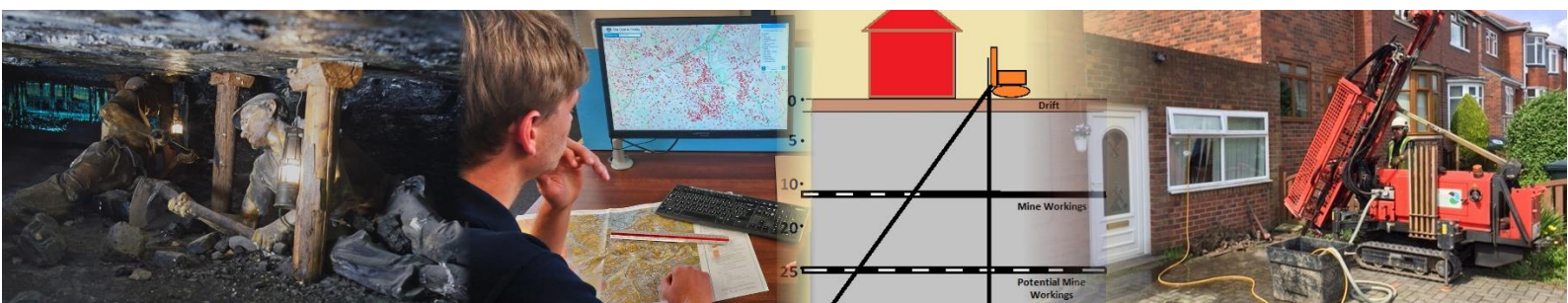




GEOLOGICAL
GEOTECHNICAL
GEOENVIRONMENTAL
CONSULTANCY
DRILLING & DATA ACQUISITION



GEOINVESTIGATE LIMITED

Coal Mining Risk Assessment (CMRA)

LOCATION	299 - 301 Grimshaw Lane, Middleton, Manchester M24 2AT
ISSUE DATE	September 2022
FOR	Gold Sketch Studios Limited
CLIENT REF.	
OUR REF.	G22390

Prepared by

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Checked by

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Senior Geoenvironmental Engineer

SUMMARY FINDINGS

OUTCOME MITIGATION REQUIRED

YES. The proposed development is possibly underlain by up to 2 levels of moderate depth coal seams, with possible unrecorded underground mine workings, with the potential to impact surface ground stability within the proposed building area, due to the depth of superficial deposits (43m) and nominal thickness of rock cover above the potential workings (5m).

Whether unrecorded workings will impact the development depends on drift/bedrock depth, mine working (if any) depth and rock cover thickness. Intrusive ground investigation is therefore required to establish these parameters within the site.

Notwithstanding, on the basis of the CMRA work to date, we are of the opinion that the mining stability and mine gas risks posed by the strata beneath this site from coal mining legacy can be mitigated by routinely adopted measures and should not preclude planning permission being registered in the interim with regard to coal mining legacy issues conditional upon the work being carried out at a later date.

WHAT TO DO NEXT

Obtain quotes for the intrusive site investigation works (if considered appropriate). The cost of the SI works should be a **"lump sum" fixed price**. Geoinvestigate can provide advice and assistance with helping you find suitable site investigation & drilling contractors. Call us on 01642 713779 or email enquiries@geoinvestigate.co.uk.

1. CMRA INTRODUCTION

Site Location and Description:

The approximate centre of this site is at National Grid Reference 388507 E, 405075 N with an elevation of 106mOD. The site is generally flat. The boundary shown in RED on the Coal Authority (CA) report provided in Appendix A corresponds with the planning application area.

Google Satellite imagery and Google Street Viewer shows the site is currently occupied by two attached houses with a garden at the rear. Access to Castle Street and Collinge Street are available through a gate in the garden, which is fenced in by a brick wall.

Proposed Development:

It is proposed to merge 299 and 301 into one property, erect a new extension to the rear of the development and provide vehicle and pedestrian access through a gate on the north-eastern side. Development and site plans are provided in Appendix B.

Historical Development:

The earliest OS map from 1890s shows that a row of terraced houses occupied the site and surrounding street. The surrounding area looks predominantly residential, with 3 cotton mills within 400m of the site. A railway lies 120m north of the site, and a farm lies 550m southwest.

By the 1950s the surrounding area expands, and more residential dwellings have been built. Engineering works lie 90m south and the previously mentioned cotton mills have closed down. Between the 1950s and 1960s a very large housing estate is built 770m west, and in the contemporary map the area appears mostly residential as industries decline.

The OS map record provides no evidence that the site itself has been subject to sand, clay or gravel pitting, stone quarrying, or surface mining activity, though mining activity may have occurred before 1890s.

Anticipated Geology:

The British Geological Survey (BGS) 1:50,000 scale map for the area (Sheet 85, Manchester) indicates that the site will be underlain by superficial deposits of Devensian Till with bedrock of the Pennine Middle Coal Measures comprising mudstone, siltstone, sandstone, and interbedded coal seams of varying thicknesses.

The location of the site is shown on the extract of BGS solid geology map presented in Appendix C.

A nearby BGS borehole (Ref: SD80NE18) record, located 120m to the east, shows clay and soil down to 1.4m below ground level (bgl), then a mix of sand, gravel, marl, and clay down to approximately 43m bgl, Blue Metal (likely mudstone) to approximately 48m bgl, then a coal seam 0.9m thick beneath this. This borehole log is presented in Appendix D.

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.

2. 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.

Coal Mining Issues	Yes	No	Risk Assessment/Remarks
Past underground coal mining		No	2.1.1
Probable unrecorded shallow workings		No	2.1.2
Spine roadways at shallow depth		No	
Mine entries		No	
Outcrop	Yes		2.1.2
Geological faults, fissures and breaklines		No	
Opencast Mines		No	
Coal Mining Subsidence		No	
Mine Gas		No	2.1.3
Site investigations		No	

Note: For those coal mining issues above identified as “Yes” or highlighted “YELLOW” a more detailed discussion and assessment are made of the risks to the application site and the proposed development.

2.1 DETAILED DISCUSSION & ASSESSMENT RESPONSE

2.1.1 Past Underground Mining

According to the Coal Authority (CA) report in Appendix A, no recorded/past underground mine workings occur beneath the property.

2.1.2 Probable Unrecorded Shallow Workings & Outcrop

According to the CA report the site does not fall within a zone of probable unrecorded shallow workings. The CA define Probable Unrecorded Shallow Workings as “Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface” (i.e., less than 30m).

The CA summary of findings map records one coal outcrop (sub-crop) 18.4m from the site, referred to as ‘Unnamed 2’. This is recorded as workable. Although this seam is not within the site boundary, it is shown on the BGS geological map to dip beneath the site. The BGS record this outcrop as the Pemberton Two Foot coal seam.

The BGS map and CA interactive map show an additional outcrop (sub-crop) 50m north of the site, named the Pemberton Four Foot. Given a stratigraphic dip to the southwest, both seams are likely to dip beneath the site.

These coal outcrops are unlikely to outcrop at the surface, as there are approximately 43m of superficial deposits within the area. However, there is not sufficient bedrock cover beneath the superficial deposits and above the potential workings to mitigate ground stability at the surface. Therefore, it would be prudent to investigate the potential for historical coal mine workings at moderate depth beneath the site.

2.1.3 Mine Gas

No mine gas incidents or remediation are recorded within 500m of the proposed development and in the UK the risk from mine gas is typically low. However, given the possible presence of shallow mine working beneath the proposed

development area and the serious nature of mine gas it is recommended that the risk is raised to **MODERATE**, until indicated otherwise by gas testing during drilling.

3. SUMMARY AND OUTCOME

This CMRA has identified the possible presence of up to two coal seams with possible unrecorded mine working within moderate depth beneath the proposed development, with insufficient bedrock cover above the potential workings to mitigate surface ground instability.

In our opinion, whether shallow mine working poses a significant risk to the development cannot be properly assessed without additional information namely drift depth, coal seam depth and mine working (if any) depth and rock cover thickness at this locality. In our opinion exploratory drilling is required to obtain this information and enable further assessment of the risks posed by shallow mine working at this locality.

Gas monitoring must be carried out during drilling.

4. MITIGATION STRATEGY PROPOSED AND CONCLUSION

To properly determine the coal mining risk at this site it is proposed to drill 2-3 boreholes at the property to target depths up to 50m to 60m (but not necessarily needed to 60m depending on ground conditions encountered) to locate shallow coal seams and mine working (if any) below the new development as well as establishing drift and bedrock depth.

Gas monitoring **MUST** be carried out during drilling.

Risks for Different Drilling Scenarios					
Air flush	Mist flush	Foam flush	Water flush	Mud flush	Additional controls
HIGH	HIGH / MED'M	HIGH / MED'M	LOW	LOW	- Monitoring at rig and other open holes. - Seal boreholes

A Coal Authority Permit needs to be obtained (ahead of) further intrusive exploratory drilling. Water Drill Flush to be used when drilling. The permit application must state **WATER ONLY DRILL FLUSH** for the safety of the public and drill crew.

On the basis of the CMRA work to date, we are of the opinion that the mining stability and mine gas risks posed by the strata beneath this site from coal mining legacy can be mitigated by routinely adopted measures and should not preclude planning permission being registered with regard to coal mining legacy issues.

In conclusion we see no reason why Planning Permission should not be granted in the interim with respect to coal mining legacy issues and that these works form a condition on the planning approval.

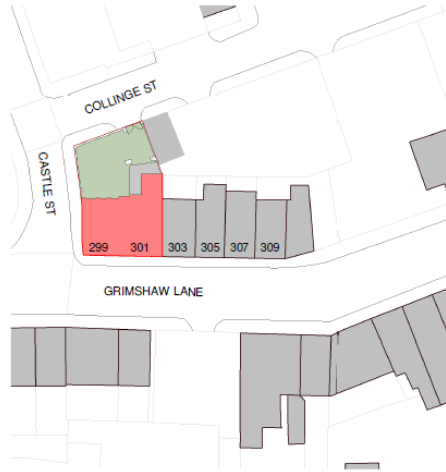
Appendices:

- CA Consultants Coal Mining Report issued 23 August 2022 ref.51003306569001.
- Proposed Development Plans and Existing Topographical Survey
- Extracts of BGS Geology Map, Sheet 85– Manchester at 1:50000 scale
- BGS borehole logs

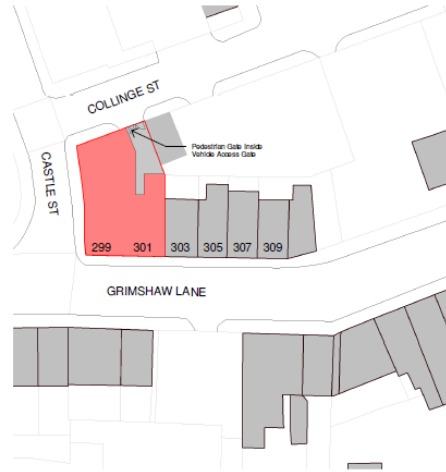
APPENDIX A
COAL AUTHORITY REPORT

APPENDIX B

PROPOSED DEVELOPMENT PLANS



1 Site - Existing
1 : 500



2 Site - Proposed
1 : 500

5 0 5 10 15 20 25
SCALE: 500
1: m



PROJECT	299-301 Grimshaw Lane Middleton	PROJECT NUMBER	GSS22033	DRAWING NUMBER	005	REV		GOLD SKETCH S T U D I O S www.goldsketch.co.uk info@goldsketch.co.uk 0161 792 9595	
TITLE	Site Plan Existing and Proposed	DRAWN BY	GJ	CHECKED BY	SG	DATE	25/07/2022		
CLIENT	Grunfeld	SCALE (@ A1)	1 : 500	No.	Description	Date		STATUS	PLANNING

NOTES:
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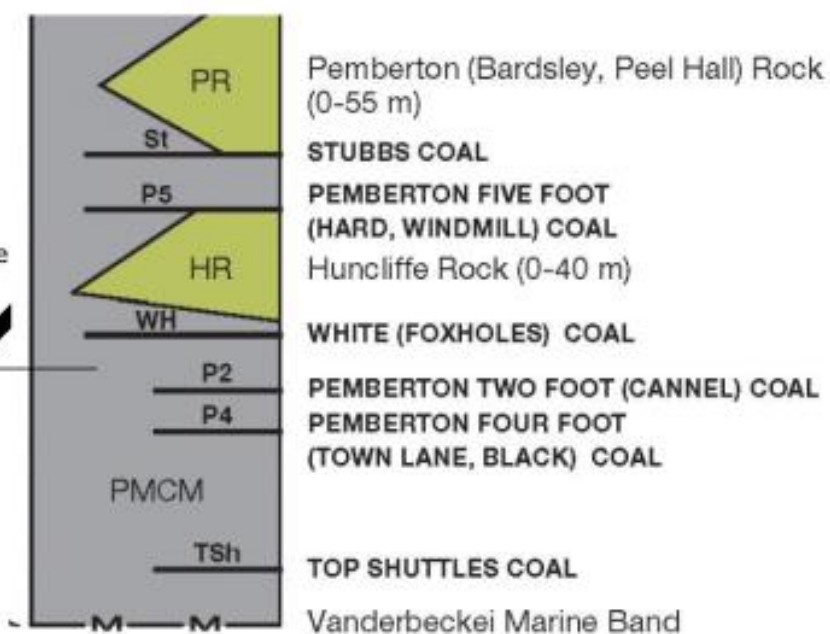
APPENDIX C

EXTRACTS OF BGS GEOLOGY MAP

APPROXIMATE
SITE LOCATION



Tentative elevation of site
relative to vertical
geology section



APPENDIX D

BGS BOREHOLD LOG SD80NE18

SD 80 NE 187

6

					Yds.	Ft.	In.
				Brought forward	...		
Black Shale	...	...	...	...	0	0	10
Coal	...	...	...	...	0	1	0
Seat of do.	...	...	...	...	1	0	6
Coal	...	...	...	...	0	0	8
Seat of do.	...	...	...	...	2	0	9
					198	1	4

Section of the Alluvial at Mr. J. W. Lees' Greengate Brewery, Chadderton, as proved by Boring in 1876.
Well afterwards sunk 142 feet.

Surf
325 + 00

142
+ 183 00

				Ft.	In.	Yds.	Ft.	In.
Clay and Soil	...	...	...	4	6			
Dry Sand	...	...	...	7	0			
Gravel	...	...	...	4	6			
Quick Sand	...	...	...	4	0			
Marl	...	...	...	2	2			
Dry Sand	...	...	...	24	10			
Quick Sand	...	...	...	2	8			
Clay and Marl	...	...	...	12	0			
Quick Sand	...	...	...	16	4			
Loam (wet)	...	...	...	4	0			
Quick Sand	...	...	...	8	6			
Clay	...	...	...	0	10			
Loam	...	...	...	34	8			
Quick Sand	...	...	...	16	0			
Blue Metal	...	...	...	19	0	47	1	0 (43.28m)
Coal	...	...	...	3	0	3		
Bottoms	...	...	...	0	9	142		
Coal	...	...	...	0	9			
Metal	...	...	...	29	6			
Brown Rock	...	...	...	3	6			
Grey Metal	...	...	...	2	6			
Grey Rock	...	...	...	9	0			
Metal	...	...	...	18	6			
						28	2	6 (25.75)
Total depth	...	...	...			76	0	6 (69.64m)
						228 18		

325
142
- 183