

**Environmental
Geotechnical
Specialists**



COAL RISK ASSESSMENT

job number J4786/19/E/EDS	date July 2019
site address 25 Clough Road Hoyland, Barnsley S74 9EA	
written by C. Mason	checked by R. A. Palmer
issued by C. Mason	

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GEO TECHNICAL
ENVIRONMENTAL



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Report on a Coal Mining Risk Assessment

Location: 25 Clough Road
Hoyland, Barnsley S74 9EA

For: Garry Greetham Associates

Report No. J4786/19/E/CRA

Report date: July 2019

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

Charlotte Mason BSc FGS
Geo-environmental Engineer

Rob Palmer MSc FGS ACIEH
Senior Geo-environmental Engineer

1. Introduction

The land adjacent to 25 Clough Road, Hoyland, Barnsley falls within the defined Development High Risk Area; therefore within the application site and surrounding area there are coal mining features and hazards which need to be considered in relation to the determination of any planning applications. Consequently, a desktop study was commissioned in order to assess the risk to the development from coal mining. This report presents the findings of the study.

2. Geological Desk Study

The geological desk study has been undertaken using the following sources of information.

- British Geological Survey map sheet¹.
- British Geological Survey *Geology of Britain Viewer*².
- Coal Authority Consultants Coal Mining Report³.
- British Geological Survey *Borehole Records*⁴.

2.1 British Geological Survey Maps and Viewer

The appropriate map sheet for the site and the geology viewer has been examined and the following table presents the indicated geology:

¹ Sources: British Geological Survey (NERC) Map Sheet 87; Barnsley; Solid and Drift Editions

² Sources: British Geological Survey (NERC) *Geology of Britain Viewer* [online resource from www.bgs.ac.uk]

³ Coal Authority Reference: 51002156762001 dated 22nd July 2019.

⁴ Sources: British Geological Survey (NERC) *Borehole Records* [online resource from <http://www.bgs.ac.uk/>]

**Table 1: Geological Data for the Site**

Strata Type	Strata Name ⁵	Previous Name ⁶	Description ³
Superficial Geology	None recorded	-	-
Solid Geology	Kents Rock (Sandstone)	-	Named sandstone member of the Pennine Middle Coal Measures Formation.

On the geological map, there are no geological dip indicators relevant to the site (i.e. within 500m of the site or within the same fault block). However, taking into the consideration the topography of the local area and the outcrop patterns, it is considered that the regional geology dips at shallow angles towards the east.

In addition, it should be appreciated that the site is within close proximity to a fault located to the north of the site. This fault is not anticipated to affect the geological conditions beneath the site or the proposed development.

There are two coal seams that are shown to outcrop within the local area. These seams are summarised as follows:

Table 2: Summary of Coal Seams Within the Vicinity of the Site.

Seam Name	Seam Thickness ^{5*}	Outcrop Distance from Site ^{5*}	Anticipated Depth below Site
Kents Thin (KN)	0 – 1.9m	20m S	Within 5m
Kents Thick (KK) (Mapplewell Coal)	0.3 – 2.6m	170m S	Within 20m

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

It should be further emphasised that the site is underlain by The Kents Rock; a sandstone member of the Pennine Middle Coal Measures Formation. Throughout the local area, this member is discontinuous in nature and ranges in thickness by 15m.

Stratigraphically, the Kents Thin Coal Seam is located at the base of the Kents Rock Sandstone. Whilst this seam is inferred to outcrop within the local area, it should be noted that this seam is also discontinuous in nature. Nevertheless, although the exact thickness of the overlying sandstone member is unclear, taking into consideration the topography of the local area, it is likely that the Kent's Thin Coal Seam could be present beneath the site at depths as shallow as 5m.

The Kent's Thick Coal seam is also shown to outcrop within the local area. This seam is known to be persistent and contains significant thicknesses of dirt partings. In Cortonwood (located east of site) the 'split' is recorded to be as thick as 10m. Furthermore, taking into consideration the topography of the local area, this seam could be present within 20m of the site surface.

⁵ Sources: British Geological Survey (NERC) Map Sheets 87; Barnsley; Solid and Drift Edition, and Geology of Britain Viewer [online resource from www.bgs.ac.uk]

⁶ Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [online resource from www.bgs.ac.uk]



2.2 Coal Authority Mines Report

As part of this study a Coal Authority Consultants Coal Mining Report has been obtained. The report is presented as Appendix 2 and for the purposes of discussion has been summarised below:

Table 3: Summary of the Consultant's Coal Mining Report

Has the report highlighted evidence or potential of:			
Ref	Mining Feature	Yes/No	Comments
1	Underground Coal Mining	Yes	The Top Hard Seam has been worked beneath the site at a depth of 86m, has an extraction thickness of 2.39m and was last worked in 1871. The Lidgett Coal Seam has been worked beneath the site at a depth of 208m, has an extraction thickness of 1.2m and was last worked in 1903. The Low Fenton Coal Seam has been worked beneath the site at a depth of 311m, has an extraction thickness of 1.07m and was last worked in 1951. The Parkgate Coal Seam has been worked beneath the site at a depth of 323m, has an extraction thickness of 1.68m and was last worked in 1926. The Thorncliffe Coal Seam has been worked beneath the site at a depth of 337m, has an extraction thickness of 0.86m and was last worked in 1941. The Silkstone Coal Seam has been worked beneath the site at a depth of 411m, has an extraction thickness of 0.86m and was last worked in 1913.
2	Probable Unrecorded Shallow Workings	No	-
3	Spine Roadways at Shallow Depth	No	No spine roadway recorded at shallow depth.
4	Mine Entries	No	None recorded within 100m of the enquiry boundary.
5	Abandoned mine plans	Yes	Plans of abandoned mine workings below the site are suggested to be available by the Coal Authority.
6	Outcrops	Yes	The Kents Thin Coal Seam is shown to outcrop 38.8m south of the site.
7	Geological Faults	No	No faults, fissures or breaklines recorded.
8	Opencast Mines	No	None recorded within 500 metres of the enquiry boundary.
9	Coal Authority Managed Tips	No	None recorded within 500 metres of the enquiry boundary.
10	Site Investigations	No	None recorded within 50 metres of the enquiry boundary
11	Remediated Sites	No	None recorded within 50 metres of the enquiry boundary.
12	Coal Mining Subsidence	No	The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31st October 1994. There is no current Stop Notice delaying the start of remedial works or repairs to the property. The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.
13	Mine Gas	No	None recorded within 500 metres of the enquiry boundary.
14	Mine Water Treatment Schemes	No	None recorded within 500 metres of the enquiry boundary.
15	Future underground mining	No	For further information please see section 3 of the Consultant's Coal Mining Report (ref 51002156762001).
16	Coal mining licensing	No	
17	Court orders	No	
18	Section 46 notices	No	
19	Withdrawal of support notices	No	
20	Payments to owners of former copyhold land	No	



2.3 Geological Survey Borehole Records

The British Geological Survey (NERC) keeps borehole records from across Britain which are available for public viewing through their website. As part of this study, the records in the area around the site have been reviewed in order to assist in establishing the geological conditions.

Unfortunately in this instance, there are no borehole scans available within the vicinity of the site that will assist with this assessment. Whilst there are borehole scans present within 500m to the south of the site, these boreholes are situated on outcrops stratigraphically below the site. Therefore, the Kents Thin and Kents Thick Coal Seams are not present within these boreholes. Furthermore, other borehole scans are available at a greater distance to the site within other faulted blocks. However, these are not anticipated to represent comparable ground conditions to those anticipated to be present below the site.

3. Risk Assessment

The risk to the stability of the proposed residential development has been evaluated from the data obtained and 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 4: Development Specific Risk Assessment

Item	Risk of Instability	Coal Seam(s) Considered	Risk Rating
1	Shallow coal seams	Kents Thin (KN)	Moderate
		Kents Thick (KK) (Mapplewell Coal)	Moderate
2	Coal workings at depth	The Coal Authority report indicates that the property is within a surface area that could be affected by past underground mining.	Low

On the basis of all of the information provided above, two coal seams are anticipated to be present within 30m of the surface at the site. Whilst these seams may be of limited thickness, the possibility of these seams being worked below the site cannot be ruled out. Historic coal mining activity is evident in the nearby area, and therefore it is considered that if coal was known to be close to ground level it could have been removed illicitly via shallow mining methods with relative ease.

It may be noted that guidance available from both the NHBC and the CIRIA publication, SP32 - *construction over abandoned mine workings*, suggests that competent overburden thickness above a coal seam should be greater than 10 times the thickness of a seam plus seam thickness in order that the collapse of workings would pose a low risk to surface structures.

On this basis, assuming a maximum thickness of the coal seams, the table below suggests the thickness of competent overburden required above each seam to mitigate instability at the surface.

**Table 5: Required Thickness of Competent Overburden**

Seam Name	Seam Thickness	Anticipated Depth below Site	Required Thickness of Competent Overburden.
Kents Thin (KN)	0 – 1.9m	Within 5m	5.5m
Kents Thick (KK) (Mapplewell Coal)	0.3 – 2.6m	Within 20m	28.6m

Based on the above information, it is considered that there will not be a sufficient thickness of competent overburden above both seams in order to prevent the risk of instability posed by the presence of any illicit workings. Therefore, a moderate risk rating has been placed on these seams, and further investigation is recommended to prove or disprove the presence of illicit mining activity.

In regard to deeper mining which could affect the site, the property is within a surface area that could be affected by deep past underground mine workings. However, any movement as a consequence of these workings is likely to have ceased. Therefore the risk posed by workings at depth can be considered low.

4. Conclusions

In light of the potential risks of instability at the site from the working of shallow coal, it cannot be recommended that development takes place without further investigation to conclusively determine the presence of such workings. This work should include physical drilling methods to explore the ground conditions.

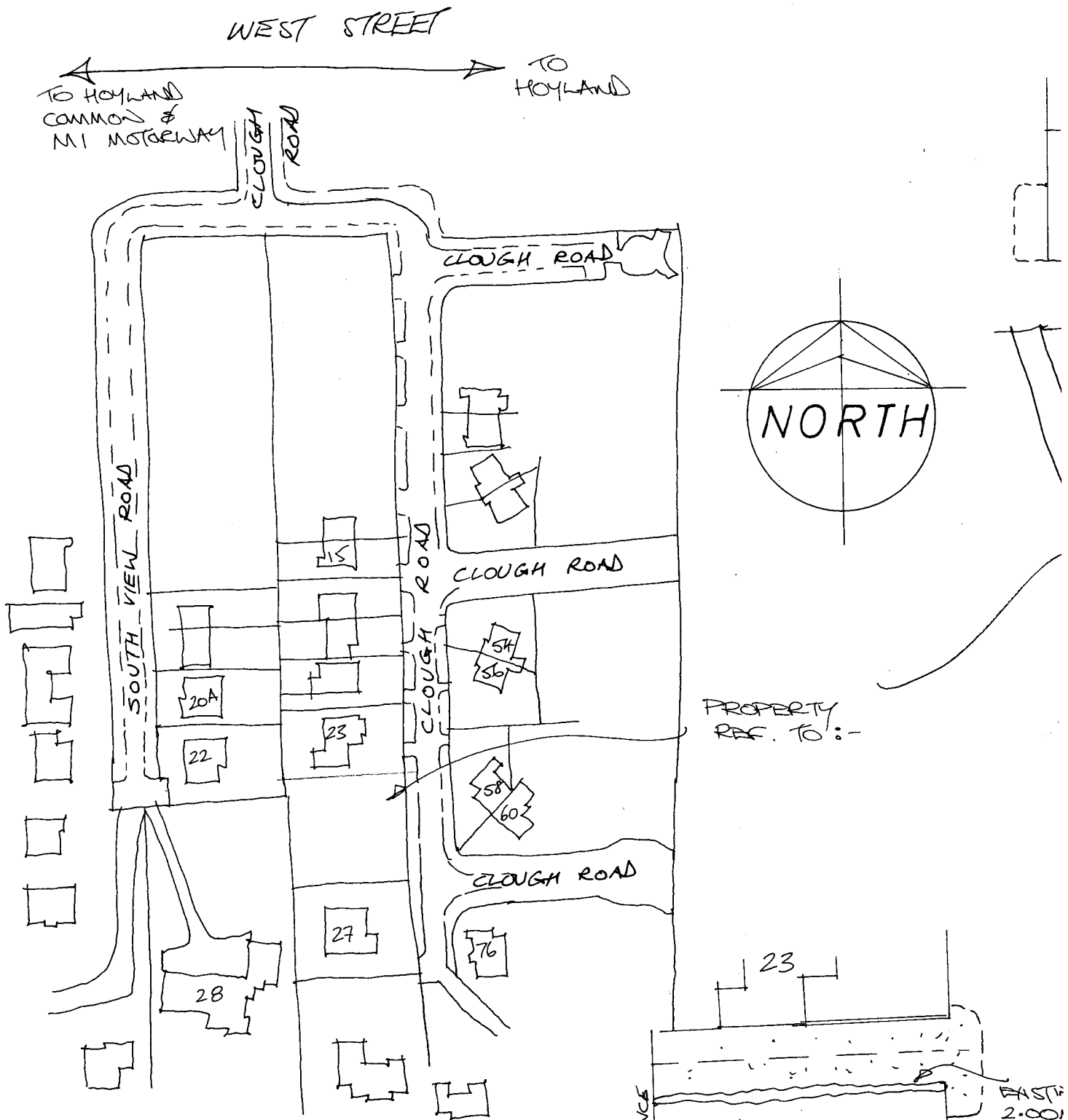
General practice is to undertake rotary openhole boreholes at three locations across the site to mitigate against the potential for drilling through intact columns associated with pillar and stall workings. Furthermore, it is normal to investigate the ground to 30m below ground level; any workings below this depth are unlikely to result in significant instability. However, in this case, the risk of instability is due to shallow workings, therefore, drilling to these depths may not be necessary and the objective should be to ensure that the shallow seams are un-worked or have sufficient competent cover. It may therefore be possible, in the first instance, to undertake one borehole to 30m below the top of the rockhead, with the remaining boreholes proving the depth and continuity of the coal seam(s). In any event, it is considered that approval should be sought with the Local Authority as to the efficacy of this approach.

It is of note that Rogers Geotechnical Services would be happy to assist in any further intrusive investigation that may be required.

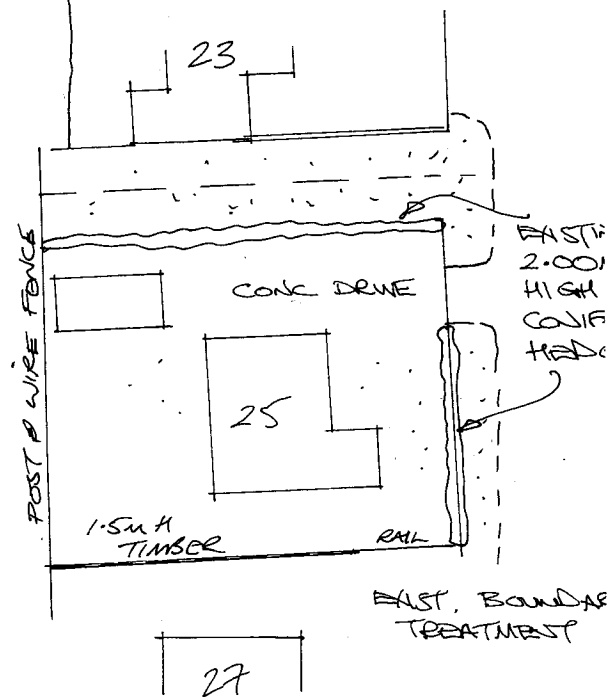


Appendix 1

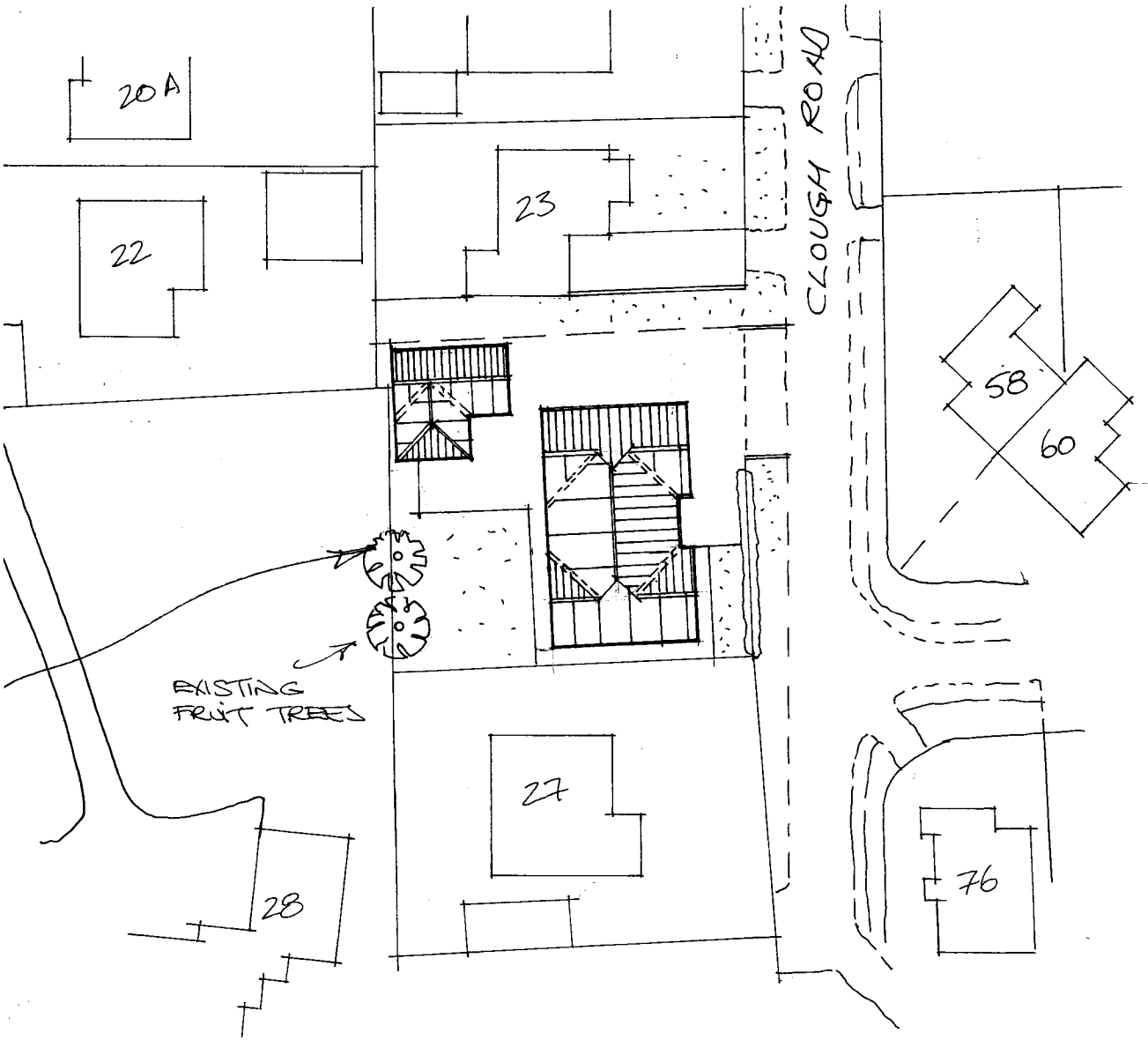
Site Plan



Location Plan 1:1250



Plot as Existing



Site Layout 1:500

Planning:

B/Regs:

Garry Greetham Associates Residential Design Consultant Westwood House 18 Carr Lane Tankersley Barnsley S75 3BE Tel(01226)746573	
PROJECT	Detached Bungalow
CLIENT	Mr. & Mrs. A. Slater
TITLE	Site & Location Layouts
ADDRESS	25 Clough Road, Hoyland, Barnsley. S74 9EA
DRAWN BY	999
SCALE	as shown
DATE	June 19
DRAWING No	911-01
REV	
Member of the Chartered Institute of Architectural Technologists	

Rev	Notes	Date

22-28

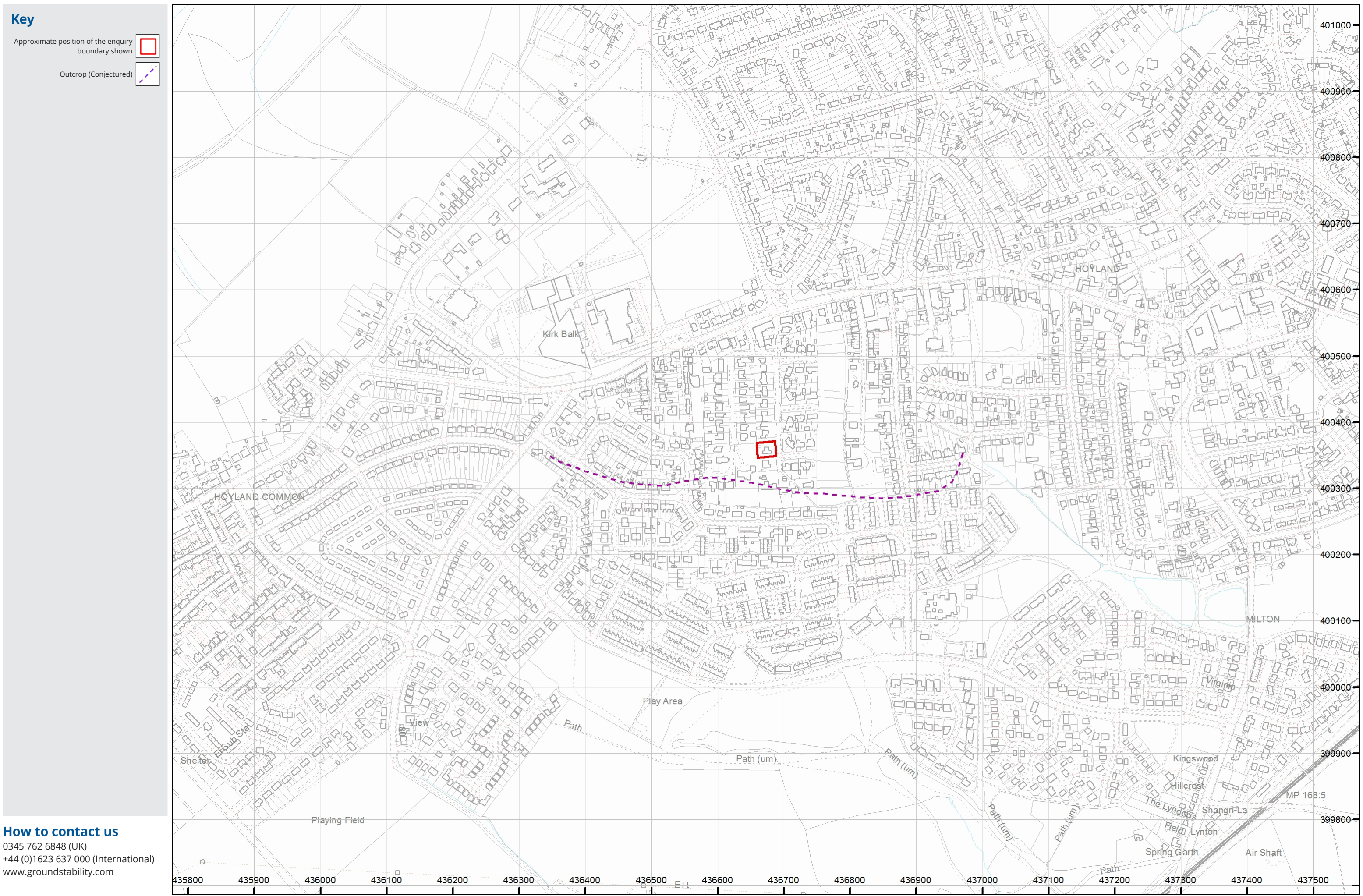
28



Appendix 2

Coal Authority Report

The map highlights any specific surface or subsurface features within or near to the boundary of the site.



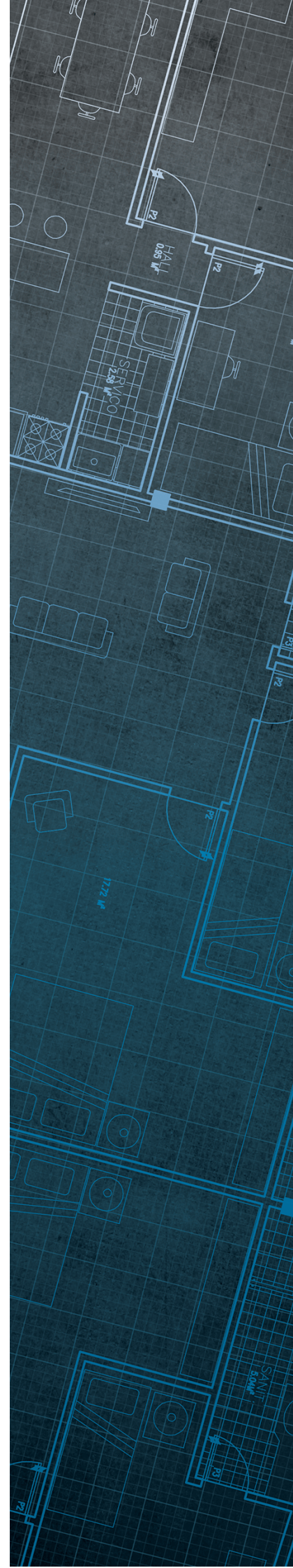


The Coal
Authority

Consultants Coal Mining Report

25 Clough Road
Hoyland
Barnsley
S74 9EA

Date of enquiry:	22 July 2019
Date enquiry received:	22 July 2019
Issue date:	22 July 2019
Our reference:	51002156762001
Your reference:	J4786/19/EDS



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

ROGERS GEOTECHNICAL SERVICES LTD

Enquiry address

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Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
PARKGATE	TOP HARD BARNSELEY	Coal	5OTZ	86	Beneath Property	2.6	North-East	239	1871
ROCKINGHAM	SWALLOW WOOD	Coal	5OU5	135	South-East	2.9	North-East	122	1960
unnamed	LIDGETT	Coal	5NM9	208	Beneath Property	2.3	North	120	1903
ROCKINGHAM	THORNCLIFFE	Coal	5OUK	294	South-West	2.8	North-East	64	1908
unnamed	LOW FENTON	Coal	5NMD	311	Beneath Property	1.7	North-East	107	1951
unnamed	TOP FENTON	Coal	5OUE	312	South-East	2.2	North-East	104	1912
HOYLAND SILKSTONE	PARKGATE	Coal	4OWI	323	Beneath Property	3.7	North-East	168	1926
ROCKINGHAM	THORNCLIFFE	Coal	5OUL	337	Beneath Property	4.1	North-East	86	1941
ROCKINGHAM	SILKSTONE	Coal	4OWA	363	South-West	2.7	East	86	1894
HOYLAND SILKSTONE	SILKSTONE	Coal	4OWB	411	Beneath Property	2.8	North-East	86	1913

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

14371	M432	NE855
9039	NE853	2250
12953	SY165	NE820

Our records show we have more plans than those shown above which could affect the enquiry boundary.

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
KENTS THIN	Coal	Yes	38.8	South	99

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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