LYONS CMC
COAL MINING & GEOTECHNICAL CONSULTANCY
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Mr R. Richardson
Silkstone Lodge
Cone Lane
Silkstone
Barnsley
S75 4LY

Date: 23rd May 2022
Your ref: (S75 4LE)
My Ref: SI 00297

FOR THE ATTENTION OF MR RICHARD RICHARDSON & ROB AGUS

Dear Sirs,

COAL MINING RISK INTERPRETATION REPORT – FOLLOWING THE SITE INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT AT FALL HEAD FARM, FALL HEAD LANE, SILKSTONE, BARNSLEY S75 4LE

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

M. Lyons
Consultant Mining Engineer
BSci CSci MIMMM

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1. Introduction

Planning permission is being considered for the demolition of the existing cottage and development of a detached dwelling at the above location subject to the mining legacy risks been fully realised and mitigated from on site, if necessary. Cape Site Services has now undertaken this work via an intrusive site investigation of 3 boreholes, the location of which is outlined on plan no. 00297/B – 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 underground coal workings
- Geological faulting/unstable bedrock
- 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 3 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.

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 plan no. 00297/B outlined in appendix 5.2. As part of the mine entry watching brief, a pre survey was undertaken with no visible evidence of any unchartered 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 Beretta Rotary Drill Rig equipped with 2m long 75mm diameter drill rods was deemed appropriate in this instance along with water flush techniques 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. Prior agreement had been

secured for these works from the Coal Authority -permit ref: 26669 – as attached for reference in appendix 5.5.

Considering the geological/mining details from our CMRA report (ref: CMRA 00297 dated 28th June 2022) boreholes were decided to be taken to the base of the Parkgate seam or to 25m if not encountered.

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

3.2 Interpretation of Findings

Boreholes proved between 0.6m to 1.5m of fill/topsoil, above brown weathered sandstone bedrock – considered to be the Parkgate Rock Sandstone. A coal seam (considered as the Parkgate seam) was then encountered below the sandstone which consisted of two leaves of coal; the upper leaf apparently of a lesser quality than the lower leaf. The seam depths and thickness were recorded as such:

	Depth to coal (m)	Upper Leaf Thickness (m)	Parting Thickness (m)	Lower Leaf Thickness (m)
Borehole No. 1	10.3	**0.4**	0.3	**0.5**
Borehole No. 2	9.5	**0.3**	0.7	**0.5**
Borehole No. 3	10.0	**0.4**	0.4	**0.5**

Borehole no. 1 was extended to 25m deep to check the strata beneath with no further coal encountered, just firm sandstones and mudstones. Boreholes 2 & 3 were terminated around 2m below the coal seam in the firm underlying strata. No signs of underground shallow workings or unstable ground were encountered at any of the three borehole locations, with water flush maintained throughout drilling. Had the holes travelled through coal pillars associated with historic shallow pillar and stall type mining, we would have expected an element of loss of flush from the weakening of lateral support to the strata through settlement and weathering. No fugitive gases were detected at any point during the drilling operations.

The logs appear to match well at the same elevation which would infer no signs of any geological faulting between the borehole locations.

4. CONCLUSIONS AND RECOMMENDATIONS

1) Although what is believed to be the Parkgate coal seam lies 'potentially' (if both leaves were worked) within an influencing depth of the proposed development, the three boreholes undertaken have proved stable ground conditions in the areas investigated, approximately three corners of the proposed footprint area - given current deigns/layouts. At such a depth and given the findings/maintenance of flush, it is unlikely that historic underground mining has taken place (particularly of both leaves via historic pillar & stall methods). However, a slight risk will always remain for such in areas not covered by this investigation; although for this scenario it would be more likely that historic pillar and stall type workings would have only worked the lower, better quality leaf of the seam – in which case the development would have more than the required 10 times the seam thickness rule of overlying strata to negate the risk of void migration compromising the stability of the development. As such, no further investigations or stabilisation works are deemed necessary of the coal seam, however it may be prudent to offer an element of strengthening within foundations, such as strengthened strip footings for example (such as two layers of A393 mesh) or similar; depending on Building Control and Regulators approval/requirements.

2) No signs of any mine entries were observed during the investigation, however slight risks are always present within the exposed coalfield for discovering such features. Watching briefs would be prudent during future ground works for any associated signs of an old mine shaft (grey circular areas of fill within sandstone bedrock would be an indication). The Coal Authority should be notified where any such feature is suspected.

3) No fugitive gases were encountered, however given the relatively shallow workable coal and overlaying porous sandstone the actual position may vary across the site depending on site specific conditions in areas not covered by this investigation (note: associated risks will increase significantly if any unchartered mine entries are discovered). A period of gas monitoring would be an option, although it may be a more desirable solution to include gas protection measures (such as a methane membrane and/or positive ventilation layers) within future foundation designs in any case; which would also protect from radon issues if required. All usual safety precautions should be employed regarding possible fugitive gases in any deep excavation work taking place.

Note: should there be any uncertainty of actual conditions during future ground works Lyons CMC or indeed the Coal Authority themselves can be further consulted for on site assessment if necessary.

A suitably qualified and competent professional should be employed to use this report to determine the conditions on site, and ultimately advise on what action, if any, is necessary to safeguard the development. It should be noted that any future works to investigate any coal seam, mines of coal or associated mine entries will need the prior consent of the Coal Authority via their permitting procedure.

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

M. Lyons
Consultant Mining Engineer
BSc CSci MIMMM

Enc.

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 C758D - "Abandoned Mine Working Manual." 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 C758D ‘Abandoned mine workings manual’.

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.

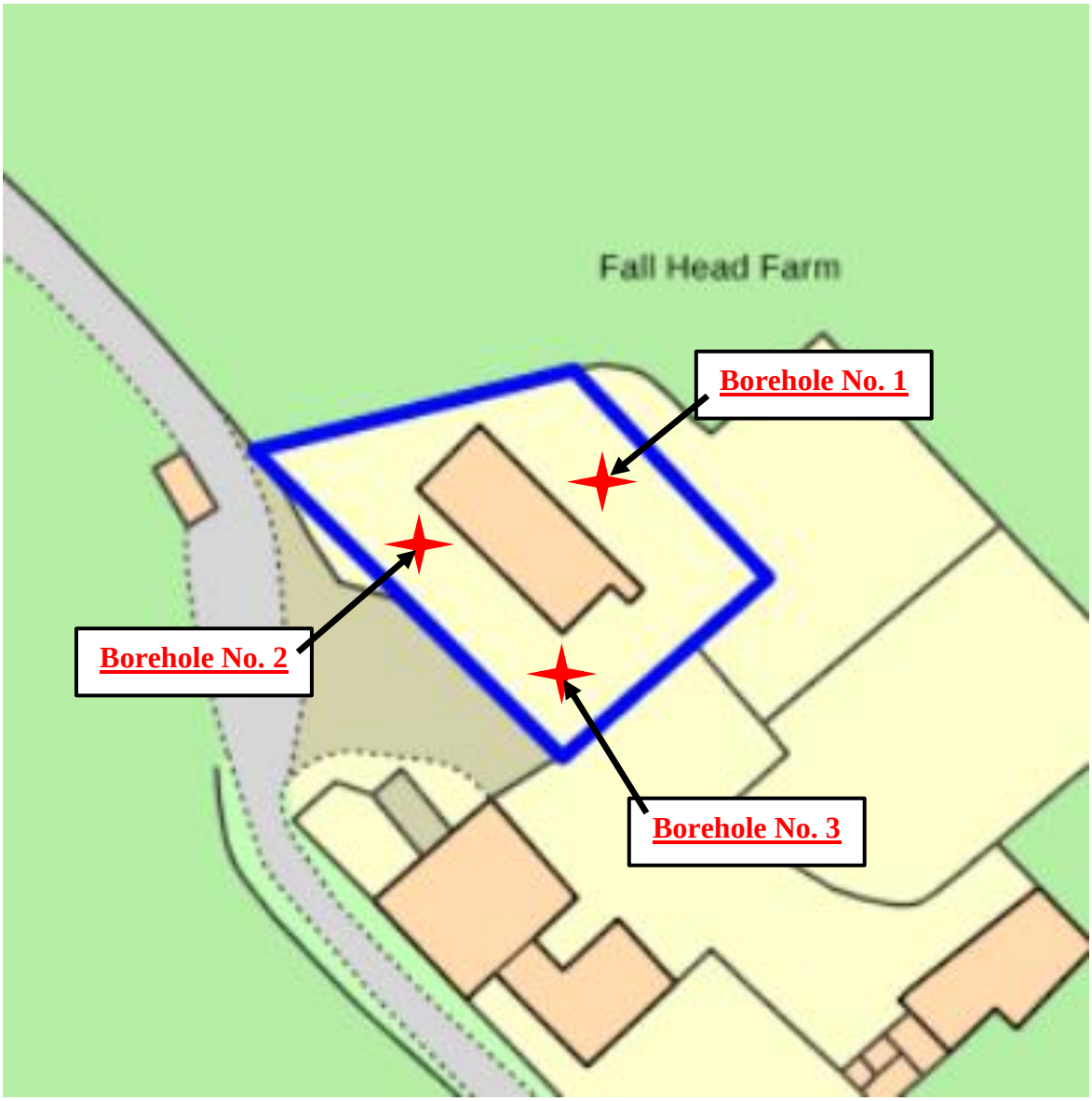
5.1.5 British Standards Institution: BS 10175 ‘The Investigation of Potentially Contaminated Sites. Codes of Practice’. BSI 2011+A1 2013.

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 No. 00297/B

LAND AT FALL HEAD FARM, FALL HEAD LANE, SILKSTONE, BARNSLEY S75 4LE
Site Investigation
Borehole Location Plan
(NTS)



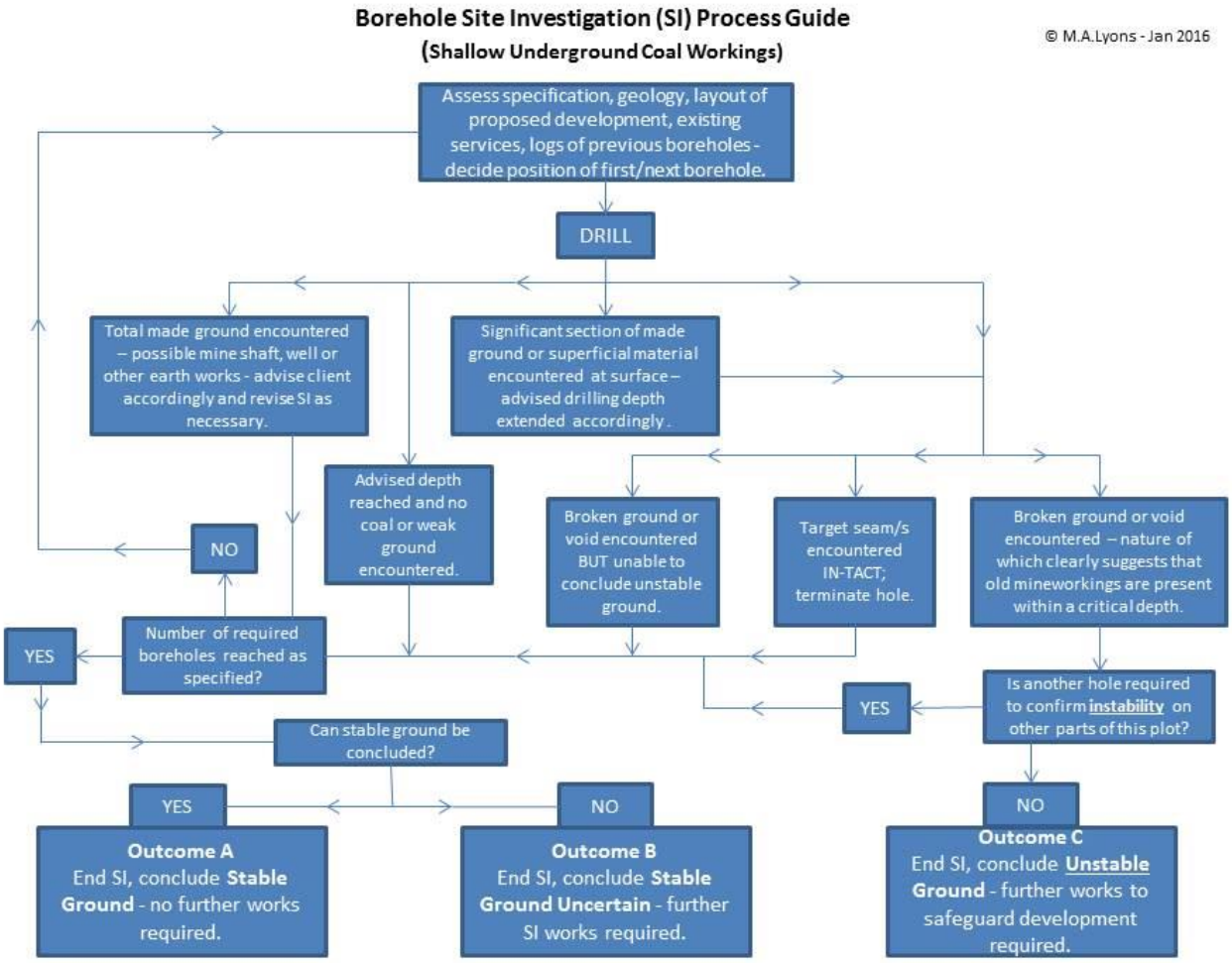
5.3 Drilling log sheets

Client: Richard Richardson	Site: Fall Head Farm, FallHead Lane, Silkstone, Barnsley. S75 4LB	Cape Site Services unit 2, rear of Castle Buildings Carlton Road, Barnsley, S71 3HX
Date: 18/05/2023	Method: water flush	Permit No: 26669
Driller: Ian Wiles		Driller Assistant: Richard Hawkins, Simon Fish
Drillers Signature:		Page No: 1

Measurements In Meters

BH No:	FROM	TO	THICKNESS	DESCRIPTION
1				
	0	1.5	1.5	Fill soil sandstone lumps
	1.5	6	4.5	Sandstone brown some bits of grey
	6	10.3	4.3	Sandstone grey with some brown
	10.3	10.7	0.4	Coal
	10.7	11	0.3	Mudstone grey
	11	11.5	0.5	Coal
	11.5	12.5	1	Mudstone grey
	12.5	15	2.5	Sandstone grey with some brown
	15	25	10	Mudstone grey odd sandstone bands
2				
	0	0.6	0.6	Fill topsoil
	0.6	1.5	0.9	Sandstone brown weathered
	1.5	8.7	7.2	Sandstone brown some bits of grey
	8.7	9.5	0.8	Sandstone grey with some brown
	9.5	9.8	0.3	Coal
	9.8	10.5	0.7	mudstone grey some sandstone
	10.5	11	0.5	Coal
	11	12	1	mudstone grey
	12	13	1	Sandstone grey with some brown
3				
	0	1	1	Fill topsoil
	1	1.6	0.6	Sandstone brown weathered
	1.6	7.3	5.7	Sandstone brown some bits of grey
	7.3	10	2.7	Sandstone grey with some brown
	10	10.4	0.4	Coal
	10.4	10.8	0.4	mudstone grey some sandstone
	10.8	11.3	0.5	Coal
	11.3	12.2	0.9	mudstone grey
	12.2	13	0.8	Sandstone grey with some brown

5.4 Site Investigation Process



5.5 Coal Authority Permit

The Coal Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 26669

Name and Address of Permit Holder:

Richard Richardson
Silkstone Lodge
Cone Lane
Silkstone
Barnsley
S75 4LY

Site Location:

Fall Head Farm
Fall Head Lane
Silkstone
Barnsley
S75 4LE

This certificate hereby grants the above named Permit Holder a Permit to carry out:-

Ground investigation by five boreholes to 25m to determine depth and nature of shallow coal seams

within the Authority's interests at the identified site location above as shown on the Grant Permit Boundary (overleaf) for the period of **12 months** from the granted date shown below. *The granting of this Permit does not constitute advice given by the Authority in relation to the proposed operations. It is the Permit Holder's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.*

Conditions:

- *Manned entry (i.e. into mine entries/workings) is strictly prohibited.*
- *Water flush*
- *Gas Monitoring CO, CH_4, CO_2, O_2, H_2S at borehole and rig*
- *Operators undertaking the work must be in possession of this certificate and the Permit boundary plan at the time of works*
- *Appropriate borehole sealing without delay and to withstand site level changes*

Signed: Paul Hobson Granted Date: ***24 April 2023***

For and on behalf of The Coal Authority

Nominated Representative: Paul Hobson, Permitting Manager;
The Coal Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG
Tel: 01623 637450; E-Mail: permissions@coal.gov.uk