



EARTH ENVIRONMENTAL
& GEOTECHNICAL

Coal Mining Risk Assessment

Watling Street

Bury

September 2021

On behalf of

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Report No. A4355/21

SEPTEMBER 2021

Report Title:	Watling Street, Bury Coal Mining Risk Assessment	
Report Reference:	A4355/21	
Client:	Mrs. Mackenzie	
Issue Date:	27th September 2021	
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1.0 INTRODUCTION

Appointment

- 1.1 Earth Environmental & Geotechnical Ltd have been commissioned by Mrs. Mackenzie (the Client), to undertake a Coal Mining Risk Assessment for a proposed new residential dwelling on vacant land along Watling Street, Bury.
- 1.2 This Coal Mining Risk Assessment is required to accompany a future planning application to Bury Council.

Objective

- 1.3 The purpose of the Coal Mining Risk Assessment is to collate available geological, mining, and historical data to assess the potential for the site to be affected by underground mining.
- 1.4 This report has been drafted in accordance with the Coal Authority (CA) Guidance Risk Based Approach to Development Management, Version 4, 2017.

Sources of Information

- 1.5 The Coal Mining Risk Assessment compiles a review of the following information sources:
- British Geological Survey of England, Sheet 76 Rochdale, 1/50,000 scale, 2008 edition.
 - British Geological Survey of England, SD71SE, 1/10,000, 2007 edition.
 - Coal Authority Interactive Map Viewer.
 - Coal Authority Mining Report.
 - British Geological Survey online borehole records.
 - Google Earth imagery.
 - Online Historical Ordnance Survey maps.
 - 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.
 - The collapse of shallow coal mine workings, Durham theses, Durham University, Garrard, 1981.
 - Construction over abandoned mineworking's, CIRIA Special Publication 32, 2002.
 - Abandoned Mineworking's Manual, CIRIA 2019.
 - Bury Council planning portal.
 - Geology of the Burnley Area, BGS Internal Report WA/00/30, 2004.

2.0 SITE LOCATION AND DESCRIPTION

- 2.1 The site is located approximately 1.9km west of Tottington town centre and lies at an elevation of approximately 273mAOD (centre of site).
- 2.2 The approximate National Grid Reference for the centre of the site is SD75454 13730 with the closest postcode being BL8 3QN.
- 2.3 The site lies adjacent to Watling Street adjacent to terraced properties in an agricultural setting on the fringe of an urban area.
- 2.4 A location plan is shown below as Figure 1 together with a photograph as Figure 2 (overleaf).

Figure 2 Site Location Plan

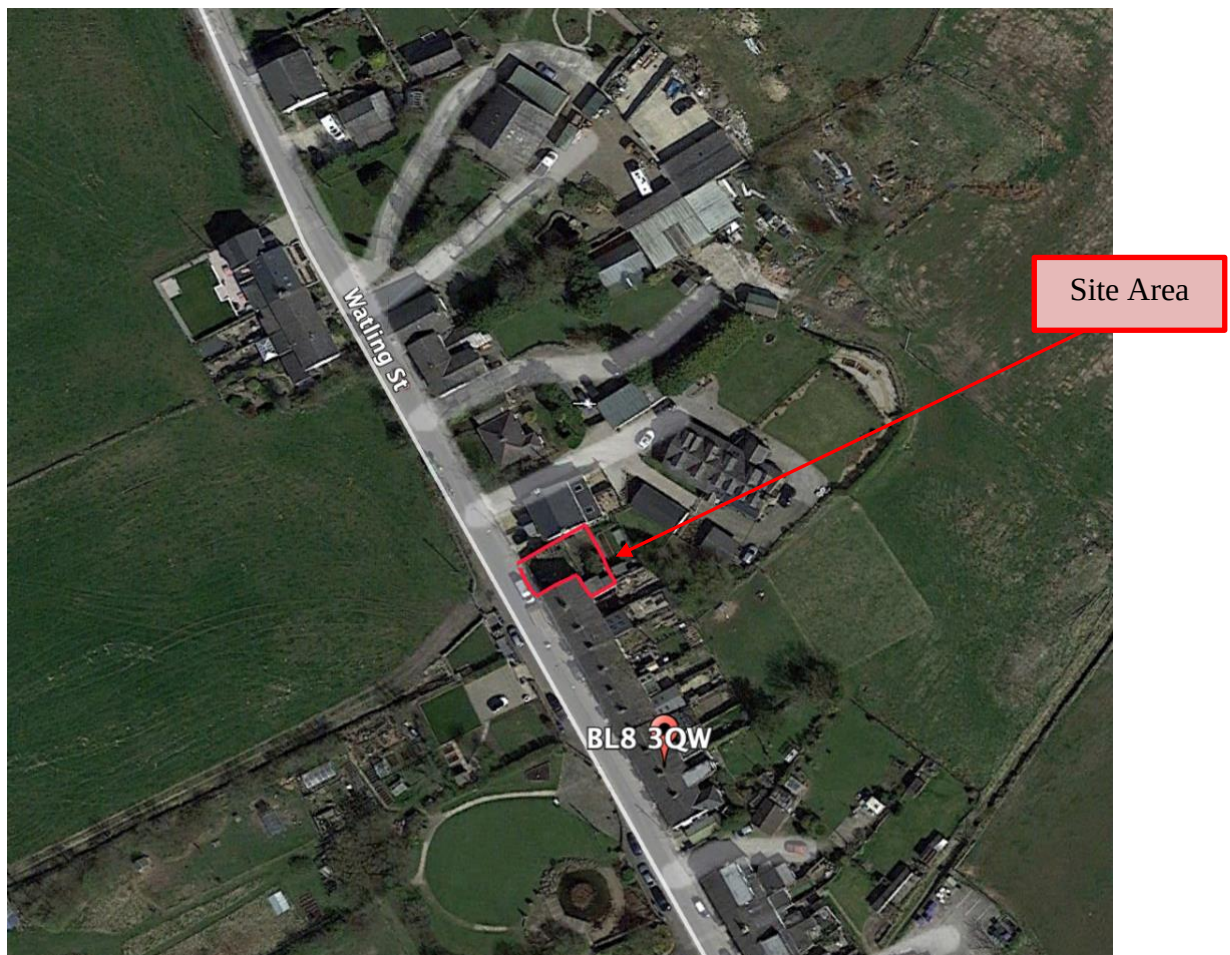
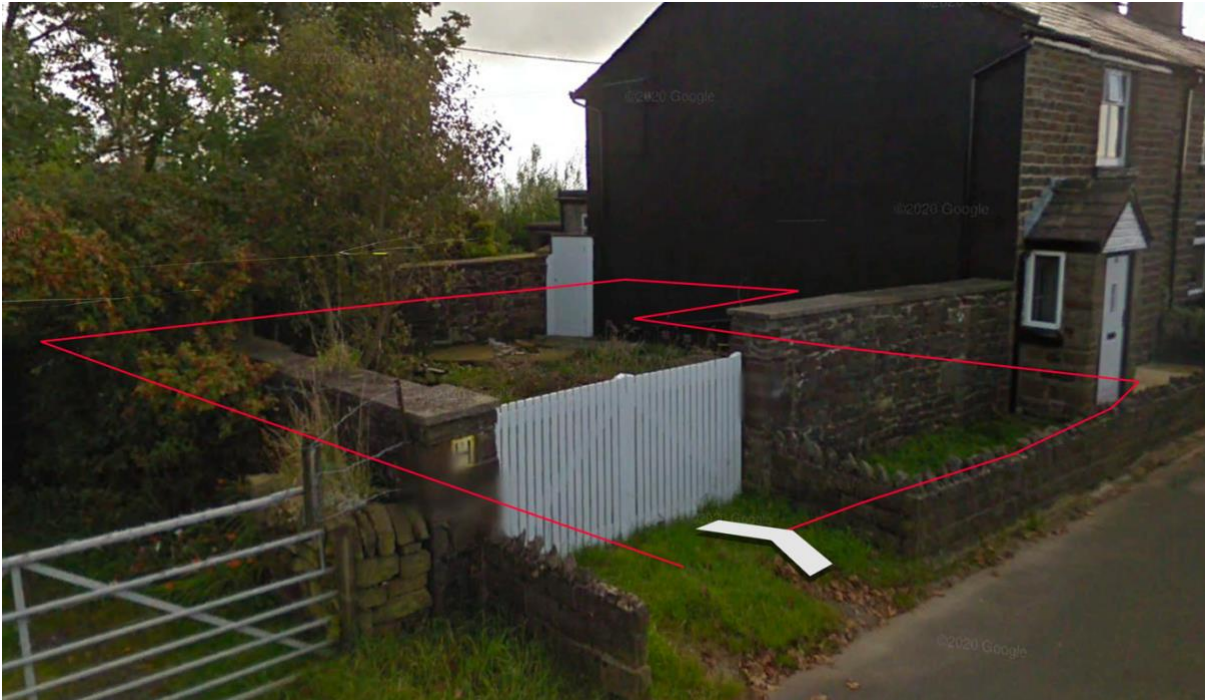


Figure 2 Aerial Photograph



3.0 ASSESSMENT OF DATA

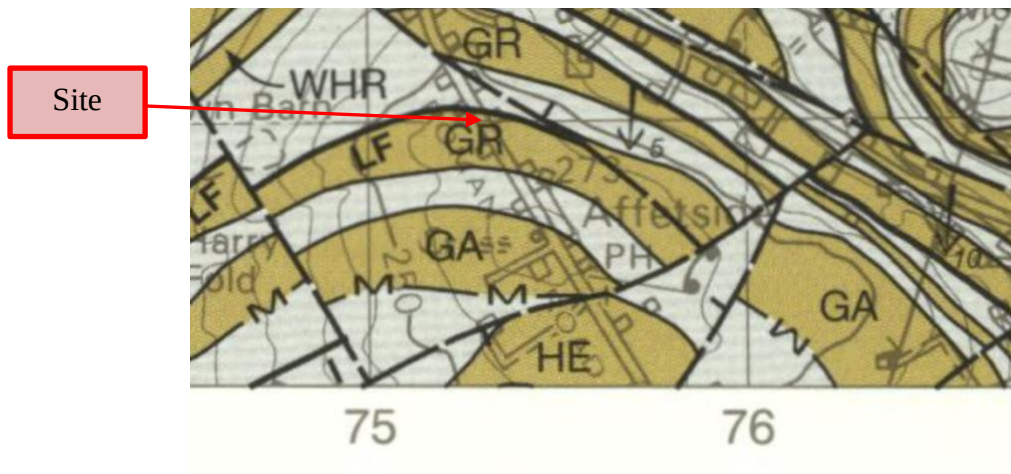
Geological Information

- 3.1 The geology of the site has been determined from geological maps for the area and examination of Coal Authority (CA) records.

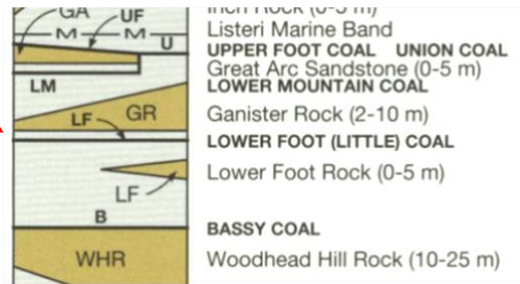
British Geological Survey Published Data Assessment

- 3.2 The site is not underlain by superficial deposits.
- 3.3 The solid geology beneath the site is shown to be the Pennine Lower Coal Measures Formation consisting of coal seams, sandstones, siltstones, and mudstones.
- 3.4 There no BGS borehole records that allow for further assessment of the local geology or shallow coal mining regime.
- 3.5 An extract from the most recently published geological map showing the approximate site location and key local geological features are presented below in Figure 3.
- 3.6 The outcrop of the Lower Foot coal seam is shown on the site, underlain by the Bassy coal seam. The Lower Foot coal seam is present about 13m above the Bassy coal the intervening strata being composed of mudstone. The thickness of the Lower Foot coal seam is 0.31m at Old Burnt Hall Pit (SD82NW/4).
- 3.7 The local dip direction is five degrees to the south.

Figure 3 Geology Map Extract



Lower
Foot coal
seam

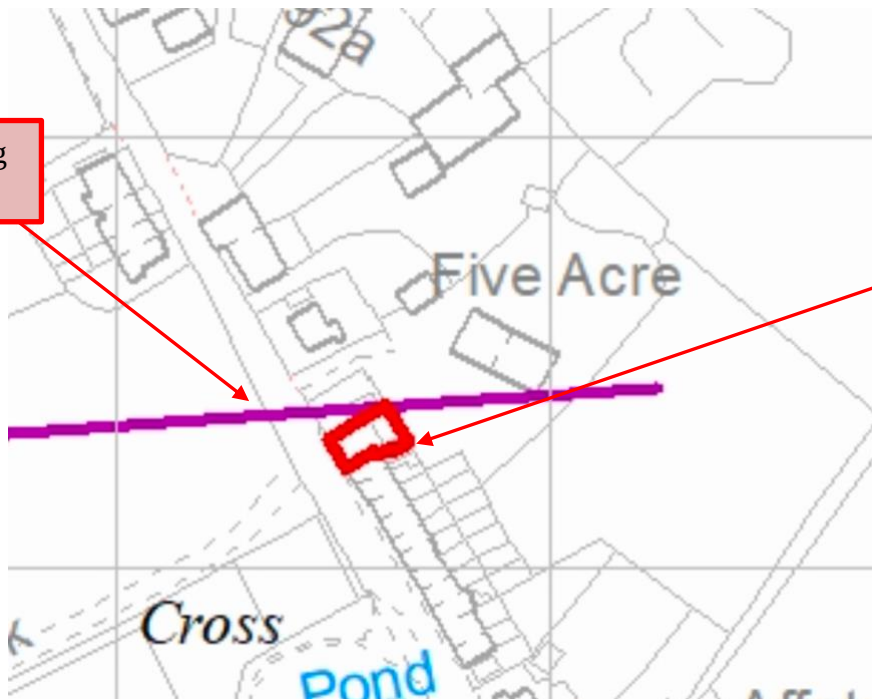


Coal Authority Records

- 3.8 Reference to the Coal Authority Online Interactive viewer shows the site to be located within a Development High Risk Area and area of Probable Shallow Mineworkings.
- 3.9 A Coal Authority Mining Report (extract shown as Figure 4) has been acquired for the site and reveals that there are no proven records of past underground mine workings beneath the site.

Figure 4 Coal Authority Map Extract

Outcropping
coal seam



Site

- 3.10 The Coal Authority report suggests that there are probable unrecorded shallow workings beneath the site. There are no past shallow coal mine workings within the area.
- 3.11 The Upper Foot coal seam outcrops on the northern the site boundary.
- 3.12 There are no records of any geological faults, opencast mines, subsidence, managed tips, or remediated sites.

Historical information

- 3.13 The available historical plans dating back to 1875 show no mining features on the site or in the local area.

4.0 COAL MINING RISK ASSESSMENT

Scope of Coal Mining Risk Assessment

- 4.1 Objectives of the coal mining risk assessment are to provide a desk-based assessment of available geological and mining information relating to the site (and wider area) and to use this information so as to identify risks present to the development from the legacy of mining.
- 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 then there is the potential that they could have been worked by formal or informal means.
- 4.5 It is also possible that if unrecorded workings are present then unrecorded mine entries may 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 workings and mine entries resulting in accumulation 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 mine workings.

Conclusions

- 4.7 The development area lies within a Coal Authority Development High Risk Area due to probable shallow mine workings beneath the site, associated with the Lower Foot coal seam.

Proposed Mitigation Strategy

- 4.8 There is a risk to the development from shallow coal mining activity beneath the site from a thin and a locally outcropping coal seam.
- 4.9 It would be prudent to incorporate a reinforced raft foundation for the new residential dwelling.
- 4.10 During the construction process all foundation excavations should be inspected if coal seams or evidence of former mineworkings are exposed.
- 4.11 If such features are found, then a remediation strategy will need to be implemented.
- 4.12 This report should allow for planning permission to be granted with relevant conditions.

APPENDIX 1

COAL AUTHORITY MINING REPORT

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.

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The report was written in 2021 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.

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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.