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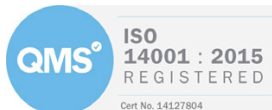


COAL MINING INVESTIGATION REPORT

job number	date
site address	
written by	checked by
issued by	



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Rogers Geotechnical Services Ltd
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Report on Rotary Probing

Location: **4 Back Lane**
Grange Moor, Wakefield.

For: Shaun Matthews

Report No. C5233/25/E/8051

Report date: September 2025

For and on behalf of **Rogers Geotechnical Services Ltd**

Imran Sakoor BEng FGS
Geo-environmental Engineer

Steven Hale BSc FGS
Geo-environmental Engineer

1. Introduction

It is understood that the site is to be developed by the construction of a number of new semi-detached dwellings. As part of the planning process a site investigation has been undertaken to establish if coal workings are present beneath the area of the proposed works. This report presents the data obtained and discusses the ground conditions in relation to the proposed development.

2. Limitations

The recommendations made and opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of the laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between borehole positions, these are for guidance only and no liability can be accepted for their accuracy.

This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of issue.

3. Preliminary Desk Study

The following information has been considered during the works.

- Appraisal of available on-line British Geological Survey and Coal Authority data.
- Review of the Coal Mining Risk Assessment (CMRA) provided by the client, produced by Haigh Huddleston & Associates Ltd (ref: E22/7986/MD/L001, August 2022).

The coal mining risk assessment indicated that a coal seam is outcropping approximately 30m West the site, which may have been worked by illicit methods. Additionally, it was noted that opencast and shallow workings have been recorded within the area.

4. Fieldworks

4.1 Acquisition of Coal Authority Permit

In order to undertake this investigation, it was necessary to obtain permission to enter or disturb Coal Authority interests. This permission was granted on the 1st August 2025 as permit reference number 30208, which is presented in Appendix 1 to this report. In accordance with the joint Coal Authority and Health and Safety Executive positioning statement, and under the requirements of the permit, the works were undertaken employing water flush drilling techniques. Furthermore, the drillers wore gas detectors on their person throughout the works.

4.2 Rotary Open-hole Boreholes

The fieldworks were completed between the 18th and 22nd September 2025, in accordance with the instruction to proceed issued by the client. These works were required in order to prove that workings were not present to a depth of 30m beneath this site.

The boreholes were sunk using a Comacchio 205 rotary drilling rig using rotary open-hole drilling techniques and employing 130mm diameter drag and tricone roller bits. Where necessary, 140mm diameter casing was temporarily installed through the overburden to support the bore. The investigation was undertaken using water flush drilling techniques in accordance with the Coal Authority and Health and Safety Executive positioning statement. Drill chippings brought to surface in the flush returns were inspected by the driller on a screen, which forms part of the re-circulation tanks. In addition, representative disturbed samples of the arisings were taken at regular depth intervals and sealed in plastic containers. The borehole positions are shown on the site plan, which is presented in Appendix 2 and the strata conditions are presented on the borehole records in Appendix 3.

Whilst it was necessary to ensure at least one borehole position was drilled to 30m depth, the required termination depth of the other positions was reviewed during the course of the fieldworks, in accordance with the findings of the geological review and CMRA. A summary of the works completed is presented below:

4.3 Summary of Works

Table 1: Summary of Completed Works

Location	Dates Drilled	Depth (m)	Comments
BH01	22/09/25	30	Target depth reached.
BH02	19/09/25	25	Terminated as sufficient data was obtained.

BH03	18/09/25	30	Target depth reached.
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5. Geological Appraisal

The available published geological data for the site has been examined and the following table presents the anticipated geology.

Table 2: Geological Data for the Site			
Strata Type	Strata Name ¹	Previous Name	Description ²
Superficial Geology	None recorded	-	-
Solid Geology	Pennine Lower Coal Measures Formation	Lower Coal Measures	Interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part.

The site is located between a pair of northwest – southeast trending faults present approximately 270m apart. On the basis of the fault markers it is apparent that the fault pattern represents a graben structure below the site. A nearby dip marker indicates that the solid geology dips by 1-2° to the east.

It should be appreciated that the Birstall Rock outcrops to the southeast of the site.

There is one notable coal seam that outcrops within the vicinity of the site, as summarised below:

Table 3: Summary of Coal Seams within the Vicinity of the Site		
Seam Name	Seam Thickness*	Outcrop Distance from Site*
Unnamed seam	unknown	80m

*All distances are given as approximations only. It should be noted that coal seam thicknesses may vary over relatively short distances.

6. Strata Conditions

In accordance with the geology of the area, the succession has been shown to include the following:

Table 4: Generalised Strata Profile			
Depth to Base (m)	Strata Type	Positions Strata was Recorded	Groundwater (m)
0.20 – 0.3	TOPSOIL	BH01, BH03	None
0.5 - 2.0	Silty CLAY with localised sandstone gravel.	All	None

¹ Sources: British Geological Survey (NERC) Map Sheets 77; Huddersfield; Solid and Drift Edition, and the Geology of Britain Viewer [online resource from www.bgs.ac.uk]

4.5 – 8.0	Yellow SANDSTONE	All	None
+25.0 – +30.0	Light and dark MUDSTONE with subordinate bands of sandstone.	All	None

'+' Denotes that the strata extended below the termination depth of the investigated positions, thus the extent of the deposit is only proven to the depths indicated.

During this investigation, below the topsoil surfacing, silty clay with localised sandstone gravel was revealed to between 0.5m and 2.0m depth. From this depth, yellow sandstone was revealed to between 4.5m and 8.0m below surface, whereupon, undifferentiated bands of mudstone were revealed to the base of all boreholes at depths of between 25m and 30m below ground level.

With respect to the local geology, it is considered that this material represents the weathered bedrock of the Pennine Lower Coal Measures Formation.

No groundwater strikes were recorded during the fieldworks. However, it is possible that the use of water flushing techniques may have masked the presence of any water strikes within the boreholes. In any event, it should be appreciated that groundwater levels are subject to seasonal variation or changes in local drainage conditions.

7. Discussion of Ground Conditions

On the basis of above, it is evident that no coal or workings are present below the site. Additionally, on the basis of the information from the Coal Mining Risk Assessment, workings are present in seams between 47m and 237m depth. It is considered that these seams are present at significant depths such that sufficient competent cover is present to mitigate the risk of collapse to surface structures. As such, it is considered that a null to negligible risk is present with respect to coal mining at this site.

8. Risk Assessment

In light of the findings of this investigation, the risk to the proposed development is considered with reference to the following ratings and definitions:

- Low - The possibility of instability is unlikely therefore no further action is necessary.
- Moderate - The possibility of instability is likely and further investigation or remedial action may be required.
- High - The possibility of instability is highly likely and further investigation or remedial action will be necessary.

Table 5: Development Specific Risk Assessment

Item	Risk of Instability	Coal Seam(s) Considered	Risk Rating
1	Shallow coal workings	Unnamed coal seam	Negligible
2	Deeper coal workings	Middleton Main, Wheatley Lime, Silkstone, Top Beeston, Black Bed	Negligible

In view of all the information obtained in this investigation, it is considered that there is a null to negligible risk of ground movement as a consequence of coal workings beneath the site.

9. References

- British Standards Institution (2015 +A1: 2020) BS 5930: *Code of practice for ground investigations*, B.S.I., London.
- Healy, P. and Head, J., 1984. *Construction over abandoned mine workings*. London: Construction Industry Research and Information Association [for] Directorate of Civil Engineering Services, Property Services Agency, Dept. of the Environment.
- Parry, D. and Chiverrell, C., 2019. *Abandoned mine workings manual*. London: CIRIA.
- British Geological Survey (NERC) (2025), BGS, Keyworth.
 - Geology of Britain Viewer:
(http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html)
 - Borehole Scans:
(<http://www.bgs.ac.uk/data/boreholescans/>)
 - Lexicon of Named Rock Units:
(<http://www.bgs.ac.uk/lexicon/>)

Appendix 1

Coal Authority Permit



Mining
Remediation
Authority

Permit to Enter or Disturb Mining Remediation Authority Interests

Permit 30208

Name and Address of Permit Holder:

Matthews - Lewis - Cockell
4 Wharfedale Road
Pogmoor
Barnsley
South Yorkshire
S75 2LJ

Site Location:

4 Back Lane
Grange Moor
Wakefield
WF4 4EJ

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

Ground investigation by three boreholes to 30m to determine presence of shallow mine workings

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, CH₄, CO₂, O₂, H₂S 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: Amy McKenna Granted Date: 1st August 2025

For and on behalf of the Mining Remediation Authority

Nominated Representative: Amy McKenna, Permitting Manager;

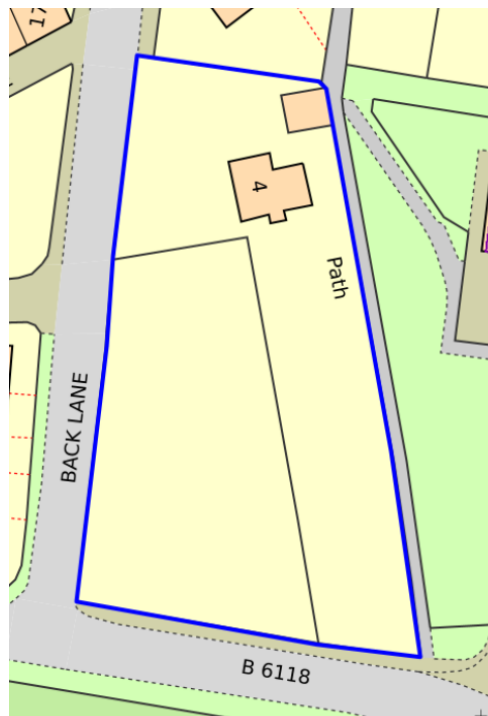


Mining
Remediation
Authority

Granted Permit Boundary

Permit Ref: 30208

Permit Boundary:



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The Mining Remediation Authority is the trading name of the Coal Authority ('TCA') established pursuant to Section 1 of the Coal Industry Act 1994, of 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG. The Coal Authority remains the legal name of the Authority

Appendix 2

Site Plan

Notes:



Rogers **Geotechnical** Services Ltd

Offices 1 & 2, Barncliffe
Business Park,
Near Bank,
Shelley,
Huddersfield,
HD8 8LU

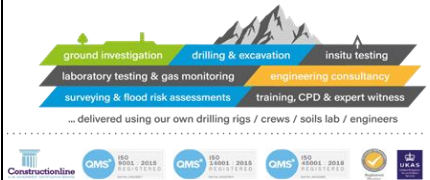
Telephone: 0843 50 66 87
www.rogersgeotech.co.uk

Client:
JD23 Commercial Properties

Job Number:
C5233/25/E/8050

Project Details:
4 Back Lane, Wakefield, West
Yorkshire, WF4 4EJ

Scale: Not to scale - reference only



Appendix 3

Borehole Records

				Borehole Log				Borehole No. BH01	
Project Name: 4 Back Lane				Project No. C5233/25/E/8051		Co-ords:		Sheet 1 of 3 Hole Type RO	
Location: Grange Moor, Wakefield				Level:		Scale 1:50			
Client: Shaun Matthews				Dates: 22/09/2025		Logged By ABk			
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20		 TOPSOIL. (Driller's description).  Yellow CLAY. (Driller's description).	1	
					2.00		 Yellow SANDSTONE. (Driller's description).	2	
								3	
								4	
								5	
					6.00		 Light grey MUDSTONE. (Driller's description).	6	
								7	
								8	
								9	
								10	
Remarks Cased to 3.0m depth.									

				Borehole Log				Borehole No. BH01	
Project Name: 4 Back Lane				Project No. C5233/25/E/8051		Co-ords:		Sheet 2 of 3 Hole Type RO	
Location: Grange Moor, Wakefield				Level:		Scale 1:50		Logged By ABk	
Client: Shaun Matthews				Dates: 22/09/2025					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					15.00			Light grey MUDSTONE. (Driller's description).	11
									13
									14
								Dark grey MUDSTONE. (Driller's description).	15
									16
									17
									18
									19
									20
Remarks Cased to 3.0m depth.									



				Borehole Log				Borehole No. BH02	
Project Name: 4 Back Lane				Project No. C5233/25/E/8051		Co-ords:		Sheet 1 of 3	
Location: Grange Moor, Wakefield				Level:		Hole Type RO			
Client: Shaun Matthews				Dates: 18/09/2025		Scale 1:50			
Logged By ABk									

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.50		 Brown silty CLAY. (Driller's description).		
							 Yellow SANDSTONE. (Driller's description).	1	
								2	
								3	
								4	
								5	
								6	
								7	
					8.00		 Yellow and grey MUDSTONE. (Driller's description).	8	
								9	
								10	

Remarks Cased to 3.0m depth. 0.5hr: filling bowser with water. 0.5hr: Set-up.		
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					Borehole Log				Borehole No. BH02 Sheet 2 of 3								
Project Name: 4 Back Lane					Project No. C5233/25/E/8051		Co-ords:			Hole Type RO							
Location: Grange Moor, Wakefield					Level:			Scale 1:50									
Client: Shaun Matthews					Dates: 18/09/2025			Logged By ABk									
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description									
		Depth (m)	Type	Results													
					11.00			Yellow and grey MUDSTONE. (Driller's description).	11								
								Dark grey MUDSTONE. (Driller's description).	12								
								13									
								14									
								15									
								16									
								17									
								18									
								19									
								20									
								Remarks									
								Cased to 3.0m depth. 0.5hr: filling bowser with water. 0.5hr: Set-up.									

				Borehole Log				Borehole No. BH02	
Project Name: 4 Back Lane				Project No. C5233/25/E/8051		Co-ords:		Sheet 3 of 3 Hole Type RO	
Location: Grange Moor, Wakefield				Level:		Scale 1:50		Logged By ABk	
Client: Shaun Matthews				Dates: 18/09/2025					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Dark grey MUDSTONE. (Driller's description).	
									21
									22
									23
									24
					25.00			End of Borehole at 25.00m	25
									26
									27
									28
									29
									30
Remarks Cased to 3.0m depth. 0.5hr: filling bowser with water. 0.5hr: Set-up.									

				Borehole Log			Borehole No. BH03 Sheet 1 of 3	
Project Name: 4 Back Lane				Project No. C5233/25/E/8051		Co-ords:		Hole Type RO
Location: Grange Moor, Wakefield				Level:		Scale 1:50		
Client: Shaun Matthews				Dates: 18/09/2025		Logged By ABk		

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30		TOPSOIL. (Driller's description).		
					1.00		Grey CLAY with sandstone gravel. (Driller's description).	1	
					4.50		Yellowish orange SANDSTONE. (Driller's description).	2	
							Grey MUDSTONE. (Driller's description).	3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks
 Cased to 3.0m depth. 0.75hrs: setup. 0.92hrs: Filling bowser.



				Borehole Log				Borehole No. BH03	
Project Name: 4 Back Lane				Project No. C5233/25/E/8051		Co-ords:		Sheet 2 of 3 Hole Type RO	
Location: Grange Moor, Wakefield				Level:		Scale 1:50			
Client: Shaun Matthews				Dates: 18/09/2025		Logged By ABk			
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Grey MUDSTONE. (Driller's description).	11
									12
									13
									14
									15
									16
									17
					18.00			Yellow SANDSTONE. (Driller's description).	18
					19.00			Grey MUDSTONE/SILTSTONE. (Driller's description).	19
									20
Remarks Cased to 3.0m depth. 0.75hrs: setup. 0.92hrs: Filling bowser.									

				Borehole Log				Borehole No. BH03	
Project Name: 4 Back Lane				Project No. C5233/25/E/8051		Co-ords:		Sheet 3 of 3 Hole Type RO	
Location: Grange Moor, Wakefield				Level:		Scale 1:50		Logged By ABk	
Client: Shaun Matthews				Dates: 18/09/2025					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Grey MUDSTONE/SILTSTONE. (Driller's description).	
									21
									22
									23
									24
									25
									26
									27
									28
									29
					30.00			End of Borehole at 30.00m	30
Remarks Cased to 3.0m depth. 0.75hrs: setup. 0.92hrs: Filling bowser.									