RHONDDA GEOTECHNICAL SERVICES

COAL MINING RISK ASSESSMENT

NEATH PORT TALBOT C.B.C.

PRE-PLANNING REF. Q2020/0185

PROPOSED COMMERCIAL DEVELOPMENT

MARDON PARK

BAGLAN ENERGY PARK

PORT TALBOT

N.P.T.

SA12 7AX

15/04/2021

RICHARD DAVIES – BSc.(hons), MSc., F.G.S.

INTRODUCTION

G.B.V. Properties are applying to Neath Port Talbot C.B.C. for full planning permission to construct a light industrial unit with a 20,000 sq.ft. floorspace at Mardon Park, Baglan. As this is classed as a major development there has been a P.A.C. process carried out. In response to initial enquiries N.P.T. responded with a letter dated 18/12/2020. This has the pre-app. Reference Q2020/0185 and states:-

"The development lies within the Coal Authorities development high risk area, you will therefore need to submit a coal report together with a coal mining risk assessment. You should take advice from a suitably qualified specialist on this matter as this could affect the development". The Coal Authority confirmed a C.M.R.A. would need to be produced to validate the full planning application in an email dated 30.03/2021.

Richard Davies BSc. (Hons), MSc., F.G.S. of Rhondda Geotechnical Services has been commissioned as the competent person to prepare a C.M.R.A. of the proposed development site. The purpose of this is to provide the L.P.A. with information on possible coal mining and an assessment of its impact on the ground stability of the site. The purpose of this C.M.R.A. is to gather all the available information and use it to identify any coal mining risks and then to quantify them. It will then suggest, if necessary, any mitigation measures to satisfy the L.P.A. that the site is, or can be made safe and stable in line with national guidelines. This will be done in line with the template and recommendations of the C.A. document Guidance for Welsh L.P.A.s (version 4, 2017).

The site is centred on Grid Reference 273900, 192600 at an elevation of approximately 5m A.O.D. and is flat and featureless. The plot covered by this C.M.R.A. is larger than the area covered by the planning application. The land is L-shaped with approximate dimensions of 115m x 150m and covers an area of 1.39 Ha. The land subject to the current planning application is rectangular measuring 85m x 75m (0.36 Ha). There are no surface watercourses, but a dry drainage swale runs around part of the perimeter. The site location and site boundary can be seen overleaf in Figures 1 and 2

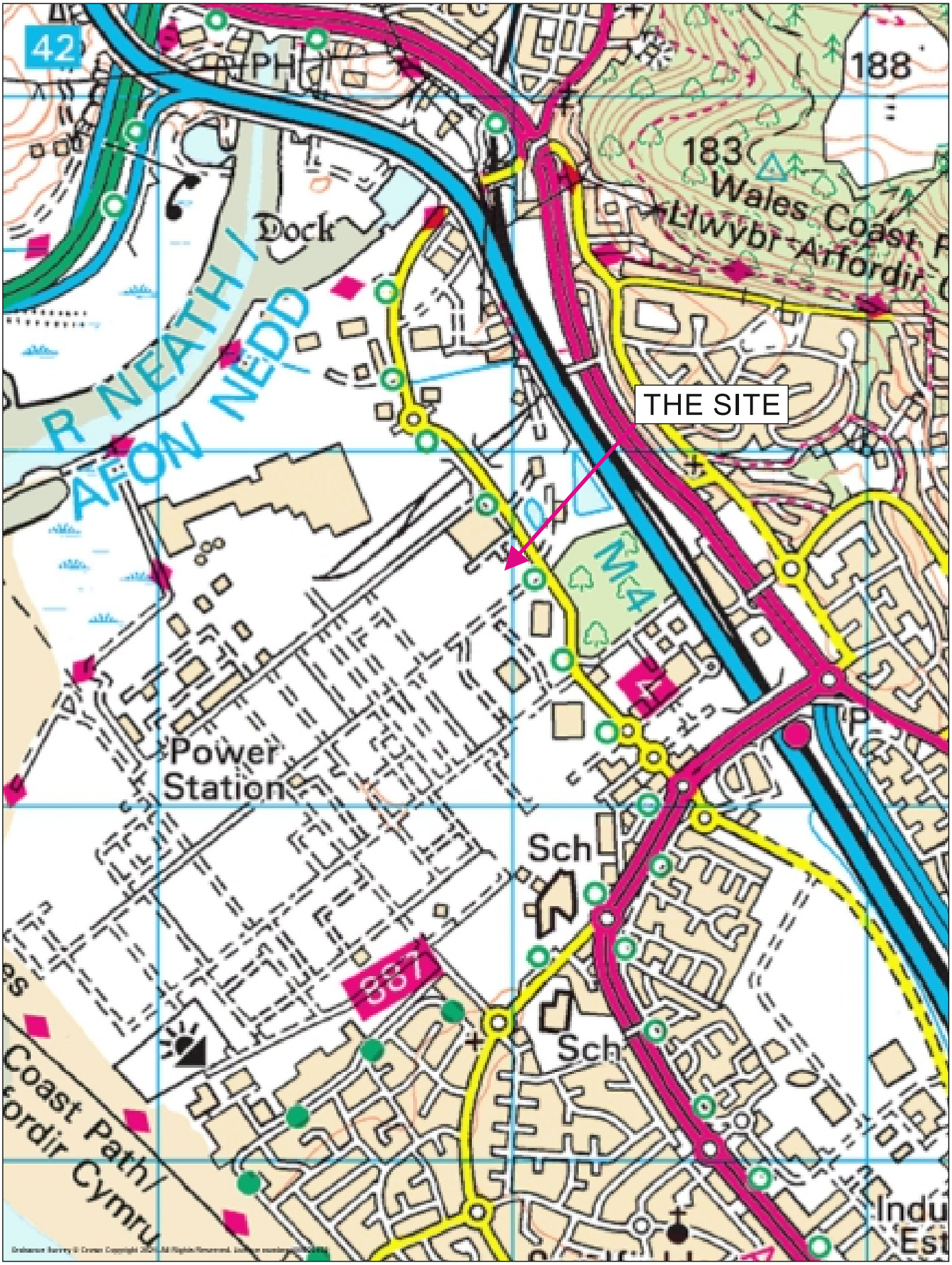

FIGURE 1
SITE LOCATION

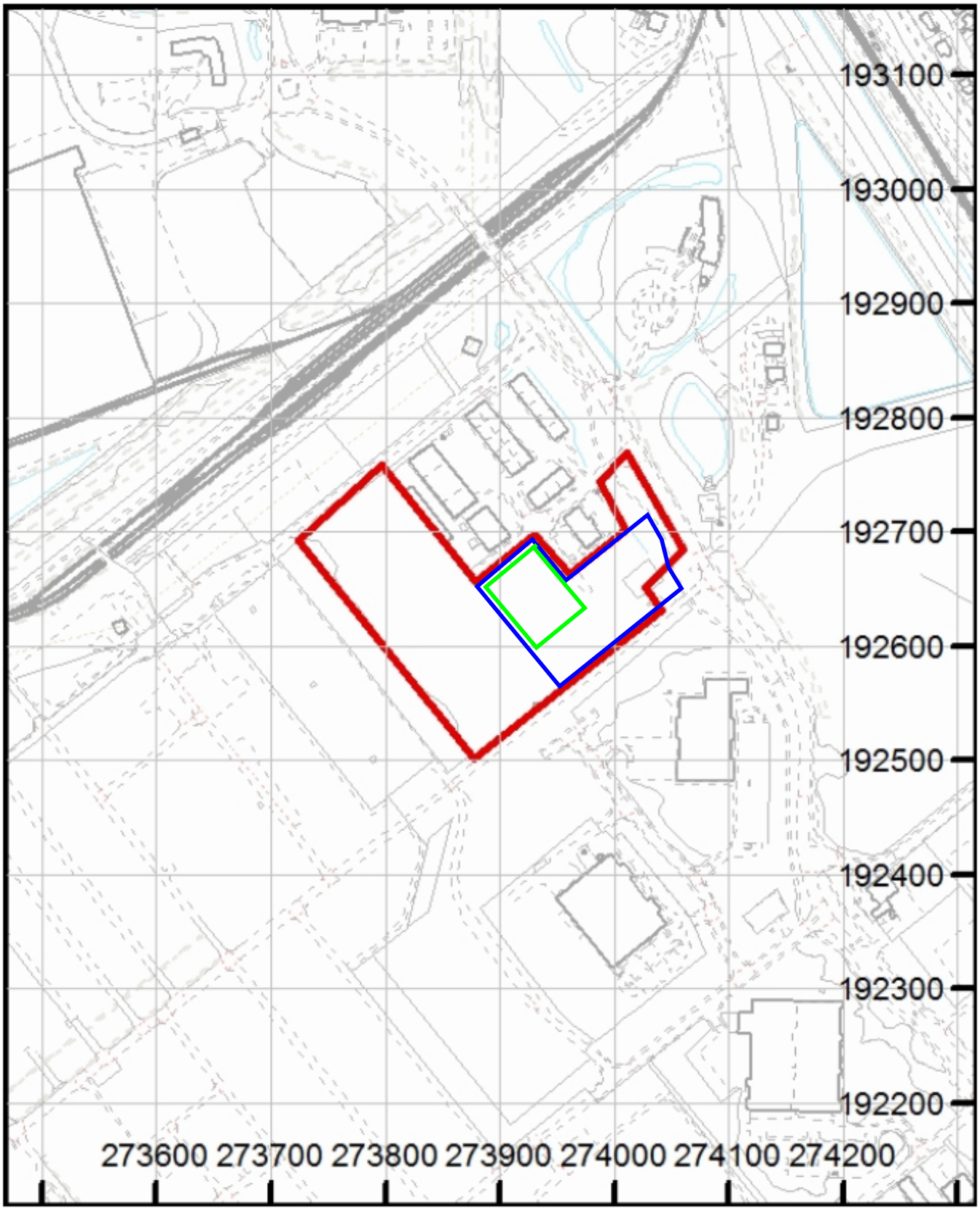

FIGURE 2

SITE BOUNDARY FROM COAL AUTHORITY CON29 REPORT.

THE SITE BOUNDARY COVERED BY THE C.M.R.A. IS IN BLUE,THE CURRENT PLANNING APPLICATION BOUNDARY IS IN GREEN.

2. SOURCES OF INFORMATION

a) Coal Authority CON29 Report ref. MR-51002044228001.

b) The C.A. interactive viewer.

c) The 6" to the mile (1:10,560) Geological Survey sheets SS 79SW (1952 resurvey, pub. 1970).

d) The Memoirs of the Geological Survey of The South Wales Coalfield, part VIII, The Country around Swansea (first edition 1907) and other mining archive sources.

e) Historic large scale (1:2500) Ordnance Survey maps of the site. Glamorgan sheet XXIV.8, 1877 edition with 1914, 1947, 1966, 1978 and 1996 revisions. 1:10,560 Glamorgan Sheet XXIVNE, 1947 was also consulted.

f) A borehole sunk nearby by Apex Drilling Services and borehole records from the B.G.S. Geoindex.

2a) The Mining Report states that the site not in an area that could be affected by any past recorded underground coal mining. However, the site is in an area where the C.A. believes there is coal at or close to the surface which may have been worked in the past. The report also states there are no present underground workings, or plans for any, although there are reserves of coal which could be worked in the future. No Section 46 notices have been given that the land is a t risk from subsidence. The report then states that there are no mine entries within, or within 20m of the boundary of the site. The C.A. is not aware of any damage due to geological faults or other weaknesses that have been affected by coal mining. The report states the site is not within the boundary of a past opencast coal mine, or within 200m of a current opencast, or within 800m of a site for which an opencast license has been granted. The C.A. have not received any damage notices or subsidence claims for any property within 50m since October 1994 (i.e. since the formation of the C.A. to take liability for legacy mining issues). There are no records of gas emissions requiring action. There are no recorded surface hazards that have required remedial action. All these facts will fed into the later quantitive risk assessment.

The Professional Opinion section recommends seeking technical advice before developing the site and gives the standard warnings about the potential risks involved during the investigation of coal seams and mine workings. The report

states the L.P.A. may require a C.M.R.A. as is indeed the case here. The complete report is attached as Appendix 2.

2b) The C.A. interactive viewer contains a vast amount of information from various sources, particularly on the mining data window. An extract from the planning window can be seen in Figure 3. The site partially lies on a linear belt of Development High Risk. From its appearance this would appear to be a buffer zone covering a shallow coal seam(s). There are multiple other linear areas of Development High Risk north of the site. These would appear to be buffer zones above other seam outcrops. The isolated small circular areas northeast of the site are 20m exclusion zones around mine entrances. In order to fully understand why a site has a high-risk status it is informative to study the Coal Mining Data window. This window is far superior to the planning window as it is at a larger scale. There are multiple datasets which can be turned on and off. Information that can be obtained on the viewer includes the exact orientation of adits, and any further information held on any mine entries, including names and depths. This additional information can be extremely useful to a risk assessment.

An extract from the Mining Data Window is reproduced as Figure 4 overleaf. For clarity only two sets of data are turned on in Figure 4- seam outcrops and mine entries. The brown lines are coal seam outcrops. Four outcrops run across or just north of the site. This would be the reason for the Development High Risk Area. The C.A. seam codes for these four seams have been inserted by the author. The seam north the site is SW0401 (Four Foot Seam in the C.A. Seam Directory). Going south across the site are SW0361 (Caerau), SW0351 (Red Vein) and SW0331 (Middle Nine Foot Top Leaf) furthest south. There will be no further comment on this seam nomenclature at this stage, as it is not central to this risk assessment. Dip directions are not shown on the data window. However, as the seam codes are in ascending order going north, it is safe to assume that the dip direction is to the north.

The red crosses are mine entries. There are none shown in Figure 4, but there are several approximately 500m east of the site, as seen in Figure 3. The data reveals these are Swan Colliery (two adits) and Baglan Hall and Park Collieries with four shafts between them. There will be further discussion of these in the next section.

FIGURE 3

EXTRACT FROM THE COAL AUTHORITY INTERACTIVE VIEWER PLANNING WINDOW. BLACK HATCHED AREAS ARE CLASSED AS DEVELOPMENT HIGH RISK. THE SITE POSITION IS HIGHLIGHTED

FIGURE 4

C.A. INTERACTIVE VIEWER, DATA WINDOW. THE BROWN LINES ARE COAL SEAM OUTCROPS WITH THEIR C.A. CODES ADDED

2c and d) The six-inch to the mile Geological Survey sheet SS 79SW covers the area around the site. An extract of SS 79SW has been reproduced as Figure 5 overleaf. A section of the stratigraphic column from the survey sheet is shown in Figure 6 with the approximate site level marked.

It is always very useful to study the survey sheets in conjunction with the Memoirs. Used together, the six-inch survey sheets and the Memoirs are an invaluable source of much detailed geological information on the area. Much of this has been obtained from mining records. Due to the high economic importance of the area, extensive government funded geological surveys were carried out in the past. These were completed in 1845, 1900 and 1953 respectively. Unlike other volumes, the Swansea Memoirs have not been updated since 1907 as coal mining had virtually ceased in the area by the time of the 1947-53 resurvey. The maps however were updated reflecting advances in seam correlation and a more standardised seam naming system.

The Survey Sheet shows that the site is underlain by bedrock of the Middle Coal Measures, which are undifferentiated in South Wales. The Amman Marine Band marks the boundary with the Lower Coal Measures and the conjectural position of this is shown just south of the site. In South Wales the Middle and Lower Coal Measures are predominantly argillaceous with closely spaced coal seams, many of which were economically important in the past. The absence of these seams south of the site all the way to the outcrop of the Gellideg Seam is significant. The map shows the strata dips at between 26^{o} and 40^{o} to the north. The dips are all north of the shafts of Baglan Hall Colliery and would have been measured underground because of the lack of bedrock outcrops. Four seam outcrops are shown in Figure 5 in a similar arrangement to Figure 4. The reason for their truncation can be seen to be the Giants Grave Fault. The outcrops are marked further north than in Figure 4. The site footprint has been accurately positioned using georeferencing, as will be seen in the following section. Two of the seams are labelled as the Upper Four Feet and the Big, neither of which underlie the site. In Figure 6 it can be seen that the Big Seam is given a thickness of 7’ (2.15m). This is very thick for South Wales, hence the name. This can be contrasted with the thicknesses of the Finery, Golden and Golden Rider, all of which were worked to the north of the site. The Upper Four feet and the two unnamed seams below the Big, which do cross the site, are unlabelled and are not assigned a thickness. This would imply they are less than 12” (300mm) thick and thus unworkable.

Mining archive material reveals that Swan and Park Collieries were components of Baglan Hall Colliery and the names Park and Baglan Hall are interchangeable in the records. Although under the same ownership, Swan Colliery is more distinct as it comprised of several adits working seams further up the stratigraphic succession. Because of this it is of little relevance to this assessment. Baglan/Park Colliery worked the Finery Seam and the Big Seam. These were recorded at 210' (64m) and 276' (84m) respectively in the upcast shaft. The Memoirs record the workings extended north, down a 45^{o} dip for a distance of 16 Chains (322m). The steep dip would have encouraged "ladderback" working. Long main roadways extend laterally at a few degrees off strike, with short down dip connections. This pattern is evident in Figure 7. This is taken from the Interactive Viewer and shows recorded underground workings. Baglan Hall colliery had a chequered financial history with frequent insolvencies, finally closing in 1889. It can be speculated that haulage and drainage problems would certainly contributed to the costs of mining there. The Memoirs thus confirm the information in the CON29 and in Figure 7 that there are no recorded workings under the site.

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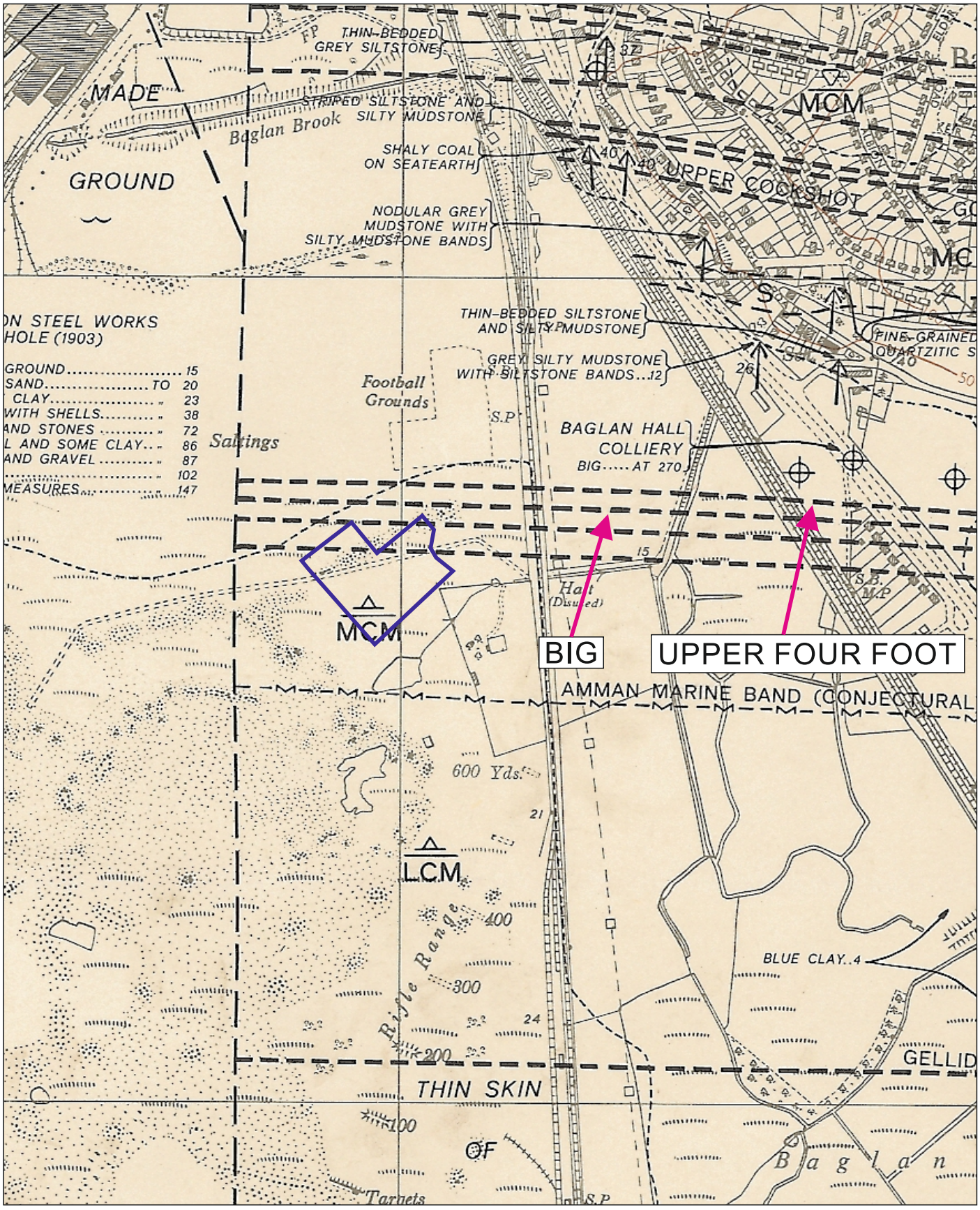

FIGURE 5

EXTRACT OF GEOLOGICAL SURVEY SHEET SS 79SW.

THE SITE IS HIGHLIGHTED IN BLUE.

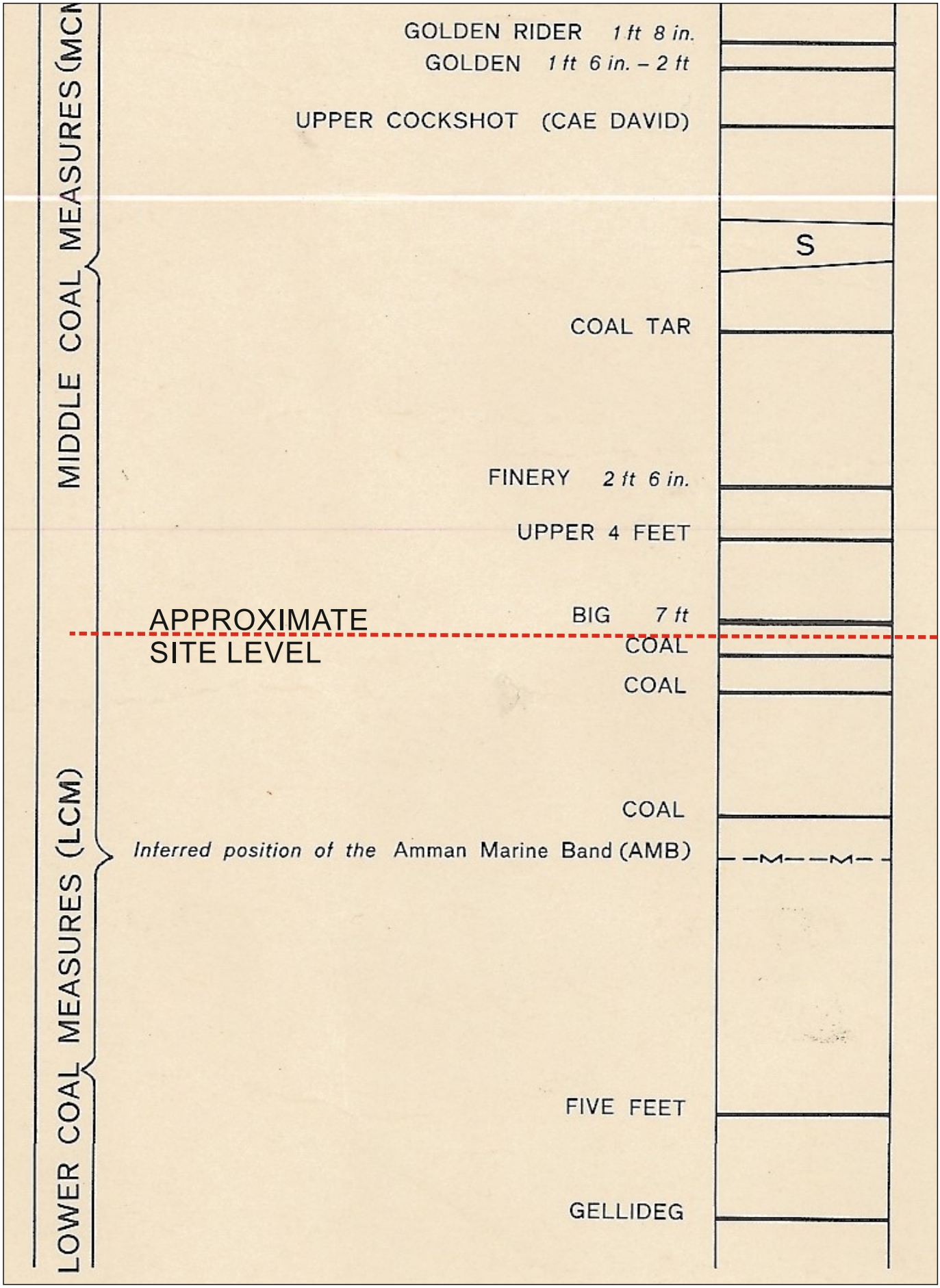

FIGURE 6
SECTION OF THE STRATIGRAPHIC COLUMN FROM SS 79SW.
THE APPROXIMATE SITE LEVEL IS SHOWN

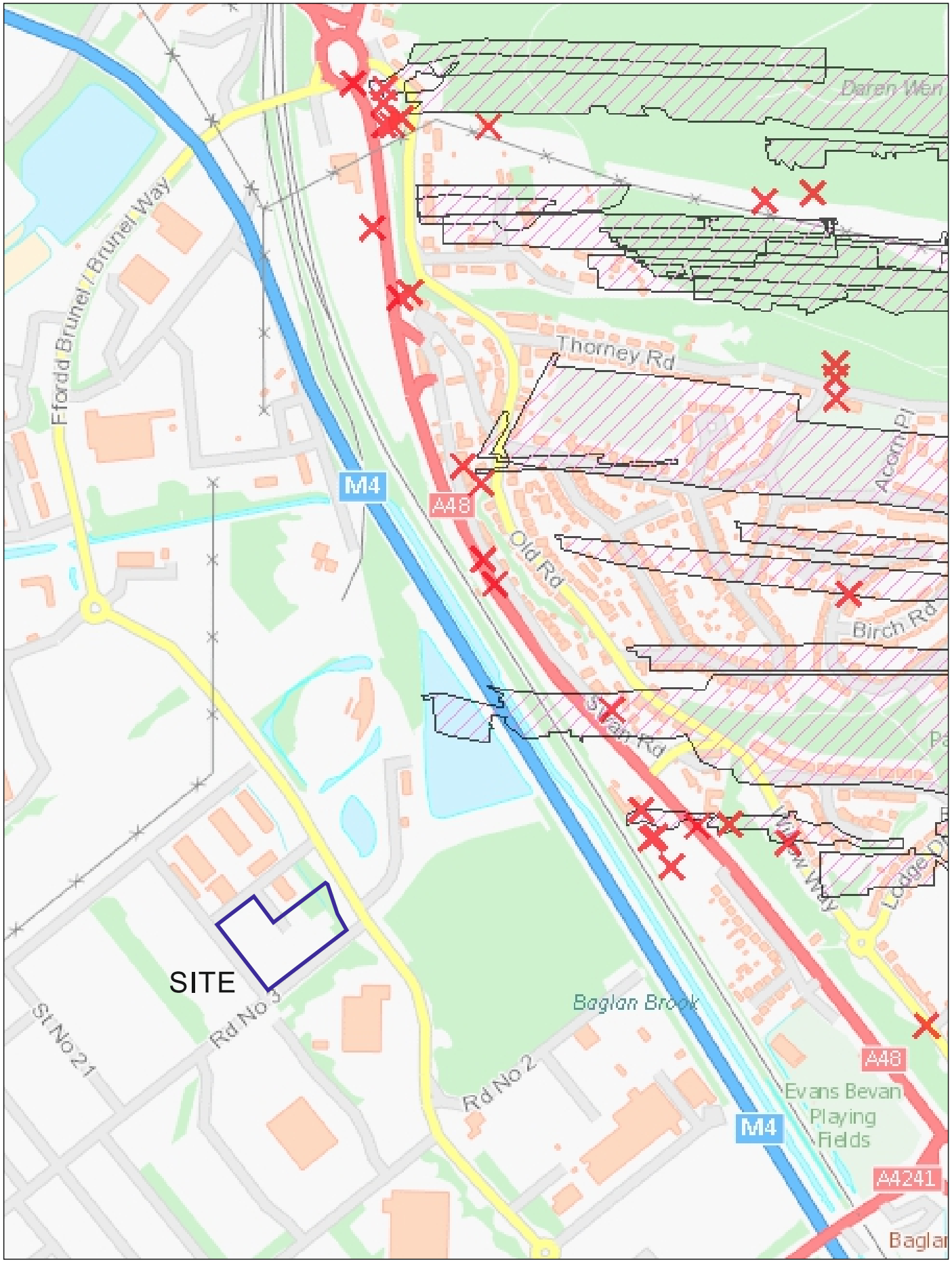

FIGURE 7
THE DISTINCTIVE PATTERN OF UNDERGROUND WORKINGS AND MINE ENTRIES EAST OF THE SITE SHOWN ON THE C.A. VIEWER

2e) Historical Ordnance Survey maps can prove invaluable in looking for evidence of coal mining activity. Since the first County Series maps were produced in the 1870's nearly all mining features have been recorded, even if they were considered "old" at that time. The site and surroundings underwent very little change from 1877 (the earliest map) to the early 1950s. Throughout this period the site was on a low sand warren with even lower lying saltings just to the north. The label saltings would indicate that the area was subject to frequent inundation by the tide. Evidently this would make it totally unsuitable for coal mining. There is no trace of any coal mining activity anywhere near the site. Omission of something from an O.S. map doesn't prove it was never there, but it is a useful strand of evidence. In contrast to the area surrounding the site, east of the Rhondda and Swansea Bay and Great Western Railways (now the courses of the A48 and M4 respectively) are multiple coal levels and air shafts. Park Colliery is marked with a complex of buildings and railway sidings, up until 1914 when it is marked as disused. Figure 8 shows the site on the 1948 1:10,560 O.S. The site is still remote from any kind of development, although tipping over the saltings has commenced from the Briton Ferry Steelworks. This process speeded up dramatically with the establishment of the new Margam Steelworks. Huge amounts of slag were spread over the entire area and the massive B.P. Chemical Plant built.

In order to position the site accurately on the older O.S. maps, and the Geological Survey map, georeferencing was used. This can be seen in Figure 9 where the outline of the site can be accurately delineated on an aerial photo and fixed on the 1914 1:2500 map. This was the earliest map available for georeferencing. This technique was also used to position the site boundary accurately on the Geological Survey Sheet. The base O.S. map for the Survey Sheet is the 1962 O.S. revision, which apart from boundary changes, is the same as the map in Figure 8. The point here is that great confidence can be placed in the positioning of the site in Figure 5.

2f) The borehole records available do not penetrate the bedrock and so do not supply any information confirming the bedrock geology as shown by the Geological Survey Sheet. What they do demonstrate is a minimum of 20m of soft water bearing sands and peaty clays. These would clearly make outcrop mining completely impossible.

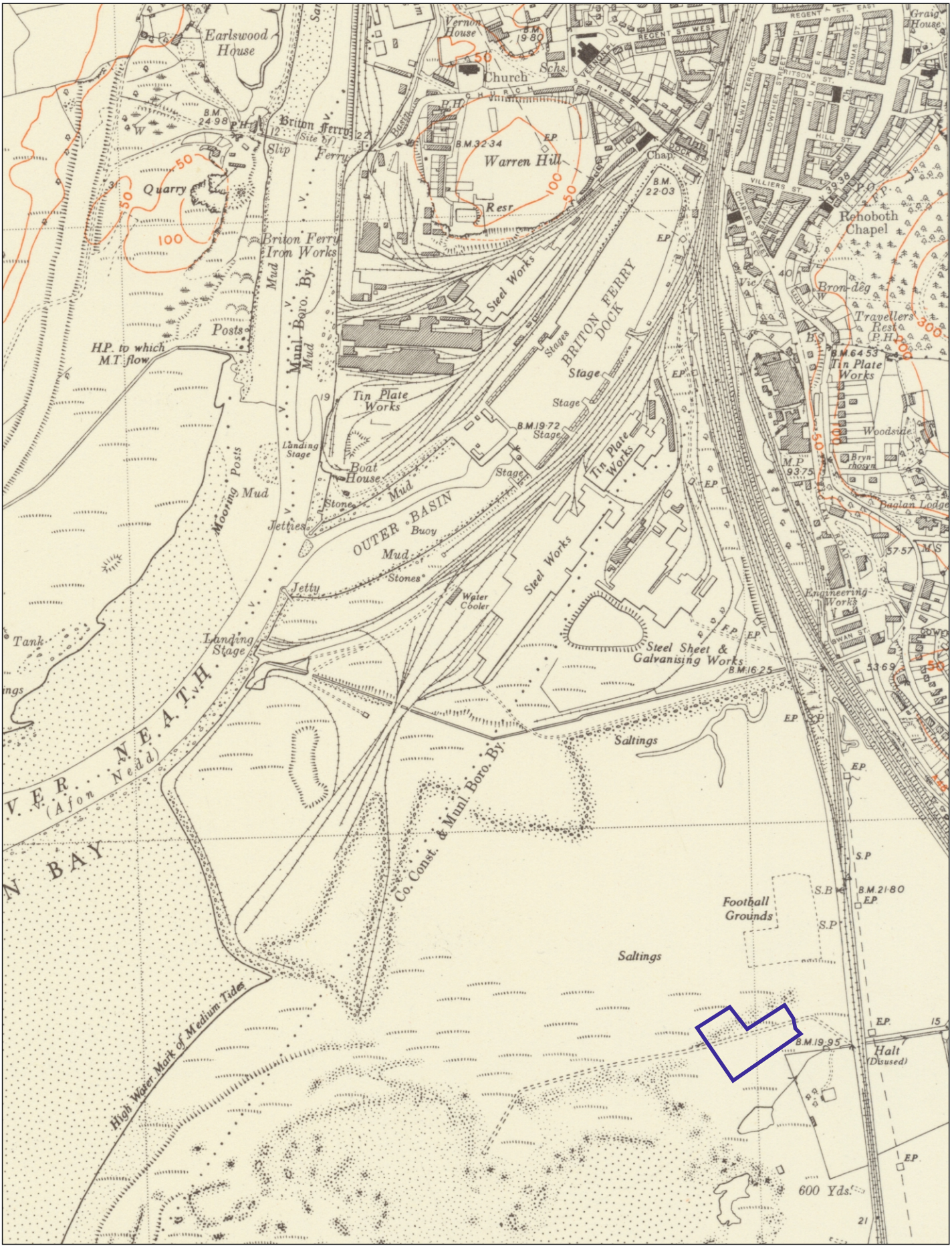

FIGURE 8
THE SITE ON THE 1948 1:10,560 O.S.

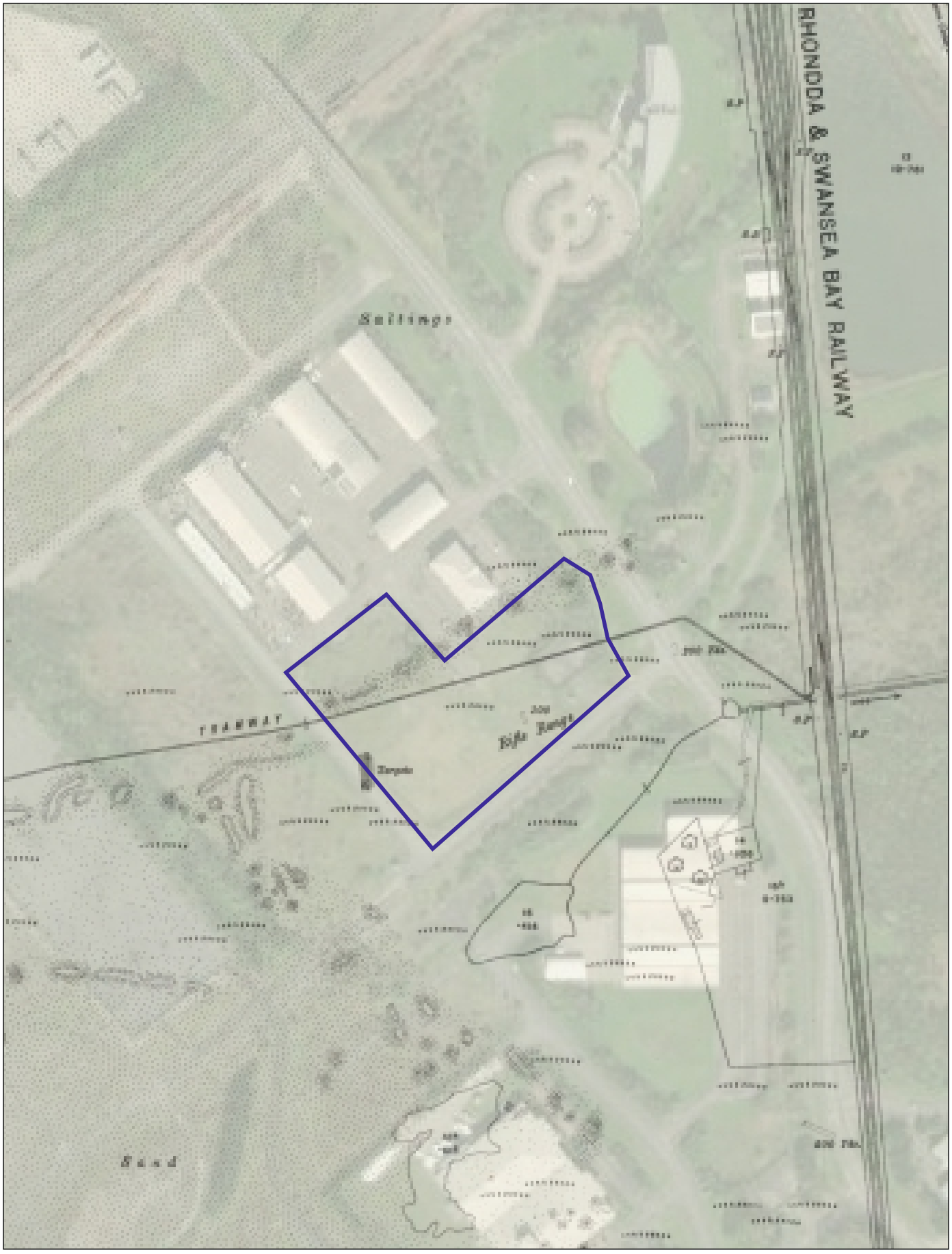

FIGURE 9
THE 1914 1:2500 O.S. MAP GEOREFERENCED
ON AN AERIAL PHOTOGRAPH OF THE SITE

COAL MINING ISSUE		YES	NO	R.A?
SHALLOW RECORDED WORKINGS			X	
SHALLOW UNRECORDED WORKINGS		X		X
MINE ENTRIES			X	
FISSURES			X	
GAS EMISSIONS			X	
SURFACE HAZARDS			X	
SURFACE MINING			X	
FUTURE MINING LICENSE			X	

3. SITE SPECIFIC COAL MINING RISKS

From the table above it can be seen that only unrecorded shallow workings require a risk assessment for this site. To first briefly deal with the issues marked NO on the table:-

a) There are no recorded shallow workings under the site. Archive material including abandonment plans, the C.A. database and the Memoirs have been searched thoroughly to reach this conclusion. The CON29 has the same conclusion. There are recorded workings well to the east of the site, but these are 270m away at their closest approach.
b) There are no recorded mine entries close to the site, the closest being 500m away.
c) The C.A. report states there are no fissures, surface hazards or lines of geological weakness affected by underground mining under the site. Neither have there been any damage notices nor subsidence claims within 50 metres of the site.
d) The C.A. report states there have been no recorded gas emissions within the area surrounding the site. Since there are no recorded workings anywhere near the site the risk can be completely discounted.
e) There has never been any surface (opencast) mining on, or near the site.

The information on the Geological Survey map compares reasonably well with that on the Interactive Viewer. However, the Interactive Viewer names the seams wrongly. This is very common on the C.A. Database. This is not a pedantic point. The correct name of any seam is needed to assess its economic importance. This fact is vitally important when trying to assess mining risks. The mining archive material suggests only two seams were mined in the immediate area of the site. These were the Finery Seam and the Big Seam. Both of these

outcrop north of the site. Because the strata dips steeply north they do not underlie the site.

The conjectural seam outcrops are exactly that-conjectural. In the vicinity of the site they have not been proved by either boreholes, mining or outcrops. They have been projected from plans of Baglan Hall/Park Colliery. Even if these projections are inaccurate and the Big Seam does underlie the site, the main reason that there cannot be mining under the site is the mining engineering situation. In particular the superficial deposits covering the site. These have a minimum thickness of 20m and have an extremely high water table. Any mining from the vicinity of the site would be completely impossible.

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4. MITIGATION STRATEGY

It is not proposed to offer any specific engineering or building location mitigation strategy. The reason for this is that there is no possibility of ground instability caused by coal mining legacy issues on the site.

5. CONCLUSION

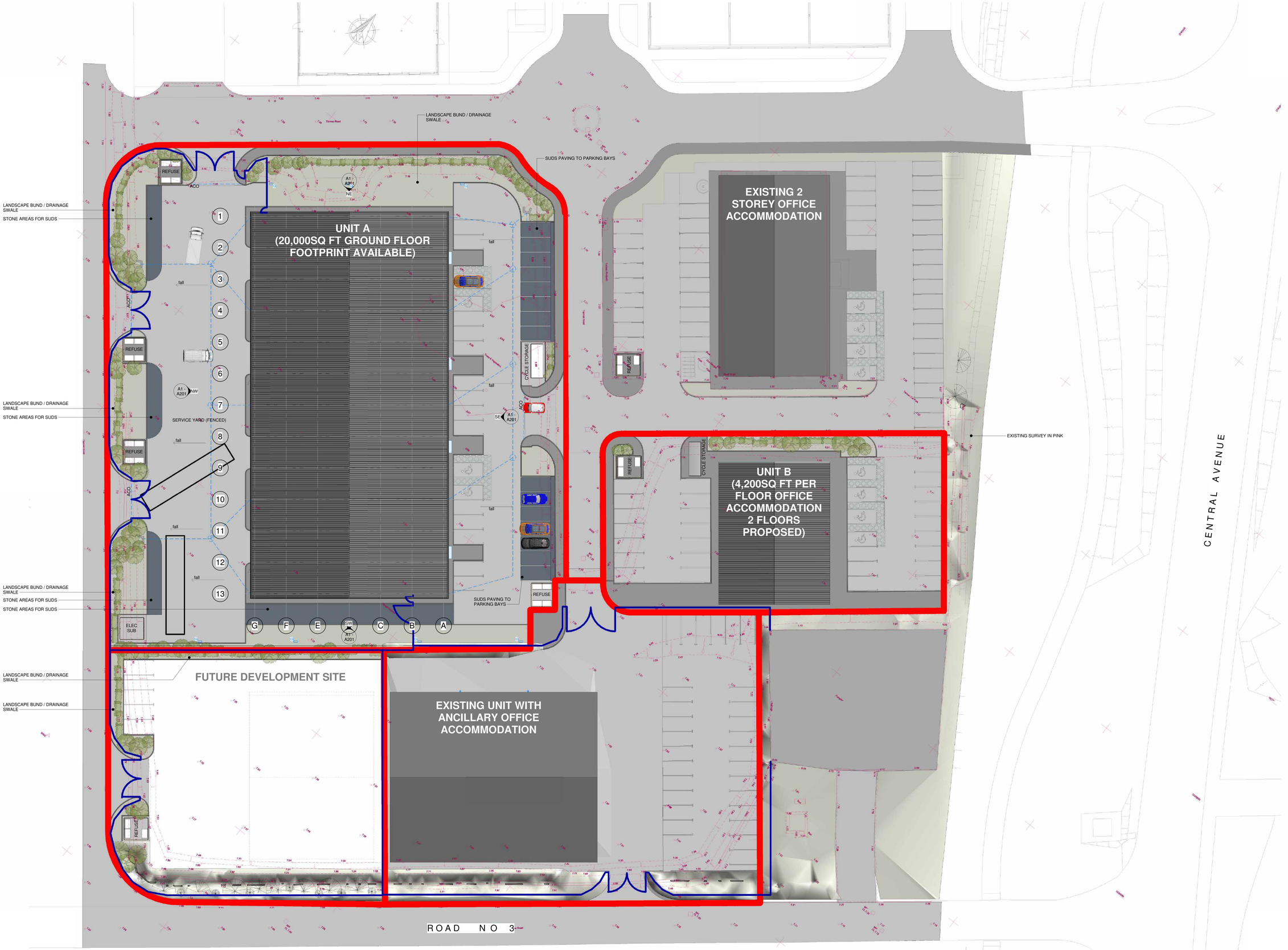
This risk assessment has presented abundant evidence from comprehensive research that there is no risk to ground stability posed by coal mining legacy issues at the site. In particular the risk from unrecorded shallow coal mining has been thoroughly investigated. The basic premise of the site being partially within a Development High Risk Area hinges on there being shallow coal outcrops crossing the site. It has been demonstrated that this is simply not the case. The conjectural outcrops, on which the C.A. Data is based, have been projected from underground workings some distance away. These workings were accessed from shafts sunk on much better ground. In actual fact these outcrops are more correctly subcrops, present under a thick blanket of sand. The site is only 5m A.O.D. and trial pitting on the site has shown the water table is very shallow, only a metre below current ground level. This level has been raised in the last 70 years. Prior to that, ground conditions would have been even worse. Clearly unrecorded shallow mining would be physically impossible.

Therefore there is no need for the site to be classified as Development High Risk, and no reason for the Coal Authority to object to planning permission being granted for the proposed development.

Richard Davies BSc. (Hons), MSc., F.G.S. 15/04/2021

APPENDIX 1

REPRESENTATIVE PLANS
OF THE DEVELOPMENT



SITE MASTERPLAN (project orientation)
1 : 200

Rev	Description	Date
A	SW arrangement added	Oct 20
B	Landscaping extent altered and suds areas added	Jan 21

STATUS | PURPOSE OF ISSUE

i.m. Design Studio
Chartered Institute of Architectural Technologists Registered Practice
27 Park Avenue, Skewen, SA108RU

PROJECT
Mardon Park
Baglan Energy Park,
South Wales

TITLE
MASTERPLAN

CLIENT
Greenwise Construction Ltd

DRAWN BY	CHECKED BY	DATE
JM		30/06/20

SCALE (@ A0)	PROJECT NUMBER
1 : 200	Project Number

DRAWING NUMBER	REV
A0 - A200	B

APPENDIX 2

COAL AUTHORITY

CON29 MINING REPORT

The Coal Authority

CON29M Non-Residential Mining Report

MARDON PARK
CENTRAL AVENUE
BAGLAN ENERGY PARK
NEATH PORT TALBOT

Date of enquiry:	**19 February 2019**
Date enquiry received:	**19 February 2019**
Issue date:	**19 February 2019**
Our reference:	**51002044228001**
Your reference:	**194644028_1|**

CON29M Non-Residential Mining Report

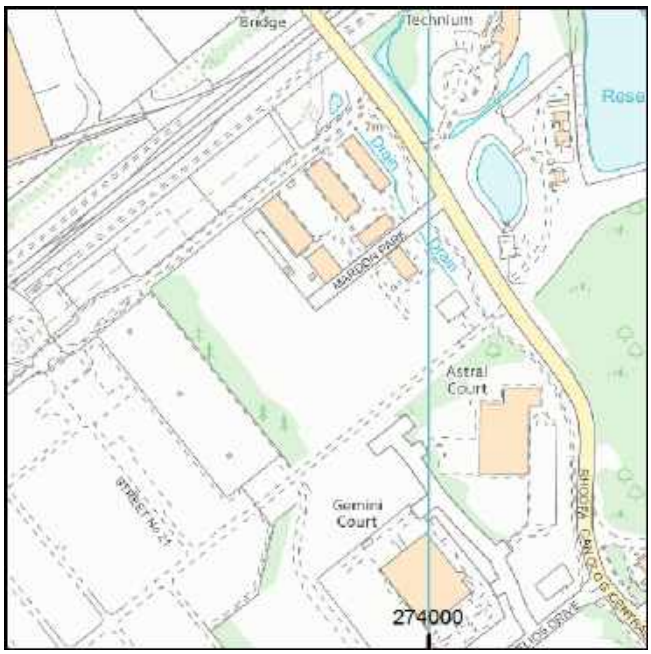
This report is based on, and limited to, the records held by the Coal Authority, at the time we answer the search.

Client name

LANDMARK INFORMATION GROUP LIMITED

Enquiry address

MARDON PARK
CENTRAL AVENUE
BAGLAN ENERGY PARK
NEATH PORT TALBOT



Approximate position of property

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

Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	Yes
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	No
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	No
13	Working facilities order	No
14	Payments to owners of former copyhold land	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is not within a surface area that could be affected by any past recorded underground coal mining.

However the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. Your attention is drawn to the Comments on the Coal Authority information section of the report.

2. Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3. Future underground coal mining

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

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

4. Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

5. Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6. Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7. Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8. Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9. 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.

10. Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11. Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

12. Withdrawal of support

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.

13. Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14. 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.

Comments on the Coal Authority information

The Coal Authority own the copyright in this report and the information used is protected by our database right.

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore 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 good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/ former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's CON29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. This report is prepared in accordance with the Law Society's Guidance Notes 2018, the User Guide 2018 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.

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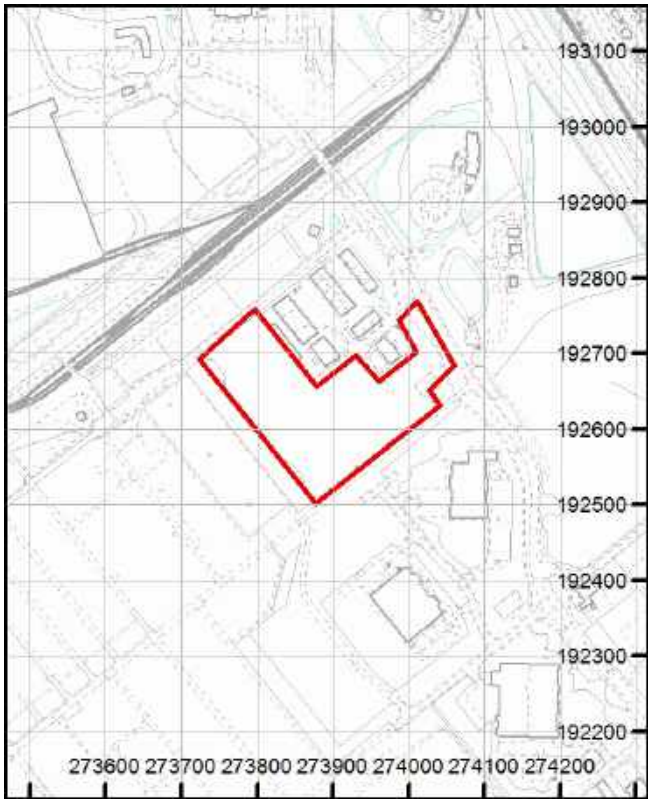
Alternative formats

If you would like this information in an alternative format, please contact our communications team on 0345 762 6848 or email communications@coal.gov.uk.

Enquiry boundary

Key

Approximate position of enquiry boundary shown



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