

Mr James Hanson
Proposed Development
Site at Highstone Lane
Ward Green
Barnsley
S70 6SR

LYONS CMC
COAL MINING & GEOTECHNICAL
CONSULTANCY

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Date: 11th September 2018
Your ref: (S70 6SR)
My Ref: SI 00260

FOR THE ATTENTION OF MR J. HANSON

Dear Sir,

**COAL MINING RISK INTERPRETATION REPORT – FOLLOWING THE INVESTIGATION AT
HIGHSTONE LANE, WARD GREEN, BARNLEY S70 6SR.**

I am pleased to supply the following report for the above named project and trust that this satisfies your requirements. Please do not hesitate to contact myself at any time for further clarification or advice.

Yours Sincerely,



M. Lyons
Consultant Mining Engineer
BSc CSci MIMMM

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1. Introduction

Planning permission is being considered for the development of a single detached dwelling at the above location subject to the mining legacy risks been fully realised and mitigated from on site, if necessary, following the Coal Mining Risk Assessment ref: CMRA 00194. Lyons CMC has now undertaken this work via an intrusive site investigation of 4 boreholes, the location of which is outlined on plan no. 00194/C – as attached and illustrated in appendix 5.2.

2. Scope of the Report

The mining legacy risks to the development are as follows:

- Instability from shallow coal workings in the Winter (Abdy) coal seam
- Uncharted mine entries
- Fugitive gas emissions

As such, these risks need to be properly determined to ensure sound stability for the development. A borehole investigation consisting of between 2 and 5 holes was deemed a reasonable level of investigation in the outset regarding potential void migration given the scale and nature of development combined with the available geological and mining information. A watching brief would also be implemented for any signs of mine entries.

It should be noted that this investigation is focused mainly on determining stability from potential shallow historic coal workings and will only provide limited information regarding the risks of uncharted mine entries. A good level of detail should be obtained to provide a more informed opinion as to fugitive gas risks.

Considering a thickness of the Winter coal seam of around 600m (along with the fact that no other workable seam is expected to interact below the Winter seam horizon), boreholes were decided to be taken to either the base of the coal or to 10m if not encountered (*providing competent strata is proved and depth to rockhead/firm ground is no more than 2m, along with one hole to 30m as per the Coal Authorities requirements*).

3. Site Investigation

3.1 Methodology

Prior to the intrusive site investigation a search for utilities was undertaken both via online data providers and physically on site using a Cable Avoidance Tool (CAT). Boreholes were marked out with tape measure from boundary lines as illustrated on the attached plan no. 00194/C (also outlined in appendix 5.2), where boreholes to investigate the coal seam are marked as 'BH'. As part of the mine entry watching brief, a pre survey was undertaken with no visible evidence of any uncharted mine entries. The process for the intrusive coal seam investigation is outlined via the system chart in appendix 5.4.

An investigation utilising a tracked Baretta Rotary Drill Rig equipped with 2m long 100mm diameter drill rods was deemed appropriate in this instance along with water flush technique to analyse returns and minimise any risks associated with mine gas emissions and spontaneous combustion. Gas monitoring equipment would be employed during works for risks associated with Methane, Carbon Monoxide, Oxygen and Carbon Dioxide. Any boreholes emitting a dangerous level of methane would be terminated and sealed immediately. All holes to be filled and sealed as soon as possible with bentonite upon termination.

The works were to be supervised by the Drilling Engineer Mr. S. Fish, and overseen by the Principal Engineer Mr. M. Lyons.

3.2 Interpretation of Findings

All boreholes proved a similar section of strata consistent with anticipated dip rates with boreholes nos. 1 & 2 (BH1 & BH2) being on the 'up-dip' side in this instance. Surface geology appears to be a moderate section of what is believed to be made ground mixed with surface clays, of between 1m to 2m in thickness. Below this lies around 3m of firm mudstones followed by around 2m of hard sandstone. This sandstone may indeed be part of the 'Abdy Rock' formation which lies above the Abdy or 'Winter' Coal Seam – with coal in the region of 800mm been proved in-tact beneath this sandstone. Boreholes were terminated in the firm siltstones at the base of the coal.

No evidence of any mine workings, collapsing ground, loss of flush or fugitive gases were noted during the works and drilling was firm throughout.

4. CONCLUSIONS AND RECOMMENDATIONS

- 1) Although a workable section of coal has been proved to lie within the critical depth of affecting surface stability, the proving of firm strata above in-tact coal at four locations around and within the footprint of the proposed building has reduced the risk of old historic workings being present from 'High' prior to the investigation to now 'Low'. As such, no further works in relation to potential shallow coal mine workings are deemed necessary, and normal foundation designs could be considered; with, if desired, some slight strengthening (*for example strip footings with two layers of A393 mesh*) to reduce any residual risks further. Considering the suspected clayey made ground of between 1m to 2m it would be prudent to liaise accordingly with the appointed building control authority for the appropriate agreed depths for formation level.
- 2) No signs of any mine entries were observed during the investigation, however a slight risk will remain for discovering such features given the presence of shallow workable coal. As such a watching brief should still be undertaken where natural ground in the future excavation work is adequately observed for any associated signs of either an old mine shaft or adit. The Coal Authority should be notified where any such feature is suspected.

- 3) No fugitive gases were encountered, and given the geology the risk of such is considered low. Having said this should there be any deep excavations taking place then suitable health and safety precautions should be employed during the works with regard to possible methane emissions from the coal or for oxygen depletion/asphyxiation. In the unlikely event that methane is detected or suspected then a methane barrier within foundations would be required.

This report and future development proposals should be submitted to the regulators for their approval prior to any works taking place.

I trust that this satisfies your requirements, however please do not hesitate to contact myself at any time for further clarification or advice.

Yours Sincerely,



M. Lyons
Consultant Mining Engineer
BSc CSci MIMMM

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THIS SITE INVESTIGATION INTERPRETATIVE REPORT IS BASED ON AND LIMITED TO THE INFORMATION IN MY RECORD AT THE TIME THE ENQUIRY IS ANSWERED. It is based on my professional opinion in line with the guidelines set out in CIRIA Special Publication 32 - "Construction Over Abandoned Mine Workings." The opinion may be overruled by Government Authorities based on other information not in my record. Further site investigations may be undertaken which would supersede the factual findings of this investigation. Copyright in this report belongs to M.A.Lyons. All rights are reserved and unauthorised use is prohibited. Copyright is not transferred to external parties by possession of this report, however, those for whom the report is compiled have the right to use it. If any unauthorised third party comes into possession of this report, they rely upon it entirely at their own risk and the author does not owe them any Duty of Care or Skill.

5 Appendix

5.1 References

- 5.1.1 CIRIA Special Publication No 32 ‘Construction Over Abandoned Mine Workings’.
- 5.1.2 British Standards Institution: BS 5930:2015 ‘Code of practice for ground investigations’ BSI 2015.
- 5.1.3 British Standards Institution: BS EN ISO 14688-1: 2002 + A1 2013 ‘Geotechnical Investigation and Testing - Identification and Classification of Soil - Part 1 - Identification and Description. BSI 2013.
- 5.1.4 British Standards Institution: BS EN ISO 14689-1: 2003 ‘Geotechnical Investigation and Testing – Identification and Classification of Rock – Part 1 – Identification and Description. BSI 2003. Incorporating Corrigendum No. 1 February 2007.
- 5.1.5 British Standards Institution: BS 10175 ‘The Investigation of Potentially Contaminated Sites. Codes of Practice’. BSI 2011+A1 2013.
- 5.1.6 British Standards Institution: BS EN ISO 22476-3: 2005 + A1 2011 ‘Geological Investigating and Testing. Field Testing. Standard Penetration Test’.
- 5.1.7 British Standard 1377:1990 Parts 1-9 ‘Methods of Test for Soils for Civil Engineering Purposes’.

5.2 Borehole Location Plan



Not To Scale (please refer to attached file for scale plan).

5.3 Drilling log sheets

LYONS CMC
COAL MINING & GEOTECHNICAL
CONSULTANCY

Daily Return (Drilling)

Sheet No.	1
Date	Friday 31/08/2018
Contract Name	Mr. J. Hanson
Contract No.	260
Working Day No.	1

Hole No.	Depth (m)	Casing	Dia	Angle	From (m)	To (m)	Description
BH1	8.20	2.00	100mm	Vertical	0	1.80	Made ground
					1.80	4.40	Mudstone
					4.40	5.00	Light mudstone
					5.00	7.30	Hard sandstone
					7.30	8.00	Coal
					8.00	8.20	Firm siltstone
BH2	8.00	1.80	100mm	Vertical	0	1.60	Made ground
					1.60	4.20	Mudstone
					4.20	5.00	Light mudstone
					5.00	7.10	Hard sandstone
					7.10	7.90	Coal
					7.90	8.00	Firm siltstone
BH3	8.50	1.50	100mm	Vertical	0	1.20	Made ground
					1.20	4.60	Mudstone
					4.60	5.20	Light mudstone
					5.20	7.50	Hard sandstone
					7.50	8.30	Coal
					8.30	8.50	Firm siltstone
BH4	8.80	1.00	100mm	Vertical	0	1.00	Made ground
					1.00	4.80	Mudstone
					4.80	5.40	Light mudstone
					5.40	7.70	Hard sandstone
					7.70	8.50	Coal
					8.50	8.80	Firm siltstone
(cont.)							

3	33.50	6.30	Sheet Total	Crew (Cape) I. Wiles S. Fish	Plant Beretta Rotary		
0	0.00	0.00	Previous Sheet Total				
3	33.5.00	6.30	Cummulative Total				

Signed: *M Lyons*

Date: 31/08/2018

5.4 Site Investigation Process

Borehole Site Investigation (SI) Process Guide (Shallow Underground Coal Workings)

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