



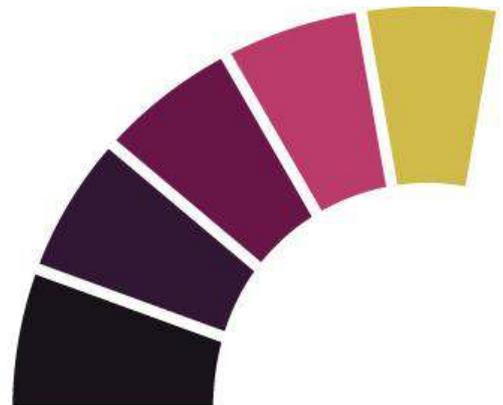
## **COAL MINING RISK ASSESSMENT AND COAL RECOVERY REPORT**

### **Residential Development (Remainder of Site) Barnsley West**

|                  |  |
|------------------|--|
| <b>Reference</b> | <b>4848-JPG-Z1-XX-RP-G-1101-S2-P02</b> |
| <b>Date</b>      | <b>August 2019</b>                     |
| <b>Author</b>    | <b>JBW</b>                             |

5 John Charles Way  
LEEDS  
LS12 6QA

Tel: 0113 263 1155  
admin@jpg.group  
www.jpg.group





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JPG (Leeds) Ltd. Barnsley West. Coal Mining Risk Assessment - Proposed Residential Zone. Dwg. 4848-JPG-SW-XX-DR-G-1308-S2-P02. Dated August 2019. Last revision dated February 2021 (Rev. P02).

Bond Bryan. Barnsley West Masterplan. Proposed Site Plan. Drawing No: BWM-BBA-ZZ-XX-DR-A-1004-S2-P05, dated May 2021 for Strata Sterling Barnsley West Limited.

### Appendix B Coal Authority Mining Reports

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## CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

Strata Sterling Barnsley West Limited  
Quay Point  
Lakeside  
DONCASTER  
DN4 5PL

This report has been prepared for the sole use and reliance of the above-named party. This report shall not be relied upon or transferred to any other parties without the express written authorisation of JPG (Leeds) Limited. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

## DOCUMENT HISTORY

| Version | Purpose/Description                            | Date        |
|---------|--|-------------|
| P01     | Final – For issue to Client                    | August 2019 |
| P02     | Final – Updated to include the latest drawings | May 2021    |



## 1.0 APPLICATION

Strata Sterling Barnsley West Limited is to submit a planning application for the proposed residential development of land to the south of Barugh Green Road (the 'site'), which forms part of the overall Barnsley West development area.

JPG (Leeds) Ltd has been commissioned to prepare a Coal Mining Risk Assessment Report for the proposed residential development site, in order to provide the Local Planning Authority with information on coal mining and an assessment of its impact on land stability.

### 1.1 Site Location and Description

The site is located approximately 3km to the west of Barnsley town centre. The approximate centre of the site is located at NGR 431600, 407500.

The site is located to the east of the M1 motorway, to the south of the A635 Barugh Green Road and to the north of the A628 Dodworth Road. A site location plan is presented as Figure 1 in Appendix A.

The site is irregular in shape and occupies an area of approximately 70 hectares. Ground levels are approximately 138m AOD in the south-west, generally falling to approximately 80m AOD in the north-east. The site generally consists of sloping arable and grazing land, which is divided into fields by hedgerows, fences and small watercourses.

A steep valley with a drainage ditch at its base extends from the south-eastern boundary and trends north; the drainage ditch is culverted where it passes below Hermit Lane. A second steep sided valley is present further to the west and trends from the southern boundary to the north. Where this valley is present to the north of Hermit Lane, it is heavily wooded and contains a stream with a pond.

The northern site boundary is formed by Barugh Green Road and, in part, adjacent residential dwellings and a nursery. The Metro Trading Centre and Claycliffe Business Park are located to the north of Barugh Green Road. Redbrook Farm is located on the north-eastern boundary. Agricultural buildings, including a large dilapidated barn, several outbuildings and a large silo, are located within the site boundary. Redbrook Plantation and residential properties are present to the north east of the site. In the south east lies Hermit Lane, aligned east to west, and Hermit House Farm. The farm complex includes two residential dwellings and several agricultural buildings, typically constructed from concrete blocks, timber and roofing of possible asbestos cement sheeting. Land to the south of Hermit Lane consists of sloping arable and grazing land, which is divided into fields by hedgerows, fences and small watercourses. The residential areas of Higham and Barugh Green are located to the west and northwest, respectively.



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## 1.2 Description and Layout of Proposed Development

It is proposed to develop the site as predominantly residential dwellings with a new school, public open space, attenuation ponds and associated highways.

A copy of the proposed development plan is presented in Appendix A and referenced below:

- Bond Bryan. Barnsley West Masterplan. Proposed Site Plan. Drawing No: BWM-BBA-ZZ-XX-DR-A-1004-S2-P05, dated May 2021 for Strata Sterling Barnsley West Limited.

## 1.3 Scope of the Coal Mining Risk Assessment

The purpose of the Coal Mining Risk Assessment Report is to:

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



## 2.0 SOURCES OF INFORMATION USED TO INFORM THIS REPORT

Sources of information upon which this risk assessment of coal mining is based are detailed below.

- The Coal Authority. Consultants Coal Mining Report. Barnsley West, South Yorkshire. Ref 51001983537002. Date of issue 28 November 2018. (See Appendix B).
- The Coal Authority. CON29M Non-Residential Mining Report. Barnsley West, South Yorkshire. Ref 51001983537001. Date of issue 28 November 2018. (See Appendix B).
- Eastwood & Partners. Geotechnical and Geo-environmental Site Appraisal. Barnsley West for Strata. Ref. 36284.001. Dated October 2013.
- The Coal Authority. Abandonment Plans (Ref's NE498, NE375, NE415, 9196, NE584).
- British Geological Survey, Sheet SE30NW (Barnsley), at 1:10,000 Scale, dated 2005.
- CIRIA Special Publication 32. Technical Guide 34. Construction Over Abandoned Mine Workings. Dated 1984.
- JPG. Geoenvironmental Desk Study Report. Barnsley West. Ref JBW/DS/4848.v3. Dated July 2019.
- JPG. Preliminary Geoenvironmental Ground Investigation. Barnsley West. Ref 4848-JPG-SW-XX-RP-G-0603-S2-P02. Dated July 2019.

The above referenced Preliminary Geoenvironmental Ground Investigation report by JPG includes details of intrusive ground investigation works comprising 11 rotary boreholes and six trial pits carried out on the proposed employment land.



### 3.0 IDENTIFICATION AND ASSESSMENT OF SITE SPECIFIC COAL MINING

| Coal Mining Issue                  | Yes | No | Remarks  |
|------------------------------------|-----|----|--|
| Surface mining (opencast workings) | Yes |    | <p>The Consultants Coal Mining Report indicates opencast coal sites (OCCSs) below large areas of the site. The surface workings are made up of three OCCSs: Craven I (in the north), Craven II (in the centre) and Hunters Cottage Extension (in the South):</p> <p><b>Craven I OCCS</b></p> <p>The Thin and Swallow Wood coal seams were extracted between 1950 and 1951. The lowest point of excavation was recorded as 68.29m AOD, with a maximum thickness of made ground of approximately 13.00m. The coal was not extracted from the central part of the Craven I due to a faulted zone.</p> <p><b>Craven II OCCS.</b></p> <p>The Gawber, Thin, Swallow Wood, Top Haigh Moor and Low Haigh Moor coal seams were extracted between 1957 and 1963. The lowest point of excavation was 44.56m AOD with a maximum thickness of made ground of approximately 43.00m.</p> <p><b>Hunters Cottage Extension OCCS.</b></p> <p>This OCCS relates to two smaller areas of opencast extraction. The Thin coal seam was extracted from below the western area and the Gawber coal seam was opencast from below the eastern area in 1954. The lowest point of excavation of the western area was 110.22m AOD, with a maximum thickness of made ground of approximately 9.00m. The lowest point of excavation in the east was 104.03m AOD, with a maximum thickness of made ground of approximately 9.00m.</p> <p>Note: old workings were identified locally in the Thin and Gawber coal seams. These are likely to represent either bell pits or localised (small-scale) opencast workings and not deeper shafts. However, this will need to be confirmed during site investigation or preparatory works. See below.</p> <p>There is a risk to the proposed development due to settlement of the underlying made ground associated with the historical OCCSs on the site including differential settlement where highwalls are present. An intrusive investigation is required to assess the characteristics of the backfilled materials.</p> <p>Proposed mitigation measures are outlined in Section 4.</p> |
| Underground coal mining.           | Yes |    | <p>The Consultants Coal Mining Report and CON29M Non-Residential Mining Report, included in Appendix B, indicates that the site is located within the zone of influence of recorded underground workings in six coal seams: Flockton Thick seam (86m-147m bgl), Top Fenton seam (144m-221m bgl), Fenton seam (146m bgl), Parkgate seam (171m-175m bgl), Silkstone seam (213m-274m bgl) and Whinmoor seam (287m – 349m bgl).</p> <p>Based on the reported vertical separation between the coal seams and seam thicknesses, none of the recorded underground workings are likely to affect the surface stability of the site.</p> <p>A residual risk remains from unrecorded underground shallow coal workings in the Gawber, Thin, Swallow Wood and Top Haigh Moor seams where they are present within influencing depth of the surface. The approximate extent of potential unrecorded underground mine workings within the development area is shown on JPG Drawing No. 4848-JPG-SW-XX-DR-G-1308, revision dated February 2021.</p> <p>The boreholes drilled as part of the 2019 JPG investigation did not encounter any underground coal workings either outwith the OCCSs or below the base of the OCCSs. In addition, no historical coal workings were encountered during the opencast operations for the Craven I and Craven II OCCSs. It is therefore considered unlikely that underground coal workings are present in the vicinity of these OCCSs.</p> <p>Further intrusive mining investigation, e.g. rotary boreholes, is required to confirm the absence of unrecorded coal workings below the proposed</p>   |



| Coal Mining Issue                     | Yes | No | Remarks   |
|---------------------------------------|-----|----|---|
|                                       |     |    | residential development area.<br><br>If any underground coal workings are proven, mitigation measures will be required; these are outlined in Section 4.  |
| Mine entries (shafts and adits)       | Yes |    | There are six recorded mineshafts located on the site. These are referenced 431406-002 to 006 and 432407-008.<br><br>The mineshafts recorded within the Hunters Cottage Extension OCCS (431406-002 to 006) are shown on the abandonment plans for opencast coal workings. It is likely that the shafts do not extend deeper than the seams in which they were exposed (Thin seam and the Gawber seam). This will need to be confirmed by intrusive investigation.<br><br>The remaining mineshaft (432407-008) is annotated on the Craven II OCCS abandonment plan as a pumping shaft. The shaft has a recorded diameter of 0.91m, the centre of which is at NGR 432004.353, 407547.744. The shaft is reported to have been capped at a level of 87.88m AOD ('buried 5 feet below restored ground level'). This will need to be confirmed by intrusive investigation as outlined in Section 4.<br><br>Mitigation measures, as outlined in Section 4, will be required following investigation of these mineshafts. |
| Coal mining geology (fissures/faults) |     | No | The Consultants Coal Mining Report indicates four faults crossing the site; two faults in the north, aligned north-east to south-west, and two faults in the south, aligned north-west to south-east.<br><br>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.<br><br>It is considered unlikely that geological faults or fissures could affect the proposed development on the site.   |
| Record of past mine gas emissions     |     | No | No records of past mine gas emissions have been recorded within 500m of the site.<br><br>Preliminary ground gas monitoring of wells installed in the opencast confirms elevated concentrations of carbon dioxide. Based on the preliminary assessment carried out by JPG, ground gas protection will be required in new buildings constructed on the site.  |
| Recorded coal mining surface hazard   | Yes |    | The CA CON29M report does not include any records of damage notices or claims for alleged subsidence damage due to coal mining in relation to the site.<br><br>There is no current Stop Notice delaying the start of remedial works or repairs to the property.<br><br>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.   |
| Coal Outcrop                          | Yes |    | The BGS 1:10,000 scale map indicates the outcrop of an unnamed thin seam (stratigraphically above the Dunsil), Dunsil seam, Gawber seam, Thin seam and Swallow Wood seam on the site.<br><br>Mitigation measures for areas where coal may outcrop under the proposed development are outlined in Section 4.   |



## 4.0 MITIGATION STRATEGY PROPOSED

### 4.1 Settlement of Opencast Backfill below the Development

A robust geotechnical solution is required for development over the backfilled opencast coal workings.

The thickness of made ground below this part of the site is estimated to be up to approximately 43m in the east. The properties of the backfilled materials within the opencasts will need to be further investigated as part of a comprehensive ground investigation. As part of the 2019 JPG ground investigation, Extensometers were installed in the Craven I and Craven II OCCSs. To-date the extensometers have been monitored on four occasions in Craven I and on six occasions in Craven II. The purpose of the extensometer monitoring is to confirm that self-weight settlement has ceased.

Settlement analysis will also be required to include total and differential settlement with respect to highwalls, in order to confirm that future settlements, including primary consolidation and secondary creep compression, are tolerable in relation to the proposed development.

It is likely that foundations for residential units will comprise either rafts or reinforced strip footings bearing onto engineered fill.

Depending on the thickness and properties of the made ground in the opencast, the following treatment methods may be appropriate.

- Removal of the full or partial thickness of made ground and replacement with engineered fill.
- Deep dynamic compaction, combined with partial re-engineering of the opencast materials.
- Surcharging.

Any earthworks should be carried out in accordance with the Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 600 Earthworks.

An assessment of the suitability of the colliery spoil materials and also natural 'cut' soils for re-use in earthworks was carried out as part of the 2019 JPG ground investigation. The laboratory testing confirmed that the materials could be re-engineered.

### 4.2 Underground Coal Workings

There remains a residual risk from potentially unrecorded underground shallow coal workings in the Gawber seam, Thin seam, Swallow Wood seam and Top Haigh Moor seam where there may be insufficient rock cover.



The approximate affected area based on recorded information and rotary boreholes drilled to-date is shown JPG Drawing No. 4848-JPG-SW-XX-DR-G-1308, revision dated February 2021.

Further coal mining investigation is required to confirm the absence of unrecorded underground coal workings below the site.

If shallow mine workings are proven, mitigation measures are likely to comprise the drilling and grouting on a 3m grid below the footprint of the proposed buildings or highways.

Foundation and pavement (road construction) design will need to take into consideration the presence of the treated underground workings (if proven).

### **4.3 Mine Entries**

There are six recorded mine entries on the site (referenced 431406-002 to 006 and 432407-008), which require investigation and possible treatment, if proven, prior to development.

The approximate locations of mine entries 431406-002 to 006 are shown on the Hunters Cottage Extension OCCS abandonment plan (NE375). It is likely that the mine entries do not extend deeper than the seams in which they were exposed (Thin seam and Gawber seam). However, this will need to be confirmed by intrusive investigation, e.g. trial trenches or rotary boreholes. If these mine entries are found to extend beyond the base of the opencast, they will require treatment.

The location of mine shaft 432407-008 (annotated as a pump shaft) is detailed on the Craven II OCCS abandonment plan (NE498). The shaft has a recorded diameter of 0.91m, the centre of which is at NGR 432004.353, 407547.744. The shaft is reported to have been capped at a level of 87.88m AOD. The shaft cap is to be located and investigated by trial pitting initially to assess the adequacy of the cap.

Once the shaft and shaft cap have been located, it is proposed to drill a rotary probe hole down the centre of the shaft to confirm the depth and state of the mineshaft backfill.

Once the shaft has been characterised, it will require appropriate treatment.

### **4.4 Coal Mining Geology (Fissures/Faults & Coal Outcrop)**

Four faults are recorded on site, two of which have been partially removed with opencast extraction and are suggested to intersect recorded underground coal mine workings.

Additional faults are indicated to be present in the Craven I OCCS with extraction terminating on the fault.



No major movement from the faults have been identified in the Consultants Coal Mining Report and so the likelihood of fault movement occurring is considered very low.

The following coal seams are conjectured to outcrop on the site and so need to be considered: unnamed thin seam (stratigraphically above the Dunsil), Dunsil seam, Gawber seam, Thin seam and Swallow Wood seam.

Due to the high calorific value of coal, there remains a residual risk of combustion where coal or coal-rich soils are encountered.

Should coal be encountered, it should be treated as incidental coal and will need to be removed at least 1m below the finished ground level and from service corridors.

#### **4.5 Ground Gas**

Although there are no recorded mine gas emission incidents within 500m of the site, consideration of ground gas in relation to the future built development on the site will need to be taken into consideration.

Potential sources of ground gas include: deep made ground associated with the backfilled opencast and coal/mines gas associated with the deep underground coal workings and possible shallow coal workings.

Monitoring wells were installed as part of the 2019 JPG ground investigation and preliminary ground gas monitoring indicates Characteristic Situation 2 protection requirements for new buildings constructed on the site.

Gas protection measures may include a gas resistant membrane and sub-floor void to prevent the ingress of gas into buildings.

#### **4.6 Other**

Although the made ground and natural soils below the site are not expected to contain any significant quantities of coal debris, it will be necessary to obtain samples and test for calorific value as part of future ground investigation works.

If any potentially combustible soils are proven, they will need to be removed at least 1m below the finished ground level and from service corridors.



## 5.0 COAL RECOVERY

The site is located within a Surface Coal Resource Area, in accordance with the Coal Authority Interactive Map.

Shallow coal seams have already been extracted from below the majority of the site, yet coal may still be present in areas where no opencast extraction has been undertaken.

As part of the enabling works for the site, an earthworks operation comprising 'cut and fill' is required. As part of these earthworks, coal seams and historical mine workings may be encountered and extracted.

Where this incidental coal is present in areas of development, it will be limited in volume and the economic value will need to be assessed.

Should it be viable to extract the coal and remove it from site for its economic value, a 'Incidental Coal Agreement' between the Coal Authority and the Site Operator is required. A report detailing the extraction of coal and any historical mine workings encountered will need to be submitted to the Coal Authority on completion of any extraction.

## 6.0 CONCLUSION

Following implementation of the above mitigation methods with regard to the site's coal mining legacy, the development area will be suitable for the construction of residential dwellings with associated infrastructure.

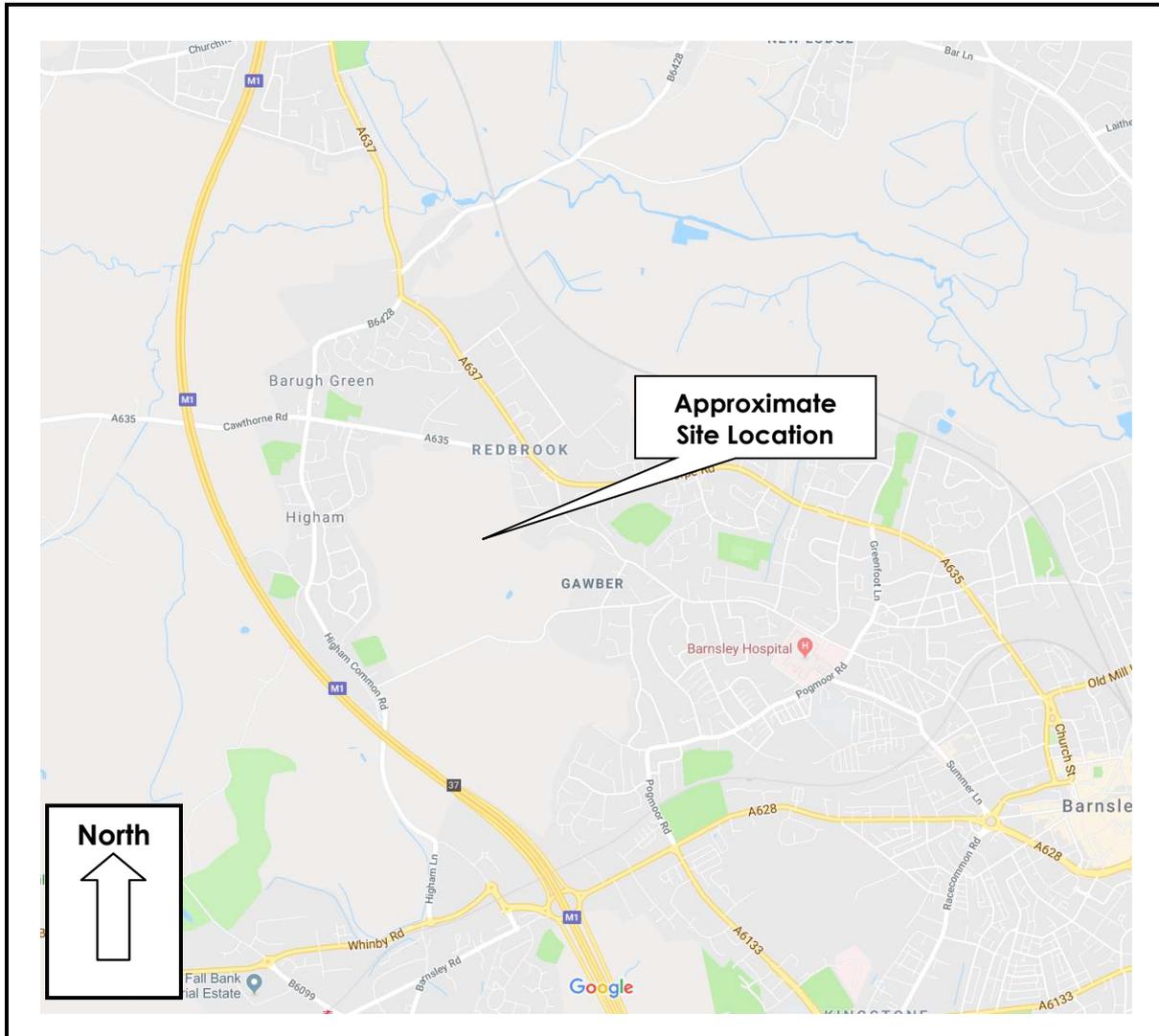
JPG Drawing No. 4848-JPG-SW-XX-DR-G-1308, revision dated February 2021 and included within this assessment indicates the approximate areas of opencast and potential unrecorded underground coal workings. Projected highwalls and faults are also shown on the plan.

Further investigation and subsequent treatment of coal workings, if proven, will be required prior to development. Further settlement analysis will be carried out prior to development to confirm that future total and differential settlement will be within tolerable limits.

Coal may be encountered during the earthworks operations. Any coal encountered during the earthworks shall be treated as 'incidental' and an agreement to remove the coal from the Coal Authority will be required.



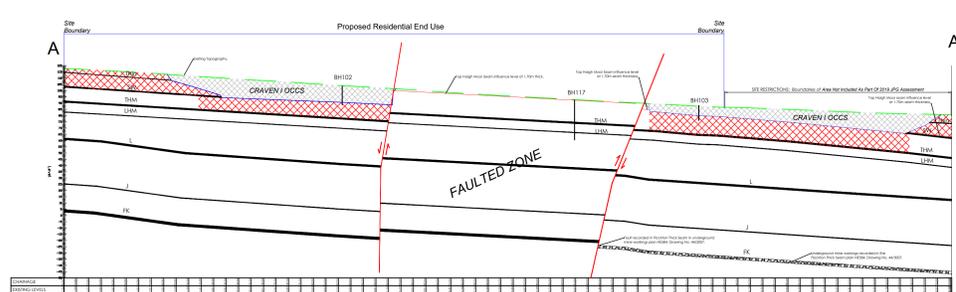
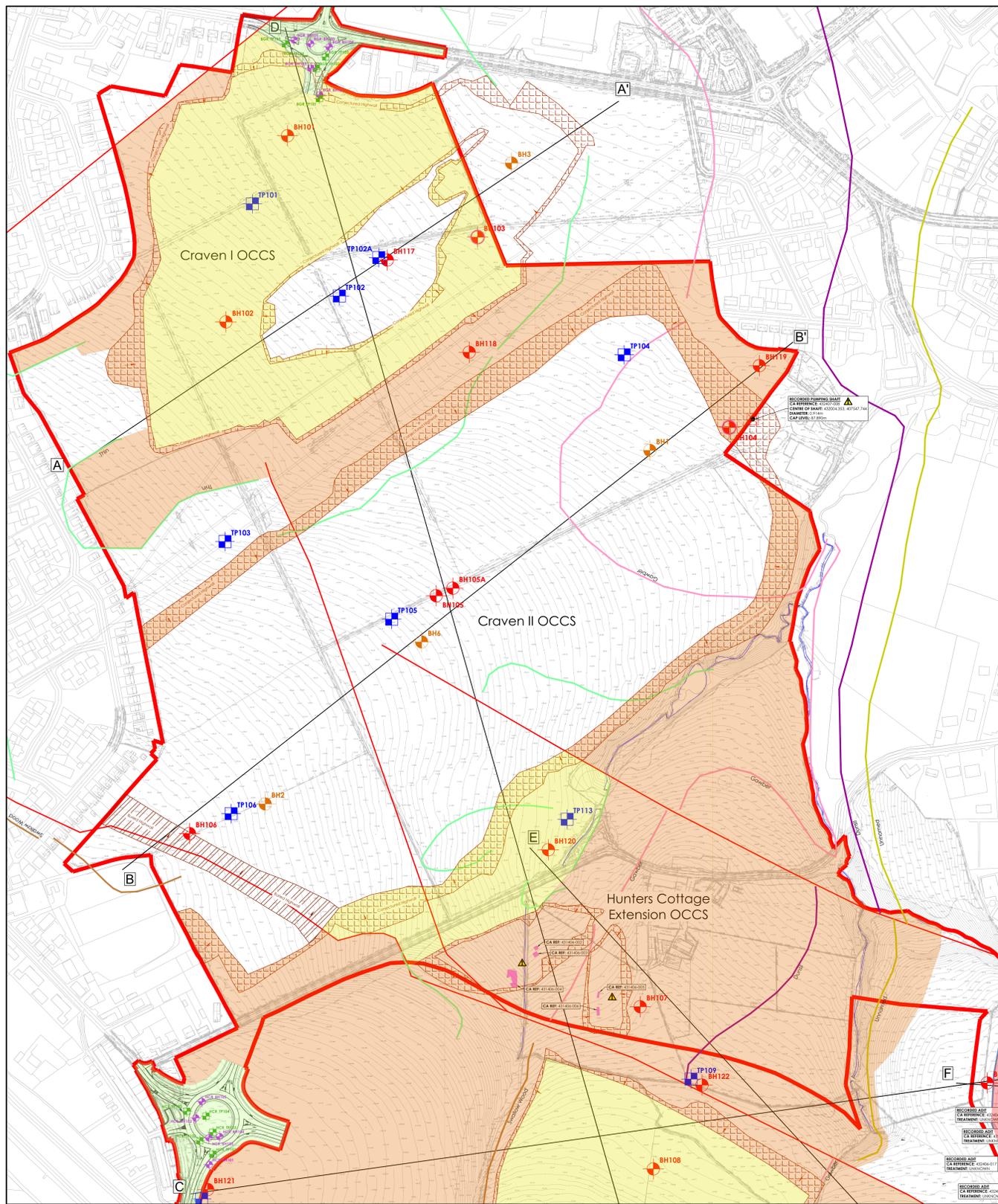
## Appendix A Figures



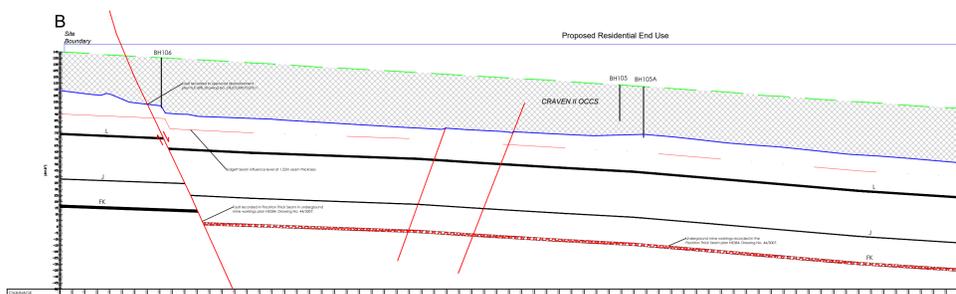
| <b>Figure 1 – Site Location Plan</b> |  |
|--------------------------------------|--|
| <b>Site</b>                          | <b>Barnsley West</b>                         |
| <b>Client</b>                        | <b>Strata Sterling Barnsley West Limited</b> |
| <b>Job Number</b>                    | <b>4848</b>                                  |
| <b>Scale</b>                         | <b>NTS</b>                                   |



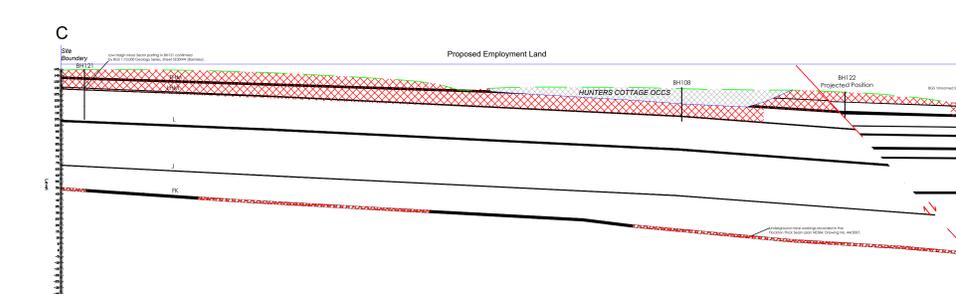
| <b>Figure 2 – Aerial Photograph</b> |  |
|-------------------------------------|--|
| <b>Site</b>                         | <b>Barnsley West</b>                         |
| <b>Client</b>                       | <b>Strata Sterling Barnsley West Limited</b> |
| <b>Job Number</b>                   | <b>4848</b>                                  |
| <b>Scale</b>                        | <b>NTS</b>                                   |



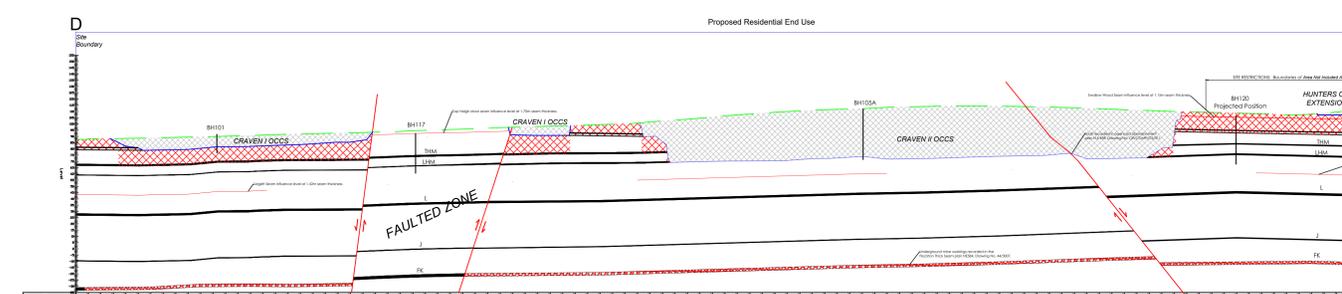
CROSS SECTION A-A', CRAVEN I  
SCALE: 1:2000



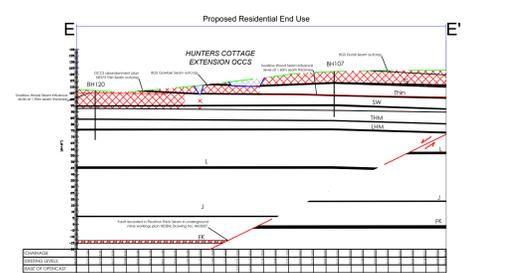
CROSS SECTION B-B', CRAVEN II  
SCALE: 1:2000



CROSS SECTION C-C', HUNTERS COTTAGE AND EXTENSION  
SCALE: 1:2000



CROSS SECTION D-D', CRAVEN I & II OCCS  
SCALE: 1:2000



CROSS SECTION E-E', HUNTERS COTTAGE EXTENSION  
SCALE: 1:2000

**GENERAL INFORMATION**  
 REFER TO JPG DRAWING NO. 4848-JPG-SW-XX-DR-G-1301-S01 FOR  
 PLAN VIEW OF CROSS SECTION LINE POSITIONS

**COAL SEAM DATA**  
 COAL SEAM INFLUENCE LEVELS HAVE BEEN INDICATED TO HIGHLIGHT  
 ZONES WHERE SETTLEMENT RISK AS A RESULT OF SHALLOW COAL MINE  
 WORKINGS IS ACCORDANCE WITH CRMA SPECIAL PUBLICATION 23-  
 CONJECTURED COAL SEAM THICKNESS HAS BEEN ESTABLISHED FROM  
 THE INFLUENCE LEVELS HAVE BEEN SHOWN AT 10 SEAM THICKNESS FROM  
 THE TOP OF THE COAL SEAM USING THE MAXIMUM RECORDED COAL  
 SEAM THICKNESS  
 THE MAXIMUM RECORDED COAL SEAM THICKNESS HAS BEEN ESTABLISHED  
 FROM THE COAL SEAM USING THE MAXIMUM RECORDED COAL  
 SEAM THICKNESS  
 THE MAXIMUM RECORDED COAL SEAM THICKNESS ARE AS FOLLOWS  
 (IN INCREASING ORDER):  
 BARNLEY SEAM: 1.00m  
 UNNAMED SEAM: 0.70m  
 DUNLS SEAM: 0.70m  
 GAWBER SEAM: 1.00m  
 SWALLOW WOOD SEAM: 1.00m  
 TOP HIGH WOOD SEAM: 1.00m  
 TOP MIDDLE WOOD SEAM: 1.00m  
 LOW MIDDLE WOOD SEAM: 1.00m  
 LOW HIGH WOOD SEAM: 1.00m  
 LOCKET SEAM: 1.00m  
 JOHN SEAM: 1.00m  
 FLOCTION THICK SEAM: 2.6m (TAKEN FROM BGS RECORDS)

**LEGEND: CROSS-SECTIONS**  
 - PROJECTED BACKFILL  
 - PROJECTED COAL SEAM  
 - PROJECTED AREA WITH INFLUENCE OF  
 POSSIBLE UNRECORDED SHALLOW MINE  
 WORKINGS  
 - RECORDED UNDERGROUND MINE  
 WORKINGS  
 - PROJECTED UNRECORDED MINE  
 WORKINGS INFLUENCE LEVEL (SEAM  
 SPECIFIC)  
 - PROJECTED FAULT

BOREHOLES DISPLAYED ON THE CROSS SECTIONS ARE FROM THE JPG 2019  
 PERIODIC SITE INVESTIGATION. REFER TO JPG DRAWING NO.  
 4848-JPG-SW-XX-DR-G-1301-S01 FOR SURVEYED BOREHOLE  
 LOCATIONS.

**DO NOT SCALE (A0)**

**NOTES**

**JPG SITE INVESTIGATION (2020)**

- JPG TRIAL PIT BARNLEY GREEN ROAD ROUNDABOUT
- JPG ROTARY BOREHOLE BARNLEY GREEN ROAD ROUNDABOUT
- JPG TRIAL PIT HIGHAM COMMON ROAD ROUNDABOUT
- JPG ROTARY BOREHOLE HIGHAM COMMON ROAD ROUNDABOUT

**JPG SITE INVESTIGATION (2019)**

- JPG TRIAL PIT LOCATION
- BH101 JPG ROTARY BOREHOLE LOCATION
- BH103 JPG ROTARY BOREHOLE LOCATION WITH EXTENSOMETER INSTALLATION

**EASTWOOD & PARTNERS SITE INVESTIGATION (2013)**

- BH1 EASTWOOD AND PARTNERS CABLE PERCUSSIVE BOREHOLE LOCATION, 2013 (APPROXIMATE POSITIONS)

**COAL MINING LEGEND**

- POTENTIAL HIGHWALL ZONE OF INFLUENCE
- RECORDED ADT
- RECORDED MINE WORKINGS
- COAL AUTHORITY RECORDED MINE ENTRY
- CONJECTURED FAULT
- CONJECTURED BARNLEY SEAM OUTCROP
- CONJECTURED DUNLS SEAM OUTCROP
- CONJECTURED GAWBER SEAM OUTCROP
- CONJECTURED THIN SEAM OUTCROP
- CONJECTURED SWALLOW WOOD SEAM OUTCROP
- CONJECTURED UNNAMED SEAM ABOVE DUNLS SEAM

**CONJECTURED COAL SEAM OUTCROPS TAKEN FROM BGS 1:10,000 SERIES GEOLOGICAL MAP, SHEET 58300W, OR OPERATIONAL ABANDONMENT PLANS. REF: DE/COMP/03/011 & DE/COMP/03/121.**

**COAL MINING RISK ASSESSMENT**

- VERY LOW RISK  
NO FURTHER SITE INVESTIGATION REQUIRED
- LOW RISK  
PRESENT TO UNDERTAKE FURTHER SITE INVESTIGATION
- LOW - MODERATE RISK  
FURTHER SITE INVESTIGATION REQUIRED
- MODERATE - HIGH RISK  
REMEDIAL ACTION ANTICIPATED

**CAUTION: MINE ENTRIES & SHALLOW WORKINGS**  
 CAUTION TO BE OBSERVED ON ALL SITES DUE TO RISK OF  
 SUDDEN COLLAPSE, LOCATIONS AND CONDITIONS OF SHALLOW  
 MINE WORKINGS AND MINE ENTRIES IS IN APPROPRIATE GROUND  
 INVESTIGATION.  
 ALL MINE ENTRIES LOCATED ON SITE TO BE SURVEYED WHERE  
 POSSIBLE AND THENCE OFF FROM PUBLIC ACCESS UNLESS  
 APPROPRIATE REMEDIAL ACTIONS ARE TAKEN.

| REV | DESCRIPTION              | DATE     | CHK | BY  |
|-----|--------------------------|----------|-----|-----|
| P02 | VERY LOW RISK AREA ADDED | 25.02.21 | JAM | LSG |
| P01 | FIRST ISSUE              | 05.06.19 | CLT | AWA |

Project  
BARNLEY WEST

Drawing Title  
COAL MINING RISK ASSESSMENT -  
PROPOSED RESIDENTIAL ZONE

**INFORMATION ISSUE**

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