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**CAPE SITE SERVICES
COAL MINING & GEOTECHNICAL
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Date: 2nd February 2021
Your ref: (S35 7HG).
My Ref: CMRA 00250

FOR THE ATTENTION OF MR R. AGUS

Dear Sir,

**COAL MINING RISK ASSESSMENT (CMRA) - FOR PROPOSED DWELLING ON LAND AT 3
CARR HEAD ROAD, HOWBROOK, WORTLEY, SHEFFIELD S35 7HG**

Introduction

Planning permission is being sought for a detached dwelling at the above named site, the location of which can be seen on the attached plan No. 00250/A in Appendix 1. The site is centred around national grid reference E: 432603 / N: 398188. 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.

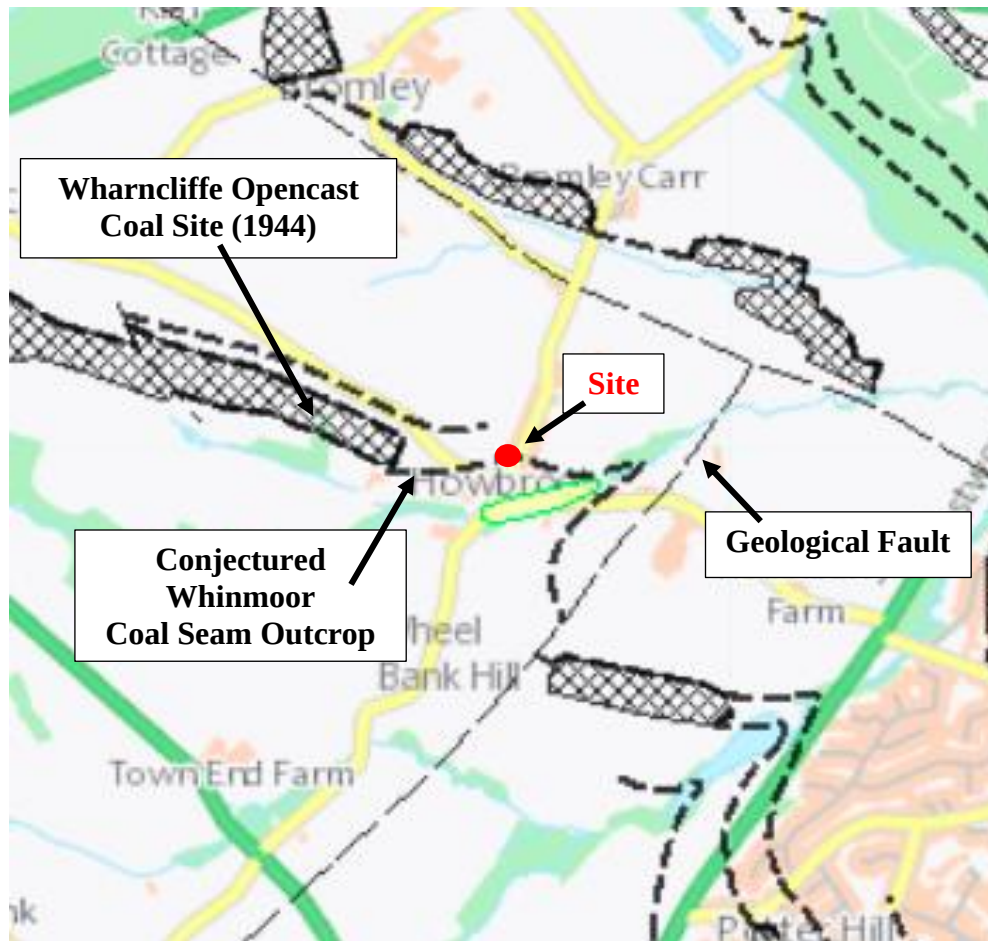
Scope of the Coal Mining Risk Assessment

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.

Surface Geology (inc. any superficial deposits)

Records indicate the site to be located on shales, mudstones and sandstones of the Lower Coal Measure series from the Carboniferous formation. No superficial deposits are indicated in this vicinity. The strata is shown to dip to the north-east at a rate of around 1 in 8 (7°) in this vicinity. Surface geology is outlined on the extract image below from the BGS Onshore Interactive Viewer:



Fault Planes or Fissures

No geological faulting is known within 100m of the site; the closest being some 260m away to the south-east as shown above. Considering the geology, along with the fact that no deep coal mining has taken place beneath the site, fissured sandstone bedrock would be unlikely, unless unrecorded shallow mining voids are present that may have weakened the overlying strata (as mentioned below).

Coal Seam Outcrops

As outlined on the extract image above from the BGS Onshore Viewer, the Whinmoor coal seam (around 0.87m thickness) is conjectured to outcrop through the site, in roughly an east to west orientation. The seam will therefore be present beneath the surface soils at the outcrop position (unless historically dug out) and dip steadily beneath the land to the north east. It should be noted that as the geology is based on conjecture some degree of uncertainty exists as to the actual outcrop position. As such, if the actual outcrop position is further southwards than anticipated then the seam may be slightly deeper than beneath the site than expected; conversely if the outcrop is further northwards then it would not be present at all.

Made Ground

No made ground is indicated in the vicinity. A slight potential will exist for historic small scale 'digging out' of coal, considering its likely shallow depth – associated pockets of made ground could be encountered, which may contain old coal spoil material (which may be aggressive to foundations).

Opencast Coal Workings.

No opencast coal operations are known within 100m of the site (*although please note the possible 'digging out' comment above*). The Whinmoor coal seam has however been worked via opencast methods nearby (around 170m west) - the former 'Wharncliffe No. 3' opencast site (as shown on the above image) which was abandoned in 1944.

Underground Coal Workings - Deep

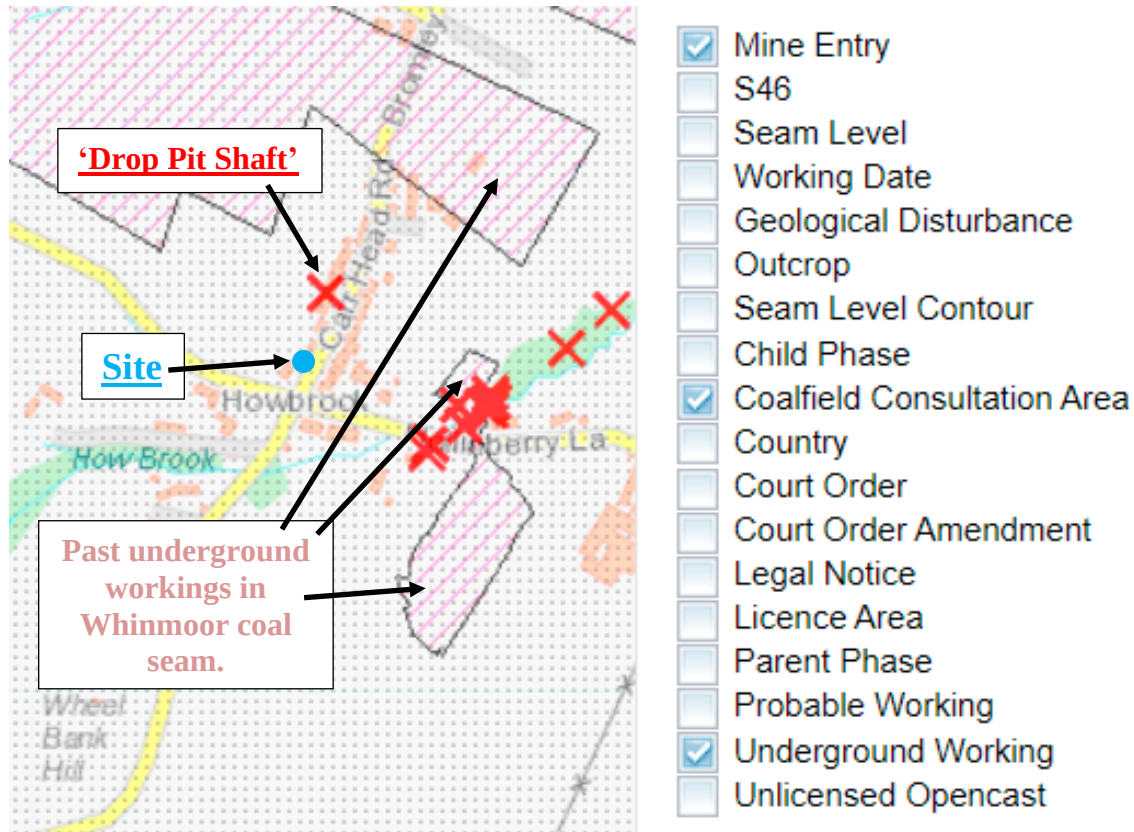
No deep coal mining (over 50m deep) has taken place beneath this site and as no coalfields now exist, it should remain stable from the deep coal mining perspective for the foreseeable future.

Underground Coal Workings - Shallow

Although no underground workings are recorded beneath this site itself in the Whinmoor seam, past workings of this coal are known in the wider area, as illustrated on the following image which forms an extract from the Coal Authorities interactive viewer. The closest known to the site are the 'Robert Haigh Pit' workings during the 1850's some 130m away to the east, with the 'Joshua Dransfield Pit' just to the south also of the same period. The Joshua Dransfield workings proved the Whinmoor seam as 870mm in thickness and the records indicate that historic workings (probably either bell pit or pillar and stall) were encountered during the operations – around 220m away to the SSE of the site.

Considering the above detail, there will be some potential for other unrecorded, possibly illicit, underground workings beneath the site itself that could cause a stability hazard to development;

should the coal be at shallow depth rather than at the surface. Any such workings would very likely be via pillar and stall methods, or bell pits, which would not normally involve substantial roadways.



It should be noted that the general rule of thumb from CIRIA C758D (Abandoned mine workings manual) guidelines is that a site would need ten times the coal seam section of competent natural strata beneath the formation level and top of the coal for it to be considered as stable whether worked or otherwise.

Mine Entries

No mine entries are known within 20m of the site itself. The closest, as can be seen in the extract image above (from the Coal Authorities Interactive Viewer), is an old mine shaft known as the 'Drop Pit Shaft' some 50m away to the NNE. No details as to depth or treatment are shown for this mine entry.

It should be noted that some potential will exist for other mine shafts or adits being encountered which there are no records considering the shallow workable coal.

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 more so if mining voids are proved.

Historical Records

According to the historical records for this site, no nearby indications of any mining or quarrying activities are noted within the site itself.

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
Mine entries (shafts and adits)	Low to Moderate
Geological faulting	Low
Geological fissures	Low
Fugitive gas emissions	Low
Surface mining (opencast workings)	Low to Moderate
Aggressive ground	Low to Moderate
Coal exposed / near foundation level	Very High

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
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*	15m

Key:

** The critical depth is calculated according to Ciria C758D 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

Information sources:

- *British Geological Survey Map Sheet SK 39 NW 1980 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 **Shallow Coal Mining** position, unless the Whinmoor coal seam is known to be at the surface on the property (and a suitably qualified engineer can provide evidence of this to the authorities) it would be recommended to undertake a borehole site investigation to check the depth nature of the coal, if present; namely whether any potential old mining voids require further considerations for safe development. Given the nature of the proposals between three to six holes to maximum depths of 15m below rockhead (beneath any fill/made ground) should suffice for this. If the Whinmoor seam is encountered then the holes can be terminated at the base of the seam as no deeper seams are anticipated within an influencing depth. If any voids are encountered that may compromise stability then further ground treatment works and/or strengthening of foundations may be required. A guide to a recommended site investigation process is outlined in appendix 2. A prior permit from the Coal Authority would be required to facilitate such an investigation.
- 3) Any shallow coal and/or made ground/spoil encountered would need removing and blinding off to reduce spontaneous combustion risks and associated aggressive impacts upon foundations. Appropriate structural foundation designs should be considered.
- 4) A watching brief should be employed during future grounds works for any signs of unrecorded mine entries. A site scrape to natural ground is the most effective procedure to check for such features, circular areas of grey fill within bedrock would be an indication. If suspected the Coal Authority (as owners) should be notified immediately for appropriate deliberations.
- 5) Considering the relatively shallow coal usual safety precautions should be employed regarding possible fugitive gases in any deep excavation work taking place, particularly if shallow coal workings are proven. 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, mines of coal or associated mine entries will need the prior consent of the Coal Authority via their permitting procedure.

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,

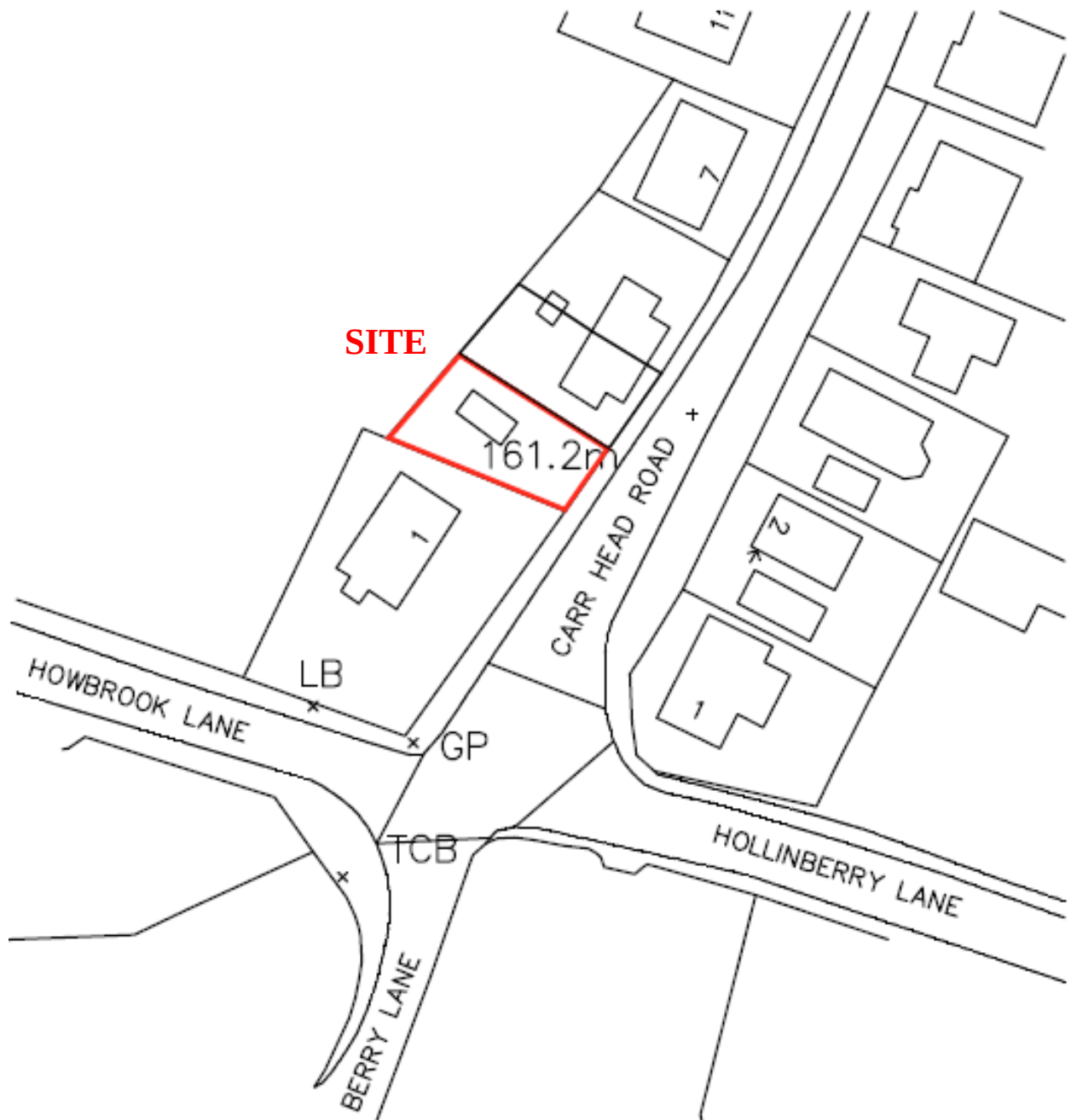
M Lyons

M. Lyons
Consultant Mining Engineer
BSc CSci MIMMM

Enc.

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 C758D "Abandoned mine workings manual." 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.

Appendix 1 – Location Plan No. 00250/A
(Not To Scale)
Site centred at O.S. 432603 / 398188



Appendix 2

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

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