enviro|solution

Coal Mining Risk Assessment

Hill Top Park
Wakefield Road
Barnsley
S71 1ND

Date: 22nd April 2025

Version 1

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Document Verification

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Report Title	Coal Mining Risk Assessment		
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Date Issued	22nd April 2025	Report Version	1
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1 Introduction

1.1 Site Location and Description

The site for the proposed gypsy/traveller site is located off Wakefield Road, in Barnsley. The British National Grid Reference for the approximate site centre is GR: 435130, 407930.

The site is rectangular in shape and covers an approximate area of 110 square metres.

The site is currently vacant and overgrown with weeds and thicket. Demolition rubble is stored in the northwestern corner of the site, probably from former structures demolished during the early 2000s.

The site is accessed via a tarmac access road leading east from Wakefield Road.

The site is sloping to the west with elevations raging approximately from 56m aOD at the beginning of the access road to 65m aOD in the eastern section of the site.

A plan showing the location of the site is presented in **Figure 1**.

Figure 1) Site Location Map

1.2 Development Proposal

It is understood that the development proposal includes the change of use of land to a gypsy/traveller site including ancillary hardstanding and erection of a day room.

The development plans are included in **Figure 3** in **Appendix A**.

1.3 Scope of Coal Mining Risk Assessment

EnviroSolution Ltd (ES) has been commissioned to prepare a Coal Mining Risk Assessment Report (CMRA) for the proposed development site, in order to provide the Local Planning Authority with information on the coal mining legacy risk(s), an assessment of their potential

impact on land stability, and provide recommendations for the need to carry out any further investigations (including intrusive boreholes if necessary) to address these risk(s).

The CMRA has been undertaken in accordance with the principles of best practice including the Coal Authority's guidance document "Risk Based Approach to Development Management - Resources for Developers Version 3" (2014) (Ref. 1), CIRIA "SP32 Construction over Abandoned Mine Workings" (2002) (Ref. 2) and CIRIA "C758D Abandoned Mine Workings Manual" (2019) (Ref. 3), CIRIA, Publication C665, Assessing risks posed by hazardous ground gases to buildings (Ref. 4) and CL:AIRE "Good Practice for Risk Assessment for Coal Mine Gas Emissions", October 2021 (Ref. 5).

The purpose of the CMRA Report is to:

- present a desk-based review of available information on the coal mining issues that are relevant to the application site;
- use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact issues;
- set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development; and
- demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of National Planning Policy with regard to development on unstable land.

1.4 Sources of Information

This report is based on current information of past mining activities relevant to the site. The following information sources have been used:

- Consultants Coal Mining Report dated 11th April 2025 (Ref: 51003491550001 **Appendix B**);
- BGS Geoindex geological map;
- BGS geological 1:50,000 England and Wales Sheet 87 Barnsley;
- BGS Geology of the Barnsley district — a brief explanation of the geological map Sheet 87 Barnsley; 2007;
- Mining Remediation Authority Map Viewer;
- Historical Ordnance Survey maps.

2 Environmental Setting

2.1 Historic Coal Mining Activity

The development site and surrounding area has been reviewed with reference to historical Ordnance Survey (OS) maps. The history of the site and immediate surrounding area are summarised in Table 1. Copies of the historical OS maps are included in **Appendix D**.

Table 1 - Historic Mapping Review

Date	Scale	Historic Mining Activity
1850-1851	1:10,560	- The site is undeveloped and lies within an agricultural field. - Gawber New Colliery 410m southwest of the site. - Old sandstone quarry 120m northeast. - Sandstone quarry 175m east.
1888-1890	1:10,560	- Colliery 90m northwest of the site. - Coal railway 90m west.
1904	1:10,560	- Colliery expanded south to within the developed site and labelled as Wallsend Main Colliery. - Old shaft 80m southwest. - Wharncliffe Colliery expanded southeast to within 400m northwest of the site.
1929	1:10,560	- Spoil heap directly east of the site. - Collieries no longer identified on the map.
1938	1:10,560	- No significant change.
1948	1:10,560	- No significant change.

Publicly available imagery shows that the site was occupied by buildings of unknown use at least by the early 2000s. They were demolished before the 2010s.

2.2 Geological Context

While Made Ground is not indicated on geological records beneath the site, it is expected to be present at the site from previous site uses (i.e., colliery spoil heap, and demolition rubble of former structures onsite) although probably not of great thickness.

The BGS geological mapping (Geoindex and BGS Sheet 87 Barnsley) show that the underlying bedrock consists of the Pennine Middle Coal Measures Formation, which is of Carboniferous age. The Pennine Middle Coal Measures Formation generally consists of interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams. According to the BGS, the bedrock has an approximate regional dip towards the northeast – **See Appendix D**. Information of recorded underground workings beneath the site obtained from the Mining Remediation Authority (MRA) interactive map confirms that the bedrock has an approximate local dip of 3-10^0 towards the northeast.

Named coal seams expected to be present beneath the site include the Two Foot (a.k.a. Royston, Half Yard; up to 2.1m-thick), Abdy (a.k.a. Winter; up to 1.9m-thick), Top Beamshaw (a.k.a. Kilnhurst; up to 2.9m-thick), Low Beamshaw (up to 1.2m-thick) coal seams (Ref. 6).

There is a geological fault intersecting the western corner of the site (access path) with an approximate trend of 140° (Whole Circle Bearing). The fault downthrows towards the southwest.

A BGS borehole record (SE30NE114) has been obtained from BGS online records. It is located approximately 160m north of the site and penetrates to a depth of 21m bgl. The borehole shows 0.40m of Made Ground overlying a succession of mudstone, punctuated by coal seams and rare sandstones. The shallowest coal seam is recorded at 7.5m bgl. with a thickness of 0.70m. The next coal seam is recorded at 8.50m bgl with a thickness of 0.20m. The third coal seam is recorded at 19.6m bgl with a thickness of 0.30m. The lowermost coal seam is recorded at 20.1m bgl with a thickness of 0.60m. It has not been possible to put local coal seam names to these occurrences.

The location of the borehole is shown in **Figure 2**.

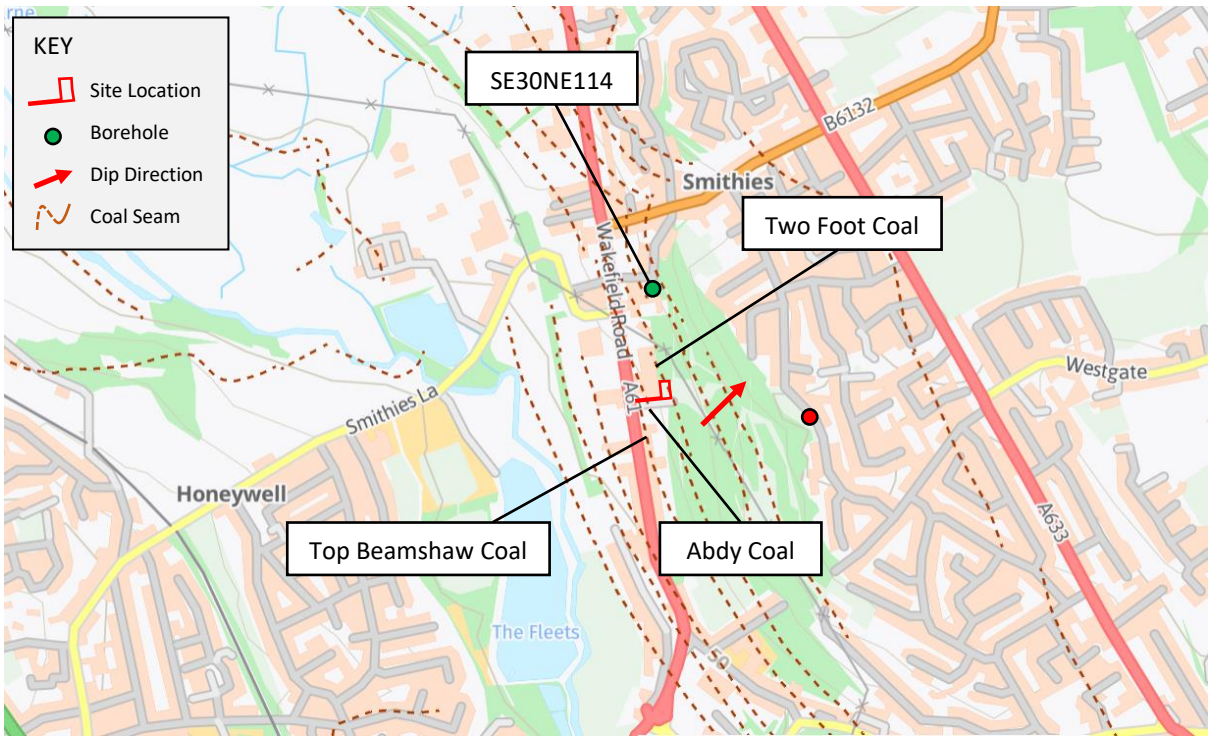

Figure 2) Coal Seam Location Map (Mining Remediation Authority Map Viewer)

Coal outcrops are shown to be intersecting the site (see **Figure 2**) and could potentially have unrecorded abandoned workings.

Some of the coal seams in this area, expected to be beneath the site, have a history of spontaneous combustion (i.e., High Hazels, Barnsley and Dunsil). The Barnsley and Dunsil coals are considered to be at a sufficient depth beneath the site to not pose a risk. However, the High Hazels coal could be at a significantly shallower depth, and it could pose a risk if it has unrecorded mine workings.

The site is situated within a Primary Opencast Coal Resource Area (**Appendix F**). The Primary Opencast Coal Resource Area is defined by the BGS as “an area that constitutes the main target for opencast coal extraction and comprises a relatively closely spaced succession of

variable but generally thick coals. Notwithstanding this, it is considered to be very unlikely that there will be any interest in developing open cast coal mining operations at this location in the short or medium-term.

A search of the Local Planning Authority planning records yielded no further information on site investigations in the surrounding area, although Mining Remediation Authority records indicate investigations have taken place directly east of the site.

3 Identification and Assessment of Site-Specific Coal Mining Risks

Table 2 below summarises the potential risks associated with coal mining legacy for the proposed development site, which have been identified from list sources of information.

Table 2 - Coal Mining Hazards Summary

Coal Mining Issues	Yes	No
Coal outcrops	X	
Underground coal mining (recorded at shallow depths)	X	
Underground coal mining (probable at shallow depths)	X	
Recorded mine entries (shafts and adits)	X	
Unrecorded mine entries (shafts and adits)	X	
Coal mining geology (fault)	X	
Record of past gas emissions	X	
Recorded coal mining surface hazard		X
Surface mining (opencast workings)	X	

The MRA Interactive Map Viewer (**Appendix G**) has identified that the site lies within a Development High Risk Area associated with recorded shallow coal mining workings beneath the site, the potential presence of a shallow unrecorded workings beneath the site, recorded mine entries within and nearby the site, and the sub-crop of 3 no. coal seams within the site boundary.

The report obtained from the MRA revealed the property is in a surface area that is affected by recorded underground mining in 8 no. coal seams at 15 no. levels at depths of between 9m and 323m. The mine workings were last worked in 1964.

Using the generally accepted 'rule-of-thumb' guidance that a competent rock strata thickness equivalent to at least ten times the extraction thickness provides adequate protection against crown-hole development and surface instability (Refs 2 and 3), the shallow mine workings may present a risk of potential surface instability.

The Two Foot Coal, which is stratigraphically higher than the Abdy (Winter) Coal, intersects the northeastern section of the site at shallow depth (<9m bgl.). This seam is known to have undergone minor underground and opencast mining in the district (Ref 6). At such shallow depths, coal would have been removed through crop excavations rather than supported underground workings, resulting in an increased thickness of Made Ground beneath the site. The increased thickness of Made Ground can increase the risk of differential settlement for new construction.

The Coal Authority report states that they are aware of 25 no. recorded mine entries (shafts and adits) within a 100m radius of the development site boundary.

The location of the mine entries is shown in **Figure 3** below.

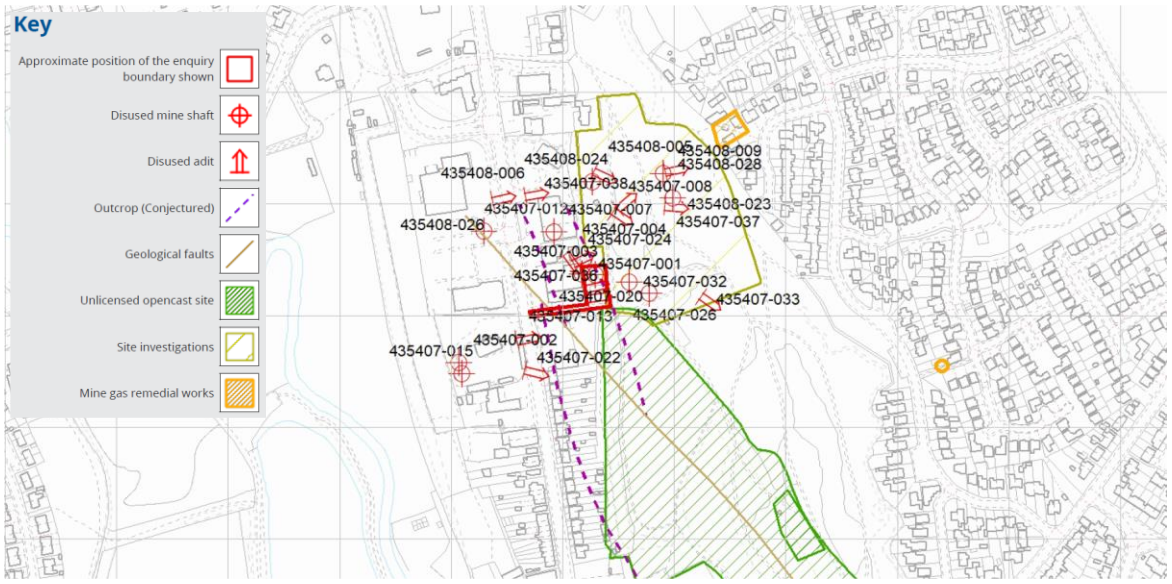

Figure 3) Mine Shaft Location Plan

Shafts and adits can pose significant risks of surface instability to development sites. The area of potential influence around a shaft can be calculated by the sum of the shaft diameter, the departure and depth to rockhead. An adit may pose a risk of instability if its position and direction indicate that it runs underneath the site.

Of the 25 no. recorded mine entries, there are 6 no. mine entries located within the site boundary or within influencing distance of the site boundary. Information of the mine entries that could potentially pose a risk to the development site is summarised in **Table 3** below:

Table 3 - *Mine Shaft Summary*

Entry type	Reference	Treatment	Departure	Assumed Shaft Diameter	Distance from Site	Adit Angle	Shaft Depth
Adit	435407-001	the adit entrance has been bricked up.	5m	1.8m	Within	78	n/a
Shaft	435407-003	Treatment details unknown	5m	2.5m	Within	n/a	Unknown
Adit	435407-004	Treatment details unknown	5m	2.5m	17m NW	144	n/a
Shaft	435407-020	Treatment details unknown	8m	2.5m	Within	n/a	Unknown
Adit	435407-024	Treatment details unknown	10m	2.5m	8m W	64	n/a
Adit	435407-036	Treatment details unknown	10m	2.5m	Within	82	n/a

The MRA report states that the property is located adjacent to a historic opencast site. The opencast site does not intersect with the development site.

There are no license requests outstanding to remove coal via this method in the future. The risk posed to the site from opencast mining methods is therefore considered to be negligible.

There are 2 no. records of past mining gas emissions approximately 146m northeast and 296m east of the site. The site has been subject to recorded, and potentially unrecorded, underground coal workings. Therefore, voids and broken ground associated with such workings can pose a risk of ground instability and may give rise to the emission of mine gas which should be considered in any future investigation and development.

CL:AIRE, 2021 Good Practice for Risk Assessment or Coal Mine Gas Emissions states that typically, a low permeability superficial cover thickness of 5-10m is generally sufficient to mitigate the risk of gas migration from shallow mine workings. However, low permeability superficial deposits are absent and geological and historic mapping indicate that Made Ground may be present with an unknown thickness. Therefore, it is feasible that mine gases may migrate to the surface from the shallow workings through fractured rock. Additionally, a fault intersects the site which may provide a migration pathway.

Additionally, the risk of mine gas from a shaft is considered minimal beyond a radius of 50m. Conversely there is a much greater risk of gas migration within 20m of a shaft (Ref. 5). Six mine entries are located within or close to the development site, with a number of mine entries further afield. It is considered that these entries may provide a preferential pathway for mine gases to the surface.

It is recommended that any conventional site investigation or remediation should include a provision for a period of ground gas monitoring.

4 Proposed Mitigation Strategy

- The MRA holds records of shallow coal workings underneath the site along with several mine entries. It is therefore recommended that a pre-construction consolidation treatment of potential abandoned, shallow coal mine workings is undertaken within the site. The spacing of the grout injection boreholes should be designed according to the footprint of the proposed development. Water flush should be used to safeguard against oxidation and potential spontaneous combustion of shallow coal. These should be backfilled with cement grout to avoid providing a future pathway for mine gases. In order to undertake these works it will be necessary to obtain a drilling permit from The Coal Authority.
- The High Hazels Coal lies beneath the site at an unknown depth, and it is recorded to have a history of spontaneous combustion. Ground gas precautions should be considered if drilling through this seam, guidance is included in CL:AIRE, 2021, Good Practice for Risk Assessment for Coal Mine Gas Emissions (Ref 5).
- Recorded and potential coal mine workings underneath the site, and the presence of several mine entries on site pose a potential mine gas risk which should be considered in any future investigations and development. It is recommended that any conventional site investigation or remedial works should include a provision a period of ground gas monitoring.
- Past crop workings of shallow coal seams beneath the site are considered possible. If present, they do not generally have an immediate risk of ground instability, and the potential risk can be dealt with through vigilance during the earthworks stage of construction. The increased thickness of Made Ground can, however, increase the risk of differential settlement for new construction.
- If coal is encountered during foundation excavation works, the coal should be over-excavated for a minimum of 1m from the foundations and replaced with blinding concrete. These actions should be adequate to seal the coal from the atmosphere to prevent spontaneous combustion.
- Any potential residual risk can be dealt with through vigilance during the earthworks stage of construction.
- Trial trenching should be undertaken to investigate the location and condition of the mine entries within the site boundary. Where possible, building directly over a mine entry should be avoided. This may involve relocating permanent structures within the development.

5 Conclusions

The Coal Mining Risk Assessment for the site at Hill Top Park in Barnsley has concluded that the potential risk associated with coal mining related issues are significant based on information from the Mining Remediation Authority and geological interpretation.

The principal risks to the development arise from:

- the presence of recorded shallow mine workings
- the potential presence of unrecorded shallow mine workings
- recorded mine entries
- unrecorded mine entries
- mine gas
- spontaneous combustion of coal seams
- increased thickness of Made Ground
- shallow coal intersected at foundation levels

It is therefore recommended that a pre-construction consolidation treatment of shallow coal mine workings and mine entries is undertaken within the site.

Prior to the commencement of intrusive works, a Coal Authority Permit will be required for drilling activities, that will disturb or enter any coal seams, coal mine workings or coal mine entries (shafts and adits). The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the intrusive works.

Additionally, it is recommended a period of ground gas monitoring is undertaken prior to remedial works, during remedial works and post remedial works.

6 References

1. Coal Authority, 2014, Risk Based Approach to Development Management Resources for Developers, Version 3.
2. CIRIA, 2002, SP32 Construction over Abandoned Mine Workings.
3. CIRIA, 2019, C758D Abandoned Mine Workings Manual.
4. CIRIA, Publication C665, Assessing risks posed by hazardous ground gases to buildings.
5. CL:AIRE, 2021, Good Practice for Risk Assessment for Coal Mine Gas Emissions.
6. BGS Geology of the Barnsley district — a brief explanation of the geological map Sheet 87 Barnsley; 2007.

Appendix A – Site Location

enviro|solution	**Site Location Map**

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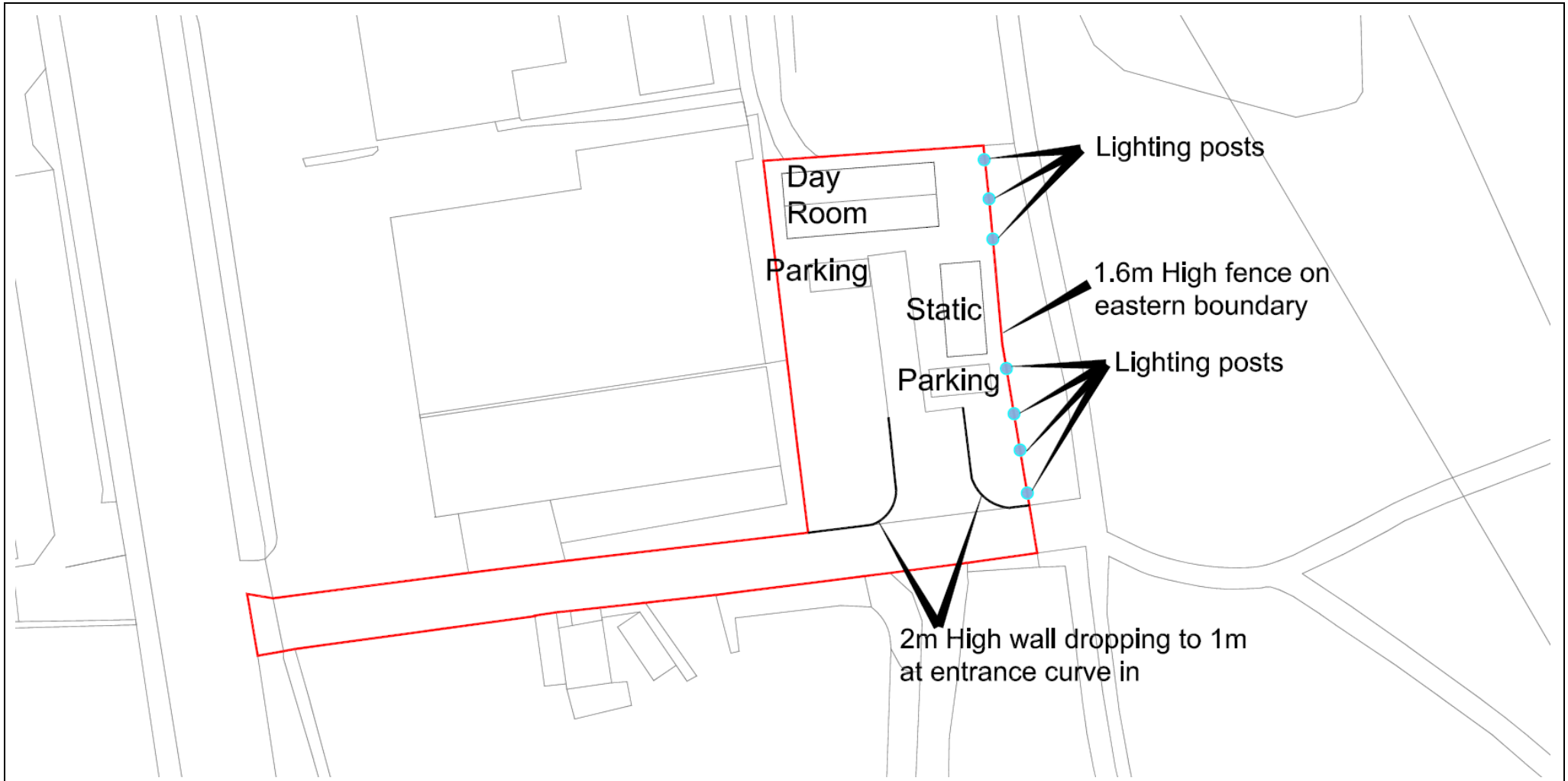
Existing Site Plan



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Proposed Site Plan

Appendix B – Mining Remediation Authority Report

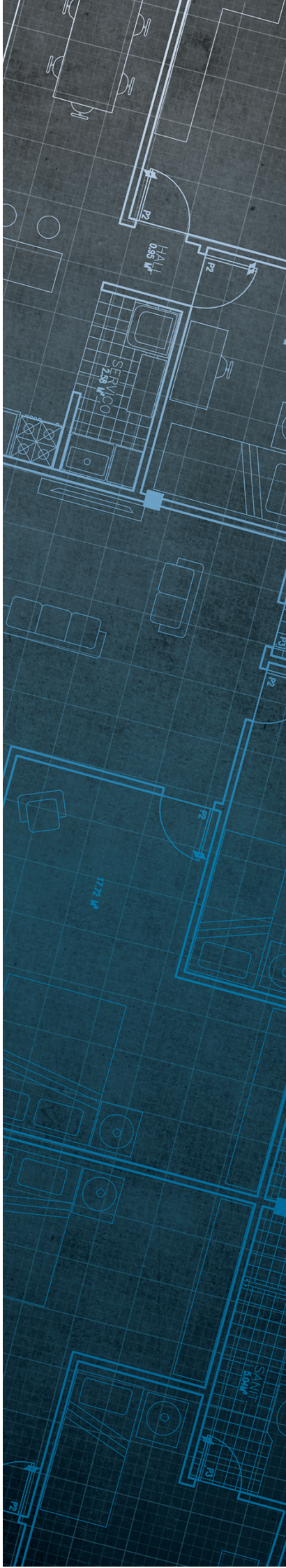
The Coal Authority

Consultants

Coal Mining Report

Sps Motorcycles
143 Wakefield Road
Smithies
Barnsley
Barnsley
S71 1ND

Date of enquiry:	**11 April 2025**
Date enquiry received:	**11 April 2025**
Issue date:	**11 April 2025**
Our reference:	**51003491550001**
Your reference:	**ES110425**



Consultants

Coal Mining Report

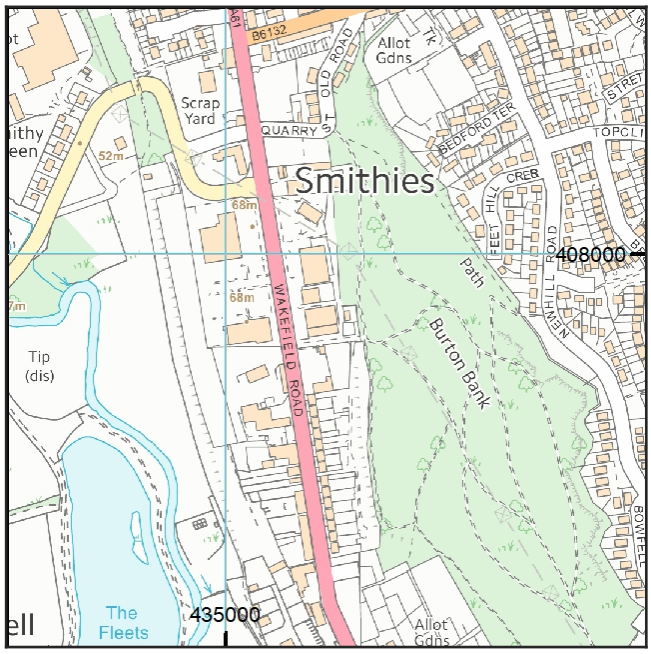
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

EnviroSolution Limited

Enquiry address

Sps Motorcycles
143 Wakefield Road
Smithies
Barnsley
Barnsley
S71 1ND



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	WINTER	Coal	6503	9	Beneath Property	9.6	North-East	140	1903
unnamed	BEAMSHAW TOP	Coal	650A	19	Beneath Property	6.6	North-East	122	1904
WALLSEND	BEAMSHAW LOW	Coal	650B	29	Beneath Property	6.0	North-East	61	1918
ROSE	BARNSLEY	Coal	650E	109	North-East	4.6	East	274	1869
ROSE	BARNSLEY	Coal	637R	134	North	2.7	East	282	1893
unnamed	TOP HAIGH MOOR	Coal	650W	186	Beneath Property	3.4	North-East	107	1959
unnamed	TOP HAIGH MOOR	Coal	650U	195	North-East	3.8	North-East	97	1953
unnamed	TOP HAIGH MOOR	Coal	637Y	198	North	3.4	North-East	99	1953
unnamed	LOW HAIGH MOOR	Coal	6382	202	North	4.7	North-East	112	1952
WHARNCLIFFE / WOODMOOR	LOW HAIGH MOOR	Coal	650O	204	North-East	7.6	North-East	112	1952
unnamed	LIDGETT	Coal	6388	221	North	2.2	North-East	79	1951
unnamed	LIDGETT	Coal	6510	226	Beneath Property	4.7	North-East	79	1958
WHARNCLIFFE / WOODMOOR	LIDGETT	Coal	650Z	239	North-East	3.9	South-East	81	1956
unnamed	LIDGETT	Coal	6389	246	North-East	2.5	North-East	79	1957
unnamed	FENTON	Coal	638E	323	North	2.9	North-East	145	1964

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

Distance to spine roadway (m)	Direction to spine roadway
Within	N/A

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	435407-001	435121 407925	the adit entrance has been bricked up.	Coal	
Shaft	435407-002	435008 407858	Treatment details unknown.*	Coal	
Shaft	435407-003	435118 407937	Treatment details unknown.*	Coal	
Adit	435407-004	435104 407955	Treatment details unknown.*	Coal	
Shaft	435407-007	435093 407975	Treatment details unknown.*	Coal	
Adit	435407-008	435145 407993	collapsed adit found on site by SYMAS in 1992. Not known if treated.	Coal	
Shaft	435407-012	435030 407976	was capped to British Coal specifications in October 1988.	Coal	
Adit	435407-013	435059 407878	Treatment details unknown.*	Coal	
Shaft	435407-015	435010 407848	Treatment details unknown.*	Coal	
Shaft	435407-020	435130 407937	Treatment details unknown.*	Coal	
Adit	435407-022	435066 407851	Treatment details unknown.*	Coal	
Adit	435407-024	435110 407946	Treatment details unknown.*	Coal	
Shaft	435407-026	435178 407920	was searched for by SYMAS in 1992 but was not found. We have no record of what steps if any have been taken to treat this shaft.	Coal	
Shaft	435407-032	435160 407930	was searched for by SYMAS in 1992 but was not found. We have no records of what steps if any have been taken to treat this shaft.	Coal	
Adit	435407-033	435224 407917	was searched for and found by SYMAS in 1992.We have no records of what steps if any have been taken to treat this mine entry.	Coal	
Adit	435407-036	435123 407915	Treatment details unknown.*	Coal	
Adit	435407-037	435192 407998	was excavated in 1996 and was found to be entirely blocked off by collapsed material and was subsequently backfilled and compacted.	Coal	
Adit	435407-038	435150 407996	was excavated in 1996 and found to be totally collapsed and blocked off and was subsequently backfilled and compacted.	Coal	
Adit	435408-005	435129 408029	was stopped off and filled with gravel and grout from the stopping to the surface by SYMAS in 1996.	Coal	
Adit	435408-006	435067 408007	Treatment details unknown.*	Coal	

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	435408-009	435191 408027	was searched for by SYMAS in 1992 but was not found. We have no record of what steps if any have been taken to treat this shaft.	Coal	
Shaft	435408-023	435199 408006	was searched for by SYMAS in 1992 but was not found. We have no record of what steps if any have been taken to treat this shaft.	Coal	
Shaft	435408-024	435127 408020	Located by SYMAS in 1992. We have no records of what steps if any have been taken to treat this mine entry.	Coal	
Adit	435408-026	435037 408002	Treatment details unknown.*	Coal	
Adit	435408-028	435192 408029	was found open for a distance of 7m up tu a loose wall stopping. The adit was subsequently grouted with 181.5 tonnes of grout in 1996.	Coal	

*For your information, before the coal industry was nationalised in 1947, there was no requirement for a mine operator to record mine entry treatment details when a mine was abandoned. Therefore, it is not unusual for us to have no treatment details for many of the 176,000 recorded mine entries on our database. Despite this lack of information, please be assured that the fact we have no treatment recorded does not necessarily mean that the mine entries were left untreated when abandoned.

Abandoned mine plan catalogue numbers

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

7396	1659	NE520
FGB520	SY174	NE535
M363	NE534	M369

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
BEAMSHAW TOP	Coal	Yes	Within	N/A	340
TWO FOOT	Coal	Yes	Within	N/A	169
WINTER	Coal	Yes	Within	N/A	335

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Fault under or close to the property recorded.

Opencast mines

Please refer to the “Summary of findings” map (on separate sheet) for details of any opencast areas 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

Distance to site investigation (m)	Direction
Within	N/A

See Section 4 for further information.

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

Distance to gas incident/remediation (m)	Direction
296.8	East
146.6	North-East

See Section 4 for further information.

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 in an area where a notice to withdraw support was given in 1981.

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.

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

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.

Site investigations

The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations.

The site requires further investigation and may influence how you approach your risk assessment.

Mine gas remedial works

The site is within an area of previous interest. It is close to where the Coal Authority has investigated and subsequently remediated the effects of mine or ground gas emissions following specific reported hazards.

The site requires further investigation and may influence your risk assessment. We recommend that you order the **Coal Authority Mine Gas Emission Report**, which will include more information about the hazard.

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. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

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.

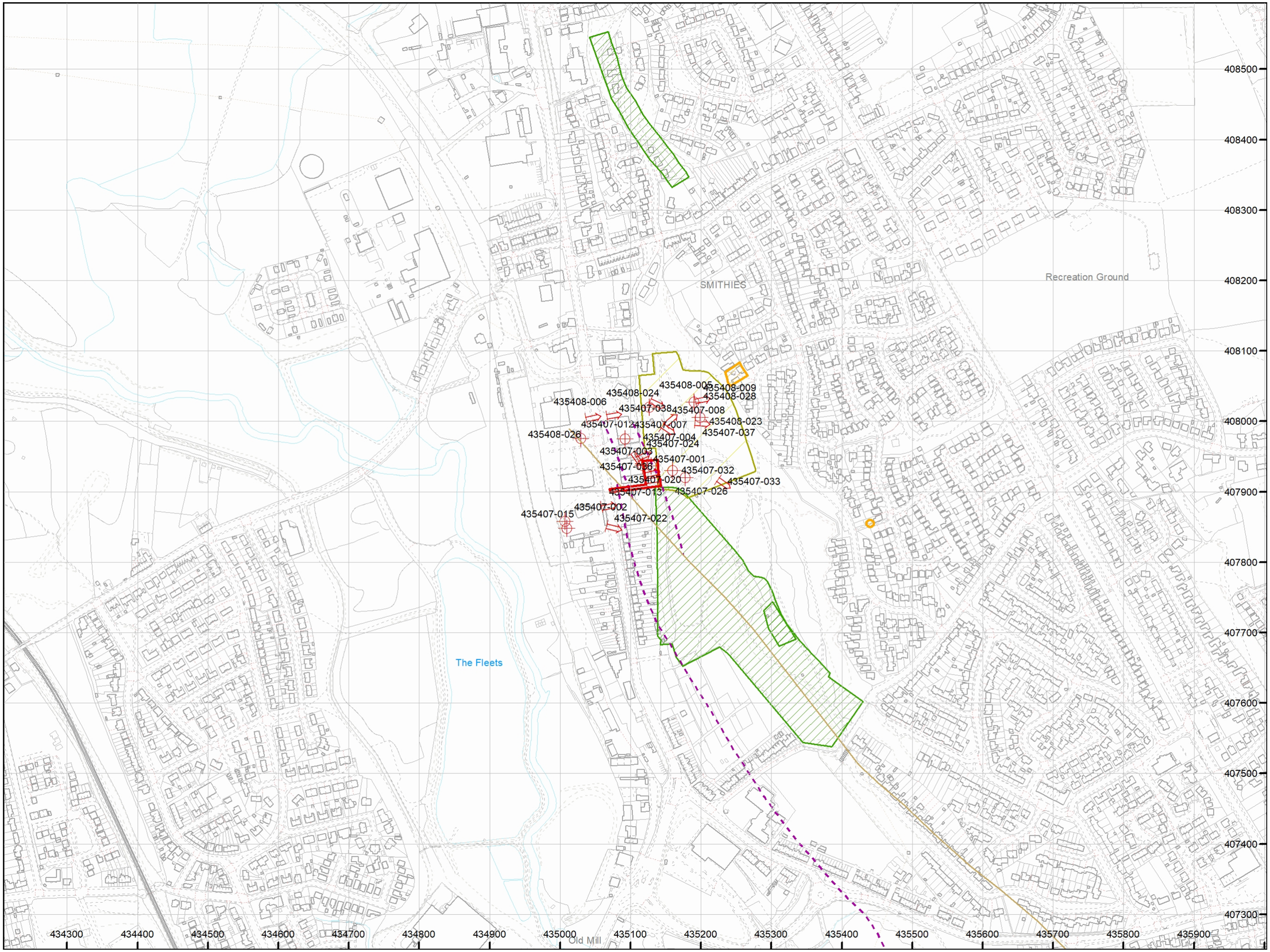
The Coal Authority

Summary of findings

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

Key

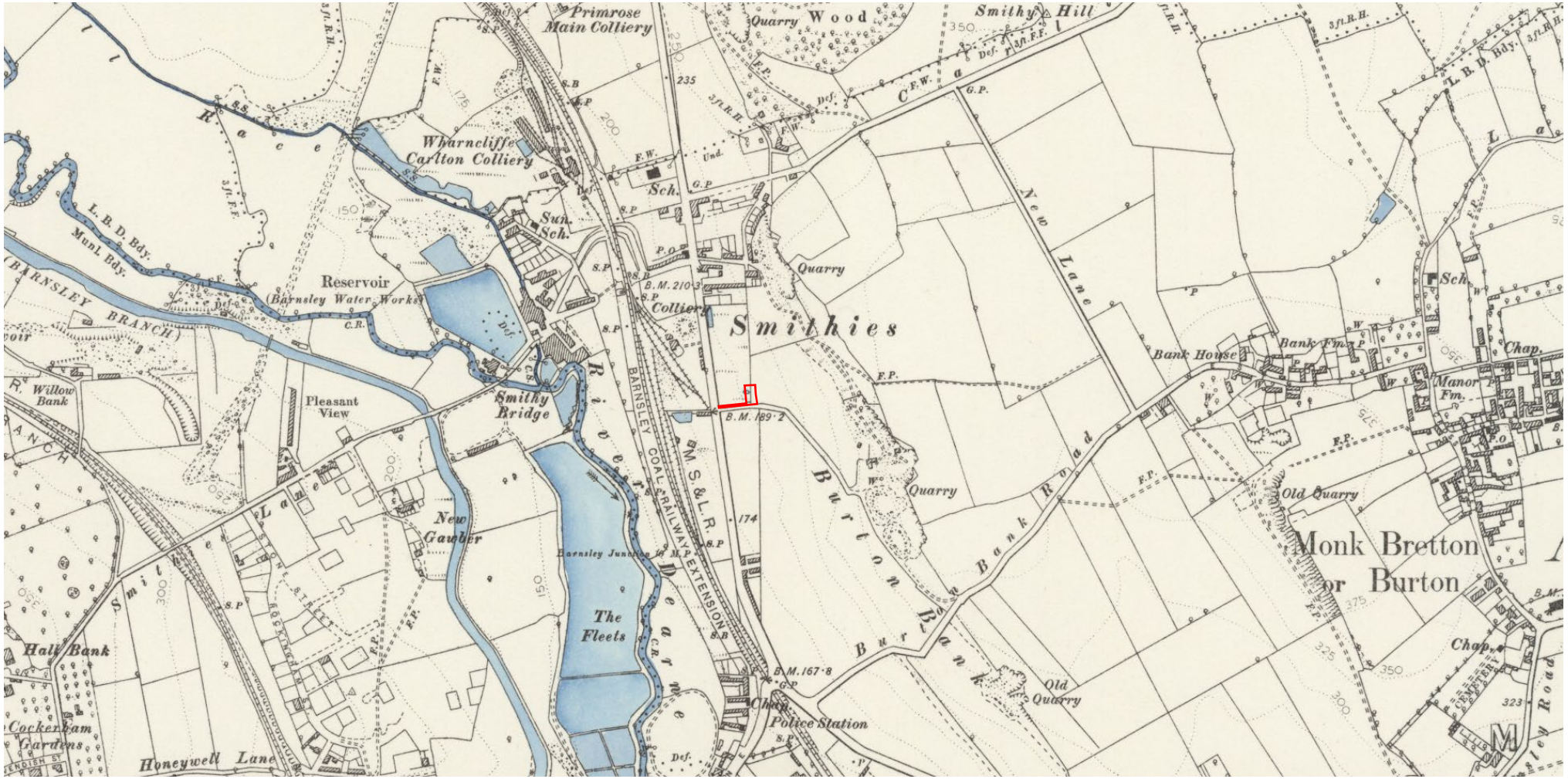
- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Disused adit
- Outcrop (Conjectured)
- Geological faults
- Unlicensed opencast site
- Site investigations
- Mine gas remedial works



How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com

Appendix C – Historic Maps

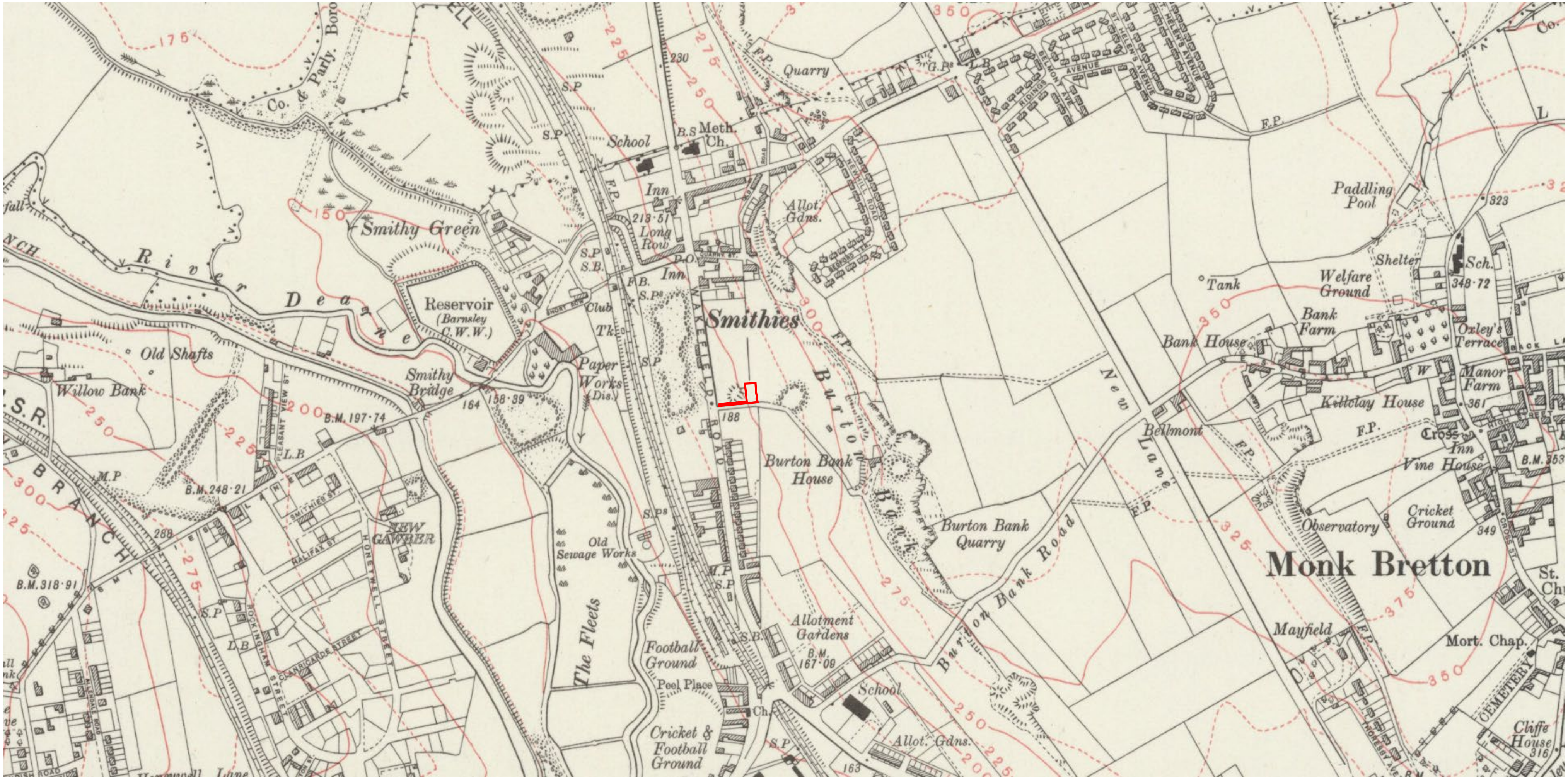
Date: 1850-1851



Date: 1888-1890

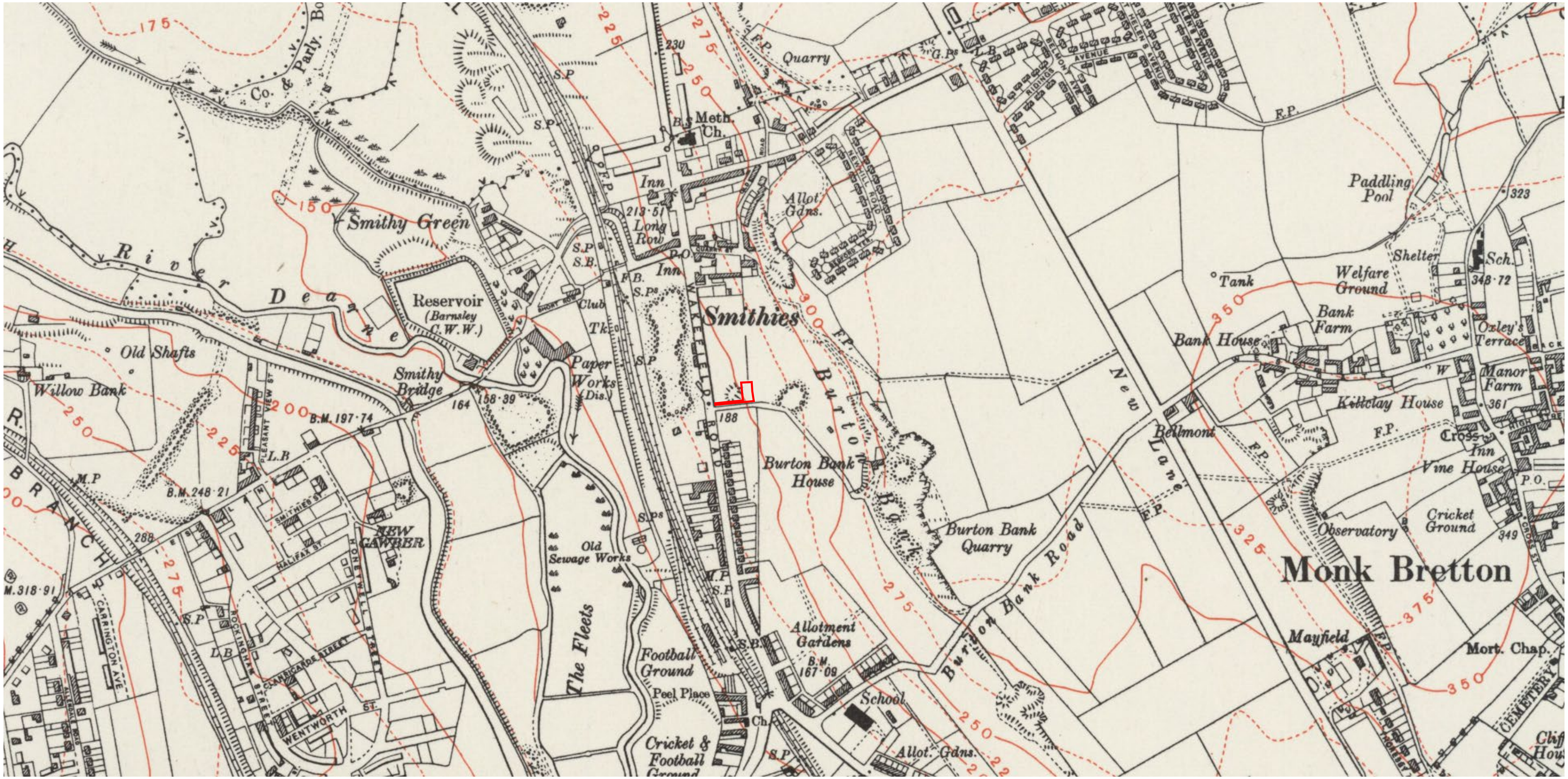

Wharncliffe
Carlton Colliery
Reservoir
School
Inn
Smy.
Sun. Sch.
Smithy Green
River Dearne
Mill Race
Reservoir (Barnsley C.W.W.)
Short Row
Smithy Bridge
Paper Works
Old Shafts
Willow Bank
Smithies
Wallsend Main Colliery
Old Shaft
Burton Bank House
Burton Bank
Burton Bank Quarry
Burton Bank Road
New Lane
New Gawber
Smithies Lane
Smithies Sewage Works (Monk Bretton U.D.C.)
The Fleets
Football Ground
Peel Place
Cricket & Football Ground
Chap.
Reservoir (Royston U.D. Council Water Works)
U.D. By.
Bank House
Bank Farm
Bellmont
Killclay House
Manor Farm
Inn
Vine House
Observatory
Cricket & Football Ground
Monk Bretton
School
Mort. Chap.
Cemetery
Cliffe House
MON
Gardens
B.M. 295·1
B.M. 210·2
B.M. 167·8
B.M. 349·8
Wakefield Road

Date: 1904



Smithies
Monk Bretton
Smithy Green
River Dearne
Reservoir (Barnsley C.W.W.)
Old Shafts
Willow Bank
Smithy Bridge
Paper Works (Dis.)
Burton Bank House
Burton Bank
Burton Bank Quarry
Burton Bank Road
New Lane
Bellmont
Bank House
Bank Farm
Welfare Ground
Paddling Pool
Shelter
Sch.
Oxley's Terrace
Manor Farm
Killclay House
Cross Inn
Vine House
Observatory
Cricket Ground
Mayfield
Mort. Chap.
Cemetery
Cliffe House
Allotment Gardens
Allot. Gdns.
School
Old Sewage Works
The Fleets
Football Ground
Peel Place
Cricket & Football Ground
New Gawber
Meth. Ch.
Long Row
Quarry
Tank
Wakefield Road

Date: 1929



Smithies
Monk Bretton
Smithy Green
Reservoir
(Barnsley C.W.W.)
River Dearne
Old Shafts
Willow Bank
Smithy Bridge
Paper Works (Dis.)
Old Sewage Works
The Fleets
Football Ground
Peel Place
Cricket & Football Ground
New Gawber
Burton Bank House
Burton Bank
Burton Bank Quarry
Burton Bank Road
Allotment Gardens
School
Allot. Gdns.
Allot. Gdns.
Quarry
Meth. Ch.
Inn
Long Row
New Lane
Bank House
Bank Farm
Welfare Ground
Paddling Pool
Shelter
Tank
Sch.
Oxley's Terrace
Manor Farm
Kiltelay House
Bellmont
Cross Inn
Vine House
Observatory
Cricket Ground
Mayfield
Mort. Chap.
Cemetery
Wakefield Road
Wentworth St.
Carrington Ave

Date: 1938

River Dearne
Smithy Green
Reservoir (Barnsley C.W.W.)
Old Shafts
Willow Bank
Smithy Bridge
Smithies
Wakefield Road
Meth. Ch.
Long Row
Allot. Gdns.
Quarry
Burton Bank
Burton Bank House
Burton Bank Quarry
Burton Bank Road
New Lane
Allotment Gardens
School
The Fleets
Old Sewage Works
Football Ground
Peel Place
Cricket & Football Ground
New Lawber
Paddling Pool
Welfare Ground
Shelter
Sch.
Tank
Bank Farm
Bank House
Oxley's Terrace
Kilclay House
Bellmont
Cross Inn
Vine House
Observatory
Cricket Ground
Monk Bretton
Mayfield
Mort. Chap.
Cemetery

Date: 1948

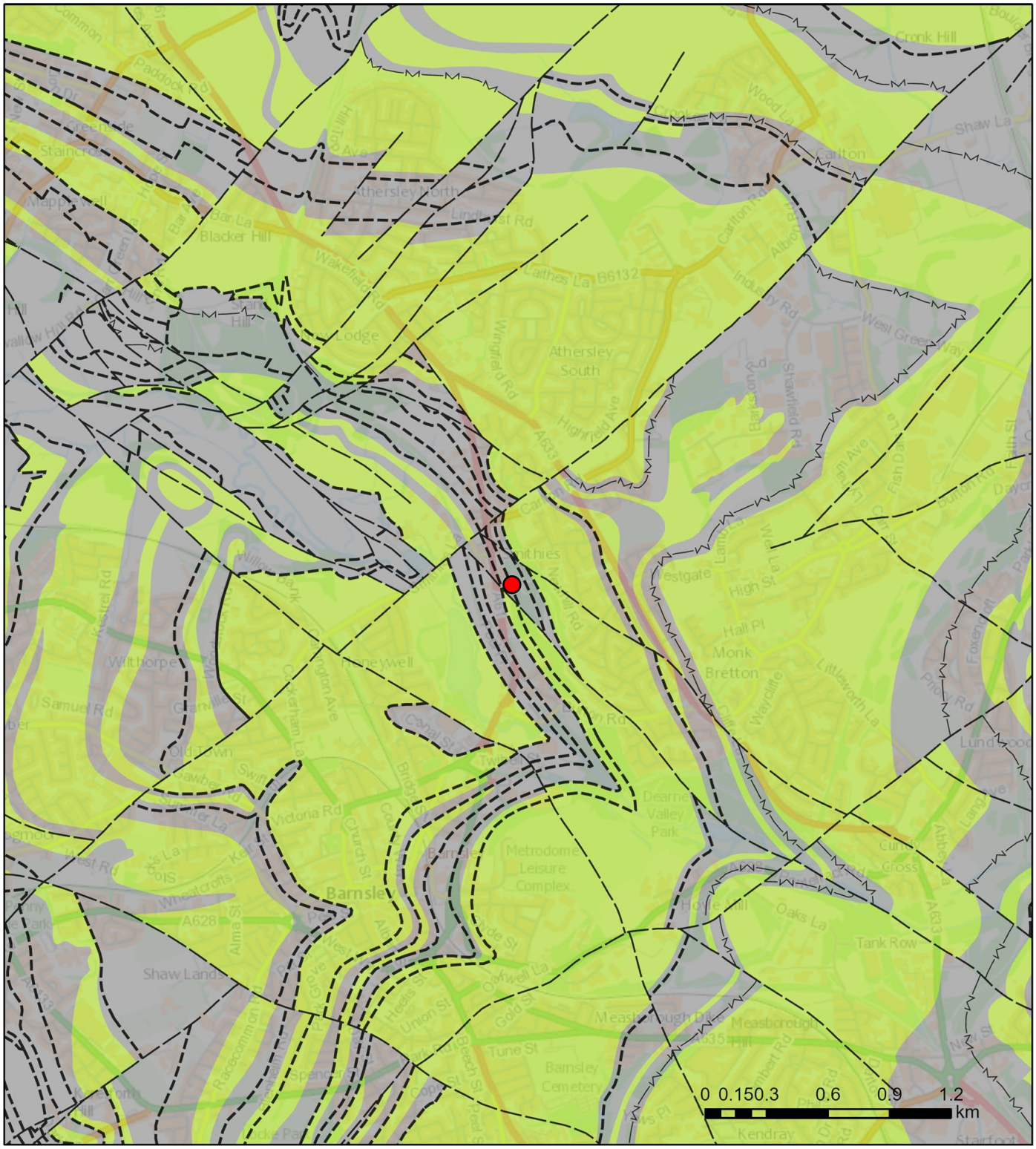
Appendix D – Geological Maps

Superficial Geology

Superficial deposits 1:50,000 scale

- GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE - SAND AND GRAVEL
- TILL, MID PLEISTOCENE - DIAMICTON
- ALLUVIUM - CLAY AND SILT
- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
- HEAD - DIAMICTON

Bedrock Geology



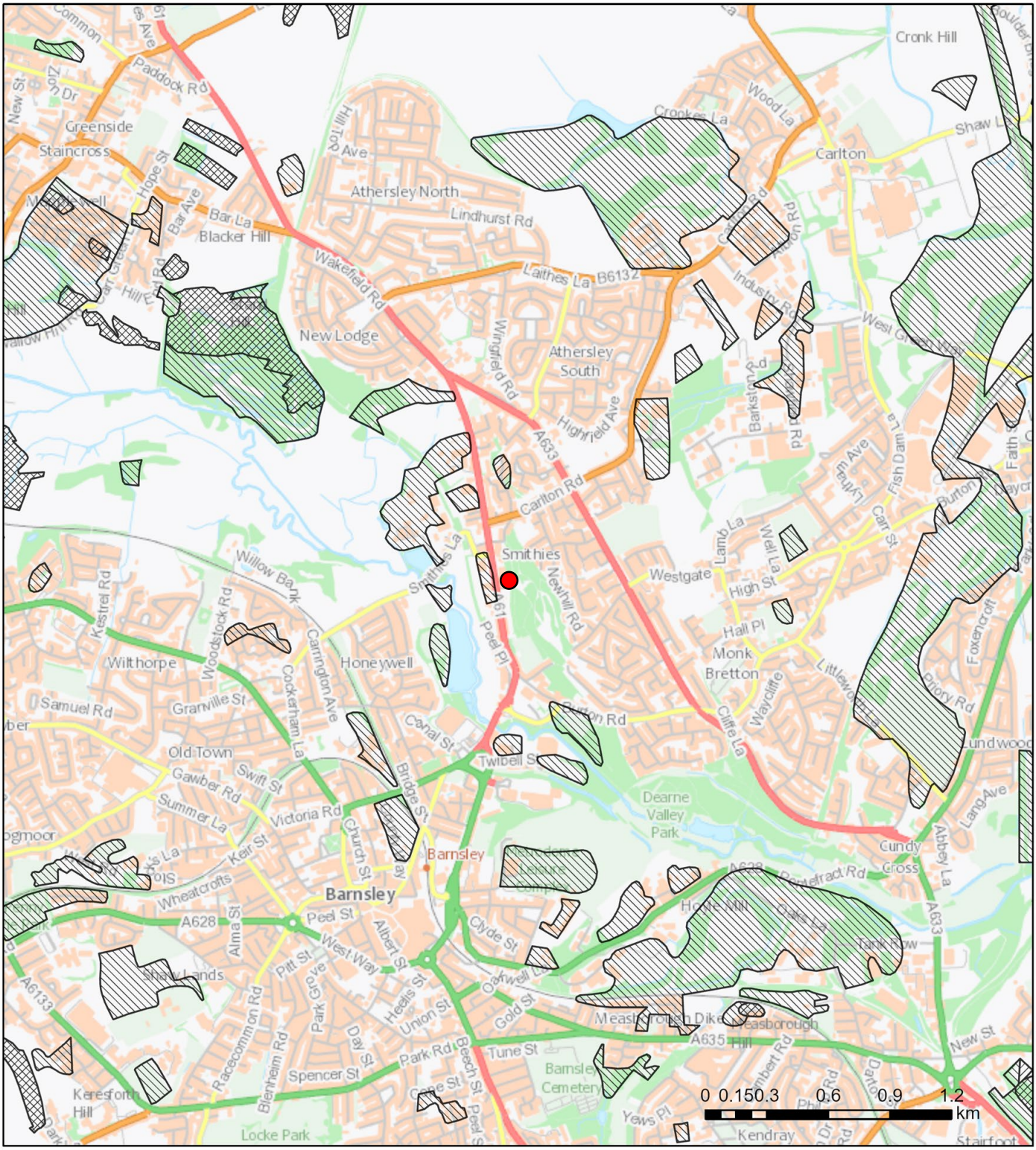
Bedrock geology 1:50,000 scale

- PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- PENNINE UPPER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- EMLEY ROCK - SANDSTONE
- PARKGATE ROCK - SANDSTONE
- PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE
- SILKSTONE ROCK - SANDSTONE
- ACKTON ROCK - SANDSTONE
- GLASS HOUGHTON ROCK - SANDSTONE
- MEXBOROUGH ROCK - SANDSTONE
- ABDY ROCK - SANDSTONE
- BARNSLEY ROCK - SANDSTONE
- CRIGGLESTONE ROCK - SANDSTONE
- HAIGH MOOR ROCK - SANDSTONE
- KENT'S ROCK - SANDSTONE
- OAKS ROCK - SANDSTONE
- PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE
- THORNHILL ROCK - SANDSTONE
- WOOLLEY EDGE ROCK - SANDSTONE
- ACKWORTH ROCK - SANDSTONE
- BRIERLEY ROCK - SANDSTONE
- NEWSTEAD ROCK - SANDSTONE
- PENNINE UPPER COAL MEASURES FORMATION - SANDSTONE

Linear features 1:50,000 scale

- Coal_seam_Inf
- Coal_seam_Obs
- Fault_Inf_Crossmark_on_downthrow_side
- Fault_Inf_Downthrow_unspecified
- Fault_Obs_Crossmark_on_downthrow_side
- Fault_Obs_Downthrow_unspecified
- Ironstone_bed_Inf
- Marine_band

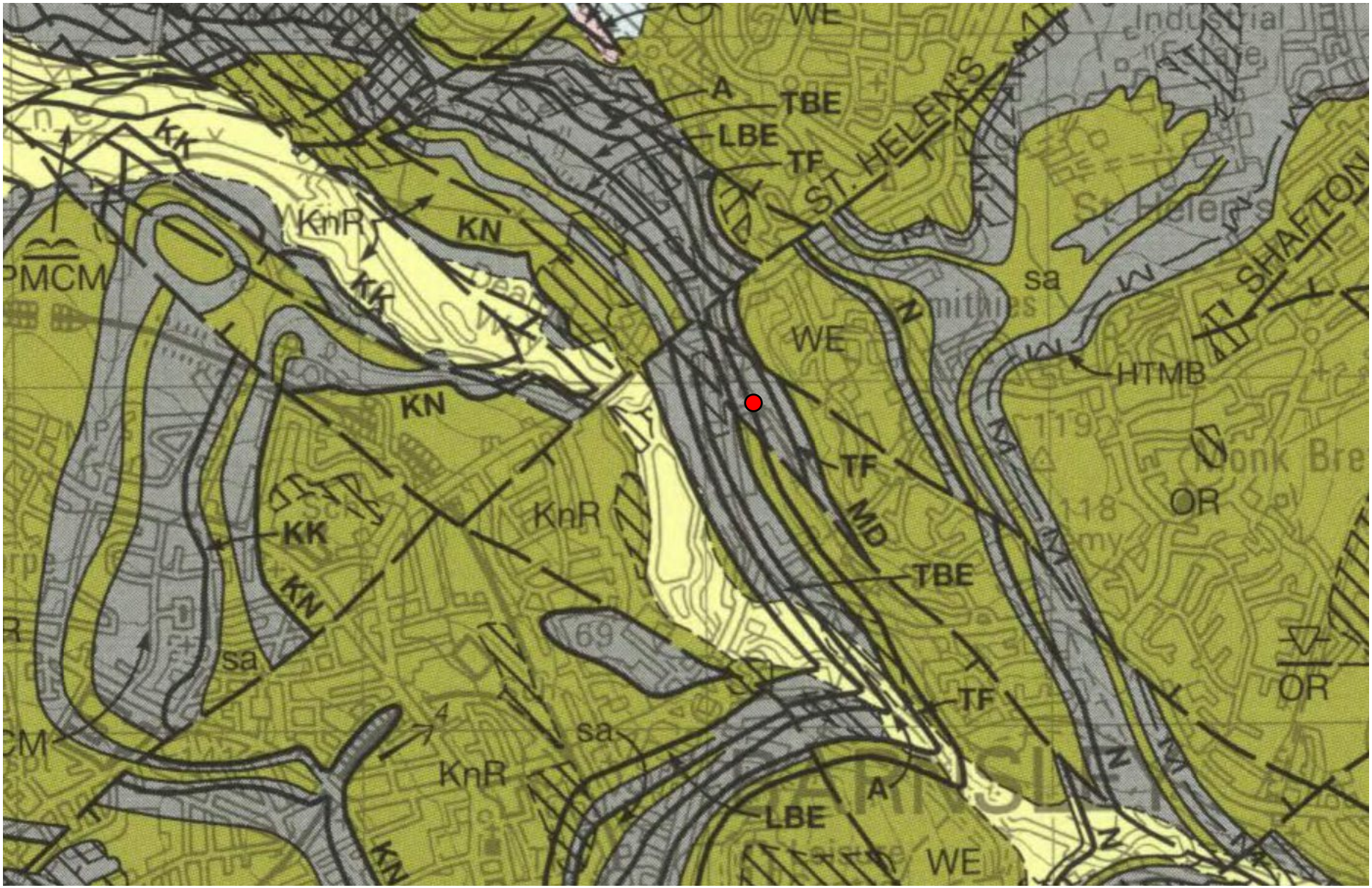
Artificial Geology



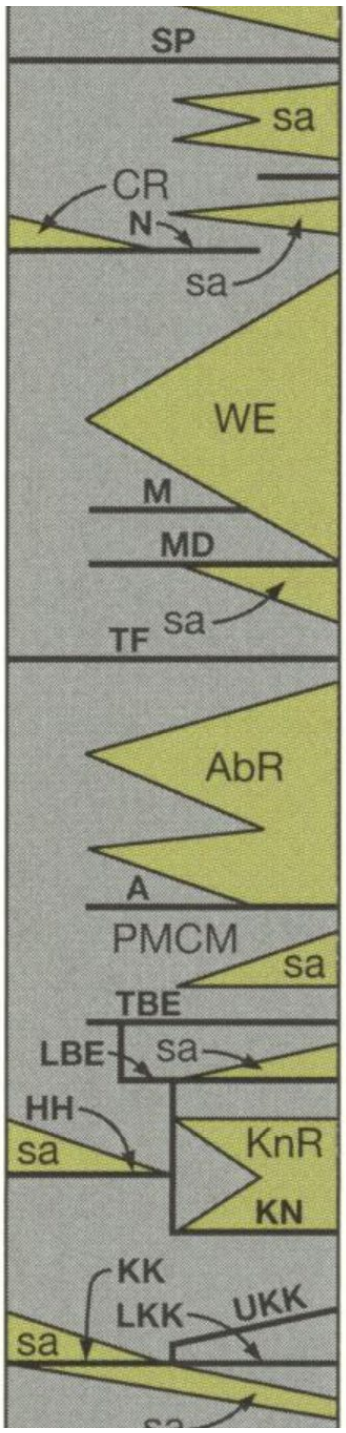
Artificial ground 1:50,000 scale

- MADE GROUND (UNDIVIDED) - ARTIFICIAL DEPOSIT
- WORKED GROUND (UNDIVIDED) - VOID
- INFILLED GROUND - ARTIFICIAL DEPOSIT

BGS Geological Survey 1:50,000 Series England and Wales Sheet 87, Barnsley



Generalized Section



SWINTON POTTERY COAL (0.1 to 2.1 m)

COAL thin

CRIGGLESTONE ROCK (0 to 5 m)

NEWHILL (STEAM) COAL (0 to 3.0 m)

WOOLLEY EDGE ROCK (0 to 40 m)

MELTONWOOD COAL (0 to 2.3 m)

MELTONFIELD (WOODMOOR; WATHWOOD) COAL (0 to 1.4 m)

TWO-FOOT (ROYSTON; HALF YARD) COAL (0.1 to 2.1 m)

ABDY ROCK (0 to 30 m)

ABDY (WINTER) COAL (0 to 1.9 m)

TOP BEAMSHAW (KILNHURST) COAL (0 to 2.9 m)

LOW BEAMSHAW COAL (0 to 1.2 m)

KENT'S ROCK (0 to 15 m)

HIGH HAZELS COAL (0 to 1.3 m)

KENT'S THIN COAL (0 to 1.9 m)

KENT'S THICK (MAPPLEWELL) COAL (KK) (0.3 to 2.6 m)

UPPER (UKK) AND LOWER (LKK)

Appendix E – BGS Borehole Logs

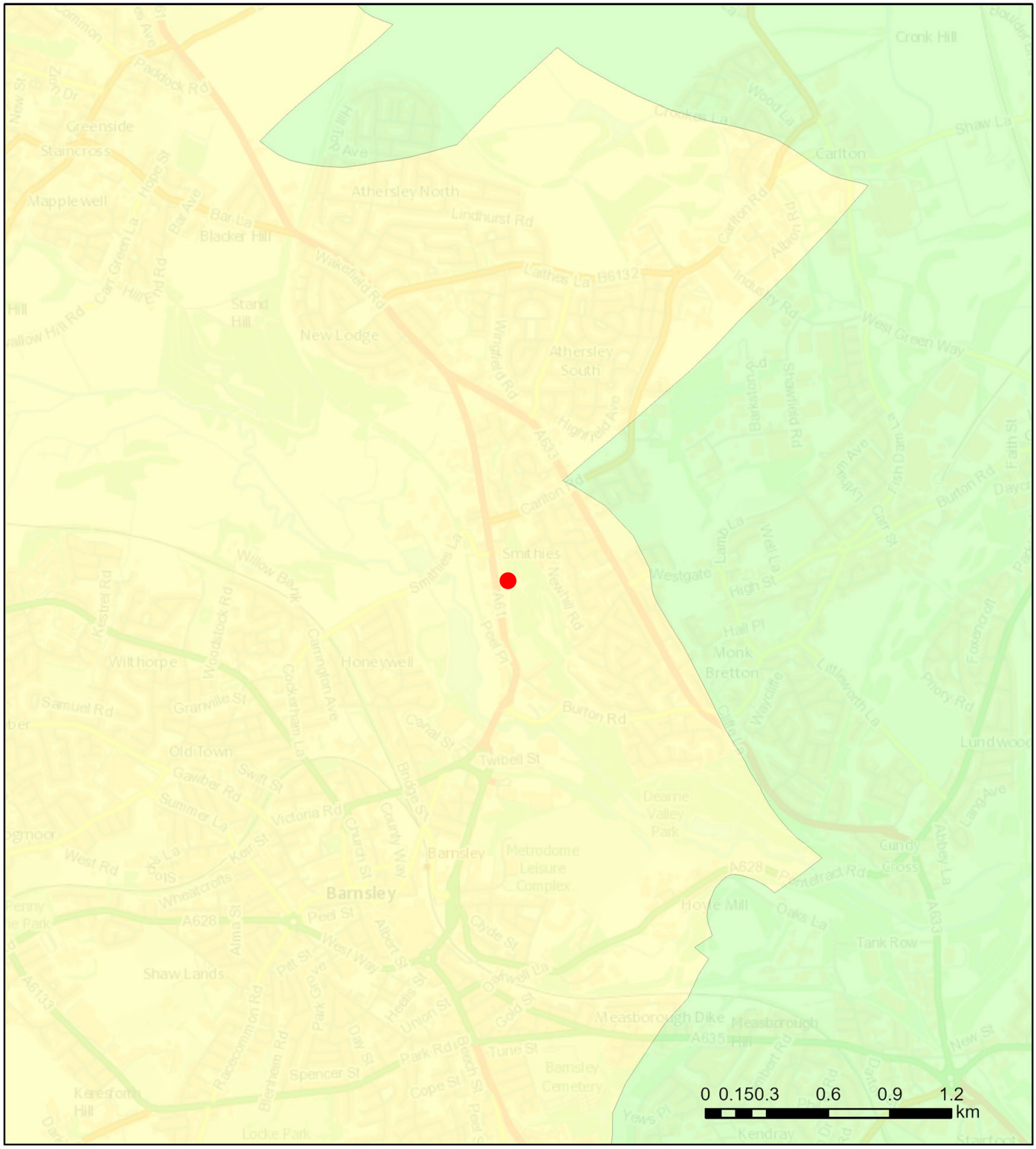
SE30NE114

SE30NE 114 351-081

Michael D. Joyce Associates Consulting Geotechnical Engineers	RECORD OF DRILLING Date 7th November 1989	Borehole Number 11
Client	Readywell Limited	
Site	Wakefield Road,	
Location	Barnsley	
Type of Drill	Rotary Percussive	Size 75mm

From	To	Description	Thick-ness	Remarks
m	m		m	
0.0	0.4	Limestone and brick rubble	0.4	
0.4	7.5	Mudstone	7.1	
7.5	8.2	COAL	0.7	
8.2	8.5	Mudstone	0.3	
8.5	8.7	COAL	0.2	
8.7	11.0	Mudstone	2.3	
11.0	11.5	Grey sandstone	0.5	
11.5	19.6	Mudstone	8.1	
19.6	19.9	COAL	0.3	
19.9	20.1	Mudstone	0.2	
20.1	20.7	COAL	0.6	
20.7	21.0	Mudstone	0.3	

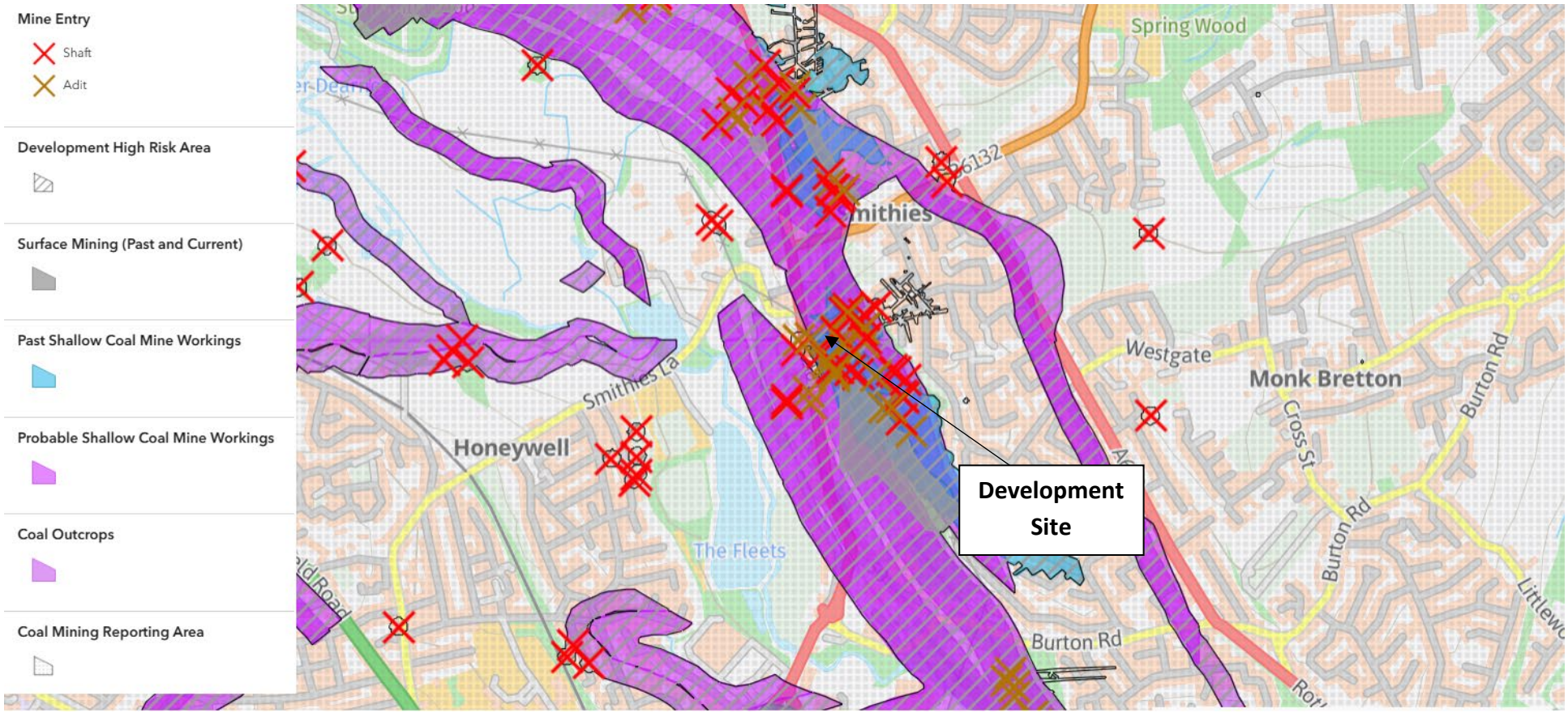
Appendix F – Coal Resource Map



Shallow Coal

- **Buried coal resource overlain by up to 50m overburden**
- **Primary opencast coal resource area**
- **Secondary opencast coal resource area**
- **Tertiary opencast coal resource area**

Appendix G – Coal Mining Summary Map



enviro|solution	**Coal Mining Summary Map**