



Rotary Borehole Site Investigation Report

LOCATION	Land at Hebble Court, Thornhill Lees, Dewsbury WF12 0AY
ISSUE DATE	24 September 2021
FOR	Mr S Patel
CLIENT REF.	
OUR REF.	G21332

Prepared by



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1. Introduction

In accordance with your instruction, Geoinvestigate Ltd carried out an intrusive rotary borehole site investigation for the proposed development located on the Land at Hebble Court, Thornhill Lees, Dewsbury, WF12 0AY.

It is proposed to erect three (3) new dwellings at the site south of the existing canal. The approximate centre of the site is at National Grid Reference E 424689, N 419684. The relative positions of the developments are shown on the attached plan in Appendix 1.

The purpose of this investigation was to investigate the site for the possible presence of shallow abandoned underground coal mine workings beneath the site. Therefore, this investigation is limited to this aspect only.

A possible shallow or near surface mining risk at the site had been identified in a mining report provided by the Coal Authority and subsequent Coal Mining Risk Assessment carried out by Geoinvestigate report ref G20411 in November 2020.

2. Geoinvestigate Coal Mining Risk Assessment Report & Mining Report

The Geoinvestigate Coal Mine Risk Assessment (Ref G20411 Dated 27 November 2020) and excerpts of the included Coal Authority Report ref 51002329925001 dated 18 November 2020 are provided in Appendix 2.

A review of the historical records available within the CMRA showed that the site by 1855 to be part of the "Slaithwaite Mill (woollen)" by 1893 the site is identified as the 'Malthouses and Hebble Mills'. The immediate banks of the canal are shown quarried (presumably sandstone quarrying) to the east of the site. A clay pit is present to the west. The Hebble Mills building stands on the canal side. The site remained largely unchanged up to the 1970s. Sometime between 1972 and 1993 the mill was demolished, and the site left unoccupied/derelict.

The geology map indicates that the site is not covered by superficial/drift deposits and rockhead of a sandstone unit within the Lower Coal Measures, lies at or near surface at this location.

The Coal Authority report identifies the site as falling within or close to Development High Risk Area (DHRA), due to its proximity to workable coal outcrop close by to the north of the property. The C.A. do not know of any levels of past underground mine workings beneath the property or in the surrounding area which could influence ground stability and that the site does not fall within in area of 'Past Shallow Coal Mine Workings'.

The CA report indicates that one coal seam outcrop of the Parkgate Coal 13.3m north of the site, the CMRA estimates that this will underlie the site perhaps around 7m, given the stratigraphic dip and elevation difference between the outcrop and the site.

There are no recorded mine shafts present within the proposed development area. A mine adit is identified to the northwest, with its corridor influence coming within close distance to the southwest corner of the site, though is not considered to impact surface ground stability within the site, it was advised that a borehole was located at this corner of the site to confirm this. However, the Coal Authority records may be incomplete, and mine entries may be present for which the Coal Authority has no knowledge.

The report therefore concluded that: *“This CMRA has identified that the site lies close to workable coal outcrop and is possibly underlain by very shallow unrecorded underground mining in this coal horizon below a covering of several metres of sandstone bedrock, the latter perhaps currently providing surface ground stability in the development area and in the surrounding area...”*

In light of the possible presence of shallow coal workings below the site, the Client commissioned Geoinvestigate to carry out a borehole investigation to evaluate this possible hazard to the development.

3. Scope of Intrusive Investigation

3.1 Scope of Works

In line with the following borehole drilling investigation was carried out at the site to establish if abandoned coal mine-workings were present in the underlying strata:

- The sinking of three (3) boreholes (RH1, RH2, and RH3) to a target depth of up to 30m with supervision of the drilling works by a qualified geotechnical engineer. The boreholes were rapidly driven to depth using Geoinvestigate’s proprietary new high-speed Microdrilling system.
- Provision of an interpretative report including site plan and borehole logs.

Microdrill’s small volume water injection system offers a safer method of investigating coal mine workings minimising the risk of combustion or explosion of coal and mine gases and the migration of hazardous gases into nearby buildings.

Gas monitoring was carried out during drilling to measure concentrations of Oxygen O₂ and potentially toxic and explosive levels of Carbon Dioxide CO₂, Methane CH₄ & Carbon Monoxide CO in the ground. On completion, the boreholes were backfilled with bentonite to seal against any potential ingress or ingress of air.

The ground conditions encountered in the boreholes (as described by the driller) are shown on the borehole logs provided in Appendix 5.

The current report focuses only on the mining situation beneath the site. It does not deal with the condition of the surface drift horizon (made ground and natural soils) which cover the site.

3.2 Drilling Technique

The condition of the ground with regard to strength and rock type was assessed by the drillers using the variations in drilling progress, drilling flush pressure, “feel”, and the nature of the arisings (drill debris) returned to surface in the water flush and whether the flush itself was returned. No rock cores were recovered from the boreholes.

The primary purpose of the boreholes in this investigation was to identify variations in rock strength and rock type and to highlight possible geotechnical hazards such as voids or broken / weak strata which might indicate abandoned mine workings or upward void migration.

4. Encountered Ground Conditions

4.1 RH1 to RH3

Each of the three rotary boreholes encountered similar ground conditions, initially comprising drift to between 8.30m to 9.20m depth, underlain by bedrock of sandstone with mudstone inclusions to 14.5m to 15.4m. RH1 then records mudstone to 18.7m, whereas RH2 and RH3 record mudstone with sandstone inclusions. Below this each borehole then encounters sandstone to a depth of 30.0m and borehole termination.

No intact coal seams, broken ground or voids were encountered in the boreholes drilled.

No hazardous gas concentrations were noted from readings taken from the boreholes during drilling.

Water flush was lost in all three boreholes, at 6.20m, 4.20m and 5.70, in RH1, RH2 and RH3 respectively.

5 Review of Ground Conditions.

The boreholes suggest that drift deposits extend to a depth of between 8.30m to 9.20m underlain by bedrock comprising of sandstone with mudstone inclusions, mudstone with sandstone inclusions/mudstone and sandstone to the base of each rotary borehole at 30.00m.

In each borehole no intact coal seams, broken ground, or voids (possibly indicative of past ground workings), were noted. Water flush was lost in all three boreholes within the drift horizon at depths of 6.20m, 4.20m and 5.70, in RH1, RH2 and RH3 respectively.

6 Conclusions

At the positions drilled, drift deposits extend to circa 9.20m underlain by bedrock comprising of sandstone with mudstone inclusions, mudstone with sandstone inclusions/mudstone and sandstone to the base of each rotary borehole at 30.00m.

The absence of broken ground, voids, or coal seams in each of the boreholes would indicate that the risk of shallow mine-working beneath the site would be **low**.

Flush was lost during the drilling exercise in all three boreholes within the drift horizon, at 6.20m, 4.20m and 5.70, in RH1, RH2 and RH3 respectively. Flush loss is commonly associated with encountering fractures or mine workings (void, broken ground, backfill etc.). However, in this case as the flush was lost within the encountered drift, this is not considered to be related to underground coal mine workings or any voiding therein. The loss of flush is currently thought to be caused by the superficial deposits having a high permeability or from voids being present within the deposits.

In this connection based on the Historical Ordnance Survey map record, old quarries were identified to the east of the site, which were likely surface excavations of sandstone and potentially of the Parkgate coal seam. The boreholes recorded a site-specific drift depth of 8.30m to 9.20m beneath the site, and the CMRA predicted the Parkgate coal to occur at 7m below the site.

Anecdotal evidence from the client suggests that the adjacent development carried out recently had required a piled foundation extending to >7m due to the depth of made ground encountered in previous geotechnical investigations.

Therefore, considering the prior, the coal seam has either been naturally eroded from the site, or most likely, the coal has been removed and quarried, potentially as part of the construction of the adjacent canal, prior to the earliest OS map records, then latterly infilled post excavation prior to or for the development of the site into Slaithwaite Mill. However, this is unrelated to the ground stability of the site, related to coal mining legacy.

Additionally, as advised by the CMRA, RH3 was located to the southwest corner of the site to determine the nature of the mine adit 424419-005 and qualify its associated risk to the site. The borehole encountered no voids or broken ground, which could be associated with workings or the mine adit (tunnel) beneath the site. It is therefore thought that the mine adits corridor lies outside of the site boundary and will have a low to very low risk to the ground stability of the site. In addition, the inferred depth of the Parkgate coal seam at depth of 7m (from the initial CMRA report) would imply that if the adit was targeting the seam, the feature would have potentially been present in the initial 8.30m to 9.20m depth at the site and has more than likely been removed by the extraction of sandstone and potential coal beneath the site.

In conclusion, the drilling has confirmed that no special foundations or ground treatments would be required to mitigate the risk to the site from damage such as subsidence, or collapse, exclusively due to the sites past coal mining legacy. However, considering the depth of the infill present and the identified past land use of the site and depth of fill a piled foundation will be required. It is also strongly advised that further geo-environmental surveys are undertaken to better understand the potential contamination risk to the site.

END OF REPORT



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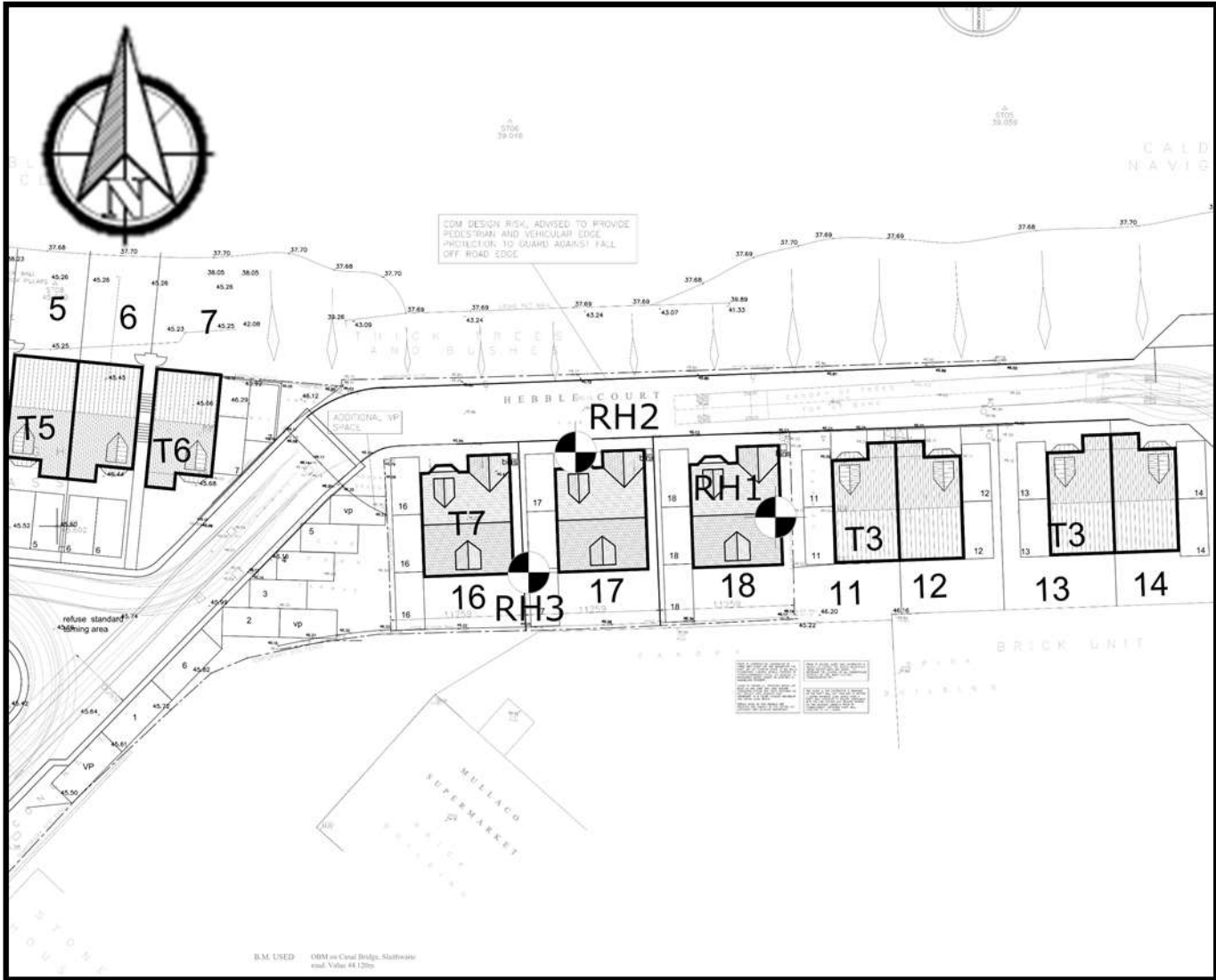
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APPENDIX 1
Site Plan & Borehole Logs

OUR REF: G21322	YOUR REF:	SITE PLAN (NOT TO SCALE)
DATE: 16/09/2021	LOCATION: Land at Hebble Court, Thornhill Lees, Dewsbury, WF12 0AY	





Key:

RH1

Rotary borehole positions

GEOINVESTIGATE Ltd.**Your Ref.****Our Ref.** G21332**RH No.1 Sheet No. 1 of 2****Location:** Land at Hebble Court, Thornhill Lees, Dewsbury, WF12 0AY**DATE:** 16/09/21

Depth (m)	Description of Strata	Thickness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
0.10	CONCRETE.	100							
	Brown DRIFT.								2.50
		9100					Flush lost at 6.20m		5.00
9.20									7.50
	SANDSTONE with MUDSTONE inclusions.								10.00
		6200							12.50
15.4									15.00
	MUDSTONE.								17.50
18.7		3300							20.00
	SANDSTONE.								22.50
		11300							25.00
30.0									

Remarks: Casing to 1.00m

Microdrill rotary open hole borehole to 30.00m

No cores recovered from borehole

No gas detected from borehole on completion

Flush lost at 6.20m. No voids encountered.

RH1

GEOINVESTIGATE Ltd.**Your Ref.****Our Ref.**

G21332

RH No.1 Sheet No. 2 of 2**Location:** Land at Hebble Court, Thronhill Lees. Dewsbury, WF12 0AY**DATE:** 16/0/2021

Depth (m)	Description of Strata	Thick-ness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
30.0	SANDSTONE.	11300							27.50 30.00
	Rotary hole terminated at 30.00m								

Remarks: Casing to 1.00m

Microdrill rotary open hole borehole to 30.00m



No cores recovered from borehole

No gas detected from borehole on completion

Flush lost at 6.20m. No voids encountered.

RH1

GEOINVESTIGATE Ltd.**Your Ref.****Our Ref.** G21332**RH No.2 Sheet No. 1 of 2****Location:** Land at Hebble Court, Thornhill Lees, Dewsbury, WF12 0AY**DATE:** 16/09/21

Depth (m)	Description of Strata	Thickness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
0.10	CONCRETE.	100							
	Brown DRIFT.								2.50
		8800					Flush lost at 4.20m		5.00
									7.50
8.90									10.00
	SANDSTONE with MUDSTONE inclusions.								12.50
		5600							15.00
14.5									17.50
	MUDSTONE with SANDSTONE inclusions.								20.00
		5700							22.50
20.2									25.00
	SANDSTONE.								
		9800							
30.0									

Remarks: Casing to 1.50m

Microdrill rotary open hole borehole to 30.00m

No cores recovered from borehole

No gas detected from borehole on completion

Flush lost at 4.20m. No voids encountered.

RH2

GEOINVESTIGATE Ltd.**Your Ref.****Our Ref.** G21332**RH No.2 Sheet No. 2 of 2****Location:** Land at Hebble Court, Thornhill Lees, Dewsbury, WF12 0AY**DATE:** 16/09/21

Depth (m)	Description of Strata	Thick-ness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
30.0	SANDSTONE.	9800							27.50 30.00
	Rotary hole terminated at 30.00m.								

Remarks: Casing to 1.50m

Microdrill rotary open hole borehole to 30.00m


No cores recovered from borehole

No gas detected from borehole on completion

Flush lost at 4.20m. No voids encountered.

RH2

GEOINVESTIGATE Ltd.**Your Ref.****Our Ref.** G21332**RH No.3 Sheet No. 1 of 2****Location:** Land at Hebble Court, Thornhill Lees, Dewsbury, WF12 0AY**DATE:** 16/09/21

Depth (m)	Description of Strata	Thickness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
0.10	CONCRETE.	100							
	Brown DRIFT.	8200					Flush lost at 5.70m		2.50 5.00 7.50
8.30	SANDSTONE with MUDSTONE inclusions.	6900							10.00 12.50
15.2	MUDSTONE with SANDSTONE inclusions.	6300							15.00 17.50 20.00
21.5	SANDSTONE.	8500							22.50
30.0									25.00

Remarks: Casing to 1.00m

Microdrill rotary open hole borehole to 30.00m

No cores recovered from borehole

No gas detected from borehole on completion

Flush lost at 5.70m. No voids encountered.

RH3

GEOINVESTIGATE Ltd.**Your Ref.****Our Ref.** G21332**RH No.3 Sheet No. 2 of 2****Location:** Land at Hebble Court, Thornhill Lees, Dewsbury, WF12 0AY**DATE:** 16/09/21

Depth (m)	Description of Strata	Thick-ness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
30.0	SANDSTONE.	8500							27.50 30.00
	Rotary hole terminated at 30.00m.								

Remarks: Casing to 1.00m

Microdrill rotary open hole borehole to 30.00m

No cores recovered from borehole

No gas detected from borehole on completion

Flush lost at 5.70m. No voids encountered.

RH3



The Coal
Authority

Granted Permit Boundary

Permit Ref: 22697

Permit Boundary:



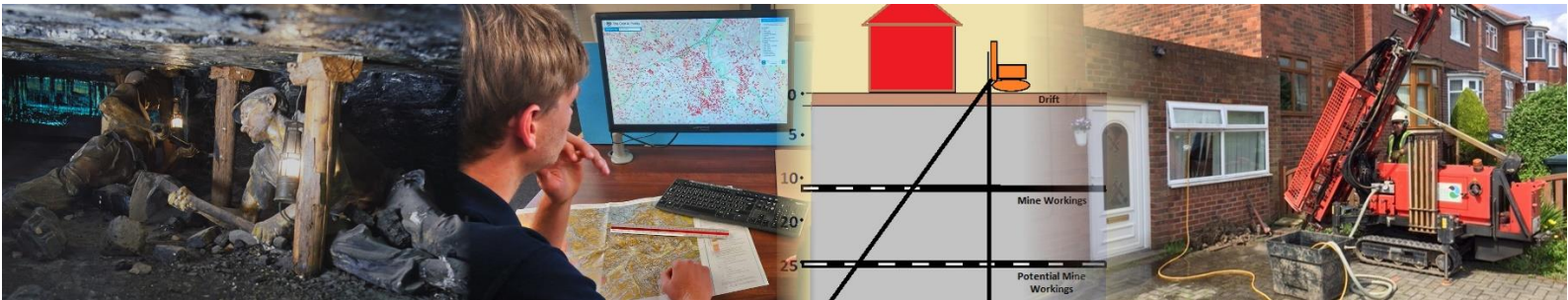
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APPENDIX 2

Geoinvestigate CMRA (Ref: G20411) & Coal Mining Report



GEOLOGICAL
 GEOTECHNICAL
 GEOENVIRONMENTAL
 CONSULTANCY
 DRILLING & DATA ACQUISITION



GEOINVESTIGATE LIMITED

Coal Mining Risk Assessment (CMRA)

LOCATION	Hebble Court, Thornhill Lees, Dewsbury, Kirklees, WF12 0AY
ISSUE DATE	27 November 2020
FOR	Siraj
CLIENT REF.	
OUR REF.	G20411

Prepared by

Charlotte Champion MGeoSci (Hons) FGS
 Senior Geo-environmental Engineer

Checked by

Ross Nicolson BSc(Hons) MSc(Eng) CEng MIM³
 Principal Geotechnical Engineer

SUMMARY FINDINGS

OUTCOME (MITIGATION REQUIRED?) YES / NO	<i>YES. This CMRA has suggested that unrecorded mine working could possibly occur within very shallow depth below the proposed development and significantly impact surface ground stability. In our opinion a drilling investigation should be carried to confirm drift/bedrock depth and coal seam and mine working (if any) depth below the site. Gas monitoring should be carried out during drilling.</i>
WHAT TO DO NEXT	<i>Obtain quotes for the intrusive site investigation works. The cost of the SI works should be a "lump sum" fixed price. Geoinvestigate can provide advice and assistance with helping you find suitable site investigation & drilling contractors. Call us on 01642 713779 or email enquiries@geoinvestigate.co.uk.</i>

1. CMRA INTRODUCTION

1.1 SITE LOCATION AND DESCRIPTION

The approximate centre of this site is at National Grid Reference E 424689 N 419684 with an elevation of approximately 46.3m AOD. The boundary shown RED in the Coal Authority (CA) report provided in Appendix A corresponds with the planning application area. It is proposed to erect 3 new detached dwellings at the site. The site is located above the Calder and Hebble Navigation Canal (built 1805 – 1808) and a steep slope down to the canal side. The location and layout of the proposed development are shown in Appendix B.

Google Street View & Satellite imagery in Appendix C shows the site currently comprises unoccupied open land with various waste materials (perhaps building materials) strewn across it and two storage containers. The present condition of the surface is unknown

The OS map record dating back to 1855 indicates the site to be originally part of the 'Slaithwaite Mill (woollen)'. By 1893 the site is identified as the 'Malthouses and Hebble Mills'. The immediate banks of the canal are shown quarried (presumably sandstone quarrying) to the east of the site. A Clay Pit is present to the west. The Hebble Mills building stands on the canal side. The site remained largely unchanged up to the 1970s. Sometime between 1972 and 1993 the mill was demolished, and the site left unoccupied/derelict.

The historical map record provides no evidence that the site itself has been subject to surface mining activity, though there is evidence of surface quarrying and working of the canal banks in the nearby surrounding area.

Description & Layout of Proposed Development: It is proposed to erect 3 new dwellings at the site. The layout of the scheme is shown in Appendix B.

Risk Methodology Applied: This document and the risk assessment methodology adopted herein is based on CA publication RISK BASED APPROACH TO DEVELOPMENT MANAGEMENT - GUIDANCE FOR DEVELOPERS Version 3, 2014 and Version 4 - 2017. The template contained therein is adopted with amendments made by Geoinvestigate Limited.

2. ASSESSMENT OF SITE-SPECIFIC COAL MINING ISSUES

The table below summarises the potential risks associated with coal mining legacy for the proposed development site identified from the CA report in Appendix A:

Coal Mining Issues	Yes	No	Risk Assessment/Remarks
Past underground coal mining	Yes		2.1.1 (refer below)
Probable unrecorded shallow workings		No	2.1.2
Spine roadways at shallow depth		No	
Mine entries		No	2.1.3
Outcrop		No	2.1.2
Geological faults, fissures and breaklines		No	
Opencast Mines		No	
Coal Mining Subsidence		No	
Mine Gas		No	2.1.4
Site investigations		No	

Note: For those coal mining issues above identified as "Yes" or highlighted "YELLOW" a more detailed discussion and assessment are made of the risks to the application site and the proposed development.

2.1 DETAILED DISCUSSION & ASSESSMENT RESPONSE

2.1.1 Past Underground Mining

The Coal Authority (CA) online interactive map information identifies the site as falling within or close to Development High Risk Area (DHRA) because of its proximity to workable coal outcrop close by to the north of the property. It is not identified as DHRA because of probable/unrecorded coal mine working though it is our experience that the CA allocate the same risk to coal outcrop and probable shallow mine working.

The CA identify the site as falling within an area of probable shallow coal mine working.

The CA report in Appendix A identifies past/recorded underground mining beneath the site in one seam of coal (Black Bed) at a depth of 266m, last worked in 1915, and one seam (Middleton Main) at 54m depth to the south east of the site, last worked in 1973. The recorded extraction thickness is 76cm (both seams). In our opinion such working likely lies too deep to impact surface ground stability within the proposed development area.

However, this does not mean that shallower unrecorded mine working does not exist beneath the site. Mine maps and other documents can get lost or destroyed over the years and if mining was very old there may be no records about it whatsoever and local memories fade quickly. Furthermore, workable coal outcrop occurs close by to the north of the site and dips beneath it.

Strata and coal seams dip 2.3 to 2.4 degrees to the south east.

2.1.2 Probable unrecorded shallow workings

According to the CA report the site does not fall within an area of probable unrecorded shallow workings. The CA define Probable Unrecorded Shallow Workings as "Areas where the Coal Authority believes there to be unrecorded coal working that exist at or close to the surface" (i.e. less than 30m).

The location of the site is shown on the extract of BGS solid geology map presented in Appendix D. The tentative elevation of the site relative to the vertical geology column is shown below the map.

The drift geology map indicates that the site is not covered by superficial/drift deposits and it is anticipated that rockhead lies at or near surface at this location.

Distant BGS borehole records (not included in this report), suggest bedrock is present at around 1m depth.

According to the geology map the site is underlain by a sandstone (Sa) unit within the Lower Coal Measures.

The CA report identifies outcrop of the Parkgate Coal, presumably corresponding with the First Brown Metal Coal (1BM shown on the geology map), 13.3m north of the site. It is speculated that this coal seam was located during the excavation of Calder and Hebble Navigation Canal in the early 1800s.

Based on the elevation difference between the site and the coal outcrop lower down in the canal and the seams dip of 2.4 degrees to the south east, it is anticipated that the Parkgate Coal will underlie the site at a depth of perhaps around 7m. It should be noted the Parkgate Coal is of economic significance in the South Yorkshire Coalfield and the CA report identifies it as 'workable'.

According to the geology map the 1BM/Parkgate Coal can be up to 0.80m thick whereas BGS publication UK Coal Resources for New Exploitation Technologies Report CR/04/015N page 178 of Stratigraphy of the South Yorkshire Coalfield gives thickness of 1.00m to 1.55m for the Parkgate and 1.00m for the 1BM. The report is not included in this CMRA.

While the CA do not identify probable unrecorded shallow working at this site it is our opinion that the presence of workable coal both beneath the site within very shallow depth and outcropping nearby as well as a nearby (perhaps very old) adit heading SE towards the site from the other side of the canal raises concern about the possible presence of unrecorded working below the new development.

Furthermore, the presence of sandstone mine roof rock could provide favourable conditions enabling very shallow underground mine working. Likewise, the presence of sandstone roof could provide favourable conditions to maintain surface ground stability above very shallow mine working and an adit/tunnel entry to them.

Regrettably, there is no available BGS borehole information nearby that might otherwise cast light on the coal mining geology below the site. A planning application c. 2012 for a recent nearby housing development at Hebble Court provided no information on the site coal mining geology.

Because of these uncertainties it is our opinion that drilling is required to establish drift/bedrock depth, coal seam/mine working (if any) within shallow depth beneath the property.

2.1.3 Mine Entries & ZOIs

No mine entries are identified by the CA within the proposed development area. However, a mine adit (tunnel) ref 424419-005 is located approximately 100m north west of the site of the far side of the canal.

Nothing is known about this adit/mine tunnel neither its age, or its depth or what coal seam or mine working it connected with. Presumably it may be steeply declined under the canal if it post-dates this excavation or it could less steep if it predated the canal and targeted the Parkgate Coal which may lie within very shallow depth < 10m on both sides of the canal.

An adit diameter of 2m is assumed and the CA give a positional uncertainty or departure up to 10m for it.

A zone of influence (ZOI) of 13m is estimated for this adit, based on the departure of 10m, assumed diameter of 2m and assumed bedrock depth of 1m at the site. The ZOI is shown on the plan in Appendix E. Based on this ZOI, and the appreciable distance of the adit entrance from the site, it is not considered that this tunnel will impact surface ground stability within the site. However, it may lie close to the south west corner of the development

While the ground stability risk to the development from adit 005 is considered to be LOW to very low it may be prudent to locate a borehole at this corner of the site to confirm this.

2.1.4 Mine Gas

No mine gas incident or remediation is recorded within 500m of the proposed development and typically, in the UK mine gas is Low risk. Notwithstanding, given the serious nature of mine gas and the possible presence of very shallow coal seam with perhaps mine working beneath the site it is recommended that in this instance the risk is raised to **MODERATE** to perhaps High until proven otherwise by gas testing.

3. SUMMARY AND OUTCOME

This CMRA has indicated that the site lies close to workable coal outcrop and is possibly underlain by very shallow unrecorded underground mining in this coal horizon below a covering of several metres of sandstone bedrock, the latter perhaps currently providing surface ground stability in the development area and in the surrounding area.

In our opinion to properly assess the ground stability risk at this site further information is required about drift/bedrock depth and coal seam and mine working (if any) depth and thickness below the property.

In the absence of available nearby borehole information it is our opinion that drilling is required within the site to establish these parameters.

Gas monitoring must be carried out during drilling.

4. MITIGATION STRATEGY PROPOSED AND CONCLUSION

This CMRA has suggested that unrecorded shallow mine working may occur within shallow depth below this site. A mine adit/tunnel may also extend close to the south west site corner but is not expected to impact the development.

In our opinion a drilling investigation should be carried to confirm that very shallow mine working does not lie beneath the proposed building development area.

To properly determine the coal mining risk at this site it is proposed to drill 3 boreholes at the property to target depths up to 30m (but not necessarily reaching 30m) to locate shallow coal seams and mine working (if any) below the new development as well as establishing drift and bedrock depth. As a precaution one hole should perhaps be located at the south west corner where a mine adit/tunnel may approach the site.

Gas monitoring **MUST** be carried out during drilling.

Risks for Different Drilling Scenarios					
Air flush	Mist flush	Foam flush	Water flush	Mud flush	Additional controls
HIGH	HIGH / MED'M	HIGH / MED'M	LOW	LOW	<ul style="list-style-type: none">Monitoring at rig and other open holes.Seal boreholes

A Coal Authority Permit needs to be obtained (ahead of) further intrusive exploratory drilling. Water Drill Flush to be used when drilling. Permit application must state **WATER ONLY DRILL FLUSH** for the safety of the public and drill crew.

On the basis of the CMRA work to date, we are of the opinion that the mining stability and mine gas risks posed by the strata beneath this site from coal mining legacy can be mitigated by routinely adopted measures and should not preclude planning permission being registered with regard to coal mining legacy issues.

In conclusion we see no reason why Planning Permission should not be granted in the interim with respect to coal mining legacy issues and that these works form a condition on the planning approval.

Appendices:

- CA Consultants Coal Mining Report issued 18 November 2020 ref 51002329925001
- Site location and development layout
- Site images
- Extracts of BGS Geology Map, Sheet 77 Huddersfield - at 1:50000 scale.
- ZOI of Adit & Geology Summary Maps with x-sections.

APPENDIX A
COAL AUTHORITY REPORT



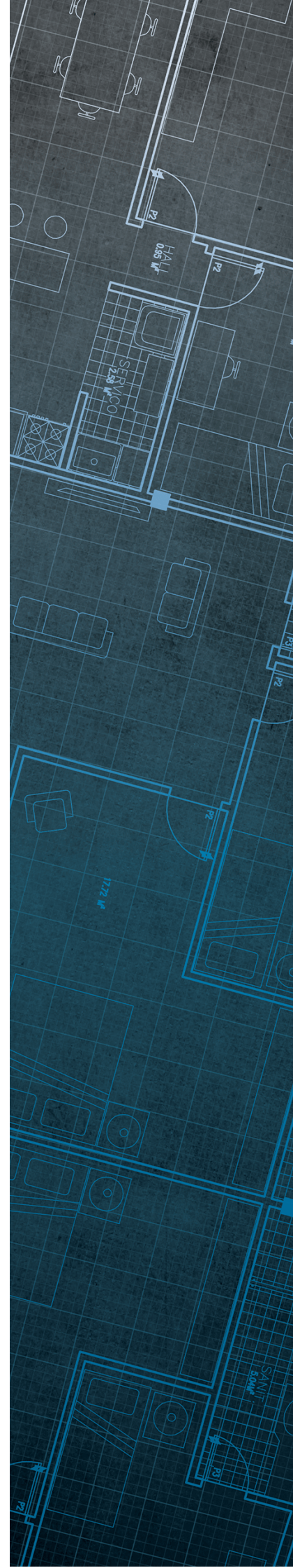
The Coal
Authority

Consultants Coal Mining Report

Hebble Court
Thornhill Lees
Dewsbury
Kirklees
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Date of enquiry: 18 November 2020
Date enquiry received: 18 November 2020
Issue date: 18 November 2020

Our reference: 51002329925001
Your reference: G20411



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

GEOINVESTIGATE

Enquiry address

Hebble Court
Thornhill Lees
Dewsbury
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WF12 0AY

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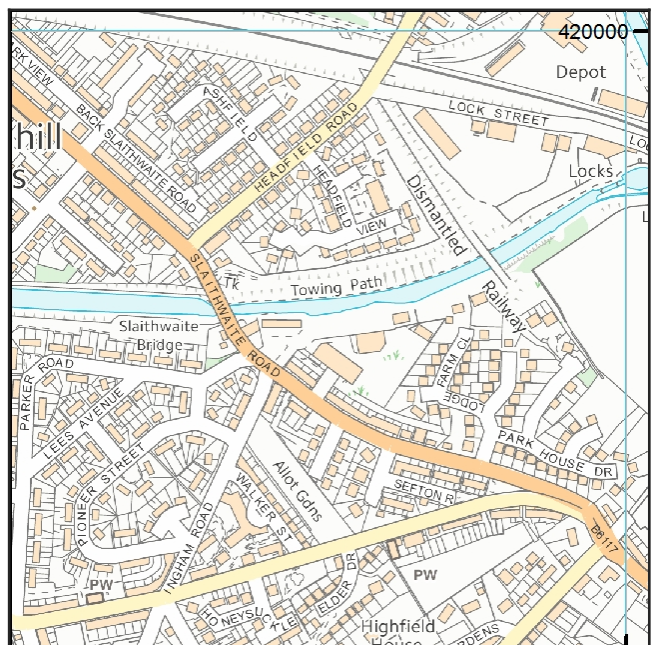
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



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
unnamed	MIDDLETON MAIN	Coal	6L4M	54	South-East	2.3	South-East	76	1873
unnamed	BLACK BED	Coal	6HVH	266	Beneath Property	2.4	South-East	76	1915

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	424419-005	424589 419743		Coal	

Abandoned mine plan catalogue numbers

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

2363	14475	14331
NE640	NE774	NE773
PO0	NE108	GCR104

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
PARKGATE	Coal	Yes	13.3	North	257

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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VAT receipt

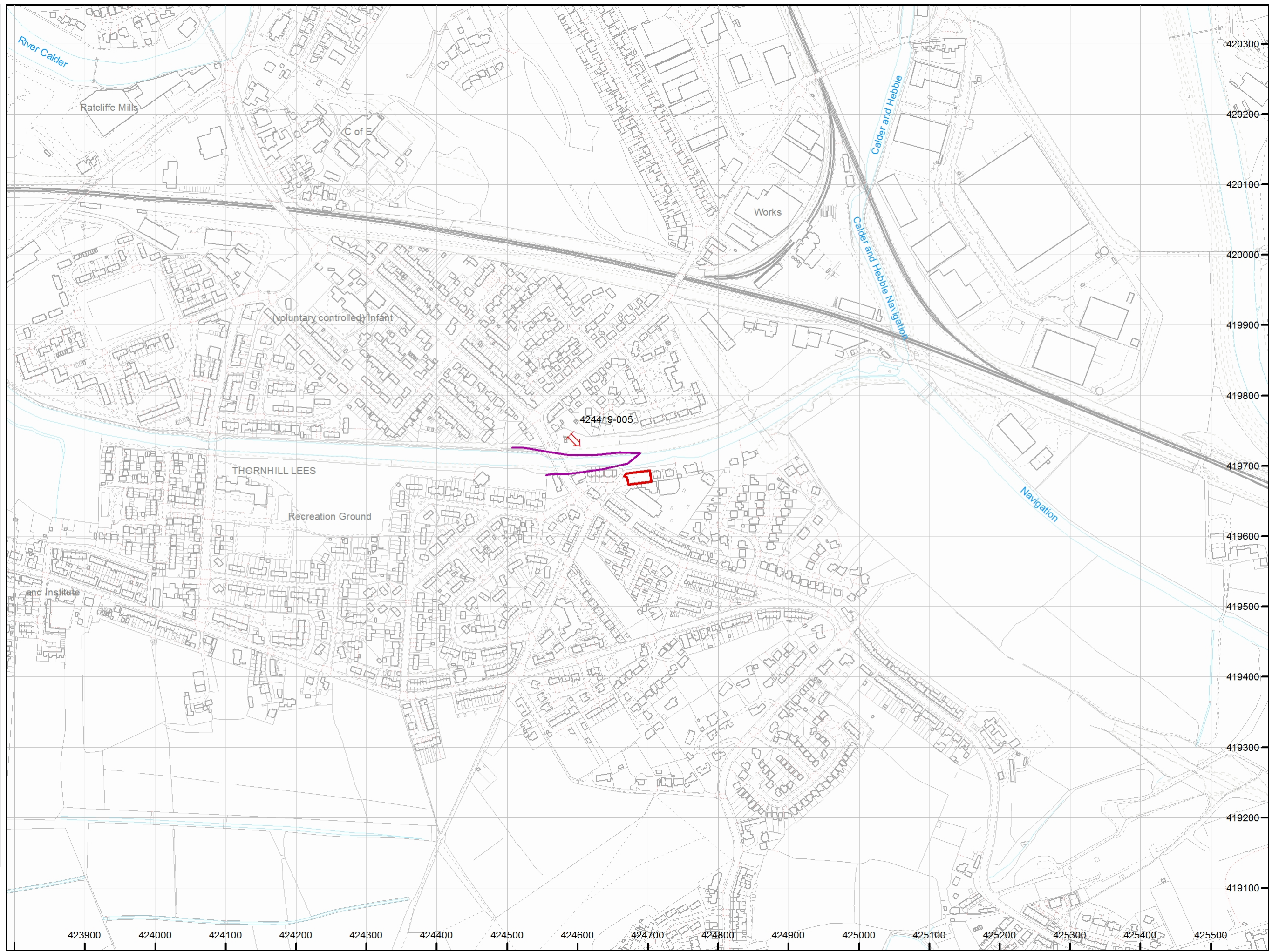
Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	18 November 2020
Issued to	GEOINVESTIGATE TERRY DICKEN INDUSTRIAL ESTATE TERRY DICKEN INDUSTRIAL ESTATE, ELLERBECK WAY STOKESLEY NORTH YORKSHIRE TS9 7AE
Property search for	HEBBLE COURT THORNHILL LEES DEWSBURY KIRKLEES WF12 0AY
Reference number	51002329925001
Date of issue	18 November 2020
Cost	£112.13
VAT @ 20%	£22.43
Total received	£134.56
VAT registration	598 5850 68

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

Key

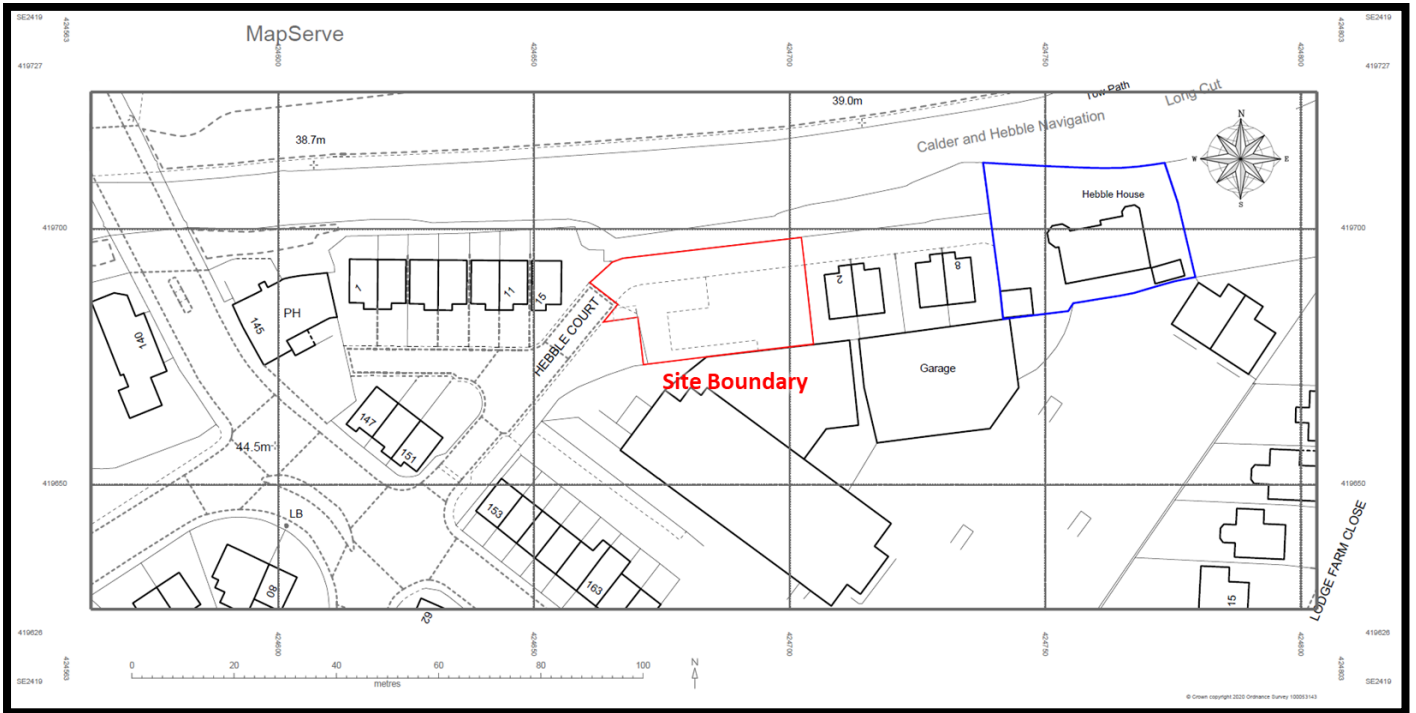
- Approximate position of the enquiry boundary shown 
- Disused adit 
- Outcrop (Proven) 

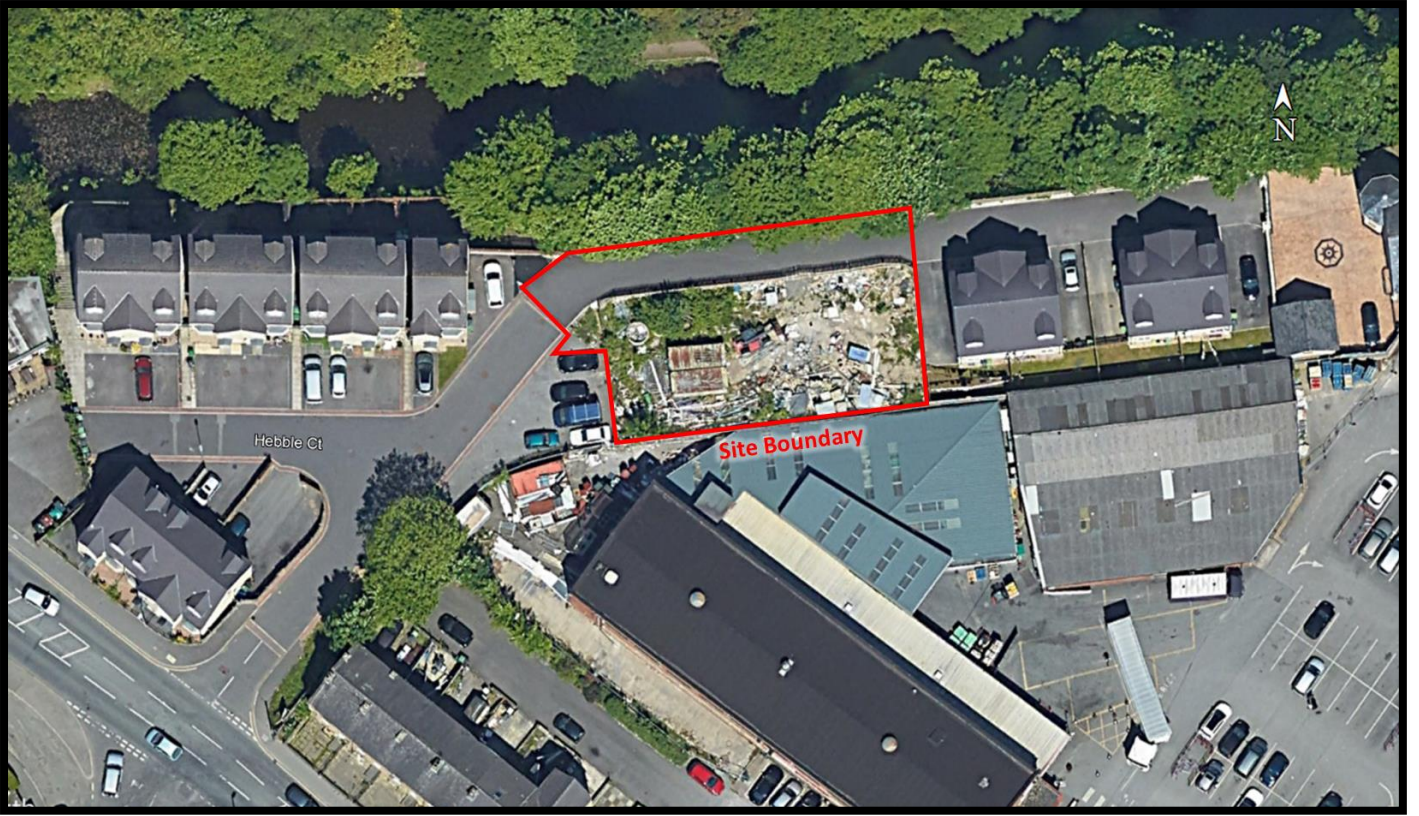
How to contact us
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www.groundstability.com



APPENDIX B

DEVELOPMENT LOCATION & LAYOUT



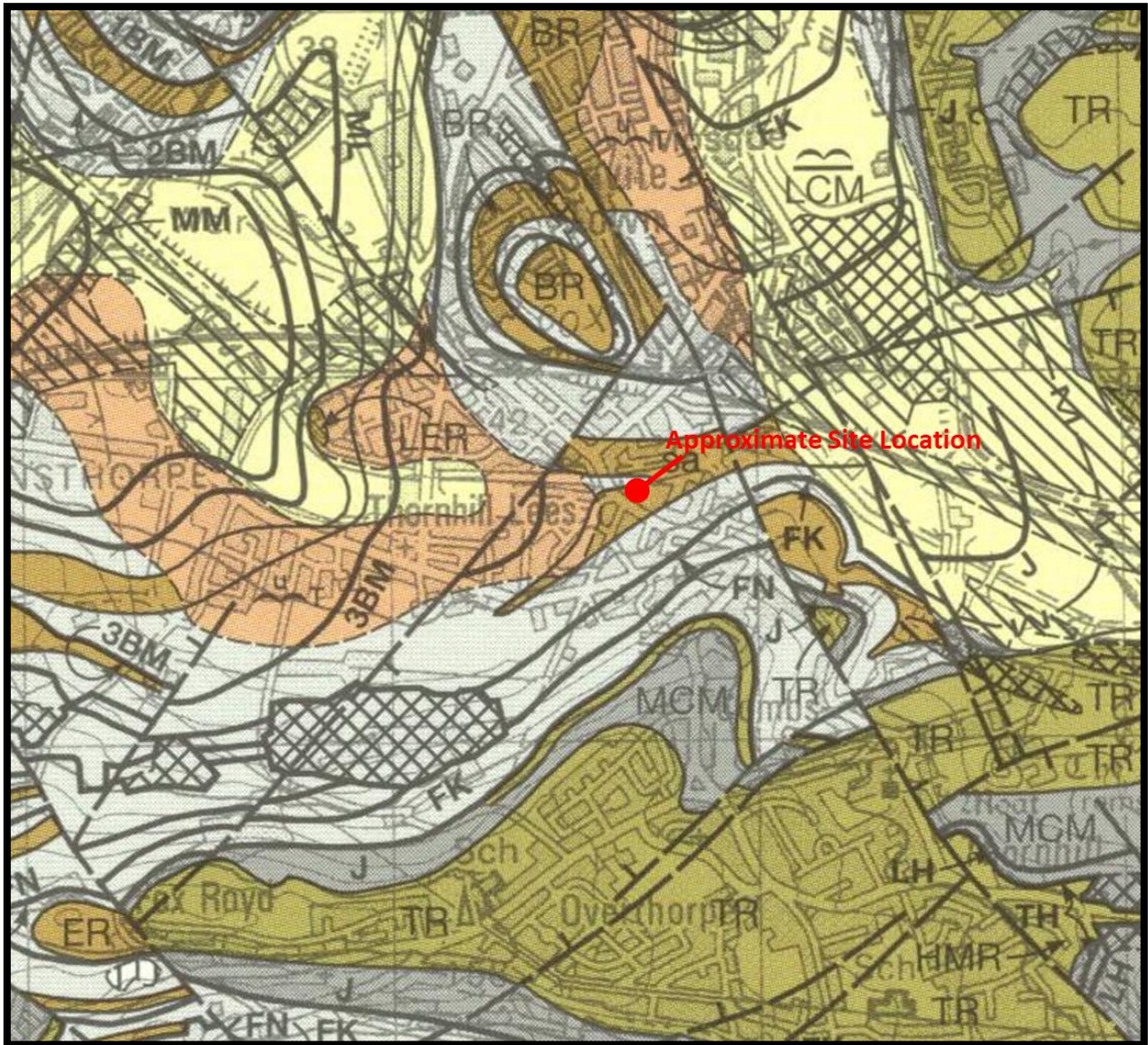


APPENDIX C
SITE IMAGES



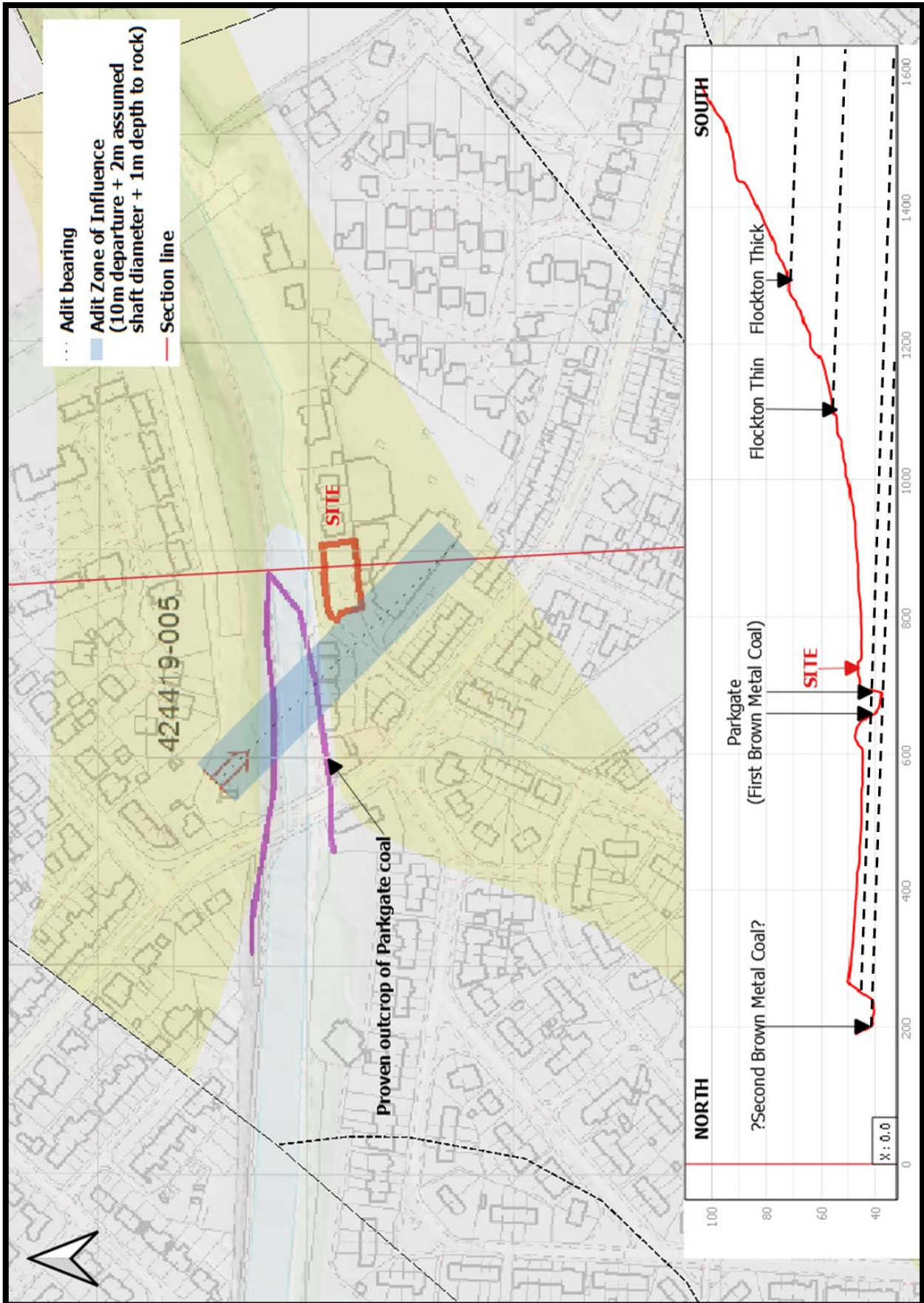
APPENDIX D

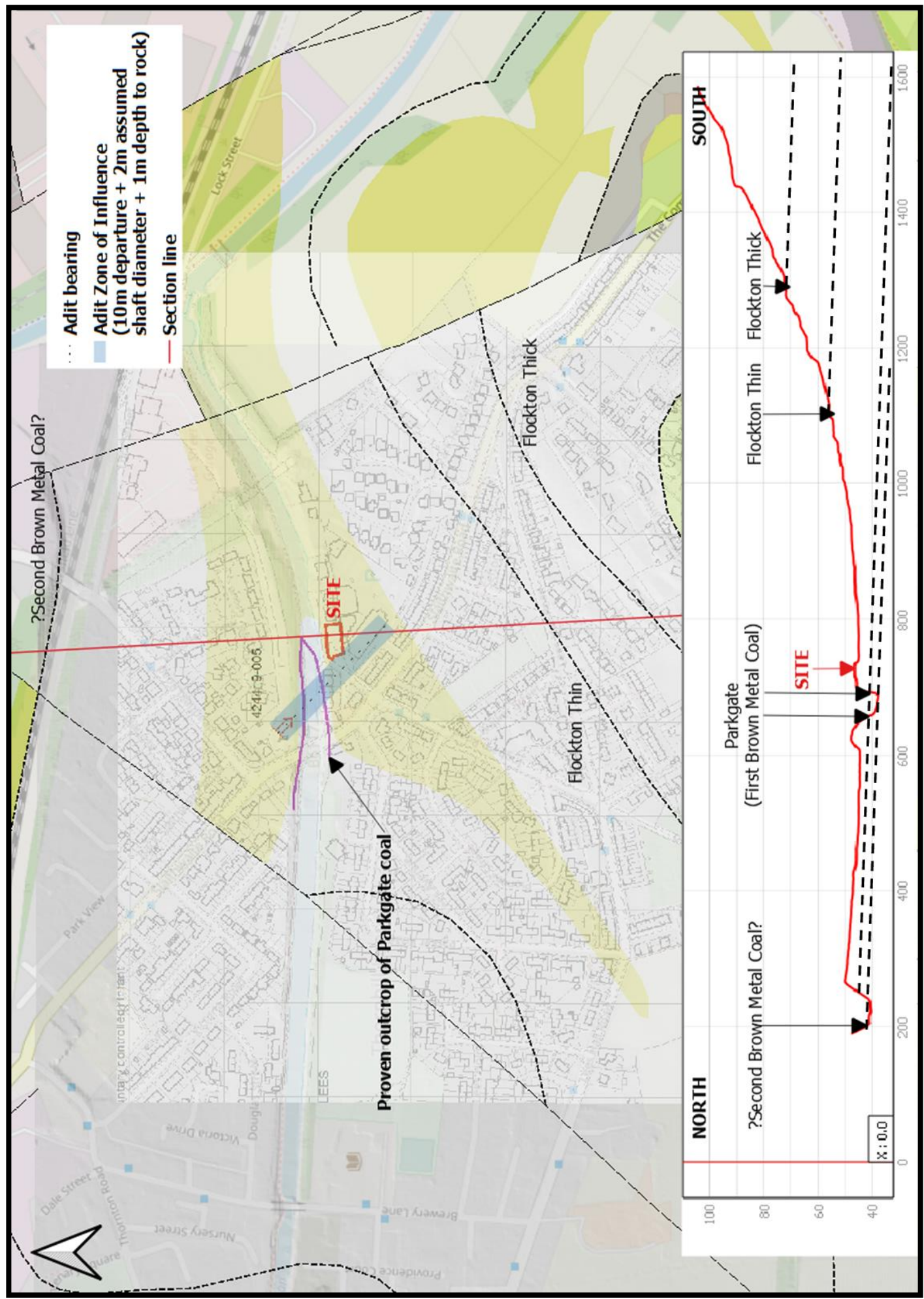
EXTRACTS BGS GEOLOGY MAP



APPENDIX E

ZOI OF ADIT & GEOLOGY SUMMARY MAPS WITH ELEVATION SECTION





Adit bearing
 Adit Zone of Influence
 (10m departure + 2m assumed
 shaft diameter + 1m depth to rock)
 Section line

