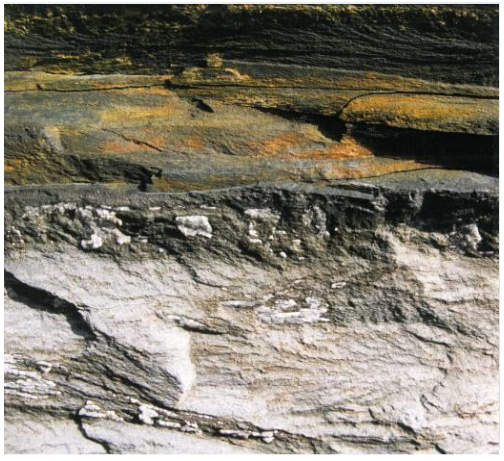
Inchmuir Road, Bathgate

Mining Stability Report Including Coal Mining Risk Assessment

April 2021



JWHROSS

CONTROL SHEET

CLIENT: Campbell of Doune Ltd

PROJECT TITLE: Inchmuir Road, Bathgate

REPORT TITLE: Mining Stability Report including Coal Mining Risk Assessment

PROJECT REFERENCE: 142968/GL/J/R1

Issue and Approval Schedule:

ISSUE 1	Name	Signature	Date
Prepared by	Stuart Tennant Mining Engineer	Signed copy held on file	26/04/2021
Reviewed by	Dave Milne Principal Mining Engineer	Signed copy held on file	26/04/2021
Approved by	Alan Blair Partner	Signed copy held on file	26/04/2021

Revision Record:

Issue	Date	Status	Description	By	Chk	App
2						
3						
4						
5						

This document has been prepared in accordance with procedure OP/P02 of the *Fairhurst Quality and Environmental Management System*

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CONTENTS

Appendices

1.0 Title

Report relative to the mining stability under and adjacent to the site of the proposed development at Inchmuir Road, Bathgate (including Coal Mining Risk Assessment).

2.0 Instructions

This Report has been prepared by JWH Ross in accordance with the instruction of Messrs. Campbell of Doune Ltd; email dated 31st March 2021 refers.

The extent of past mining in minerals other than coal, e.g., ironstone, fireclay and limestone, within Central Scotland is considerable, and often overlooked. This report addresses mining stability in relation to all mineral extraction. It is particularly noted that subsidence damage caused by the extraction of minerals other than coal is not covered by the Coal Mining (Subsidence) Act 1991.

This Report includes a Coal Mining Risk Assessment, as may be required under the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008, where a project is located within a Coal Mining Development Referral Area.

3.0 Limitations

This Report is for the private and confidential use of the Client(s) for whom the Report is undertaken and should not be reproduced in whole or in part, or relied upon by third parties for any use whatsoever. JWH Ross accepts no duty or responsibility (including negligence) to any party other than the stated Client(s) and disclaims all liability of any nature whatsoever to any such party in respect if this Report.

The Report is based on the geological and mining records at present available. The contents of the Report are believed to be accurate but since mining records and information for this District may be incomplete, we cannot accept responsibility for any insufficiency or inaccuracy in the information provided.

We must advise that this Report only examines the solid geology and associated minerals; it is not to be construed as inferring that the engineering or chemical properties of the natural or man-made superficial deposits are satisfactory or otherwise, since these latter matters are outwith the scope of our Brief.

4.0 Subjects

The Subjects occupy a rectangular area of land in the grounds of an industrial plot at the north west of Inchmuir Road, Bathgate as shown outlined in red on appended Drawing 142968/9002. The approximate National Grid co-ordinates of the site are 297886 667004. The current development proposals relate to the construction of a vehicle maintenance workshop.

5.0 Researches

In connection with this investigation we have researched and taken into account information from the undernoted sources:-

- Published geological maps, namely, County Series Linlithgowshire IX SW, National Grid Series NS 96 NE and BGS 1:50,000 sheet 31E Falkirk (1997)

- Historical Ordnance Survey topographical maps prepared to scales of 1:2500 and 1:10560
- Memoirs of the Economic Geology of the Central Coalfield of Scotland (Area VI) Bathgate, Wilsontown and Shotts, published in 1923
- Abandonment plan catalogues, mine plan records and previous mineral investigation Reports held in the mining Archives of JWH Ross
- Non-confidential borehole data held by the British Geological Survey
- Coal Authority Mining Report, dated 8th September 2020 – Ref 51002307729001

6.0 Geology

According to published geological map information, the solid strata underlying the Subjects belong to the Limestone Coal Formation of the Carboniferous Period and dip generally towards the west at a gradient of approximately 1 in 2.5. The foregoing series of rocks are sedimentary in nature and consist of sandstones, siltstones, mudstone and limestones together with occasional ironstones and numerous seams of coal.

Particular to the subjects, published geological mapping suggests that the Bathgate Main Coal (locally referred to as the Wilsontown Main Coal) outcrops some 120m west of the Subjects on a north - south trend, with the Bathgate Jewel Coal cropping a further 30m west thereafter as shown at the approximate positions on appended drawing 142968/9002. Given the Geological structure and the dip of the strata towards the west at this locality in this area, it follows that these seams will not be present beneath the site of the subjects, having been eroded away at some time in the past.

The geological structure at the site locus is complicated by the presence of an east to west trending fault located south of the Subjects and an igneous quartz-dolerite intrusion on a similar trend to the north. We should explain the nature of geological faults and the uncertainties which attend their precise position underground and at the surface. Faults are planes of movement about which adjacent blocks of rock strata have moved relative to each other. They are seldom vertical and commonly consist of zones, perhaps up to several tens of metres wide, containing several fractures. The portrayal of faults as a straight line is therefore a generalisation. The fault to the south of the Subjects has the effect of displacing the strata down to the south.

On perusal of the journals pertaining to Mosside No.6 bore, the records of which being held within the archive of the British Geological Survey, we note a lack of mineral horizons attaining a workable thickness recorded therein. On account of the borehole's position i.e. to the east of the outcrop of the Bathgate Main Coal, it follows that the strata underlying this seam appear to be devoid of workable seams.

Further historic borehole information in the vicinity of the Subjects suggests that superficial deposits are likely to comprise stiff to very stiff clays, with rock head depth in the order of 10 metres.

7.0 Past Mining

Our search of Abandoned Mine Plan Catalogues, together with records and plans held in the Archives of JWH Ross has revealed no record of extraction under or in close proximity to the site of the Subjects. The nearest underground operations were conducted some 120 metres to the west of the site within Bathgate Main Coal, with the operations conducted via pits belonging to the Mosside Colliery.

Where the published geological information indicates that the Bathgate Main Coal will outcrop to the west of the site, the prevailing strata dip towards the west at this locality precludes the possibility that these workings may extend beneath the Subjects

Apart from the abovementioned recorded operations, we should point out that the winning and working of the minerals in this District may have commenced an extremely long time ago, before it became a statutory requirement to keep plans of mines (1850) and to lodge with the Secretary of State all plans of abandoned mines (1872). Consequently, the plan record information at our disposal may be incomplete and the possibility of earlier unrecorded extraction must be fully considered.

The aforementioned Mosside No.6 bore indicates that the strata underlying the area to the east of the crop of the Bathgate Main coal is devoid of workable seams, with only thin and 'foul' coals present.

The relevant economic geology memoir notes that, *"The Carboniferous Limestone Series of the Bathgate area is characterised by a great development of volcanic rocks – lavas, ashes and agglomerates – and associated intrusions*". It is of particular note that the bulk of the lavas attributable to this reference occur beneath the horizon of the Bathgate Main Coal.

Under such circumstances, where intruded igneous rock is juxtaposed against much older sedimentary strata, it commonly results in the surrounding rock becoming heat affected and its mineralogy altered. Where this strata contains coal seams or other workable minerals, the resultant effect of the foregoing alters their characteristics, often reducing their quality and in some cases removing them altogether.

As a consequence of the foregoing, the apparent prevalence of igneous intrusions at this locality may go some way to explaining the lack of any notable seams within the strata underlying that area to the east of the Bathgate Main Coal outcrop. Moreover, with the site located beyond the outcrop of the lowest workable seam in the strata sequence at this locality, the likelihood that unrecorded workings will extend thereunder may be considered very low.

8.0 JWH Ross Past Mining Risk Assessment

The information provided above in Section 6 (Geology) and Section 7 (Past Mining) forms the basis for the current assessment of mining instability risk.

8.1 Definition

"Risk" is a combination of the likelihood of an "occurrence" and the assessment of the severity of the consequences. This can be discussed with reference to a variety of scenarios, i.e., risk to life, risk to property and risk of financial loss.

The magnitude of risk relative to each scenario will depend on a number of factors (such as accessibility to personnel, existence of structures or the interruption of services). In addition the perception of risk will depend on such considerations as the background knowledge of the persons involved and the degree of their involvement.

The assessment of risk to proposed or existing surface development from subsidence effects due to historic mining is a difficult process requiring significant professional judgement and experience. This process is complicated by the fact that the information needed to make an assessment with a high degree of confidence is incomplete and involves uncertainty.

Unless otherwise stated, the JWH Ross risk rating of potential mining subsidence makes the following presumptions that the risk:

- is derived from underground mineral workings (including coal)

- excludes the risk of mine entries (covered separately in our separate section on old shafts and adits)
- relates to typical residential development
- excludes likelihood of occurrence within a timeframe

8.2 Recorded Mine workings

Where “Abandonment” or “Unsigned” mine plan record information exists, the principal contributing factors that influence the assessment of potential future mining subsidence are:

- The thickness of the mineral
- The inclination of the strata
- The extraction height of the workings
- The number of seams worked and any interaction between them
- The mining technique utilised
- The extraction ratio
- Roof conditions
- The date of the workings
- The extent of mine workings and the perceived accuracy thereof
- The layout of the workings in relation to the proposed development
- The thickness and nature of overlying rock strata
- The thickness and nature of overlying superficial deposits
- The condition of the working (void, collapsed, partially collapsed)
- The influence of geological faults and igneous intrusions
- Information obtained from boreholes

8.3 Unrecorded Mine Workings

Early mining was somewhat secretive due to lack of legislation regarding the keeping of plan records and rivalry between mining companies. Early mining was also generally at shallow depth in the best and thickest seams.

Under the “Past Mining” section of the Coal Authority Report may be/is contained the sentence *“However you may wish to know that the property is in an area where coal is believed to exist at or close to the surface that may have been worked at some time in the past”*. This is a direct reference to the possible presence of unrecorded extraction, i.e., workings that may have taken place prior to the time that it became a statutory requirement to keep or lodge Abandonment Plans.

An assessment of the potential for shallow unrecorded workings to exist must take into account additional wider ranging information sources and factors, including but not limited to:

- The degree of economic importance of the relevant seams to the early mineral operators
- Local thickness and quality of the seam(s) in question

- Evidence that may be obtained from plan record information in the wider surrounding area, e.g., did the up-dip recorded workings encounter “old waste”?
- The position of known old pit shafts and adits in the locality in relation to geological structure and recorded/unrecorded mining
- Borehole data on a wider basis providing information on the thickness and quality of the seam

8.4 JWH Ross Risk Rating Table

The table that follows below presents a summarised risk assessment of past mining activity (including coal mining) taking into account the information set out in the previous sections of this Report.

Column A represents the likelihood of an abandoned mine working being present (within the uppermost sequence of strata) under or within lateral influencing distance of the site. The 0 – 5 rating below is based on the following:-

0 – Underlying strata sequence known to be devoid of workable seams

1 – no workable seams recorded or suspected

2 – workable seam present, but no workings recorded. Unrecorded extraction unlikely

3 – workable seam present - condition unknown

4 – workable seam present and unrecorded workings suspected

5 – workings recorded or unrecorded workings established

Column B represents the estimated depth range. The 0 – 5 rating is based on the following:-

0 – seam/workings outwith critical depth

1 – seam/workings at or just within critical depth

2 – seam/workings with relatively high ratio of overlying rock strata to extraction height

3 – seam/workings with relatively low ratio of overlying rock strata to extraction height

4 – seam/workings close to outcrop

5 – seam/workings at outcrop

N.B. Critical depth is normally taken to equate to overlying rock strata being 10 times the extraction height, however, this can vary considerably due to the influence of other factors, e.g., the method of extraction.

Column C represents the overall Risk Rating (C = A x B). The 0 – 25 rating is a simplified classification system which may allow the site to be “cleared” with regard to the development or may identify aspects that should be considered in more detail or investigated further. The 0 – 25 rating provides the following general risk category:-

0	Negligible
1 – 5	Very low
6 – 10	Low
11 – 15	Moderate
16 – 20	High

21 – 25 Very High

The implications of the above categories in relation to the current proposals/situation are expanded in the Summary/Conclusions Section at the end of this Report.

Table 1 - Past Mining Risk Assessment

Inchmuir Road, Bathagte	Column A Likelihood of workings.	Column B Estimated depth range	Column C (A x B) Overall Risk Rating
Assessed Category of the Subjects	1	0 - 1	**0 - 1**

9.0 Future Mining

It is our understanding that there is no underground mining presently taking place under or in proximity to the site. On the basis of current economics, available technology and planning regulations, we consider that the possibility of underground mining can be ruled out in the foreseeable future.

10.0 Old Pit Shafts/Adits

We have located no plan information to indicate the presence of any old pit shafts or mine entrances either within the site boundaries or in such close proximity as to have an influence on surface stability. Similarly, the Coal Authority comment that there are no known coal mine entries within, or within 20 metres of, the boundary of the property.

11.0 Mine Gas Emissions

The Coal Authority have confirmed that they have no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

12.0 Conclusions/Recommendations

Our overall past mining risk assessment places the site of the Subjects in the category of Negligible to Very Low. In relation to the current proposal this may be reasonably interpreted as follows:

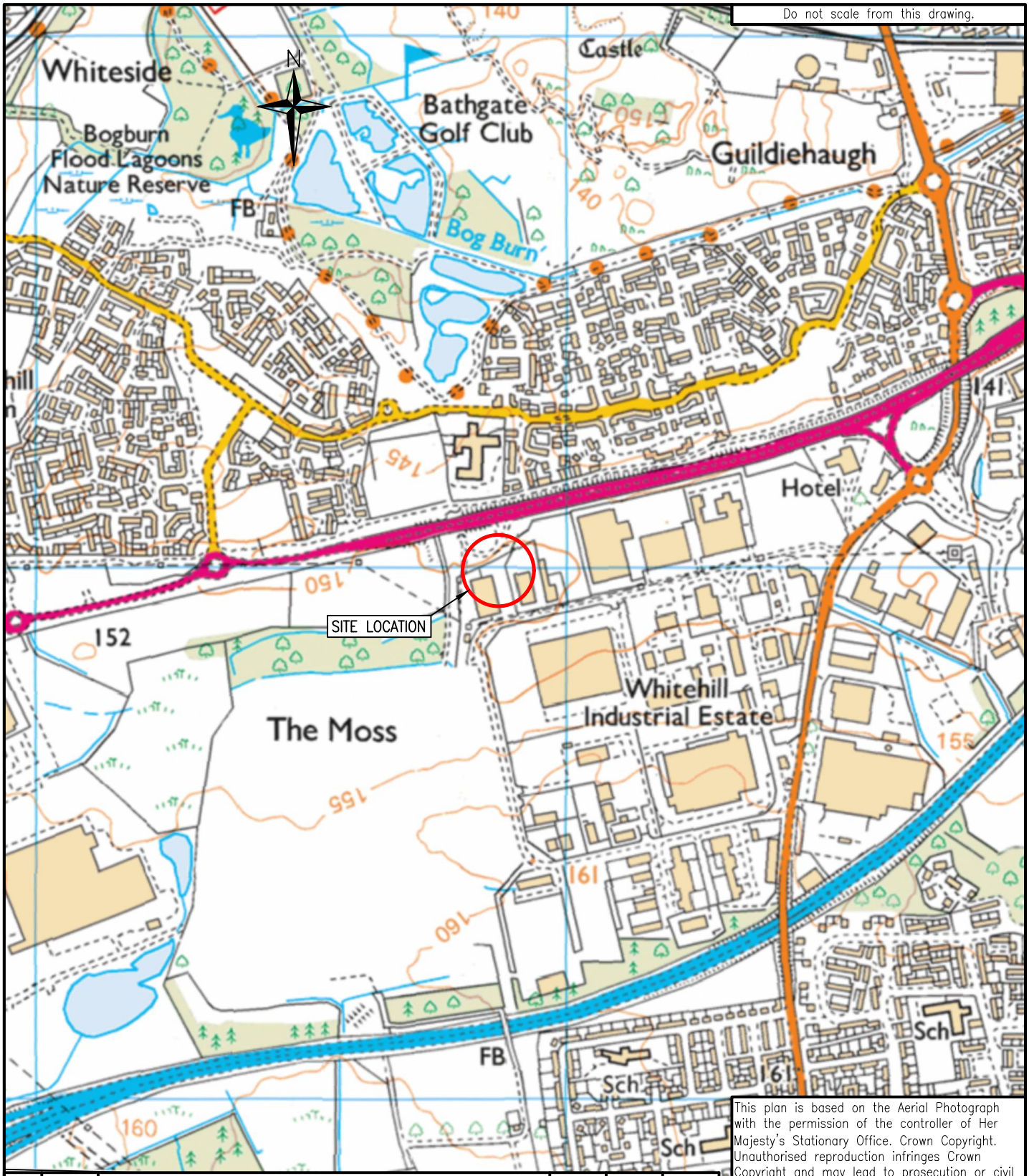
The information at our disposal indicates that the Bathgate Main and Jewel Coals will outcrop some little distance to the west of the Subjects, and with the prevailing strata dip towards the west at this locality, it follows that these seams will not be present beneath the site. Additionally, evidence gleaned from the geological memoirs and historical borehole information suggests that the strata beneath the horizon of the Bathgate Main Coal are devoid of workable minerals at the locus of the Subjects, partially on account of the prevalence of igneous intrusions.

In line with the foregoing, we are of the view that the available evidence does not support the likelihood that any unrecorded extraction has taken place local to the Subjects and as such, we are of the opinion that the Subjects at Inchmuir Road, Bathgate may be considered satisfactory from a mineral stability aspect.

Appendix 1

Drawing No. 142968/9001 – Site Location Plan

Do not scale from this drawing.



Rev.	Date	Description	Drawn	Checked	Approved

Client:
CAMPBELL OF DOUNE LTD

Project Title:
INCHMUIR ROAD, BATHGATE

Drawing Title:
SITE LOCATION PLAN

JWHROSS
225 Bath Street,
GLASGOW, G2 4GZ
Tel: 0141 285 8700 Fax: 0844 381 4412

Scale at A4:	Status:	
NTS	For Report	
Drawn:	Checked:	Approved:
CMCC	ST	DM
Date:	Date:	Date:
14/04/21	14/04/21	14/04/21
Drawing No.:		Revision:
142968/9001		–

Appendix 2

Drawing No. 142968/9002 – Composite Site Plan

Do not scale from this drawing.

N

Strata Dip

CONJECTURAL OUTCROP OF JEWEL COAL

CONJECTURAL OUTCROP OF BATHGATE MAIN COAL

BGS BOREHOLE REFERENCE NS96NE74

Rev.	Date	Description	Drawn	Checked	Approved

LEGEND:

- SITE BOUNDARY
- APPROXIMATE SOUTHERN EXTENT OF QUARTZ-DOLERITE DYKE
- CONJECTURED MINERAL SEAM OUTCROP
- APPROXIMATE POSITION OF GEOLOGICAL FAULT (TICK ON DOWNTHROWN SIDE)
- APPROXIMATE POSITION OF MOSSIDE NO. 6 BOREHOLE

Client:
CAMPBELL OF DOUNE LTD

Project Title:
INCHMUIR ROAD, BATHGATE

Drawing Title:
COMPOSITE SITE PLAN

JWHROSS
225 Bath Street,
GLASGOW, G2 4GZ
Tel: 0141 285 8700 Fax: 0844 381 4412

Scale at A3:	Status:		
NTS	For Report		
Drawn:	Checked:	Approved:	
CMCC	ST	ST	
Date:	Date:	Date:	
15/04/21	15/04/21	15/04/21	

Drawing No.: 142968/9002

Revision: –

Appendix 3

Coal Authority Report, dated 8th September 2020 – Ref 51002307729001

The Coal Authority

CON29M
coal mining report

33 INCHMUIR ROAD, BLACKBURN, WEST LOTHIAN, EH48 2EP

Known or potential coal mining risks

Further action

No further reports from the Coal Authority are required. Further information on any next steps can be found in our Professional opinion.

For more information on our reports please visit www.groundstability.com

Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. In view of the coal mining circumstances we would recommend that any planned or future development should follow detailed technical advice before beginning work on site. Please see page 3 for further details on Future development.

Your reference: 7163-20
Our reference: 51002307729001
Date: 8 September 2020

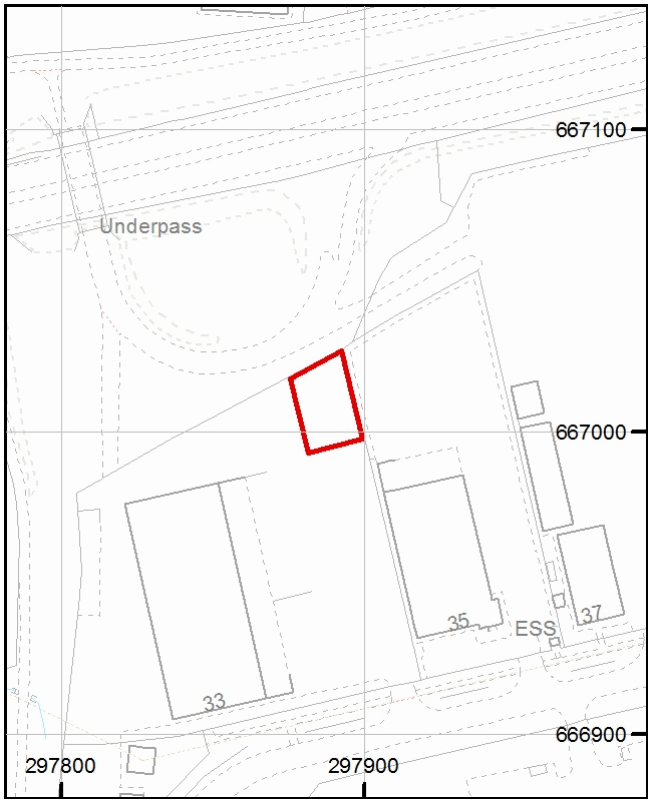
Client name: CAMPBELL OF DOUNE LTD

If you require any further assistance please contact our experts on:
0345 762 6848
groundstability@coal.gov.uk

Enquiry boundary

Key

Approximate position of enquiry boundary shown



We can confirm that the location is **on the coalfield**

Map data

This report is prepared in accordance with the latest Law Society's Guidance Notes 2018, the User Guide 2018 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.

Accessibility

If you would like this information in an alternative format, please contact our communications team on 0345 762 6848 or email communications@coal.gov.uk.

Professional opinion

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed.

If you are looking to develop, or undertake works, within a coal mining development high risk area your Local Authority planning department may require a Coal Mining Risk Assessment to be undertaken by a qualified mining geologist or engineer. Should you require any additional information then please contact the Coal Authority on 0345 762 6848 or email cmra@coal.gov.uk.

Detailed findings

Information provided by the Coal Authority in this report is compiled in response to the Law Society's CON29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL.

1 Past underground coal mining

The property is not within a surface area that could be affected by any past recorded underground coal mining.

However the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. Your attention is drawn to the Professional opinion sections of the report.

2 Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3 Future underground coal mining

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4 Mine entries

There are no recorded coal mine entries known to the Coal Authority within, or within 20 metres, of the boundary of the property.

This information is based on the information that the Coal Authority has at the time of this enquiry.

Based on the Coal Authority's knowledge of the mining circumstances at the time of this enquiry, there may be unrecorded mine entries in the local area that do not appear on Coal Authority records.

5 Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6 Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7 Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8 Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9 Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, 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 preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10 Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11 Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

12 Withdrawal of support

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13 Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14 Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Statutory cover

Coal mining subsidence

In the unlikely event of any coal mining related subsidence damage, the Coal Authority or the mine operator has a duty to take remedial action in respect of subsidence caused by the withdrawal of support from land or property in connection with lawful coal mining operations.

When the works are the responsibility of the Coal Authority, our dedicated public safety and subsidence team will manage the claim. The house or land owner ("the owner") is covered for these works under the terms of the Coal Mining Subsidence Act 1991 (as amended by the Coal Industry Act 1994). Please note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

If you believe your land or property is suffering from coal mining subsidence damage and you need more information on what to do next, please use the following link to our website which sets out what your rights are and what you need to consider before making a claim.
www.gov.uk/government/publications/coal-mining-subsidence-damage-notice-form

Coal mining hazards

Our public safety and subsidence team provide a 24 hour a day, 7 days a week hazard reporting service, to help protect the public from hazards caused by past coal workings, such as a mine shaft or shallow working collapse. To report any hazards please call 01623 646 333. Further information can be found on our website: www.gov.uk/coalauthority.

Glossary

Key terms

adit - horizontal or sloped entrance to a mine

coal mining subsidence - ground movement caused by the removal of coal by underground mining

Coal Mining Subsidence Act 1991 - the Act setting out the duties of the Coal Authority to repair damage caused by coal mining subsidence

coal mining subsidence damage - damage to land, buildings or structures caused by the removal of coal by underground mining

coal seams - bed of coal of varying thickness

future opencast coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal from the surface

future underground coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal underground. Although it is unlikely, remaining coal reserves could create a possibility for future mining, which would be licensed by the Coal Authority

mine entries - collective name for shafts and adits

payments to owners of former copyhold land - historically, copyhold land gave rights to coal to the copyholder. Legislation was set up to allow others to work this coal, but they had to issue a notice and pay compensation if a copyholder came forward

shaft - vertical entry into a mine

site investigation - investigations of coal mining risks carried out with the Coal Authority's permission

stop notice - a delay to repairs because further coal mining subsidence damage may occur and it would be unwise to carry out permanent repairs

subsidence claim - a formal notice of subsidence damage to the Coal Authority since it was established on 31 October 1994

withdrawal of support - a historic notice informing landowners that the coal beneath their property was going to be worked

working facilities orders - a court order which gave permission, restricted or prevented coal mine workings

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