

Coal Mining Risk Assessment

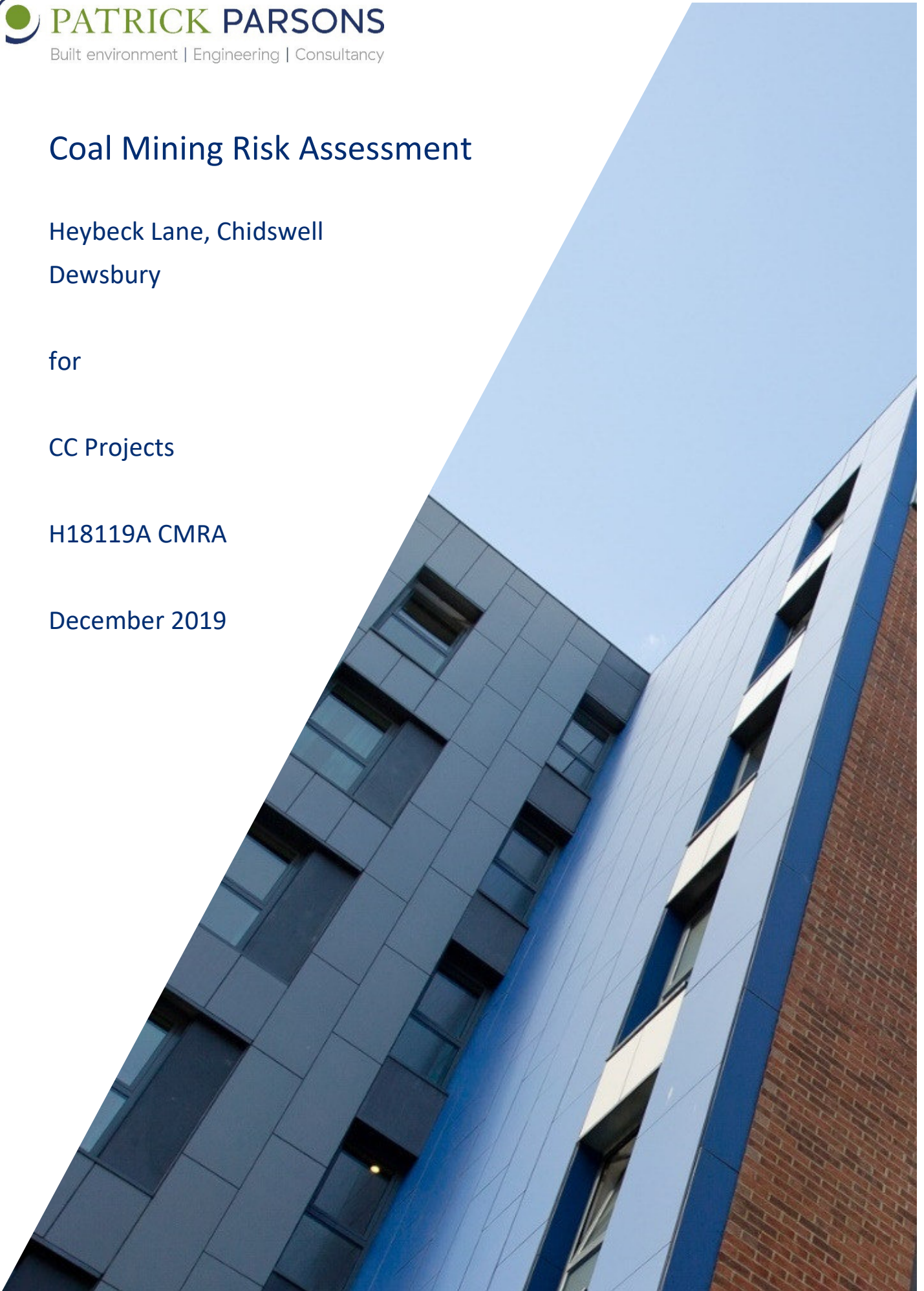
Heybeck Lane, Chidswell
Dewsbury

for

CC Projects

H18119A CMRA

December 2019



Coal Mining Risk Assessment
Heybeck Lane, Chidswell
for
CC Projects

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Should you have any queries relating to this document please contact:

Patrick Parsons Limited
5, Waverley Road
Huddersfield
West Yorkshire
HD1 5NA

T: +44 (0) 1484 516977

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Appendix A – Figures

Appendix B – Coal Authority Consultants Mining Report and Shaft Data Sheets

Appendix C – Coal Authority Mine Abandonment Plans

Executive Summary

Proposal	Residential development with associated infrastructure.
Current land use	Agricultural land (7.16ha) with existing levels in the northwest at approximately 106.5m falling to 89.0m AOD in the southeast. An unnamed watercourse crosses the southeastern spur.
Mining related Site history	2 former mine shafts are present within or adjacent to the northwestern Site boundary. Past deep mining has occurred beneath the Site. The former Solway and Tufty Farm Extension opencast coal sites together with the Dogloach pit are present within 500m of the Site. The Site lies within an area significantly affected by historic mining activities.
Geology	Directly underlain by Middle Coal Measures strata with the Horbury Rock sandstone beneath the northwestern part. The Beck Bottom Stone coal seam outcrops within the Site and this, together with the Gawber, 27 Yard and Swallow Wood coal seams, all underlie the Site at shallow depth.
Mining history and context	3 seams of worked coal are recorded as present at between 34 and 216m, last worked in 1922, however, shallow coal is present beneath the Site. The Beck Bottom Stone coal has been historically worked at outcrop locally. Numerous former mine entries are recorded north, east and south of the Site. Unrecorded mine entries could be present within the Site. The site lies within an area of probable past shallow coal mining and is within a Development High Risk Area as defined by the Coal Authority. The Site itself comprises part of a much larger area historically proposed for opencasting.
Mining related risks	There is a potential for unrecorded shallow mining beneath the Site potentially leading to surface instability – High. Both recorded and unrecorded former mine entries are/may be present on the Site – High. Mine gases may be present within the Site – Moderate to High.
Mitigation of risks	Proof drilling is recommended to confirm the status of the underlying Beck Bottom, Gawber, 27 Yard and Swallow Wood coal seams. If shallow mining is confirmed as potentially affecting surface stability, consolidation by drill and grout would be required. Intrusive investigation to determine the location of the former recorded shafts within the Site with appropriate treatment and capping required.

	Vigilance during Site enabling works to check for past unrecorded mine entries. Incorporation of protection measures for mine gases may be required within new development, subject to monitoring and the advice of regulators.
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The above summary should not be used in isolation and reference should be made the full report which provides a detailed assessment of the risks affecting the development.

1.0 Introduction

1.1 Commission

Patrick Parsons Ltd (PPL) were commissioned by Deloitte Real Estate (DRE) on behalf of the CC Projects (CCP) to undertake a Coal Mining Risk Assessment for land at south of Heybeck Lane, Chidswell, Dewsbury, referred to as the 'Site' from therein, in order to provide the Local Planning Authority with information on potential coal mining risks at the Site and an assessment of their potential impact on land stability.

1.2 Limitations

This report is based on and limited to an assessment of the information undertaken here. PPL is not responsible for ground conditions not revealed during this review. This report is prepared for the CCP and their agents only and is not to be relied upon by any third parties without the express written permission of PPL.

1.3 Site Location and Description

The Site comprises an approximate 7.16ha (17.69 Acres) irregular shaped parcel of land located immediately southeast of the junction of Leeds Road (A653) and Heybeck Lane in Chidswell near Dewsbury, at approximate National Grid Reference (NGR) 427040mE, 424300mN. The extent of the Site is as delineated by the red line boundary presented on Enjoy Design Drawing No. 18,006-00-501 Rev. B, dated October 2019 and included in Appendix A.

The Site comprises a mixture of arable and pastoral agricultural land that is divided by hedgerows into several fields. Existing levels fall significantly towards the southeast/east by a maximum of approximately 16.0m. Ground elevations are approximately 106.5m and 94.5m above ordnance datum (AOD) at the northwestern and northeastern corners of the Site respectively falling to approximately 98.0m and 89.0m AOD within the southwestern and southeastern parts respectively.

An unnamed watercourse is present immediately south of the site flowing generally southeastwards. At a point along the southern boundary of the Site, the watercourse forms a distributary and flows across the southeastern spur of the Site, partially culverted throughout its initial course. The remainder of the watercourse is in open channel and leaves the Site following a course immediately southeast of the Site boundary and flowing northeastwards.

An overhead electricity transmission line passes close to the Site's southwestern corner continuing just beyond the southern boundary. Pylons are present just beyond the Site's southwestern and southeastern corners.

The northern and western Site boundaries are formed by the rear gardens of residential properties fronting Heybeck Lane and Leeds Road (A653) respectively. Agricultural land and Dum Wood are present to the east with further agricultural land to the south. A Site location plan is presented as Drawing No. H18119A-701, included in Appendix A.

1.4 Proposed Development

It is understood that the Site is proposed to be developed for a residential end use. The Proposed Development is within an allocation that is compliant with Kirklees Metropolitan

Borough Council (KMBC) Local Plan and specifically policy LP38 regarding minerals safeguarding. A proposed indicative masterplan by Enjoy Design, Drawing No. 18,006-00-101 Rev. C is included in Appendix A

1.5 Scope of Works

The purpose of this Coal Mining Risk Assessment is to:

- Present a desk-based review of available information on the coal mining issues which are relevant to the development Site;
- Assess the risks to the Proposed Development from coal mining legacy, including the cumulative impact of issues;
- Recommend any further works considered necessary to confirm the risk posed by coal mining legacy;
- Set out appropriate outline mitigation measures to address any coal mining legacy issues affecting the Site, including any necessary remedial works and/or demonstrate how coal mining issues influence 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 of unstable land.

2.0 Sources of Information Used to Inform this Report

2.1 Rationale

This Coal Mining Risk Assessment has been undertaken following the Coal Authority guidance document 'Risk Based Approach to Development Management, Guidance for Developers', Version 4, 2017.

2.2 Information Sources

The risk assessment of coal mining issues has been based on the following sources of information.

- Coal Authority (CA) Consultants Coal Mining Report, Ref. 51001886467001, 18 July 2018 (Appendix B);
- CA Shaft Plan and Data Sheets, Ref. 51001886467002, 19 July 2018 (Appendix B);
- CA Abandonment Plans, 'Top Haigh Moor Coal Seam Underground', Plan Ref. 10091 and 'Tufty Farm Extension Opencast', Plan Ref. NE771 (Appendix C);
- CA Interactive Map Viewer;
- BGS 1:10,000 Geological Map Solid and Drift Edition Sheet SE22SE;
- BGS 1:10,560 County Series 2nd Edition Geological Map Solid and Drift Edition Sheet 232SE Batley;
- BGS Technical Report WA/96/17, 'Geology of the Ossett Area', Lake RD, 1996;
- BGS GeoIndex Online Viewer;
- Geological Survey Memoir 'Geology of the Country Around Wakefield', Sheet 78, 1940;
- 'Sections of Strata of the Coal Measures of Yorkshire', Wilcockson W H 3rd Edition, 1950;
- Geological Survey Memoir 'The Geology of the Yorkshire Coalfield', Green A H, 1878;
- Ordnance Survey (OS) Historical Mapping, and;
- Online Local Authority Planning Submissions Portal.

3.0 Identification of Site Specific Coal Mining Risks

3.1 History of the Site and its Surroundings

A summary of the salient points relating to the mining legacy of the Site and its environs is presented below. This is based upon information provided by historical OS mapping as included within the accompanying Phase I Geoenvironmental Desk Study Report (Ref. H18127 Rev. 2) for a larger area and, including the Site.

Dates	On-Site	Off-Site
1854 - 1895	The Site is shown as open fields.	A sandstone quarry is present to the south.
1895 – 1931	The Babes in the Wood Colliery is present in the northwestern corner of the Site including associated buildings, infrastructure, a mineral railway and shafts. By 1908 the colliery is shown as disused. Remainder of the Site is open fields.	Dogloach Water Pit is present approximately 450m southeast. Chidswell and Low Laithes collieries are present to the southwest and southeast respectively. A sandstone quarry is present to the northwest.
1931 - 1949	No change.	The area of the Dogloach Water Pit to the southeast comprises a tank and a shaft with areas of deposited/infilled ground (spoil). Now labelled Dogloitch Water Pit (pumping), the shaft is likely to be part of the mine dewatering system associated with the on Site Babes in the Wood colliery underground workings. Soothill and Shaw Cross collieries are present to the southwest.
1949 - present	The Site is shown as open fields.	Residential properties are present along the western and northern boundaries. c. 1969 opencast workings are indicated approximately 1km to the southeast. c. 1972 the Haigh Hall opencast workings are indicated approximately 1.2km southeast. Opencast workings are indicated approximately 750m northwest.

3.2 Geology

Published geological information indicates the Site to be directly underlain by undifferentiated (mudstones, siltstones, sandstones and coal seams) solid strata of the Carboniferous Middle Coal Measures. The Horbury Rock sandstone unit directly underlies the northwestern part of the Site. The strata dip gently towards the north/northeast at approximately 1° to 3° . No superficial soils are recorded.

Nearby archive BGS intrusive information indicates competent rockhead at approximately 2.0m depth, typically overlain by residual clay or granular soils.

The Soothill Wood Fault is present approximately 200m northeast of the Site striking northwest to southeast and downthrowing to the southwest. No faults directly affect the Site itself.

The Beck Bottom Stone coal seam is conjectured to outcrop within the northwestern part of the Site together with the lower leaf of the Beck Bottom Stone coal seam, the latter conjectured as outcropping within the southern and southwestern parts of the Site. The underlying Gawber coal seam is conjectured as outcropping just south and southwest of the Site together with the next deepest 27 Yard coal seam, which is conjectured as outcropping further to the southeast. Although not indicated as outcropping within the same fault block, the next deepest Swallow Wood coal seam underlies the Site, in turn underlain by the Top Haigh Moor coal seam. It is considered that the Beck Bottom Stone coal (both leaves), Gawber, 27 Yard and Swallow Wood coal seams all potentially underlie the Site at shallow (<30m) depth. The conjectured outcrop of these coal seams is presented on Drawing No. H18119A-702, included in Appendix A.

Regional thicknesses for the Beck Bottom Stone coal (both leaves) are 0 to 1.3m, for the Gawber coal (often as 2 leaves) 0 to 0.9m, for the 27 Yard coal (often as 2 leaves) 0.2 to 0.9m, for the Swallow Wood coal (often as 2 leaves) 0.2 to 1.0m and the Top Haigh Moor coal seam 0.7 to 2.1m (including mudstone partings).

3.3 Coal Seams and Supporting Intrusive Information

Local information for these coal seams from various sources including abandonment plans of former opencast coal sites within the vicinity of the Site and collieries within the Site (included in Appendix C) indicate the Beck Bottom Stone coal (both leaves) to be present at thicknesses of between 0.43 to 1.3m, Gawber coal (1 or 2 leaves) 0.27 to 0.69m and 3.9 to 6.0m below, 27 Yard coal (both leaves) 0.43 to 0.66m and 8.3 to 14.0m below, Swallow Wood coal (both leaves) 0.4 to 0.66m and 3.7 to 7.0m below with the Top Haigh Moor coal seam (including mudstone partings) at 0.91 to 0.94m and 13.4m below.

The anticipated coal seam thicknesses and separation, together with their anticipated depths beneath the Site, is summarised in the table below.

Site Specific Coal Seam Information

Coal Seam	Average Thickness (Separation) (m)	Anticipated depth below Site (m) (assuming 2m of superficial cover)
Beck Bottom Stone (upper leaf)	0.12 to 0.18	0 to 8

Coal Seam	Average Thickness (Separation) (m)	Anticipated depth below Site (m) (assuming 2m of superficial cover)
Beck Bottom Stone (lower leaf)	0.53 to 0.64 (0.5)	0 to 12
Gawber (both leaves)	0.69 (3.9 to 6)	3 to 20
27 Yard (both leaves)	0.43 to 0.66 (8.3 to 14)	19 to 38
Swallow Wood (both leaves)	0.4 to 0.66 (3.7 to 7)	26 to 45
Top Haigh Moor (including mudstone partings)	0.91 to 0.94 (13.4)	34 to 47.5

3.4 Coal Authority Consultants Coal Mining Report

A Coal Authority Consultants Coal Mining Report, included as Appendix B, has been obtained for the Site and provides the following information:

- Recorded past underground coal mine workings in 3 coal seams at 34 to 216m beneath the Site, last worked in 1922;
- No spine roadways are recorded as being present at shallow depth beneath the Site;
- No probable former shallow coal mine workings are considered as present beneath the Site;
- No licensed or unlicensed opencast workings are recorded within the Site boundary, the closest is approximately 350m northwest;
- There are 2 no. former mine entries located within, or within close proximity of, the Site boundary. These are specifically in the northwestern corner of the Site;
- No remediated sites are recorded within 50m of the Site;
- No coal mining related subsidence notices or claims have been recorded within 50m of the Site since 1994;
- No mine gas emissions are recorded within 500m of the Site;
- No mine water treatment schemes are recorded within 500m of the Site;
- No present or future underground coal mining activities are recorded;
- No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

3.5 Coal Authority Interactive Map Viewer

The CA Interactive Map Viewer indicates an area within the northwestern part of the Site as a Development High Risk Area (DHRA) associated with the 2 former mine entries and a coal seam outcrop (Beck Bottom Stone coal) present within this part of the Site. In addition, a DHRA is indicated adjacent to the southeastern boundary of the Site, likely to be associated with recorded past shallow underground mine workings within the Top Haigh Moor coal seam.

Recorded past shallow coal mine workings are indicated adjacent to the southeastern boundary of the Site (within the Top Haigh Moor coal seam). No areas of probable former shallow coal mine workings are indicated as present on the Site itself.

The Site itself is the subject of an historic licenced area (including a larger adjacent area extending south and southeast) for the extraction of coal by opencast methods named the Windsor opencast Site. The Windsor opencast site was never commenced.

Both licensed and unlicensed former opencast workings are indicated as present within 500m of the Site to the northwest, east and southeast.

3.6 Underground Coal Mining (Recorded and Probable)

3.6.1 Deep Mining (>30m)

The Site lies within an area of extensive historic coal mining. The Babes in the Wood colliery formerly occupied the northwestern corner of the Site and the CA abandonment plan (Ref. 10091), included as Appendix C, indicates former underground workings within the Top Haigh Moor coal seam beneath the majority of the Site, excepting the far northeastern corner. In addition, information held by the CA indicates recorded historic mine workings within the deeper Flockton Thin coal and the underlying Middleton Main coal seams at depths of 156 and 216m respectively. All these mine workings are assessed as deep (>30m).

3.6.2 Shallow Ming (<30m)

Given the presence of several coal seams at shallow depth beneath the Site, it is likely that these may have been historically mined and, as such, probable shallow unrecorded mine workings are anticipated beneath the Site. Such areas are presented on Drawing No. H18119A-702, included in Appendix A. The Beck Bottom Stone coal seam is the shallowest seam beneath the Site, which outcrops within the Site. This coal seam is recorded as worked at outcrop approximately 185m north and further to the southeast and south of the Site and was proved as extensively historically worked within the Tufty Farm Extension opencast Site to the southeast. The underlying Gawber, 27 Yard and Swallow Wood coal seams may also potentially have been historically mined at shallow depth beneath the Site.

3.7 Surface or Opencast Coal Workings

The Site is unaffected by former opencast coal workings. However, as previously stated, the Site including a much larger area to the south and southeast was the subject of an historic licence granted for opencasting. This was to be the Windsor opencast site, but the scheme was never commenced.

The surrounding area has been intensely historically opencast for the numerous shallow coal seams present. Former opencast coal sites (OCCS) include the Solway OCCS approximately 375m northwest, the Tufty Farm Extension OCCS approximately 650m east/southeast and the Nook OCCS approximately 700m northeast.

3.8 Mine Entries

The CA record 2 former mine entries (shafts) as being present on, or within close proximity, of the Site. These relate to the former Babes in the Wood colliery within the northwestern corner of the Site and their positions as recorded by the CA are presented on Drawing No. H18119A-702, included in Appendix A.

Mine shaft Ref. 426424-001 is located on the Site itself and within the extreme northwestern corner at NGR 426988mE, 424387mN. The shaft is indicated on the CA abandonment plan Ref. 10091 and was sunk to exploit the underlying Top Haigh Moor coal seam. The depth of the shaft is 47.5m and it has been infilled to an unknown specification. The diameter of the shaft is not recorded. Information from the CA interactive map viewer suggests the position of the shaft has a departure or tolerance of 5m, as plotted from historical sources of information.

Mine shaft Ref. 427424-001 is located just outside of the Site itself and adjacent to the Site boundary within the northwestern corner at NGR 427024mE, 424392mN. The shaft is also indicated on the CA abandonment plan Ref. 10091. The depth of the shaft is 47.5m and it has been infilled to an unknown specification. The shaft is understood to be present within the rear garden of property no. 13 Heybeck Lane and has been physically located comprising an approximate 6ft (1.8m) diameter infilled brick lined structure. Information from the CA interactive map viewer suggests the position of the shaft has a departure or tolerance of 5m, as plotted from historical sources of information.

The Dogloach pit is present approximately 400m to the southeast and serves the same underground workings as the Babes in the Woods colliery within the Top Haigh Moor coal seam.

Numerous other CA recorded mine entries are present north, east and south of the Site. Given the presence of outcropping and shallow coal seams beneath the Site, the presence of unrecorded former mine entries (shafts and adits) cannot be completely discounted.

4.0 Mining Risk Assessment

Taking cognisance of the above findings, there are several risks presented to the redevelopment of the Site by coal mining legacies, which are discussed below.

4.1 Shallow Mine Workings

CIRIA Guidance C758 'Construction Over Abandoned Mine Workings' (2019) states that the maximum height of collapse is generally assessed as being 10 times the worked coal seam thickness. It is normal engineering practice to assume that there is a risk of surface instability if there is less than 10 times worked coal seam thickness competent cover above any worked coal seam. It should be noted that competent cover means rock and (superficial deposits such as glacial till or residual soils do not reasonably contribute to this cover).

The Beck Bottom Stone coal, the Gawber, the 27 Yard and the Swallow Wood coal seams are all anticipated as being present at depths of less than 30m beneath all or part of the Site. Unrecorded historic mine workings within these coal seams are considered as probable. Taking into account the anticipated depth to competent bedrock of approximately 2m, it is considered that there is insufficient cover of competent rock overlying the Beck Bottom Stone and Gawber coal seams to maintain surface stability in the event of these seams having been mined. With regard to the underlying 27 Yard and Swallow Wood coal seams, there is potentially adequate thickness of competent rock cover, however, this would not be the case should exploitation of the overlying Gawber and Beck Bottom Stone coals have occurred.

Underground mineworkings are recorded within the deeper Top Haigh Moor coal seam beneath the Site at depths greater than 34m. The thickness of competent rock cover overlying these workings is considered as being sufficient to maintain surface stability. However, again this would be dependent upon the presence of any mineworkings within the overlying coal seams.

The table below summarises the anticipated competent rock cover above these coal seams and an assessment of likely surface stability.

Anticipated Surface Stability with Respect to Coal Seams beneath the Site

Coal Seam	Max. Recorded Thickness (m)	Anticipated depth below Site (m) (assuming 2m of superficial cover)	Ratio of Competent Cover	Potential Surface Instability (if mine workings are present)
Beck Bottom Stone (upper leaf)	0.18	0 to 8	0 to 1:33	Yes
Beck Bottom Stone (lower leaf)	0.64	0 to 12	0 to 1:16	Yes
Gawber (both leaves)	0.69	3 to 20	1:1 to 1:26	Yes
27 Yard (both leaves)	0.66	19 to 38	1:26 to 1:54	No

Coal Seam	Max. Recorded Thickness (m)	Anticipated depth below Site (m) (assuming 2m of superficial cover)	Ratio of Competent Cover	Potential Surface Instability (if mine workings are present)
Swallow Wood both leaves)	0.66	26 to 45	1:36 to 1:65	No
Top Haigh Moor (including mudstone partings)	0.94	34 to 47.5	1:34 to 1:48	No

An indicative zonation of the Site showing areas of potential surface instability that may require ground consolidation by grouting (subject to confirmation of the presence of past mineworkings by intrusive investigation) is presented on Drawing No. H18119A-702, included in Appendix A.

4.2 Mine Entries

There are 2 CA recorded former mine entries (shafts) on or adjacent to the Site boundary and additional unrecorded mine entries may be present within the Site itself.

Untreated former mine entries may potentially present a risk to development by way of surface instability and collapse. In addition, there is a zone of influence associated with all mine entries within which there is a risk to surface stability. This applies to such features within or adjacent to the Site. The position of CA recorded former mine shafts and their anticipated zones of influence are presented on Drawing No. H18119A-702, included in Appendix A.

4.3 Mine Gases

The presence of probable former shallow mine workings together with recorded deeper mine workings beneath the Site presents a potential risk from the upwards migration of associated mine gases within these voids. Former mine entries may also provide a preferential pathway for movement of mine gases. These mine gases present a potential human health risk to end users of the Site within the built environment.

4.4 Risk Assessment

The significance of the potential linkages identified above can be assessed using the following criteria:

- **Low risk** – not likely to cause significant harm to development or human health. Remedial measures are not likely to be required;
- **Moderate risk** – it is possible that significant harm to development or human health could occur depending on site specific circumstances. Remedial measures may be required as part of the development to mitigate potential risks;
- **High risk** – it is likely that significant harm to development or human health will occur unless appropriate remedial measures are incorporated into the development.

The table below summarises the potential risks to development associated with the coal mining legacy of the Site:

Risk Assessment Summary

Coal Mining Issue	Risk		Risk Assessment and Rating
	Yes	No	
Underground Coal Mining (recorded at shallow depths)	-	No	No underground mine workings are recorded at shallow depth (<30m) beneath the Site. Deep (>30m) mine workings are present within the Top Haigh Moor, Flockton Thin and Middleton Main coal seams beneath the Site.
Underground Coal Mining (probable at shallow depths)	Yes	-	The northwestern part of the Site lies within a DHRA with probable unrecorded mine workings at shallow depth considered as present beneath the entire Site associated with the Beck Bottom Stone, Gawber, 27 Yard and Swallow Wood coal seams. Nearby historic mining of the Beck Bottom Stone coal seam at outcrop has occurred. The risk of surface instability from any potential mine workings within these seams is considered as – High .
Mine Entries (shafts and adits)	Yes	-	2 no. former mine shafts are recorded within or adjacent to the Site. Reliable information on the treatment of these shafts is not available. The presence of other unrecorded mine entries on the Site cannot be completely discounted. The risk of mine entries affecting the Proposed Development is considered as – High .
Coal Mining Geology (fissures)	-	No	No faults, fissures or breaklines are recorded beneath the Site.
Record of past mine gas emissions	Yes	-	No mine gas emissions are recorded on or near the Site. However, probable shallow and recorded deeper mine workings beneath the Site may present a source of hazardous mine gas. The risk of mine gas emissions affecting the Proposed Development is considered as – Moderate to High .
Recorded coal mining surface hazards	-	No	No remedial works, damage notices or claims are recorded.
Surface mining (opencast coal workings and quarrying)	-	No	No opencast coal workings are recorded within 250m of the Site. No former quarries are recorded within 250m of the Site.

5.0 Mitigation Strategy Proposed

The risk assessment has identified the Proposed Development to be at a **High** risk from both probable unrecorded mine workings at shallow depth and recorded and unrecorded former mine entries together with a **Moderate to High** risk from hazardous mine gases arising from probable shallow and recorded deeper mine workings beneath the Site.

5.1 Probable Shallow Mine Workings

The CA indicates the northwestern part of the Site to lie within a Development High Risk Area and the entire Site is assessed as being underlain by probable historic shallow mine workings associate with the Beck Bottom Stone, Gawber, 27 Yard and Swallow Wood coal seams. In addition, the Beck Bottom Stone coal seam outcrops within the Site. The risk is assessed as **High**.

The surface stability of the Site cannot be guaranteed in the absence of intrusive investigation, which would be required in order to fully assess these potential risks across the Site. It is recommended that a series of rotary boreholes are put down to a maximum of 30m depth with all such works undertaken with an appropriate CA licence and permissions. Such intrusive works would confirm the nature and depth of the underlying shallow coal seams. In the event of a risk to surface stability being proved, subsequent treatment of shallow mine workings by drill and grout would be necessary to achieve ground consolidation prior to development and foundations may need to be reinforced. Any design of such mitigation measures for the presence of shallow mine workings would need to be undertaken in consultation with the Coal Authority.

5.2 Mine Entries

The recorded presence of 2 no. former mine entries (shafts) on and adjacent to the Site together with the potential for other unrecorded mine entries to be present on the Site itself present a potential risk to development by way of surface instability, potential collapse and movement of mine gases. The risk is assessed as **High**.

A zone of influence is associated with former mine entries (either present on the Site or adjacent to the Site) whereby any development within the zone would be affected by potential surface instability. The nature of any Proposed Development on the Site requires assessing in terms of the potential risk presented by any such features to that specific development layout, if such features are confirmed as being present.

The surface stability of the Site cannot be guaranteed in the absence of intrusive investigation, which would be required in order to fully assess these potential risks presented by such features. It is recommended that a series of trenches together with a surface scrape are undertaken to adequate depth to prove natural soils in an attempt to determine the exact location and condition of the recorded shafts within the northwestern area of the Site. All such works will need to be undertaken with an appropriate CA licence and permissions. If mine entries are identified on the Site, or adjacent to the Site, then these may require treatment by drill and grout and subsequent capping or partial excavation and incorporation of a geotextile reinforcement spanning their extent and potential zone of influence, as appropriate. Although possible in principle, the construction over treated and capped mine shafts is not encouraged

and the Proposed Development layout may require changing to accommodate the presence of such features. Any design of such mitigation measures with respect to mine entries would need to be undertaken in consultation with the Coal Authority.

During initial intrusive site investigation and subsequent Site enabling works and a Site strip, there may still be the potential for encountering unrecorded mine entries. As such, the exposed subsoils should be checked for the presence of disturbed and potentially unstable ground associated with backfilling of such features.

5.3 Mine Gases

Probable shallow and recorded deep mine workings beneath the Site together with recorded and unrecorded former mine entries within the Site give rise to the potential of mine gas emissions migrating to the surface and posing a human health risk to Site end users and proposed properties. The risk is assessed as **Moderate to High**.

In order to quantify this risk, it is recommended that borehole monitoring wells are installed during a ground investigation and a ground gas monitoring programme is undertaken to confirm the ground gas regime and aid the design of appropriate mitigation measures, if required.

In all scenarios, an appropriately designed mitigation strategy and subsequent recommendation of mitigation measures will effectively address the identified risks and allow the safe construction of the Proposed Development.

6.0 Conclusions

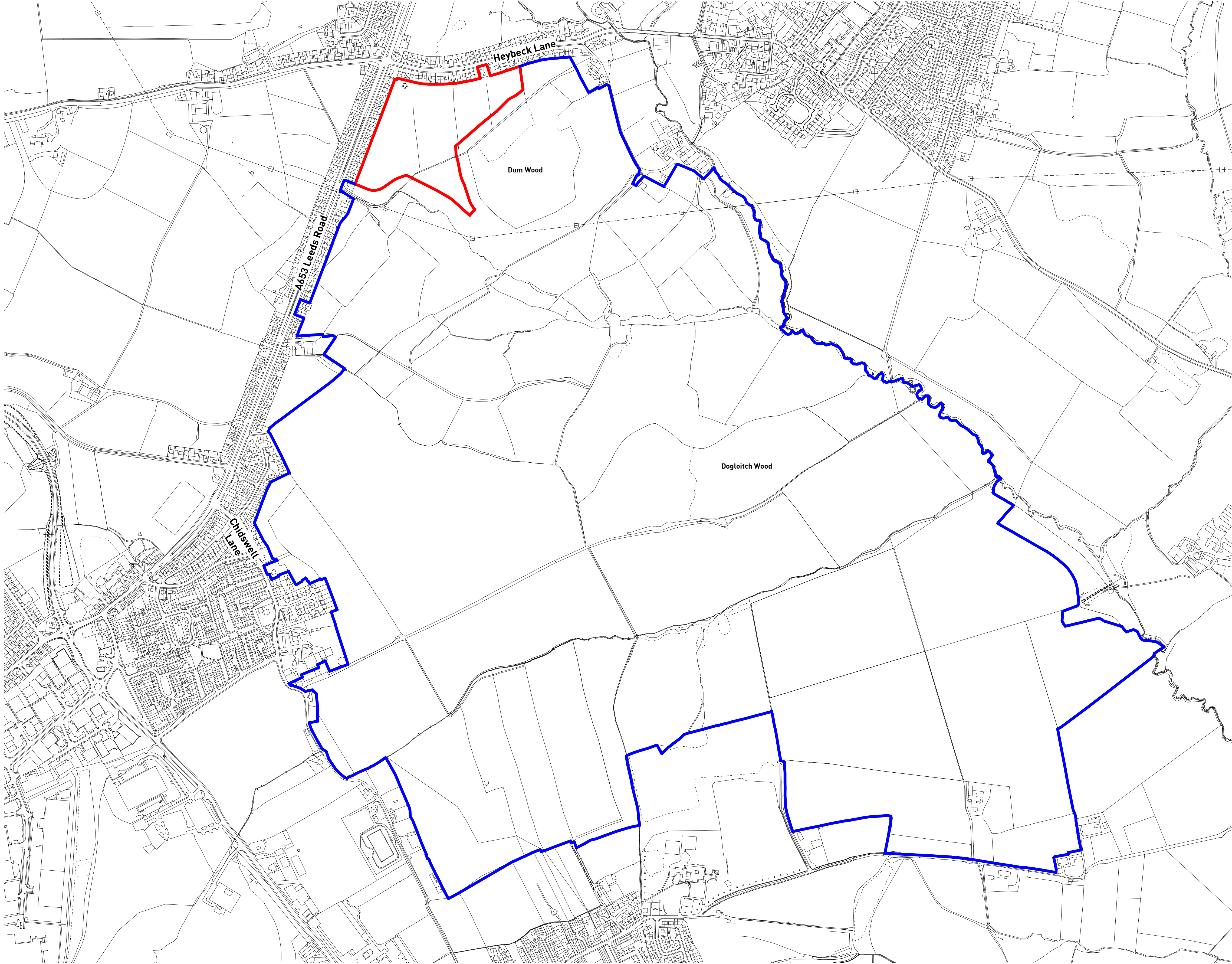
A Coal Mining Risk Assessment has been undertaken on behalf of the CC Projects to inform the proposed residential development of the Site located south of Heybeck Lane, Chidswell near Dewsbury, West Yorkshire. The Proposed Development complies with KMBC Local plan policy LP38. This assessment has been undertaken in accordance with Coal Authority guidance.

The risk assessment has identified coal mining legacy related issues that pose a risk to the Proposed Development including probable unrecorded former shallow coal mine workings, recorded and unrecorded past mine entries and associated mine gases.

It is considered that archive exploratory records undertaken during investigations for the proposed Windsor OCCS are subject to a comprehensive assessment. Additional intrusive ground investigation is necessary to prove the extent of unrecorded shallow mine workings beneath the Site, to determine the location of former mine entries within the Site and to monitor for potential mine gases.

Subject to the findings of the intrusive ground investigation, the Proposed Development may require a specific mitigation strategy and the design of mitigation measures. Any necessary mitigation measures are likely to comprise the stabilisation of shallow mine workings using drilling and grouting techniques, treatment and capping of former mine entries and the incorporation of gas protection measures within any new development.

Appendix A – Figures





- Legend
- Indicative greenspace
- Existing ancient woodland, trees and hedgerows
- Ancient woodland buffer zone
- Indicative tree planting
- Indicative residential gardens
- Existing TPO to be removed
- Proposed application boundary
- Land under applicants ownership
- Existing Right of Way route
- Indicative cycle route
- Indicative estate road

Total indicative plots = 181

Heybeck Lane - Plot Layout

1 : 750

N

1 : 750

0153045m

Contractor must verify all dimensions on site before commencing any work or shop drawings. If this drawing exceeds the quantities taken in any way the Architects are to be informed before the work is initiated. Only figured dimensions to be taken from this drawing. Do not scale off this drawing. Drawings based on Ordnance Survey and / or existing record drawings - design and drawing content subject to Site Survey, Structural Survey, Site Investigations, Planning and Statutory Requirements and Approvals. Authorised reproduction from Ordnance Survey Map with permission of the Controller of Her Majesty's Stationery Office. Crown Copyright reserved. Enjoy Design Ltd.

Notes.	
00 Series General Arrangement Notes	
1. Any areas indicated on the plans are approximate. They relate to the likely areas of the building at the current state of the design and are calculated using the stated eg(NIA) method from the Code of Measuring Practice 5th Edition RICS/SVA. Any decision to be made on the basis of these predictions, whether as to project viability, pre-letting, lease agreements or the like, should include due allowance for design development and building tolerances. Floor areas are subject to Planning, Building Control and other statutory approvals.	3. Refer to Enjoy NBS for full outline performance specification of Architectural Elements.
2. Any structural, services or fit out detail shown is for coordination only, refer to relevant Consultants/Clients information for details.	4. THE CONTENT OF THIS DRAWING IS FOR DESIGN INTENT AND REQUIRES FURTHER DESIGN DEVELOPMENT AND COORDINATION WITH ALL RELEVANT CONSULTANTS, SUB-CONTRACTORS, SPECIALIST DESIGNERS AND STATUTORY AUTHORITIES.

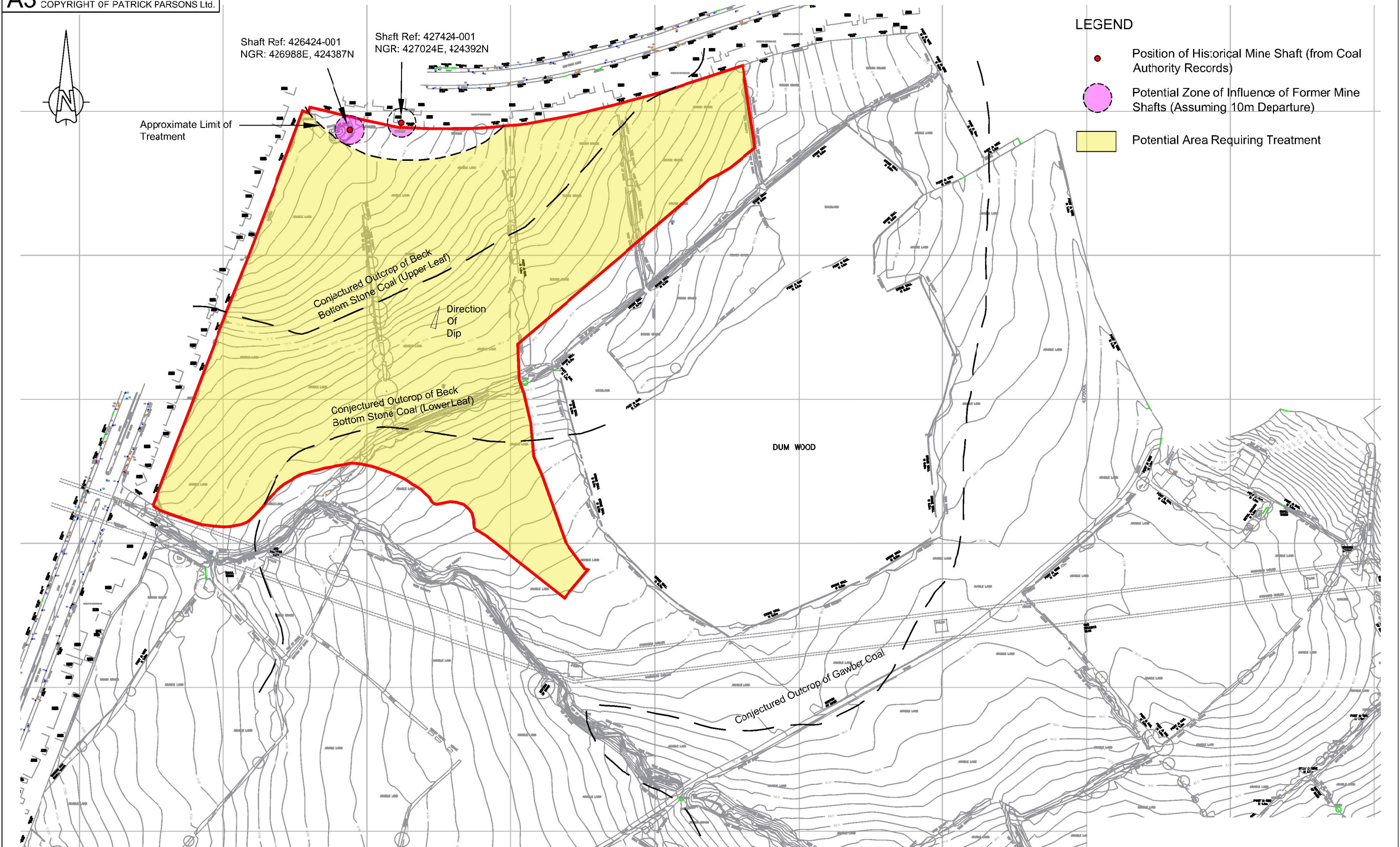
					PLANNING	The Old Brewery High Court Leeds LS2 7ES Tel: 0113 242 3622 www.enjoy-design.co.uk	Client:		Job No:	
							The Church Commissioners		18,006	
							Project:			
							Chidswell Masterplan			
							Title:			
							Heybeck Lane, Indicative Site Layout			
							Date:			
							Scale:		Checked by:	
C	Legend updated;	DH	01/11/19	RG						
B	Red line boundary updated;	DH	09/10/19	RG						
A	General design update in line with latest proposals;	DH	04/09/19	RG						
Rev.	Des.	By	Date	Ch.	Status:					

ENJOY
DESIGN

ENJOY
DESIGN



 PATRICK PARSONS T. +44 (0)1484 516 977 E. info@patrickparsons.co.uk W. www.patrickparsons.co.uk	Client CC PROJECTS	Drawing SITE LOCATION PLAN	Scales NTS	Drawn ACV NOV 2018	Checked JR
	Project LAND AT CHIDSWELL (SITE A)		Drawing No. H18119A - 701	Rev. P1	



**Appendix B –
Coal Authority Consultants Coal Mining Report and Shaft Data
Sheets**

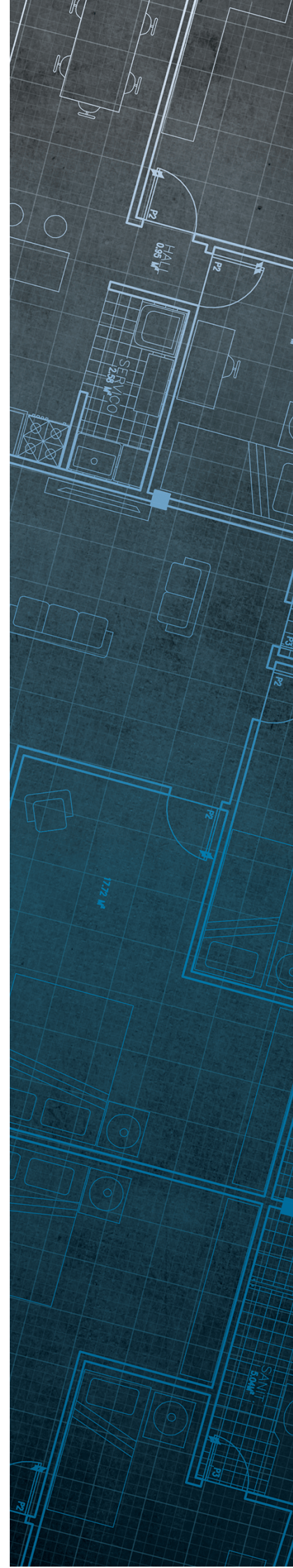


The Coal
Authority

Consultants Coal Mining Report

Heybeck Lane
Woodkirk
Dewsbury
Kirklees

Date of enquiry:	18 July 2018
Date enquiry received:	18 July 2018
Issue date:	18 July 2018
Our reference:	51001886467001
Your reference:	H18119/TD/3240a



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

Patrick Parsons Limited

Enquiry address

Heybeck Lane
Woodkirk
Dewsbury
Kirklees

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com



 @coalauthority



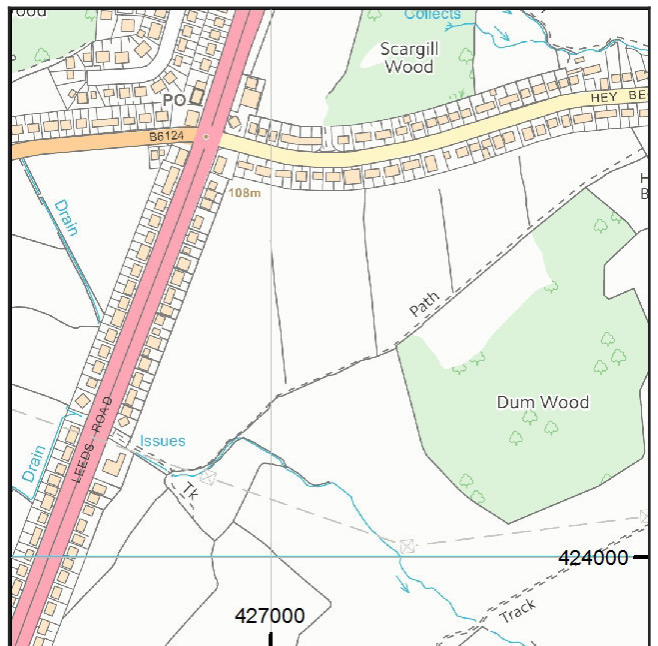
[in/company/the-coal-authority](https://www.linkedin.com/company/the-coal-authority)



f /thecoalauthority



 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
UNAMED	TOP HAIGH MOOR	Coal	6YPO	34	Beneath Property	0.9	North-East	98	1873
unnamed	TOP HAIGH MOOR	Coal	6YPP	34	Beneath Property	0.9	North-East	98	1863
unnamed	FLOCKTON THIN	Coal	6HYT	152	South	1.3	North-East	43	1925
unnamed	FLOCKTON THIN	Coal	6YPT	156	Beneath Property	0.8	North-East	38	1922
unnamed	LOW FENTON	Coal	6YPV	172	South	0.6	East	75	1924
unnamed	LOW FENTON	Coal	6HZ0	173	South	0.6	East	75	1924
unnamed	MIDDLETON MAIN	Coal	6YPZ	176	North	0.7	West	107	1941
unnamed	MIDDLETON MAIN	Coal	6HZ2	210	South	1.1	East	60	1905
UNAMED	MIDDLETON MAIN	Coal	6YQ2	216	Beneath Property	0.3	South-East	135	1906
unnamed	TOP BEESTON	Coal	6HZ7	290	South-East	0.6	South-West	74	1943

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	426424-001	426988 424387	has been filled to an unknown specification	Coal	
Shaft	427424-001	427024 424392	according to the owner of 13 Heybeck Lane this 6 ft diameter brick lined shaft was located by them and found to be filled	Coal	

Abandoned mine plan catalogue numbers

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

16447	14165	M95
M29	NE617	8529
M106	M107	NE641

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
HARLEY	Coal	Yes	Within	N/A	42
HARLEY	Coal	Yes	Within	N/A	43
HARLEY	Coal	Yes	Within	N/A	104

Geological faults, fissures and breaklines

No faults, fissures or breaklines 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

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

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

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

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

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

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

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

Payments to owners of former copyhold land

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

Section 4 – Further information

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

Development advice

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

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

Section 5 – Data definitions

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

Past underground coal mining

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

Probable unrecorded shallow workings

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

Spine roadways at shallow depth

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

Mine entries

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

Abandoned mine plan catalogue numbers

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

Outcrops

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

Geological faults, fissures and breaklines

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

Opencast mines

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

Coal Authority managed tips

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

Site investigations

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

Remediated sites

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

Coal mining subsidence

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

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

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

Mine gas

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

Mine water treatment schemes

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

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

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

Future underground mining

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

Coal mining licensing

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

Court orders

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

Section 46 notices

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

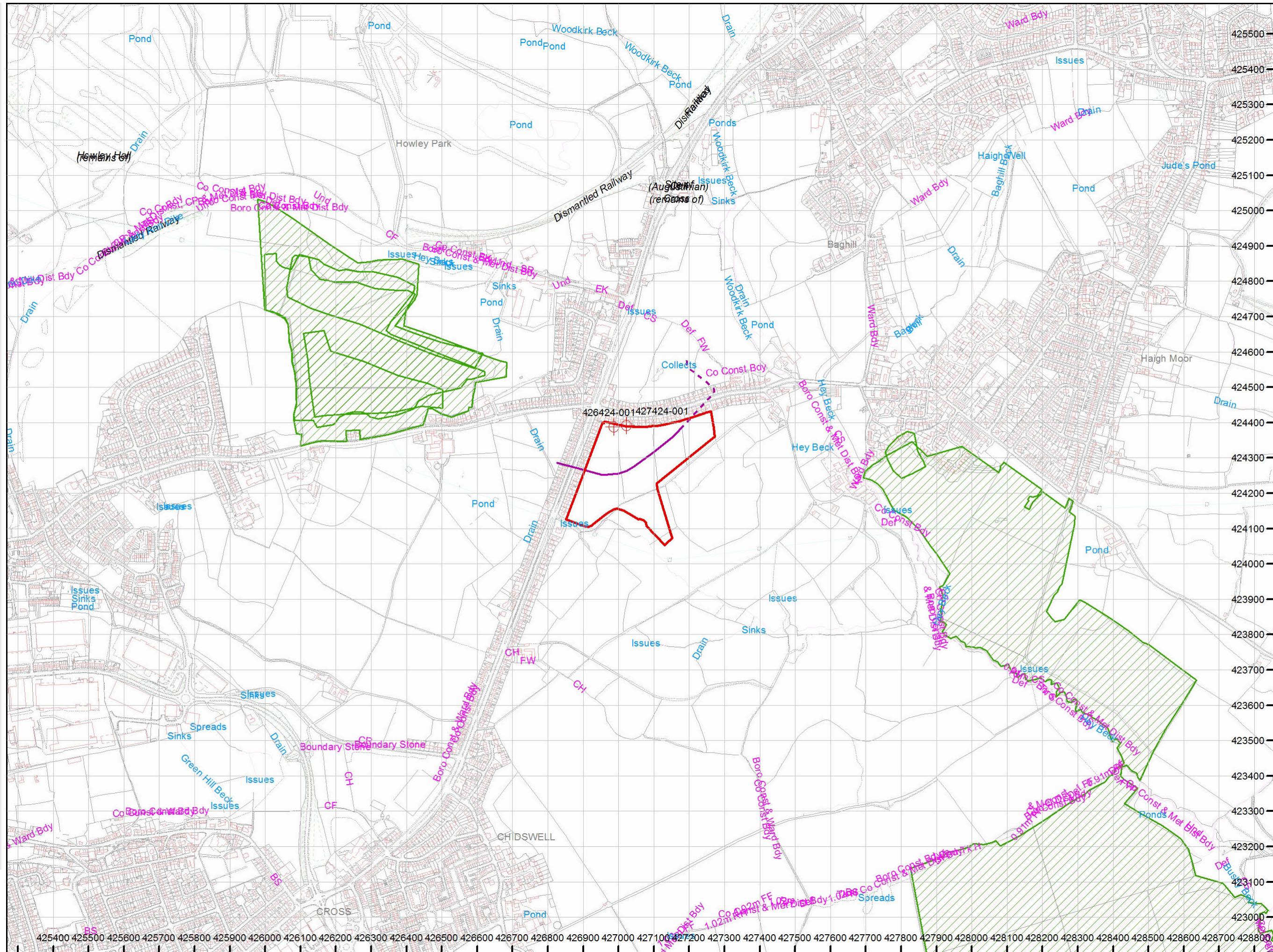
Withdrawal of support notices

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

Payment to owners of former copyhold land

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

Approximate position of the enquiry boundary shown	
Disused mine shaft	
Outcrop (Proven)	
Outcrop (Conjectured)	
Unlicensed opencast site	



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

Issued by:

The Coal Authority, Property Search Services, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG
Website: www.groundstability.com Phone: 0345 762 6848

**PATRICK PARSONS LIMITED
WATERLOO HOUSE
THORNTON STREET
NEWCASTLE UPON TYNE
NE1 4AP**

Our reference:	51001886467002
Your reference:	H18119/TD/3240b
Date of your enquiry:	18 July 2018
Date we received your enquiry:	18 July 2018
Date of issue:	19 July 2018

This report is for the property described in the address below and the attached plan.

Shaft Plan and Data Sheets

HEYBECK LANE, WOODKIRK, DEWSBURY, KIRKLEES

I refer to the enquiry dated 18 July 2018, received 18 July 2018, in connection with the above.

As requested I enclose the mine entry data sheet(s) held for the mine entry/entries referred to.

Mine Entry Data

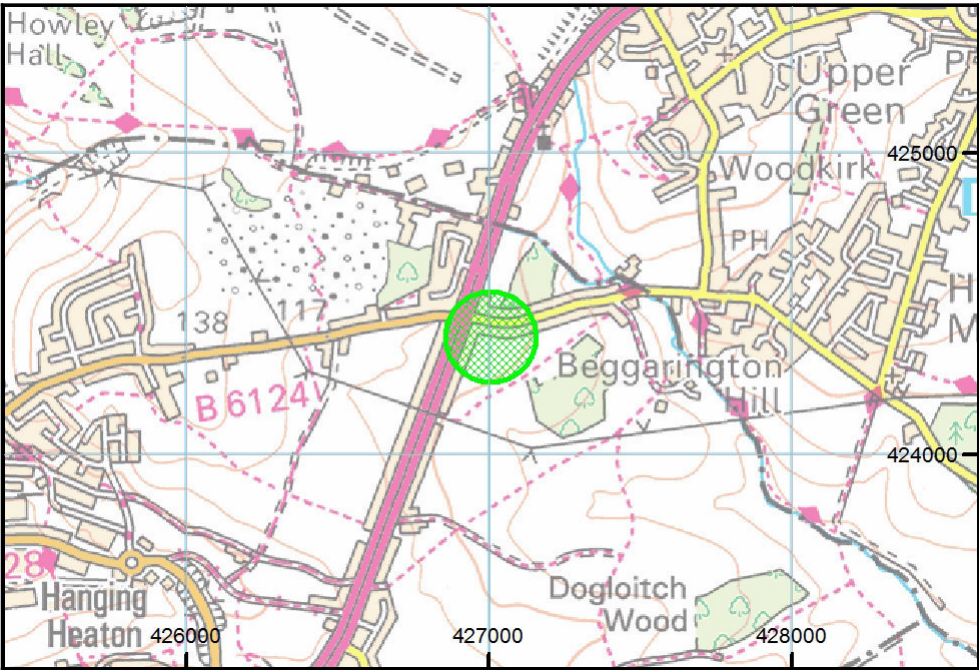
Shaft/adit:	Shaft
Reference:	427424-001
Source:	1st Ed. 1/2500 O.S. Yorkshire 232/12 Ab plan 10091
Colliery name:	Unknown
Entry name:	Unknown
Date abandoned:	Unknown
Depth of superficial deposits (m):	Unknown
Depth of shaft (m):	47.5
Diameter of shaft (m):	Unknown
Probable adit azimuth:	Not Applicable
Treatment details:	according to the owner of 13 Heybeck Lane this 6 ft diameter brick lined shaft was located by them and found to be filled
Conveyance:	Not Applicable
Easting:	427024
Northing:	424392
Other information:	None

Mine Entry Data (continued)

Shaft/adit:	Shaft
Reference:	426424-001
Source:	1st Ed. 1/2500 O.S. 1st and 2nd Ed. Geological. Ab plans 10091 M95
Colliery name:	Unknown
Entry name:	Unknown
Date abandoned:	Unknown
Depth of superficial deposits (m):	Unknown
Depth of shaft (m):	47.5
Diameter of shaft (m):	Unknown
Probable adit azimuth:	Not Applicable
Treatment details:	has been filled to an unknown specification
Conveyance:	Not Applicable
Easting:	426988
Northing:	424387
Other information:	None

Location map

Approximate position of enquiry



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This plan shows the approximate location of the disused mine entry / entries referred to in the attached mining report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan.

Property owners have the benefit of statutory protection (under the Coal Mining Subsidence Act 1991). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A leaflet setting out the rights and obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by visiting www.groundstability.com.

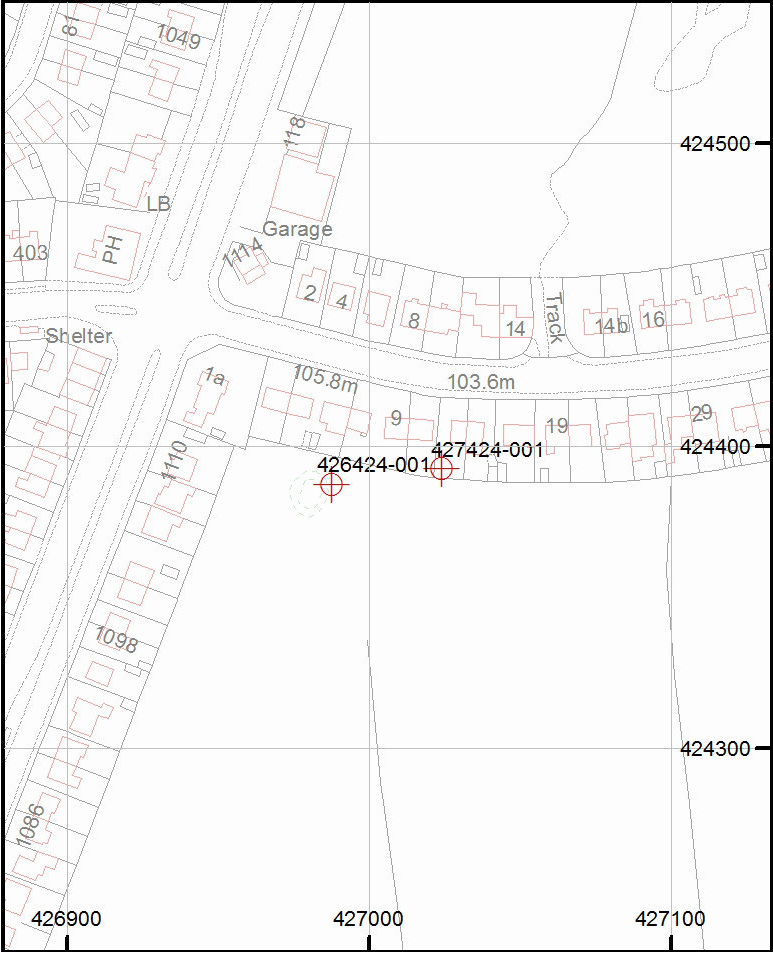
If you wish to discuss the relevance of any of the information contained in this report, you should seek the advice of a qualified mining engineer or surveyor. If you or your advisor wish to examine the source plans from which the information has been taken, these are available to view, free of charge, at our Head Office in Mansfield. To book an appointment please ring 01623 637225. Should you or your advisor wish to carry out a physical investigation that may enter, disturb or interfere with any disused mine entry, prior permission of the owner must be sought. For coal mine entries, the owner will normally be the Coal Authority.

The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries).

Our emergency telephone number is 01623 646333.

Key

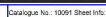
Disused Adit or Mineshaft



Appendix C – Coal Authority Mine Abandonment Plans

Scale - 2 Chains to One Inch

Signed - H. E. Newbold.
Surgeon.
N of Certificate 1256

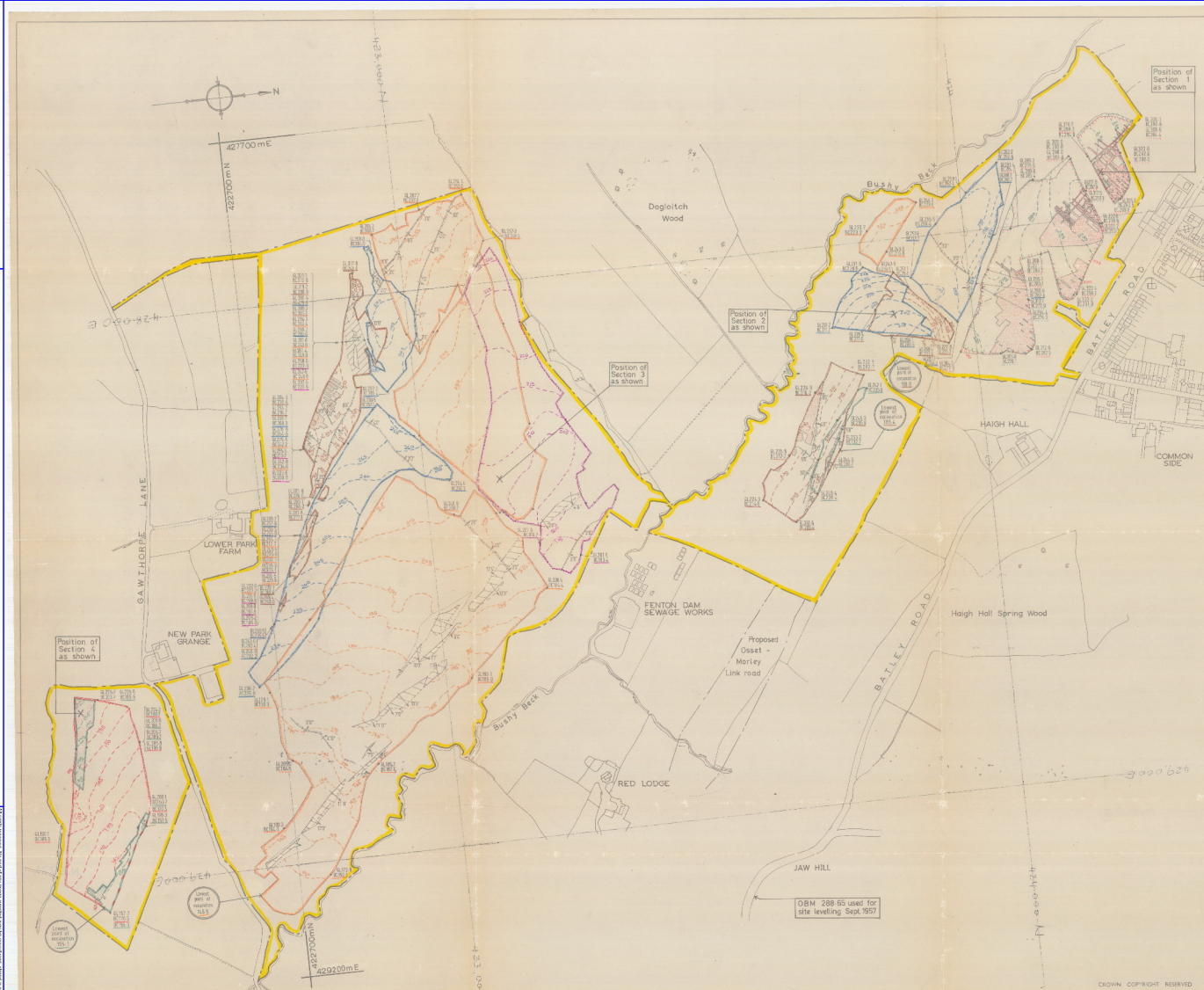


Date: 25/07/2018

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Scale: 2 CHAINS TO 1 INCH (1 TO 1584)



LEGEND

LOCATION
1:2500 SCALE ORDINANCE SHEET REFERENCE SE 2723, 2822/3, 2822/3A, 2722A, 282A, 3026, 3126.
DATE OF ORDINANCE SHEET 1955 : 1956 : 1952
NAME OF SITE TUFTY FARM EXTENSION
LOCATION OF SITE 5 miles South of Leeds
COUNTY Yorkshire
PARISH Morley

QUANTITIES WORKED
TOTAL AREA ACQUIRED 247.72 ACRES SHOWN
TOTAL AREA WORKED BY LIEBING BATTERS 127.52 ACRES
TOTAL COAL RECOVERED, NETT ABOVE 355,083 TONS

VERTICAL SECTIONS
VERTICAL SCALE 4 in to 1 inch

GENERAL DESCRIPTION
TYPE OF LAND Agricultural
NATURE OF OVERBURDEN Clay, sandstone, shale and ironstone nodules.
NATURE OF COAL Gas-thrifle Rider, Gas-thrifle, Gas-bar, 27' base-top leaf, Top-Haigh Moor
SPECIAL REMARKS Good Quality Coal, Back Bottom Stone, 27' base-top leaf, Swallow Wood, Low Haigh Moor, Medium Quality Coal.

OPERATIONAL DATES
ACQUIRED 26-6-07
COMMENCEMENT OF COALING 10-6-70
COMPLETION OF COALING
COMPLETION OF RESOLING
HANKED OVER TO MINISTRY OF AGRICULTURE, F & F
FINALLY RESOLVED

COPY SENT TO DATE INITIALS

Mining Records (2)	
RESM (1)	
Geological Survey (1)	

VERTICAL SECTIONS
SECTION 1
SECTION 2
SECTION 3
SECTION 4

Head Office

Newcastle upon Tyne

UK Locations

Birmingham

Chester

Glasgow

Guildford

Huddersfield

London

Manchester

International Locations

Dubai

Sydney

Telephone

+44(0)191 261 9000

Email

info@patrickparsons.co.uk

Website

patrickparsons.co.uk