



COAL MINING RISK ASSESSMENT

**Y BRYN,
DUKE STREET,
RHOS,
WREXHAM,
WALES,
LL14 1SU**

Prepared for:

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Date:

13th October 2020



EnviroSolution Ltd

Document Verification

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1 Introduction

1.1 Site Location and Description

The site for the proposed new residential dwelling is located at Y Bryn, Duke Street, Wrexham in North Wales, LL14 1SU. The National Grid Reference for the development site is GR: 329352 346365. The plot is rectangular in shape and covers an area of approximately 170m². The ground elevation at the site is approximately 165m aOD, falling gently towards the east.

The site is currently occupied by a domestic garage and detached shed serving the property of Y Bryn situated to the north. The site is accessed via Duke Street from the east.

The site is bounded by residential properties to the north, east and south, and a chapel to the west.

A plan showing the location of the site is shown in **Figure 1**.

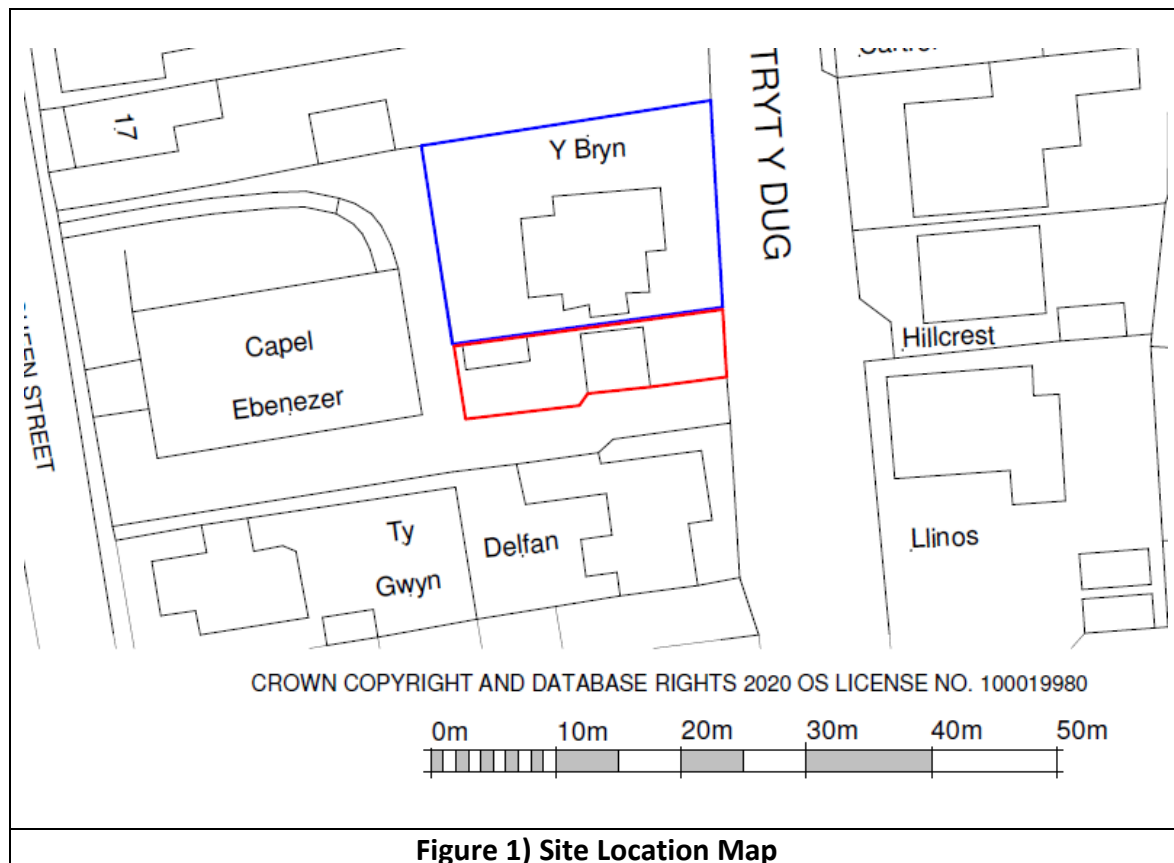


Figure 1) Site Location Map

1.2 Development Proposal

It is understood that the current proposal includes the demolition of the existing detached garage and the construction of a new residential dwelling.

Details of the existing and proposed site layouts are shown in **Appendix A**.

1.3 Scope of Coal Mining Risk Assessment

EnviroSolution Ltd has been commissioned to prepare a Coal Mining Risk Assessment Report (CMRA) for the proposed development site, in order to provide the Local Planning Authority with information on the coal mining legacy risk(s), an assessment of their potential impact on land stability, and provide recommendations for the need to carry out any further investigations (including intrusive boreholes) to address these risk(s).

The CMRA has been undertaken in accordance with the principles of best practice including the Coal Authority's guidance document "Risk Based Approach to Development Management - Resources for Developers Version 3" (2014) (Ref. 1), CIRIA "SP32 Construction over Abandoned Mine Workings" (2002) (Ref. 2) and CIRIA "C758D Abandoned Mine Workings Manual" (2019) (Ref. 3).

The purpose of the CMRA Report is to:

- present a desk-based review of available information on the coal mining issues that 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 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; and
- 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.

1.4 Sources of Information

This report is based on current information of past mining activities relevant to the site. The following information sources have been used:

- Consultants Mining Report dated 30th September 2020 (Ref: 5100_2311_529001 **Appendix B**);
- BGS Geoindex geological map;
- BGS geological 1:50,000 England and Wales Sheet 121 Wrexham;
- Coal Authority Interactive Website;
- Historical Ordinance Survey maps.

2 Environmental Setting

2.1 Historic Coal Mining Activity

The development site and surrounding area has been reviewed with reference to historical Ordnance Survey (OS) maps. The history of the site and immediate surrounding area are summarised in Table 1. Copies of the historical OS maps are included in **Appendix C**.

Table 1 - Historic Mapping Review

Date	Scale	Historic Mining Activity
1872	1:10,560	- The site is undeveloped. - Extraction pit in close proximity to the site. - Several surface expressions resembling mine shafts located 300m south and 350m southeast of the site. - Brick and Tile Works 470m east and 510m west of the site.
1898	1:10,560	- Brick and Tile works disused. - Mine shafts now shown to be disused.
1938	1:10,560	- Surrounding town further developed. - Mine shafts no longer marked on maps.

It is assumed that the coal mining features identified on historical maps have been incorporated into the recorded coal mining legacy presented in the CA Consultants Report (**Appendix B**).

2.2 Geological Context

The BGS geological mapping (Geoindex and BGS Sheet 121 Wrexham) show that the site is directly underlain by diamicton superficial deposits which are of Quaternary age. Diamicton generally consists of unsorted clays, silts, sands and gravels. The site lies close to the edge of the diamicton sheet, and as such, its thickness is not expected to exceed 5m. Recorded drift thickness stated on the Coal Authority Interactive Viewer Map supports this.

The bedrock geology is shown to belong to the Pennine Lower/ Middle Coal Measures Formation which is of Carboniferous age. The Pennine Lower/ Middle Coal Measures Formation generally consists of interbedded grey mudstones and siltstones and pale grey sandstones with common coal seams. According to the BGS, the bedrock has a regional dip of 6° towards the east – **See Appendix D**.

The site lies in close proximity to a geological fault which downthrows to the west. The fault is responsible for repeating coal seam sub-crops in the area.

The Main coal outcrop is shown to be located in close proximity to the site (see **Figure 2**) and is likely to be encountered at shallow depths (c. 5m). Further outcrops of coal are located further to the west. The Main Coal appears to be missing from Coal Authority records.

The site is situated within a Secondary Opencast Coal Resource Area (**Appendix E**). The Secondary Opencast Coal Resource Area is defined by the BGS as “representing one or more zones that contain opencast coal resources, but in which the coals are generally thinner and less concentrated in vertical and areal distribution. Coals from this resource zone have been exploited and continue to be worked, albeit on a smaller scale than the primary area coals”. Notwithstanding this, it is considered to be very unlikely that there will be any interest in developing open cast coal mining operations at this location in the short or medium-term.

3 Identification and Assessment of Site-Specific Coal Mining Risks

Table 2 below summarises the potential risks associated with coal mining legacy for the proposed development site, which have been identified from list sources of information.

Table 2 - Coal Mining Hazards Summary

Coal Mining Issues	Yes	No
Coal outcrops		X
Underground coal mining (recorded at shallow depths)	X	
Underground coal mining (probable at shallow depths)	X	
Recorded mine entries (shafts and adits)	X	
Unrecorded mine entries (shafts and adits)	X	
Coal mining geology (fissures)		X
Record of past gas emissions		X
Recorded coal mining surface hazard		X
Surface mining (opencast workings)		X

The Coal Authority Interactive Map Viewer (**Appendix F**) has identified that the site lies within a Development High Risk Area associated with the presence of shallow recorded coal workings and the potential for unrecorded shallow coal workings beneath the site.

The report obtained from the Coal Authority (Consultants Coal Mining Report, reference 51002311529001, dated 30th September 2020) revealed the property is in a surface area that could be affected by recorded underground mining in 2 no. coal seams at depths of 24m and 107m respectively. The seams were last worked in 1860. The shallower seam, identified as the Crank, is reported to be c. 0.80m thick.

Assuming a competent rock strata thickness equivalent to at least ten times the extraction thickness, provides adequate protection against vertical void migration leading to crown-hole development and surface subsidence (Ref 2 and 3 – See Table 5.1), it is considered that the risk posed by past recorded coal workings is low. It is assumed that the thickness of superficial material does not exceed 16m.

The Coal Authority report also states that the property is in an area where the Coal Authority believe there is coal at or close to the surface (Main Coal) which may have been worked in the past. The Coal Authority has drawn attention to this and has stated that the presence of unrecorded shallow coal should be considered. It is considered that if these seams have been worked in the past, they could present a risk of surface instability.

The Coal Authority report states that they are aware of 16 no. recorded mine entries within 100m of the development site boundary. The majority of the shafts can be discounted as potential hazards to the proposed development due to the distance from the site. Assuming a superficial thickness of 5m, two mine shafts have been identified as potential hazards to the site as it is interpreted that their area of influence may intersect the proposed building footprint. The two shafts are summarised in Table 3 below.

Table 3 - Mine Shaft Summary

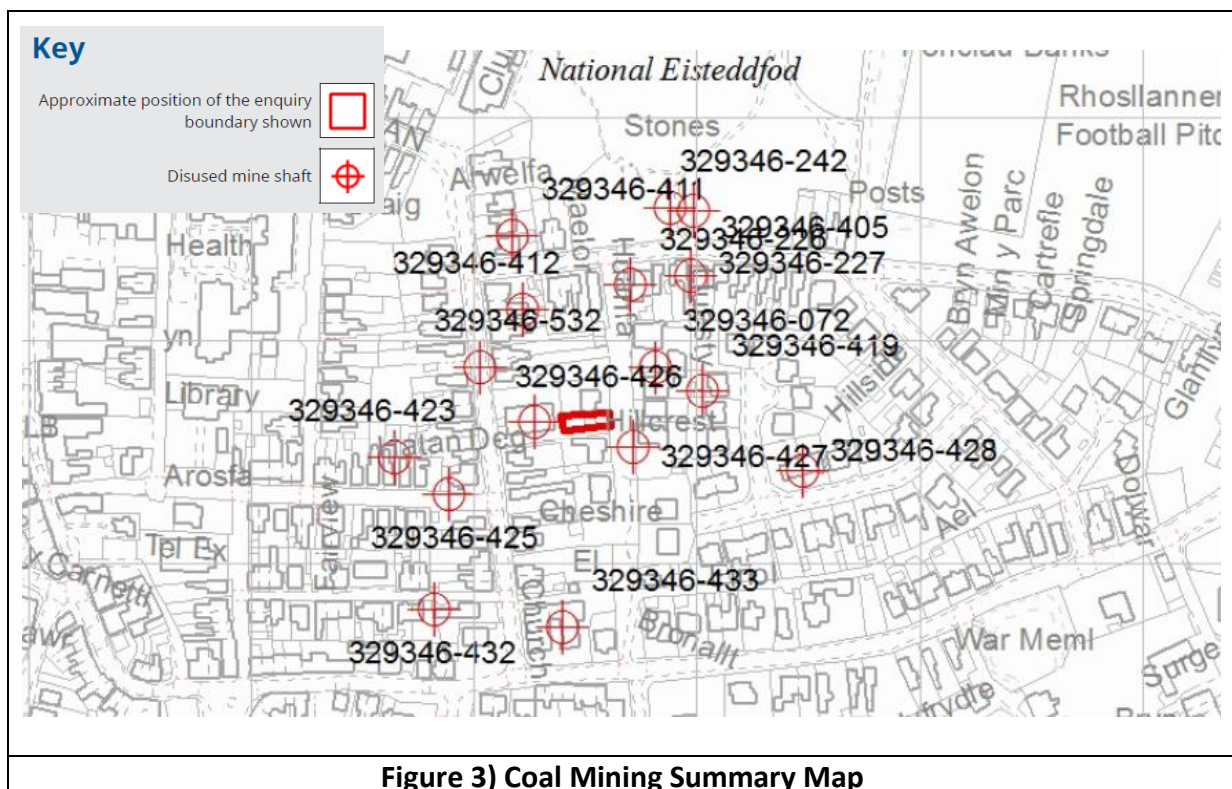
Shaft Reference	Entry Type	Distance from Site	Assumed Shaft Diameter	Departure
329346-426	Shaft	15m	2m	10m
329346-427	Shaft	17m	2m	10m

It is noted that the current best-plot-position of the shafts (distance from site boundary) is greater than the estimated departure, ie. the shafts almost certainly fall outside the site boundary. However, they could still influence the positions of built development within the site boundary.

Notwithstanding this, there may also be mine entries in the vicinity that have not been recorded.

The Coal Authority mining report states the property is not within the boundary of a historic or current opencast site, and there are no license requests outstanding to remove coal via this method in the future. The risk posed to the site from opencast mining methods is therefore considered to be negligible.

None of the coal seams referred to above have a particular history of spontaneous combustion, except that there is a general risk where mining methods left a significant thickness of roof coal. Given the position of the sandstone in the overlying strata at this site, it is considered that if worked, roof coal would probably not have been left.



4 Proposed Mitigation Strategy

- Two mine shafts have been recorded close to the site boundary. A programme of trial trenching is unlikely to be feasible to due existing structures above these locations. It is considered that intrusive investigations to determine the thickness of the superficial cover may reduce the risk of potentially unstable ground affecting the site. The possibility of unrecorded mine shafts has been highlighted in the Coal Authority report. The potential risk can be dealt with through vigilance during the earthworks stage of construction.
- It is recommended that up to 3 no. rotary boreholes are advanced to a minimum depth of 30.0m below ground level. Water flush should be used to safeguard against oxidation and potential spontaneous combustion of shallow coal. In order to undertake these works it will be necessary to obtain a drilling permit from The Coal Authority.
- If coal is encountered during foundation excavation works, the coal should be over-excavated for a minimum of 1m from the foundations and replaced with blinding concrete. These actions should be adequate to seal the coal from the atmosphere to prevent spontaneous combustion.

5 Conclusions

The Coal Mining Risk Assessment for the site at Y Bryn , Wrexham in North Wales has concluded that the risk associated with coal mining related issues cannot be ruled out based on information from the Coal Authority and geological interpretation.

The principal risks to the development arise from:

- the presence of unrecorded shallow mine workings associated with coal seams of workable thickness that are known to be present beneath the site area;
- the potential presence of coal at or close to the surface which could intersect proposed building foundations;
- recorded mine entries;
- unrecorded mine entries.

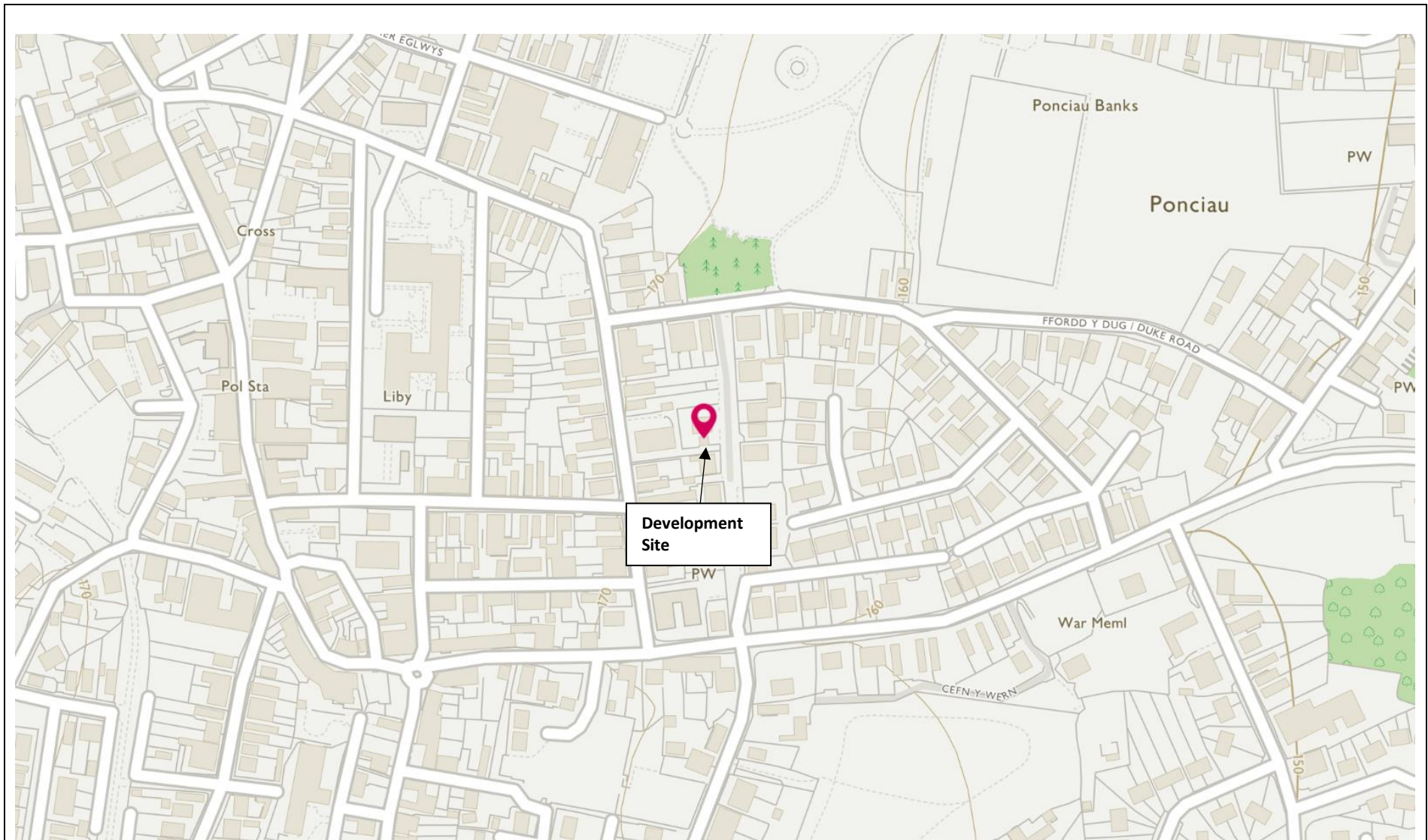
It is therefore recommended that further intrusive ground investigations are undertaken. These might include the drilling of a up to 3 no. rotary probe borehole(s) close to the proposed development to determine the superficial thickness along with obtaining evidence of potential unrecorded coal mine workings.

Prior to the commencement of intrusive works, a Coal Authority Permit will be required for drilling activities, that will disturb or enter any coal seams, coal mine workings or coal mine entries (shafts and adits). The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the intrusive works.

6 References

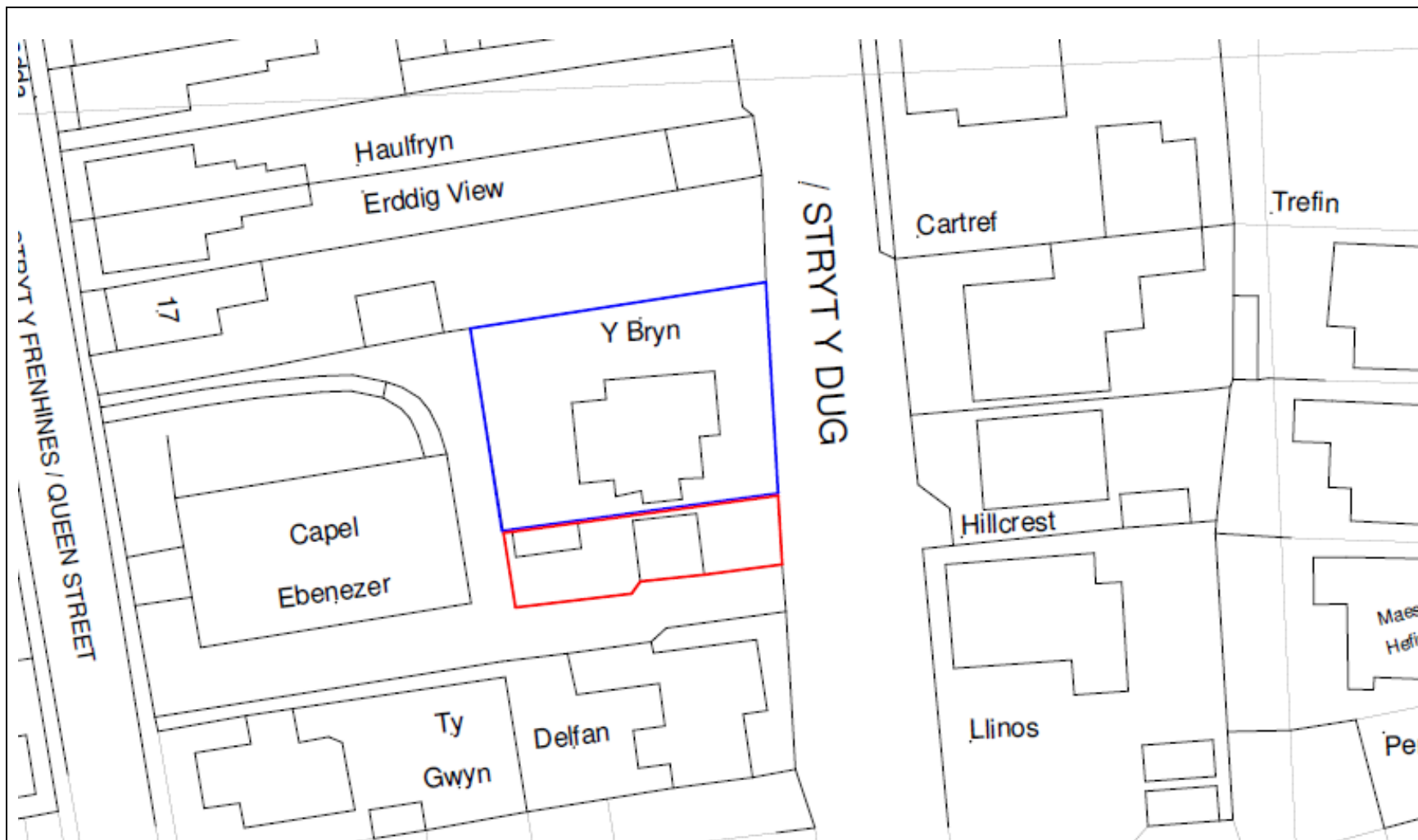
1. Coal Authority, 2014, Risk Based Approach to Development Management Resources for Developers, Version 3.
2. CIRIA, 2002, SP32 Construction over Abandoned Mine Workings.
3. CIRIA, 2019, C758D Abandoned Mine Workings Manual.
4. CIRIA, Publication C665, Assessing risks posed by hazardous ground gases to buildings.

Appendix A – Site Location

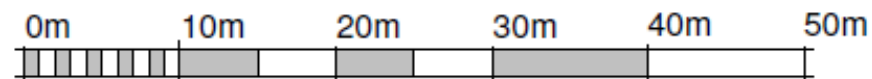


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Site Location Map

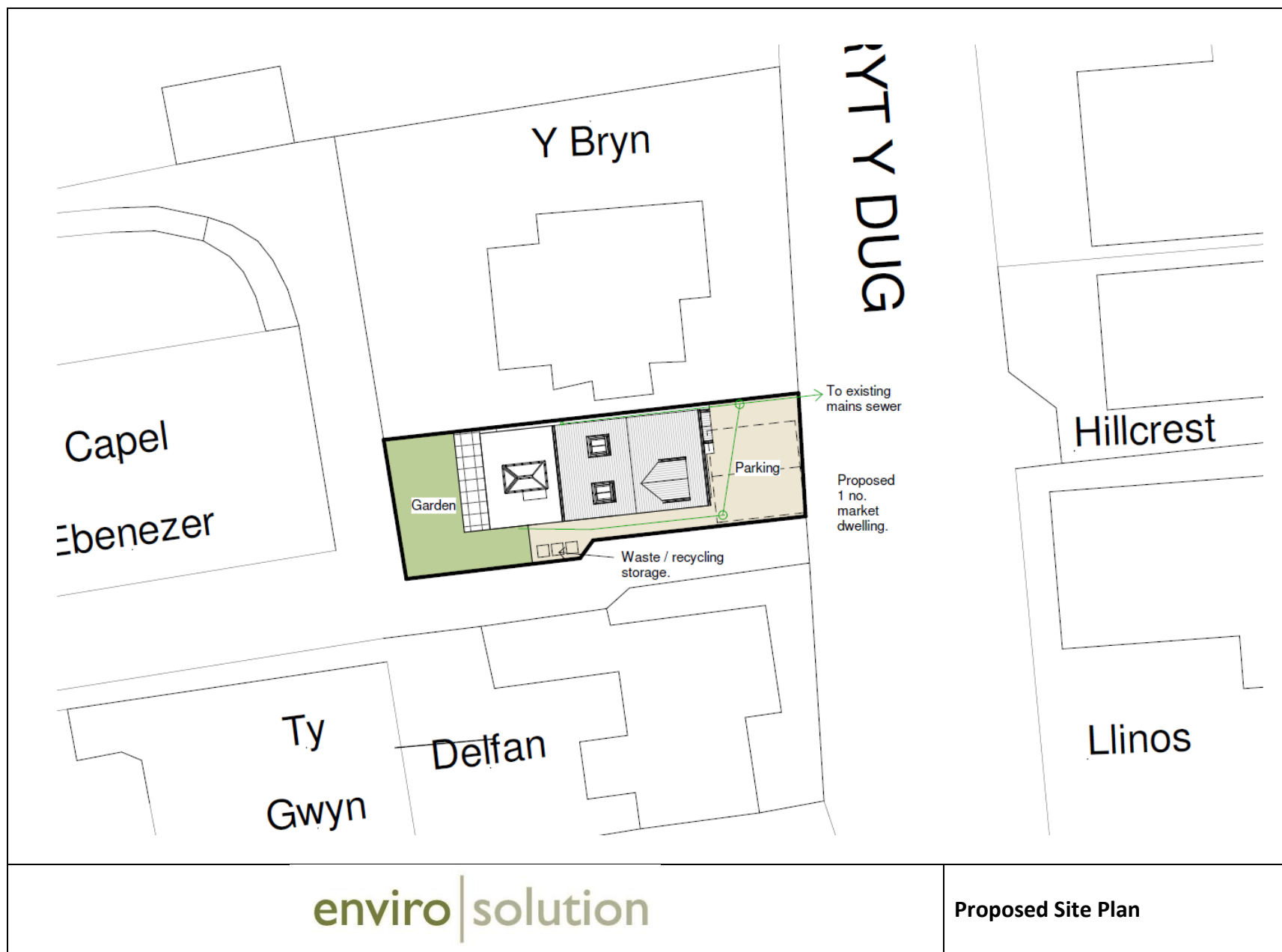


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Existing Site Plan



Appendix B – Coal Authority Report



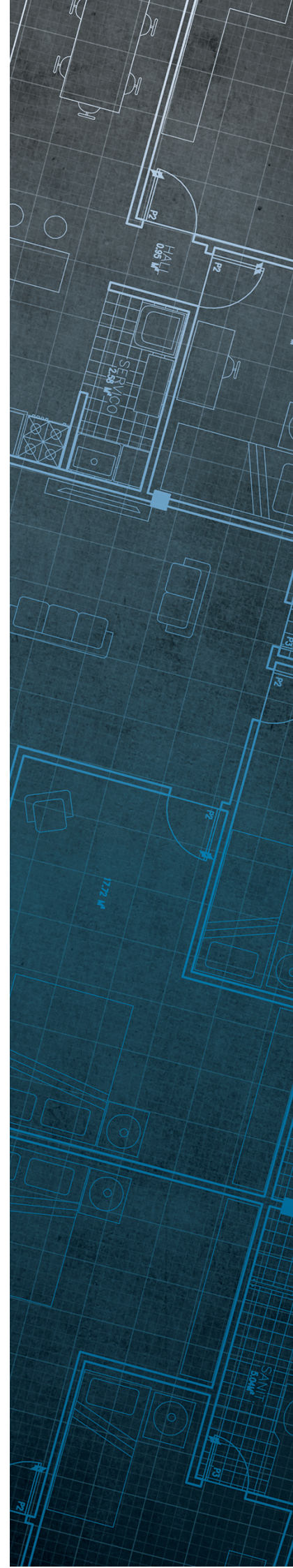
The Coal
Authority

Consultants Coal Mining Report

Y Bryn
Duke Street
Rhosllanerchrugog
Wrexham
LL14 1SU

Date of enquiry:	30 September 2020
Date enquiry received:	30 September 2020
Issue date:	30 September 2020

Our reference:	51002311529001
Your reference:	ES300920



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

EnviroSolution Limited

Enquiry address

Y Bryn
Duke Street
Rhosllanerchrugog
Wrexham
LL14 1SU

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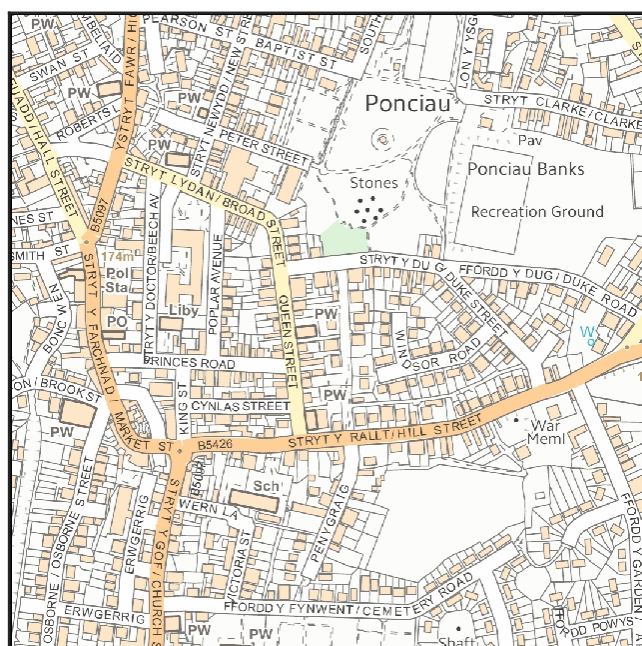
www.groundstability.com

 @coalauthority

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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
BRANDY	CRANK	Coal	7BNX	24	Beneath Property	6.0	East	80	1860
unnamed	WALL AND BENCH	Coal	7OLD	107	Beneath Property	6.0	East	110	1860

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
Shaft	329346-072	329382 346388	This entry was searched for in 1986 by NKC Geotech Ltd using probe drilling at 1m centres over an area of 12m 2. The shaft was not found and it was concluded that it did not exist or lies off the site being developed.	Coal	
Shaft	329346-226	329371 346425		Coal	
Shaft	329346-227	329398 346429	The gable wall area of Arfyn - Duke Street was investigated by excavation in 1989 by Strucutral Foundation Services Ltd but no evidence of this shaft was found. However as a precaution underpinning was carried out to the gable wall and a short section of internal wall.	Coal	
Shaft	329346-242	329389 346459		Coal	
Shaft	329346-405	329399 346458	The shaft was found filled with colliery waste. A reinforced concrete cap 7m ² was founded at 4.5m on sandstone rockhead. The excavation was backfilled	Coal	
Shaft	329346-411	329318 346447	After the shaft was located during a site investigation the shaft fill was grouted by NKC Geotech Ltd. The shaft was then capped at 3m depth on rockhead. The 6mx 6m x 600mm R35 Concrete cap contained sulphate resistant cement with T12 bars top and bottom reinforcement. The overburden fill was well compacted hardcore in 225mm layers vibro compacted with top soil overlain reinstating the surface	Coal	
Shaft	329346-412	329322 346414		Coal	
Shaft	329346-419	329403 346377		Coal	
Shaft	329346-423	329265 346348		Coal	
Shaft	329346-425	329289 346331		Coal	
Shaft	329346-426	329328 346363		Coal	
Shaft	329346-427	329372 346352		Coal	
Shaft	329346-428	329448 346342		Coal	
Shaft	329346-432	329283 346280		Coal	
Shaft	329346-433	329340 346272		Coal	
Shaft	329346-532	329303 346388		Coal	

Abandoned mine plan catalogue numbers

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

NW1506	NW1508	16713
NW1406	0	14897
14894	NW1505	NW1507

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

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

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

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

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

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

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

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

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.

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.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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Key

☐

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Appendix C – Historic Maps



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Date: 1872
Scale 1:10,560

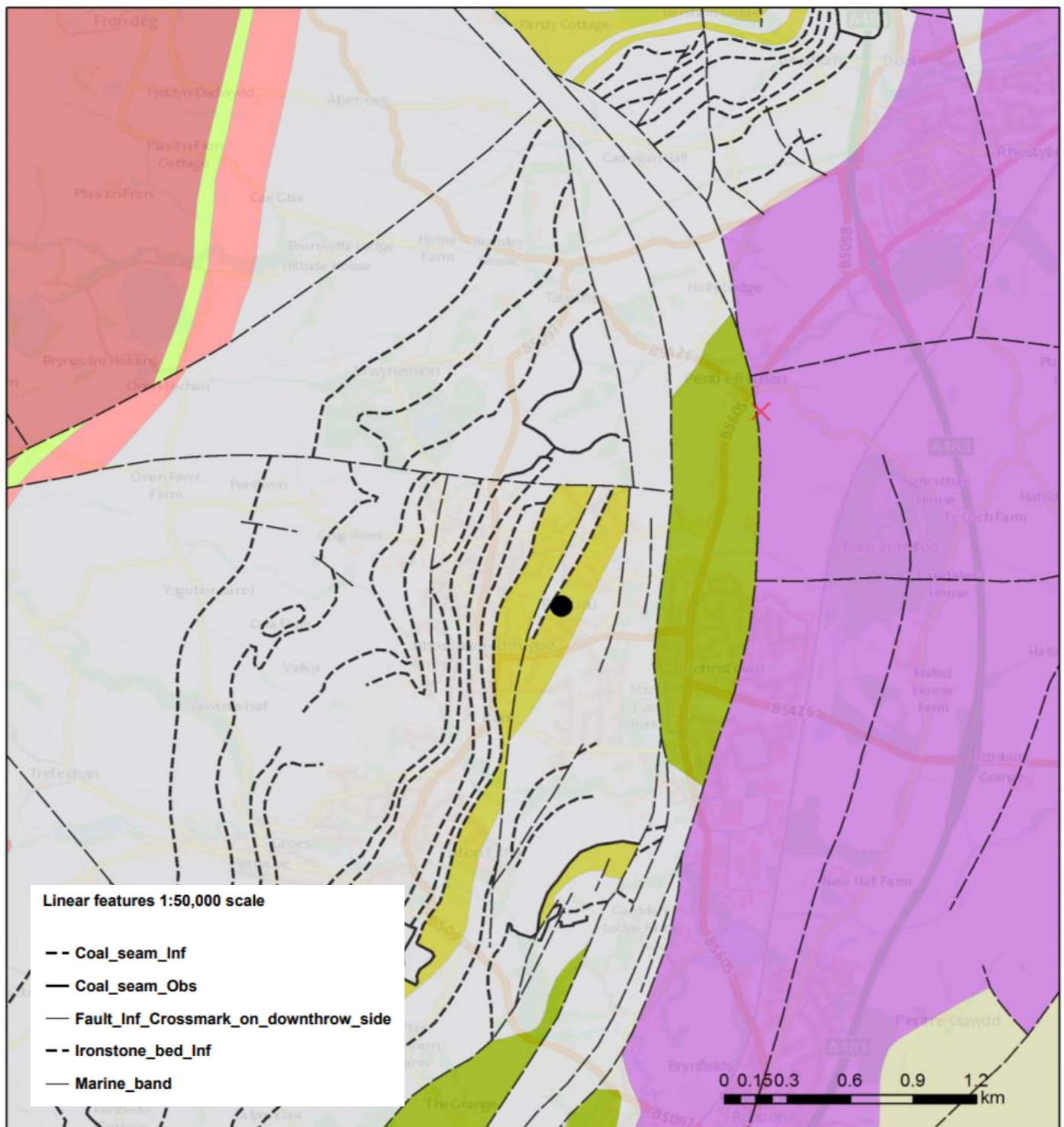


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Date: 1938
Scale 1:10,560

Appendix D – Geological Maps

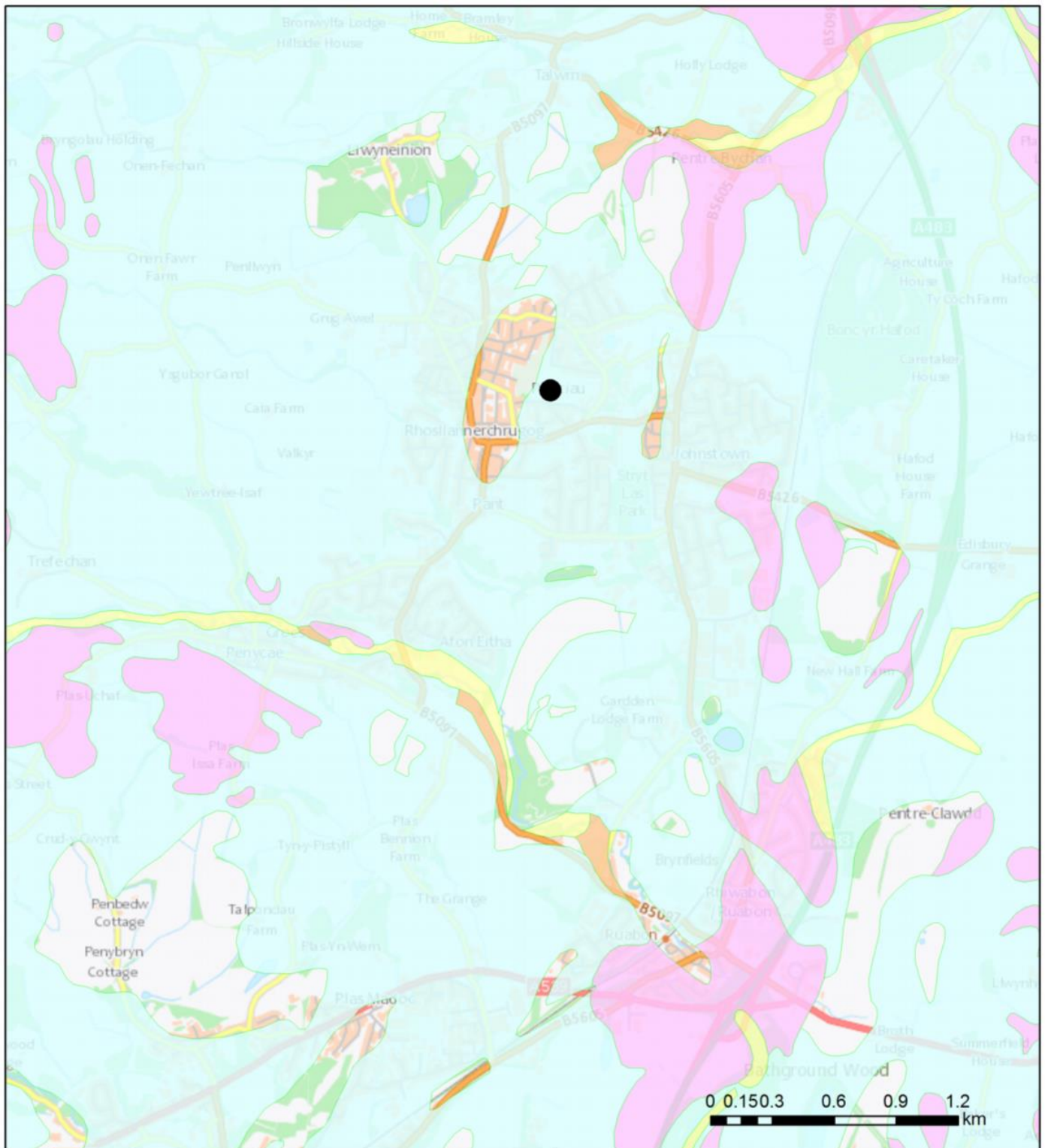
Bedrock Geology



Bedrock geology 1:50,000 scale

- [PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION \(UNDIFFERENTIATED\) - MUDSTONE, SILTSTONE AND SANDSTONE](#)
- [ETRURIA FORMATION - MUDSTONE](#)
- [HALESOWEN FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE](#)
- [GWESPYR SANDSTONE - SANDSTONE AND \[SUBEQUAL/SUBORDINATE\] ARGILLACEOUS ROCKS, INTERBEDDED](#)
- [SALOP FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE](#)
- [CEFN-Y-FEDW SANDSTONE FORMATION - SANDSTONE AND \[SUBEQUAL/SUBORDINATE\] ARGILLACEOUS ROCKS, INTERBEDDED](#)
- [BOWLAND SHALE FORMATION - MUDSTONE](#)
- [PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION \(UNDIFFERENTIATED\) - SANDSTONE](#)
- [CEFN-Y-FEDW SANDSTONE FORMATION - CHERT](#)
- [CEFN ROCK - SANDSTONE](#)

Superficial Geology



Superficial deposits 1:50,000 scale

GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE - SAND AND GRAVEL

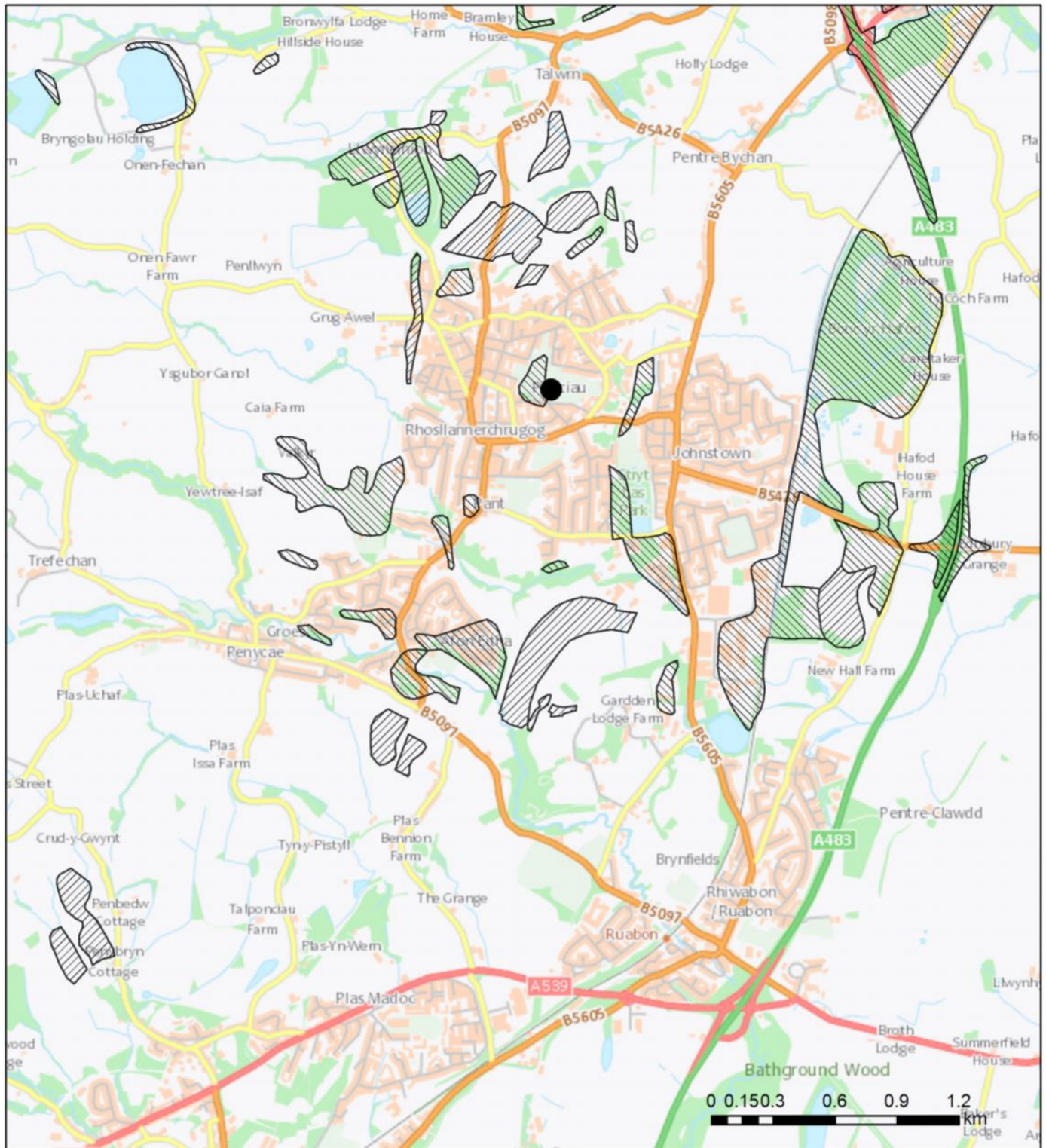
TILL, MID PLEISTOCENE - DIAMICTON

ALLUVIUM - CLAY AND SILT

HEAD - DIAMICTON

RIVER TERRACE DEPOSITS, 1 - SAND AND GRAVEL

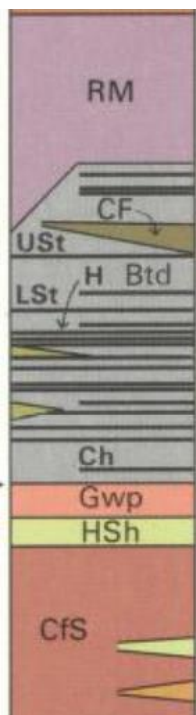
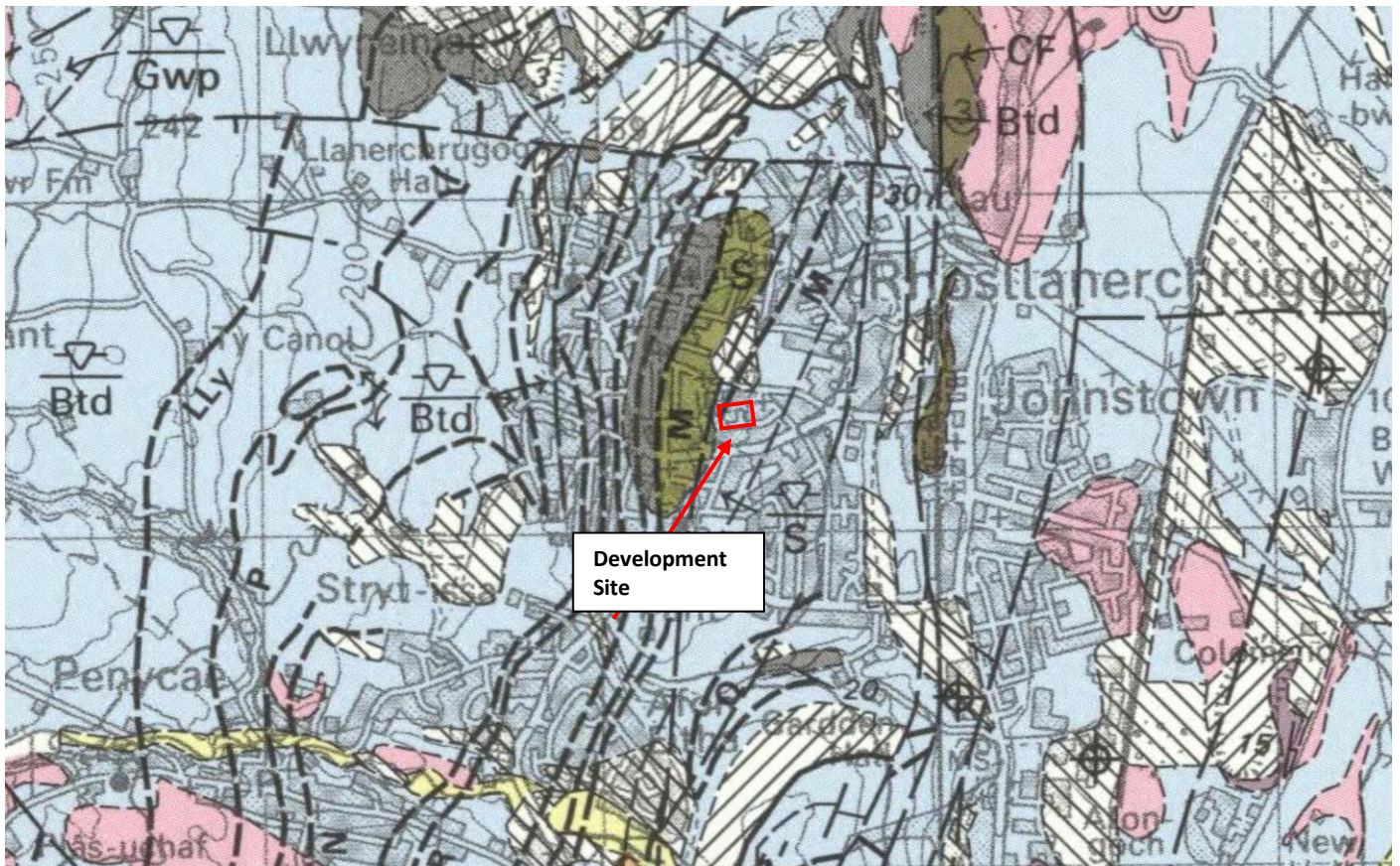
Artificial Geology



Artificial ground 1:50,000 scale

-  **MADE GROUND (UNDIVIDED) - ARTIFICIAL DEPOSIT**
-  **WORKED GROUND (UNDIVIDED) - VOID**

BGS Geological Survey 1:50,000 Series England and Wales Sheet 121 Wrexham



RUABON MARL FORMATION
(240-330)

BY
Cefn Rock

BETTISFIELD Fm
(400-520)
(Productive Coal Measures)

S = sandstone

M

FG

RY

LLy

Ch

Gwp

HSh

Cfs

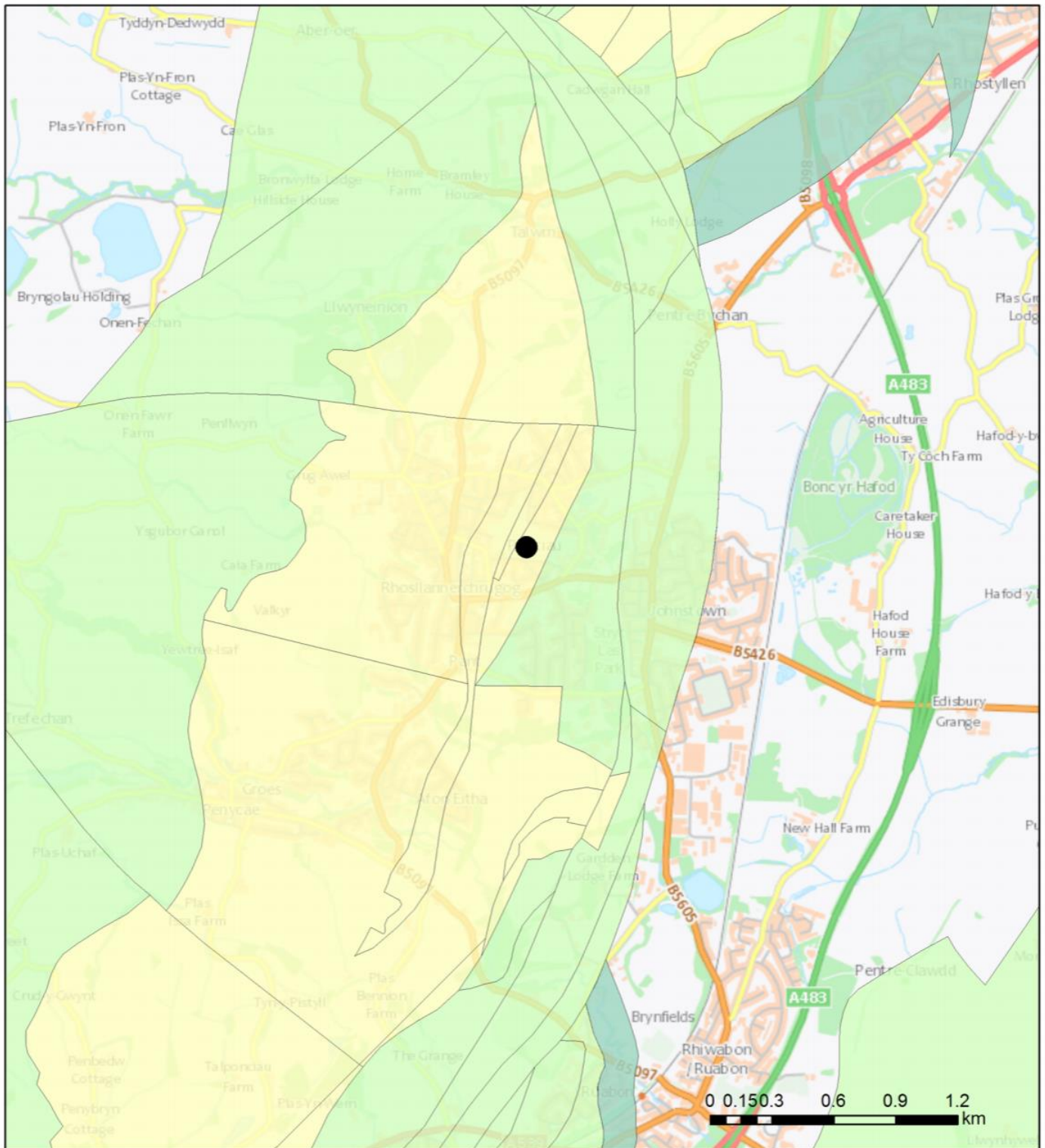
mudstones

cherty beds

COAL SEAM NAMES

Mo	MORLAS
BY	BERSHAM YARD GROUP (from ALPHA (α) or ALPHA RYDER (αR) to DELTA (Δ) or DELTA BENCH (ΔB))
USt	UPPER STINKING
W	WARRAS
LSt	LOWER STINKING
Po	POWELL
H	HOLLIN
C	CRANK
Q	QUAKER
M	MAIN
Cr	CROWN
UR	UPPER RED
LR	LOWER RED
FG	FIRECLAY GROUP
N	NANT
RY	RUABON YARD
P	PREMIER
LLy	LLWYNEINION HALF-YARD
Ch	CHWARELAU

Appendix E – Coal Resource Map



Shallow Coal

- Buried coal resource overlain by up to 50m overburden
- Primary opencast coal resource area
- Secondary opencast coal resource area
- Tertiary opencast coal resource area

Appendix F – Coal Mining Summary Map

