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Date: 20th September 2019
Your ref: (S75 3JD).
My Ref: CMRA 00219

FOR THE ATTENTION OF THOMAS AGUS

Dear Sir,

**COAL MINING RISK ASSESSMENT (CMRA) - FOR PROPOSED RESIDENTIAL
DEVELOPMENT AT LAND AT STATION ROAD, DODWORTH, BARNSELY S75 3JD**

Introduction

Planning permission is being sought for residential development at the above named site, the location of which can be seen on the attached plan No. 00219/A. The site is centred around national grid reference E: 431383 / N: 405256. A Coal Mining Risk Assessment is required for the proposals, in order to competently address the mining legacy for the site and determine what impact this may have had upon the land. The assessment is intended to be included as a supporting document to a future planning application to Barnsley Local Authority.

Scope of the Coal Mining Risk Assessment

The purpose of this 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 the cumulative impact of issues;
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any further works that may be necessary; and
- Demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to development on unstable land.

British Geological Survey Information

Surface Geology (inc. any superficial deposits)

Records indicate the site to be located on sandstone of the Middle Coal Measure series from the Carboniferous formation. No superficial deposits are indicated in this vicinity.

Coal Seam Outcrops

The 'Joan' coal seam is conjectured to outcrop some 90m to the south-west of the site which will dip beneath the land gently to the north-east below the site under consideration. Given the lay of the land and considering the geological fault which will throw the seam slightly deeper, it is likely that the Joan coal will be around 10m or more beneath the site itself, if the conjectured detail is accurate. Records indicate that the Joan coal seam is of around 0.5m in section.

Made Ground

No made ground is indicated in the vicinity; some may be experienced from the past development on the site.

Fault Planes or Fissures

A geological fault is conjectured to pass some 75m away to the south-west which should not affect the site. The sandstone bedrock may contain natural fissures that could have been opened out by the past deep mining operations as detailed below.

Abandoned Mines Records

Opencast Coal Workings.

The 'Station Lane' Opencast site worked the 'Flockton Thick' coal seam some 200m away to the south-west of the site. The abandonment plan detail from these operations indicates the Flockton Thick seam as being 1m thick in that vicinity.

Underground Coal Workings - Deep

Deep coal mining (over 30m deep) has taken place beneath this area in several coal seams in the past; all associated settlement will be long complete and as no coalfields now exist, the site should remain stable from the deep coal mining perspective for the foreseeable future.

Underground Coal Workings - Shallow

Relatively shallow workings are recorded in the Flockton Thick coal seam beneath the site from the former Dodworth Colliery in 1885. It is difficult to ascertain the depth of these workings from the available information, but given nearby shaft section detail (Higham Colliery as detailed below) they are estimated at 25m or more. No shallow workings of the higher Joan coal seam are known beneath the site or in close proximity. The closest known workings of Joan seam are the former 'Woodvale' Opencast site some 1.1km to the north-west, which indicated a seam thickness of 0.5m at that location.

Mine Entries

No mine entries are known within 20m of the site, however given the probable presence of shallow workable coal the likelihood of uncharted mine entries being present of which there is no record should not be ruled out.

The shaft section detail from the former Higham Colliery some 1.5km to the north indicates the Joan coal seam as around 0.56m thickness and the Flockton Thick seam around 1.9m (including a dirt band). It also details the Flockton Thick seam as around 17m below the Joan seam.

Fugitive Gases

As far as we are aware, no evidence of coal mining related fugitive gas emissions are known within 250m of the site. However there will be some risk for associated gases in relation to the shallow coal and coal workings, particularly considering permeable sandstone that may contain fissures.

Historical Records

According to the historical OS sheets for this area no indications are apparent of any old quarrying or other mining related operations in the vicinity of the site.

Coal Mining Risk Assessment (based on the above).

Coal Seam / Coal Mining Issue	Risk Assessment (VeryHigh/High/Moderate/Low/VeryLow)
Underground coal mining (at shallow depths)	Moderate to High
Mine entries (shafts and adits)	Low
Geological faulting	Low
Geological fissures	Moderate
Fugitive gas emissions	Moderate
Surface mining (opencast workings)	Low
Aggressive ground	Low
Coal exposed / near foundation level	Low

Defined Risk Assessment

(Where 'Underground Coal Mining' above = Very High to Moderate)

Extent of known underground mining in this/these shallow coal seam/s in the wider vicinity	(Extensive / Much / Occasional / None Known) Much (F.Thick) / Occasional (Joan)
Intrusive Site Investigation of Coal Seam / Mines of Coal (given nature of proposals).	(Required / Recommended / Unnecessary)** Required
Advised critical depth beneath foundation level to investigate considering geology and nature of the shallow coal/s*	30m (Note - one hole to 30m may prove the Flockton workings as out of range of affecting the surface)

Key:

** The critical depth is calculated according to Ciria Publication 32 guidance which details that for the land to be regarded as stable from any voided mineworkings, then a suitable section of competent rock cover above the workings should be proved that is equal or greater than ten times the 'in-tact' coal seam thickness. The advised critical depth to investigate to in this report takes*

into account the available geological information, any nearby mining records and may include a contingency for the seam to be of a slightly greater thickness than anticipated. Due care and diligence should be employed on-site to ensure that sound information is gathered of the in-tact seam thickness, particularly if concluding that old workings are outside the critical depth of affecting stability for the proposed development.

**** Where :**

Required	<i>Intrusive Site Investigation required of the shallow coal/s and/or mine entries to determine any necessary stabilisation works for the given development.</i>
Recommended	<i>Intrusive Site investigation recommended – given a lower level of risk in relation to the nature of proposed development some proposals may reduce the risk to an acceptable level via suitable design considerations.</i>
Unnecessary	<i>Intrusive Site Investigation deemed unnecessary – given geological/mining information.</i>

Coal Authority

Prior written permission from The Coal Authority is required for intrusive activities which will disturb or enter any coal seams, coal mine workings or coal mine entries (shafts and adits). Further information on The Coal Authority's permissions process can be found at:

www.coal.gov.uk/services/permissions/index.cfm

Note: permission is not usually required for 'incidental' coal that is encountered in excavations for foundations for example.

Information sources:

- *British Geological Survey Map Sheet ST 67 SW 1955 Edition*
- *British Geological Survey – Geology Of Britain Viewer*
- *Coal Authority Interactive Viewer and Mine Abandonment Plans*
- *Historical Mapping – old-maps.co.uk*

CONCLUSIONS

- 1) The site can be regarded as stable from the **Deep Coal Mining** perspective, and as no coal fields now remain this position should continue for the foreseeable future.
- 2) Given the level of risk from the **Shallow Coal Mining** perspective an intrusive site investigation should be carried out to determine whether there are any associated stability issues for the proposals. Considering the geological and mining information between 3 and 6 boreholes would be advised, firstly to check the Joan coal seam (estimated at around 10m deep) but then to check whether the deeper Flockton Thick seam workings pose a stability risk. If the Flockton thick seam is not encountered within 30m then it would be reasonable to assume that they will not influence the surface stability even if the Joan coal seam is also worked. In such a case then only the Joan seam should be checked further if it is considered to be at a depth that may influence surface stability should any uncharted old workings be present. If enough detail is obtained to suggest that the Joan coal seam is in-tact and unworked, and the Flockton seam is too deep to affect surface stability, then no further works would be required. Conversely, historic workings may be proved in the Joan seam and it might be considered that the Flockton seam workings could interact with the higher workings to cause instability at the surface. In such a case then further works should be considered such as grouting, piling and/or suitably engineered foundations. The annexed system chart 'Recommended Site Investigation Process' provides a guide for a suitable investigation.
Note: prior permission from the Coal Authority would be required to investigate or treat a coal seam or coal workings.
- 3) Although a relatively low risk, any uncharted mine entries encountered should be reported to the Coal Authority (as owners) for their comments on what further operations may be necessary to safeguard the development. *Note: prior permission from the Coal Authority would be required to investigate or treat a coal mine entry.*
- 4) A watching brief should be employed during the future grounds works for any signs of fissured sandstone bedrock – this may require treatment works to stabilise and/or foundations designed accordingly.
- 5) Considering the relatively shallow coal and/or coal workings along with porous, and maybe fissured, sandstone bedrock, usual safety precautions should be employed regarding possible fugitive gases in any deep excavation work taking place. Mitigation measures may also be required within foundation design, such as a methane membrane or positive ventilation.

A suitably qualified and competent professional should be employed to use this report to determine the conditions on site, and ultimately advise on what action, if any, is necessary to safeguard the development. It should be noted that any future works to investigate any coal seam or associated mine entries will need the prior consent of the Coal Authority.

I trust that this satisfies your requirements, however please do not hesitate to contact myself at any time for further clarification or advice.

Yours Sincerely,

M Lyons

M. Lyons
Consultant Mining Engineer
BSc CSci MIMMM

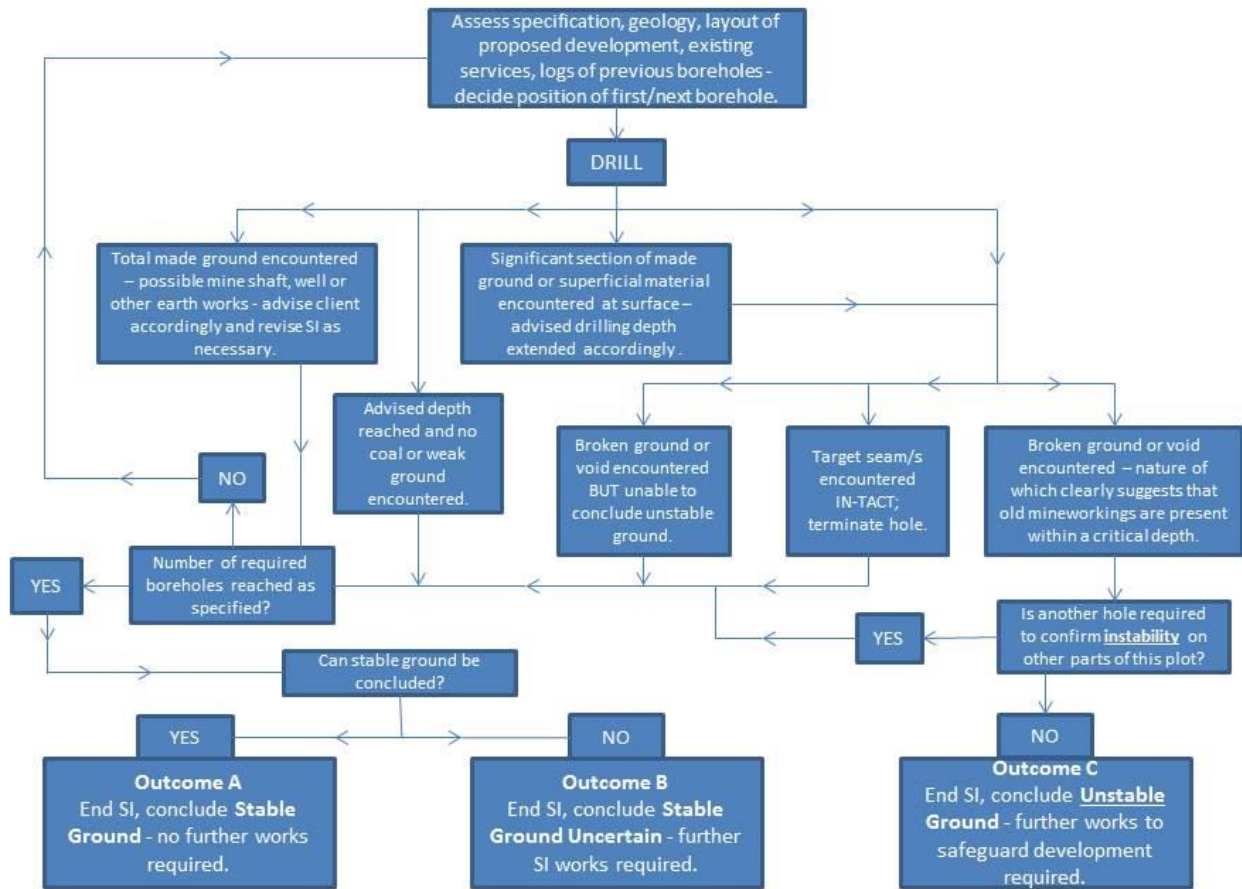
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THIS COAL MINING RISK ASSESSMENT IS BASED ON AND LIMITED TO THE INFORMATION IN MY RECORD AT THE TIME THE ENQUIRY IS ANSWERED. It is based on my professional opinion in line with the guidelines set out in CIRIA Special Publication 32 - "Construction Over Abandoned Mine Workings." The opinion may be overruled by Government Authorities decisions based on other information not in my record. If a site investigation is recommended then this risk assessment will be superseded by the factual findings of that investigation. All site investigation work should be carried out by a competent professional from which independent conclusions and recommendations for safe development should be provided. It should be noted that: no operation should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. The investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases; these risks both under and adjacent the site should be fully considered in any proposals both for personnel and public safety. Copyright in this CMRA belongs to M.A.Lyons. All rights are reserved and unauthorised use is prohibited. Copyright is not transferred to external parties by possession of this report, however, those for whom the report is compiled have the right to use it. If any unauthorised third party comes into possession of this report, they rely upon it entirely at their own risk and the author does not owe them any Duty of Care or Skill.

Annex:

Borehole Site Investigation (SI) Process Guide (Shallow Underground Coal Workings)

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Scale – 1 : 1250 (image @A4)

Map showing a residential area with a conjectured outcrop of the Joan Coal Seam. The outcrop is indicated by a red line with red dots, labeled "CONJECTURED OUTCROP OF JOAN COAL SEAM". A fault line is shown as a black line with a red arrow, labeled "FAULT". The map includes various buildings and landmarks, such as the "Play Area", "Club", "Library", "Police Station", "Station Inn (PH)", "Communal Centre", "Allotment Gardens", "Dodworth Methodist Church", "Memorial", "Shelter", "Gas Grot", and "TCB". Streets shown include "MITCHELSON AVE", "HAWTHORNE CRESCENT", "STATION ROAD", "CLIFFE CRESCENT", "BARNLEY ROAD", and "EDWALE CLOSE". A specific site is highlighted with a green outline and labeled "SITE". The map also shows a "Sub Sta" and a "Shed". Distances are marked with stars and numbers, such as 141.6m, 139.9m, 137.6m, 135.0m, and 134.0m.