GROUNDTECH
CONSULTING

BIRKENSHAW

COAL MINING RISK ASSESSMENT

ORION HOMES

AUGUST 2024

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PROJECT	*WHITEHALL ROAD, BIRKENSHAW*
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CLIENT CONTACT	*IAN HALLIDAY*
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1.0 INTRODUCTION

1.1 Objectives

Groundtech Consulting Limited have been instructed by Orion Homes to undertake a Preliminary Coal Mining Risk Assessment for a site at Whitehall Road in Birkenshaw.

The Coal Mining Risk Assessment will quantify the risk from potential underground mine workings based on available desk based information.

The following reports have been previously undertaken for the subject site and should be read in conjunction with this report:

- *RSK Site Investigation referenced 350520-R01, dated November 2022*
- *ARP Geotechnical Limited Ground Investigation referenced ORH/20, dated July 2023*

1.2 Proposed Development

The proposed development is residential end use comprising 23 No detached and semi detached dwellings with associated private gardens, driveways, access roads and soft landscaping.

Proposed Development

1.3 Limitations

This Coal Mining Risk Assessment is based on information obtained from a number of sources and the information is assumed to be correct.

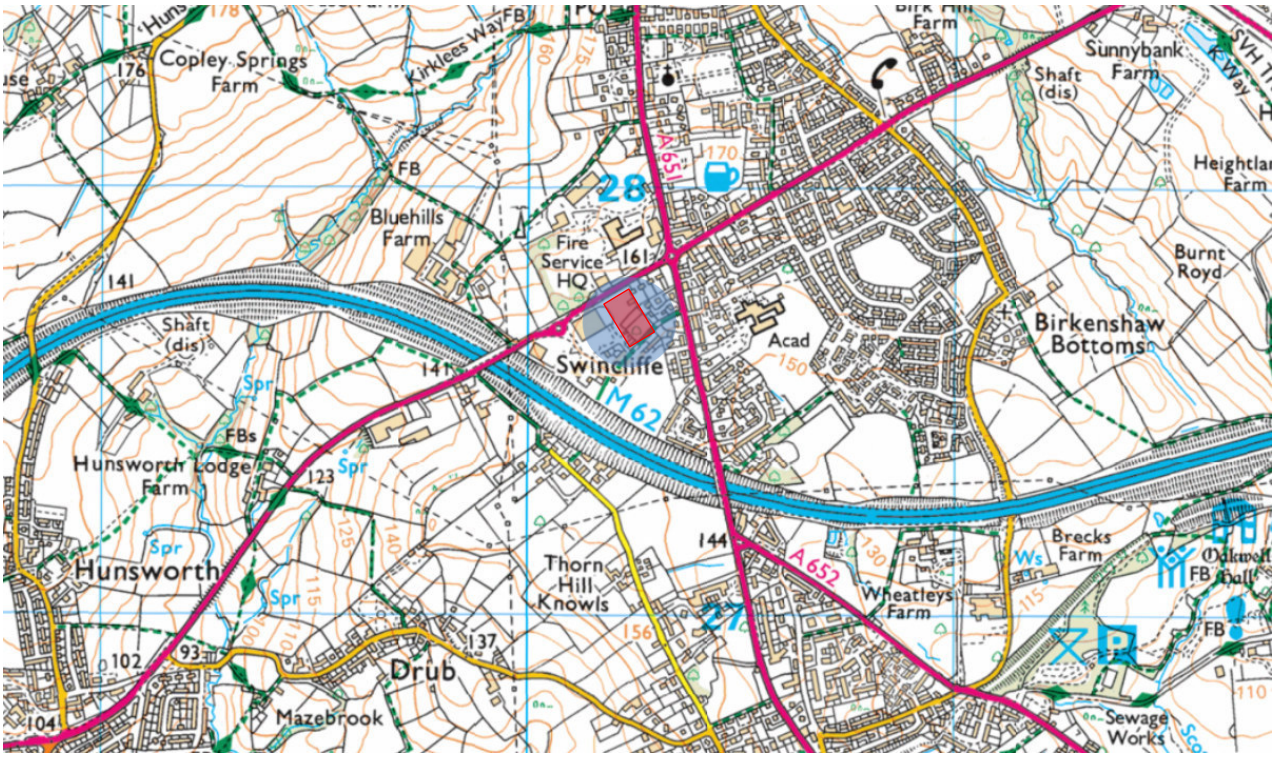
Other conditions may exist on the site that have not been taken into account in this assessment as they are outside the scope of works. Groundtech Consulting are not responsible for these circumstances that are not outlined in the report.

The assessment has been prepared for the exclusive use of the client. No third parties may rely on or reproduce the contents of the report without the written permission of Groundtech Consulting Limited. If any unauthorised third party comes into possession of the report, they rely on it at their own risk and Groundtech Consulting Limited will not be obliged to provide a duty of care.

2.0 SITE SETTING

2.1 Location

The site is located circa 4.7 miles south east of Bradford City Centre, as shown on the Project Location Plan *GRO-23390-P01* and is approximately centred on National Grid Reference *439118, 424304.*



Project Location

2.2 Site Description

The site is almost rectangular in shape and split into a *Northern Parcel* and *Southern Parcel*. The entire site is approximately 0.8 hectares in area. The *Northern Parcel* is generally flat and sits at a circa 1.0m lower level than the *Southern Parcel*. The topography of the *Southern Parcel* is uneven and hummocky.

Northern Parcel
This area of site is occupied by an existing two storey brick-built residential dwelling in the eastern section of the parcel. Immediately north of the dwelling is a block paving access road utilised as a driveway accessed via Whitehall Road to the north of the site. A small wooden fenced garden area is located south of the dwelling.

The remaining areas of this parcel are soft surfaced predominantly with grass and shrubbery, with the density of the shrubbery increasing towards the site boundaries. Mature trees are present at the centre of the site immediately west of the existing residential dwelling as well as along the boundaries of the site.

The *Northern Parcel* is bounded by a circa 1.0m tall retaining wall to the north, palisade fencing to the west and hedgerow/trees to the south. The eastern boundary is defined by the neighbouring residential property and associated hedgerow/garden to the south eastern boundary.

Southern Parcel

The *Southern Parcel* is unoccupied and appears undeveloped.

This section of the site is also predominantly soft surfaced with grass and associated shrubbery including bramble. The vegetation in the centre of the centre of site is less dense than the surrounding areas, some semi-mature to mature trees are present in the centre.

A treeline of mature trees is situated along the southern site boundary, the boundary is defined by a small wooden fence. The northern site boundary is defined by hedgerow and mature trees and the western boundary is generally undefined with shrubbery present. Similarly to the *Northern Parcel*, the eastern boundary of this parcel is defined by the existing residential dwellings and associated garden areas to the east.

Surrounding Features

The parcels are surrounded by the following features/land uses:

- *North* - *Whitehall Road, woodland and industrial land use*
- *East* - *Residential dwellings and gardens*
- *South* - *Lockgate Rise and residential dwellings with gardens*
- *West* - *Commercial land use and Heathfield Lane*

3.0 SUMMARY OF INFORMATION

3.1 Sources

The information presented within this Coal Mining Risk Assessment was obtained from a number of sources including:

- *Coal Authority Consultants Mining Report*
- *Memoir of the Huddersfield 'Sheet 77' Coalfield*
- *Geological Survey Sheet 77, Huddersfield at 1:50,000 Scale - Solid and Drift Edition*
- *Coal Authority Interactive Map*
- *RSK Site Investigation referenced 350520-R01 and dated November 2022.*
- *ARP Geotechnical Limited Ground Investigation referenced ORH/20 and dated July 2023*

The Coal Mining Risk Assessment presented on the following pages has been compiled to assess the risks associated with historic coal mining based on the information obtained from all sources.

3.2 Geology

No superficial deposits are indicated to underlie the site.

The solid geology underlying the majority of the site is the Lepton Edge Rock which comprises Sandstone and forms part of the Pennine Lower Coal Measures. The Pennine Lower Coal Measures encroaches onto the north eastern corner of the site which characteristically comprises Mudstone, Siltstone, Sandstone and Coal seams.

3.3 Coal Seams

The underlying bedrock strata (Lepton Edge Rock) forms part of the Pennine Lower Coal Measures which is a coal bearing stratum. The Pennine Lower Coal Measures underlies the north eastern corner of the site. The Brown Metal Coals outcrops beneath the site and the second nearest seam is the Middleton Little Coal which outcrops to west and dips towards site. These seams described in more detail below.

Brown Metal Coals
Geological records indicate that the First and Second Brown Metal Coal outcrops in the *Northern Parcel.* The First and Second Brown Metal Coals are indicated to be joined together to create a single seam on geological maps. The First Brown Metal Coal is indicated to be between 0m to 1.0m thick and the Second Brown Metal Coal is indicated between 0m to 0.8 thick.

Previous investigation undertaken by RSK have recorded the coal seam at a shallower level in TP6 and deepest in TP8, this indicates the outcrop of the 2nd Brown Metal Coal is further to the south west than the published records indicate. The RSK investigation has recorded the weathered coal as between 0.2m and 0.4m thick in the *Northern Parcel.* Furthermore, the RSK investigation has not encountered two different coal seams in this location indicating the seam encountered onsite was the 2nd Brown Metal and the 1st Brown Metal is further north east as indicated on the maps. The investigation did not recorded any workings in the Brown Metal Coal on the site with competent bedrock being present between 2.6m and 4.0m begl.

The Brown Metal Coals outcrops to the north of the *Southern Parcel* and dips away from this section of the site and is therefore not influencing this parcel. Sandstone is recorded at very shallow depths beneath the *Southern Parcel* directly beneath the topsoil.

Middleton Little Coal

The Middleton Little Coal Seam is indicated to be the next coal seam in the geological sequence which outcrops 400m west of the *Northern Parcel* of the site and 800m west of the *Southern Parcel* of the site. The angle of dip is not recorded on geological maps or the Coal Authority (CA) records, likely due to its insignificance and poor quality. At its thickest, this seam is indicated to be approximately 0.2m to 0.9m thick. At Drighlington, immediately east of the site, the seam is indicated to be approximately 0.3m thick.

The published geological memoir indicates that the Middleton Little Coal is of no value in the western part of its northern outcrop, however thickens eastwards towards site. In the north, the seam is indicated to be approximately 15m to 18m beneath than the Brown Metal Coals.

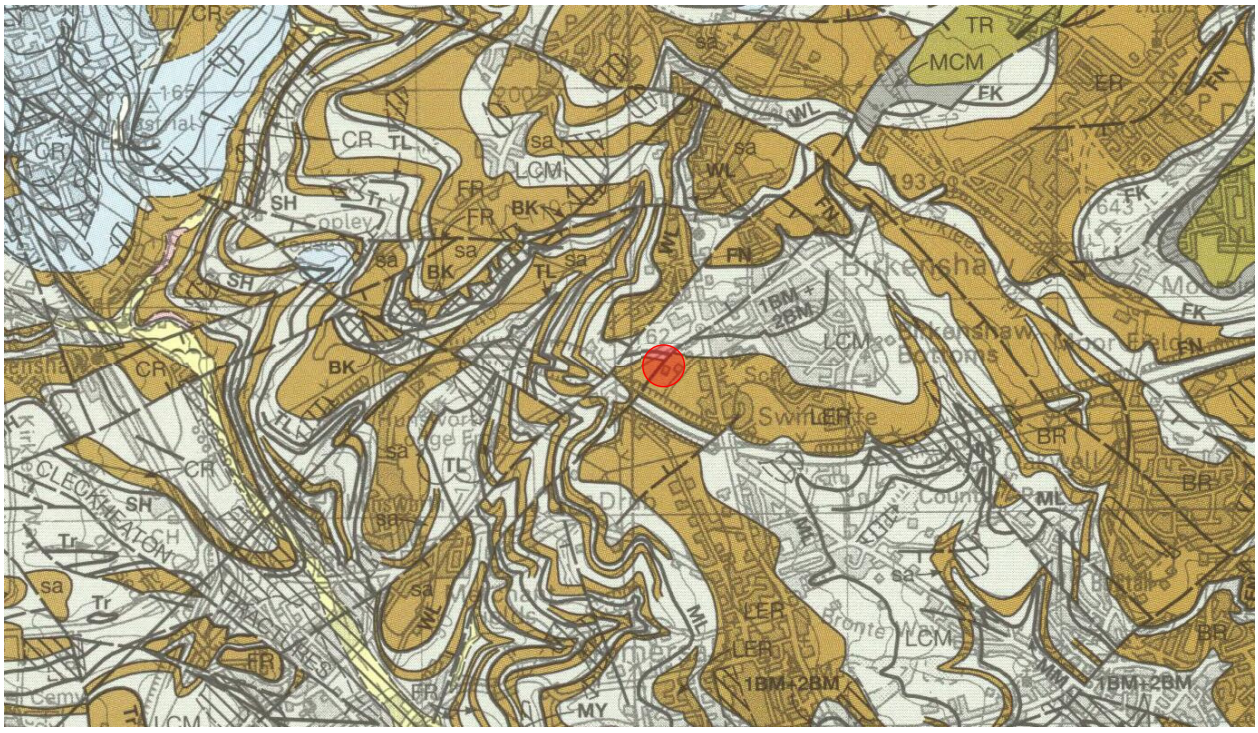
The thickness of the Middleton Little Coal around the Birkenshaw area is unknown and has never been worked in this location. No sections of Birkenshaw or Hunsworth Lodge Collieries or of the old sinkings to the Middleton Bed here having been kept.

The Middleton Lower Coal has never been worked in the Birkenshaw area and is evidently thin, as in the neighbouring localities of Gomersal and Drighlington.

Additional Seams

The Middleton Main Coal is the next in the geological sequence and lies circa 15m below the Middleton Little Coal. The Middleton Main is indicated to contain dirt partings, however is recorded to have been worked on a small scale around the area of Gomersal which is located south of the site. There are no recorded workings in the Middleton Main Coal beneath the site.

CA information indicated that the Blocking Coal is the shallowest worked coal seam at circa 91m begl followed by the Shirtcliffe Coal at circa 130m begl.



Solid and Drift

A summary of the identified coal seams is provided below.

Seam	Approximate Thickness (m)	Est Depth below top of bedrock (m)
1st Brown Metal	*0.0 - 1.0*	*Immediate*
2nd Brown Metal	*0.0 - 0.8*	*Immediate*
Middleton Little	*0.2 - 0.9*	*13.0 – 15.0*
Middleton Main	*1.0*	*30.0*

The estimated depths to the seams are taken from information provided by the Coal Authority Report and geological information, the thickness is taken from the Memoir.

3.4 Geological Faults

An unnamed fault runs through the site in a south west to north east orientation, indicated to downthrow on the north western side of the fault.

3.5 Previous Ground Investigations

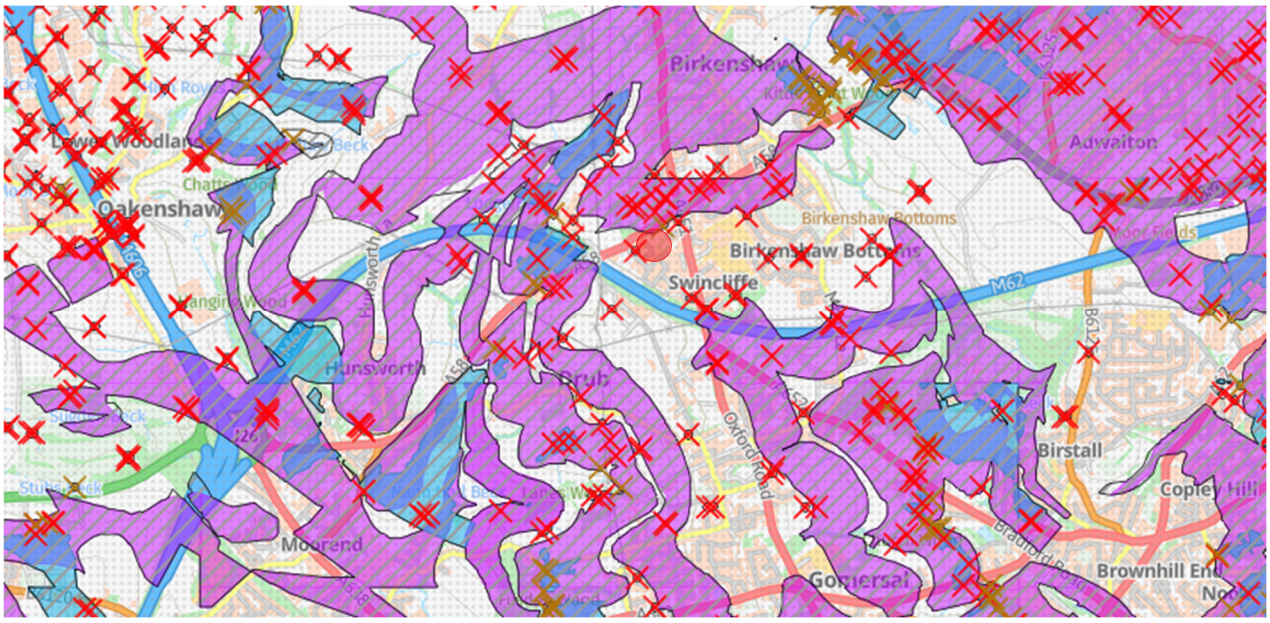
Previous Ground Investigation was undertaken by ARP Geotechnical Limited in the *Northern Parcel* of the site. Seven trial pits were excavated across the site to a maximum depth of between 2.8m and 4.3m begl where the excavations became too difficult to excavate due to competent bedrock. Weathered coal was encountered between 0.8m and 3.1m begl with a general thickness of between 0.2m and 0.4m. The coal was shallowest in the TP6 and deepest in TP8 indicating outcrop for Second Brown Metal Coal is further to the south west beneath the site than the geological records show, the first brown metal seam is split and indicated further north east.

A previous investigation has been carried out by RSK, dated November 2022 where eight No. windowless sample boreholes were drilled in the *Southern Parcel*. No coal was encountered during the Ground Investigation. Weathered Sandstone bedrock recovered as occasionally clayey sand and gravel (Lepton Edge Rock) was encountered at minimum depths of between 0.1m and 0.4m begl to a maximum depth of between 0.75m and 2.42m begl where refusals were recorded.

3.6 Coal Authority Information

The following information has been obtained from the online Interactive Coal Authority Map:

- *There are no mine shafts within 20m of the site, nearest is an adit located circa 35m east*
- *No fissures or break lines are shown to be affecting the site*
- *There is a coal seam outcrop in the Northern Parcel of the site*
- *There are no known past workings recorded beneath the site*
- *The site is not indicated to lie in an area of probable past shallow mine workings*
- *The site is not located within 1km of a surface mining area*
- *The site does not lie within a Development High Risk Area*



High Risk Development Area (hatching), Mine Entries (crosses), Past Shallow Mine Workings - Recorded (blue), Probable (purple).

3.7 Coal Mining Report

The site lies in an area where the Law Society and Coal Authority recommends a mining search is undertaken due to past or current mining possibly affecting the site. A copy of the report is appended, and a summary of the main findings is presented below.

Past Underground Mining
The Silkstone (Blocking Coal) is indicated to be present beneath the site at 100m, dipping to the north east with a dip angle of 2° and extraction thickness of 70cm. The Silkstone is recorded to have been last worked in 1928.

The Whinmoor (Shirtcliffe Coal) Coal is indicated to be present 148m beneath the site dipping to the north at an angle of 1.2°, last worked in 1969.

Probable Unrecorded Shallow Workings
The site is indicated to lie in an area where there are probable shallow coal workings.

Present Underground Mining
The site is not situated within a surface area affected by present underground mining.

Future Underground Mining
The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

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

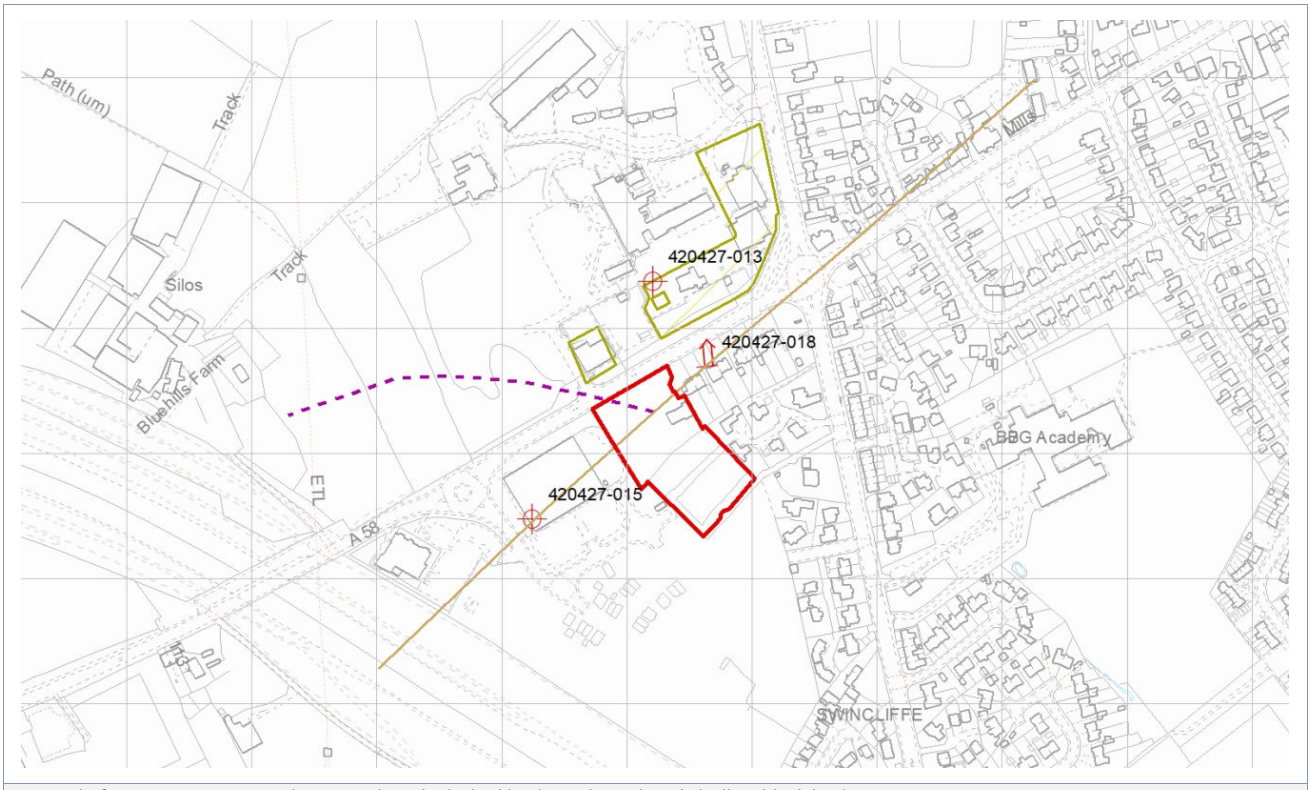
Mine Entries

Two mine entries and an adit have been identified by the Coal Authority close to the site.

Mine Entry No.	Shaft / Adit	Grid Reference	Treatment Description
420427-013	*Shaft*	*420221 427837*	*Not given*
420427-015	*Shaft*	*420125 427647*	*Not given*
420427-018	*Adit*	*420264 427771*	*Not given*

The adit is indicated at an angle of 355° heading away from site. It is likely that the adit is targeting the first brown metal seam away from site.

The positions of the shafts are highlighted on the plan below:



Mine Shaft Entry Locations, Coal Outcrop (purple dashed line), Geological Fault (yellow block line)

Coal Mining Geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

A fault is located beneath the site as indicated on the map above.

Past Opencast Mines

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

Present Opencast Mines

The property does not lie within 500 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

Future Opencast Mines

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

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
The Coal Authority has no record of a mine gas emission requiring action.

Hazards relating to coal mining
The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

There are no remediated sites within 50m.

Withdrawal of support
The property is in an area where a notices to withdraw support were given in 1951 and 1954.

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.

3.8 Site History

JNP Group undertaken a trial pitting exercise onsite (Ref. NG7020.L004/WHI/NDT/kef, dated September 2008). The report is appended and a summary of the relevant information is provided below.

The aim of the trial pitting exercise was to determine if quarrying had been undertaken on the site with respect to the former quarrying in the area. Historical mapping was analysed and indicated that the area was heavily quarried however it was determined that the site s in existing sandstone quarry did not encroach the site boundary based on the mapping.

The investigation was carried out on Thursday 7th August 2008 using a JCB excavator.

No evidence of quarrying indicated on the historical maps extended onto the site. The ground conditions comprised topsoil over natural bedrock which is consistent with the other investigations at the site.

4.0 COAL MINING RISK ASSESSMENT

The Coal Mining Risk Assessment presented on the following pages has been compiled to assess the risks associated with historic coal mining based on the information obtained from all sources.

- The table below represents the first stage in the risk assessment process based on a **desk based assessment.**
- In order for a development site to be deemed 'suitable' the level of risk needs to be reduced to an acceptable level. The purpose of each stage of risk assessment is to establish if there is a requirement for additional stages of assessment in order to have sufficient confidence that the surface of the site is stable for development.

Coal Mining Risk Assessment for a residential development at Birkenshaw				
Issue	Hazard	Site Affected	Consequence	Recommended Mitigation Measures
Recorded Coal Workings	➢ *Ground subsidence* ➢ *Ground instability*	***No -*** *The Coal Authority report states that past underground mining has been recorded in two seams beneath the site between 100m and 150m begl.* *The recorded workings are of the Blocking Coal (c.91m begl) and Shirtcliffe Coal (c.130m begl).* *There are no recorded shallow mine workings beneath the site.* *Based on the recorded workings being a minimum depth of 91m begl, significant rock cover is indicated and no risk is present of the surface stability of site.* *The CA report indicates that due to the age of the workings, all movements have now ceased.*	*Ground subsidence associated with historic mine workings can give rise to levels of damage to the built environment that may affect both serviceability and design life of a structure.*	***No further action required.***

Coal Mining Risk Assessment for a residential development at Birkenshaw				
Issue	Hazard	Site Affected	Consequence	Recommended Mitigation Measures
Recorded Mine Entries	➢ *Catastrophic collapse of mine entry leading to ground instability or voids at the ground surface.* ➢ *Settlement of the ground surface above/adjacent to the mine entry.* ➢ *Generation of crown holes at the ground surface.* ➢ *Mines gas emissions.*	***No -** There are no recorded mine entries within 20m of site. The nearest mine entry is circa 35m east of the site and is indicated to be an adit, outside influencing distance of site.*	*Ground subsidence associated with mine shafts can give rise to levels of damage to the built environment that may affect both serviceability and design life of a structure. Furthermore, mine shaft entries give a direct pathway for mine gas emissions to migrate to the surface of the site*	***No further action required.***
Unrecorded Coal Workings	➢ *Ground subsidence* ➢ *Ground instability*	***Yes –** The Coal Authority Report indicate that unrecorded mine workings may be present beneath the site, however the Coal Authority interactive map indicates that the site does not lie within an area of probable shallow coal workings and the geological memoir also shows no indication of shallow workings beneath the site or in the surrounding area.* *The shallowest coal seam (Brown Metal) is indicated outcrop beneath the site. This sem is indicated to be split into the 1st and*	*Ground subsidence associated with historic mine workings can give rise to levels of damage to the built environment that may affect both serviceability and design life of a structure.*	***Further investigation is recommended in the north eastern extent of the site to confirm if workings are present associated with the 1st Brown Metal coal seam.*** ***A watching feature for coal mining features is recommended as a precaution during ground works.***

Coal Mining Risk Assessment for a residential development at Birkenshaw				
Issue	Hazard	Site Affected	Consequence	Recommended Mitigation Measures
		2nd Brown Metal beneath the site. The 2nd Brown Metal seam has been encountered by the previous investigation in the Northern Parcel between 0.2m and 0.4m thick and a depth of between 0.8m and 3.1m begl. The seam was intact across the site and no indication of the seam being worked was recorded. The seam is indicated to outcrop in the Northern Parcel and dip to the north east. The outcrop of this appears to be more in the west than recorded on the CA maps according to previous investigation at this location. The coal encountered onsite is the Second Brown Metal seam and the First brown metal is further north east as recorded on the CA maps. The 1st Brown Metal seam is not located beneath any of the proposed residential dwellings and is possibly located in the north eastern section of the site, a risk has not been identified. The coal was recovered as highly weathered, of poor quality and of limited thickness (c.0.2m to 0.4m). *There is no risk to the south of the fault which has been downthrown and Sandstone bedrock is present. The*		

Coal Mining Risk Assessment for a residential development at Birkenshaw				
Issue	Hazard	Site Affected	Consequence	Recommended Mitigation Measures
		location of the fault is shown on plan GRO-24208-P02 and Sandstone is present for the majority of the site. *The next shallowest coal seam is the Middleton Little Coal which has a recorded thickness of circa 0.3m (1 foot) in the surrounding area and has never been worked due to being of little value and limited thickness. Furthermore, sufficient cover would be present at 15m below Brown Coals and no risk is present.* *The shallowest coal seam to have a potential impact to the stability of the surface of the site is the Middleton Main Coal which lies circa 15m below the Middleton Little Coal therefore at a depth of circa 30m beneath the site. The geological memoir indicates that the Middleton Main is circa 1.0m thick, therefore sufficient rock cover (circa 28 times) is present above this seam if worked.* *All remaining seams are at significant depth to have no influence to the stability of the surface of the site.*		

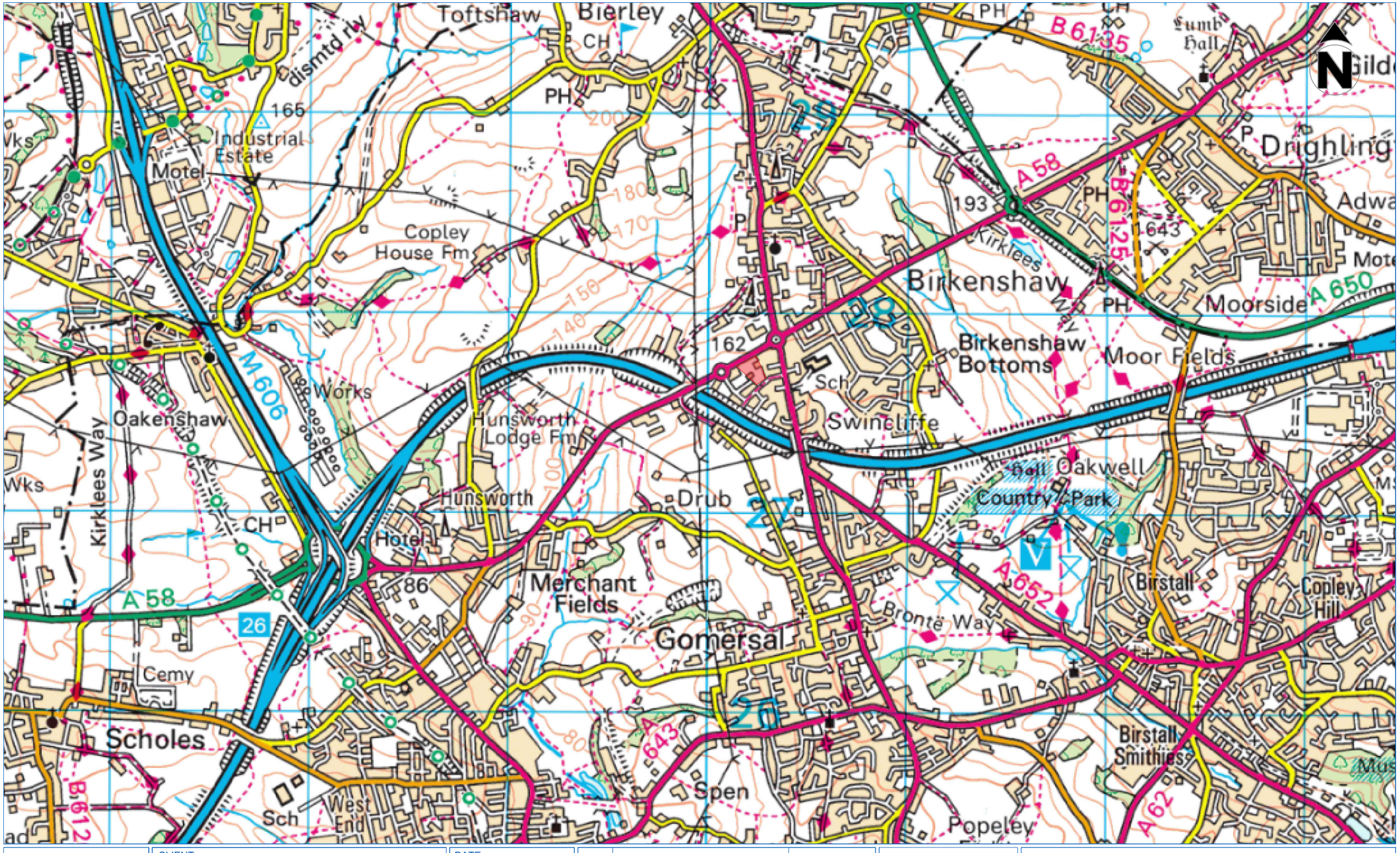
Coal Mining Risk Assessment for a residential development at Birkenshaw				
Issue	Hazard	Site Affected	Consequence	Recommended Mitigation Measures
		The adit dips at an angle of 355 degrees and is indicated away from site to the north east. The adit is likely targeting the 1st Brown Metal seam.		
Unrecorded Mine Entries	➢ *Catastrophic collapse of mine entry leading to ground instability or voids at the ground surface* ➢ *Settlement of the ground surface above/adjacent to the mine entry* ➢ *Generation of crown holes at the ground surface* ➢ *Mines gas emissions*	***No** - CA records indicate that the shallow seams are of little value due to their limited thickness and are unlikely to have been worked. The geological memoir indicates that the Middleton Lower seam is of poor quality in the Birkenshaw area. No sections of Birkenshaw or Hunsworth Lodge Collieries or of the old sinkings to the Middleton Bed here having been kept.* *Previous Ground Investigation on the site also indicated no areas of deep Made Ground or likelihood of shallow workings.*	*Ground subsidence associated with historic mine entries can cause instability, subsidence and is a source of mine gases.*	***A watching brief is recommended during ground works as a precaution.***
Coal Mining Geology (fissures)	➢ *Ground subsidence.* ➢ *Mixtures of noxious of explosive gases reaching the ground surface via faulted/broken strata*	***Yes –** A fault is indicated beneath the site running south west to north east and downthrown to the north west.*	*Movement due to reactivation of the fault can give rise to levels of damage to the built environment that may affect both serviceability and design life of a structure.*	***Foundations for proposed buildings on the site should be reinforced to the structural engineers specification.***

Coal Mining Risk Assessment for a residential development at Birkenshaw				
Issue	Hazard	Site Affected	Consequence	Recommended Mitigation Measures
	and entering buildings, structures, confined spaces etc., when an explosive or asphyxiating hazard may be generated. ➢ *Stepped rockhead profiles where there has been subsidence across faults, impacting settlement. Of proposed structures.*			
Records of mine gas emissions	➢ *Mixtures of noxious of explosive gases reaching the ground surface via superficial deposits, faulted/broken strata or poorly filled mine entries and entering structures, confined spaces etc., when an explosive or asphyxiating hazard may be generated.*	***No -*** *Mine workings are recorded beneath the site at depth.* *The CA report indicates that there are no records of mine gas emissions near site.* *A gas monitoring programme was previously carried out by RSK in the Southern Parcel and recorded a maximum concentration of methane of 0.1%v/v and a maximum carbon dioxide concentration of 1.4%v/v. No depleted oxygen levels were recorded during the monitoring*	*Mine gases may be present within historic workings and mine shafts which could potentially migrate into proposed buildings underlain by historic mine workings.*	***No further action required.***

Coal Mining Risk Assessment for a residential development at Birkenshaw				
Issue	Hazard	Site Affected	Consequence	Recommended Mitigation Measures
		period and no evidence of other mine gasses such as hydrogen sulphide and carbon monoxide were recorded, therefore no risk to mine gasses is present on site. The site was classified as CS1. *Furthermore, the workings beneath the site are at a significant distance to not have an impact.*		
Recorded coal mining surface hazard. Surface mining (opencast workings)	➢ *Ground subsidence.* ➢ *Ground instability.* ➢ *Potential of a ground gas source and/or migration pathway. Potential settlement problems.* ➢ *Combustible material left behind after historic opencast workings may ignite if in the vicinity of excessive heat such as utility cables.*	***No –*** *CA records indicate that there are no opencast coal mines within 500m of the site boundary.* *Previous ground investigations across the site indicated no Made Ground to be present therefore there is no risk from colliery spoil.* *The Second Brown Metal is a combustible seam and has been encountered across the northern section of the site at shallow depths. The first brown metal is indicated to be present further North East.* *A previous trial pitting exercise was undertaken at the site to determine if*	*Ground gases may be generated which could potentially migrate into proposed buildings.* *The coal recorded across the north of the site could be subject to combustibility.*	***Combustibility testing should be undertaken to record the calorific value and assess the combustibility of the coal if excavated during the enabling works.*** ***Excavated coal should be considered combustible and consideration into the prevention of ignition should be undertaken during groundworks in accordance with CIRIA C758. This will include deepening through coal for foundations when encountered and placing sufficient clay cover system in gardens to isolate for lifetime of development.***

Coal Mining Risk Assessment for a residential development at Birkenshaw				
Issue	Hazard	Site Affected	Consequence	Recommended Mitigation Measures
		quarrying had been extended onsite site. The exercise confirmed no evidence of quarrying was present onsite.		

Plans



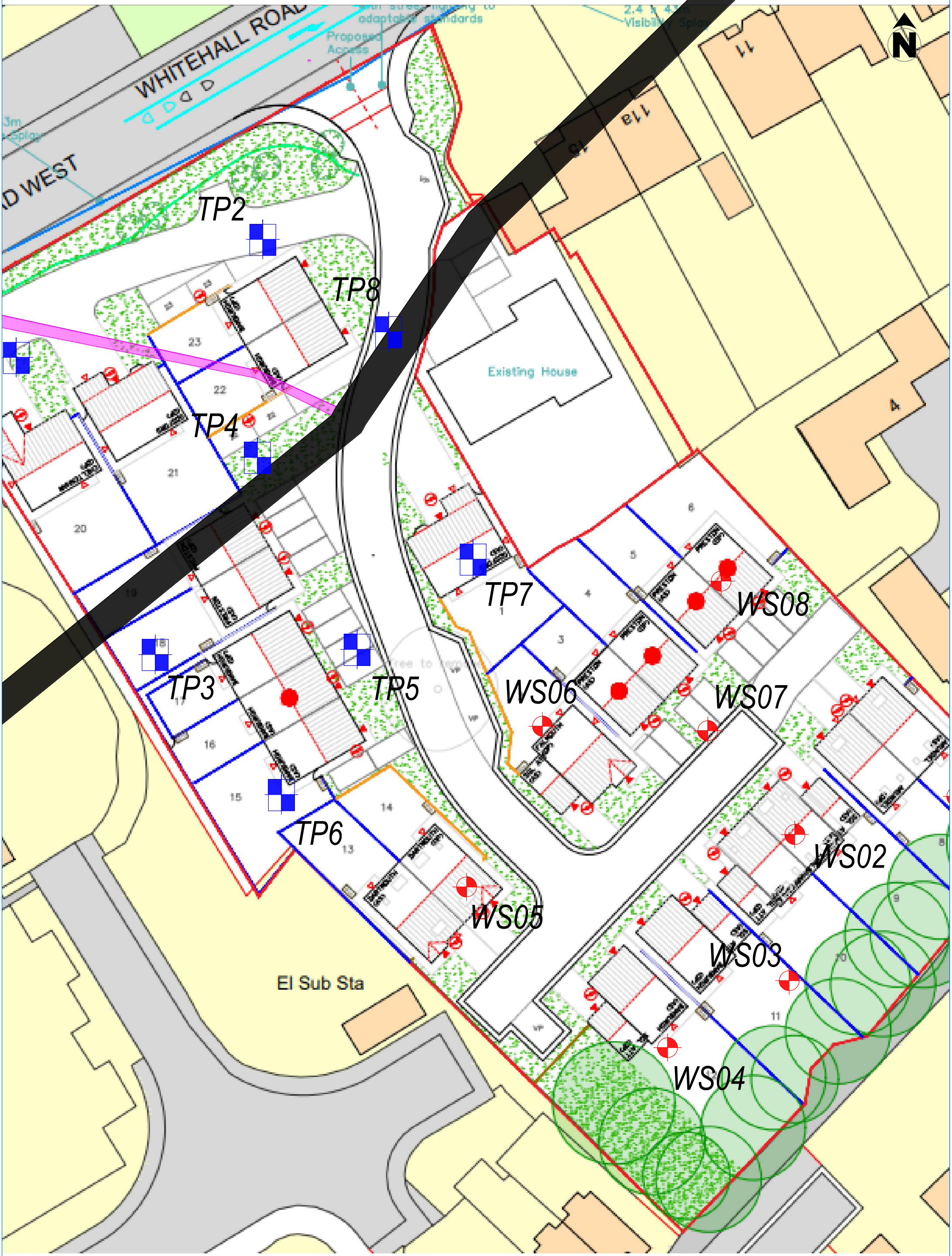
GROUNDTECH CONSULTING	CLIENT: ORION HOMES	DATE: AUGUST 2024
	PROJECT TITLE: BIRKENSHAW	SCALE: NTS
	PLAN TITLE: PROJECT LOCATION PLAN	PLAN NUMBER: GRO-24208-P01

Rev.	Details	Date

Status	
Preliminary	
Draft	
Issued	●
For Comment	
Approved	

Notes

Site Location



GROUNDTECH CONSULTING	CLIENT: ORION HOMES	DATE: AUGUST 2024	Rev.	Details	Date
	PROJECT TITLE: BIRKENSHAW	SCALE: NTS			
	PLAN TITLE: COAL MINING FEATURES PLAN	PLAN NUMBER: GRO-24208-P02			

Status	
Preliminary	
Draft	
Issued	●
For Comment	
Approved	

Notes

- Approximate position of Brown Metal Coal Outcrop
- Approximate position of Fault
- Approximate position of ARP Trial Pits
- Approximate position of RSK Windowless Sample Boreholes

Previous Site Investigation Records

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Birkenshaw	**JGC (1980) LTD**	**WS01**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
350520	**28.07.22**	**---**	**---**	**1** of **1**
	End: **28.07.22**			

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.10	1	ES				Light brown gravelly slightly clayey fine to coarse SAND with abundant roots. Gravel is sub-angular fine to coarse of sandstone. (TOPSOIL)	0.10	
0.40 - 0.70 (59mm dia)	0.40-0.70	1	SPT	11,13/21,29 for 75mm			Light brown gravelly fine to coarse SAND. Gravel is angular to sub-angular fine to coarse of sandstone. (WEATHERED SANDSTONE)	(0.65)	
							Inspection pit refused at 0.75m depth with smallest barrell.	0.75	

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.40m depth.
3. No groundwater encountered.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Dart 227**	**Structural Soils**	**WHopkins**	

RSK GEOSCIENCES

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Birkenshaw	**JGC (1980) LTD**	**WS02**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
350520	**28.07.22**	**---**	**---**	**1** of **1**
	End: **28.07.22**			

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.30	1	ES				Light brown slightly clayey slightly gravelly fine to coarse SAND with rootlets. Gravel is sub-angular of sandstone. (TOPSOIL)	(0.40) 0.40	
0.50 - 1.00 (79mm dia)	0.80	2	ES				Orangish brown and light brown sandy angular fine to coarse GRAVEL of sandstone. (WEATHERED BEDROCK)	(0.95)	
	1.00-1.30	1	SPT	5,7/22,28 for 75mm				1.35	
	1.00	3	SPTLS						
	1.25	3	SPTLS				Inspection pit refused at 1.35m depth.		

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 1.00m depth.
3. No groundwater encountered.
4. Backfilled with bentonite.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Dart 227**	**Structural Soils**	**WHopkins**	AGS

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Birkenshaw	**JGC (1980) LTD**	**WS03**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
350520	End: **28.07.22**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
0.40 - 1.00 (79mm dia)	0.20	1	ES				Light brown slightly gravelly fine to coarse SAND with rootlets. Gravel is sub-angular fine to coarse sandstone. (TOPSOIL)	(0.40) 0.40	
	0.80	2	ES				Light brown sandy angular fine to coarse GRAVEL of sandstone. (WEATHERED BEDROCK)	(0.78) 1.18	
	1.00-1.23	1	SPT	8,12/50 for 75mm					
	1.00	3	D				Inspection pit terminated at 1.18m depth in bedrock.		

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 1.00m depth.
3. No groundwater encountered.
4. Backfilled with bentonite.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Dart 227**	**Structural Soils**	**WHopkins**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Birkenshaw	**JGC (1980) LTD**	**WS04**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
350520	End: **28.07.22**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.10	1	ES				Light brown slightly gravelly slightley clayey fine to coarse SAND with rootlets. (TOPSOIL)	(0.35)	
								0.35	
0.35 - 1.00 (89mm dia)							Light brown sandy angular fine to coarse GRAVEL of sandstone. (WEATHERED BEDROCK)		
	0.90	2	ES					(1.15)	
	1.00-1.45	1	SPT	N=49					
1.00 - 1.50 (69mm dia)	1.20	3	D						
								1.50	
	1.50-1.50	2	SPT	NP			Inspection pit terminated at 1.50m depth in bedrock.		
	1.50	4	D						

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 1.00m depth.
3. No groundwater encountered.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Dart 227**	**Structural Soils**	**WHopkins**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Birkenshaw	**JGC (1980) LTD**	**WS05**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
350520	**28.07.22** End: **28.07.22**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20	1	ES				Light brown slightly gravelly slightly clayey SAND with rootlets. (TOPSOIL)	(0.30) 0.30	
0.50 - 0.70 (79mm dia)							Light brown sandy angular fine to coarse GRAVEL of sandstone. (WEATHERED BEDROCK)	(0.53)	
	0.70-0.93	1	SPT	9,10/50 for 75mm				0.83	
							Inspection pit terminated at 0.83m depth in rock.		

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.70m depth.
3. No groundwater encountered.
4. Backfilled with bentonite.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Dart 227**	**Structural Soils**	**WHopkins**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Birkenshaw	**JGC (1980) LTD**	**WS06**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
350520	**28.07.22** End: **28.07.22**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.10	1	ES				Brown slightly clayey slightly gravelly fine to coarse SAND with rootlets. Gravel is sub-angular fine to medium of sandstone and brick. (TOPSOIL)	(0.30)	
	0.30	2	ES					0.30	
0.40 - 1.00 (89mm dia)							Light orangish brown sandy sub-angular fine to coarse GRAVEL of sandstone. (WEATHERED BEDROCK)		
	1.00-1.45	1	SPT	N=36					
	1.00	3	SPTLS					(2.12)	
1.00 - 2.00 (79mm dia)	1.45	3	SPTLS				. . . At depth 1.50m-2.00m: Clayey.		
	1.60	4	D						
	2.00-2.41	2	SPT	5,6/6,10,14,20 for 30mm					
	2.00	4	D						
							Inspection pit terminated at 2.42m depth.	2.42	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 1.00m depth.
3. No groundwater encountered.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Dart 227**	**Structural Soils**	**WHopkins**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Birkenshaw	**JGC (1980) LTD**	**WS07**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
350520	**28.07.22**	**---**	**---**	**1** of **1**
	End: **28.07.22**			

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
0.30 - 0.80 (101mm dia)	0.30	1	ES				Brown slightly clayey gravelly fine to coarse SAND with rootlets. Gravel is sub-angular fine to coarse of sandstone. (TOPSOIL)	(0.30) 0.30	
	0.60	2	ES				Light orangish brown sandy angular fine to coarse GRAVEL of sandstone. (WEATHERED BEDROCK) . . . At depth 0.30-0.60m: Clayey.	(0.90)	
	0.80-1.18	1	SPT	11,7/7,10,33 for 75mm					
	1.00	3	D					1.20	
							Inspection pit refused at 1.20m depth due to SPT on bedrock.		

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.80m depth.
3. No groundwater encountered.
4. Backfilled with bentonite.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Dart 227**	**Structural Soils**	**WHopkins**	

RSK GEOSCIENCES

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Birkenshaw	**JGC (1980) LTD**	**WS08**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
350520	**28.07.22**	**---**	**---**	**1** of **1**
	End: **28.07.22**			

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20	1	ES				Soft dark brown sandy slightly gravelly CLAY with roots. Gravel is sub-angular fine to medium of sandstone and brick. (TOPSOIL)	(0.30) 0.30	
0.30 - 1.00 (101mm dia)	0.30-0.75	1	SPT	N=19			Light orangish brown slightly clayey sandy angular to sub-angular fine to coarse GRAVEL of sandstone.	(1.05)	
	0.80	2	ES						
	1.00-1.24	2	SPT	10,12/25,25 for 10mm					
	1.00	3	D						
							Inspection pit refused at 1.35m depth due to bedrock.	1.35	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.30m depth.
3. No groundwater encountered.
4. Backfilled with bentonite.
5. ES2 no tub.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Dart 227**	**Structural Soils**	**WHopkins**	AGS

ARP Geotechnical Limited

Trial Pit Log

TrialPit No **TP1** Sheet 1 of 1

Project Name: Whitehall Road West, Birkenshaw	Project No. ORH/20	Co-ords: 420182.54 - 427737.49 Level:	Date 29/06/2023
Location: Birkenshaw	Pit Dimensions (m) Length: 1.80 m Width: 0.60 m Depth: 2.80 m	Machine Type: JCB 3CX	Scale 1:25
Client: Orion Homes Ltd			Logged: AMJ

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
						Dark brown slightly sandy clayey TOPSOIL.
0.20 - 0.45	ES		0.20			POSSIBLE MADE GROUND. Soft to firm dark brown slightly sandy silty CLAY (reworked natural ground).
			0.45			High strength (stiff) light brown slightly sandy silty CLAY.
0.80		HSV=110				
1.00		HSV=120	1.00			
1.20	D					High strength (stiff) dull yellow/buff slightly sandy silty CLAY.
			1.80			Weathered Coal Seam.
			2.10			Medium strength (firm to stiff) dull grey slightly sandy silty CLAY.
2.50		HSV=70				
			2.70			Extremely weak SILTSTONE (recovered as cobble and gravel sized pieces).
			2.80			End of Pit at 2.800m Bedrock encountered. Difficult to excavate any further.

1 2 3 4 5

Groundwater: None Encountered.

Backfill: Backfilled with arisings upon completion.

Stability: Stable throughout.

Remarks: None

ARP Geotechnical Limited

Trial Pit Log

TrialPit No **TP2** Sheet 1 of 1

Project Name: Whitehall Road West, Birkenshaw	Project No. ORH/20	Co-ords: 420209.54 - 427752.79 Level:	Date 29/06/2023
Location: Birkenshaw	Pit Dimensions (m) Length: 1.80 m Width: 0.60 m Depth: 3.60 m	Machine Type: JCB 3CX	Scale 1:25
Client: Orion Homes Ltd			Logged: AMJ

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
0.00 - 0.30	ES					Dark brown slightly sandy clayey TOPSOIL.
			0.30			Soft to firm light brown slightly sandy silty CLAY.
0.60		HSV=70	0.60			Medium strength (stiff) dull yellow/buff slightly sandy silty CLAY.
			1.80			Medium strength (firm to stiff) dull grey slightly sandy silty CLAY.
			2.70			Weathered Coal Seam.
			3.00			Extremely weak SILTSTONE (recovered as cobble and gravel sized pieces).
			3.60			End of Pit at 3.600m Bedrock encountered. Difficult to excavate any further.

1 2 3 4 5

Groundwater: None Encountered.

Backfill: Backfilled with arisings upon completion.

Stability: Stable throughout.

Remarks: None

ARP Geotechnical Limited	Trial Pit Log	TrialPit No **TP3** Sheet 1 of 1

Project Name: Whitehall Road West, Birkenshaw	Project No. ORH/20	Co-ords: 420187.38 - 427721.98 Level:	Date 29/06/2023
Location: Birkenshaw	Pit Dimensions (m) Length: 1.70 m Width: 0.70 m Depth: 2.90 m	Machine Type: JCB 3CX	Scale 1:25
Client: Orion Homes Ltd			Logged: AMJ

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
0.00 - 0.30	ES					Dark brown slightly sandy clayey TOPSOIL.
			0.30			
						High strength (firm to stiff) dull yellow/buff slightly sandy silty CLAY.
0.80		HSV=76				
			1.00			Mudstone band.
			1.10			High strength (stiff) dull yellow/buff slightly sandy silty CLAY.
1.40		HSV=130				
			1.90			Weathered Coal Seam.
			2.10			Stiff dull grey slightly sandy silty CLAY.
			2.60			Extremely weak SILTSTONE (recovered as cobble and gravel sized pieces).
			2.90			End of Pit at 2.900m Bedrock encountered. Difficult to excavate any further.

Groundwater: None Encountered.

Backfill: Backfilled with arisings upon completion.

Stability: Stable throughout.

Remarks: None

ARP Geotechnical Limited

Trial Pit Log

TrialPit No **TP4** Sheet 1 of 1

Project Name: Whitehall Road West, Birkenshaw	Project No. ORH/20	Co-ords: 420209.78 - 427737.43 Level:	Date 29/06/2023
Location: Birkenshaw	Pit Dimensions (m) Length: 1.90 m Width: 0.70 m Depth: 3.10 m	Machine Type: JCB 3CX	Scale 1:25
Client: Orion Homes Ltd			Logged: AMJ

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
0.00 - 0.20	ES		0.20			Dark brown slightly sandy clayey TOPSOIL.
0.80		HSV=76				High strength (stiff) dull yellow/buff slightly sandy silty CLAY.
1.30		HSV=106				
			2.20			Weathered Coal Seam.
2.70	D		2.55			Firm to stiff dull grey slightly sandy silty CLAY (recovered as cobble and gravel sized pieces).
			2.90			Extremely weak SILTSTONE (recovered as cobble and gravel sized pieces).
			3.10			End of Pit at 3.100m Bedrock encountered. Difficult to excavate any further.

1 2 3 4 5

Groundwater: None Encountered.

Backfill: Backfilled with arisings upon completion.

Stability: Stable throughout.

Remarks: None

ARP Geotechnical Limited

Trial Pit Log

TrialPit No **TP5** Sheet 1 of 1

Project Name: Whitehall Road West, Birkenshaw	Project No. ORH/20	Co-ords: 420206.32 - 427719.42 Level:	Date 29/06/2023
Location: Birkenshaw	Pit Dimensions (m) Length: 1.80 m Width: 0.60 m Depth: 3.10 m	Machine Type: JCB 3CX	Scale 1:25
Client: Orion Homes Ltd			Logged: AMJ

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
			0.25			Dark brown slightly sandy clayey TOPSOIL.
0.30	ES					High strength (stiff) dull yellow/buff slightly sandy silty CLAY.
0.70		HSV=120				
1.20		HSV=124				
			2.30			Weathered Coal Seam.
			2.60			Firm to stiff dull grey slightly sandy silty CLAY (recovered as cobble and gravel sized pieces).
			2.90			Extremely weak SILTSTONE (recovered as cobble and gravel sized pieces).
			3.10			End of Pit at 3.100m Bedrock encountered. Difficult to excavate any further.

Groundwater: None Encountered.

Backfill: Backfilled with arisings upon completion.

Stability: Stable throughout.

Remarks: None

ARP Geotechnical Limited

Trial Pit Log

TrialPit No **TP6** Sheet 1 of 1

Project Name: Whitehall Road West, Birkenshaw	Project No. ORH/20	Co-ords: 420206.09 - 427690.48 Level: 160.50	Date 29/06/2023
Location: Birkenshaw	Pit Dimensions (m) Length: 1.80 m Width: 0.70 m Depth: 2.80 m	Machine Type: JCB 3CX	Scale 1:25
Client: Orion Homes Ltd			Logged: AMJ

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
0.00 - 0.30	ES					Dark brown slightly sandy clayey TOPSOIL.
			0.30	160.20		
						High strength (stiff) dull yellow/buff slightly sandy silty CLAY.
0.70		HSV=130				
			0.80	159.70		
						Weathered Coal Seam.
			1.20	159.30		
						Firm to stiff dull grey slightly sandy silty CLAY (recovered as cobble and gravel sized pieces).
2.20 - 2.50	D					
			2.60	157.90		
						Extremely weak MUDSTONE (recovered as cobble and gravel sized pieces).
			2.80	157.70		
						End of Pit at 2.800m Bedrock encountered. Difficult to excavate any further.

Groundwater: None Encountered.

Backfill: Backfilled with arisings upon completion.

Stability: Stable throughout.

Remarks: None

RrTP_v1.053

ARP Geotechnical Limited

Trial Pit Log

TrialPit No **TP7** Sheet 1 of 1

Project Name: Whitehall Road West, Birkenshaw	Project No. ORH/20	Co-ords: 420227.05 - 427710.68 Level: 160.70	Date 29/06/2023
Location: Birkenshaw	Pit Dimensions (m) Length: 1.90 m Width: 0.60 m Depth: 4.30 m	Machine Type: JCB 3CX	Scale 1:25
Client: Orion Homes Ltd			Logged: AMJ

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
0.00 - 0.20	ES					Dark brown slightly sandy clayey TOPSOIL.
			0.30	160.40		Stiff dull yellow/buff slightly sandy silty CLAY.
			0.80	159.90		High strength (stiff) dull yellow/buff and grey slightly sandy silty CLAY.
1.30		HSV=130				
			2.20	158.50		Weathered Coal Seam.
			2.50	158.20		Firm to stiff dull grey slightly sandy silty CLAY (recovered as cobble and gravel sized pieces).
			4.10	156.60		Extremely weak SILTSTONE (recovered as cobble and gravel sized pieces).
			4.30	156.40		End of Pit at 4.300m Bedrock encountered. Difficult to excavate any further.

1 2 3 4 5

Groundwater: None Encountered.

Backfill: Backfilled with arisings upon completion.

Stability: Stable throughout.

Remarks: None

ARP Geotechnical Limited	Trial Pit Log	TrialPit No **TP8** Sheet 1 of 1

Project Name: Whitehall Road West, Birkenshaw	Project No. ORH/20	Co-ords: 420226.55 - 427745.45 Level: 159.50	Date 29/06/2023
Location: Birkenshaw	Pit Dimensions (m) Length: 1.90 m Width: 0.70 m Depth: 3.90 m	Machine Type: JCB 3CX	Scale 1:25
Client: Orion Homes Ltd			Logged: AMJ

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
0.00 - 0.30	ES					Dark brown slightly sandy clayey TOPSOIL.
			0.30	159.20		High strength (stiff) dull yellow/buff slightly sandy silty CLAY.
1.20	D					
1.20		HSV=80				
1.50		HSV=130				
			3.10	156.40		Weathered Coal Seam.
			3.40	156.10		Firm to stiff dull grey slightly sandy silty CLAY (recovered as cobble and gravel sized pieces).
			3.70	155.80		Extremely weak SILTSTONE (recovered as cobble and gravel sized pieces).
			3.90	155.60		End of Pit at 3.900m Bedrock encountered. Difficult to excavate any further.

Groundwater: None Encountered.

Backfill: Backfilled with arisings upon completion.

Stability: Stable throughout.

Remarks: None

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Also at: Chesham
Leamington Spa
Sheffield
Teesside
Thames Gateway

Our Ref: NG7020.L004/WHI/NDT/kef

Your Ref:

Chkd: ndt

Date: 08 September 2008

Mr J Farrar
Farrar Bamforth Associates Ltd
51 Trinity Street
HUDDERSFIELD
HD1 4DN

Dear John

Re: Whitehall Road West, Birkenshaw BD11 2DE
Planning Reference: TP/RG/92423

Further to John Wood's letter of the 23 July 2008 we have now carried out a trial pitting exercise to investigate whether quarrying has taken place within the site boundary, which was deemed sufficient by Mr Nasir Dad at Kirklees Council as a Phase II report relating to the above planning application.

Prior to carrying out the trial pits we compiled information from a number of sources relating to quarrying in the area and we have attached this in Appendix A to demonstrate the historical record information relating to the quarrying in the area. The documentation consists of a geological map extract showing the sandstone quarry, a copy of Drawing NG6160-052 indicating the location of the filled quarry based on measurements taken during the investigation on the adjacent development in September 2005 and photos taken during the excavation of the material within the filled quarry. As can be seen from this historical information the quarrying does not appear to cross over the site boundary. We can also confirm that the writer of this report personally witnessed the excavation of the made ground from the filled quarry in February 2006, and that it was backfilled with inert 6F2 material.

Trial pits were carried out on Thursday, 7 August 2008, using a JCB excavator. The trial pit locations are indicated on the attached location plan in Appendix B. The trial pit logs are appended in Appendix C.

As can be seen from the enclosures, there is no evidence of the quarrying indicated on the historical maps extending onto the site. It can also be seen that the ground beneath the site consists of topsoil over natural material with bedrock encountered at shallow depth. There are a number of large trees on the site, with roots at shallow depth.

In conclusion, we note the following:-

1. There is no evidence to suggest that the quarrying extends onto the site.

2. The ground beneath the site appears to be natural material.
3. The foundations for the new dwellings should take into consideration the shallow depth large tree roots.

We trust this will be sufficient for you to proceed with the Planning Application for the project; however, should you require any further details then please do not hesitate to contact me.

Kind regards

Associate

Encs: Appendices A, B and C

Copy to: Ivan Conroy, Conroy Brook Developments (plus encs)

jnp group
Consulting Engineers

APPENDIX A

David Bellis
CONSULTING SURVEYORS

8 Mornington Terrace, Harrogate,
North Yorkshire, HG1 5DH
Telephone (01423)529911 Fax:
(01423)529922 Email: user@bellis.co.uk
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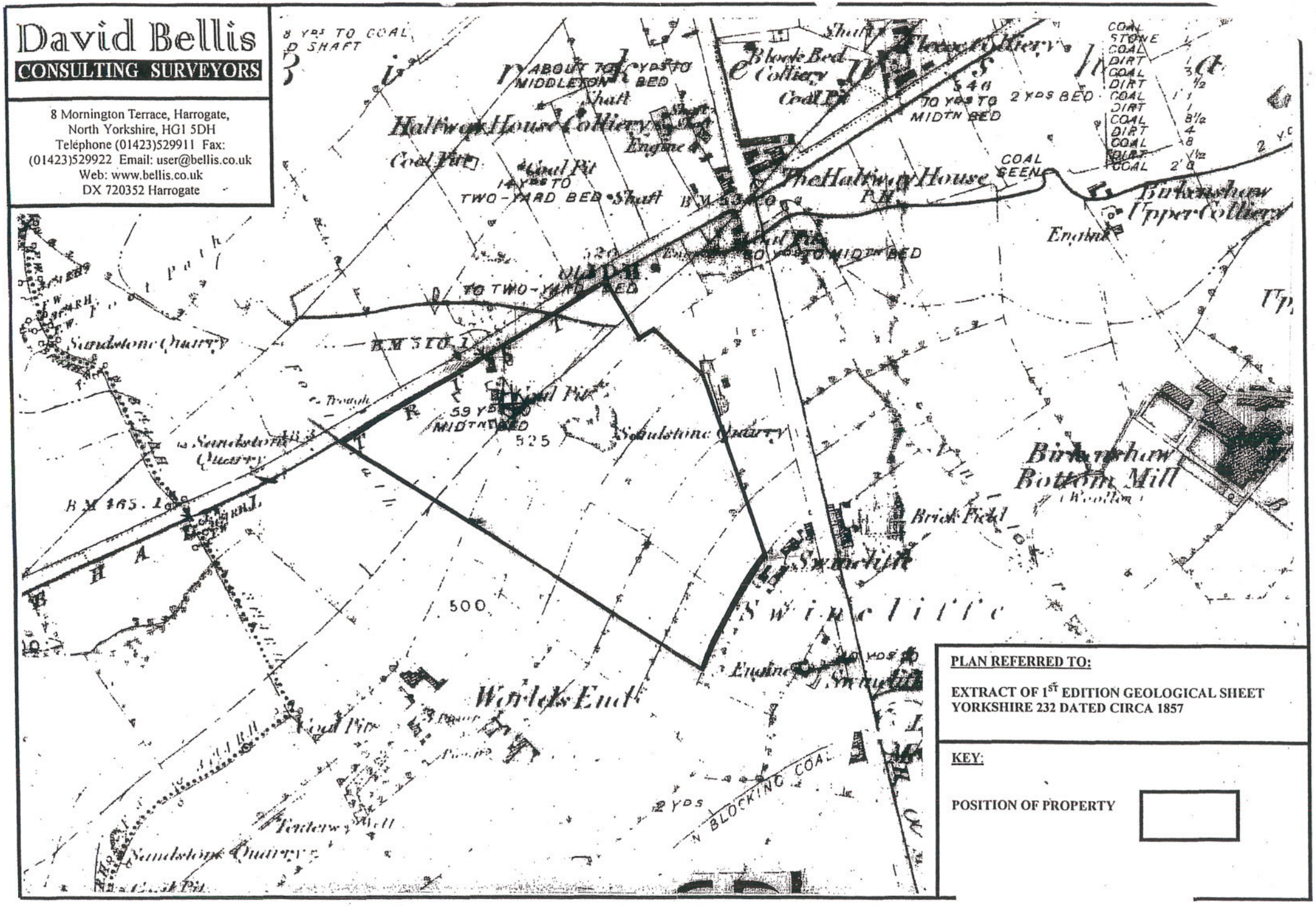
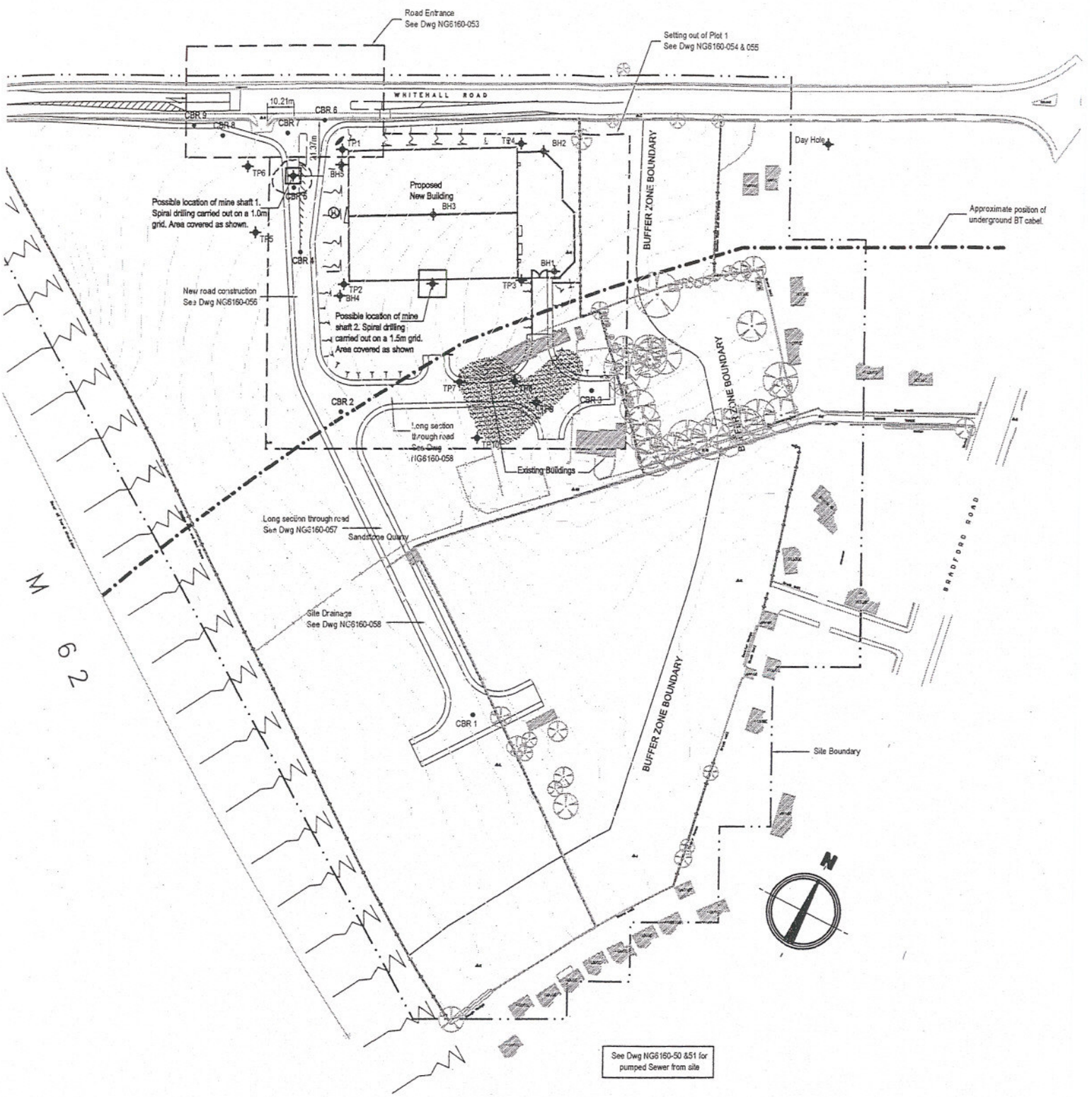


PLAN REFERRED TO:

EXTRACT OF 1ST EDITION GEOLOGICAL SHEET YORKSHIRE 232 DATED CIRCA 1857

KEY:

POSITION OF PROPERTY



EXTERNAL WORKS GA

(Scale 1:1000)

jnp group
Consulting Engineers

APPENDIX B

WHITEHALL ROAD WEST
Proposed pedestrian refuge traffic island
private drive
ramp
Shared Access
Drive No 15
Garage
Set Stone Drive
Accessway
screen fence
Existing rockery
Existing young trees
Remove Hawthorn & Undergrowth
Remove shrubs and small trees
remove group of poplar trees, mixed trees and shrubs
Tree planting as buffer zone on adjacent business park
private drive
Sycamores to remain
Remove Poplar
remove intermediate trees
Sycamores to remain
Tree planting as buffer zone on adjacent business park
Tree planting as buffer zone on adjacent business park
Bridleway
remove tree
Rev A: Amendments to suit Tree
Revisions:
Residenti

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APPENDIX C

forward thinking
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Client	Conroy Brook Developments c/o Farrar Bamforth Associates	Drawn By RJW	Date 07/08/2008
Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 1	Drawing No. NG7020-TP1	Rev.

Samples & Insitu Tests		Water Depth (m)	Depth (m)	Description of Strata	O.D. Level	Legend
Depth	Type					
			300mm	Top Soil		
			500mm	Soil/ Stone/ Clay		
			1m	Light brown clay with sand lenses and siltstone fragments		
			1.6m	Stiff yellow clay mottled with grey silty clay		

Remarks

Hole Dry

Trial Pit Log

QA Ref: QD0190 Rev B

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Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 2	Drawing No. NG7020-TP2	Rev.

Samples & Insitu Tests		Water Depth (m)	Depth (m)	Description of Strata	O.D. Level	Legend
Depth	Type					
			200mm	Top Soil	Sample	2A
			500mm	Top Soil / stone / clay mixture		
			1m	orangy brown clay	Sample	2B
			1.6m	orange mottled grey clay (firm to stiff)		

Remarks

Hole Dry

Trial Pit Log

QA Ref: QD0190 Rev B

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Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 3	Drawing No. NG7020-TP3	Rev.

Samples & Insitu Tests		Water Depth (m)	Depth (m)	Description of Strata	O.D. Level	Legend
Depth	Type					
			150mm	Top Soil		
			550mm	Soil / stone / clay mix		
			950mm	Weathered silt stone		
			1.5m	Orangy clay, some grey mottling, stiff		

Remarks

Hole Dry

Trial Pit Log

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Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 4	Drawing No. NG7020-TP4	Rev.

Samples & Insitu Tests		Water Depth (m)	Depth (m)	Description of Strata	O.D. Level	Legend
Depth	Type					
			200mm	Top Soil /roots 10mm Ø	Sample	4A
			600mm	Clay / stones		
			1.3m	Broken stone / weathered sandstone		

Remarks

Hole Dry

Trial Pit Log

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Client	Conroy Brook Developments c/o Farrar Bamforth Associates	Drawn By RJW	Date 07/08/08
Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 5	Drawing No. NG7020-TP5	Rev.

Samples & Insitu Tests		Water Depth	Depth	Description of Strata	O.D. Level	Legend
Depth	Type	(m)	(m)			
			200mm	top soil / roots 15mm Ø	Sample	5A
			600mm	Clay/ stones		
			1.3m	Broken Orangy stone/ weathered sandstone		

Remarks

Hole Dry

Trial Pit Log

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Client	Conroy Brook Developments c/o Farrar Bamforth Associates	Drawn By RJW	Date 07/08/08
Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 6	Drawing No. NG7020-TP6	Rev.

Samples & Insitu Tests		Water Depth (m)	Depth (m)	Description of Strata	O.D. Level	Legend
Depth	Type					
			200mm	Top soil / roots 8mm Ø	Sample	6A
			600mm	Clay / Stones		
			1.3m	Broken stone / weathered sandstone		

Remarks

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Client	Conroy Brook Developments c/o Farrar Bamforth Associates	Drawn By RJW	Date 07/08/08
Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT7	Drawing No. NG7020-TP6	Rev.

Samples & Insitu Tests		Water Depth	Depth		Description of Strata	O.D. Level	Legend
Depth	Type	(m)	(m)				
			300mm		Top soil / roots up to 50mm Ø		
			1m		Stone / weathered mud stone		

Remarks
Cable uncovered at shallow depth

Trial Pit Log

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Client	Conroy Brook Developments c/o Farrar Bamforth Associates	Drawn By RJW	Date 07/08/08
Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 8	Drawing No. NG7020-TP8	Rev.

Samples & Insitu Tests		Water Depth (m)	Depth (m)	Description of Strata	O.D. Level	Legend
Depth	Type					
			400mm	Top soil / roots 25MM Ø		
			1.3m	weathered sandstone		

Remarks

Trial Pit Log

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Client	Conroy Brook developtments c/o Farrar Bamforth Associates	Drawn By RJW	Date 07/08/08
Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 9	Drawing No. NG7020-TP9	Rev.

Samples & Insitu Tests		Water Depth (m)	Depth (m)	Description of Strata	O.D. Level	Legend
Depth	Type					
			300mm	Top soil / roots 50mm Ø	Sample	9A
			1.3m	Broken stone		

Remarks

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Client	Conroy Brook Developments c/o Farrar Bamforth Associates	Drawn By RJW	Date 07/08/08
Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 10	Drawing No. NG7020-TP10	Rev.

Samples & Insitu Tests		Water Depth	Depth		Description of Strata	O.D. Level	Legend
Depth	Type	(m)	(m)				
			350mm		Top soil / roots 12mm Ø		
			1.2m		orangy coloured weathered sandstone		

Remarks

Trial Pit Log

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Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 11	Drawing No. NG7020-TP11	Rev.

Samples & Insitu Tests		Water Depth (m)	Depth (m)	Description of Strata	O.D. Level	Legend
Depth	Type					
			400mm	Top soil / roots 30mm Ø	Sample	11A
			1.2m	Light orange weathered sandstone		

Remarks

Trial Pit Log

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Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT12	Drawing No. NG7020-TP12	Rev.

Samples & Insitu Tests		Water Depth (m)	Depth (m)	Description of Strata	O.D. Level	Legend
Depth	Type					
			300mm	Top soil		
			500mm	orangy sandstone weathered		

Remarks

Trial Pit Log

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Job	Whitehall Road, West Birkenshaw BD11 2DS	Checked By NDT	Scale
Title	TRIAL PIT 13	Drawing No. NG7020-TP13	Rev.

Samples & Insitu Tests		Water Depth	Depth		Description of Strata	O.D. Level	Legend
Depth	Type	(m)	(m)				
			300mm		Top soil		
			1m		sandstone		

Remarks

Trial Pit Log

Coal Authority Mining Report

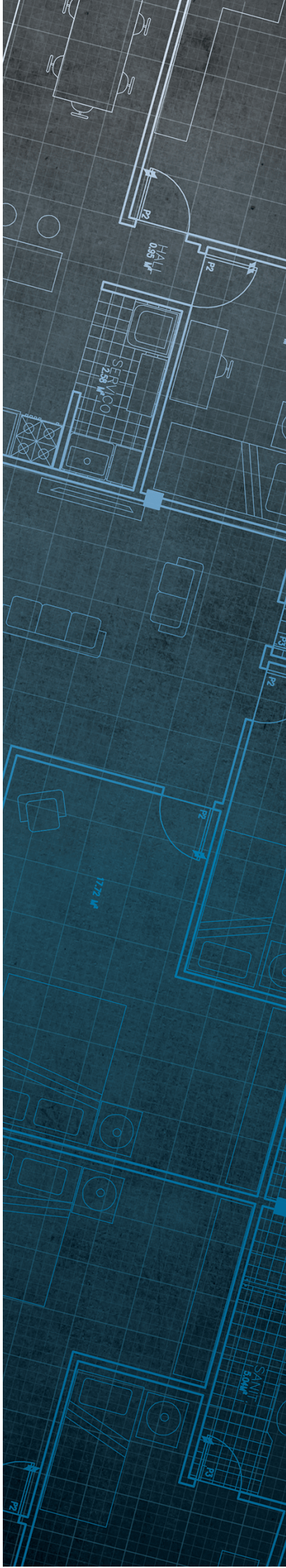
The Coal Authority

Consultants

Coal Mining Report

1 Whitehall Road West
Birkenshaw
Bradford
Kirklees
BD11 2LS

Date of enquiry:	**22 August 2024**
Date enquiry received:	**22 August 2024**
Issue date:	**22 August 2024**
Our reference:	**51003445577001**
Your reference:	**ORD-24208**



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Coal Mining Report

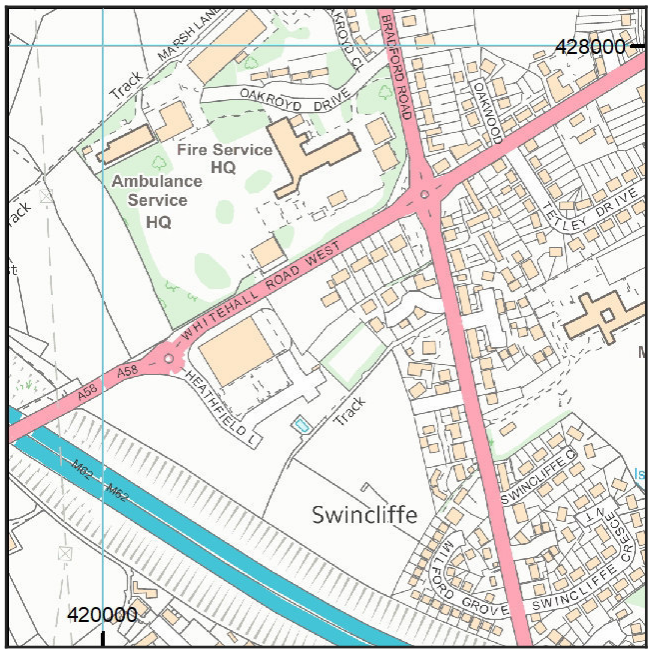
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

ORFORD INVESTMENTS

Enquiry address

1 Whitehall Road West
Birkenshaw
Bradford
Kirklees
BD11 2LS



Approximate position of property

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

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Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

@coalauthority
/company/the-coal-authority
/thecoalauthority
/thecoalauthority

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	SILKSTONE	Coal	6Z1E	100	Beneath Property	2.0	North-East	70	1928
unnamed	WHINMOOR	Coal	6Z1I	148	Beneath Property	1.2	North	71	1969

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	420427-013	420221 427837		Coal	
Shaft	420427-015	420125 427647		Coal	
Adit	420427-018	420264 427771		Coal	

Abandoned mine plan catalogue numbers

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

FGB336	FGB956	2764
FGB667	2275	M49
FGB335	PO0	GCR215

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
LOW FENTON	Coal	Yes	Within	N/A	284

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

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

Distance to site investigation (m)	Direction
20.4	North-West
45.5	North
21.9	North

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

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 in an area where notices to withdraw support were given in 1951 and 1954.

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.

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.

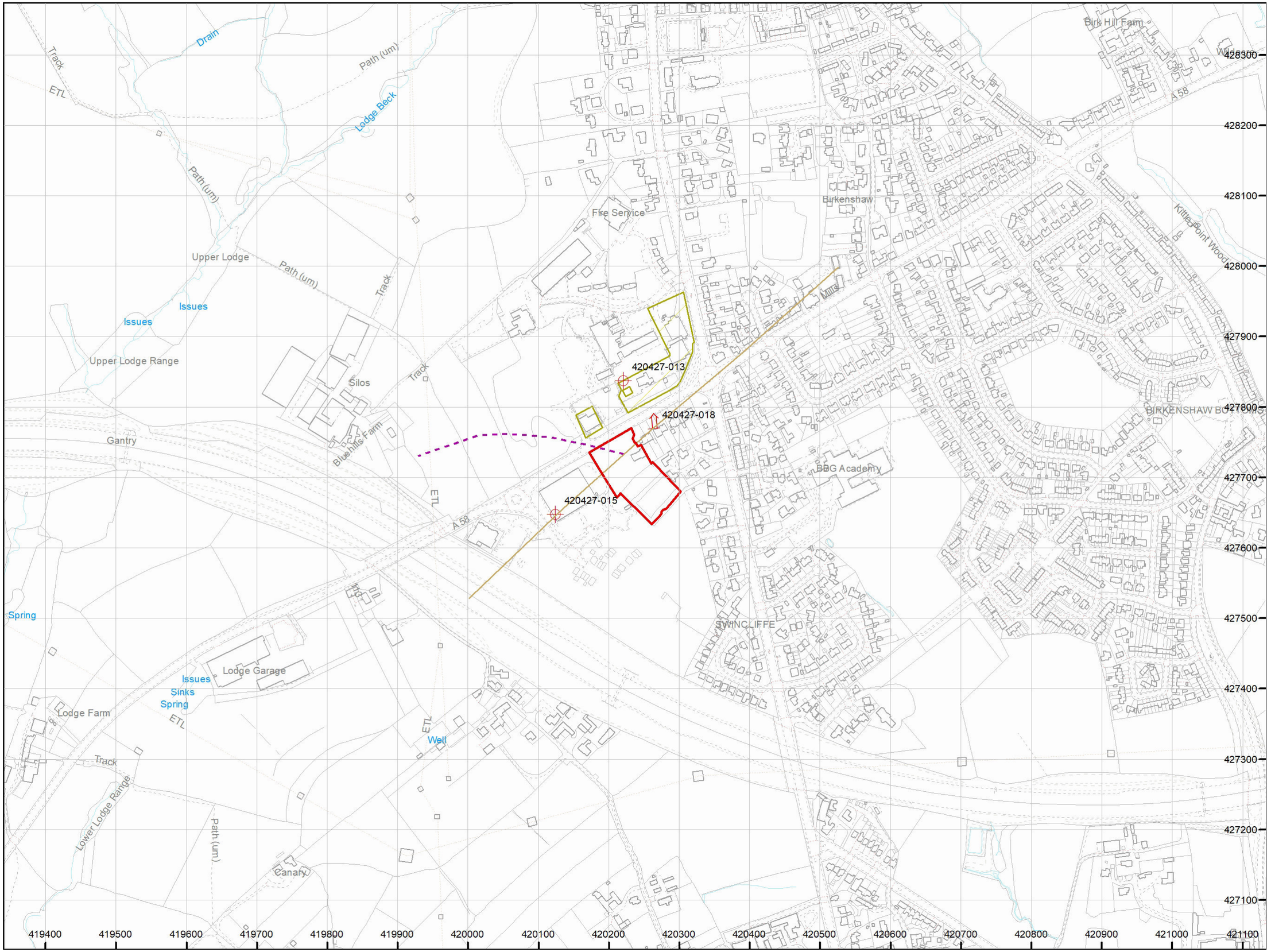
The Coal Authority

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
- Site investigations



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Limitations

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This contract was completed by Groundtech Consulting on the basis of a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with due skill and care, taking into consideration the project brief provided, project objectives, agreed scope of works, prevailing site conditions and budget allocation.

Other than that defined in the paragraph above, Groundtech Consulting provides no other accountability or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted industry practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Groundtech Consulting. A third party who relies on this report, does so at their own and sole risk and no liability to such parties is provided by Groundtech Consulting.

It is the understanding of Groundtech Consulting that this report is to be used for the intended purpose as set out in the introduction. The purpose was instrumental in determining the scope and level of the services provided. Should the purpose of the report or the proposed end use of the site change, this report will no longer be directly applicable, and its validity readdressed. No reliance upon the report in the revised situation should be assumed by the client without the permission of Groundtech Consulting.

The report was written in 2022, later changes in legislation, statutory requirements and industry best practices have not been considered and this should be allowed for. Ground conditions can also change and should be investigated if there is any significant delay in acting on the findings of this report. The period of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions in this report should not be relied upon in the future without the written confirmation from Groundtech Consulting that it is safe to do so.

The observations and conclusions outlined in this report are based exclusively on the services that were provided as set out in the agreement between the client and Groundtech Consulting.

Groundtech Consulting are not liable for the existence of any condition, the discovery of which would require additional investigation outside the agreed scope of works or core competency. The services provided are based upon Groundtech Consulting observations of existing physical conditions at the site gained from site reconnaissance together with interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and Groundtech Consulting assume the information to be correct.

No responsibility can be accepted for errors for third party information presented in this report. Groundtech Consulting were not authorised to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Groundtech Consulting are not liable for any inaccurate information, misrepresentation of data or conclusions, which may inform the scope of investigation undertaken by Groundtech Consulting and forms the contract with the client.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable due to its heterogeneous properties and as investigation exploratory locations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report, particularly between exploratory holes. The extent of the limited area depends on the soil and groundwater conditions, together with other constraints such as the position of any existing structures and underground utilities. Geo-Environmental testing was carried out for a limited number of parameters [as stipulated in the contract] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The groundwater level often has not had time to reach equilibrium and a monitoring period is required. Furthermore, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawings provided in this report are not meant to be an accurate base plan, but are preliminary and used to present the general relative locations of features on, and surrounding, the site.