

Report No. BC/MB/04.19.04.

Coal Mining Risk Assessment: Proposed New Club House at the Wern Sports Ground.

Prepared on behalf of:

Merthyr Rugby Club.

By:



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THE ENTERPRISE CENTRE, MERTHYR INDUSTRIAL PARK,
PENTREBACH, MERTHYR TYDFIL, SOUTH WALES, CF48 4DR.
TEL: 01443 693353, FAX: 01443 693351
EMAIL: SALES@BLANDFORDCONSULTING.COM
WWW.BLANDFORDCONSULTING.COM

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Mining Risk Assessment: New Club House, Land at the Wern Sports Ground.

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Drawing No:		Scale:
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Appendix I: Copy of The Coal Authority's Report, reference no. 51002046522001.

Appendix II: Copy of Public Health England's Radon Gas Report.

Mining Risk Assessment: New Club House, Land at The Wern Sports Ground.

1 Introduction

This report has been prepared on behalf of our client:

***Merthyr Rugby Club,
Dynevor Street,
Georgetown,
Merthyr Tydfil,
CF48 1BA***

and relates to the Wern Sports Ground, Cae'r-Wen, Ynys Fach Estate, Merthyr Tydfil. It is proposed to construct a new club house. This report discusses the geology and mining history of the Site and the immediately surrounding area as they may affect the proposed development. Recommendations are made for exploratory boreholes to examine in greater detail and, where appropriate, stabilise any shallow mine workings that may underlie that part of the area where the new club house is proposed.

The following sources of data were used in the compilation of this report:

- i) Research of published geological records;*
- ii) Research of mining records held at The Coal Authority's archive in Mansfield;*
- iii) The findings of The Coal Authority's report, reference no. 51000874376001;*
- iv) the archive records of Blandford Consulting.*

The findings of this report are necessarily based upon the data used in its compilation and may be amended in the future in the light of additional material information. The report must only be used in its entirety for its stated purpose.

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2 Brief Description of the Site

The Wern Sports Ground is located on the western fringes of Merthyr Tydfil, approximately 600m south-west of the town centre; it is irregular in outline and occupies an area of approximately 0.26 hectares (see Figure 1 and *General Location Plan, drawing no. BC/MB/04.19.04.01*). The plot of land that is the subject of this report, 'the Site' is a rectangular area located at the north-eastern corner of the Wern Sports Ground; it has approximate maximum dimensions of 53m by 23m. The Wern Sports Ground is located in a residential area on the fringes of the town and is bounded on its western side by the A 470 (T), beyond which is open countryside. It is situated close to the floor of the Taff Valley and the Site is at an approximate elevation of 187m aod.

Figure 1
Aerial View of the Wern Sports Ground



3 Geology of the Site

The Site is situated near the northern margin of the South Wales Coalfield and is underlain at shallow depths by strata assigned to the Lower Coal Measures, a sub-division of the

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Upper Carboniferous Period. The most recently published geological sheet at 1:10,560 scale (SO 00 NW) shows the inferred positions of the outcrop of the Five Feet and Gellideg Seams to be present beyond the south-west corner of the Site (see *Geology Plan, drawing no. BC/MB/04.19.04.02*). The next seam below the Gellideg Seam in the geological sequence is the Garw Seam; the interval between the two is approximately 30m. There are a number of ironstone bands within the coal measures lying between the two seams with two further ironstone bands, the Rosser Veins, present below the Garw Seam. The regional dip of the coal measures around the Wern is south-westwards with the result that the published geology sheet would indicate that the Five Feet and Gellideg Seams do not underlie the Site. However, earlier ground investigation carried out at the Wern indicates that the actual outcrop positions are slightly further to the north-east than are shown on the published geological sheet with the result that the Gellideg Seam underlies the Site. The shallow coal measures underlying the Site are the Gellideg Seam and the measures down to the Garw Seam, including the five ironstone bands.

The coal measures of the South Wales Coalfield have been affected by large faults. In the Ynys Fach area these large faults have a slightly sinuous trace at the surface and an average trend towards the north-west. The published geological sheet indicates that the Site is not affected by large scale faulting.

The published geological sheet indicates that locally the coal measures are overlain with deposits of glacial boulder clay. Other ground investigations at the Sports Ground have identified the presence of Made Ground across much of the area. Published geological records indicate that the Site is not affected by landslip.

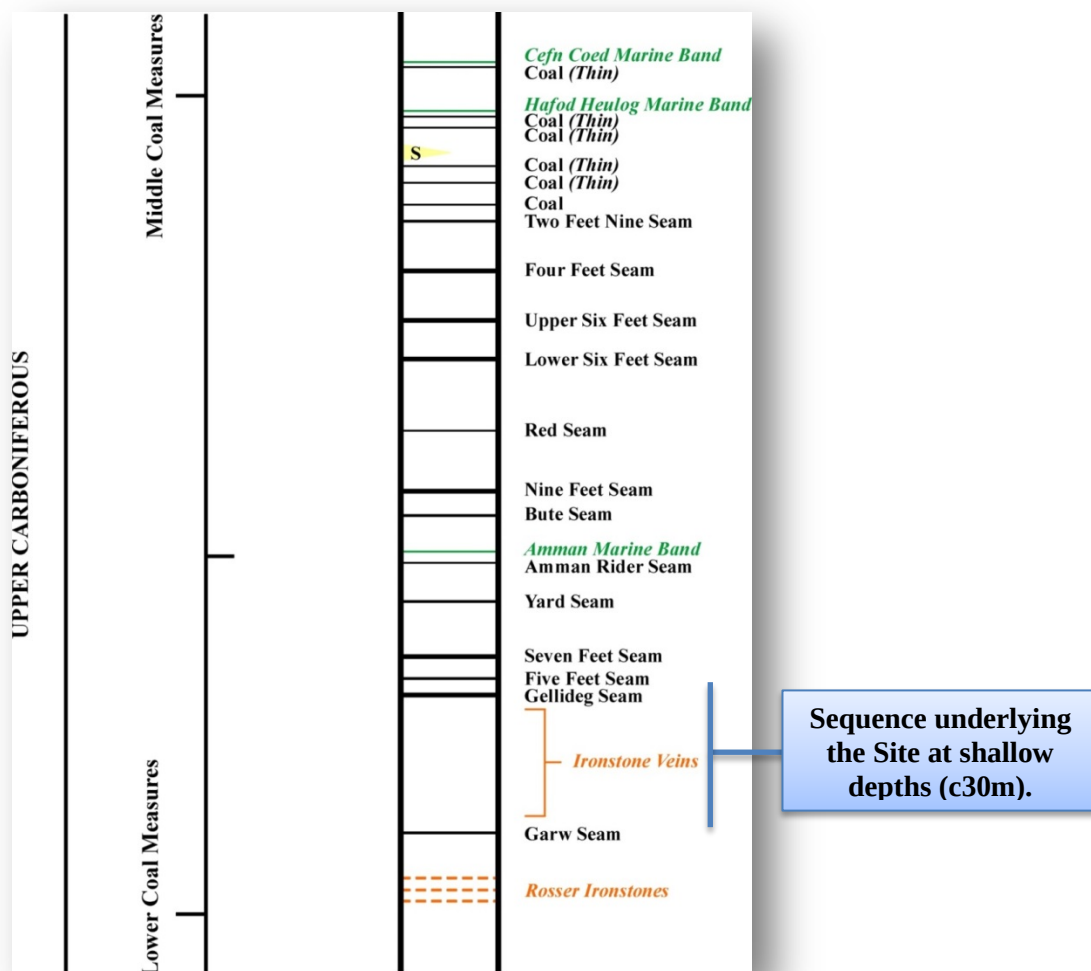
4 Mining History

The area has been subject to extensive mining operations for both coal and ironstone dating back to the earliest part of the nineteenth century. Coal seams and ironstone veins were accessed by adits driven into the mining horizons near their outcrops and by shafts sunk into the deeper coal seams and ironstone veins; there are a large number of disused shafts and adits in the locality. Air shafts were also sunk in order to provide ventilation to the underground mining

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operations. Both the Five Feet Seam and the Gellideg Seam were mined underground in the immediate vicinity of the Site; although our search of coal mining records identified no record of old workings underlying the Site. The records held by The Coal Authority are not a complete record of past mining activities and the presence of unrecorded old workings cannot be dismissed, particularly in this area where extensive underground mining operations began before comprehensive records were being kept.

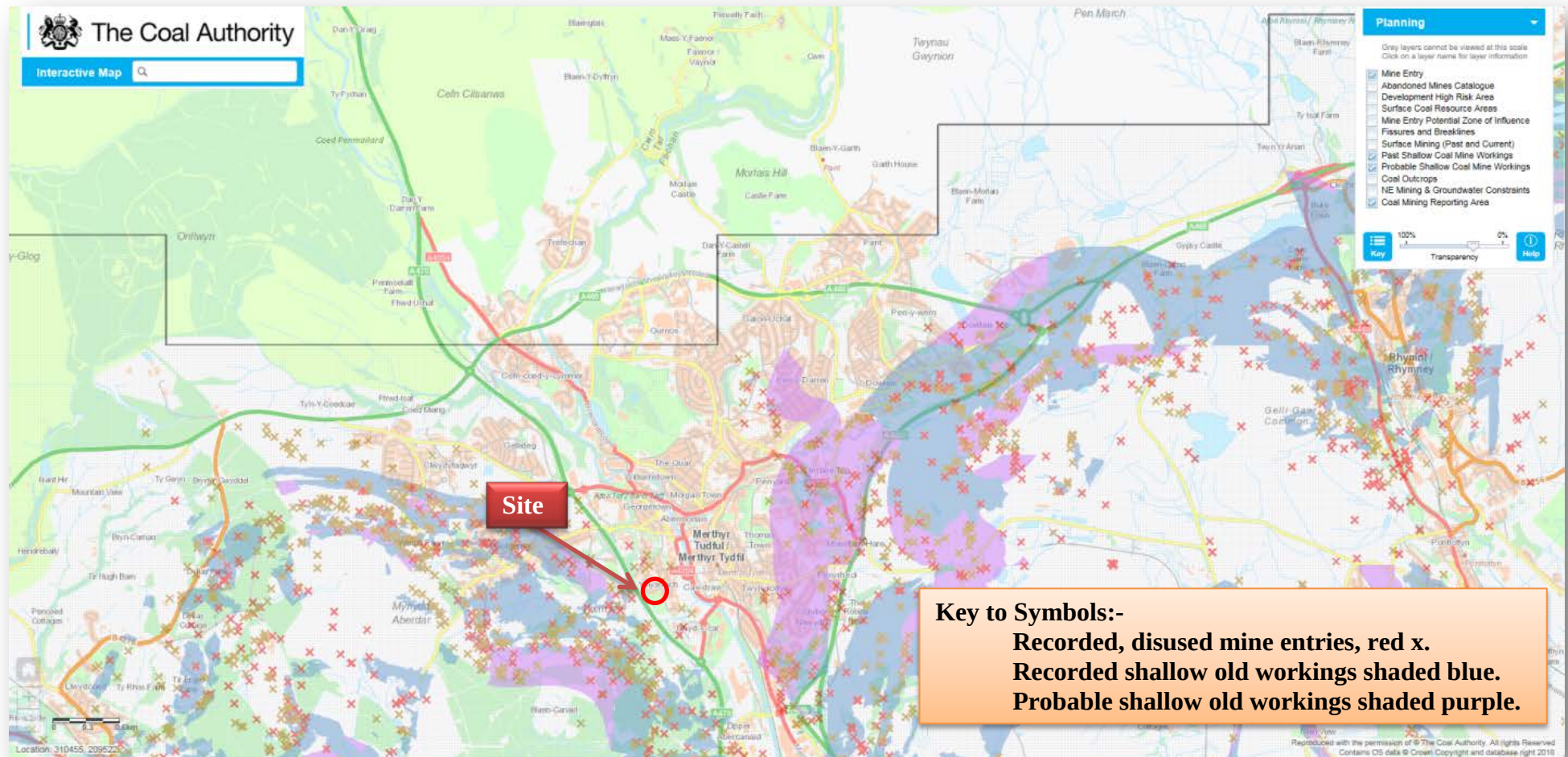
Figure 2
Part of the Stratigraphic Column.
 Scale: Not to Scale.



Since the early 1800s extensive underground mining operations took place in the five ironstone veins present between the Gellideg Seam and the Garw Seam together with the Rosser

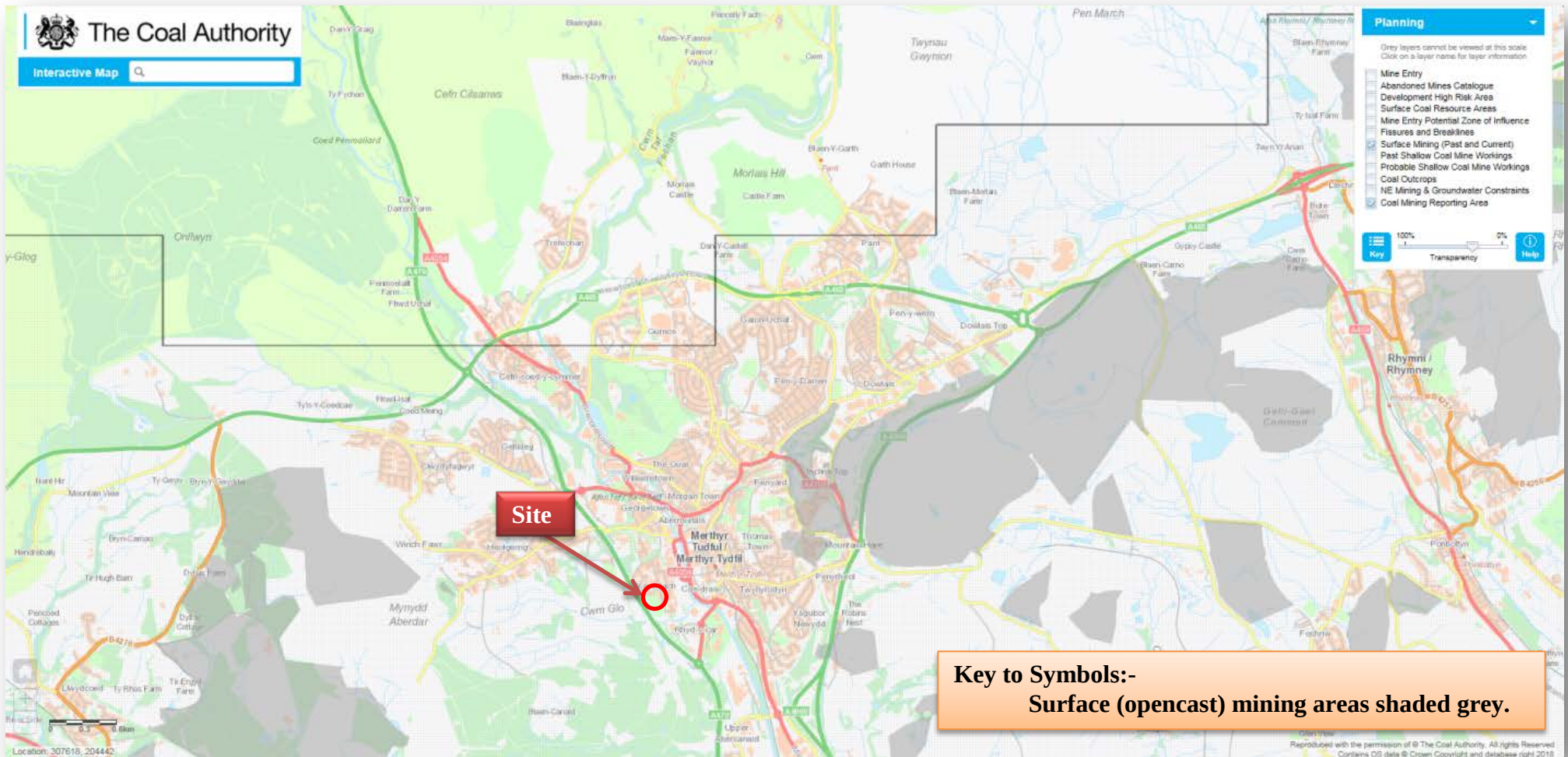
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Figure 3
Print-out of The Coal Authority's Interactive Map
 (Accessed 25th April 2019)



/Cont....

Figure 4
Print-out of The Coal Authority's Interactive Map
(Accessed 25th April 2019)



/Cont....

Veins. The workings were prosecuted from a number of drift mine entries and shafts that were interconnected and stretched from Clwydyfagwyr southwards to Abercanaid. The Rhydycar Pit, 200m south-east of the Site, was an important part of this extensive mining operation; the underground mining operations for the ironstone veins extended across the area of the Site.

Otherwise, there are no active coal mines in the locality, either deep mines or opencast, that would affect the structural integrity of the proposed redevelopment and the Site has not previously been part of an opencast coal site.

Our searches found no record of a disused shaft or adit within the confines of the Wern Sports Ground or within 20m of its boundary, a situation confirmed by The Coal Authority *report no. 51002046522001*. The risk of an unrecorded mine entry being present within the Site cannot be entirely discounted. The Site has not been part of an opencast coal site, and there have been no opencast mining operations close enough to the Site to affect the structural integrity of the proposed development. There are no operating collieries within influencing distance of the Site.

5 Mine Gases

When coal seams are disturbed during mining operations methane can be released and can collect with other mine gases in the mining voids left by the operations. In certain circumstances mine gases can accumulate within buildings and cause fire or explosion or can result in asphyxiation. A number of studies of the old workings across South Wales and dating back to the mid to late twentieth century have shown that there is little risk from mine gases. This may be as a result of the nature of the coal seams or because the shallow old workings have vented most of the mine gases to atmosphere or is as a result of the combination of the two. There are no shallow coal workings beneath the Site that could act as a source of mine gases and The Coal Authority has no record of an emission of mine gas at the Site that has required action.

6 Radon Gas

Current advice is that the risk from Radon gas should be assessed for new dwellings and also for enclosed buildings that are to be occupied, whether regularly or part time. The risk to

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the Club House has been assessed by obtaining a Radon gas report from Public Health England. The Radon gas report was obtained for 24 Penlan View, which is the closest property to the position of the proposed club house. The shallow geology underlying 24 Penlan View and the location of the club house is the same so that the findings of the Radon report are applicable to the proposed club house. The report states the location is not in a Radon affected area.

7 Risk Assessment: Discussion and Recommendations

7.1 Solid Geology

There are no features associated with the solid geology of the Site that would require any particular measures to be included in the design and construction of the foundations for the proposed new club house. It is recommended that no further action is required in this respect.

7.2 Mining History

7.2.1 Shallow Mine Workings

The area has been subject to extensive underground mining operations since at least the earliest part of the nineteenth century. The inferred outcrop positions for the Five Feet and Gellideg Seams pass through the Wern Sports Ground, south-west of the Site but earlier ground investigations at the Wern indicate that the outcrops are further north-east than are shown on the published sheet. Consequently, the Gellideg Seam underlies the Site at very shallow depths and at least some of the five ironstone veins are present at shallow depth (less than 30m from the surface) beneath the Site. Our searches found no record of old workings in the Gellideg Seam underlying the Site. The underground mine workings in this locality are relatively ancient and predate the keeping of comprehensive mining records. The possibility of unrecorded workings in the Seam being present beneath the Site cannot be ruled out; if such workings are present they will be at very shallow depths.

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Beneath the Gellideg Seam there are five ironstone veins that have been mined extensively throughout this area. The old workings extend beneath the Sports Ground and at least some of the workings have been found to be at very shallow depths. The mining records held by The Coal Authority are overwhelmingly of the coal mining industry together with only very limited records from the mining of other minerals, including ironstone. There is a significant risk that old workings in one or more of the ironstone veins are present beneath the Site at shallow depths.

Shallow old workings are likely to underlie the Site at more than one horizon, either coal or ironstone or both, and the workings are likely to be at sufficiently shallow depths whereby there is a significant risk that they may collapse to the surface and induce surface subsidence that could adversely affect the structural integrity of the proposed new club house. It is recommended that rotary percussive boreholes are drilled to determine the details of the shallow geology in the vicinity of the new club house and any old workings found to be present are stabilised by means of a drilling and grouting operation.

7.2.2 Mine Entries

Our searches found no record of disused mine entries within the bounds of the Wern Sports Ground or 20m of its boundaries. Although the presence of an unrecorded entry cannot be entirely dismissed, there are mining records of local underground mine workings and these identify no mine entries within the confines of the Site. The situation should be monitored during site clearance works and if any suspicious features are observed then excavation work must stop immediately and advice sought from a Chartered Geologist or from The Coal Authority.

7.2.3 Mine Gases

Various studies of the shallow old workings in the Heolgerrig area have found no particular risk from mine gases. However, it would be prudent to monitor any exploratory boreholes for evidence of mine gases.

/Cont....

7.3 Radon Gas

A Radon gas report obtained for the immediately adjacent 24 Penlan View identifies that current advice is that the location is not in a Radon affected area. The shallow geology beneath 24 Penlan View and the location of the proposed club house is the same so that the findings of the Radon report can be applied to the Site.

7.4 Summary of Risk Assessment

There is a significant risk of shallow mine workings being present beneath the Site in one coal seam and/or ironstone vein with the old workings at shallow enough depths to pose a risk of surface subsidence and to have an impact on the structural integrity of the proposed club house.

7.5 Recommendations

When the precise details of the proposed redevelopment have been confirmed the risk resulting from the mining heritage at the Site should be further explored with exploratory boreholes. It would be prudent to include in any exploration programme monitoring to assess the presence or otherwise of mine gases. If shallow old workings are found to be present the risk to the club house from those mining relics should be reduced by means of drilling and grouting.

The recommended further site investigation and any subsequent works will require a permit from The Coal Authority accompanied by a risk assessment and should be designed and supervised by a Chartered Geologist or other competent person.

7.6 Foundation Options

In so far as the solid geology of the Site is concerned no particular measures need be included in the design and construction of the foundations.

/Cont....

The findings of the recommended borehole investigation and ground investigation will be needed to inform the appropriate choice of foundation options.



**Dr Malcolm Blandford,
Chartered Geologist.**

Report Date: 25th April 2019.

**Blandford Consulting,
Consultant Geologists and Geotechnical Engineers,
The Enterprise Centre, Merthyr Industrial Park, Pentrebach, Merthyr Tydfil, CF48 4DR.
Tel. No. (01443) 693353. Fax. No. (01443) 693351.**

PLANS



*The Enterprise Centre,
Merthyr Industrial Park,
Pentrebach,
Merthyr Tydfil,
South Wales,
CF48 4DR.*

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Geologists Working With The Environment...

Study on Land at Merthyr Rugby Club Ground.

General Location Plan.

Plan Scale: 1:50,000.

Key to Symbols:



Approximate Position of Site.

Note:
North is at top of plan.

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MERTHYR TYDFIL,
SOUTH WALES,
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Drawing No: BC/MB/04.19.04.01.



Study on Land at Merthyr Rugby Club Ground.

Geology Plan.

Plan Scale: 1:10,560.

Key to Symbols:

— Approximate Site Boundary.

Note:
North is at top of plan.

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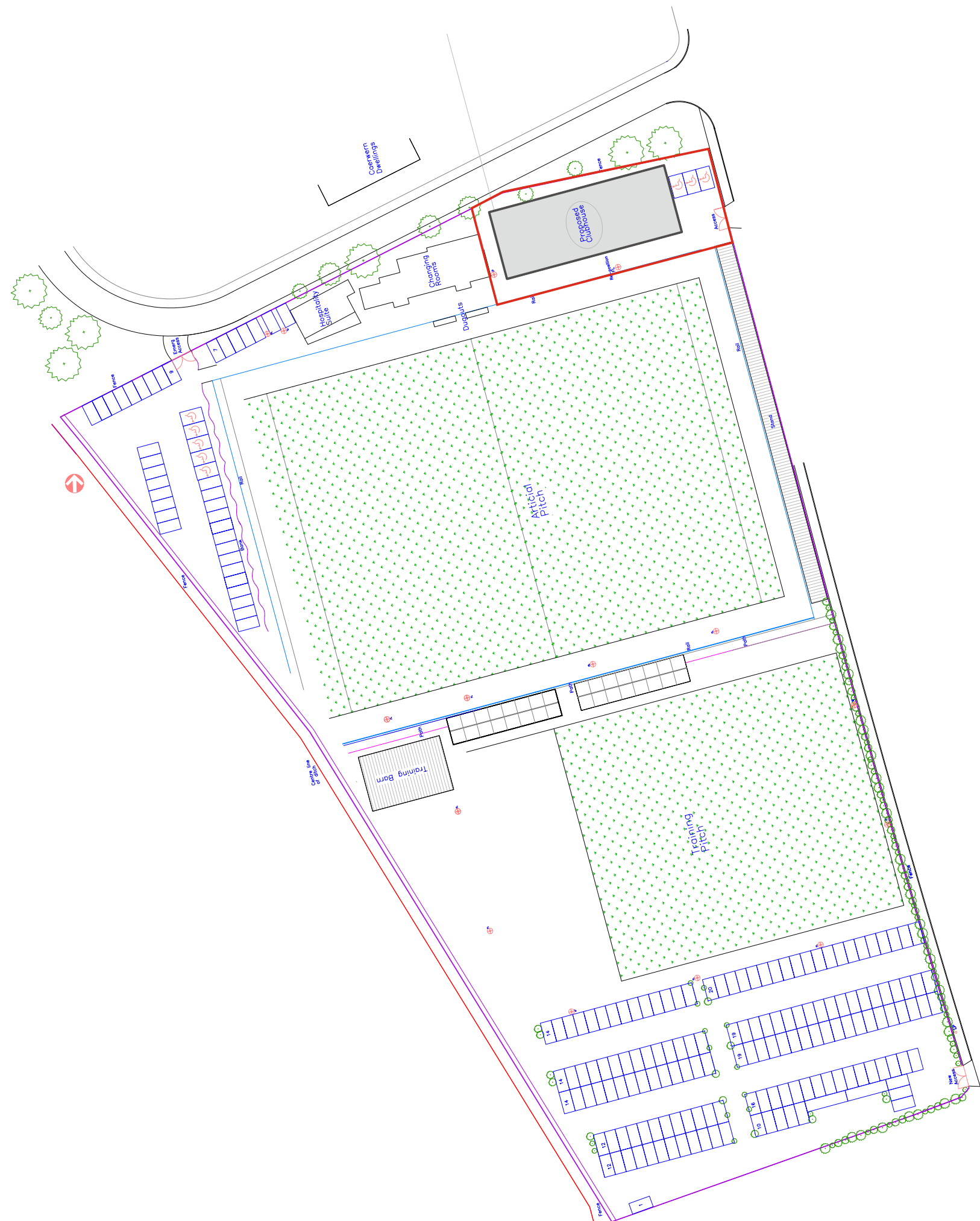


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Drawing No: BC/MB/04.19.04.02.





Study on Land at Merthyr Rugby Club Ground.

Detailed Location Plan.

Plan Scale: 1:1,000.

Key to Symbols:

— Approximate Site Boundary.

Notes:

North is at top of plan.

*Drawing extracted from drawing
prepared by Utopia Design Ltd.*

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Drawing No: BC/MB/04.19.04.03.

APPENDIX I

**COPY OF THE COAL
AUTHORITY'S MINING
REPORT REFERENCE NO.
51000874376001**



*The Enterprise Centre,
Merthyr Industrial Park,
Pentrebach,
Merthyr Tydfil,
South Wales,
CF48 4DR.*

BLANDFORD CONSULTING

Geologists Working With The Environment...



Issued by:

The Coal Authority, Property Search Services, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG
Website: www.groundstability.com Phone: 0345 762 6848 DX 716176 MANSFIELD 5

BLANDFORD CONSULTING
MERTHYR TYDFIL INDUSTRIAL PARK
PENTREBACH
MERTHYR TYDFIL
MID GLAMORGAN
CF48 4DR

Our reference: **51000874376001**
Your reference: **Merthyr Rugby Club**
Date of your enquiry: **29 April 2015**
Date we received your enquiry: **29 April 2015**
Date of issue: **29 April 2015**

This report is for the property described in the address below and the attached plan.

Non-Residential Coal Authority Mining Report

6 CAE'R WERN, MERTHYR TYDFIL, CF48 1AE

This report is based on and limited to the records held by, the Coal Authority, and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Coal mining	See comments below
Brine Compensation District	No

Information from the Coal Authority

Underground coal mining

Past

According to the records in our possession, the property is not within the zone of likely physical influence on the surface from past underground workings.

However the property is in an area where the Coal Authority believe 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 prior to any site works or future development activity. Your attention is drawn to the Comments on Coal Authority Information section of the report.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

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

The property is not in an area that is likely to be affected at the surface from any planned future workings.

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

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

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

Coal mining geology

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

Opencast coal mining

Past

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

Present

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

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

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.

Coal mining subsidence

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

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

The 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

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

Hazards related to coal mining

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

Withdrawal of support

The property is not in an area for which a notice of entitlement to withdraw support has been published.

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

Working facilities orders

The property is not in an area for which 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.

Payments to owners of former copyhold land

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

Comments on Coal Authority information

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.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional Remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim 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 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

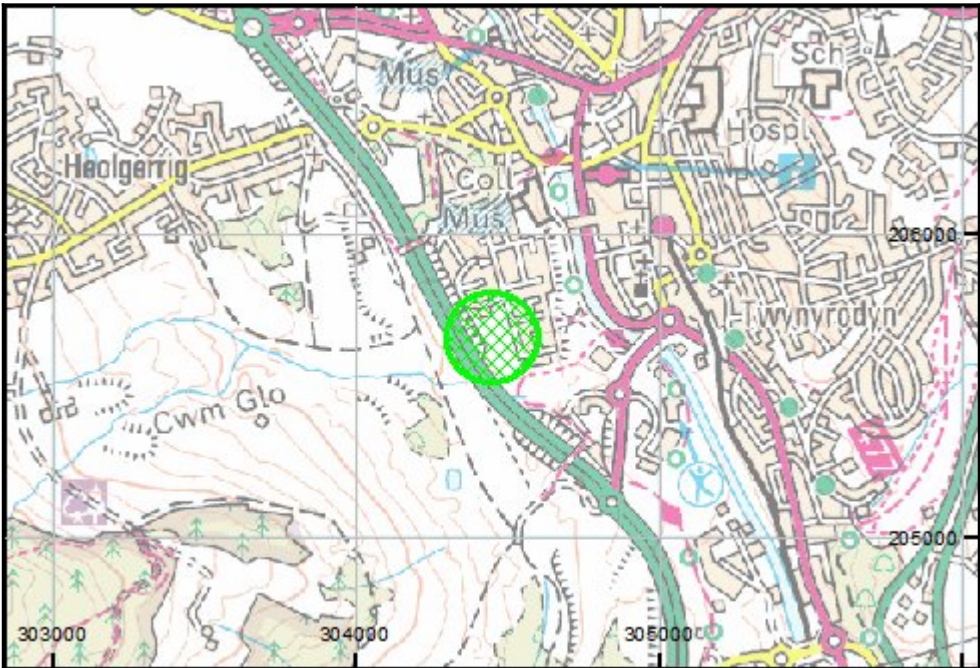
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Issued by:	The Coal Authority, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG
Tax Point Date:	29 April 2015
Issued to:	BLANDFORD CONSULTING MERTHYR TYDFIL INDUSTRIAL PARK PENTREBACH MERTHYR TYDFIL MID GLAMORGAN CF48 4DR
Property Search for:	6 CAE'R WERN, MERTHYR TYDFIL, CF48 1AE
Reference Number:	51000874376001
Date of Issue:	29 April 2015
Cost:	£59.00
VAT @ 20%:	£11.80
Total Received:	£70.80
VAT Registration	598 5850 68

Location map



Approximate position of property

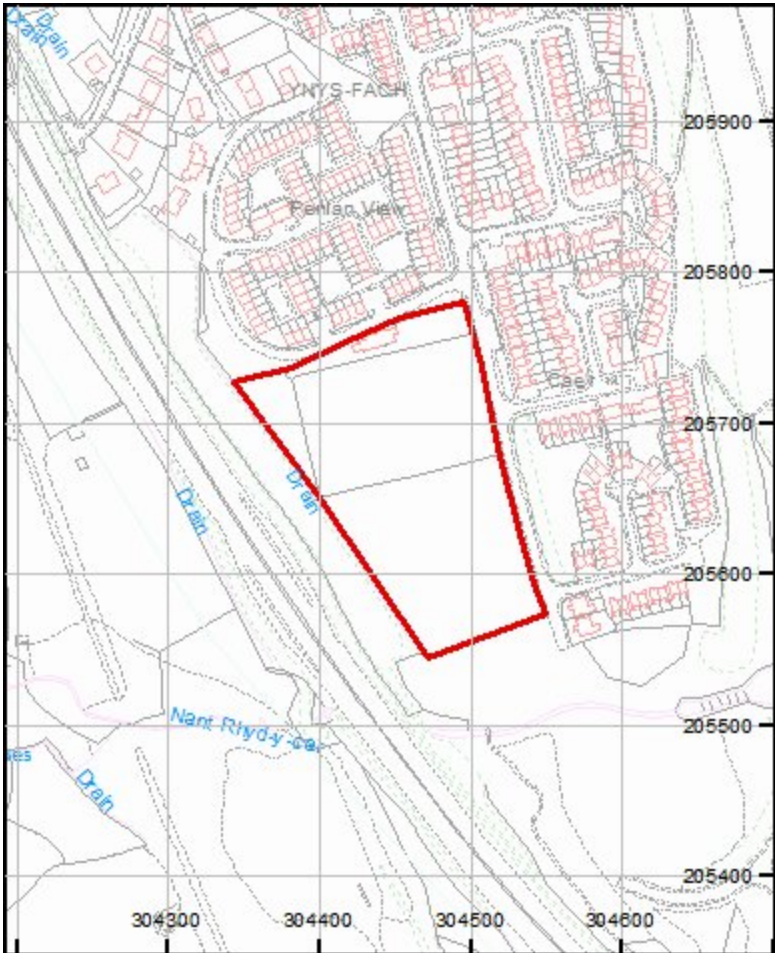


Enquiry boundary

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Key

Approximate position of enquiry boundary shown



APPENDIX II

COPY OF PUBLIC HEALTH ENGLAND'S RADON GAS REPORT



*The Enterprise Centre,
Merthyr Industrial Park,
Pentrebach,
Merthyr Tydfil,
South Wales,
CF48 4DR.*

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Geologists Working With The Environment....



Radon Risk Report for addresses in England and Wales

Issued by Public Health England and British Geological Survey. This is Based upon Crown Copyright and is reproduced with the permission of Land & Property Services under delegated authority from the Controller of Her Majesty's Stationery Office, © Crown copyright and database right 2014MOU512.

Address searched: 24 Penlan View, Merthyr Tydfil, CF47 8NJ

Grid reference searched:

304391 East

205756 North

Date of report: 11 August 2016

Guidance for existing properties

Is this property in a radon Affected Area? - No

The estimated probability of the property being above the Action Level for radon is: 0-1%

The result may not be valid for buildings larger than 25 metres.

This report informs you of the estimated probability that this particular property is above the Action Level for radon. This does not necessarily mean there is a radon problem in the property; the only way to find out whether it is above or below the Action Level is to carry out a radon measurement in an existing property.

Radon Affected Areas are designated by the Public Health England. PHE advises that radon gas should be measured in all properties within Radon Affected Areas.

If you are buying a currently occupied property in a Radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were above the Radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and the results of re-testing confirmed the effectiveness of the measures.

Further information is available from PHE or <http://www.ukradon.org>

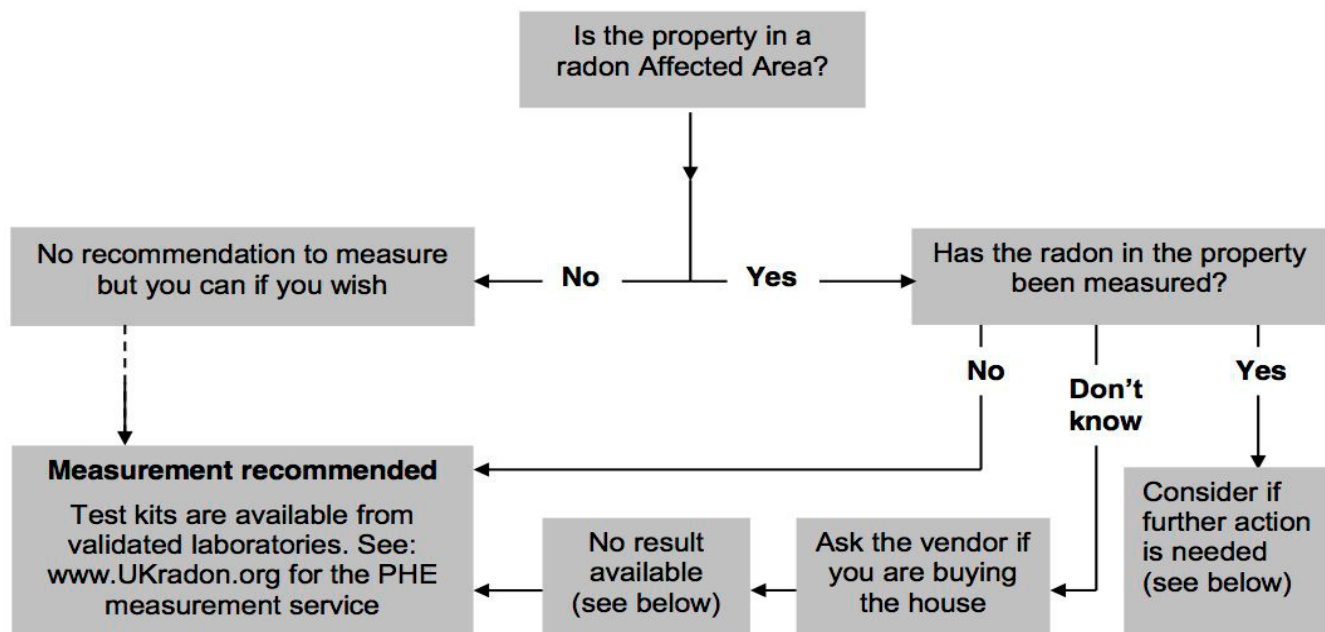
Guidance for new buildings and extensions to existing properties

What is the requirement under Building Regulations for radon protection in new buildings and extensions at the property location? - None

If you are buying a new property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

See the Radon and Building Regulations for more details.

PHE guidance for occupiers and prospective purchases



Existing radon test results: There is no public record of individual radon measurements. Results of previous tests can only be obtained from the seller. Radon levels can be significantly affected by changes to the building or its use, particularly by alterations to the heating and ventilation which can also be affected by changes in occupier. If in doubt, test again for reassurance.

Radon Bond: This is simply a retained fund, the terms of which are negotiated between the purchaser and the vendor. It allows the conveyance of the property to proceed without undue delay. The purchaser is protected against the possible cost of radon reduction work and the seller does not lose sale proceeds if the result is low. Make sure the agreement allows enough time to complete the test, get the result and arrange the work if needed.

High Results: Exposure to high levels of radon increases the risk of developing lung cancer. If a test in a home gives a result at or above the Action Level of 200 Becquerels per cubic metre of air (Bq/m³), formal advice will be given to lower the level. Radon reduction will also be recommended if the occupants include smokers or ex-smokers when the radon level is at or above the Target Level of 100 Bq/m³; these groups have a higher risk. Information on health risks and radon reduction work is available from PHE. Guidance about radon reduction work is also available from some Local Authorities, the Building Research Establishment and specialist contractors.

PHE designated radon website:

<http://www.ukradon.org>

Building Research Establishment:

<http://www.bre.co.uk/page.jsp?id=3137>