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LYONS CMC
COAL MINING & GEOTECHNICAL
CONSULTANCY

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Date: 28th August 2023
Your ref: (S75 4PY).
My Ref: CMRA 00369

FOR THE ATTENTION OF JULIAN SENIOR & PETER THOMPSON

Dear Sir,

COAL MINING RISK ASSESSMENT (CMRA)
FOR PROPOSED DEVELOPMENT AT LAND TO THE REAR OF 6 BEACON CLOSE,
SILKSTONE COMMON, BARNSELY S75 4PY

Introduction

Planning permission is being considered to demolish and rebuild the community hall at the above named site, the location of which can be seen on the attached plan No. 00369/A in Appendix 1. The site is centred around national grid reference 429273E / 404591N. 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 MBC.

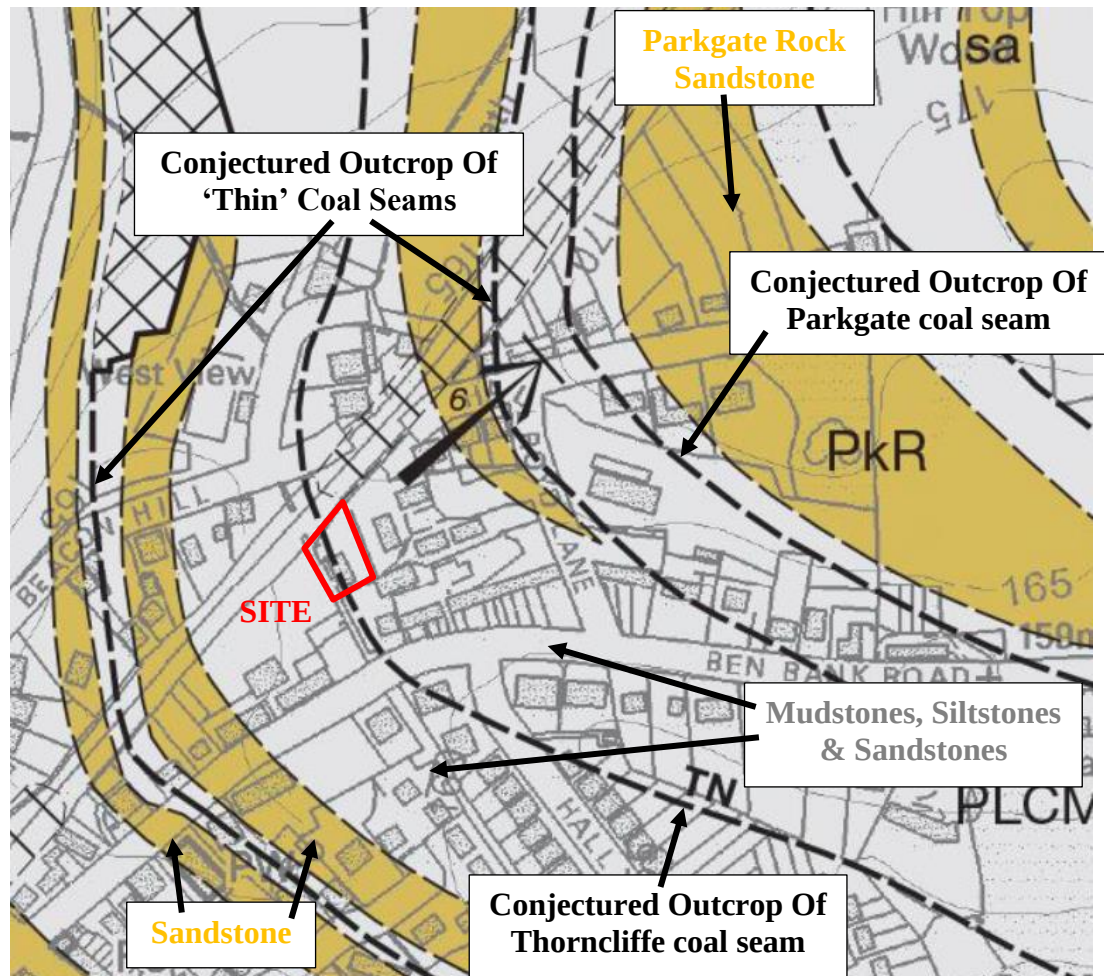
Scope of the Coal Mining Risk Assessment

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.
- The report will not consider other geotechnical or geo-environmental issues.

Surface Geology (inc. any superficial deposits)

Records indicate the site to be located on mudstones/siltstones/sandstones of the Middle Coal Measure series from the Carboniferous formation, with the strata shown to dip to the north-east at a rate of around 1 in 10 (6°) in this area. No superficial deposits are indicated in the vicinity of the site itself. A summary of the surface geology is illustrated on the image below which is an extract from the BGS Sheet SE20SE 2005 Edition:



Fault Planes or Fissures

No geological faulting is known or conjectured within 100m of the site and given the anticipated geology the likelihood of fissures within sandstone bedrock is considered low in this instance.

Coal Seam Outcrops

As outlined on the extract image above the 'Thorncliffe' coal seam is conjectured to outcrop through the site roughly from north to south as shown. Shaft section detail from the former 'New Sovereign' colliery (around 1km to the east), indicates the Thorncliffe seam as 4ft 8in (1.4m) in thickness.

A 'Thin' un-named coal seam is conjectured to outcrop some 110m away to the south-west as indicated above. The New Sovereign shaft section indicates an un-named coal seam around 10m below the Thorncliffe seam of 3ft 9in (1.15m) in thickness, but which includes various dirt bands.

A thin coal seam, along with the Parkgate coal seam, is shown to outcrop further to the north-east which will dip away clear of the site; therefore not present at shallow depth.

Made Ground

BGS records show no made ground beneath the site itself. A slight potential will exist however for infilled ground being experienced that could be associated with small scale historic 'digging out' of shallow coal.

Opencast Coal Workings.

No opencast coal sites are known within 100m of the site.

Underground Coal Workings - Deep

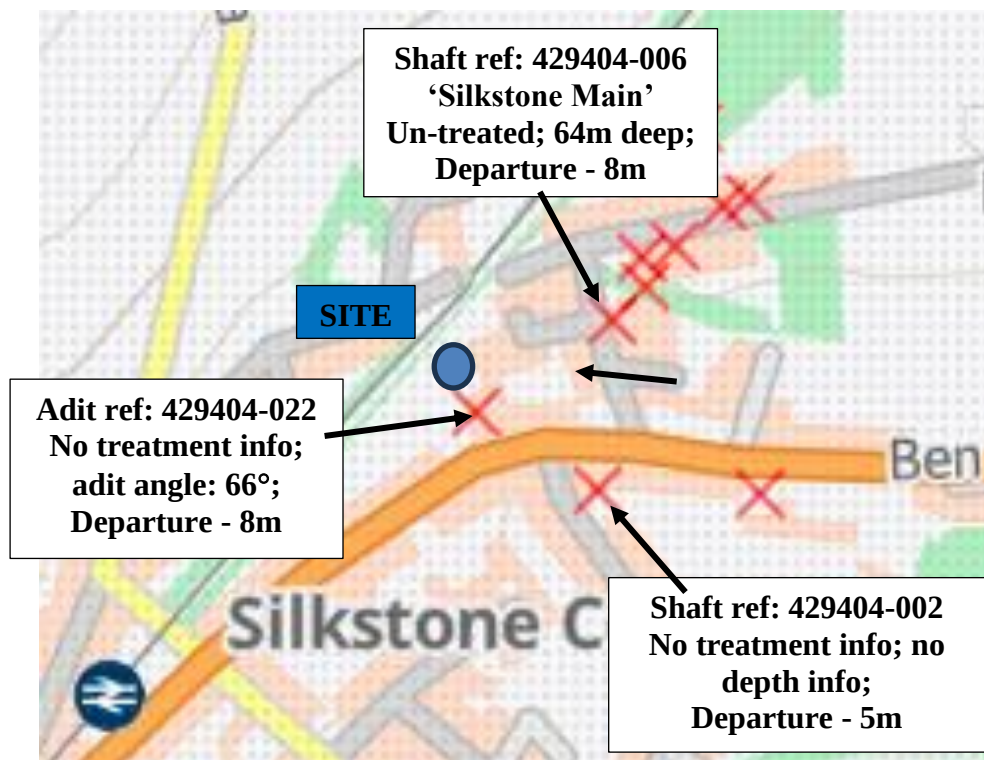
Deep coal mining (over 50m deep) has taken place beneath the site in various coal seams, all settlement from which will be long complete. As no coalfields now exist, the site should remain stable from the deep coal mining perspective for the foreseeable future.

Underground Coal Workings - Shallow

Although no recorded workings are known in the shallow coal seams as detailed above (Thorncliffe seam and 'un-named' seam), there will be some risk of unrecorded, possibly illicit, workings being present; which is reflected in the fact that the site is located in a Coal Authority area of 'probable shallow coal workings'. **Note informatives nos. 1 & 2 in appendix 2.** It is also noted that the 'Silkstone Four Foot' coal seam (of around 1.3m thickness) has been worked beneath this area with possible roadways (access tunnels) passing beneath the site itself – possibly within 30m deep.

Mine Entries

The nearby mine entries to the site are illustrated on the following image which forms an extract from the Coal Authorities interactive viewer information. As can be seen, adit ref: 429404-022 lies within 20m of the site – as illustrated on the attached plan no. 00369/A in Appendix 1. This mine adit (tunnel entrance) is not known to have been treated, but is recorded as having an angle of 66° (ENE) – which infers the direction of the roadway/tunnel that either follows the shallow coal seam as it dips beneath the land, or accesses the coal seam below. As can be seen, the tunnel is not shown to pass beneath the site itself. The plan position of the adit is shown as being around 16m away from the boundary of the site.



Given the shallow workable coal, a slight risk will be present for discovering old mine entries of which there are no records. Grey circular areas of fill material within natural ground would be an indication of an old back filled mine shaft for example.

Fugitive Gases

As far as we are aware, no evidence of coal mining related fugitive gas emissions are known within 250m of the site. Given the information there will be some associated risks given the shallow workable coal. These risks will increase if old mining voids are proved and more so if any old mine entries are discovered.

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	Moderate
Surface mining (opencast workings)	Low
Aggressive ground	Moderate
Coal exposed / near foundation level	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/rock-head level to investigate considering geology and nature of the shallow coal/s*	30m

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 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 SE20SE 2005 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 Mining** position a limited intrusive mining investigation should be undertaken to a) determine the depth/thickness/nature of any made ground; and b) to check the depth and nature of any shallow coal seams and possibly the roadways/workings in the deeper Silkstone Four Foot seam, if present. Three water-flush boreholes to 30m below rock-head/foundation level would suffice for this in the outset; preferably triangulated around the perimeter of the proposed building. **Note informatives 1 & 2 in Appendix 2.** A permit from the Coal Authority should be secured prior to such an investigation. If any mining voids are encountered within an influencing depth then further stabilisation works and/or appropriate foundation designs would need to be considered.
- 3) Any coal exposed in future foundation works should be removed and blinded off with suitable grade concrete to protect foundations from attack and minimise the risks of spontaneous combustion.
- 4) Any made ground encountered (possibly associated with digging out of shallow coal) will require appropriate considerations for suitable foundation designs, particularly if there is any discontinuity of depths to rock-head (i.e deeper on one side from the other) which would give rise to possible differential settlement issues and/or rotational slip potential.
- 5) It is considered that the nearby mine adit ref: 429404-022 will be in a position (above the 8m departure as specified) and direction that should not affect the stability of the proposed building. This aspect should be confirmed with the Coal Authority who will have a more precise location for this feature.
- 6) 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.
- 7) In terms of the fugitive mine gas risks from the potential shallow coal and nearby mine entry, it would be prudent, in the absence of any further gas monitoring (*note informative no. 3 in appendix 2*), to include gas protection measures (such as a methane membrane for example) within future foundation designs; which could also protect from radon issues if required. All

usual safety precautions should be employed regarding possible fugitive gases in any deep excavation work taking place.

- 8) If no evidence of any shallow mining and/or mine entries are determined to be of effect for the development then usual foundation solutions can be considered in line with the appointed Building Control departments advice/requirements.

Note: should there be any uncertainty of actual conditions during future ground works Lyons CMC or indeed the Coal Authority themselves can be further consulted for on site assessment if necessary.

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,

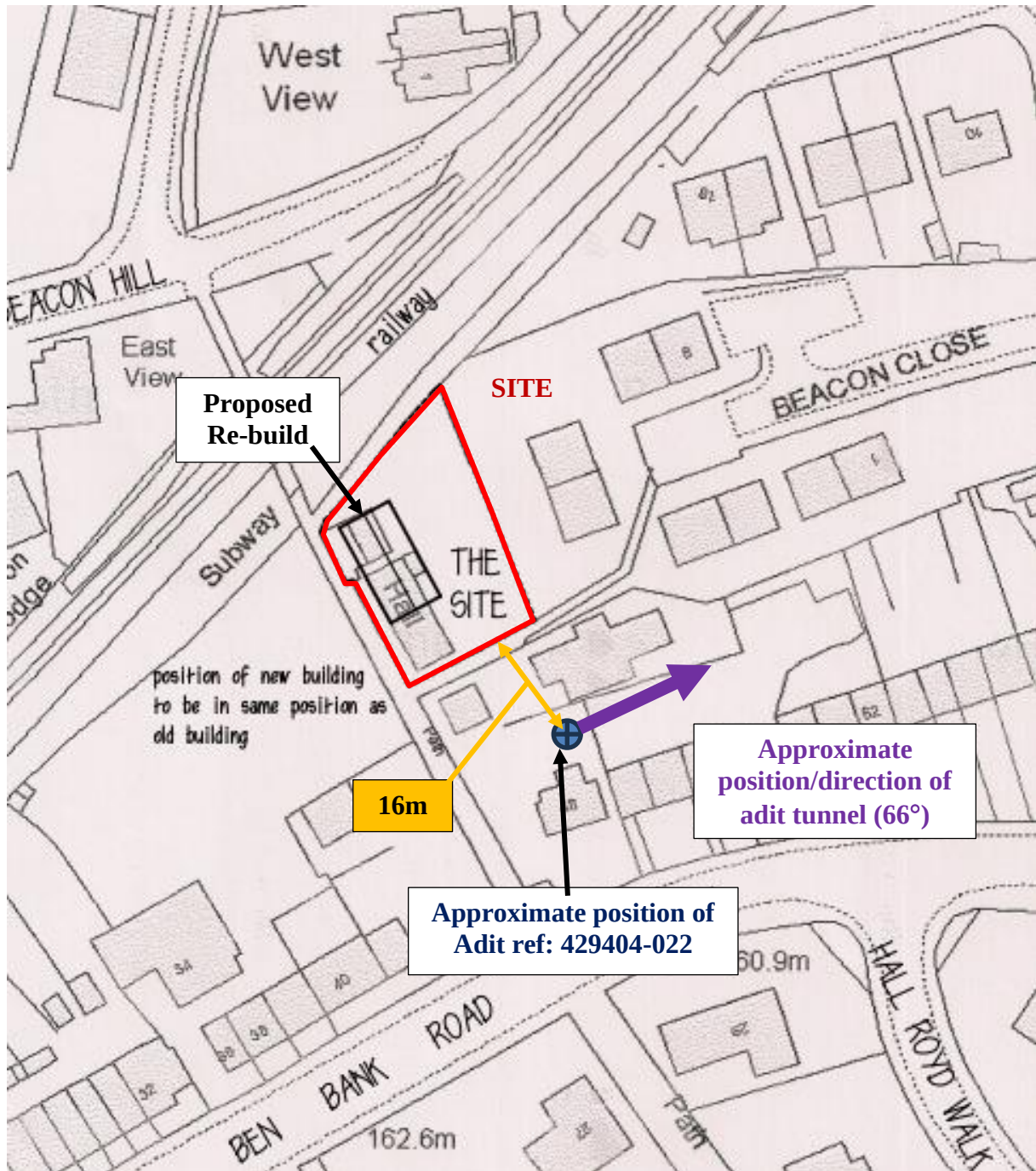
M Lyons

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. 00369/A
(Not To Scale)
Site centred at NGR: 429273E / 404591N



Appendix 2 - Informatives

- 1) The relatively recently revised CIRIA document titled ‘Abandoned Mine Workings Manual’, which replaced Special Publication 32 (1984), indicates that the use of empirical or ‘rule of thumb’ guides, as the design basis for treatment depth, has been successfully observed for many years for a wide range of abandoned mine workings and overlying rock/soil strata scenarios. As such, the guidance indicates that further design/ground stabilisation considerations will be required if there is less than 10 times the aggregate measured height of mine workings as competent rock cover above the workings.
- 2) For information, should the grouting of any mine workings be required, a 10:1 PFA/cement mix or similar would need to be injected into the workings and any other disturbed strata above it under pressure on an OS coordinated treatment grid approved by the Coal Authority (and Building Control/third-party Warranty provider as required). Specific proposals to treat any mine workings would need to be submitted in the form of a standalone ‘Specification’, with a separate permit to treat being obtained from the Coal Authority. The method of consolidation is dependent on the nature of the bedrock strata and the underground mining conditions encountered, although fissile strata, such as shales and mudstone deposits, do permit mining voids to migrate upwards to quite high levels. All grouting works would need to be supervised by a competent engineer, with a final validation report being produced to confirm what works were undertaken and whether they were successful or not.
- 3) Ground gas monitoring can be undertaken to confirm or discount the presence of an elevated gassing regime within the underlying soils. Elevated concentrations of mine gases (e.g. CO₂, CH₄) may be present within the coal seams, voids in or above any shallow mine workings, areas of made ground/opencast backfill, and in any permeable bedrock strata (and any organic rich surficial soils). The period of monitoring to be undertaken should be broadly completed in accordance with current guidance [BS8485]. Piezometers would need to be installed (during drilling works for example) to facilitate this.