Project No: EAL.247.26
Date: 28th October 2026

Mr Jonathan Smith
The Butchers Arms
Chesterfield Road
Oakerthorpe
Alfreton
DE55 7LN

Dear Jonathan,

Re: The Butchers Arms, Oakerthorpe – Rotary Probe Drilling Investigation

BACKGROUND

The works described and reported herein were required to address potential mining legacy risk to a proposed redevelopment of the site with three residential dwellings. As part of the proposed redevelopment it is understood that the existing public house building will be converted. However, as this conversion does not require any significant ground workings, it is considered to be exempt from the requirements of further assessment/investigation. As such the investigation was targeted at the area of the three proposed dwellings. Site location and proposed development plans are included in **Appendix A.**

It is understood that the site has previously benefitted from a prior planning permission for the erection of two dwellings (Ref: AVA/2024/0008). As part of this application a Coal Mining Risk Assessment (CMRA) prepared by Geo-Logic was submitted. Erda Associates Ltd. have not reviewed a copy of the previous CMRA. However, it is understood that this identified a possible medium to high risk of probable surface and shallow workings in the Deep Soft, Deep Hard and Piper coal seams. As such intrusive investigation was recommended to investigate this further.

COAL MINING INVESTIGATION WORKS

Erda Associates Ltd. attended the subject property in order to undertake a probe drilling investigation for the site. The works were undertaken under Coal Authority Permit 32300.

In summary, the works comprised the advancing of three boreholes to a maximum depth of 30.00mbgl. All boreholes were drilled utilising a water flush medium. Boreholes were generally reinstated with bentonite backfill upon completion.

A borehole location plan and exploratory hole logs are included in **Appendix B,** for reference.

GROUND STABILITY ASSESSMENT

Probe Drilling

The site was generally recorded to be underlain by made ground (comprising reworked natural strata) to depths of between 0.27m and 7.40mbgl.

The made ground was generally immediately underlain by grey brown mudstone with occasional sandstone horizons.

A total of two coal seams were encountered in RBH01. The shallowest seam was recorded at depths of between 1.70m to 2.85mbgl. The second seam was encountered at depths of between 4.00m and 4.15mbgl. Both seams were noted to be intact and are considered most likely to be two leaves of the Deep Hard seam. Loss of flush was recorded from 15.90mbgl. However, no voids or broken ground horizons were noted throughout the borehole.

Made ground in conjunction with loss of flush and very soft strata were encountered in RBH02 from ground level down to 6.15mbgl. It is noted that the depth of this material broadly corresponds to the depth of the suspected Deep Hard seam encountered in RBH01. As such it is considered likely that this is representative of shallow unrecorded opencast extraction of the Deep Hard seam. An intact coal seam was also encountered in RBH02 at depths of between 18.90m and 19.25mbgl. This may be representative of the Piper

seam. Loss of flush was recorded from 23.90mbgl.However no voids or broken ground horizons were noted throughout the borehole.

Made ground in conjunction with loss of flush, possible fill and very soft strata was encountered in RBH03 from ground level to 7.40mbgl. It is noted that the depth of this material broadly corresponds to the depth of the suspected Deep Hard seam encountered in RBH01. As such it is considered likely that this is representative of shallow unrecorded opencast extraction of the Deep Hard seam. RBH03 was terminated in natural mudstone at 8.00mbgl. Due to drill rods and casing jamming in the overlying fill, it was not possible to advance this borehole further.

Drilling rates in competent strata were noted to remain consistently between 5 minutes to 22 minutes per 1.50m length run.

Based on the above findings, the ground conditions encountered in RBH02 and RBH03 are considered consistent with possible shallow opencast extraction of the Deep Hard seam, although this interpretation has not been independently confirmed. The associated deep made ground and very soft strata may present a risk of differential settlement beneath the proposed development.

An appropriate foundation solution will therefore be required to accommodate the identified ground conditions. Piled foundations or a suitably designed ground improvement solution may be appropriate, subject to detailed assessment of the ground conditions and proposed structural loads. The appointed structural engineer should review the investigation findings and determine the appropriate foundation and/or ground improvement strategy.

Losses of drilling flush were recorded in RBH01 and RBH02 at depths of 15.90 m and 23.90 m, respectively. No associated voids or broken ground were identified. The cause of these losses has not been established, and they do not, in isolation, confirm the presence of mine workings at these depths.

Nevertheless, the possibility of deeper workings or other features capable of accepting drilling flush cannot be excluded. The implications of these observations should be considered by the appointed structural engineer when assessing the proposed foundation solution.

Deep made ground was not encountered in RBH01, whereas substantial thicknesses of made ground were encountered in RBH02 and RBH03. This variation may reflect the presence of a boundary or highwall associated with possible historical opencast extraction. However, the precise extent and configuration of any former working have not been established.

The proposed development may therefore be affected by variable ground conditions, with a potential risk of differential settlement where foundations extend across natural ground and deep made ground. The implications of these conditions should be considered by the appointed structural engineer when determining the foundation solution.

Final foundation/ground improvement design/mitigation should be undertaken by the appointed structural engineer.

Unrecorded Mine Entries
The risk of unrecorded mine entries being present on site is considered to be low to moderate. A watching brief should be maintained during groundworks and foundation excavations for features potentially indicative of mine entries. Should any suspected mine entries be encountered, works in the affected area should be suspended pending further assessment by a suitably qualified specialist.

Mine Gas
Boreholes were monitored for mine gas emissions during the investigation works. No adverse gas readings were recorded during the monitoring undertaken. However, these observations do not conclusively exclude the potential for future ground gas emissions, particularly given the presence of deep made ground and the possibility of historical mining.

The requirement for ground gas protection measures should be considered separately in accordance with the proposed development design and an appropriate assessment of ground gas risk.

CONCLUSION
The probe drilling investigation identified ground conditions consistent with possible shallow opencast extraction in RBH02 and RBH03, comprising deep made ground and very soft strata. These conditions may

present a risk of differential settlement beneath the proposed dwellings. The precise extent of any former workings and the location of any associated highwall have not been established.

Losses of drilling flush were also recorded at depth in RBH01 and RBH02. Although no associated voids or broken ground were identified, the cause of these losses remains uncertain and the possibility of deeper mine workings or other features cannot be excluded.

The investigation findings should be provided to the appointed structural engineer to inform the design of an appropriate foundation solution. Piled foundations or ground improvement may be appropriate, subject to detailed consideration of the ground conditions, proposed structural loads and the potential for differential settlement. The implications of the recorded drilling fluid losses should also be considered as part of this assessment.

The risk of unrecorded mine entries being present on site is considered to be low to moderate. A watching brief should be maintained during groundworks and foundation excavations, with further assessment undertaken if any suspected mine entries are encountered.

No adverse mine gas readings were recorded during the investigation. However, the potential for ground gas associated with the deep made ground and historical mining should be considered separately when determining whether gas protection measures are required.

The findings and recommendations in this report are based on the ground conditions encountered at the exploratory hole locations. Ground conditions may vary between these locations, and the investigation cannot exclude the presence of unforeseen localised features.

The report should be provided to the appointed structural engineer for consideration as part of the detailed foundation design. Any proposed foundation or ground improvement solution should be supported by an appropriate design addressing the identified ground conditions and potential mining-related risks.

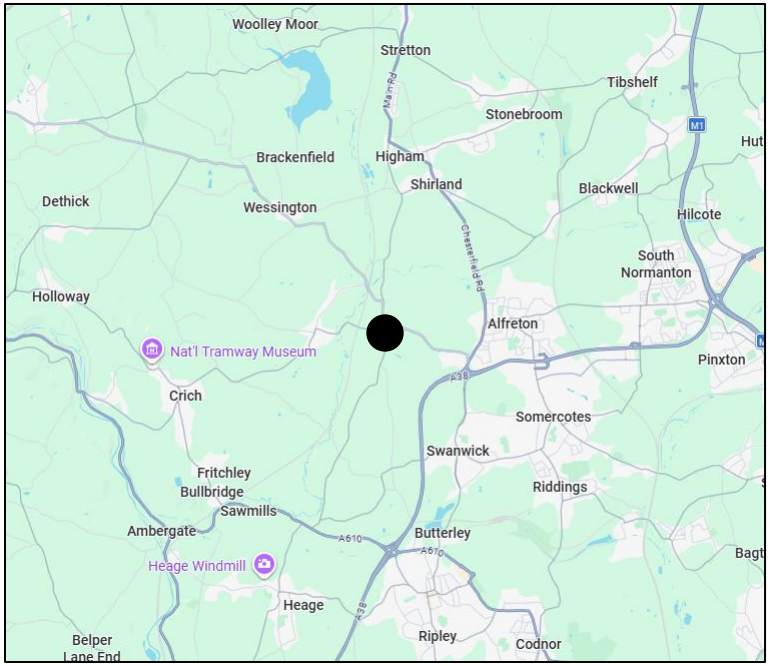
Yours Sincerely

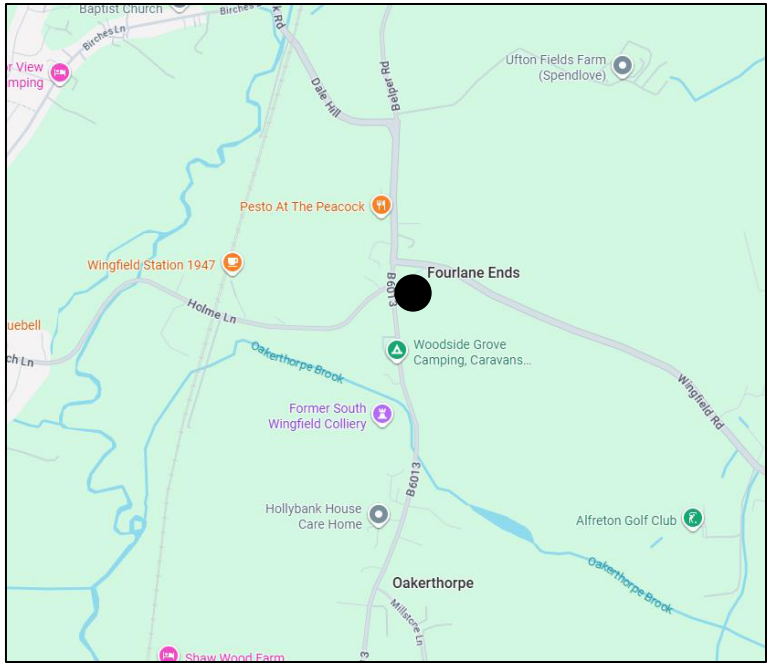


Phil Devitt, BSc MSc MRICS
Director

Encl.
Appendix A – Site Plans
Appendix B – Exploratory Hole Location Plan and Exploratory Hole Logs
Appendix C – Coal Authority Permit Closure Form

Appendix A





KEY:

● Approximate Site Location

DO NOT SCALE

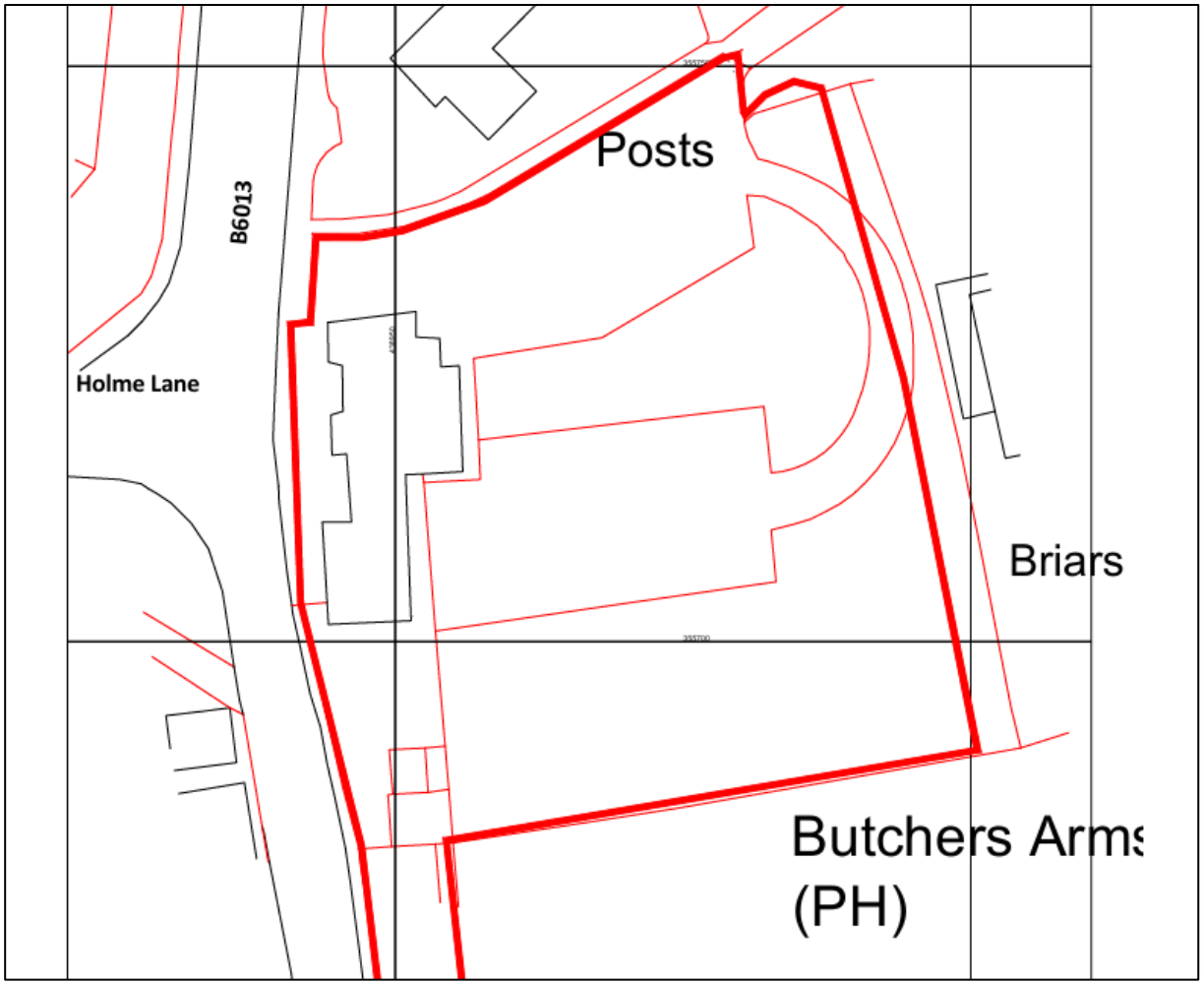
Erda Associates ltd

TITLE: Site Location

PROJECT: Butchers Arms, Oakerthorpe

PROJECT No:	DATE:
EAL.247.26	10/2026

SCALE :	DRAWN :	DWG No:
NTS	PD	Figure 1



KEY:

Site Boundary

DO NOT SCALE

Erda Associates ltd

TITLE:

Site Layout

PROJECT:

Butchers Arms, Oakerthorpe

PROJECT No:	DATE:
EAL.247.26	10/2026

SCALE :	DRAWN :	DWG No:
NTS	PD	Figure 2



KEY:

DO NOT SCALE

Erda Associates ltd

TITLE:

Development Proposal

PROJECT:

Butchers Arms, Oakerthorpe

PROJECT No:	DATE:
EAL.247.26	10/2026

SCALE :	DRAWN :	DWG No:
NTS	PD	Figure 3



KEY:

Rotary Borehole

DO NOT SCALE

Verda Associates ltd

TITLE:

Development Proposal

PROJECT:

Butchers Arms, Oakerthorpe

PROJECT No:	DATE:
EAL.247.26	10/2026

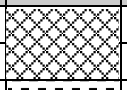
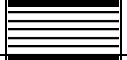
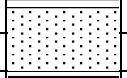
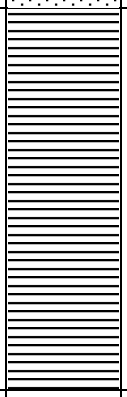
SCALE :	DRAWN :	DWG No:
NTS	PD	Figure 4

Appendix B



GEO Environmental Engineering

247.26 Butchers Arms, Oakerthorpe. RBH01

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / ROP Samples
0.00	0.09	MADE GROUND: TARMACADAM.		
0.09	0.27	MADE GROUND: Gravel sub-base.		
0.27	1.70	Light brown and grey sandy CLAY.		1.50-3.00: 5 mins
1.70	2.85	COAL.		
2.85	4.00	Grey-brown MUDSTONE.		3.00-4.50: 19 mins
4.00	4.15	COAL.		
4.15	5.40	Grey MUDSTONE.		4.50-6.00: 22 mins
5.40	6.30	Light grey-brown SANDSTONE.		6.00-7.50: 17 mins
6.30	15.90	Grey brown MUDSTONE.		7.50-9.00: 11 mins 9.00-10.50: 13 mins 10.50-12.00: 17 mins 12.00-13.50: 19 mins 13.50-15.00: 15 mins 15.00-16.50: 14 mins
15.90	25.00	Loss of flush. No returns. Noted as solid. No broken ground or voids noted.		16.50-18.00: 25 mins 18.00-19.50: 21 mins 19.50-21.00: 15 mins 21.00-22.50: 14 mins 22.50-24.00: 16 mins 24.00-25.00: 10 mins
		End of borehole. Borehole backfilled with bentonite and arisings on completion. No adverse gas detected while or after drilling.		Hand dug before drilling. Cased to 3.00m.

Site: Butchers Arms, Oakerthorpe, Derbyshire, DE55 7LN.
Client: Erda
Client Reference: 247.26
Driller: GE
Site Works Date: 19/10/2026
Plant: Beretta T22 Tracked rotary rig with water flush

Log Notes:
ROP = Rate of penetration (rotary drilling)
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

GEO Environmental Engineering

247.26 Butchers Arms, Oakerthorpe. RBH02

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / ROP Samples
0.00	0.20	MADE GROUND: Grass over dark brown sandy, gravelly TOPSOIL.		
0.40	2.40	MADE GROUND: Light brown sandy CLAY with much sandstone gravel and rare brick and coal fragments noted.		1.50-3.00: 7 mins
2.40	6.15	Loss of flush. Very soft with harder large fragments. Likely backfilled material. No returns.		3.00-4.50: 3 mins 4.50-6.00: 1 min 6.00-7.50: 10 mins
6.15	8.10	Grey and occasionally light grey MUDSTONE. Some coal inclusions noted from 7.30-7.50m.		7.50-9.00: 14 mins
8.10	9.90	Light grey-brown SANDSTONE.		9.00-10.50: 16 mins
9.90	18.90	Grey brown MUDSTONE.		10.50-12.00: 10 mins 12.00-13.50: 20 mins 13.50-15.00: 9 mins 15.00-16.50: 11 mins 16.50-18.00: 15 mins 18.00-19.50: 17 mins
18.90	19.25	COAL.		
19.25	23.90	Grey MUDSTONE.		19.50-21.00: 13 mins 21.00-22.50: 21 mins 22.50-24.00: 20 mins
23.90	30.00	Loss of flush. No returns. Noted as solid. No broken ground or voids noted.		24.00-25.50: 13 mins 25.50-27.00: 12 mins 27.00-28.50: 10 mins 28.50-30.00: 15 mins
		End of borehole. Borehole backfilled with bentonite and arisings on completion. No adverse gas detected while or after drilling.		Hand dug before drilling. Cased to 6.00m.

Site: Butchers Arms, Oakerthorpe, Derbyshire, DE55 7LN.
Client: Erda
Client Reference: 247.26
Driller: GE
Site Works Date: 20/10/2026
Plant: Beretta T22 Tracked rotary rig with water flush

Log Notes:
ROP = Rate of penetration (rotary drilling)
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

GEO Environmental Engineering

247.26 Butchers Arms, Oakerthorpe. RBH03

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / ROP Samples
0.00	0.15	MADE GROUND: Grass over dark brown sandy, gravelly TOPSOIL.		
0.15	0.60	MADE GROUND: Brown clayey, gravelly SAND.		
0.60	3.60	MADE GROUND: Light brown sandy CLAY with much sandstone gravel and rare brick and coal fragments noted.		1.50-3.00: 5 mins 3.00-4.50: 9 mins
3.60	5.30	Soft light grey brown MUDSTONE. Possible fill.		4.50-6.00: 2 mins
5.30	7.40	Loss of flush. Very soft with harder large fragments. Likely backfilled material. No returns.		6.00-7.50: 2 mins
7.40	8.00	Grey and occasionally light grey MUDSTONE.		7.50-8.00: 12 mins
		End of borehole due to drill rods and casing jamming up. Borehole backfilled with bentonite and arisings on completion. No adverse gas detected while or after drilling.		Hand dug before drilling. Cased to 5.70m. Casing stuck.

Site: Butchers Arms, Oakerthorpe, Derbyshire, DE55 7LN.
Client: Erda
Client Reference: 247.26
Driller: GE
Site Works Date: 21/10/2026
Plant: Beretta T22 Tracked rotary rig with water flush

Log Notes:
ROP = Rate of penetration (rotary drilling)
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

Website: www.geoenvironmentalengineering.com
Email: info@geoenvironmentalengineering.com
Telephone: 08456 768 895 / 07883 440 186

Appendix C

Mining Remediation Authority

Permit Closure Summary Form

Permit Ref.	32300	Project / Site Location	Butchers Arms, Oakerthorpe, DE55 7LN

Please supply all relevant documents, including this completed form within 3 months of the permitted works being completed.

Where relevant the report should include; borehole logs and details of mine or mine entry treatment works carried out (incl. engineering drawings, grout takes etc.) and a scaled site layout plan (correlated to O.S N' Grid) showing all relevant mine entry positions, coal seams, voids and broken ground proved by the works.

Summary of works **Start date** 19.10.2026 **Finish date** 21.10.2026

Have any variations occurred? ☒ No ☐ Yes **If so was the Authority notified?** ☐ No ☐ Yes

Please describe;

Did if any of the following incidents occur?

☐ Spontaneous combustion ☐ Water emission ☐ Gas emission (elevated or above action levels)
☐ Geotechnical instability ☐ Legal issues incl. damage or potential claims ☒ **None**

If yes, please detail each item;

Were any of the following encountered? Please give a brief summary of the works undertaken.

☐ Intact coal only ☐ Broken ground ☒ Backfilled ground ☐ Voids

Description;

See attached report.

Will further works be necessary that require a Permit? ☒ No ☐ Yes

If yes, please describe, including any recommendations;

See attached report.

Name: Phil Devitt	**Email:** p.devitt@erda-ltd.co.uk
Company: Erda Associates Ltd.	**Tel:** 07531 051197