	295197-038	295129 197920		Coal	
Adit	295197-039	295136 197913		Coal	
Adit	295197-040	295143 197912		Coal	
Adit	295197-041	295151 197904		Coal	
Adit	295197-063	295048 197999		Coal	
Adit	295198-014	295012 198030		Coal	
Adit	295198-015	295016 198027		Coal	
Adit	295198-016	295020 198025		Coal	
Adit	295198-017	295025 198018		Coal	
Adit	295198-018	295033 198015		Coal	
Adit	295198-019	295039 198007		Coal	
Adit	295198-020	295043 198005		Coal	
Adit	295198-044	295164 198368	The entrance to this adit is sealed with local stone	Coal	

Abandoned mine plan catalogue numbers

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

SWR1344	9969	SWR2454
SWR1363	PO0	SWR1376
SWA720	3272	SWR1366

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
ABERGORCHI	Coal	Yes	Within	N/A	160
TORMYNDD	Coal	Yes	Within	N/A	115
TORMYNDD	Coal	Yes	Within	N/A	132
TORMYNDD	Coal	Yes	Within	N/A	138

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

Distance to site investigation (m)	Direction
33.9	West

See Section 4 for further information.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

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

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

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

Mine gas

Distance to gas incident/remediation (m)	Direction
341.7	South-West

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.

Development advice

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

Site investigations

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

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

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.

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. 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.

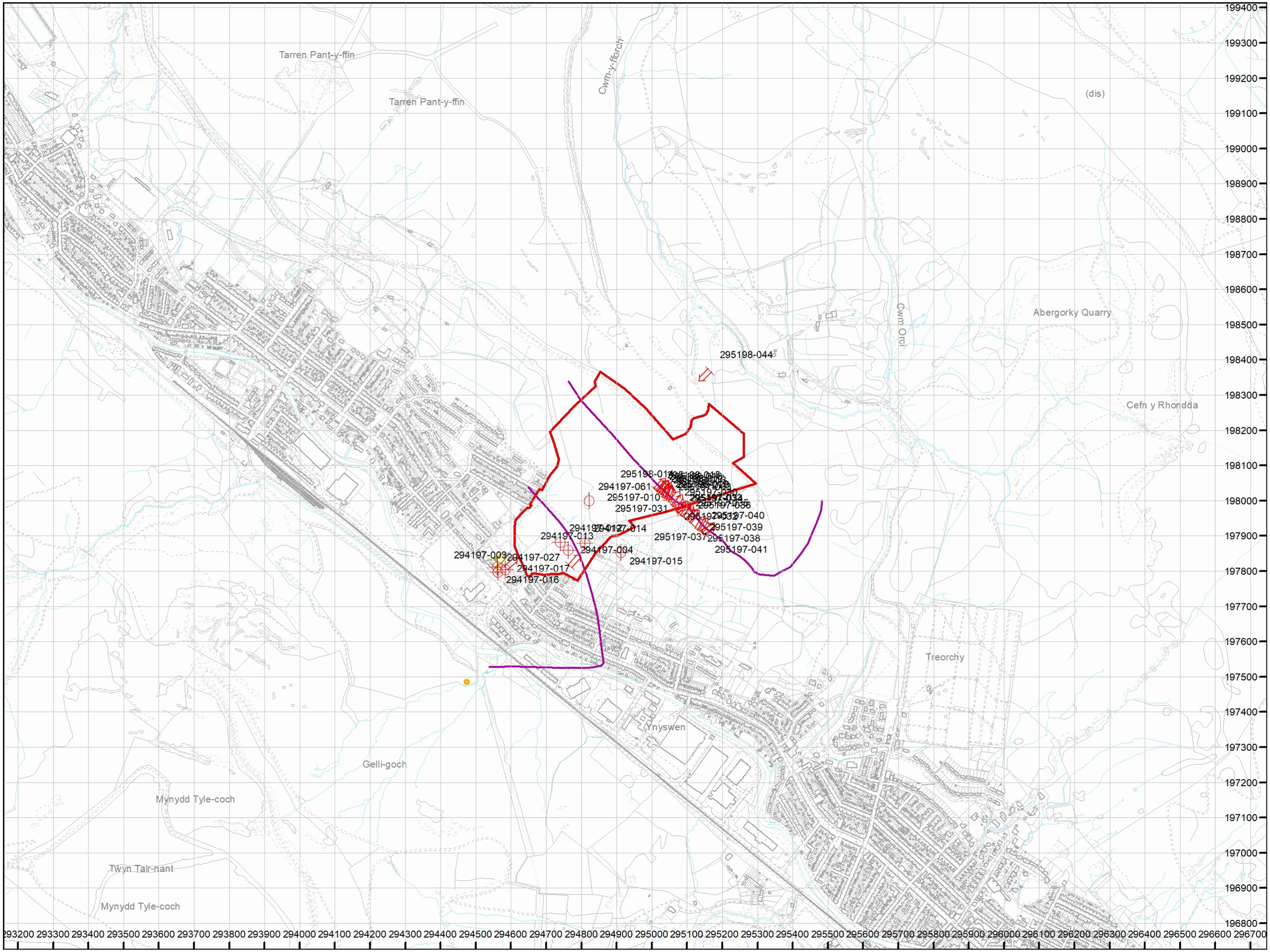
The Coal Authority

Summary of findings

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

Key

- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Disused adit
- Outcrop (Proven)
- Site investigations
- Mine gas remedial works



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