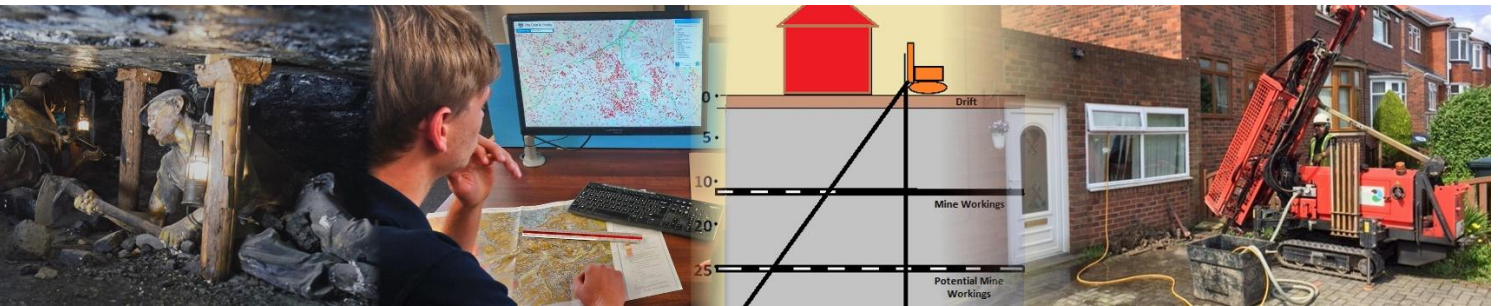




GEOINVESTIGATE LIMITED

Coal Mining Risk Assessment (CMRA)

LOCATION	Smart Electrical Systems, Goat Mill Road, Merthyr Tydfil, CF48 3TD
ISSUE DATE	4 th February 2026
FOR	Smart Electrical Systems
CLIENT REF.	
OUR REF.	G24229 Revised February 2026

Prepared By



Laura Robbins BSc (Hons) MSc MEnvSc
Principal Geoenvironmental Engineer

Checked By



Ross Nicolson BSc (hons) MSc CEng MIMMM
Principal Geotechnical Engineer

1. CMRA INTRODUCTION & COAL MINING HAZARDS

1.1 Site Location and Description

The approximate centre of the site is at National Grid Reference 306354 E, 207325 N. Ground height is approximately 287mOD. The site lies to the south of Goat Mill Road.

The site is currently occupied by Smart Electrical Systems warehouse with associated vehicle hardstanding. A site image is provided in Appendix B. Warehouses are present to the north, east and west and rough open ground to the south.

It is proposed to erect a small extension at the southwest corner of the warehouse as per the development plans provided in Appendix C.

1.2 Historical Maps

A desk study of limited available historical OS maps shows in 1875 the site occupied by Dowlais Iron and Steel Works, with Dowlais Great Tip directly south. According to the historical mapping the proposed building extension is likely to be underlain by an unknown but appreciable thickness of industrial spoil/made ground. The surrounding area is predominantly industrial activity. By 1951 the Iron works and associated buildings are identified as an agricultural engineering works and other factories. The 1:10,000 geology map of the area published in 1972 shows the existing warehouse with the site previously occupied by a large bakery.

1.3 Anticipated Geology

The location of the site is shown on the extract of British Geological Survey (BGS) 1:50,000 Solid Geology map (Sheet 231 Merthyr Tydfil) and BGS 1:10,000 (Sheet SO00NE) both presented in Appendix D. These maps and the BGS's online Geoindex mapping service show the site underlain by an unknown thickness of Made Ground comprising mainly spoil from coal and ironstone working, in turn underlain by an unknown thickness of natural superficial deposits of Devensian Till (Diamicton)/ Boulder Clay. This, in turn, is underlain by the South Wales Lower Coal Measures Formation comprising mudstone, siltstone and sandstone, interbedded with several named coal seams of varying thickness. The bedrock geology also includes Ironstone Veins/horizons.

Outcrop of the Gellideg Coal is shown to the southeast of the new extension dipping southeast at 6 degrees.

The CA report identifies outcrop of the Lower 7FT Bottom Leaf Coal dipping southeast and therefore perhaps likely to underlie the new extension within very shallow depth i.e. < 10m depth. According to the vertical geology columns in Appendix D, the 7FT Coal is expected to be underlain by the 5FT and Gellideg Coal horizons possibly lying within shallow depth i.e. <30m.

A geological fault, trending northwest-southeast is present to the east of the new extension and does not impact it directly. The bedrock strata are down thrown on the south side of the fault. Though rare, geological faults in combination with mine workings, can give rise to ongoing surface creep, differential movement and building damage where buildings are placed over them though typically movement is very small.

The CA identify historic (c. 1878) underground workings in the Rosser Ironstone at 22m beneath the reports larger search area but only according to the CAs online interactive mapping service occurring on the north side of the fault and therefore not under the new building which instead may be underlain by unrecorded shallow working in the 7Ft Coal within shallow depth.

Recent nearby borehole site investigation activity to the southwest of the development area associated with Merthyr Tydfil Planning Permission P/17/0283 records drift/bedrock depth of 12m and 13m with coal encountered in one borehole between 20.70 - 21.60m and mine workings between 15.60 - 16.80m in another while distant BGS logSO00NE/144 some 540m to the northeast of the site records drift/bedrock depth of 14m.

BGS log SO00NE/72 some 280m to the southwest of the site presented in Appendix D records the presence of several named Ironstone Veins between the Lower 4FT Coal and the Farewell Rock including the Rosser Ironstone and similarly worked ironstone horizons in addition to workable coal seams may also be expected to be present below the new extension perhaps all within shallow depth.

Regrettably no BGS borehole information is available within or adjacent to the site that might otherwise shed light on the mining geology below the new building.

In Geoinvestigate's opinion the possible presence of very shallow and shallow mine working poses significant risk to the new extension requiring further intrusive site investigation.

1.4 Mine Workings & Mine Shafts

The CA report in Appendix A identifies one (1) level of past underground mine working beneath the search boundary in the Rosser Ironstone at 22m depth. However as discussed in section 1.3 of this CMRA because this working does not underlie the new extension it does not impact surface ground stability in the development area.

However, the CA place the site in area of probable shallow coal mine workings. The CA define Probable Unrecorded Shallow Workings as *"Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface"* (i.e., less than 30m).

Section 1.3 of this CMRA identifies possible very shallow unrecorded mine working in the 7FT Bottom Leaf Coal with possible further unrecorded shallow working in the 5FT and Gellideg Coal seams below the 7FT, as well as possible ironstone workings.

In Geoinvestigates opinion the possible presence of very shallow and shallow coal and ironstone mine working poses significant risk to the new extension requiring further intrusive site investigation.

The CA report identifies six mine entries at this locality 2 mine shafts and 4 adits. The positions of these mine entries and their calculated zones of influence (ZOIs) are shown in relation to the existing building and the new extension in Appendix E.

With regard to the new extension (RED hatch) at the southwest corner of the existing building only perhaps mine adit/tunnel 306207-077 raises some concern. However, because the extension lies well outside the departure/positional uncertainty of this mine entry (BLUE hatch) and at the outer periphery of its ZOI (YELLOW hatch), then, the ground stability risk posed by this adit is considered to be Low and of lesser importance than the ground stability risk posed by possible shallow mine working beneath the new building. Furthermore, in Geoinvestigates opinion, the ZOI calculated for this mine adit and mine adits generally is overly conservative, as it is based on a crude model developed for vertical mine shafts which have larger volumetric collapse potential and therefore greater lateral draw impact/disturbance. In addition, this adit is heading east, away from the new building.

Notwithstanding drilling investigation should be carried out to establish drift depth below the extension and to further assess the impact of this adit entrance though shallow mine working poses greater hazard.

Though adit 306207-020 heads southeast towards the new building it is Geoinvestigates opinion that it is likely to lie beyond an influencing depth of the extension which at this point lies some 75m from the adit entrance.

1.5 Geological Faults Fissures & Breaklines

The geological map shows a geological fault to the northeast of the new building and therefore beyond influencing distance of it with regard to surface ground stability.

Faults can also provide pathways to the surface for mine gas movement though the anticipated presence of several metres of Boulder Clay beneath the site may provide a barrier to gas migration. However, in this instance the risk may

increase as this fault may connect with multiple levels of mine workings though to date there has been NO reported mine gas incident at the property.

1.6 Opencast Mines

Though the CA report identifies opencast site to the south of the search boundary very close to the new extension the BGS mapping confirms that no opencast excavation is present here rather deep made ground is present.

1.7 Mine Gas

According to the CA report no mine gas incidents or remediation have been recorded within 500m of the enquiry boundary and typically on the UK coalfields mine gas risk to surface development is low. Circumstances where gas risk increases include proximity (typically < 50m) to mine entries (adits and shafts), proximity to recorded mine gas incidents, where development is located above or adjacent to very shallow and shallow (< 30m) unflooded mine workings or roadway tunnels. In addition, increased mine gas risk can be attributable to coal seams with a history of spontaneous combustion, natural or artificial pathways providing routes for gas migration eg permeable soil cover, pathways created by geological faults, mining induced breaklines/fractures, collapsed mine roof strata, mining subsidence, mining sinkholes/crown holes and unsealed boreholes.

This CMRA has indicated that conditions may exist at this site increasing mine gas risk namely the possible presence of shallow mine workings beneath the new extension together with several mine entries and nearby geological faulting. In addition, there may a landfill gas risk from the nearby 'Great White Tip' identified in the CA report to the immediate south of the development.

2. RISK ASSESSMENT OF SITE-SPECIFIC COAL MINING ISSUES

The risk assessment methodology adopted in this section 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 broadly adopted in the table below with amendments made by Geoinvestigate Limited. The factual information it is based on, is derived mostly from the CA Consultants Coal Mining Report and additional desk study information including available historical maps, geological maps & memoirs, BGS boreholes, online articles etc. It is not an exhaustive desk study review. Therefore, if new information is released or found in the future, this CMRA may require updating.

The table also provides advice on next step mitigation and the likely planning decision.

RISK ASSESSMENT & MITIGATION		
Coal Mining Issues/Hazards	Risk	Next Step Mitigation
Past/recorded underground coal mining	L	
Probable unrecorded shallow workings	M H	Drilling to enable further assessment.
Outcrop	M	Drilling to enable further assessment
Spine roadways at shallow depth	NONE	
Mine entries	L	Drilling to enable further assessment
Geological faults, fissures and breaklines	L	
Mine gas	M	Longer term gas monitoring in special gas wells or alternatively adopt gas protection measures
Opencast mines within 500m	L	
Coal mining subsidence claims within 50m	NONE	
Site investigations within 50m	YES	
Likely Planning Decision	Yes/No	Reason
Is planning permission likely to be given with respect to coal mining legacy issues CONDITIONAL upon carrying out further intrusive investigation leading to possible building design mitigation at a future date but before construction begins?	Yes	Yes. Because the site is NOT significantly impacted by known mine entry proximity hazard and the site specific ground stability and mine gas risks to the proposed development identified in this CMRA arising from possible shallow mine working and mine gas require further assessment but can be mitigated by further intrusive site investigation and (if required) routine engineering solutions.

Assessed risk level – High, Medium Low. NONE

MGRA – specialist mine gas risk assessment.

3. CMRA OUTCOME & RECOMMENDATIONS

This CMRA has identified increased risk to the proposed development from possible shallow underground mine workings and mine gas. Drilling investigation is required to further assess both risks. However, as these risks can be mitigated by routine engineering solutions **planning permission should not in our opinion be withheld with respect to coal mining legacy issues** providing further intrusive investigation is carried out at a future date and the permission is **CONDITIONED** accordingly.

In Geoinvestigate's opinion a minimum of 2 or 3 rotary open boreholes without core sample recovery should be made at the site to depths up to 30m (but not necessarily reaching 30m) to establish bedrock depth and mine workings depth (if any) beneath the new building.

A Coal Authority Permit needs to be obtained (ahead of) further intrusive exploratory drilling. As per the table below 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. **Failure to do so may result in prosecution by the HSE and a hefty fine.**

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

Boreholes must be sealed on completion.

Gas monitoring **MUST** be carried out during drilling and may provide further indication of mine gas risk.

However, in this instance longer term gas monitoring in specially installed gas wells is likely to be required to further assess the ground gas risk.

Alternatively, if longer term gas monitoring is to be avoided the installation of precautionary gas protection measures may be considered in the design of the new buildings in line with “Characteristic Situation 2” (CS2) based upon the CIRIA 665 (revised) report – “Assessing the risks posed by hazardous ground gases to buildings”. However, agreement will be required from the Local Planning Authority for this alternative proposal.

In this instance owing to the likely presence deep made ground including mine spoil beneath the new building additional shallower geotechnical and geoenvironmental site investigation is also likely to be required to enable foundation design and to check for ground contamination.

WHAT TO DO NEXT? Obtain quotes for the intrusive site investigation works. 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.

Appendices:

- A. CA Consultants Coal Mining Report issued 22 November 2022 ref. 51003326230001
- B. Site Image.
- C. Proposed Development
- D. Geology Map Extracts & BGS Log
- E. Mine Entry ZOIs

APPENDIX A
COAL AUTHORITY REPORT



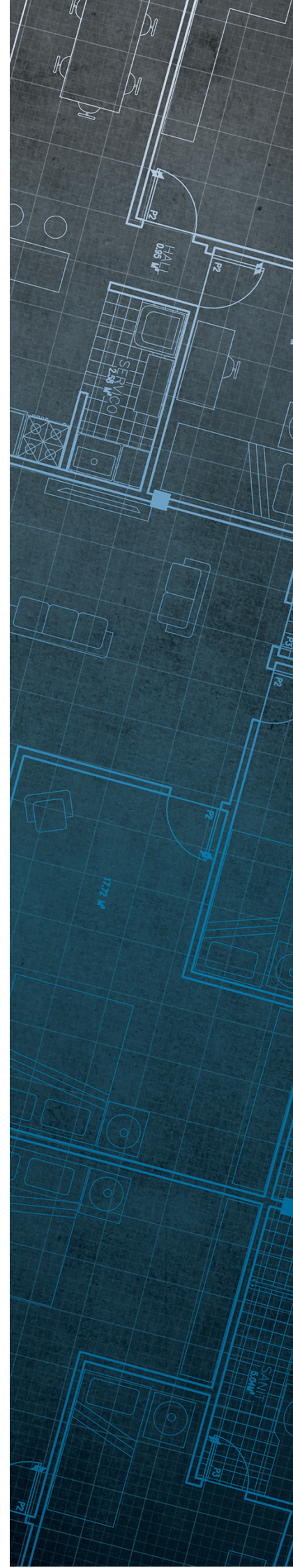
The Coal
Authority

Consultants Coal Mining Report

Smart Electrical Systems
Unit 10
Phoenix Industrial Estate
Goat Mill Road
Dowlais
Merthyr Tydfil
Merthyr Tydfil
CF48 3TD

Date of enquiry:	17 December 2024
Date enquiry received:	17 December 2024
Issue date:	17 December 2024

Our reference:	51003469599001
Your reference:	G24229



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

Smart Electrical Systems
Unit 10
Phoenix Industrial Estate
Goat Mill Road
Dowlais
Merthyr Tydfil
Merthyr Tydfil
CF48 3TD

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

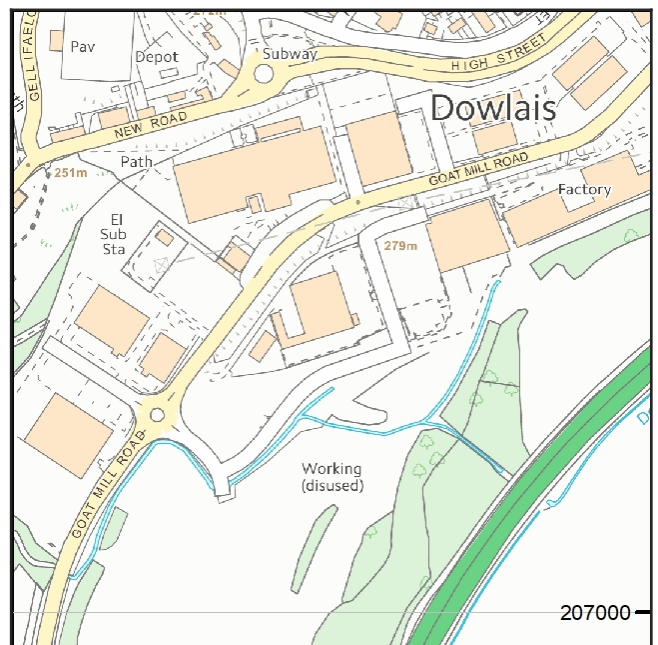
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

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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
unnamed	ROSSER IRONSTONE	Ironstone	4E5J	22	Beneath Property	4.8	South-East	127	1878

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	306207-020	306282 207339		Ironstone	
Adit	306207-021	306280 207331		Ironstone	
Shaft	306207-022	306374 207351		Coal	
Adit	306207-077	306329 207301		Coal	
Shaft	306207-102	306359 207340		Coal	
Adit	306207-103	306367 207343		Coal	

Abandoned mine plan catalogue numbers

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

17930	837	SWR2510
SWR2523	8194	

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
LOWER 7FT BOTTOM LEAF	Coal	Yes	Within	N/A	223

Geological faults, fissures and breaklines

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

Fault under or close to the property recorded.

Opencast mines

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

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

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

Site investigations

Distance to site investigation (m)	Direction
11.0	East

See Section 4 for further information.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

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

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

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

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

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

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

Payments to owners of former copyhold land

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

Section 4 – Further information

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

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.

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.

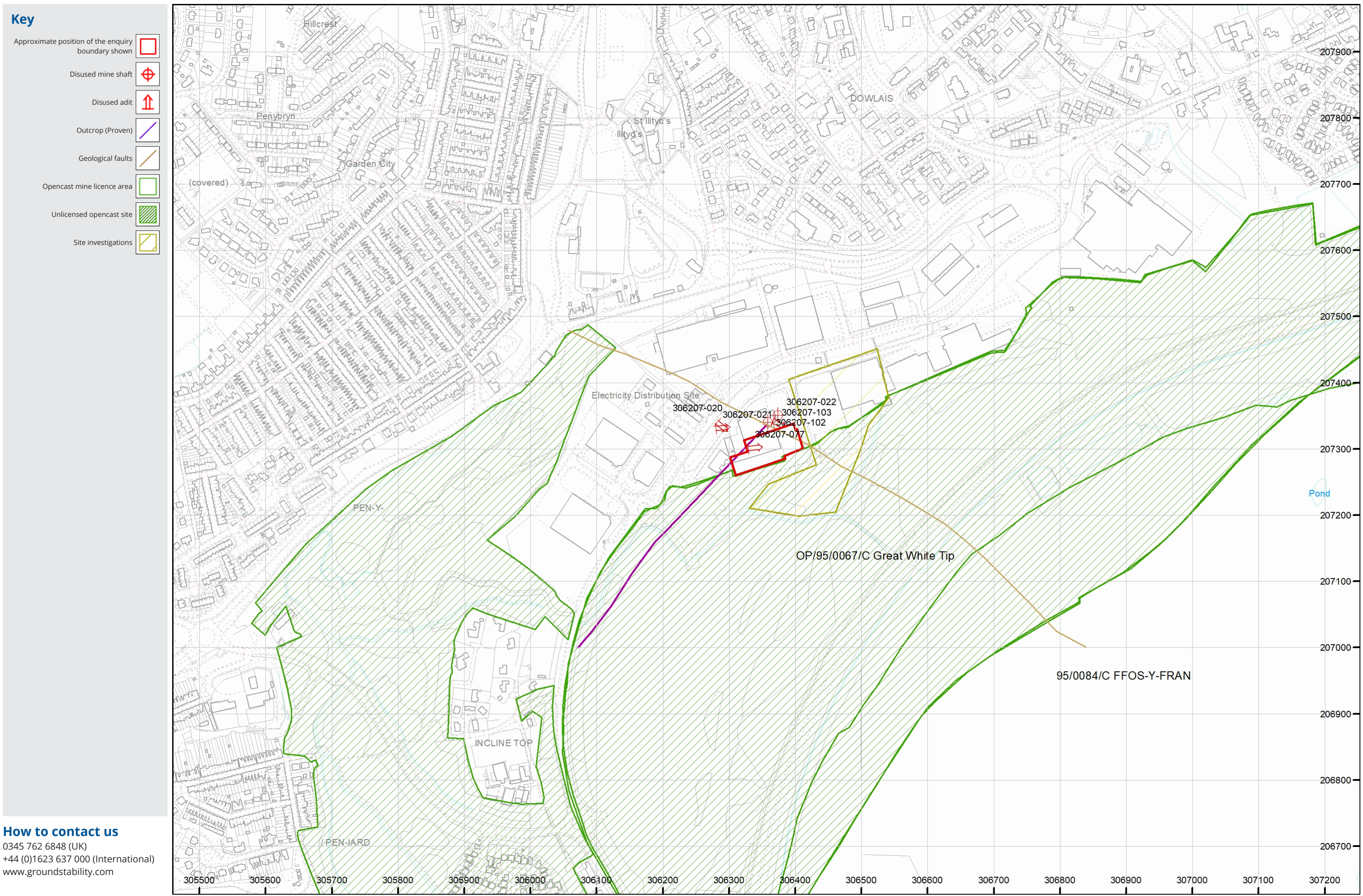
Withdrawal of support notices

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.

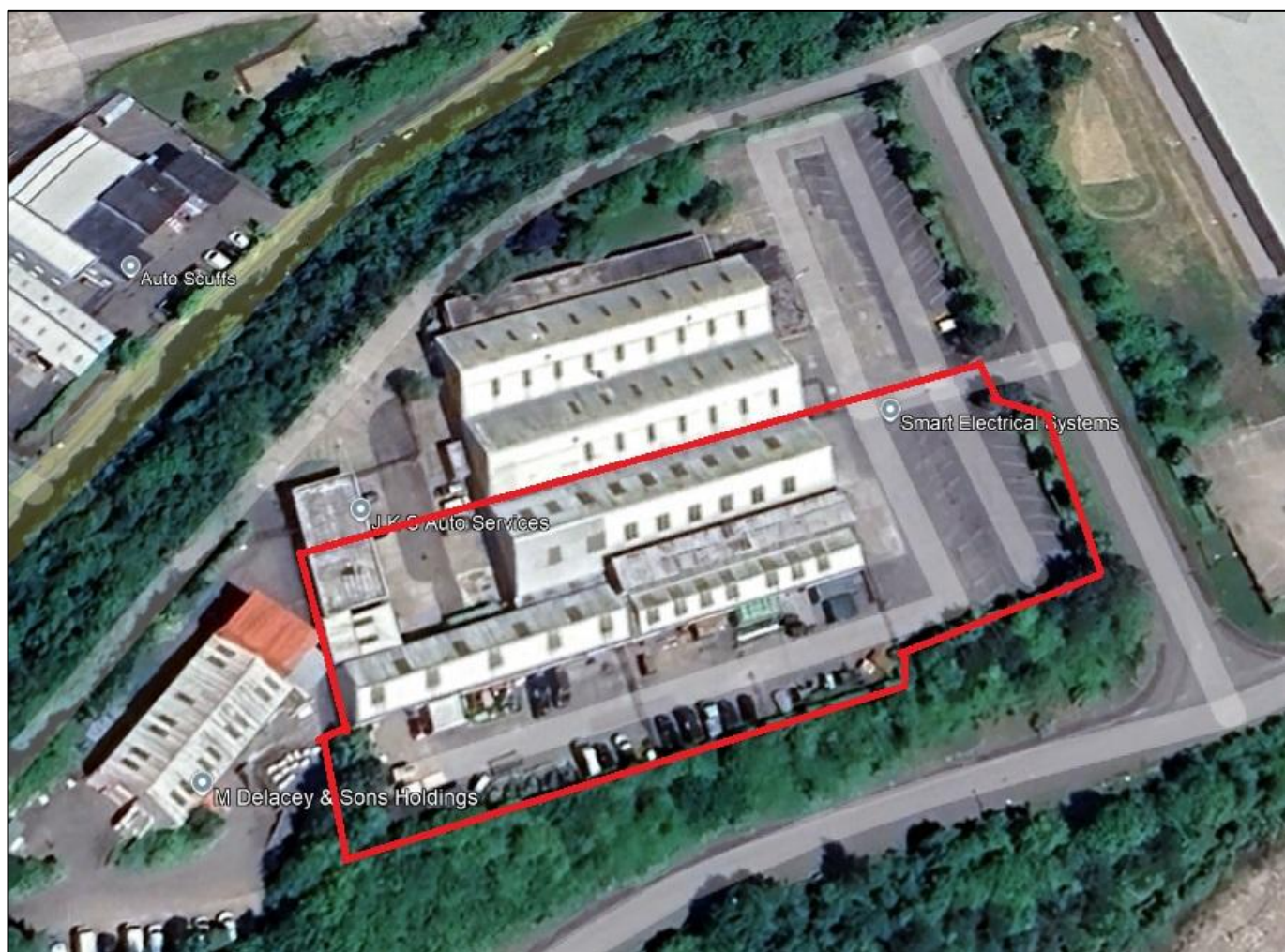
Payment to owners of former copyhold land

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.

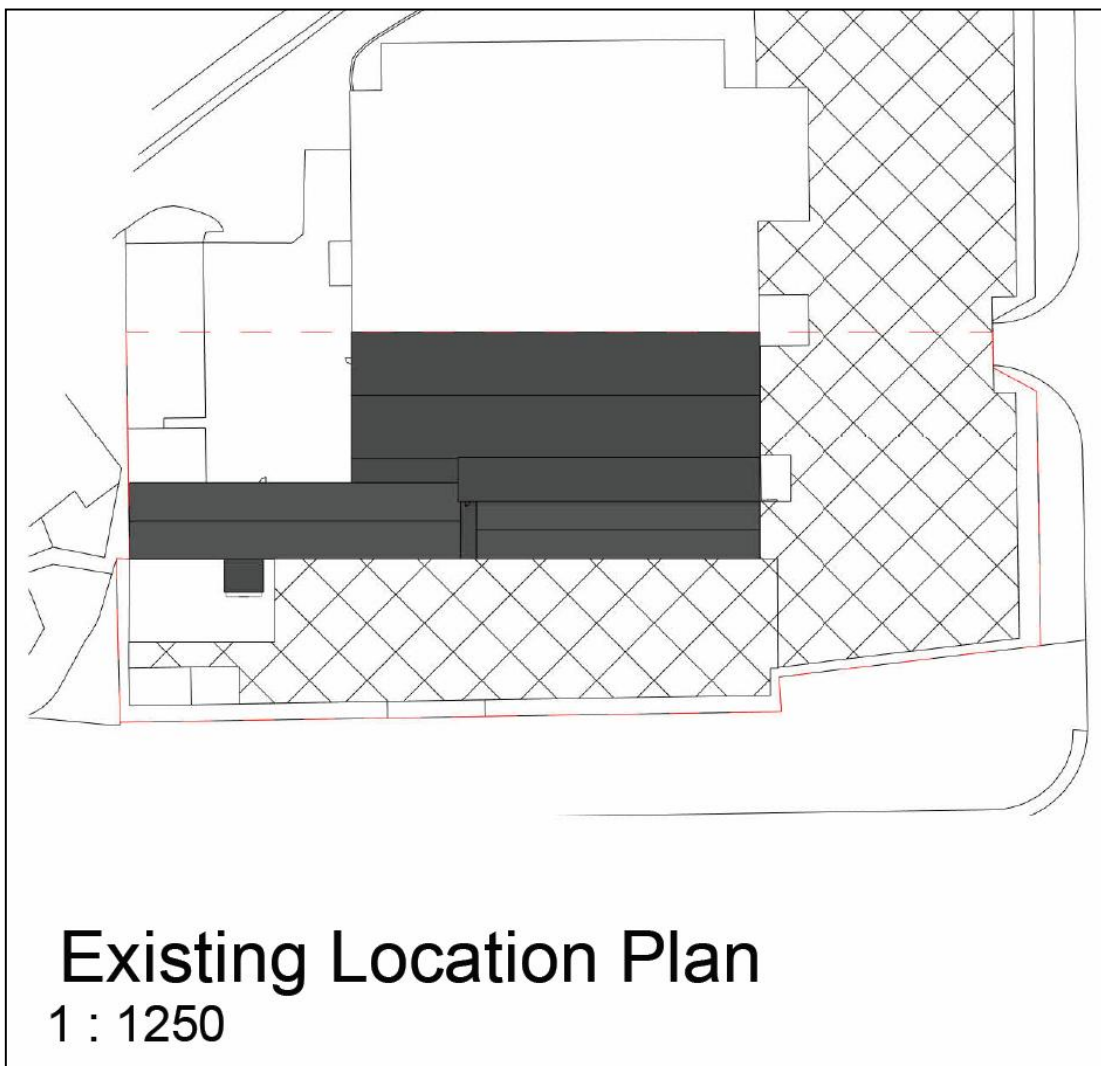
The map highlights any specific surface or subsurface features within or near to the boundary of the site.



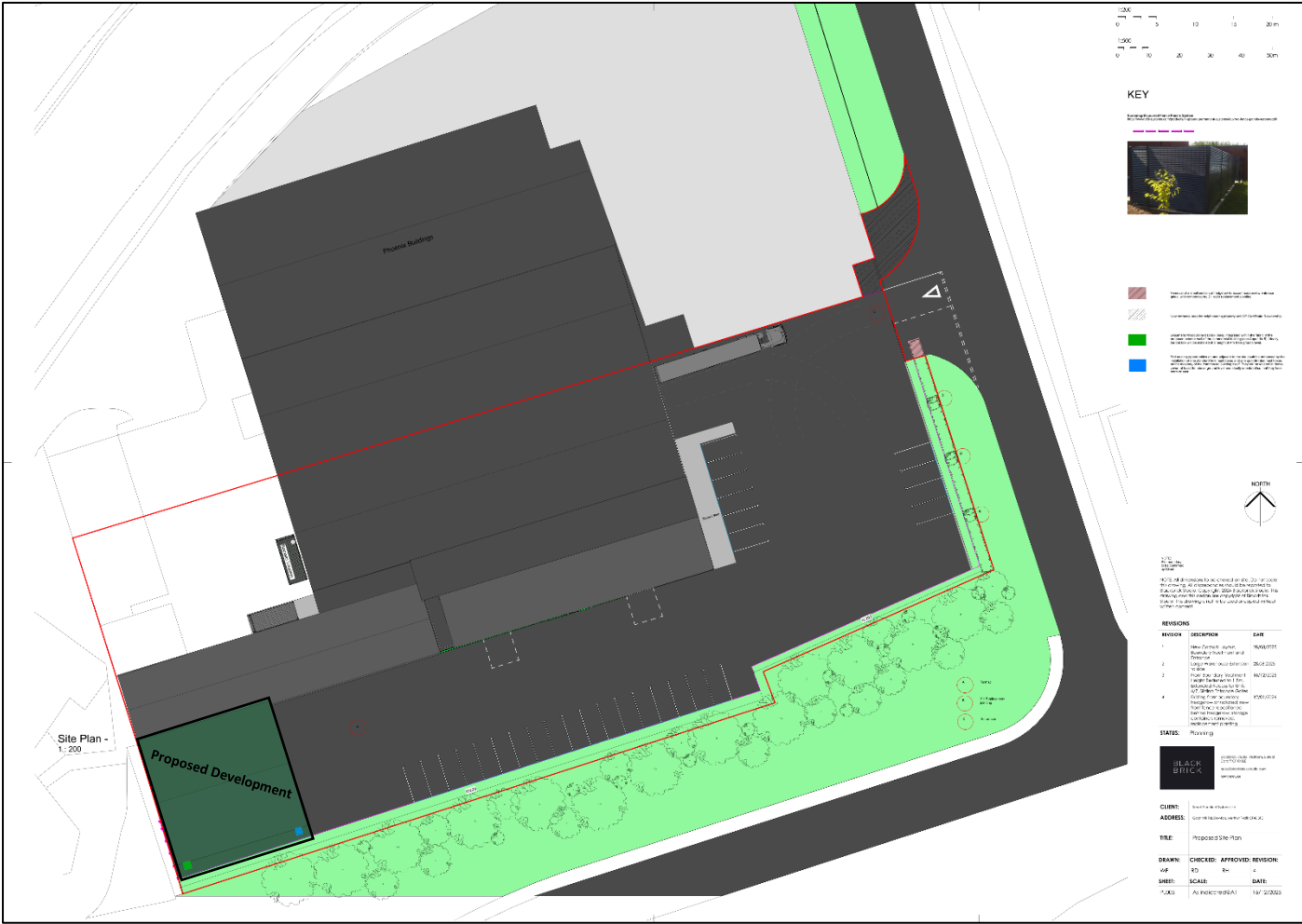
APPENDIX B SITE IMAGE



APPENDIX C
DEVELOPMENT PLANS
EXISTING & PROPOSED



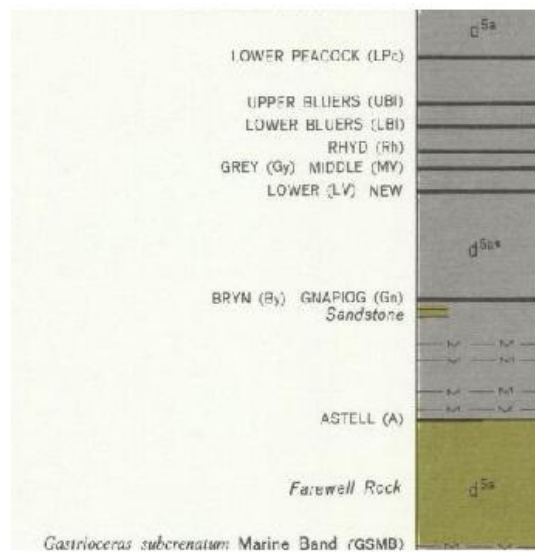
PROPOSED SITE PLAN

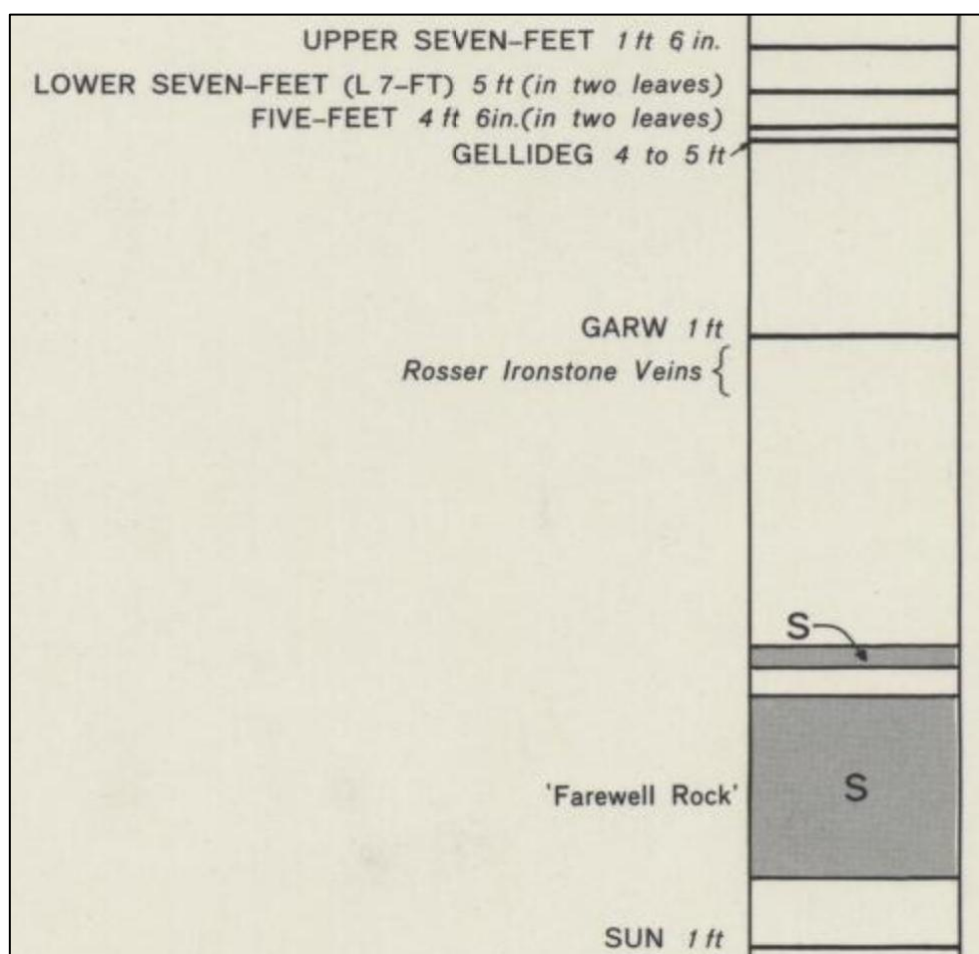
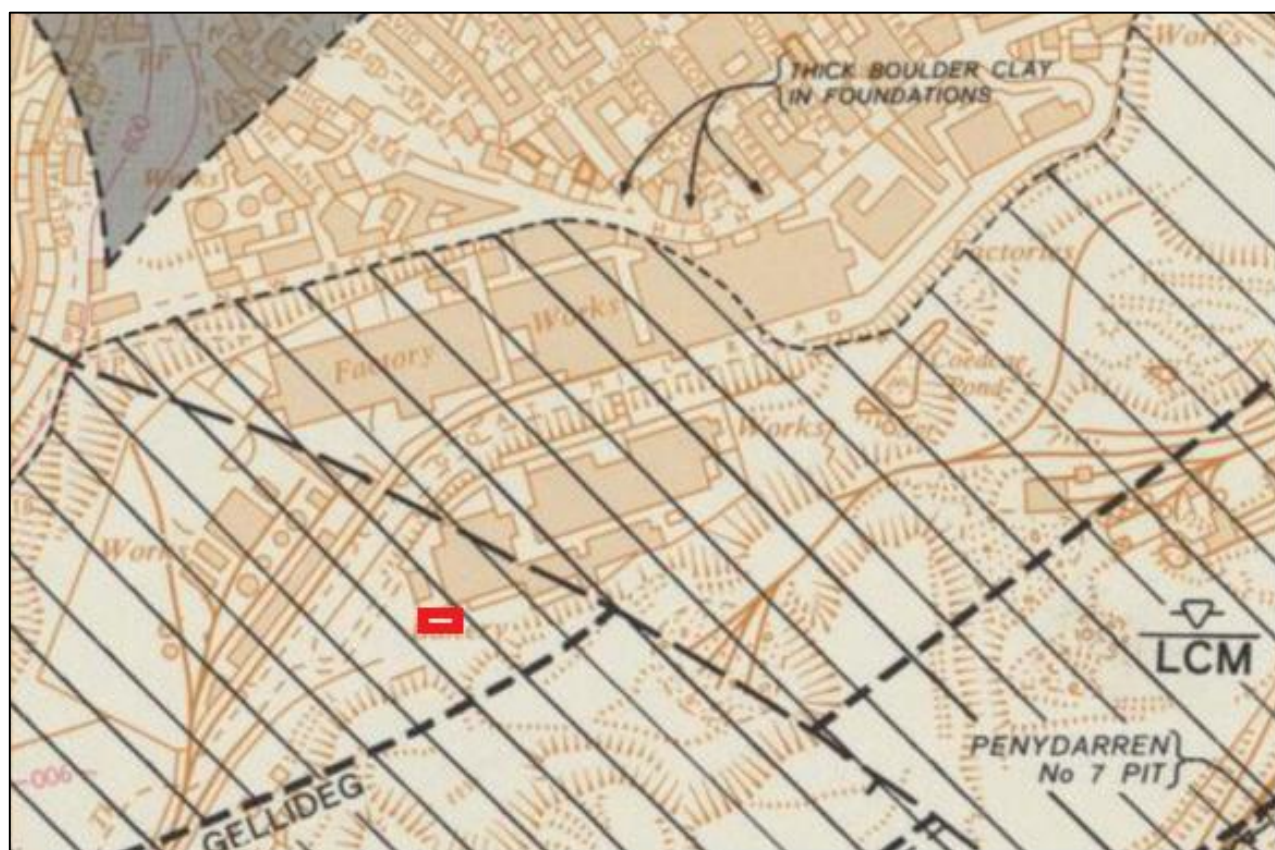


APPENDIX D GEOLOGY MAP EXTRACTS



approximate site location





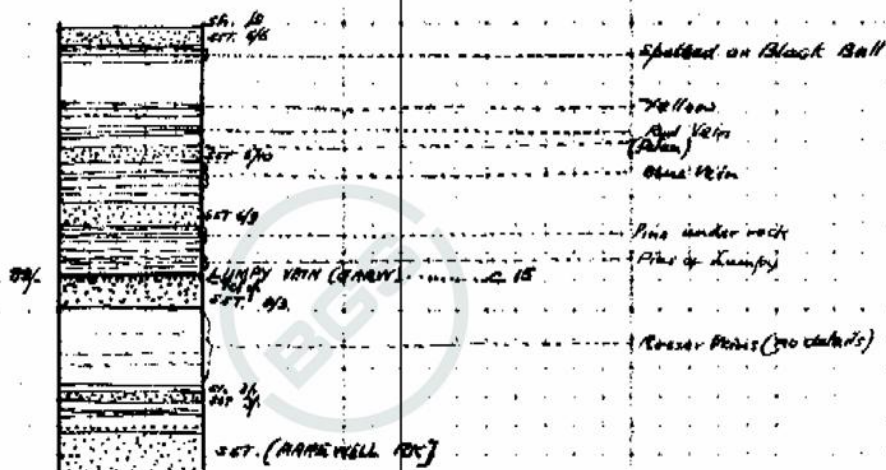
STRATA BETWEEN THE LOWER 4-FT.
COAL AND FAREWELL ROCK AT

231/34

DOWLAIS SO OO NE

72

063 070



APPENDIX E
MINE ENTRY ZONE OF INFLUENCE

