



EARTH ENVIRONMENTAL
& GEOTECHNICAL



Coal Mining Risk Assessment

Land Opposite Royal Oak
Cottages

Brynydd

Wrexham

December 2023

On behalf of

Paul Evans & Pam Hughes



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CONTENTS

1.0	INTRODUCTION.....	1
	Appointment	1
	Objective	2
	Sources of Information	2
2.0	SITE LOCATION AND DESCRIPTION.....	3
3.0	ASSESSMENT OF DATA.....	4
	Geological Information	4
	British Geological Survey Published Data Assessment.....	4
	Coal Authority Records	6
4.0	COAL MINING RISK ASSESSMENT	9
	Scope of Coal Mining Risk Assessment.....	9
	Data Limitations.....	9
	Coal Mining Risks.....	9
	Conclusions.....	10
	Proposed Mitigation Strategy	10

FIGURES

Figure 1	Proposed Development Plan
Figure 2	Site Location Plan
Figure 3	British Geological Survey Boreholes
Figure 4	NKC Site Investigation Boreholes
Figure 5	BGS Geology Map Extract
Figure 6	Coal Authority Map Extract

APPENDICES

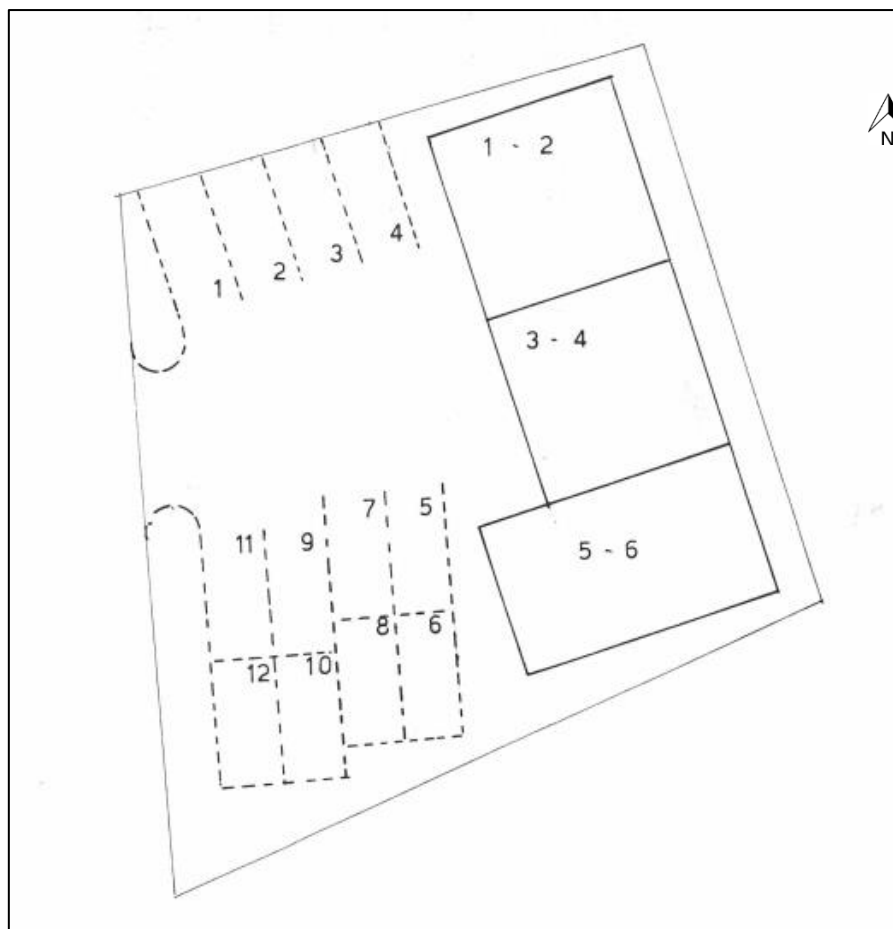
Appendix 1	Coal Authority Consultants Mining Report
Appendix 2	Report Limitations

1.0 INTRODUCTION

Appointment

- 1.1 Earth Environmental & Geotechnical Ltd have been commissioned by Paul Evans & Pam Hughes (the Client), to undertake a Coal Mining Risk Assessment for a proposed development on land opposite Royal Oak Cottages, Ponciau, Wrexham.
- 1.2 It is understood that the proposed development consists of the construction of up to six dwellings with associated landscaping and car spacing.
- 1.3 The site is the car park of a recently (2020) demolished public house (Royal Oak) with an outdoor seating area. The Royal Oak was built in 1835, the area formerly being fields east of the village of Ponciau according to the Ponciau estate map of 1826.
- 1.4 Access to the proposed development will be provided from Oak Road adjacent to the east of the site and/or from Brynydd via Fennant Road adjacent to the west of the site.
- 1.5 A proposed development plan has been provided and is shown as Figure 1.

Figure 1: Proposed Development Plan



Objective

- 1.6 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.
- 1.7 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

- 1.8 The Coal Mining Risk Assessment compiles a review of the following information sources:
- British Geological Survey of England & Wales, Denbighshire, Sheet SJ24 NE, 1/10,560, 1978 edition and Wrexham Sheet 121, 1/50,000, 1994.
 - 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.
 - British Geological Survey, "GeoIndex," [Online]. Available: <http://mapapps2.bgs.ac.uk/geoindex/home.html>.
 - The collapse of shallow coal mine workings, Durham theses, Durham University, Garrard, 1981.
 - CIRIA SP32 'Construction over abandoned mine workings'," 1984.CIRIA C758D, 'Abandoned mineworkings manual'," 2019Wigan Council planning portal.
 - old-maps.co.uk, "Old Maps," old-maps.co.uk, 2020. [Online]. Available: <https://www.old-maps.co.uk>. [Accessed 08 October 2020].
 - NKC Geotech, Mining Investigation Report, 29 June 2017.

2.0 SITE LOCATION AND DESCRIPTION

- 2.1 The site is located on the corner of Fennant Road to the south, Oak Road to the east, and Brynydd to the west, Ponciau, Wrexham, approximately 5.8km southwest of Wrexham Central Train Station.
- 2.2 The approximate National Grid Reference for the centre of the site is SJ 29689 46813 (X: 329689, Y: 346813), with the closest postcode being LL14 1HY.
- 2.3 The site is currently unoccupied consisting of hardstanding ground which is currently being used as a car park.
- 2.4 Adjacent to the northern boundary are residential dwellings.
- 2.5 Surrounding the immediate site proximity are residential dwellings, with agricultural land located 225m to the east. Ponciau pool is located 100m southeast of the site's southern boundary.
- 2.6 The site can be access by either Fennant Road, Oak Road or Brynydd.
- 2.7 A location plan is shown below as Figure 2 (below).

Figure 2: Site Location Plan



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

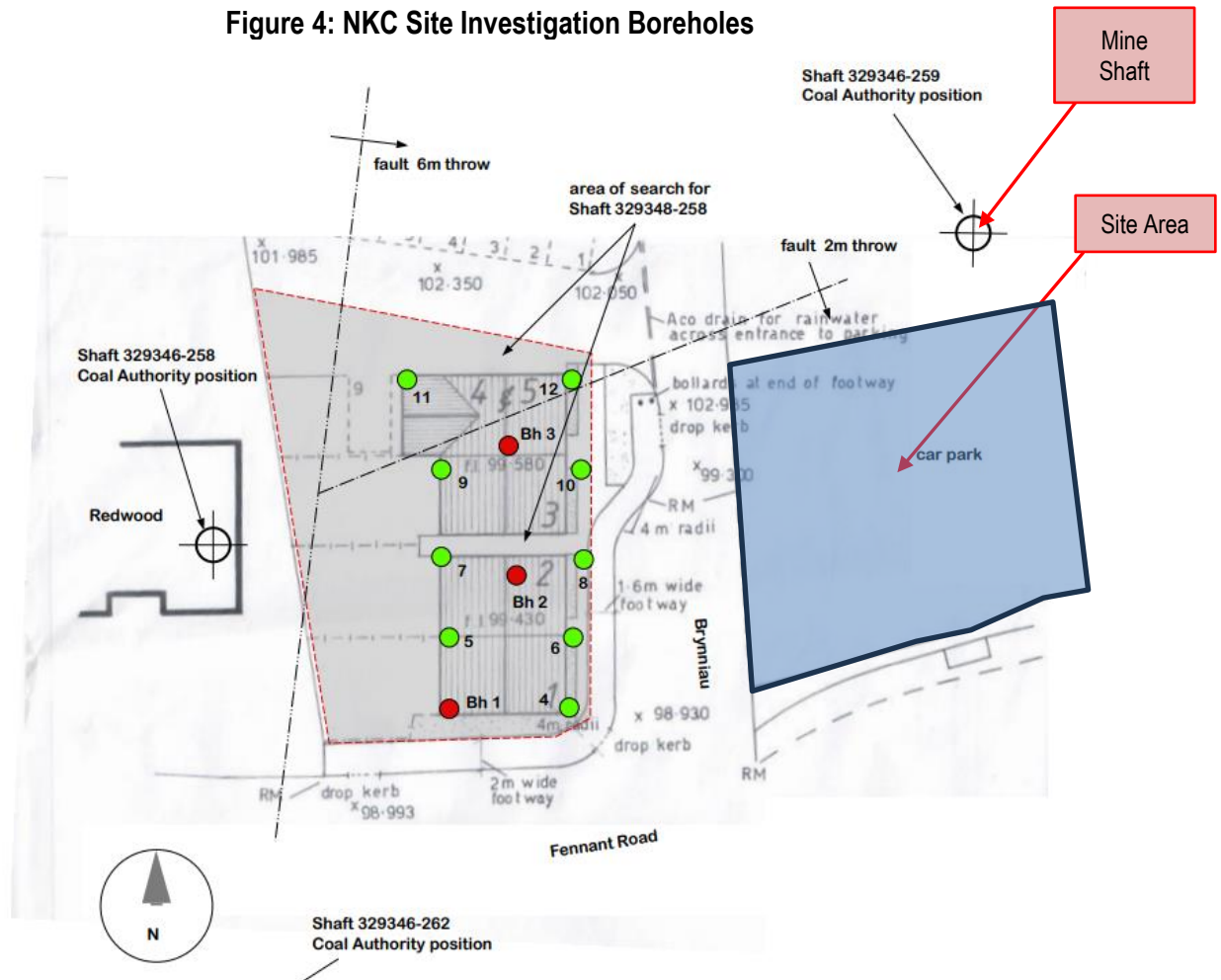
- 3.2 Superficial deposits of Devensian Till, comprising Diamicton, are recorded to underlie the site. This stratum is commonly referred to as Boulder Clay.
- 3.3 The solid geology beneath the site is recorded to be the Pennine Lower & Middle Coal Measures Formation comprising coal seams, mudstone, siltstone, and sandstone of Carboniferous age.
- 3.4 There are several BGS borehole records near to the site and these are shown in Figure 3 below.

Figure 3: British Geological Survey Boreholes



- 3.5 Borehole record SJ24N740 on or close to the northern boundary is an unnamed shaft.
- 3.6 Borehole record SJ24N739 to the west of the site is a unnamed shaft.
- 3.7 Borehole record SJ24N741 to the east of the site is a unnamed shaft.
- 3.8 A previous site investigation is available 10m west of the site (NKC Geotech Ltd 'Mining Investigation Report', dated June 2017). Figure 4 (below) shows the location of all rotary open hole boreholes.

Figure 4: NKC Site Investigation Boreholes



- 3.9 The investigation included the drilling of rotary open-hole boreholes to investigate the shallow coal mining regime, as well as excavation and probe drilling for a mine shaft recorded to be on site.
- 3.10 The borehole records show superficial deposits to 1.5m underlain by sandstone, shale, and coal seams. The report suggests that the regional dip of strata is seven degrees to the east.
- 3.11 The Main Coal seam was found at a depth of 18m bgl. The Brassey Coal seam was found at a depth of 25.8m bgl.
- 3.12 The investigation found no evidence of past shallow mining activity within the Main Coal seam.
- 3.13 The underlying Brassey coal seam has been partially worked but lies “too deep to affect surface stability”.
- 3.14 The report concluded that proposed dwellings could use reinforced strip foundations designed to span 2.0m, with no other necessary remedial work.
- 3.15 An extract from the most recently published geological map showing the approximate site location and key local geological features are presented in Figure 5.

- 3.16 The geological map shows the inferred outcrop of the Main coal seam approximately 140m west of the site, overlain by sandstone (Main Rock).
- 3.17 The Main coal is split into two coals seams, 0.7m and 1.80m thick.
- 3.18 The inferred direction of dip of strata is to the east based on the geological map.

Coal Authority Records

- 3.19 Reference to the Coal Authority Online Interactive viewer shows the site to be located within a Development High Risk Area and area of Proven Shallow Mineworkings.
- 3.20 A Coal Authority Mining Report (extract shown as Figure 6) has been acquired for the site. This indicates that past underground mining has occurred beneath the site. This is related to the Main Coal seam that was last mined in 1860 at a depth of 13m bgl.
- 3.21 The seam is recorded to have an extraction thickness of 2.4m with a dip of 7.5 degrees to the east.
- 3.22 The report states that there are probable unrecorded shallow workings beneath the site, however the Coal Authority Interactive Viewer indicates that the site lies within an area of moderate probable coal workings.
- 3.23 Despite the information on geological maps the Coal Authority reports suggests that there are no local outcrops.
- 3.24 There are several mine entries recorded within 100m of the site with shaft 329346-259 located close to the northern boundary of the site. There is no record in relation to treatment of the mineshaft. The Coal Authority Interactive Viewer suggests a positional accuracy (departure) of 10m.
- 3.25 There are no faults, fissures or breaklines recorded on site.
- 3.26 There are records of opencast mining within 500m of the site. The closest extent of the boundary is located 275m northwest of the site.
- 3.27 There are no records of claims regarding coal mining subsidence within 50m of the site boundary.
- 3.28 There are no records of any managed tips or remediated sites within 500m of the site.
- 3.29 No records of mine gas have been recorded within 500m of the site boundary.

Figure 5: BGS Geology Map Extract

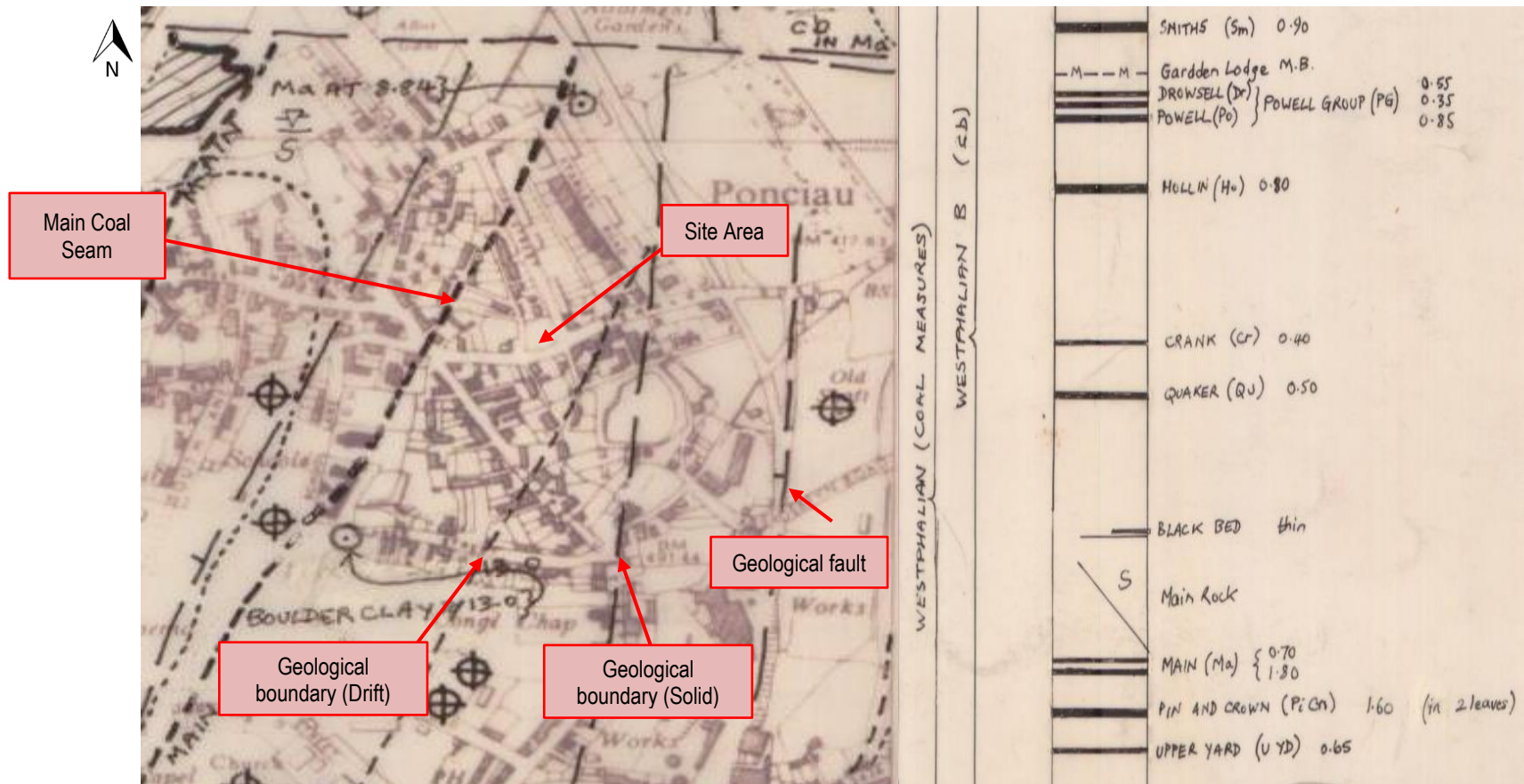
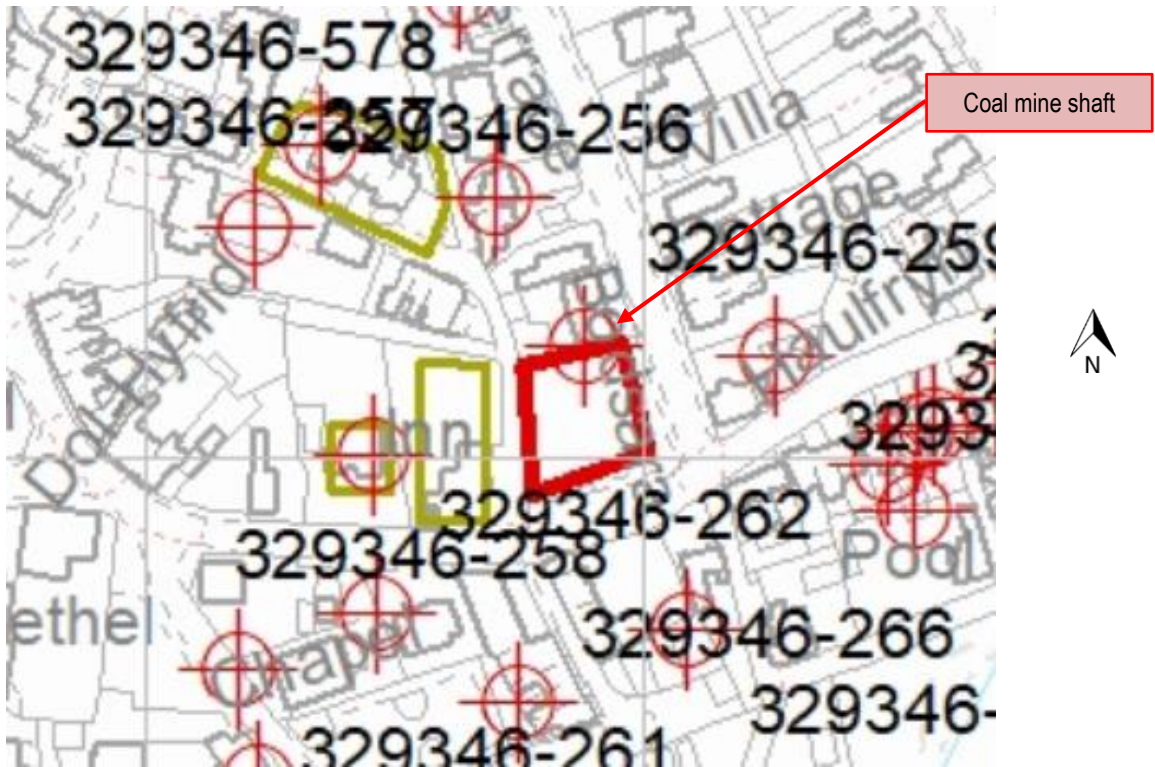


Figure 6: Coal Authority Map Extract



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 It is understood that the proposed development consists of the construction of a up to six dwellings with associated landscaping and car spacing.
- 4.8 The site lies within a Coal Authority Development High Risk Area and the Coal Authority report indicates that the site is located within an area of probable shallow coal mine workings beneath the site.
- 4.9 There is an abandoned mine shaft located on the northern boundary of the site.
- 4.10 The Coal Authority report indicates the Main coal seam is present beneath the site and is recorded as being mined at depth of 13m bgl. The coal seam had an extraction thickness of 2.4m.

Proposed Mitigation Strategy

- 4.11 Information suggests there could be a risk of historical shallow workings being present beneath the development area.
- 4.12 As a result, a site investigation is recommended in order to further assess the shallow coal mining regime.
- 4.13 Furthermore, the mine shaft that is currently located near to the northern site boundary has no records of treatment works within the Coal Authority report. A a site investigation would be necessary to prove/disprove the location the shaft position, as it may not be on the site, or its zone of influence may extend onto the site.
- 4.14 The site investigation will require a permit from the Coal Authority, together with the development of a risk and method statement.
- 4.15 This report should allow for planning permission to be granted with relevant conditions in relation to the site investigation and any possible remedial measures.

APPENDIX 1

COAL AUTHORITY CONSULTANTS 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 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.

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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.

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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.