LYONS CMC
COAL MINING & GEOTECHNICAL CONSULTANCY
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Geo2 Remediation Ltd
Coniston House
Louisa Street
Bradford
BD10 8NE

Date: 13th May 2022
Your ref: (HD8 8RF).
My Ref: CMRA 00295

FOR THE ATTENTION OF MR ADAM WILSON

Dear Sir,

COAL MINING RISK ASSESSMENT (CMRA) - FOR PROPOSED RESIDENTIAL DEVLOPMENT AT CUCKSTOOL ROAD, DENBT DALE, HUDDERSFIELD, WEST YORKSHIRE HD8 8RF

Introduction

Planning permission is being sought for the development of four detached dwellings at the above named site, the location of which can be seen on the attached plan No. 00295/A in Appendix 1. The site is centred around national grid reference E: 423312 / N: 408572. 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 Kirklees Council. The applicant has secured and provided a Coal Authority 'Consultants Report' ref: 51002774590001 dated 13th December 2021, which has been taken into account in this report *(note: this was for a larger site area at that time).*

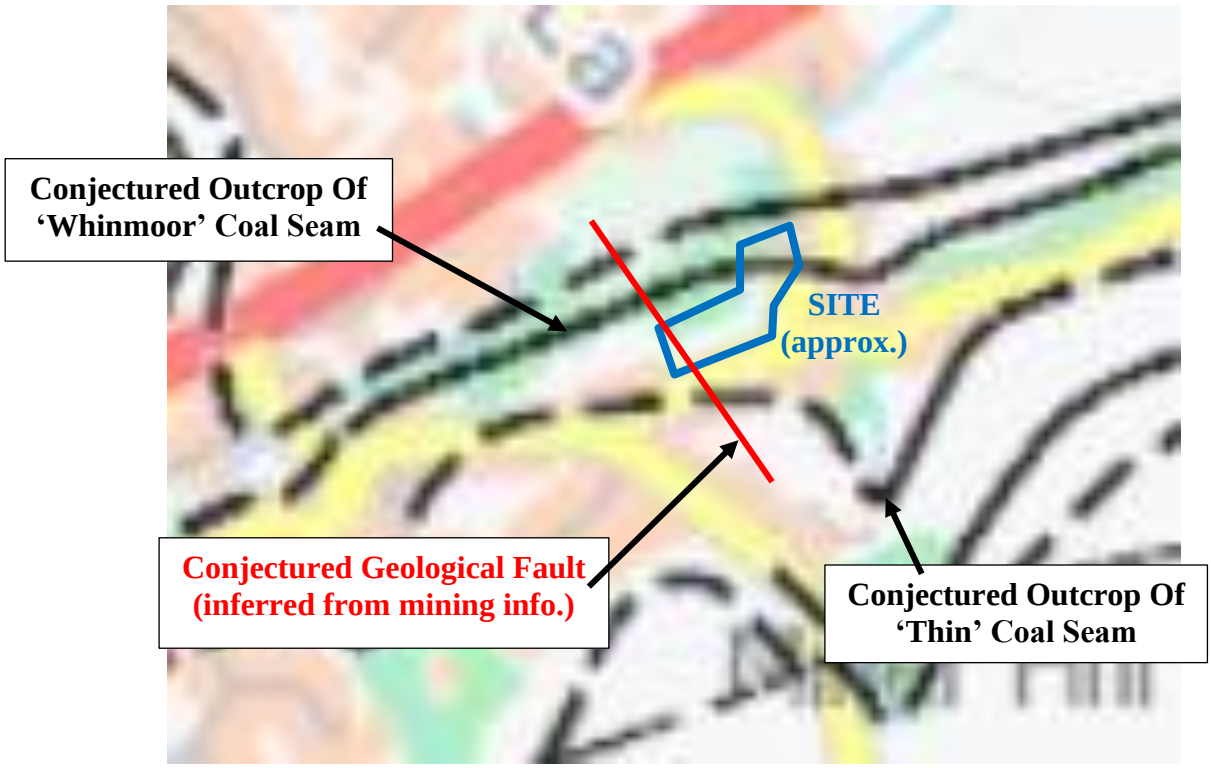
Scope of the Coal Mining Risk Assessment

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 sandstone, shales and mudstones of the Lower Coal Measure series from the Carboniferous formation. No superficial deposits are indicated in the vicinity of the site itself. Strata is shown to dip southwards at a shallow rate of around 1 in 12 (5°) in this vicinity. A summary of the surface geology is illustrated on the image below which is an extract from the BGS Onshore Interactive Viewer:



Fault Planes or Fissures

Given past mining information in the area a geological fault is conjectured to pass through the western edge of the site as indicated, trending in a NNW to SSE direction. This may consist of either a single plane of fracturing or a 'zone' of various such planes in the same orientation. Sandstone bedrock may also contain natural fissures that could have been opened out by the past underground coal mining in the area.

Coal Seam Outcrops

The Whinmoor coal seam is shown to outcrop through the northern part of the site as indicated; however this will be around 30m to the north of the proposed development area as currently planned. This coal is shown to be in the region of 1.6m in thickness with two dirtbands (as detailed below). A thin coal seam is conjectured above the Whinmoor coal seam which will dip

away to the south clear of the site. However, a slight possibility will be present of discovering this coal seam beneath surface soils along the southern boundary of the site.

Given the lay of the land (steep valley side to the river Dearne northwards) the Whinmoor seam is likley to be around 10m to 20m deep beneath the proposed development area – indeed the Coal Authority Consultants Report outlines it as '23m deep' to this coal; although this may related to the known workings on the south-eastern part of the site where it will be deeper.

Made Ground

According to BGS records no made ground is indicated in the vicinity of the site.

Opencast Coal Workings.

No opencast coal operations are known within 250m of the site.

Underground Coal Workings - Deep

No deep coal mining (over 50m deep) has taken place beneath the site 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

The Whinmoor seam is known to have been worked in this vicinity via the mine entries detailed below, which formed the past Denby Dale Colliery just to the north of the development area, abandoned in 1922. The mine adits (tunnel entrances) followed the coal seam beneath the land southwards from where it outcropped along the valley side. Other workings of this seam around 600m west (abandoned in 1877) indicate a seam section of the Whinmoor as:

Coal	22cm
Dirt	15cm
Coal	35cm
Dirt	40cm
Coal	45cm
Total	**157cm**

The Coal Authorities consultants report indicates a similar thickness of 1.65m.

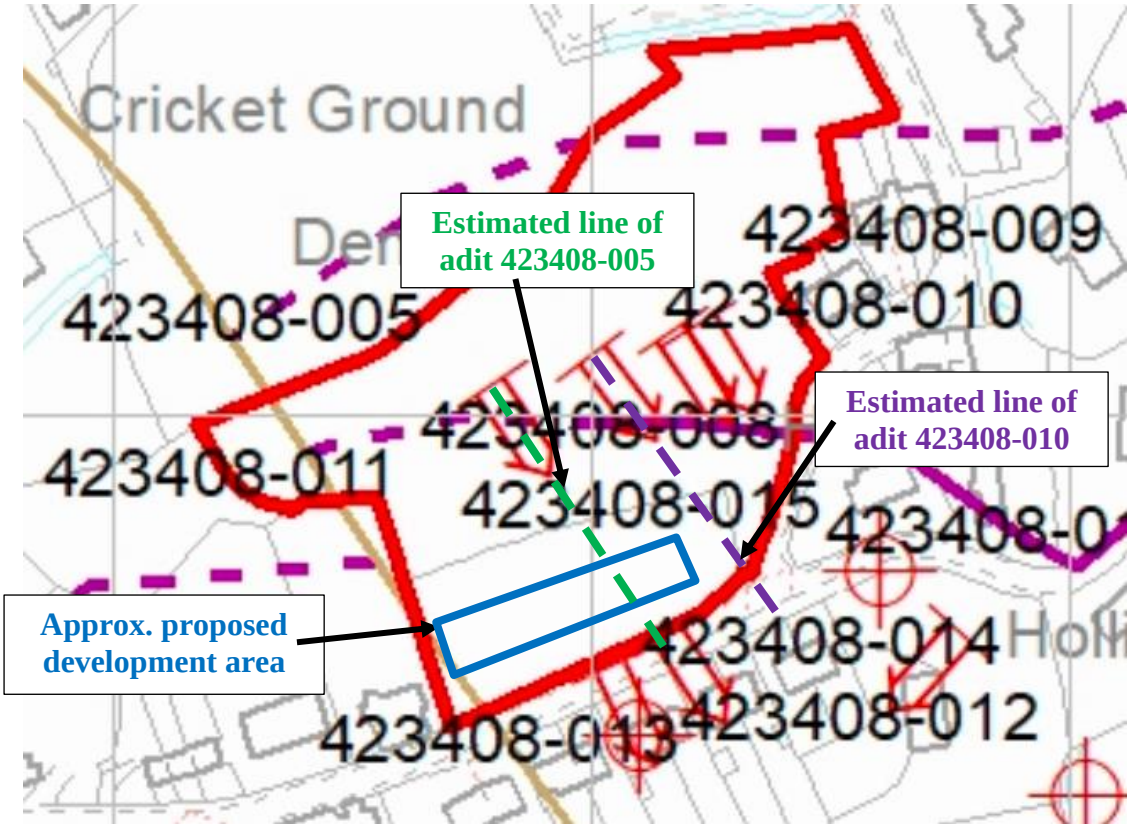
Considering the above, the coal seam may have been worked via pillar and stall methods beneath the site, in which case any old mining voids may compromise stability be they less than 10 times the seam thickness below bedrock/formation levels (in this instance less than 17m deep). The mine adit (tunnel) which is shown to travel beneath the site is likely (no specific details are

apparent) to be in the region of 2m to 2.5m in height; therefore this could have a greater impact on surface stability from possible void migration issues – potentially up to 25m deep beneath bedrock/formation levels.

No other coal seam workings are expected below the Whinmoor seam horizon.

Mine Entries

The recorded mine entries within the vicinity of the site are illustrated in the following image as an extract from the Coal Authorities Consultants Report.



Mine Adit ref: 423408-005 would be estimated to travel beneath the site in the position as shown (CA details indicate an adit angle of 146°, named as 'Denby Dale Colliery Day Hole'; no information as to any treatment).

Mine adit ref: 423408-010 woulkd be estimated to travel clear of the currently proposed development area as illustrated above (CA details indicate an adit angle of 143°, named as 'Denby Dale Colliery'; no information as to any treatment).

Mine adits 423408-012 & 423408-013 are shown just to the south – some potential will exist for discovering made ground along the southern boundary of the site associated with these; or indeed the former 'portal' (tunnel entrance) itself.

It should also be noted that some potential will exist for other mine entries being encountered mine shafts or adits) of which there are no records.

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/coal workings and nearby mine entries.

Historical Records

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

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*	**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 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	*Intrusive Site Investigation **required** of the shallow coal/s and/or mine entries to determine any necessary stabilisation works for the given development.*
Recommended	*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.*
Unnecessary	*Intrusive Site Investigation deemed **unnecessary** – given geological/mining information.*

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 SE 20 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, three aspects will require investigation to determine the actual on-site position. A) the likelihood of any old pillar and stall workings/old mining voids in the Whinmoor coal seam that may require further treatment/design considerations; B) the depth and nature of mind adit 423408-005 which is very likely to travel beneath the site and affect surface stability; and C) that mine adit ref: 423408-010 lies clear of affecting the development. At currently proposed development scale/layouts, between 4 to 8 boreholes (depending on findings on the day) would be recommended to competently ascertain aspect A - whether any old mining voids require further design considerations such as drilling and grouting, piled or strengthened foundations or a combination of such. Once the depth of the Whinmoor seam is determined, a number of boreholes should then be carried out to determine the line and condition of mine adit ref: 423408-005, to again establish what further design considerations will be required. Holes should then extend to at least 5m to the east of the proposed development footprint area to determine that mine adit ref: 423408-010 lies clear of affecting stability or otherwise.

   Re-locating proposed development clear of the mine adit/s will be an option depending on the outcome of the site investigation.

3) Any coal exposed at the surface beneath surface soils will require appropriate considerations for removal and blinding off to help prevent chemical attack on foundations and reduce the risk of spontaneous combustion risks.

4) In terms of the fugitive mine gas risks from the potential shallow coal and nearby mine entry, the only way to prove whether protection measures are or aren't required would be for a period of gas monitoring via boreholes and stand pipes, usually undertaken over a period of 3 to 6 months. Without this investigation it may be a more pragmatic solution to include gas protection measures (such as a methane membrane) within foundation designs in any case.

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

5) A watching brief should be employed during future grounds works for any signs of the mine adit entrances on the southern boundary of the site and indeed any other unrecorded mine entries (shafts or adits) throughout the site as a whole. A site scrape to natural ground is the most effective procedure to check for such features, areas of grey fill within bedrock would be an indication. If suspected the Coal Authority (as owners) should be notified immediately for appropriate deliberations.

6) A watching brief would also be required for any signs of the geological faulting or opened out fissures in sandstone bedrock. Associated ground treatment works may be required to stabilise any such features prior to foundation works.

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.

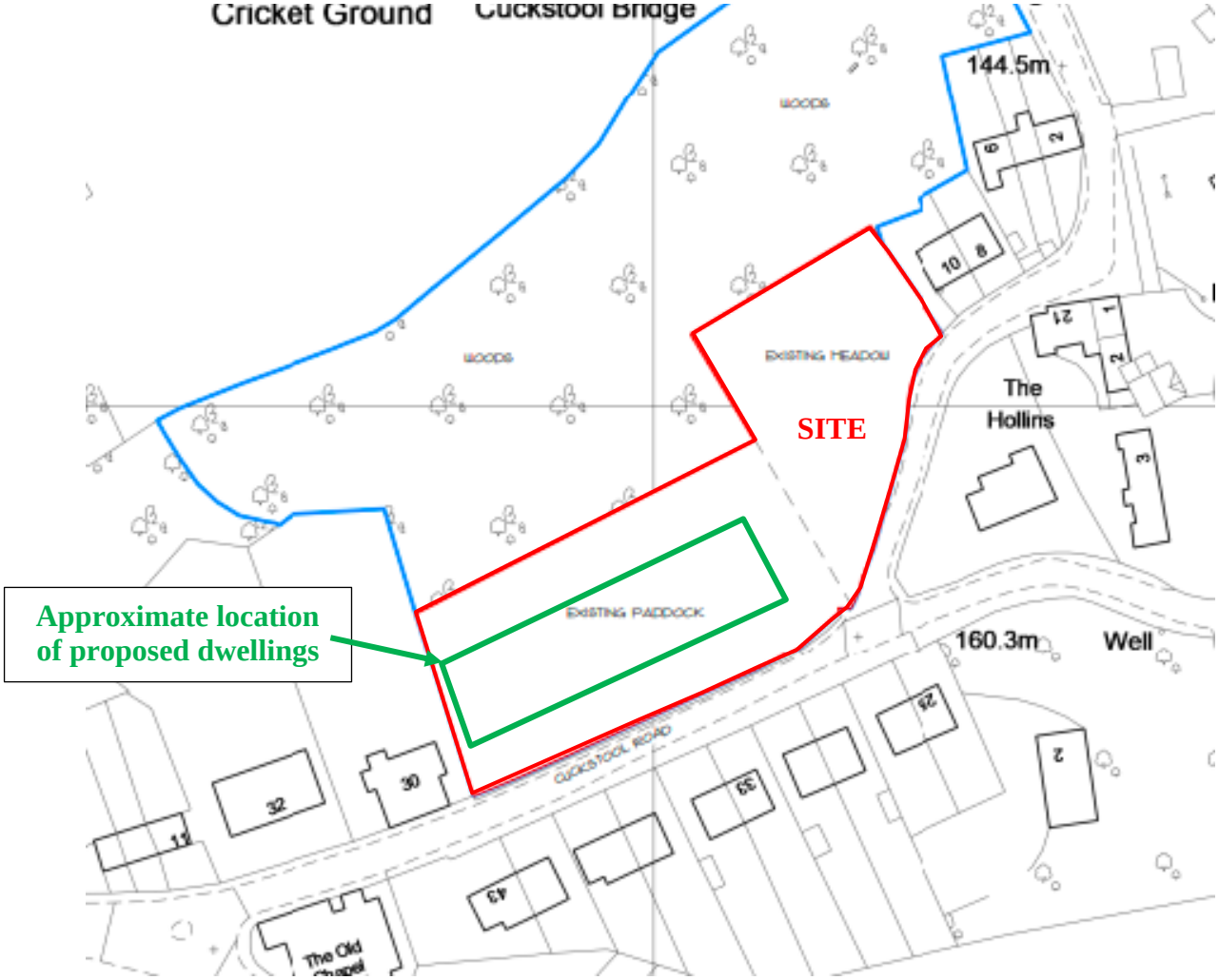
Yours Sincerely,

M Lyons

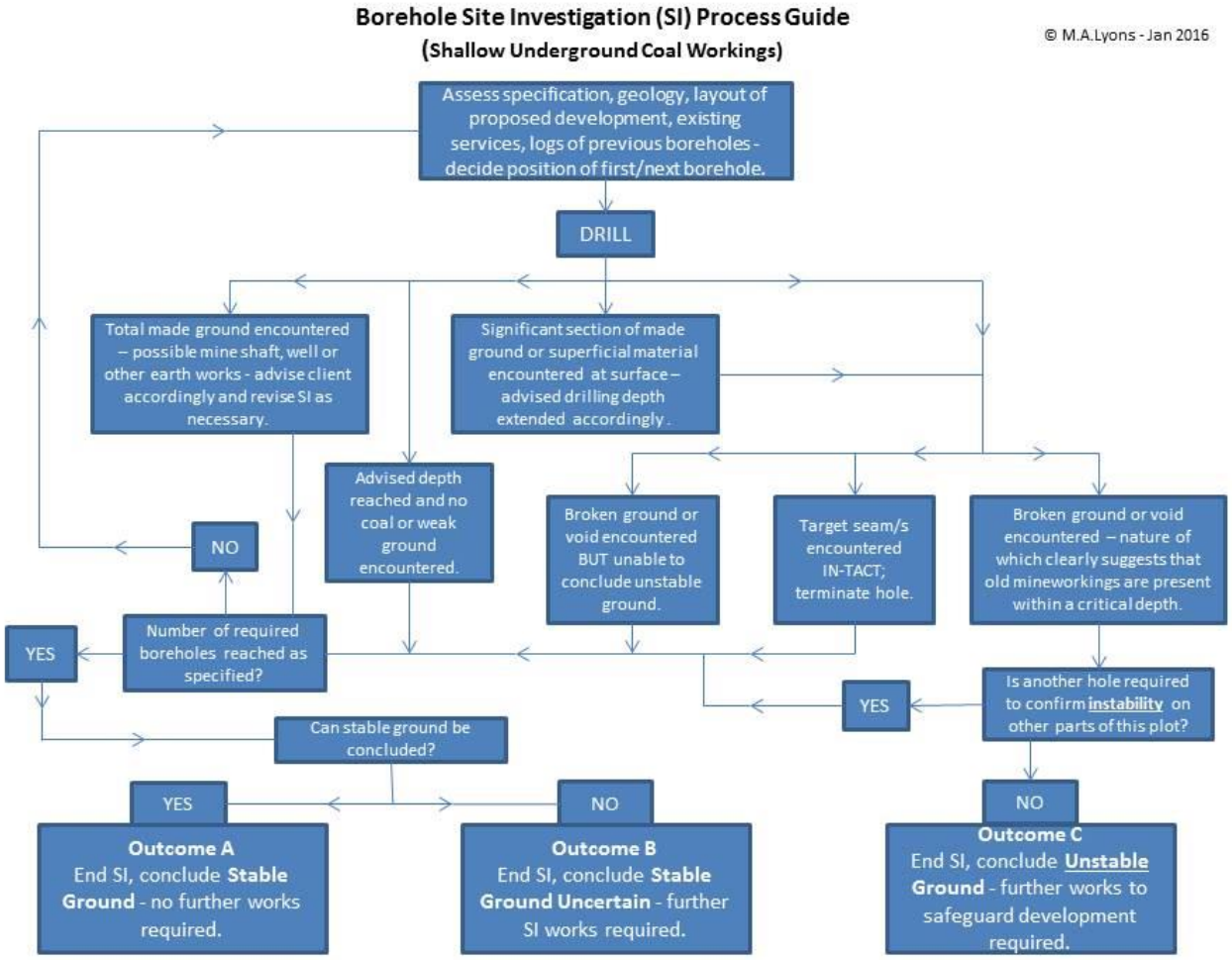
M. Lyons
Consultant Mining Engineer
BSc CSci MIMMM

Enc.

Appendix 1 – Location Plan No. 00295/A
(Not To Scale)
Site centred at OS NGR 423312 / 408572



Appendix 2


Borehole Site Investigation (SI) Process Guide
(Shallow Underground Coal Workings)
© M.A.Lyons - Jan 2016
Assess specification, geology, layout of proposed development, existing services, logs of previous boreholes - decide position of first/next borehole.
DRILL
Total made ground encountered – possible mine shaft, well or other earth works - advise client accordingly and revise SI as necessary.
Significant section of made ground or superficial material encountered at surface – advised drilling depth extended accordingly.
Advised depth reached and no coal or weak ground encountered.
Broken ground or void encountered BUT unable to conclude unstable ground.
Target seam/s encountered IN-TACT; terminate hole.
Broken ground or void encountered – nature of which clearly suggests that old mineworkings are present within a critical depth.
NO
YES
Number of required boreholes reached as specified?
YES
Is another hole required to confirm instability on other parts of this plot?
Can stable ground be concluded?
YES
NO
NO
Outcome A
End SI, conclude Stable Ground - no further works required.
Outcome B
End SI, conclude Stable Ground Uncertain - further SI works required.
Outcome C
End SI, conclude Unstable Ground - further works to safeguard development required.