

EARTH ENVIRONMENTAL
& GEOTECHNICAL

Coal Mining Risk Assessment

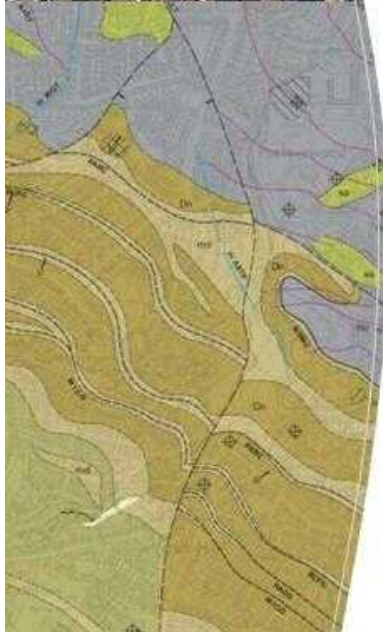
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Bristol

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Report Ref: B3461

December 2023



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COAL MINING RISK ASSESSMENT

2 ST. ANNES ROAD

BRISTOL

BS5 8RE

FOR

HOUSING PLOT LTD

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Report No. B3461/23

DECEMBER 2023

Report Title:	2 St. Annes Road, Bristol, BS5 8RE Coal Mining Risk Assessment
Report Reference:	B3461/23
Client:	Housing Plot Ltd
Issue Date:	12th December 2023
Drafted By:	J. Seaton
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1.0 INTRODUCTION

Appointment

- 1.1 Earth Environmental & Geotechnical (Southern) Ltd was instructed by Housing Plot Ltd (the 'Client'), to undertake a Coal Mining Risk Assessment for a proposed development in Bristol.
- 1.2 A Coal Mining Risk Assessment is required to support a planning application and to assist with the site design process.

Proposed Development

- 1.3 At the time of writing this report, proposed development details were not available.

Objective

- 1.4 The purpose of the Coal Mining Risk Assessment is to collate available geological, mining and historical data in order to assess the potential for the site to be affected by underground mining. This report has been drafted in accordance with the Coal Authority Coal Mining Risk Assessment Template, January 2011.

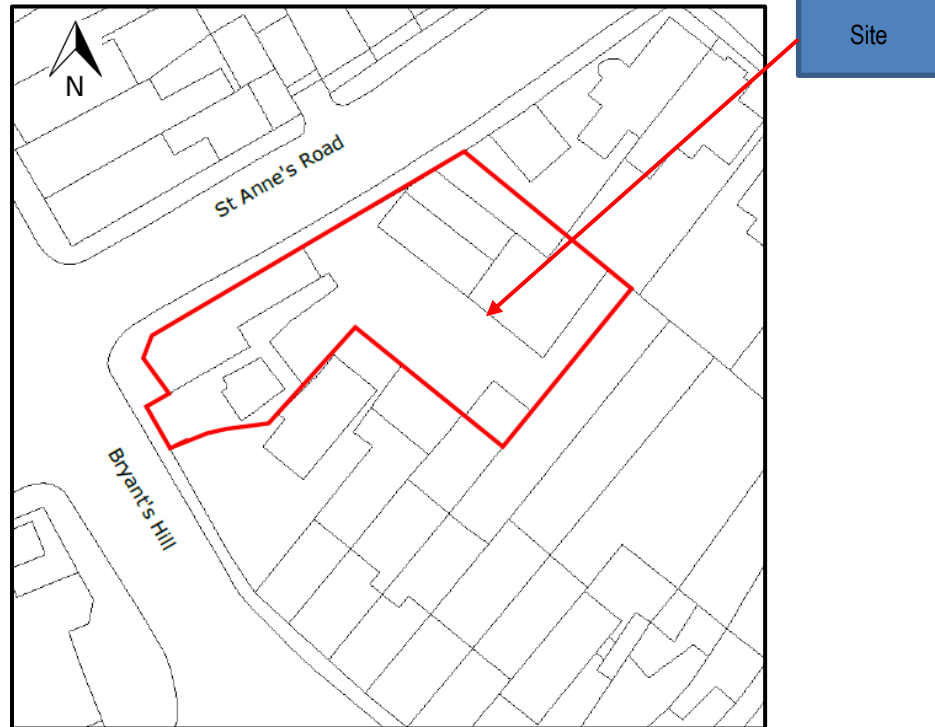
Sources of Information

- 1.5 The Coal Mining Risk Assessment comprises of a review of the following information sources:
- Online British Geological Survey maps and data.
 - Coal Authority Report reference 51003394452001 dated 11th December 2023.
 - Coal Authority Interactive Map Viewer.
 - British Geological Survey online borehole records.
 - Google Earth imagery.
 - Site Investigations in Areas of Mining Subsidence, FG Bell, 1975.
 - The threat of abandoned mines on the stability of urban areas, Barry Clarke, IAEG2006 Paper Number 379, The Geological Society of London, 2006.
 - Construction over abandoned mineworkings, CIRIA Special Publication 32, 2002.
 - Abandoned Mineworkings, CIRIA 758.

2.0 SITE LOCATION AND DESCRIPTION

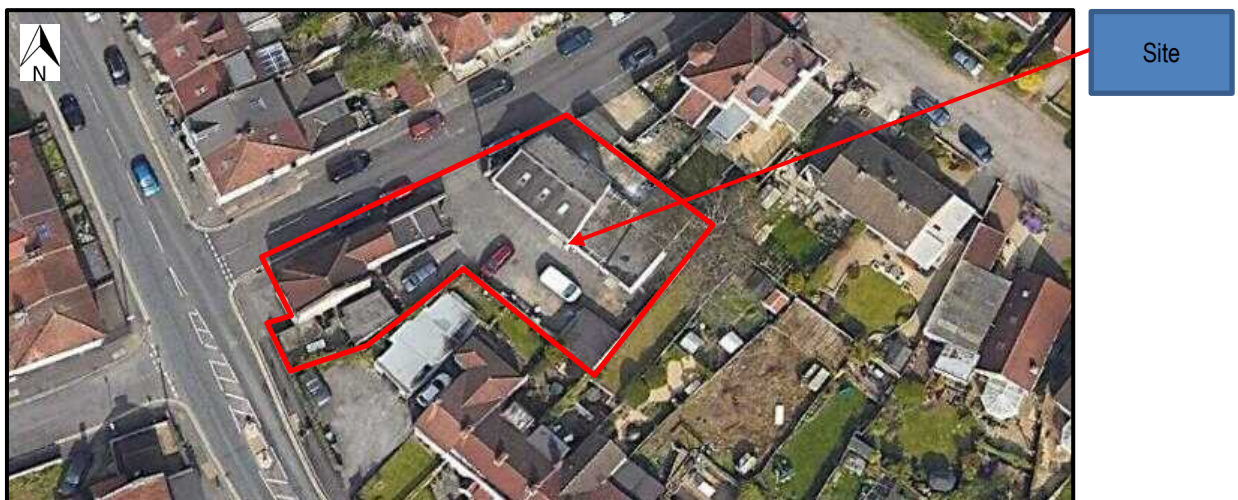
2.1 The site is located immediately to the south of St. Annes Road in Bristol at National Grid Reference 363747 172744 with a nearest postcode of BS5 8RE. The site and surrounding area are shown in Figure 2 below.

Figure 1 – Site Location Plan



2.2 The site is bounded to the north by St. Annes Road, to the west by Bryants Hill and to the east and south by residential properties. The site and surrounding area are shown in the aerial photograph (Figure 2) below.

Figure 2 – Aerial Photograph Showing Site and Surrounding Area



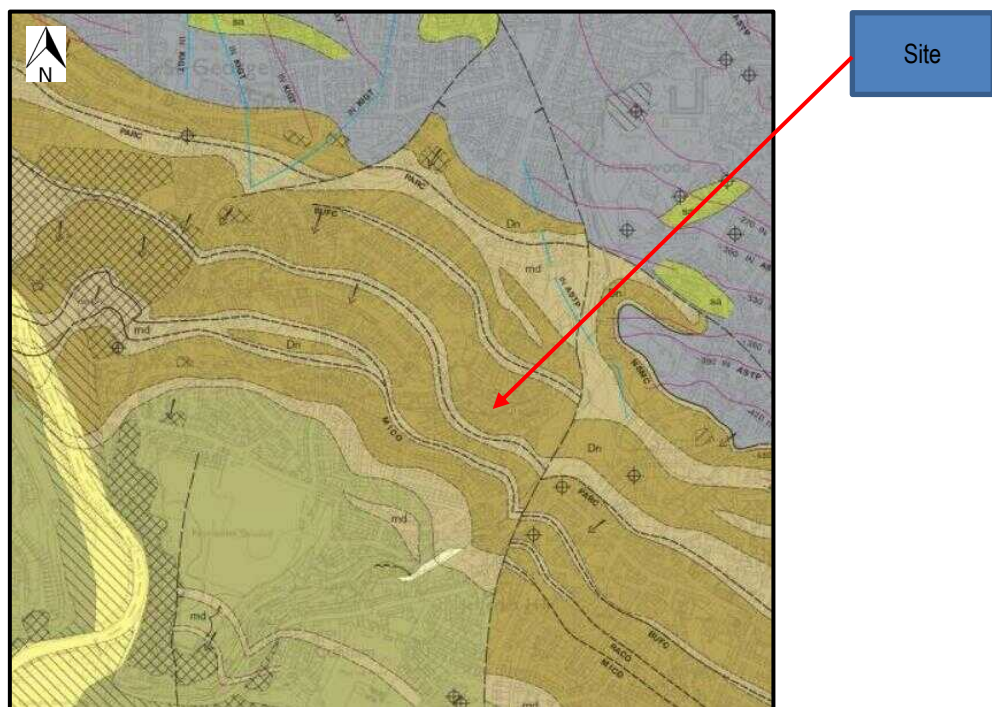
2.3 At the time of writing this report, the site was occupied by 2 St. Annes Road comprising a mixture of single-storey and two-storey buildings and an area of hardstanding parking.

3.0 ASSESSMENT OF DATA

Geological Information

- 3.1 The geology of the site has been determined from acquisition of geological maps for the area and examination of Coal Authority records.
- 3.2 The British Geological Survey (BGS) indicates the site is directly underlain by the Downend Member of Carboniferous Age.
- 3.3 The Downend Member is described as comprising sandstone with some conglomerate and pebbly sandstone and sporadic fissile mudstone beds. Some workable coal seams are also present.

Figure 3 – Geological Map Extract



- 3.4 There are no historical borehole records close to the site.
- 3.5 The regional dip of strata is to the south/southwest.
- 3.6 There are no geological faults or other linear features located on or close to the site.

Coal Authority Records

- 3.7 A Coal Authority Mining Report has been acquired for the site and is included in Appendix 1.
- 3.8 The shallowest recorded workings beneath the site are the Buff Seam at a depth of 53mbgl, with an extraction thickness of 90cm and a dip of 19.6° to the southwest, last worked in 1873.
- 3.9 The Coal Authority Report indicates there are probable unrecorded workings at shallow depth beneath the site.

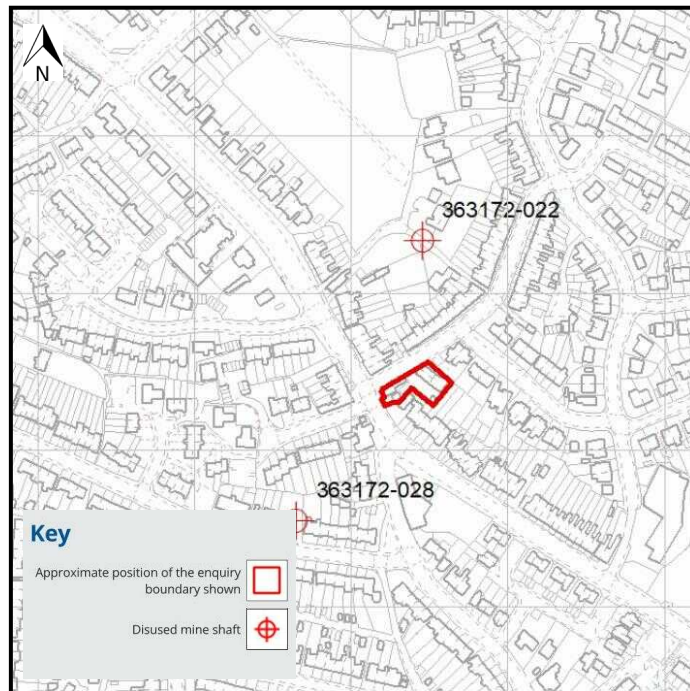
- 3.10 Examination of the Coal Authority online interactive map viewer indicates the site is located within a Development High Risk Area (DHRA) associated with unrecorded shallow workings, as shown in Figure 4 below.

Figure 4 – Site Location and Development High Risk (Hatched) Area



- 3.11 The site is not within a surface area that could be affected by present or future-planned underground mining.
- 3.12 There are 2 recorded mine shafts within 100m of the site which are recorded to have mined coal. The nearest is located approximately 90m to the north of the site at NGR 363746 172833. Another is located approximately 120m southwest of the site at NGR 363666 172654 which was found, filled and subsequently drilled and grouted to full depth by PS Geotechnical Consultancy for Ashwin Construction in December 2020. A reinforced concrete shaft cap was installed in October 2021. The shaft locations are shown in Figure 5 overleaf.

Figure 5 – Shaft Location Plan



- 3.13 There are no coal outcrops close to the site.
- 3.14 There are no opencast mines or Coal Authority Managed Tips within 500m of the site.
- 3.15 There are no records of remediated sites or coal mining subsidence within 50m of the site.
- 3.16 The Coal Authority has no record of mine gas emissions or mine water treatment schemes on or within 500m of the site.
- 3.17 There are no records of future planned underground mining on or close to the site.

4.0 COAL MINING RISK ASSESSMENT

Scope of Coal Mining Risk Assessment

- 4.1 The objective of the coal mining risk assessment is to provide a desk-based assessment of available geological and mining information relating to the assessment site (and wider area) and to use this information to identify risks present to the proposed development.
- 4.2 As part of the risk assessment, potential mitigation measures (if required) should be considered, including any necessary remedial works.
- 4.3 The outcome of the risk assessment should demonstrate to the Local Authority that the proposed development is or can be made safe (and stable) to meet the requirements of the National Planning Policy Framework (NPPF).

Data Limitations

- 4.4 It should be appreciated that it did not become a legal requirement to deposit coal mining abandonment plans until the 1870's and that this requirement was not rigorously enforced for some time after. Many shallow coal seams were worked prior to the introduction of first edition Ordnance Survey Maps and information on these workings is often not available. Therefore, if coal seams were accessible, they could have been worked by formal or informal means.
- 4.5 If unrecorded workings are present, then unrecorded mine entries may also be present.

Coal Mining Risks

- 4.6 The risks associated with coal mining are as follows:
- Collapse of relict workings beneath buildings causing damage to the building fabric and infrastructure.
 - Migration of mine gases from old mine works and mine entries resulting in build-up of flammable and asphyxiating gases in confined areas.
 - Consolidation of relict workings and overlying strata causing structural defects in building fabric and infrastructure.
 - Failure of mine entries causing loss of ground beneath building and external areas.
 - Spontaneous combustion of old mineworkings.

Summary of Risk

- 4.7 The shallowest recorded past underground workings beneath the site are at a depth of 53mbgl, last worked in 1873. These workings are considered at a sufficient depth as to not affect development at the surface.
- 4.8 The site is located within a Development High Risk Area, associated with unrecorded shallow depth mine workings, which could potentially influence development at surface, depending on depth and size.
- 4.9 The closest recorded mine shaft entry is located approximately 90m to the north of the site. It should be noted that Coal Authority records have a departure of 10m in any one direction of these type of

features due to historical inaccuracies in plotting locations and transferring data. Taking the potential departure distance into account, it is considered the shafts is at a sufficient distance from the site as to not affect the site itself.

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

Table 1 – Summary of Potential Risks Associated with Coal Mining Legacy

Coal Mining Issue	Yes	No	Risk Assessment
Underground coal mining (recorded at shallow depths)		N	Low
Underground coal mining (probable at shallow depths)	Y		Moderate
Coal Outcrops		N	Low
Mine entries (shafts and adits)		N	Low
Coal mining geology (fissures)		N	Low
Record of past mine gas emissions		N	Low
Recorded coal mining surface hazard		N	Low
Surface mining (opencast workings)		N	Low

Proposed Mitigation Strategy

- 4.11 The site is located in an area where there could be unrecorded coal mine workings at shallow depth beneath the site.
- 4.12 As a result, further site investigation work is considered necessary which will require a permit (and fee) from the Coal Authority. The site investigation should allow for a minimum of two rotary open holes drilled to a depth of 30m to determine the presence or not of unrecorded workings.
- 4.13 A method statement and risk assessment will need to be supplied to the Coal Authority.

Planning Permission

- 4.14 Despite the proposed ground investigation works recommended above, we see no reason why Planning Permission should not be granted in the interim (with respect to coal mining legacy issues) with the proposed mitigation works forming a condition on the planning approval.

APPENDIX 1

COAL AUTHORITY MINING REPORT



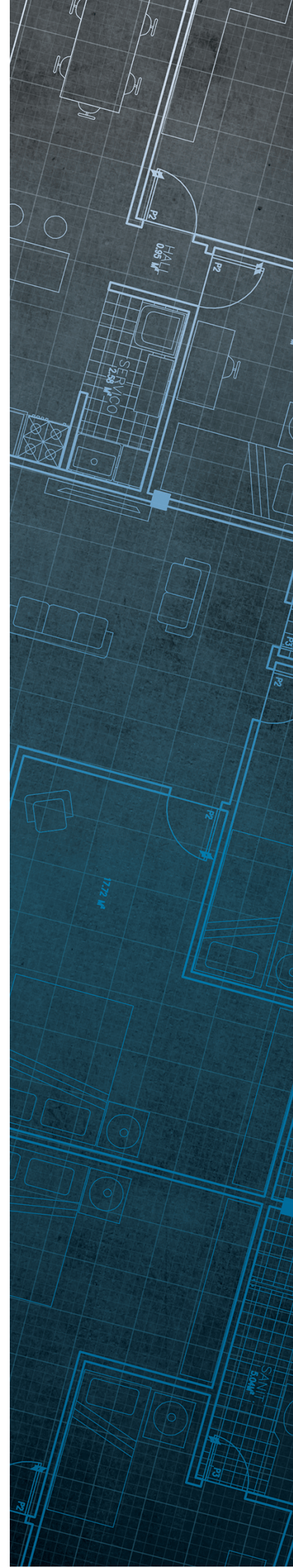
The Coal
Authority

Consultants Coal Mining Report

2 St Annes Road
St George
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Bristol City
BS5 8RE

Date of enquiry: 11 December 2023
Date enquiry received: 11 December 2023
Issue date: 11 December 2023

Our reference: 51003394452001
Your reference: B3461



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

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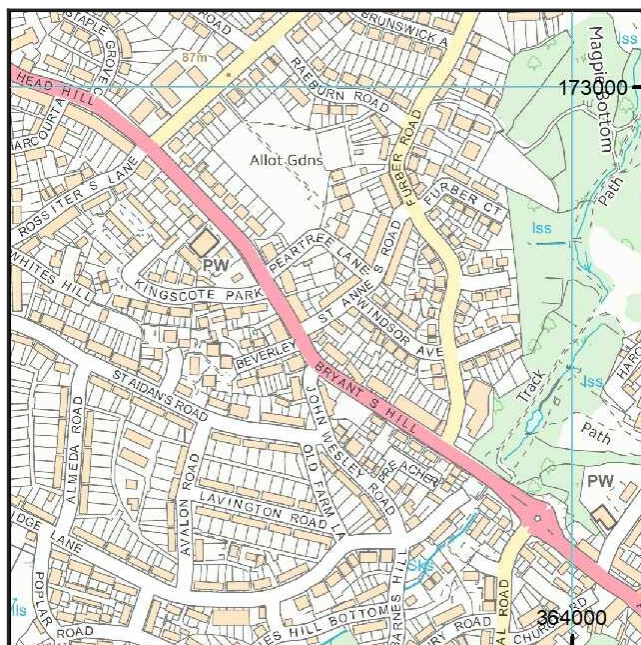
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

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Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

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	BUFF	Coal	3BB8	53	Beneath Property	19.6	South-West	90	1873
unnamed	SEVEN FOOT (RED ASH)	Coal	3B90	395	North-East	17.5	South	90	1900
unnamed	SEVEN FOOT	Coal	3B8U	533	East	23.6	South	80	1920

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	363172-022	363746 172833		Coal	
Shaft	363172-028	363666 172654	Found filled and subsequently drilled and grouted to full depth by PS Geotechnical Consultancy for Ashwin Construction in December 2020. Reinforced concrete shaft cap was installed in October 2021	Coal	

Abandoned mine plan catalogue numbers

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

SWR3406	17639	SWR3425
8953	PO0	SWR3407
3556		

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.

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.

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

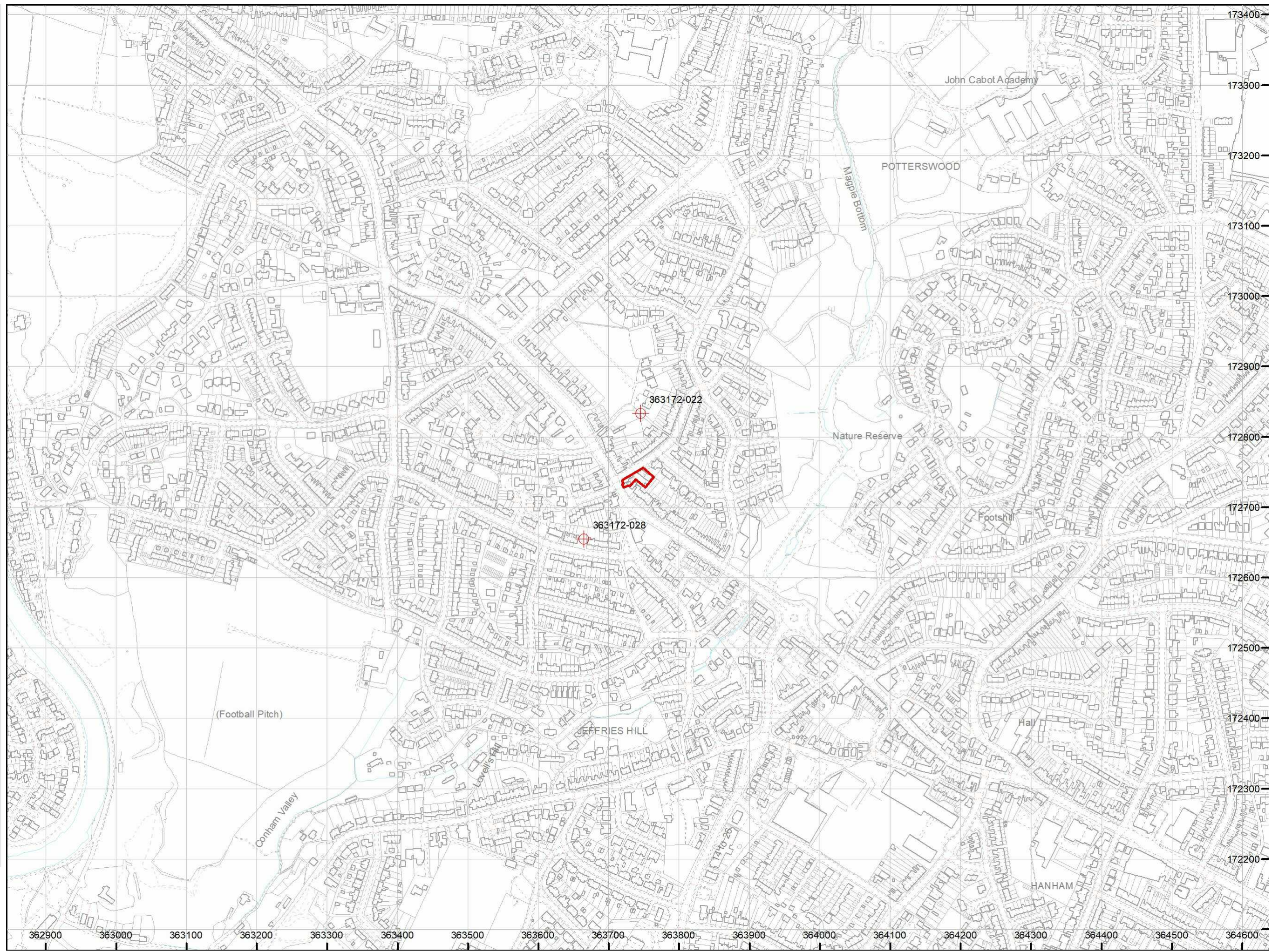
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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

Key

- Approximate position of the enquiry boundary shown 
- Disused mine shaft 

How to contact us
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APPENDIX 2

REPORT LIMITATIONS

REPORT LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd on the basis of a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill, and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget and staff resources allocated to the project.

Other than that, expressly contained in the above paragraph, Earth Environmental & Geotechnical Ltd provides no other representation or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Earth Environmental & Geotechnical Ltd.

If a third party relies on this report, it does so wholly at its own and sole risk and Earth Environmental & Geotechnical Ltd disclaims any liability to such parties.

It is Earth Environmental & Geotechnical Ltd understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was an important factor in determining the scope and level of the services. Should the purpose for which the report is used, or the proposed use of the site change, this report will no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without Earth Environmental & Geotechnical Ltd review and advice shall be at the client's sole and own risk.

The report was written in 2023 and should be read in light of any subsequent changes in legislation, statutory requirements and industry best practices. Ground conditions can also change over time and further investigations, or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice of Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report.

Earth Environmental & Geotechnical Ltd is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Earth Environmental & Geotechnical Ltd did not seek to evaluate the presence on or off the site of electromagnetic fields, lead paint, radon gas or other radioactive materials.

The services are based upon Earth Environmental & Geotechnical Ltd observations of existing physical conditions at the site gained from a walkover survey of the site together with Earth Environmental & Geotechnical Ltd interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified.

No responsibility can be accepted for errors within third party items presented in this report. Further Earth Environmental & Geotechnical Ltd was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Earth Environmental & Geotechnical Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Earth Environmental & Geotechnical Ltd and including the doing of any independent investigation of the information provided to Earth Environmental & Geotechnical Ltd save as otherwise provided in the terms of the contract between the client and Earth Environmental & Geotechnical Ltd.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.