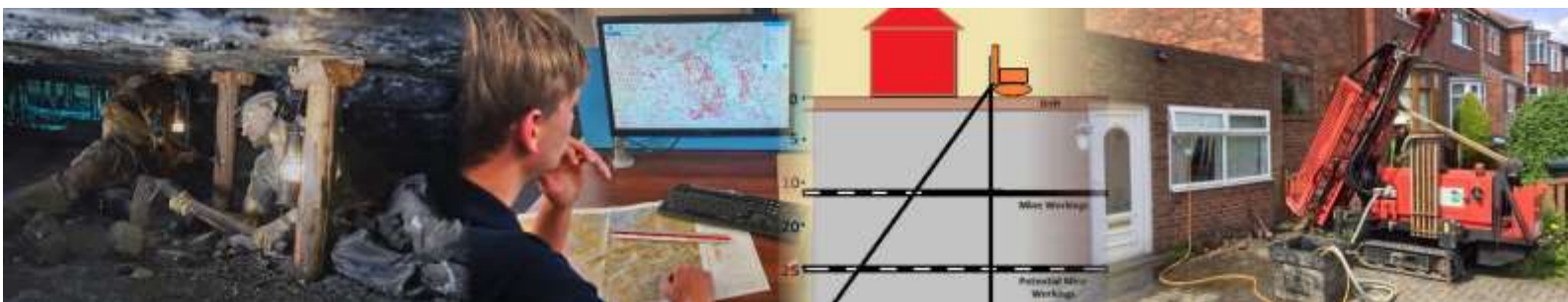




GEOLOGICAL
GEOTECHNICAL
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CONSULTANCY
DRILLING & DATA ACQUISITION



GEOINVESTIGATE LIMITED

Coal Mining Risk Assessment (CMRA)

LOCATION	35 Parish Road, Cwmgwrach SA11 5SW
ISSUE DATE	16 February 2022
FOR	Clive Griffiths
CLIENT REF.	
OUR REF.	G22041

Prepared by

A handwritten signature in black ink, appearing to read "Tom Goldring".

Thomas Goldring MGeol(Hons) FGS
Geo-environmental Engineer

Checked by

A handwritten signature in black ink, appearing to read "Ross Nicolson".

Ross Nicolson BSc(Hons) MSc(Eng) CEng MIMMM
Principal Geotechnical Engineer

SUMMARY FINDINGS

OUTCOME MITIGATION REQUIRED (YES/NO?)

YES. The proposed development is possibly underlain by two levels of very shallow/shallow coal seams with perhaps unrecorded underground mine workings with the potential to significantly impact surface ground stability within the proposed building area.

Whether unrecorded workings will impact the development depends on drift/bedrock depth, mine working (if any?) depth and rock cover thickness. Intrusive ground investigation is therefore required to establish these parameters within the site.

Notwithstanding, on the basis of the CMRA work to date, we are of the opinion that the mining stability and mine gas risks posed by the strata beneath this site from coal mining legacy can be mitigated by routinely adopted measures and should not preclude planning permission being registered in the interim with regard to coal mining legacy issues conditional upon the work being carried out at a later date.

WHAT TO DO NEXT

Obtain quotes for the intrusive site investigation works (if considered appropriate). The cost of the SI works should be a **"lump sum" fixed price**. Geoinvestigate can provide advice and assistance with helping you find suitable site investigation & drilling contractors. Call us on 01642 713779 or email enquiries@geoinvestigate.co.uk.

1. CMRA INTRODUCTION

Site Location and Description:

The approximate centre of this site is at National Grid Reference E 287610, N 205433 with an elevation around 130m at its northwest corner rising to around 134m AOD at its east site boundary. The site is located on hillside rising eastwards. The boundary shown in RED on the Coal Authority (CA) report provided in Appendix A corresponds with the planning application area.

Google Satellite and Street View imagery shows the site comprises an older dormer style bungalow located on a bespoke modern residential estate with woodland to the north.

It is proposed to demolish the existing bungalow and erect two new detach buildings on the plot. Site location and development plans are provided in Appendix C.

The OS map record from 1897 shows the site was undeveloped ground at this early date with an old (mining) tramway and old quarry in the vicinity. Multiple old air shafts are shown to the distant north of the property.

By 1938 the existing bungalow within the property was established with Parish Road installed around the early 1960s

The OS map record provides no clear evidence that the site itself has been subject to surface mining activity though quarrying, mine adits/shafts and coal opencast are recorded in the surrounding area. However Google Satellite imagery suggests that opencast activity may have occurred to the north and southeast of the property

A brief, limited desk top inspection of buildings, roads and walls in the site vicinity using Google Street View found no obvious visible surface evidence indicative of mining subsidence.

Description & Layout of Proposed Development: It is proposed to demolish the existing bungalow and erect two new detach dwellings in its place. Site location and development plans are provided in Appendix C.

Risk Methodology Applied: This document and the risk assessment methodology adopted herein is based on CA publication RISK BASED APPROACH TO DEVELOPMENT MANAGEMENT - GUIDANCE FOR DEVELOPERS Version 3, 2014 and Version 4 - 2017. The template contained therein is adopted with minor amendments made by Geoinvestigate Limited.

2. ASSESSMENT OF SITE SPECIFIC COAL MINING ISSUES

The table below summarises the potential risks associated with coal mining legacy for the proposed development site, identified from list sources of information.

Coal Mining Issues	Yes	No	Risk Assessment/Remarks
Past underground coal mining		No	2.1.1 (refer below)
Probable unrecorded shallow workings		No	2.1.2
Spine roadways at shallow depth		No	
Outcrop	Yes		2.1.2
Geological faults, fissures and breaklines		No	
Opencast Mines		No	2.1.3
Coal Mining Subsidence		No	
Mine entries		No	2.1.4
Mine Gas		No	2.1.5
Site investigations		No	

Note: For those coal mining issues above identified as “Yes” or highlighted “YELLOW” a more detailed discussion and assessment are made of the risks to the application site and the proposed development.

2.1 DETAILED DISCUSSION & ASSESSMENT RESPONSE

2.1.1 Past Underground Mining

According to the Coal Authority report in Appendix A, no recorded/past underground mine workings occur beneath the property.

CA online mining information identifies coal mine working to the distant east of the site dipping 6 or 7 degs SE. This source also identifies coal outcrop and mine shafts and adits on the same section of hillside on which the proposed building development is located.

The absence of recorded shallow working below the site does not mean that shallower unrecorded mine working does not exist beneath the site that the CA have no records of. Mine maps and other documents can get lost or destroyed over the years and if mining was very old there may be no records about it whatsoever and memories fade quickly.

2.1.2 Probable Unrecorded Shallow Workings

According to the CA report the site does not fall within an area of probable unrecorded shallow workings. The CA define Probable Unrecorded Shallow Workings as “Areas where the Coal Authority believes there to be unrecorded coal working that exist at or close to the surface” (i.e., less than 30m).

However, the CA identify the site and this hillside locality as falling within Development High Risk Area (DHRA) because of the presence of coal outcrop within the site and multiple coal outcrop on the hillside below it. An extract of the CA online interactive map is provided in Appendix D.

Because the strata dips SE, the site may be underlain by four workable coal horizons lying within very shallow and shallow depth beneath the new development.

It is Geoinvestigate’s experience that the CA considers that coal outcrop poses the same risk as Probable Shallow Mine Working.

The location of the site is shown on the extract of BGS solid geology and larger scale maps presented in Appendix E. The tentative elevation of the site relative to the vertical geology column is shown below the BGS map. The drift/soil horizon above the solid geology bedrock is not shown on the column.

Comparison of the BGS geology map and the CA online interactive map perhaps shows differences in coal outcrop positions between the different map sources. However, this does not impact the outcome of this CMRA.

The BGS geology map indicates the site is underlain by bedrock of South Wales Lower Coal Measures Formation comprising mudstone, siltstone, and sandstone each with interbedded coal seams of varying thickness.

The geology map indicates that drift/soil cover is Devensian Till (Diamicton) of unknown thickness at this locality but perhaps shallow because of the site's hillside location. BGS borehole information to the south of the site suggests that bedrock on this hillside may be covered by 2.4m of Glacial Drift of Boulder Clay type. This borehole log is not included in this report.

The CA report identifies outcrops of the Five-Foot Coal withing the site (far northwest corner) and the Upper Gellideg Coal 45m to the northwest. The CA identify two other coal outcrops on the hillside below the site making a total of four dipping towards the site and therefore underlying it.

Assuming a stratigraphic dip of 6 or 7 degrees and accounting for the rise in ground level across the site places the Five-Foot Coal and unrecorded working within it at 0m to 6m depth beneath the new buildings, the Upper Gellideg Coal at 7m to 14m with perhaps two further lower/deeper coal horizons possibly within 30m depth of the surface.

Both the Five Foot and Upper Gellideg seams are identified as "workable" by the CA.

BGS publication "UK Coal Resource for New Exploitation Technologies Final Report" report, identities the Five-Foot Gellideg as having thickness of 1.37m - 2.01m.

In conclusion, owing to the presence of possible unrecorded very shallow and shallow mine working below the site and several mine entries on the same section of adjacent hillside it is our opinion that exploratory drilling is required to check what depth coal seam and mine working (if any?) occurs beneath the new building and if there is adequate thickness of rock cover above such working to safeguard the stability of both new buildings.

Drilling will also confirm site specific drift/bedrock depth, this being an important factor in assessing the risk of mining related ground instability.

Drilling will also establish whether mine gas is present beneath the new building.

2.1.3 Opencast Mines

According to the CA report a long narrow finger of 'unlicensed opencast site' trending NW – SE occurs some 45m north of the property with further larger areas of opencast to the southeast of the property.

Google Satellite imagery perhaps provides corroboratory evidence for the existence of this opencast.

In our opinion the long narrow finger of opencast shown by the CA to the north of the site is a former haul road excavation petering out/nipping out to the north of the property and unlikely to contain infill at this point and therefore unlikely to pose a landfill or mine gas risk to the proposed development.

In our opinion while this opencast site does not impact ground stability within the proposed development area it's presence raises further concern about possible multiple shallow coal horizons at this locality.

2.1.4 Mine Entries

The CA report identifies no mine shafts within 100m of the enquiry boundary. However, the presence of several mine adits and mine shafts on the same section of slope in the vicinity of the property raises further concern about shallow mine working on this hillside.

2.1.5 Mine Gas

No mine gas incident or remediation is recorded within 500m of the proposed development and typically, in the UK mine gas is Low risk. Notwithstanding, given the possible presence of shallow mine working beneath the proposed development it is recommended that the risk is raised to **MODERATE** to perhaps High until indicated otherwise by gas testing during drilling.

3. SUMMARY AND OUTCOME

This CMRA has identified the possible presence of multiple, but most probably two, very shallow and shallow possible mine working levels beneath the new building.

In our opinion, whether mine working poses a significant risk to the development cannot be properly assessed without additional information namely drift depth, coal seam depth, mine working depth (if any) and rock cover thickness at this locality. In our opinion, exploratory drilling is required to obtain this information and enable further assessment of the risks posed by shallow mine working at this locality.

Gas monitoring must be carried out during drilling.

4. MITIGATION STRATEGY PROPOSED AND CONCLUSION

To properly determine the coal mining risk at this site it is proposed to drill three (3) boreholes at the property to target depths up to 30m (but not necessarily reaching 30m) to locate shallow coal seams and mine working (if any) below the new development as well as establishing drift and bedrock depth.

Gas monitoring **MUST** be carried out during drilling.

Risks for Different Drilling Scenarios					
Air flush	Mist flush	Foam flush	Water flush	Mud flush	Additional controls
HIGH	HIGH / MED'M	HIGH / MED'M	LOW	LOW	- Monitoring at rig and other open holes. - Seal boreholes

A Coal Authority Permit needs to be obtained (ahead of) further intrusive exploratory drilling. Water Drill Flush to be used when drilling. The permit application must state WATER ONLY DRILL FLUSH for the safety of the public and drill crew.

On the basis of the CMRA work to date, we are of the opinion that the mining stability and mine gas risks posed by the strata beneath this site from coal mining legacy can be mitigated by routinely adopted measures and should not preclude planning permission being registered with regard to coal mining legacy issues.

In conclusion we see no reason why Planning Permission should not be granted in the interim with respect to coal mining legacy issues and that these works form a condition on the planning approval.

Appendices:

Appendices:

- CA Consultants Coal Mining Report issued 31 January 2022 ref 51002963743001.
- Site images.
- Site location & development plans
- Extract of CA online interactive mapping
- Extracts of BGS Geology Map, Sheet 231 - Merthyr Tydfil at 1:50000 scale & Geoinvestigate superficial and solid geology map interpretations.

APPENDIX A
COAL AUTHORITY REPORT



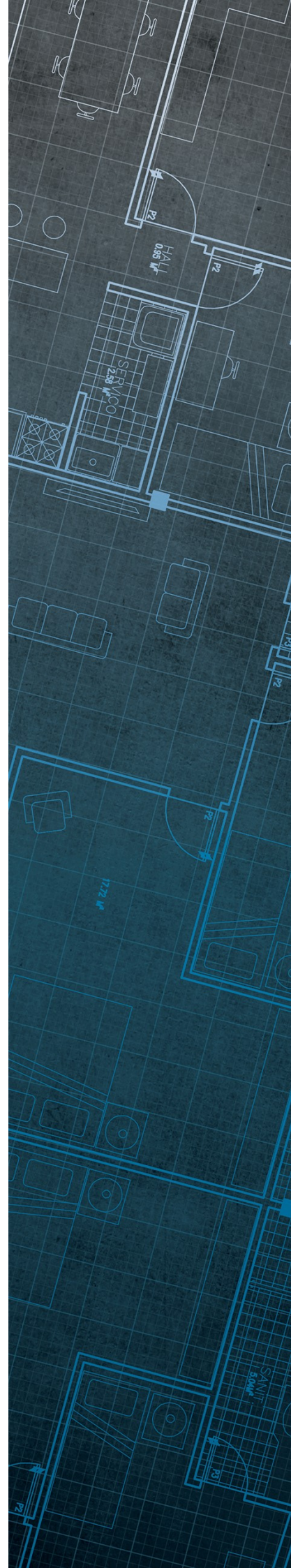
The Coal
Authority

Consultants Coal Mining Report

35 Parish Road
Blaengwrach
Neath Port Talbot
SA11 5SW

Date of enquiry:	31 January 2022
Date enquiry received:	31 January 2022
Issue date:	31 January 2022

Our reference:	51002963743001
Your reference:	G22041



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

GEOINVESTIGATE

Enquiry address

35 Parish Road
Blaengwrach
Neath Port Talbot
SA11 5SW

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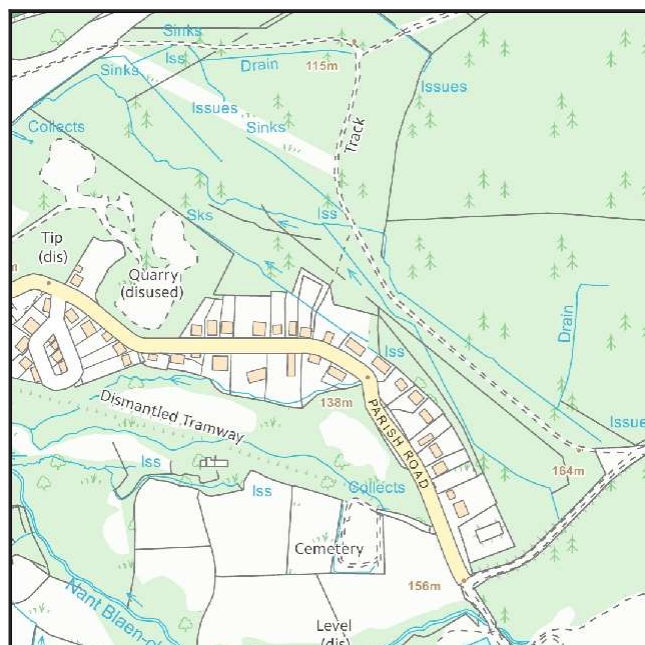
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

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Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

No past mining recorded.

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

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

SW2705	PO0	
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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
FIVE FOOT	Coal	Yes	Within	N/A	35
UPPER GELLIDEG	Coal	Yes	45.1	North-West	36

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

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

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

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

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

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

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

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

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

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

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

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.