The Coal Authority

Coal Mining Risk Assessment

For development at: Baggerwood Farm, Bagger Wood Road, Hood Green, Barnsley, S35 7AX

For proposal: Construction of agricultural building

Assessment Summary

Assessment Result	LOW RISK
Recommended Further Work	ADVISORY COAL GAS RISK ASSESSMENT

The Coal Authority works to resolve the impacts of mining by growing its expertise, innovation, organisational capability and efficiency.

It manages the effects of past coal mining, including subsidence damage claims which are not the responsibility of licensed coal mine operators and is an executive non-departmental public body, sponsored by the Department of Business, Energy and Industrial Strategy. This report is valid for 90 days.

Limit of liability

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Any advice provided in this report does not prejudice our position as a statutory consultee.

Version	Compiled	Checked	Date
1.1	PB	HB	14th March 2022

Section 1 – Description of site and proposed development

a) Site location and Description

The Coal Authority has been commissioned to prepare a Coal Mining Risk Assessment Report for a proposed development at Baggerwood Farm, Bagger Wood Road, Hood Green, Barnsley, S35 7AX (see Figure 1), in order to provide the Local Planning Authority with information on coal mining and an assessment of its impact on land stability.

The approximate site centre co-ordinates are E430265, N402247. The proposed development area requires access via Bagger Wood Road. The site has an approximate elevation 182m AOD.

Figure 1: Site location plan



b) Description and layout of proposed development

The Coal Authority understands that the developer plans to construct an agricultural building (see Appendix A).

This report is a revision to the original report, issued on 11/05/2021. The data within the Consultants Coal Mining Report has been checked for updates with no amendments to the Coal Authority's mining database taking place that affect the contents of the original Consultants Coal Mining Report.

c) Scope of 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 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.

Any works that intersect coal mine workings, mine entries or coal seams may have implications for mine gas, spontaneous combustion and surface collapse. Coal Authority permission is required prior to any such works taking place. Further detailed advice can be provided upon request.

The Coal Authority's adopted policies regarding building over or close to mine entries and managing gas risks can be viewed at:

www.gov.uk/government/publications/building-on-or-within-the-influencing-distance-of-mine-entries

www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases

Section 2 – Sources of information used to inform this report

Source reviewed	Yes	No	Remarks
Coal mining report	X		Consultants Coal Mining Report (Appendix B)
Other mining records	X		Abandonment plans – SY95, NE40
Geological plans	X		OS geological sheet SE30SW (1981)
BGS Boreholes		X	
Other	X		BGS GeoIndex, Ratten opencast prospecting site records

The above information sources have been used to provide an assessment of the potential mining risk within the remainder of the report.

Section 3 – Identification and assessment of site specific coal mining related risks

The Coal Authority's search of its detailed coal mining information identifies the following site specific coal mining legacy risks to the site.

Coal mining issue	Reported		Risk assessment	
	Yes	No	Rating	Comment
a) Underground coal mining (recorded at shallow depths)		X	Low risk	None recorded at shallow depths
b) Underground coal mining (probable at shallow depths)	X		Low risk	None considered likely at shallow depths
c) Mine entries (shafts and adits)		X	Low risk	None recorded
d) Coal mining geology (faults and fissures)	X		Medium risk	Fault recorded to pass through site, locally displacing coal seams
e) Record of past mine gas emissions or potential		X	Medium risk	Silkstone coal recorded to be prone to spontaneous combustion. All mine workings pose a potential gas risk which should be considered in any future investigations and development
f) Recorded coal mining surface hazard		X	Low risk	None recorded
g) Surface mining (opencast workings)	X		Low risk	Opencast site recorded 225m northeast of the development site boundary not considered to be of influence to development

A desk based study of the coal mining information has been used to risk assess the coal mining features above. A summary of the risk posed by these features is summarised after thorough analysis of the information sources. Comment on each specific coal mining issue follows below:

a) Underground Coal Mining (recorded at shallow depths)

Coal mining at depths shallower than 30m beneath ground level can typically pose challenges to ground stability at the surface. The magnitude of this effect depends

upon the exact depth of any workings, the thickness of competent rock cover and the extraction thickness of any coal mine workings.

The Coal Authority Consultants Coal Mining Report in Appendix B states that the development site is not in an area of recorded shallow coal mine workings.

The Consultants Coal Mining Report records two seams of coal to have been worked beneath the property; the Silkstone coal at 48m depth, last worked in 1871 with a recorded extraction thickness of 1.67m and the Whinmoor coal at 91m depth, last worked in 1865 and with a recorded extraction thickness of 0.71m. The Whinmoor coal is also recorded worked north of the site at 98m depth, last worked in 1967.

The workings in the Silkstone coal are shown on abandonment plan SY95 'Unnamed Colliery' with the entire site shown to be underworked. The plan does not record a seam thickness or depth to workings in the vicinity of the site and it is unclear as to where the figures quoted within the Consultants Coal Mining Report have been sourced from. The generalised vertical section (GVS) on the OS geological sheet SE30SW (1981) records the Silkstone seam to be between 0.62-2.08 in thickness in the area. The sheet does not record the seam to outcrop in the vicinity of the site however does record the overlying seam (the Silkstone Four Foot seam) to outcrop approximately 115m west, with the outcrop being shown as approximately curvilinear, displaced by a fault orientated approximately NE-SW and shown to throw to the north. The outcrop is recorded to be present at an elevation of approximately 187m. The GVS records the Silkstone Four Foot seam to be approximately 40m above the Silkstone coal. The geological sheet records the Silkstone Four Foot seam to dip at 9° to the northeast to the south of the site, placing the seam at an additional 13m depth beneath the site when the difference in elevation is considered, placing the Silkstone seam at approximately 53m depth. It is therefore considered likely that the depth recorded within the Consultants Coal Mining Report is approximately accurate.

Consequently the risk to this development from underground coal mining (recorded at shallow depths) is considered to be low.

b) Underground coal mining (probable at shallow depths)

Areas of probable shallow coal mine workings are identified as part of the Development High Risk Area for which no recorded plan exists, but where it is likely that workable coal at shallow depths has been mined before records were kept. The data has been estimated from available mining records by qualified mining surveyors. Since 1872 there has been a law that requires all coal mine operators to deposit working plans of the mine with the government following the cessation of operations. Prior to this date the plans were often destroyed or kept in private ownership.

Where the extraction of coal has occurred there is the potential for voids to remain long after mining has ceased. The depth of workings generally dictates the length of time that significant voids may remain, but other factors including the size of mine roof supports and the competency of overlying strata can influence the time for natural consolidation to occur. Waste material produced during mining was sometimes used to backfill abandoned sections of mine workings, therefore

reducing the volume of open cavities or voids that remain. The method of backfilling workings is typically not recorded and cannot be relied upon as a satisfactory form of remediation.

The Coal Authority Consultants Coal Mining Report in Appendix B states that the development site is in an area of probable shallow coal mine workings. As discussed within section 3a it is anticipated that the Silkstone Four Foot coal will be present beneath the site at around 13m depth. The seam is recorded on sheet SE30SE to be between 0-1.07m in thickness and outcrops approximately 115m west of the site. Old workings in the seam are recorded on the geological sheet 130m north of the site, close to the outcrop.

The site report for the Hood Green (Ratten) opencast prospecting site was reviewed in the making of this coal mining risk assessment. The files record a number of boreholes to have been drilled in the vicinity of the development site boundary, summarised below:

BH Reference	Distance to site	Depth	Depth to rockhead	Depth to base of coal	Thickness of coal	Notes
A13	10m S	26ft 9in (8.15m)	1ft (0.3m)	25ft 2in (7.67m)	1ft 2in (0.36m)	Seam intact
A17	25m N	30ft (9.14m)	1ft (0.3m)	NA	NA	No coal seams, workings, or voids
A18	12m E	49ft (14.94m)	1ft (0.3m)	NA	NA	No coal seams, workings, or voids
A20	Within	45ft (13.72m)	1ft (0.3m)	NA	NA	No coal seams, workings, or voids

Other comments of note within the report include the statement "The Silkstone Four Feet seam was located but probed too thin to warrant working (presumed by opencast methods) and "old workings in Silkstone Four Feet seam were recorded in one borehole (DH25 Ratten) in Area 'A' which is near an old shaft" (DH25 approx. 600m east of development site area). It is therefore concluded that the Silkstone Four Feet seam has not been worked beneath the development site boundary and consequently the risk to the proposed development from this seam is low.

The Claywood Ironstone is recorded within the GVS to be present between the Silkstone Four Foot and Silkstone seams, approximately 20m below the Silkstone Four foot seam. No thickness is recorded for the seam however given the Silkstone Four Foot seam is considered unlikely to be worked beneath the development site boundary, it is considered sufficient competent cover will likely exist above this seam.

Consequently the risk to this development from underground coal mining (probable at shallow depths) is low.

c) Mine entries (shafts and adits)

The Coal Authority Consultants Coal Mining Report in Appendix B shows no mine entries are recorded within 100m of the development site.

The development site sits within a historical mining area and therefore there is a residual risk of unrecorded mine entries to be present on site. All site operatives should be made aware of this potential risk and a watching brief should be maintained during site works.

Consequently the risk to this development from mine entries (shafts and adits) is low.

d) Coal mining geology (Faults and fissures)

The development site sits upon the Pennine Lower Coal Measures Formation, consisting of coal, sandstones, siltstones and mudstones. No BGS boreholes are available in the vicinity of the site, however a section on the Stainborough Fold opencast site abandonment plan (NE40) records 1ft (0.31m) of soil overlying sandstone at the site, with the boundary recorded 225m northeast of the development site boundary.

The Consultants Coal Mining Report records a fault to pass through the development site boundary, shown to locally displace coal seams. This fault is orientated northeast-southwest and downthrown to the north.

Faults can act as pathways for gas and water, cause surface instability and result in dissimilar coal conditions/hazards due to their relative displacement of strata.

e) Record of past mine gas emissions or potential

There are no recorded past gas emissions recorded in the surrounding area, however, coal seams and coal mine workings pose a potential gas risk which should be considered in any future investigations and development. At development sites with shallow coal workings, probable shallow coal mine workings, or pathway features such as mine entries and geological disturbances on or nearby the site, the Coal Authority recommends that a more detailed gas risk assessment to be undertaken in accordance with relevant guidance.

The Silkstone coal is known to be liable to spontaneous combustion and precautions should be taken in case of such an incident during all ground works at the site.

f) Recorded coal mining surface hazard

None recorded.

g) Surface mining (opencast workings)

The Coal Authority Consultants Coal Mining Report in Appendix B records an opencast site to be present 225m northeast of the development site boundary. Due to the distance between the site and the opencast boundary it is not considered to influence the proposed development. Consequently the risk to this development from surface mining (opencast workings) is low.

Section 4 – Proposed mitigation strategy

a) Site investigation and/or remediation

After a thorough desk based review of the available evidence, it is probable that the development site has not been subject to the influence of coal mining legacy features. Accordingly, an intrusive site investigation will not be required.

The Silkstone coal is known to be liable to spontaneous combustion and precautions should be taken in case of such an incident during all ground works at the site.

Guidance on drilling or piling through coal can be found at:

www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases

Due to the difficulties in identifying coal related gas hazards, it may be prudent to consider completing a gas risk assessment for the development site. This may recommend basic gas protection measures within the foundation design, which are resistant to permanent gases (carbon dioxide, methane, carbon monoxide) and comparable to that suggested in BR211, as commonly used to protect against radon in residential properties.

Where development is proposed over areas of coal or past coal workings at shallow depth, developers should consider wherever possible removing any remnant shallow coal. This will enable the ground to be stabilised and remove a hazard prior to construction of any foundations associated with the development. Prior extraction of surface coal requires an Incidental Coal Agreement from the Coal Authority. Further information can be found at:

www.gov.uk/get-a-licence-for-coal-mining

Should coal seams be found, at or near the depth of the development's foundations, they may pose a risk of spontaneous combustion if exposed to air or may act as pathways for ground gases to reach the development. A competent engineer should be consulted if coal is encountered in, or adjacent to, the foundations of the proposed development.

Concrete, cements and renders may be susceptible to attack from elevated levels of sulfates in the ground. The Building Research Establishment reports that most cases of sulfate attack occur in and adjacent to coal field areas and related industrial centres. It would be prudent for the issue of sulfate attack to be considered during the foundation design to ensure they comply with the Building Regulations 2010.

You may also wish to refer to the Construction Industry Research and Information Association (CIRIA) publication C758 "Abandoned Mine Workings Manual".

b) Coal Authority permit

Any intrusive activities, including initial site investigation boreholes and any subsequent treatment of coal mine workings/coal mine entries for ground stability purposes require the prior written permission of the Coal Authority. Application forms for Coal Authority permission and further guidance on this matter can be obtained from the Coal Authority's website at:

www.gov.uk/get-a-permit-to-deal-with-a-coal-mine-on-your-property

Follow on services can be requested using the details in the contacts section.

Section 5 – Conclusions

This report has identified that the proposed development site is not known to have been subject to past coal mining activity that will influence the development. The risk to the site from legacy mining features is low.

The Coal Authority advises the developer undertake a detailed Gas Risk Assessment where proposed development occurs over shallow coal reserves as is the case here.

Section 6 – Contacts

Planning and Local Authority Liaison Service

Tel: 01623 637 119

Email: planningconsultation@coal.gov.uk

Website: www.gov.uk/planning-applications-coal-mining-risk-assessments

Surface Hazards Emergency Service

Tel: 01623 646 333 (open 24 hours a day, 7 days a week)

24-hour number for reporting public safety hazards and incidents associated with coal mining

Mining Reports Service

To purchase site specific coal mining information go to our website;

www.groundstability.com

Licensing and Permitting Service

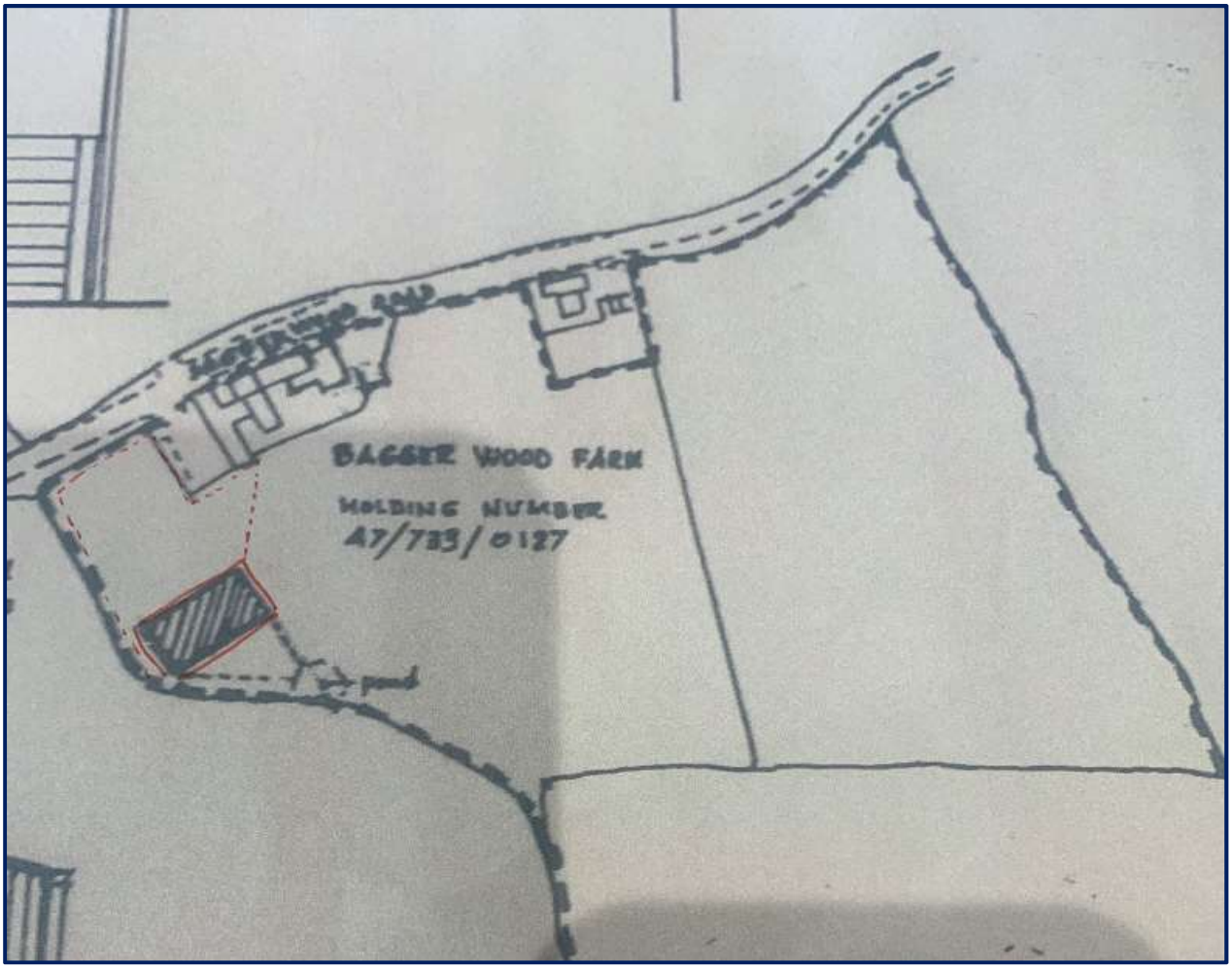
Email: permissions@coal.gov.uk

Tel: 01623 637 320

For permission to enter or disturb coal mine entries and coal seams.

Section 7 – Appendices

Appendix A – Plan showing proposed development layout



Appendix B – Non-Residential Coal Mining Consultants Report