Coal Mining Risk Assessment

LOCATION
Proposed Development, 3a Bear Lane Close, Polesworth, Warwickshire, B78 1BH

ISSUE DATE
March 2017

FOR
Mr John Garry

CLIENT REF.

OUR REF.
G17073

Prepared by
Ross Nicolson BSc(Hons) MSc(Eng) CEng MIMM
Principal Geotechnical Engineer

1. INTRODUCTION

Name of Applicant: John Garry

Issuing Company: Geoinvestigate Ltd, Units 4 & 5, Terry Dicken Industrial Estate, Stokesley, North Yorkshire TS9 7AE

Competent Person: Ross Nicolson BSc (Hons.) Eng. Geol., MSc Eng., CEng IOM3 - Principal Geotechnical Engineer

Site Location and Description:

National Grid Reference SK 26470 02881 denotes the approximate centre of the property. No visit has been made to the site to confirm its current surface condition or that of the surrounding area.

The development comprises the erection of an end terrace house at the side of a No 43a Bear Lane, Polesworth. The small plot on which the new building is located is some 22m x 6m width.

Ground level at the site is about 70m or 71m AOD. Ground level rises gently to the east and falls to the west.

A review of historical OS maps dating back to 1885 show the site was a field in 1885 becoming part a football ground by 1939 then a large housing estate by 1972. The earliest maps show Pooley Hall Colliery to the northwest of the site and a pond or spoil heap to the east of the site near a railway cutting. The map record shows no surface evidence indicative of coal mining within the site or nearby it.

The boundary shown in red on the CA Mining Report attached corresponds with the planning application.

Description & Layout of Proposed Development:

It is proposed to add a 2 storey side extension to the existing house at No 43a.

Risk Methodology Applied

This document and the risk assessment methodology adopted herein is based on CA publication RISK BASED APPROACH TO DEVELOPMENT MANAGEMENT - GUIDANCE FOR DEVELOPERS Version 3, 2014 and Version 4 - 2017. The template contained therein is adopted with minor amendments made by Geoinvestigate Limited.

Scope of the Coal Mining Risk Assessment

The purpose of this Coal Mining Risk Assessment Report is to:

- Present a desk-based review of selected items of available information reviewed 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 further intrusive site investigation works and/or 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.

2. SOURCES OF INFORMATION USED TO INFORM THIS REPORT
The following sources of information have been used and form the basis of the risk assessment of coal mining issues provided in this report. Relevant reports/extracts have been appended.

- An up-to-date Coal Mining Report from the CA dated 27th February 2017 referenced 5100138418001.
- Geological information on the bedrock and superficial geology obtained from the British Geological Survey (BGS) Sheet 155 Coalville at 1:50000 scale.
- The Coal Authority’s online interactive map viewer.
- A site history based on limited Ordnance Survey map records of the area dating back to 1885.
- Historic borehole logs obtained from the BGS archive.
- Google Street View and Satellite images.

3. IDENTIFICATION AND ASSESSMENT OF SITE SPECIFIC COAL MINING ISSUES

The table below summarises the potential risks associated with coal mining legacy for the proposed development site, identified from list sources of information.

<table>
<thead>
<tr>
<th>Coal Mining Issues</th>
<th>Yes</th>
<th>No</th>
<th>Risk Assessment/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past underground coal mining</td>
<td>Yes</td>
<td>No</td>
<td>CA’s past underground coal mining table records workings in the Doubles coal seam at 125m and the Bench coal seam at 130m. As both seams lie at considerable depth their impact on surface stability is assessed to be low risk.</td>
</tr>
<tr>
<td>Probable unrecorded shallow workings</td>
<td>Yes</td>
<td>No</td>
<td>The CA define Probable Workings as underground workings for which no recorded plan exists but where it is likely that workable coal at shallow depths has been mined before records were kept. Further consideration required of impact of shallow mining on surface stability in site area</td>
</tr>
<tr>
<td>Outcrops</td>
<td></td>
<td></td>
<td>No faults, fissures or break lines recorded</td>
</tr>
<tr>
<td>Spine roadways at shallow depth</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Future underground mining</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>License details (AOR)</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Section 46 notices</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Geology</td>
<td></td>
<td></td>
<td>No faults, fissures or break lines recorded</td>
</tr>
<tr>
<td>Mine entries</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Court orders</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Worked out opencast sites</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Coal mining related hazards</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Coal mining subsidence</td>
<td></td>
<td></td>
<td>The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, since 31 October 1994. There is no current stop notice delaying the start of remedial works or repairs to the property. The Coal Authority is not aware of any request having been made to carry out preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.</td>
</tr>
</tbody>
</table>

Note For those coal mining issues above identified as “yes” a more detailed discussion and assessment should be made of the risks, both individually and cumulatively, to the application site and the proposed development.

DETAILED DISCUSSION & ASSESSMENT RESPONSE

1. The Coal Authority’s interactive map viewer shows the site falls within a Development High Risk Area (DHRA) which raises serious concerns about ground instability arising from mine workings and hazardous mine gases as well as other potential coal legacy hazards.
2. The site falls within an area where there are probable unrecorded shallow coal mine workings. Whether mine workings exist or not beneath the site and at what depth they lie is unknown.
3. The CA defines Probable Workings as underground workings for which no recorded plan exists but where IT IS LIKELY that workable coal at shallow depths HAS BEEN MINED before records were kept.
4. The CAs interactive mine entry plan shows that there are no mine shafts in close proximity to the site nor within it.
5. No coal outcrops are shown beneath the site or in close proximity to it.
6. The position of the site is shown on the geological map provided in Appendix B.
7. The tentative elevation of the site relative to the vertical geology column is shown on the map inset.
8. The site is shown to be underlain by an unknown thickness of Glacial Till of diamicton and possibly of boulder clay type.
9. The positions of borehole logs SK20SE/4 and 44 are shown on the geology map. Their logs are presented in Appendix C.
10. A geological fault is present to the east of the site.
11. Information on coal geology beneath the development site can be extrapolated from SK20SE/4 to the site as both positions occur along more or less the same strike and on the same downthrown side of the fault.
12. Drift depths of 5.12m and 11.43m (8.27m ave. depth) were encountered in boreholes 44 and 4 respectively.
13. An interpretation of the vertical coal geology beneath the site is presented in Appendix D. This has been constructed using the CAs depth of 125m for the Double Coal Seam, by measuring the heights of the coal seams above the Double using the scaled vertical geology column and by using the coal seam depths provided by borehole SK20SE/4. As can be seen there is good correspondence between both sets of information. The ‘Smithy’ coal seam is also known as the Low Main (LM) ties up well.
14. Based on the foregoing, the top of the ELL coal seam (1.37m thickness) would be expected to occur at a depth of 26.3m below the development site and the Slough coal seam (0.8m thick.) at 41.2m. Both seam thicknesses are mineable.
15. The thin ‘Smut’ at 17.9m depth possibly refers to weathered soft coal. This coal seam is underlain by 1.7m thickness of fireclay and may correspond with the Ryder (R) coal seam. This seam being of poor quality and thin < 0.16m is unlikely to have been worked beneath the site.
16. The TWO Yard (2YD) and Bare (BA) coal seams are missing in SK20SDE/4 because they have been removed by geological processes 1000s of years ago to be replaced by drift deposit.
17. On the assumption that the development site is underlain by 8.27m thickness of drift (probably of boulder clay type) followed by the top of the ELL at 26.3m there would be 18m or rock cover above the 1.4m thick ELL seam and any mine workings it may contain.
18. The general rule of thumb for stability to exist whereby crown hole migration is unlikely to reach surface requires that the thickness of rock cover ≥ 10 x coal seam thickness. In this instance this condition is met and exceeded. Consequently were mine workings to exist in the ELL they would not significantly impact the surface stability of the proposed building development. Even if drift depth was to increase to 12m the site would still be safe.
19. Neither would workings in the underlying Slough coal at 41.2m depth affect surface stability.
20. Hazardous gases associated with coal seams and underground coal workings are unlikely to pose a significant risk to the development in this instance because firstly typically across the UK coalfields gas is rarely a problem, secondly with regard to this property there is no record of a site specific gas problem and thirdly there is no geological faulting beneath the site or in close proximity to it which might otherwise provide a favourable pathway for gas migration to the surface. In addition it the site is likely to underlain by very low permeability boulder clay which will further inhibit upward gas movement.
21. Given the foregoing favourable outcomes of this CMRA it is our opinion that there is reasonable confidence that coal mining legacy and hazardous gas do not pose significant hazards to the proposed surface development. As a consequence NO further exploratory drilling or other mitigation measures are required with regard to coal mining legacy.
22. The risk of additional or other mine entries occurring within the site is considered by us to be Very LOW but not negligible. If an additional mine entry/s are found during subsequent shallow geotechnical investigation or at the start of the construction groundworks the appropriate remedial action can be taken then including notifying the Coal Authority.
23. In light of the foregoing this CMRA desk study has been able to show with reasonable confidence that there are NO significant coal mining stability or gas hazards to the proposed development which is SAFE.

24. Consequently NO further exploratory drilling or other mitigation measures are required.

4. MITIGATION STRATEGY PROPOSED

Notes This section is the key part of the Coal Mining Risk Assessment Report. It should explain how the coal mining issues have influenced the proposed layout and design of the development. The mitigation strategy will set out and illustrate with plans where necessary how the on-site issues identified in section 3 will be dealt with to ensure safety and stability of the development. This should include the assessment of mine gas and the necessary mitigation measures required as necessary. You may wish to refer to the Construction Industry Research and Information Association (CIRIA) publication Special Publication 32 “Construction over Abandoned Mine Workings”

Where the desk-based assessment cannot conclude with certainty the extent of the coal mining risks on the site; details of further proposed on-site intrusive investigation works should be set out.

However, it is of paramount importance that this does not simply evade the issue and therefore place the Local Planning Authority in a position where it cannot be satisfied that coal mining legacy could give rise to some doubt that planning permission could not be granted.

MITIGATION RESPONSE

1. NONE REQUIRED. THE SITE IS SAFE.

5. CONCLUSION

Notes The Coal Authority would expect the Coal Mining Risk Assessment Report to conclude with a brief summary of risks and the remedial measures required for the proposed development site. The report should demonstrate a clear strategy for addressing the coal mining legacy and how the requirements of national planning policy with regard to development on unstable land have been addressed.

OUR RESPONSE

The Coal Authority have identified this site as falling within a Development High Risk Area (DHRA) where there is potentially a serious risk to surface development from mining related ground instability and hazardous mine gases arising from past coal mining legacy.

The site is identified by the Coal Authority as one where there is probable shallow coal mine working and where according to the Coal Authority it is likely that workable coal at shallow depths has been mined before records were kept.

Notwithstanding this CMRA outcome has confirmed with reasonable confidence that there is NO significant impact on the proposed development from coal mining legacy and the site is SAFE.

In conclusion we see no reason why Planning Permission should not be granted with regard to coal mining legacy.
Appendices:

B. Extract of Geological Map, Sheet 155 Coalville. Superficial and Bedrock Geology @ 1:50000 scale.
C. BGS logs SK20SE/4 & SK20SE/44
D. Tentative coal geology section constructed using stratigraphic column and SK20SE/4

Other historical OS maps, borehole logs, site images and photographs have not been included because it was considered that they did not provide significant useful additional information.
Non-Residential Coal Mining
Consultants Report

43A BEAR LANE CLOSE, POLESWORTH, WARWICKSHIRE, B78 1BH

Date of enquiry: 27 February 2017
Date enquiry received: 27 February 2017
Issue date: 27 February 2017

Our reference: 51001383418001
Your reference: G17073
Non-Residential Coal Mining Consultants Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name
GEOSTABILITY

Enquiry address
43A BEAR LANE CLOSE, POLESWORTH, WARWICKSHIRE, B78 1BH

How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

© The Coal Authority
Non-Residential Coal Mining Consultants Report, reference 51001383418001
Detailed findings

Past underground coal mining

<table>
<thead>
<tr>
<th>Colliery</th>
<th>Seam</th>
<th>Mineral</th>
<th>Panel</th>
<th>Depth (m)</th>
<th>Direction to working</th>
<th>Disposition</th>
<th>Extraction thickness (cm)</th>
<th>Year</th>
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<tbody>
<tr>
<td>NORTH WARWICK</td>
<td>DOUBLES</td>
<td>Coal</td>
<td>4TNQ</td>
<td>125</td>
<td>Beneath Property</td>
<td>0.0</td>
<td>127</td>
<td>1939</td>
</tr>
<tr>
<td>NORTH WARWICK</td>
<td>BENCH</td>
<td>Coal</td>
<td>4TNS</td>
<td>130</td>
<td>Beneath Property</td>
<td>0.0</td>
<td>137</td>
<td>1934</td>
</tr>
</tbody>
</table>

Probable unrecorded shallow workings
Yes.

Outcrops
None recorded.

Spine roadways at shallow depth
None recorded.

Future underground mining
None recorded.

Licence details (AOR)
None recorded.

Section 46 notices
None recorded.

Geology
No faults, fissures or breaklines recorded.

Mine entries
None recorded.
**Court orders**
None recorded.

**Worked out opencast sites**
None recorded.

**Coal mining related hazards**
None recorded.

**Coal mining subsidence**
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There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.
Enquiry boundary

**Key**
Approximate position of enquiry boundary shown

---

**How to contact us**

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

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VAT receipt

Issued by
The Coal Authority
200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

Tax point date
27 February 2017

Issued to
GEOINVESTIGATE
TERRY DICKEN INDUSTRIAL ESTATE
TERRY DICKEN INDUSTRIAL ESTATE,
ELLERBECK WAY
STOKESLEY
NORTH YORKSHIRE
TS9 7AE

Property search for
43A BEAR LANE CLOSE
POLESWORTH
WARWICKSHIRE
B78 1BH

Reference number
51001383418001

Date of issue
27 February 2017

Cost
£100.00

VAT @ 20%
£20.00

Total received
£120.00

VAT registration
598 5850 68
APPENDIX B
GEOLOGY MAP

SITE GL 70m

SK205E/4 GL @ 67m AOD
Drift depth 11.48m
ELL coal (1.37) @ 43.7m AOD
Slough coal (0.8) @ 28.8m

SK205E/44 GL @ 76m AOD
Drift to 5.32m depth

Elevation of site relative to vertical geology column
**APPENDIX C**

**BOREHOLE LOGS**

---

**GEOLOGICAL SURVEY OF GREAT BRITAIN**

**RECORD OF SHAFT OR BORE FOR MINERALS**

<table>
<thead>
<tr>
<th>Name of Shaft or Bore given by Geological Survey:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>For whom made:</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Towns or Village:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Exact site:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Purpose for which made:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Ground Level at bore relative to O.D.:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Made by:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Information from:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Examiner:</th>
</tr>
</thead>
</table>

---

**SPECIMEN NUMBERS AND ADDITIONAL NOTES**

Polsworth Colliery.

From a paper by the Rev. James Varley in the Geol. Trans., vol. II, p. 291. The section was furnished by Dr. Power, of Lichfield.

---

**RISINGS AND BORINGS**

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Depth</th>
</tr>
</thead>
</table>

---

**APPENDIX C**

**BOREHOLE LOGS**
GEOL O GICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

Name and Number given by owner:

For whom made:

Town or Village: County:

Exact site: Attach a tracing from a map, or a sketch-map, if possible.

Purpose for which made:

Ground Level of shaft relative to O.D. If not ground level give O.D. of beginning of shaft

Made by: Date of sinking:

Information from: Date received:

Examined by:

SPECIMEN NUMBERS AND ADDITIONAL NOTES

Polesworth Colliery.

MESSRS. HOW AND CO.'S PIT NEAR THE RAILWAY STATION.

FROM REV. W. H. COLEMAN'S MSS.

<table>
<thead>
<tr>
<th>Strata</th>
<th>Thickness</th>
<th>Depth</th>
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</thead>
<tbody>
<tr>
<td>Coal</td>
<td>16 0</td>
<td>9</td>
</tr>
<tr>
<td>Gravel and sand</td>
<td>2 0</td>
<td></td>
</tr>
<tr>
<td>Blue band</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chalk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue band</td>
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<td>Stony band</td>
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<td></td>
</tr>
<tr>
<td>Strong blue stone</td>
<td>2 0</td>
<td></td>
</tr>
<tr>
<td>Blue band</td>
<td>10 0</td>
<td></td>
</tr>
<tr>
<td>Coal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong band</td>
<td>1 0</td>
<td>55 10</td>
</tr>
<tr>
<td>Soft band</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chapel and bat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stony clunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stony bed; ironstone balls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Church and bat; ironstone balls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong band</td>
<td>10 0</td>
<td>58 3</td>
</tr>
<tr>
<td>Coal</td>
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<td></td>
</tr>
<tr>
<td>Smithy coal</td>
<td>2 4</td>
<td>155 9</td>
</tr>
<tr>
<td>Chalk</td>
<td>4 0</td>
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<tr>
<td>White sandstone</td>
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<tr>
<td>Blue band</td>
<td>1 0</td>
<td>176 9</td>
</tr>
<tr>
<td>White stone</td>
<td>3 0</td>
<td></td>
</tr>
<tr>
<td>Blue band; ironstone</td>
<td>21 6</td>
<td></td>
</tr>
<tr>
<td>Blackstone</td>
<td>2 0</td>
<td></td>
</tr>
<tr>
<td>Soft blue band</td>
<td>10 0</td>
<td>176 9</td>
</tr>
<tr>
<td>Coal</td>
<td>1 0</td>
<td></td>
</tr>
<tr>
<td>Dark coloured clunch</td>
<td>5 0</td>
<td></td>
</tr>
<tr>
<td>Dark coloured clunch</td>
<td>6 0</td>
<td></td>
</tr>
<tr>
<td>Coal, Main or Seven-Foot Coal</td>
<td></td>
<td>180 9</td>
</tr>
</tbody>
</table>
APPENDIX D
TENTATIVE VERTICAL
COAL GEOLOGY

[Diagram showing geology column with various seam heights and estimated depths of coal seams below site.]

Coal Geology