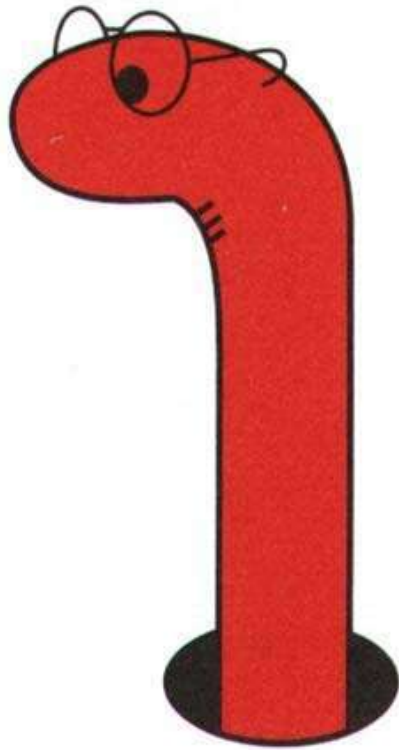


Electronic Report



WORMS EYE

Worms Eye Limited
PO Box 1157
COLNE
BB9 4HS

01282 414649
info@wormseye.co.uk

Our Ref: Bolton Road / M26 3BX / 2023
Date: 13 September 2023

Mr Mohammed Amirinejad
53 Hulton Lane
Bolton
BL3 4JD

Copy to: Gary Walker
Walker1082@worms-eye.co.uk

amirinejad.mohammed@gmail.com

LAND AT BOLTON ROAD, RADCLIFFE, M26 3BX

COAL MINING RISK ASSESSMENT

INTRODUCTION

A commercial development is proposed. Worms Eye have been commissioned to prepare a Desk Top Coal Mining Risk Assessment in order to assess the impact of coal mining on the site.

SITE LOCATION

The site is a rectangular plot, about 35 by 18m, located to the south of Bolton Road in Radcliffe and at OS Grid Reference 377453, 407371. The site is vacant and grass surfaced.

The area slopes down to the southeast. This is a residential area with houses to the north, northeast, south and west, and a school to the southeast.

LEGAL/COPYRIGHT

Material may be included in this report from Ordnance Survey (Licence No. AL100031635), Landmark, Environment Agency, Coal Authority and others. It may be copyright and the usual restrictions apply. This report can only be relied upon if the invoice has been paid promptly and in full. This report may be signed by an individual, but only on behalf of Worms Eye Limited.

PROPOSED DEVELOPMENT

It is proposed to build a block of three retail units at the centre of the site with rear (south) yards and parking at the north.

SCOPE OF COAL MINING RISK ASSESMENT

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

- Present a desk study of available information on coal mining issues relevant to the site.
- Identify and assess risks to the development from coal mining legacy.
- Set out mitigation measures to address coal mining issues affecting the site, and/or demonstrate how coal mining issues have influenced the development.
- Demonstrate to the Local Planning Authorities the application site is, or can be made, safe and stable to meet national planning policy with regard to development on unstable land.

SOURCES OF INFORMATION USED TO INFORM THIS REPORT

The following data sources have been reviewed in preparing this risk assessment.

- British Geological Survey map, Solid and Drift edition, 1:50000 scale.
- A Coal Mining Consultants Report dated, 17/8/23
- A site history based on historic Ordnance Survey mapping of the area.
- Memoirs of the Geological Survey

GEOLOGY OF SITE

A geological fault is shown to run northwest-southeast beneath the site, with a small down throw to the southwest. The geological map indicates that either side of the fault, the underlying solid rocks are unnamed strata, usually mudstone, of the Pennine Middle Coal Measures, dipping to the southeast at about 10°.

Surface drift is shown as glacial till (boulder clay), the geological map suggests about 10m thick.

SHALLOW COAL SEAMS

The geology map shows the Top 3 Yards seam outcrops beneath the site either side of the fault, and dips to the southeast, passing beneath the site at very shallow depth below rockhead.

The next seam in the sequence is the Rams seam at about 34m below rockhead southwest of the fault and 21m below rock head northeast of the fault. The next seams in the sequence are over 50m below the Rams seam.

SITE HISTORY

Historical maps suggest the site has been developed since the late 1800s with a series of buildings on the north, south and west sides. These were demolished circa 1970s. No mining related features are shown on or close to the site.

MINING REPORT

A Coal Authority mining report has been obtained, and is enclosed. The salient points are as follows:

- Workings are present in three seams of coal below the site:
 - Roger seam, 38m deep, 2m extracted in 1887.
 - Trencherbone seam, 320m deep, 1.1m extracted in 1888.
 - Cannel seam, 384m deep, 0.9m extracted in 1893.
- No spine roadway recorded at shallow depth.
- The Roger coal seam outcrops northeast-southwest, across the middle of the fault southwest of the fault, and near the southeast corner northeast of the fault.
- The site is underlain by probable unrecorded shallow workings.
- No present or future planned underground mining.
- No known mine entries within 100 metres.
- No opencast mining or record of mine gas emissions within 500m.
- No subsidence claims, since 1994, or remediated sites within 50m.
- The site is within an area of previous interest, close to a previous investigation 26m east. The site requires further investigation.

IDENTIFICATION AND ASSESSMENT OF SITE SPECIFIC COAL MINING RISKS

The table below initially summarises the potential risks associated with coal mining for the site.

Coal Mining Issue	Yes	No	Risk Assessment
Recorded underground coal mining	✓		38m, possible risk
Underground coal mining (recorded at shallow depths)		✓	
Underground coal mining (possible at shallow depths)	✓		Shallow seam
Future underground coal mining		✓	
Mine entries (shafts and adits)		✓	
Coal mining geology (fissures)		✓	
Record of past mine gas emissions		✓	
Unrecorded mine gas emissions	✓		Shallow seam
Recorded coal mining surface hazards		✓	
Surface mining (opencast workings)		✓	
Nearby subsidence claims		✓	

For those coal mining issues identified as “yes” a more detailed discussion is made below.

Shallow Underground Mining – unrecorded/probable/possible

There is conflicting data between the CA and geology maps. The CA indicate that the Roger and Top Furnace are the shallowest seams. However, the geology map suggests the Top 3 Yards and the Rams are the shallowest seams. These need to be considered further and the Geological Memoir for this area has been reviewed. To achieve a minimal thickness of rock cover over a worked coal seam, 10 times the seam thickness is widely accepted.

The next seams in the sequence are the Rams and Stubbs, but at 45m and 100m below Roger they are neither shallow nor a risk to the site.

Shallow Mining

Both the CA and the geology map show there are two shallow coal seams, which are all potentially workable seams.

CA Data				Geology Map			
Seam	Depth Below Rock (m)	Thickness (m)	Cover/Seam Thickness	Seam	Depth Below Rock (m)	Thickness (m)	Cover/Seam Thickness
Roger	<2	2	<2	Top 3 Yards*	<2	1.3 – 4.6	<2
Top Furnace	30	1.2	25	Rams	21	1.3	16

* - Usually a split seam with up to 1.8m of fireclay parting.

Mine Gas

There is a shallow, worked, coal seam, below about 10 – 15m of clay (estimate) which would impede migration of gases. Taking into account the depth of the seam, possible workings, and overlying clay, it is considered that there is a potential mine gas risk, expected to be a low risk.

DISCUSSION

Shallow Mining

Although there is conflicting data between the CA and the geology map, the findings indicate that using either source there are two shallow coal seams. The depth of these suggests there may be insufficient thickness of rock cover over the shallowest seam to minimise damage to the structure in event of a collapse of mine workings.

The findings also suggest sufficient rock cover over the deeper seam to minimise damage to overlying structures.

Although the potential inaccuracies on the geology map pose difficulties with making accurate measurements. It is considered that the Coal Authority Report, geology map and memoirs suggest workings are likely and that there may be insufficient rock cover.

Mine Gas

There is a shallow coal seam. It is considered that this poses a potential low gas risk to the development and a period of gas monitoring is required.

MITIGATION STRATEGY PROPOSED

Shallow Mining

There is a risk of future mining subsidence from unrecorded workings in the shallowest coal seam. There is a need to confirm its depth and thickness. To do this it will be necessary to drill boreholes (Coal Authority permission required). It is suggested 3 boreholes extend to 30m below rock head (estimated 40m deep).

Mine Gas

There are potential risks of mine gas from shallow workings migrating up to the development. It is suggested the 3 gas monitoring points are installed and tested for methane, carbon dioxide, oxygen on 4 occasions over a 1 month period.

CONCLUSION

Watching Brief

In common with many mining areas, it is recommended that site staff keep a watching brief during the project, particularly while excavations are taking place. Any unusual features such as voids, cracks, ground movement or strange soil conditions should be flagged up and safely checked out.

Shallow Mining

The findings suggest here is a shallow coal seam beneath the proposed building. The anticipated depth suggests there may be insufficient cover above the seam and a potential risk to the proposed development, if the workings are present and these were to collapse.

A series of rotary boreholes are required which should provide all round coverage.

Mine Gas

The shallow coal seam is considered to be a potential gas risk to the development and it is recommended that a period of gas monitoring is carried out.

Yours faithfully

on behalf of Worms Eye Ltd



David Lord

BSc (Hons)

FGS MEnvSc AIEMA

LAND OFF BOLTON ROAD, RADCLIFFE, M26 3BX

List of Appendices – COAL MINING RISK ASSESSMENT

Proposed Site Plans

Coal Mining Report

Coal Authority Summary Map

Extract From Geology Map

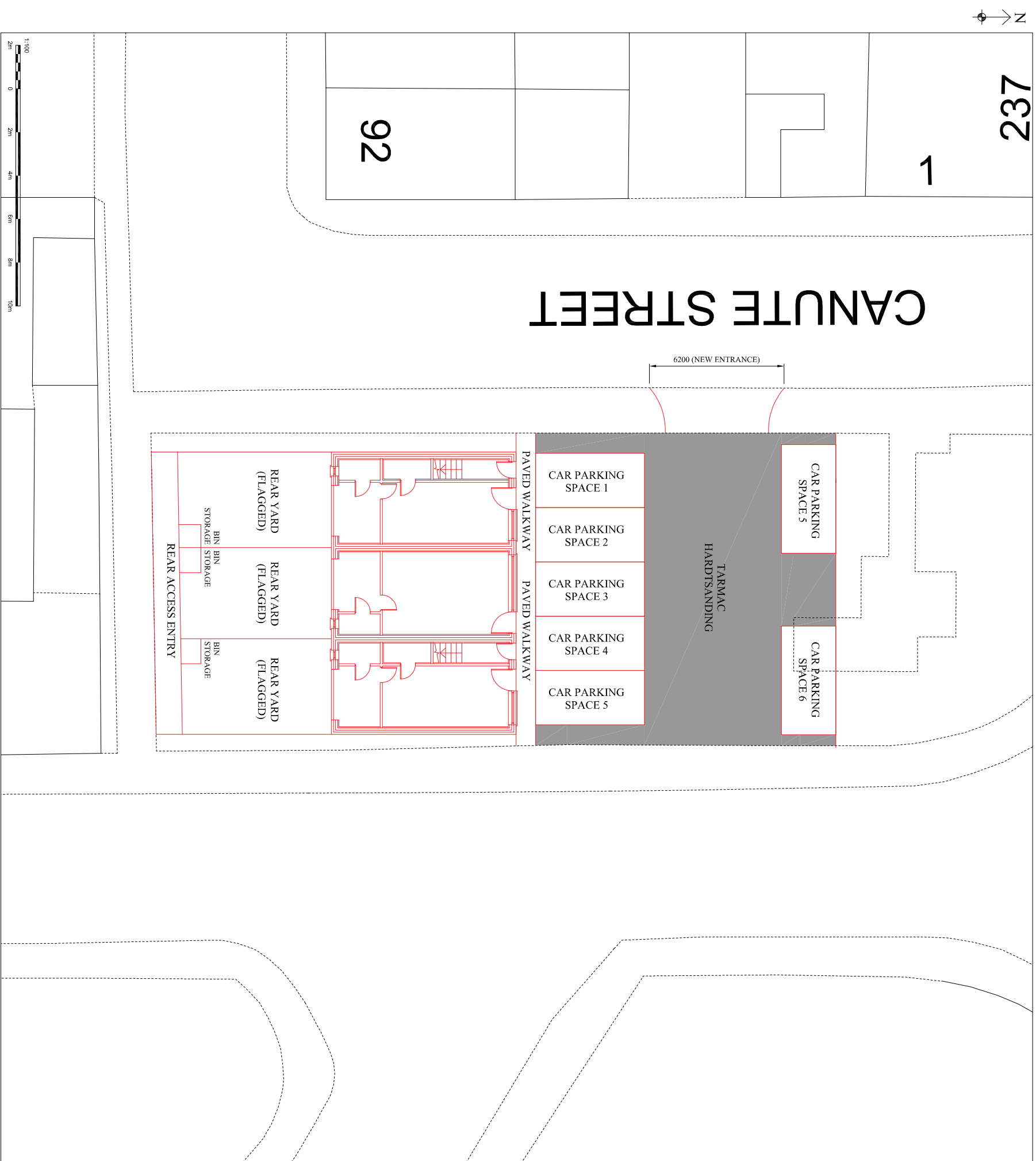
Historical Maps

ABBREVIATIONS

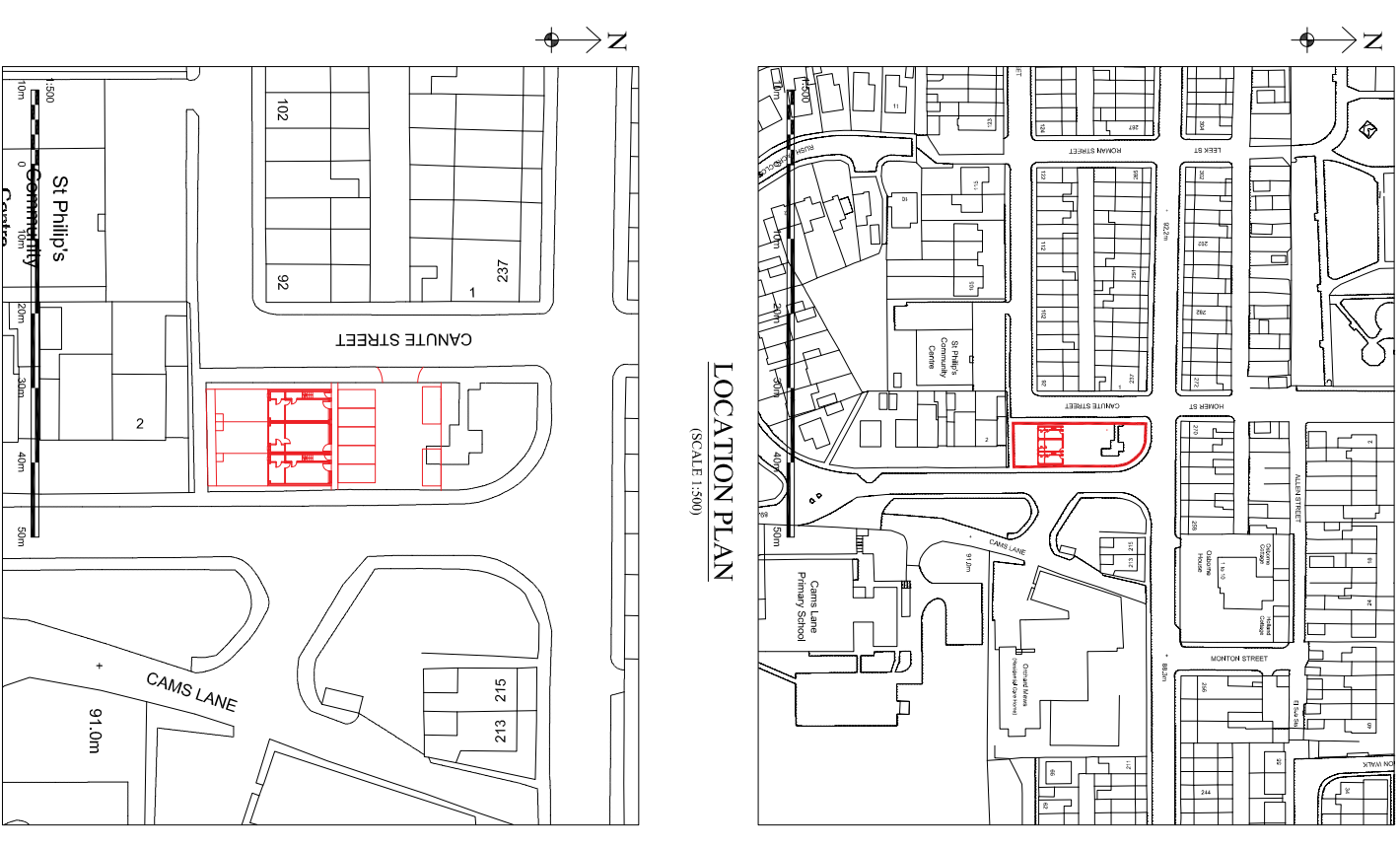
<u>Chemical</u>	BAP	Benzo(a)pyrene
	BTEX	Benzene, toluene, ethylbenzene, xylene
	DAHA	Dibenzo(ah)anthracene
	MTBE	Methyl tertiaryt-butyl ether (additive to petrol)
	EPH	Extractable Petroleum Hydrocarbons (formerly Diesel Range Organics – DRO)
	NFD	No fibres detected (asbestos test)
	PAH	Polycyclic aromatic hydrocarbons
	PCB	Polychlorinated biphenyls
	PID	Photo ionisation detector
	PRO/GRO	Petrol range organics/gasoline range organics
	SVOC	Semi-volatile organic compounds
	TCE	Trichloroethylene
	TPH	Total petroleum hydrocarbons
	VOC	Volatile organic compounds
<u>Other</u>	AGS	Association of Geotechnical Specialists
	BGS	British Geological Survey
	BRE	Building Research Establishment
	CBR	California Bearing Ratio
	CIEH	Chartered Institute of Environmental Health
	CIRIA	Construction Industry Research and Information Association
	CLEA	Contaminated Land Exposure Assessment (Environment Agency)
	CLR 8	Contaminated Land Research Report 8 (Environment Agency)
	DWQ	Drinking water quality
	EA	Environment Agency
	EQS	Environmental quality standards
	ICRCL	Inter-departmental Commission for the Reclamation of Contaminated Land
	LQM	Land Quality Management Ltd (Land and Environmental Consultancy)
	NHBC	National House Builders Council
	SGV	Soil Guideline Values
	SPT	Standard penetration test
	TPHWG	TPH Working Group

1. This report should be considered in relation to the objectives agreed between Worms Eye and the Client, outlined in the introduction.
2. For the work, reliance has been placed on publicly available data, obtained from the sources identified in the report. The information is not exhaustive and further information may be available from other sources. When using the information it has been assumed it is correct, and no attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and guidelines, for land and groundwater contamination, enforced by the Local Authority and the Environment Agency.
4. During the site walkover, reasonable effort was made to obtain an overview of the site. However, no attempt was made to enter areas that are unsafe, a risk to health and safety, locked, barricaded, overgrown, or areas not made accessible.
5. Access, the presence of services and activities on the site, limited locations where sampling could be carried out and the techniques that could be used.
6. Assessments are based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. The conclusions and recommendations provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
8. Worms Eye cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright of this report, and other plans or documents prepared by Worms Eye, is owned by them, and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies may be made and distributed by the client, as expected, in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability, or warranties, shall be extended to other parties by Worms Eye, without their written agreement.
9. New information, revised practices, or changes in legislation, may necessitate the re-interpretation of the report, in whole or in part.

LAND AT HARPER FOLD ROAD, RADCLIFFE



PLANNING APPROVAL



A	15.04.23	ISSUED FOR PLANNING APPROVAL
TRAINING STATUS		
PLANNING APPROVAL		
PRODUCT		
LAND AT HARPER FOLD Rd RADCLIFFE		
TITLE		
PROPOSED 3 No. COMMERCIAL UNITS (CLASS E) AND 3 No. RESIDENTIAL APARTMENTS (CLASS C3)		
SCALE & SIZE		
1:50 @ A1 UNO	STATUS	DATE
PROJECT No.	PLANNING APP.	APR. 23
HE-001	1041047 No.	453
001	A	



The Coal
Authority

Consultants Coal Mining Report

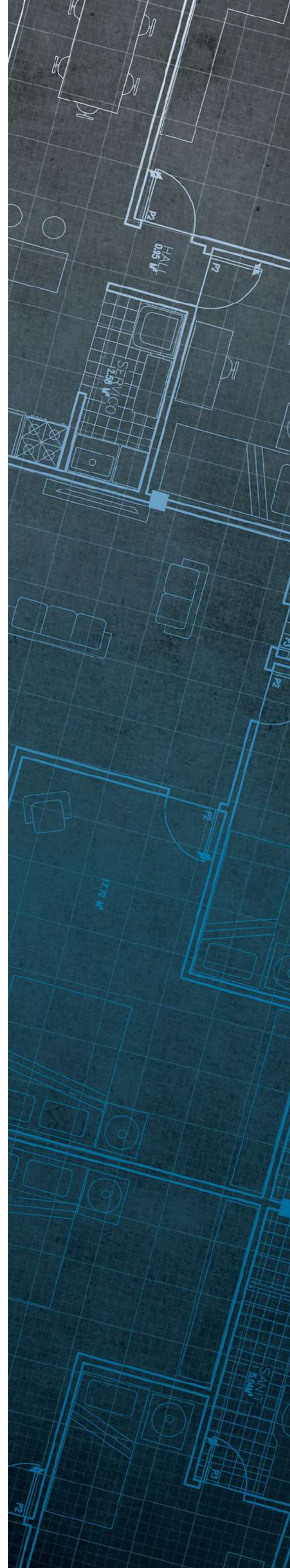
1 Canute Street
Radcliffe
Bury
M26 3BX

Date of enquiry:
Date enquiry received:
Issue date:

17 August 2023
17 August 2023
17 August 2023

Our reference:
Your reference:

51003373347001
Bolton Road



Consultants

Coal Mining 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

David Lord

Enquiry address

1 Canute Street
Radcliffe
Bury
M26 3BX

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2018. All rights reserved.

Ordnance Survey Licence number: 100020315

Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	ROGER	Coal	3Z3E	38	Beneath Property	9.5	South-East	200	1887
unnamed	TRENCHERB ONE	Coal	3YYL	320	Beneath Property	11.2	South	110	1888
unnamed	CANNEL	Coal	3YPA	384	Beneath Property	9.3	South	90	1893
unnamed	CANNEL	Coal	3YQ8	384	West	8.4	South	90	1894
unnamed	CANNEL	Coal	3YQN	393	West	8.5	South-East	90	1894

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

3428	NW983	16820
NW991	1249	

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
ROGER	Coal	Yes	Within	N/A	53
ROGER	Coal	Yes	Within	N/A	249

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Fault under or close to the property recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

Distance to site investigation (m)	Direction
26.3	East

See Section 4 for further information.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

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.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

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.

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.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

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.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. 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. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

Site investigations

The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations.

The site requires further investigation and may influence how you approach your risk assessment.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

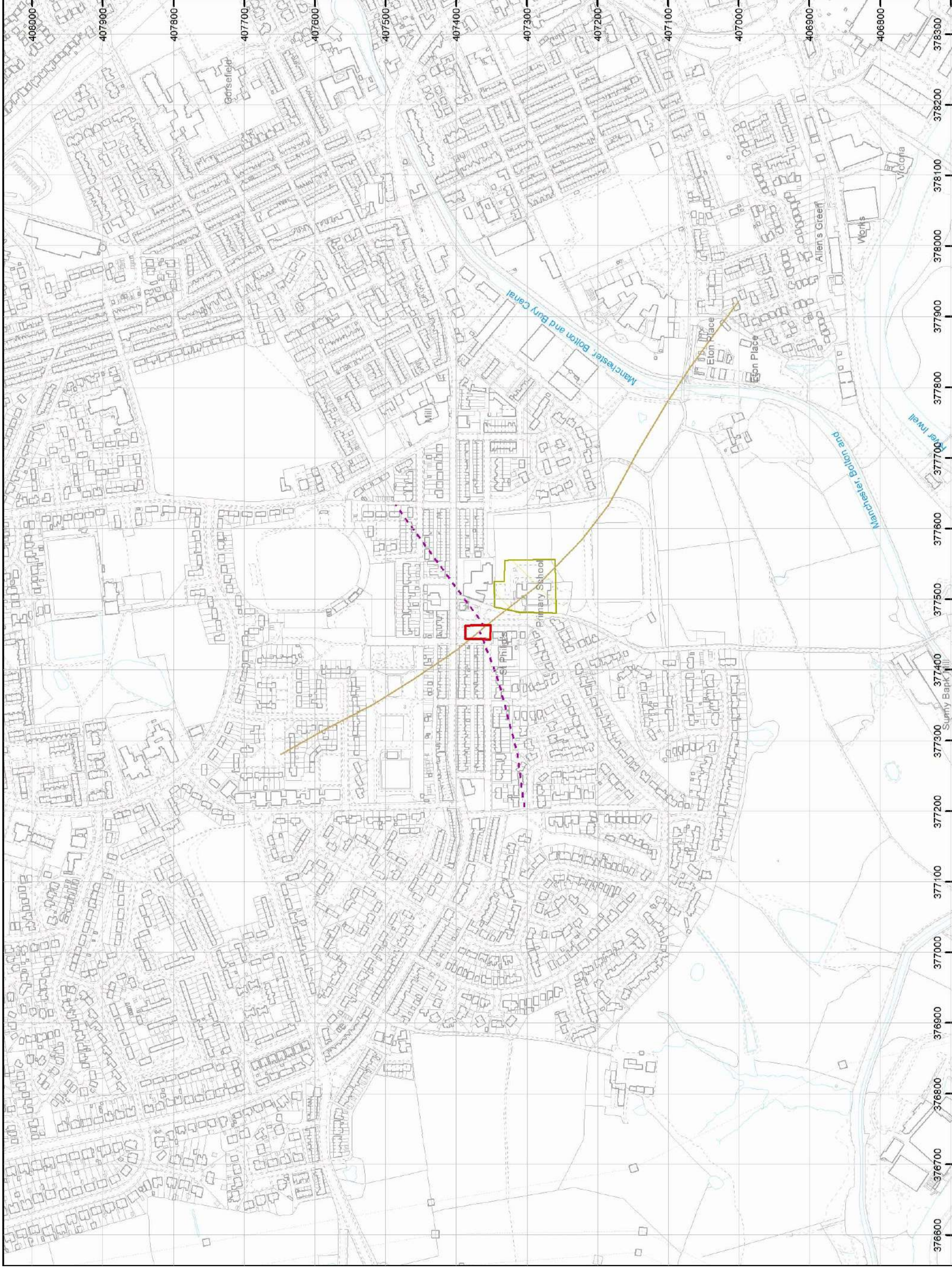
Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.



Key

-  Approximate position of the enquiry boundary shown
-  Outcrop (Conjectured)
-  Geological faults
-  Site investigations

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com

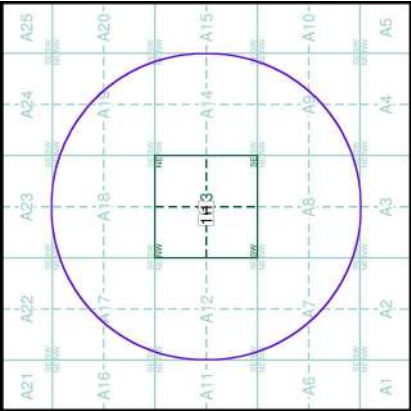
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A

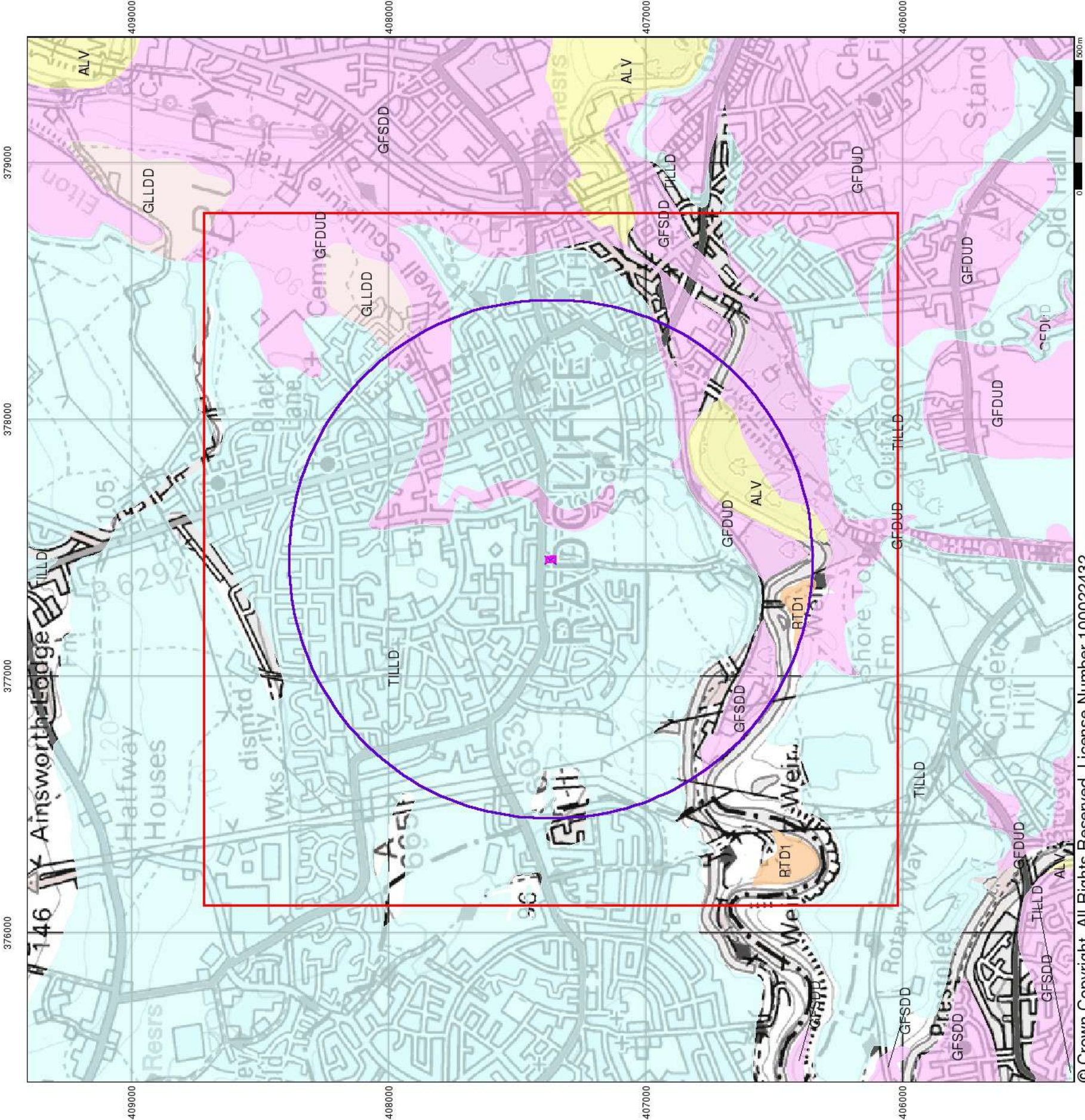


Order Details:

Order Number: 315792024_1_1
Customer Reference: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details:

, 92, Higher Dean Street, Raddiffe, Manchester, M26 3TE



Bedrock and Faults

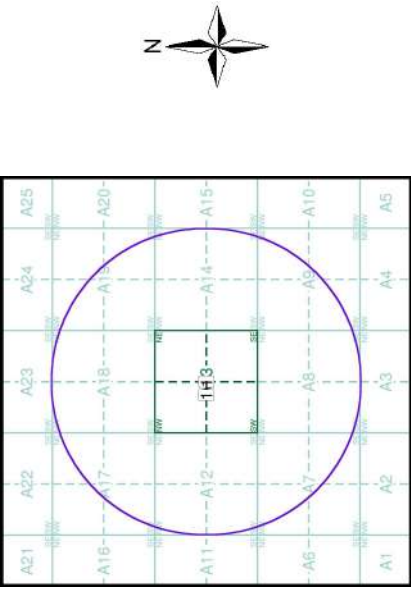
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A

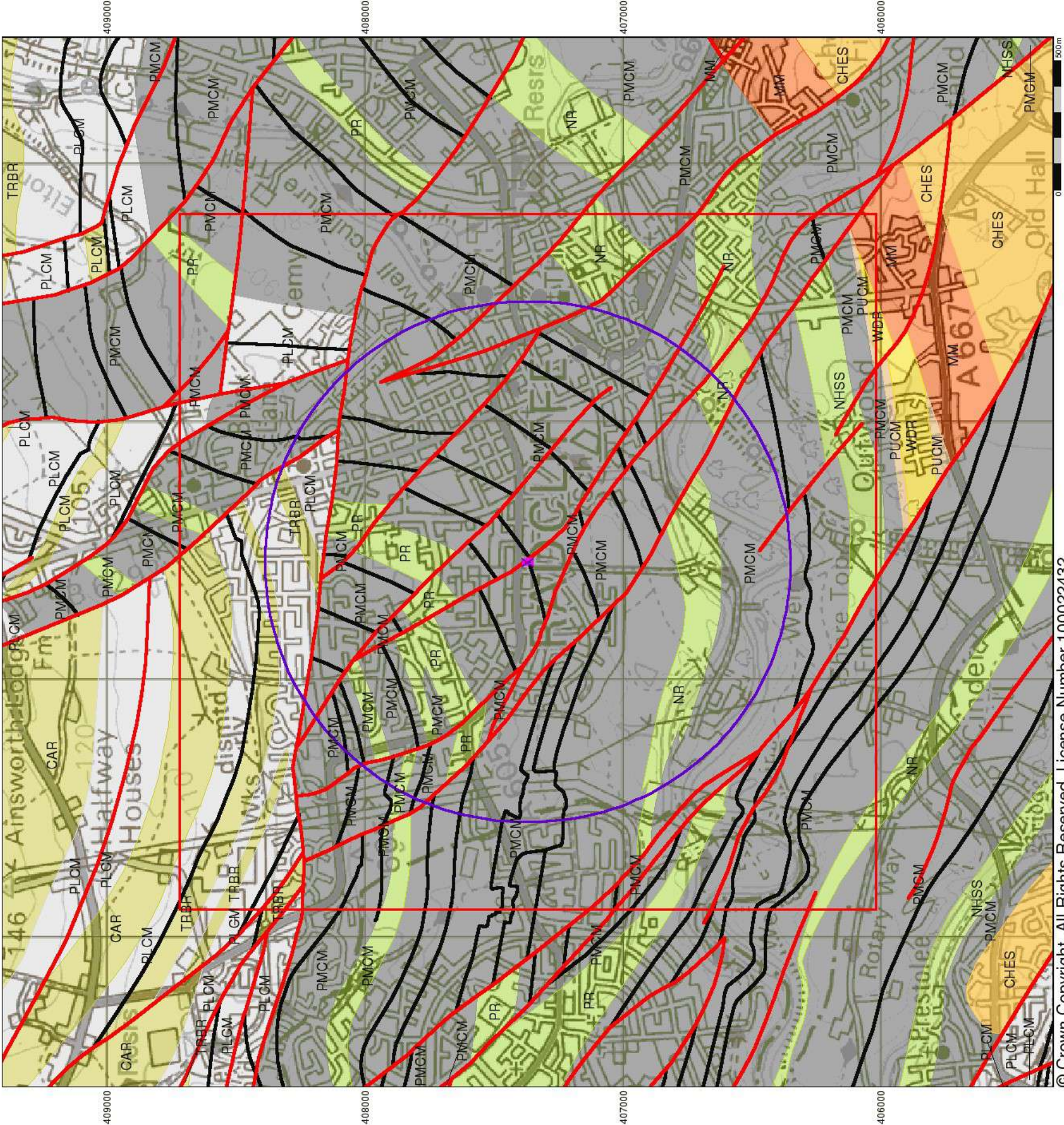


Order Details:

Order Number: 315792024_1_1
Customer Reference: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details:

, 92, Higher Dean Street, Raddiffe, Manchester, M26 3TE



Lancashire And Furness

Published 1850

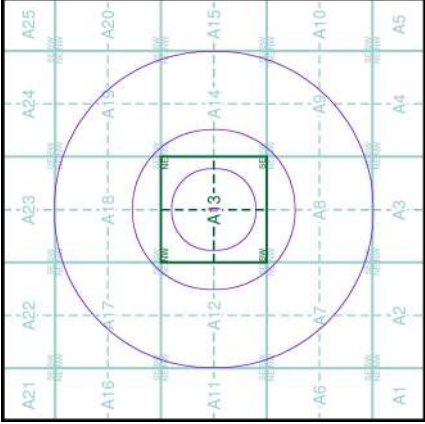
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

08700	1850	1:10,560
09500	1850	1:10,560

Historical Map - Slice A



Order Details

Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details

, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE

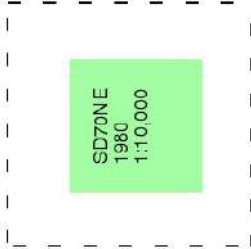
Ordinance Survey Plan

Published 1980

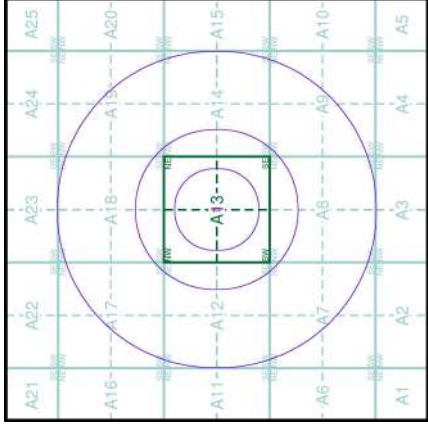
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details

, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE

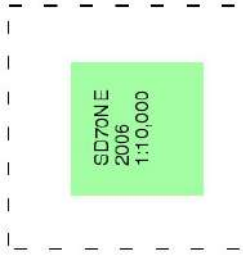
10k Raster Mapping

Published 2006

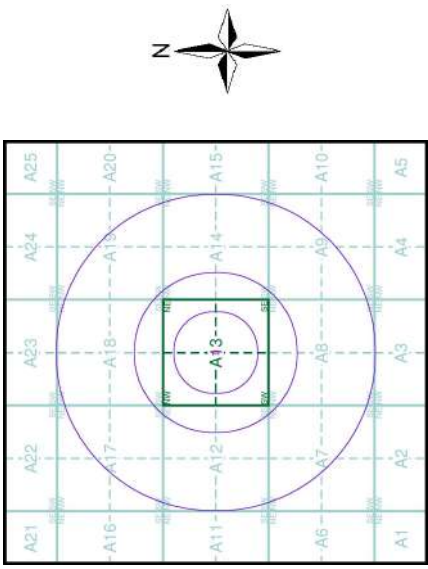
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

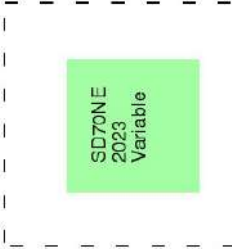
Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details

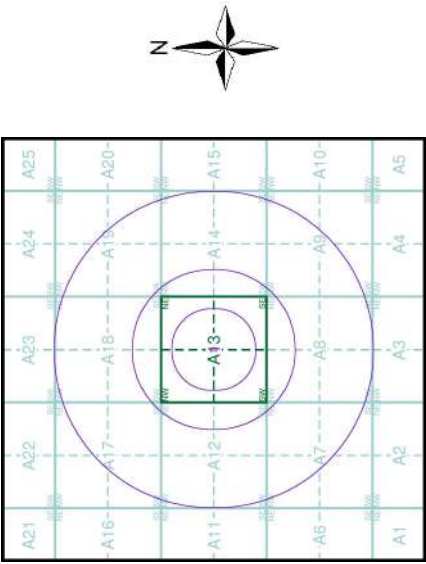
, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details

, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE



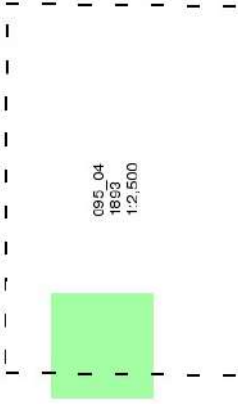
Lancashire And Furness

Published 1893

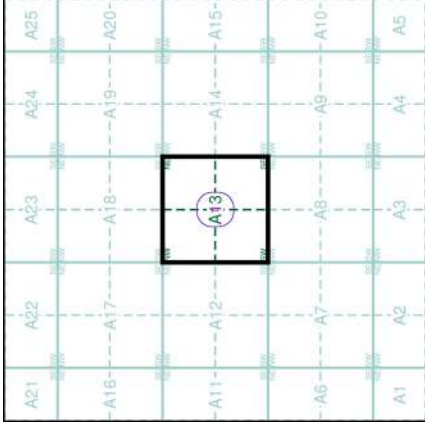
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

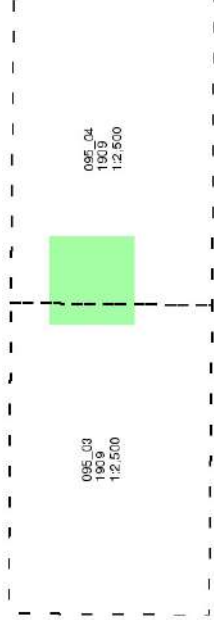
Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

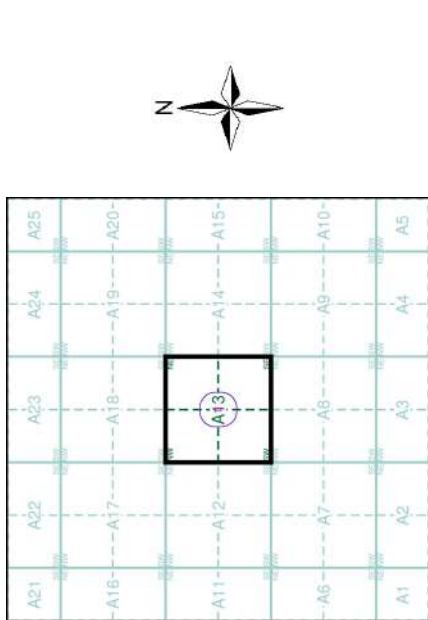
, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

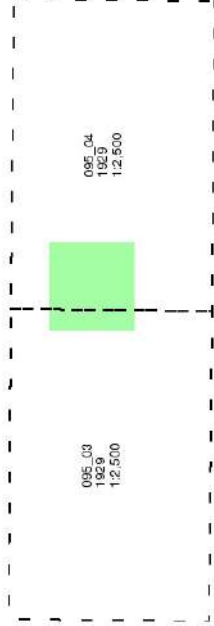
Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

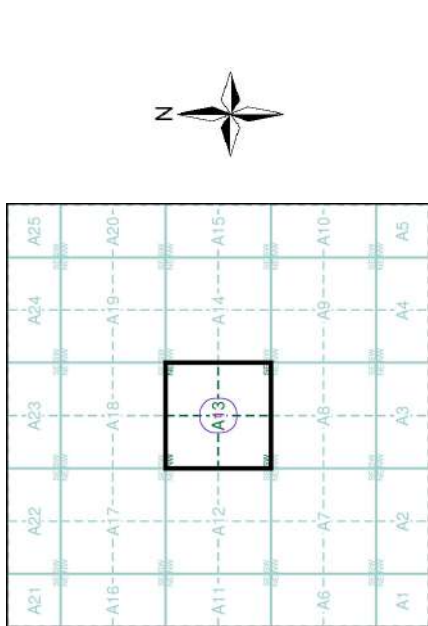
, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what was considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

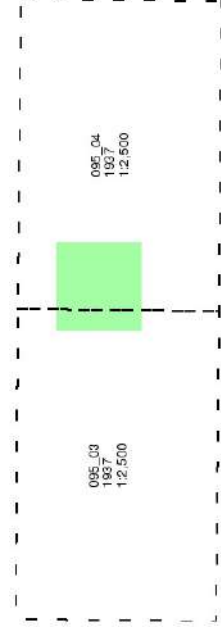
Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

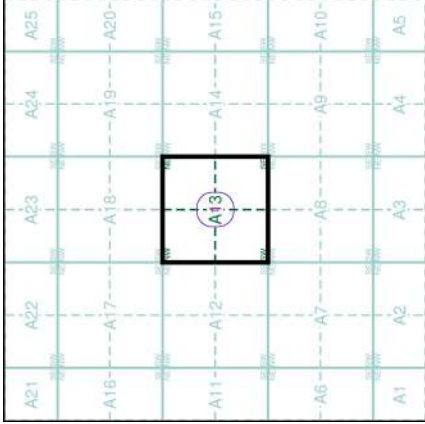
, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

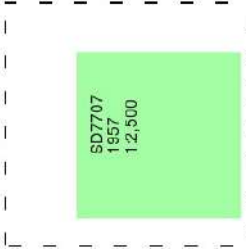
Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

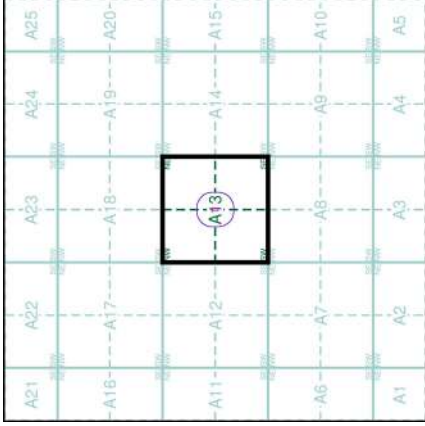
, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13

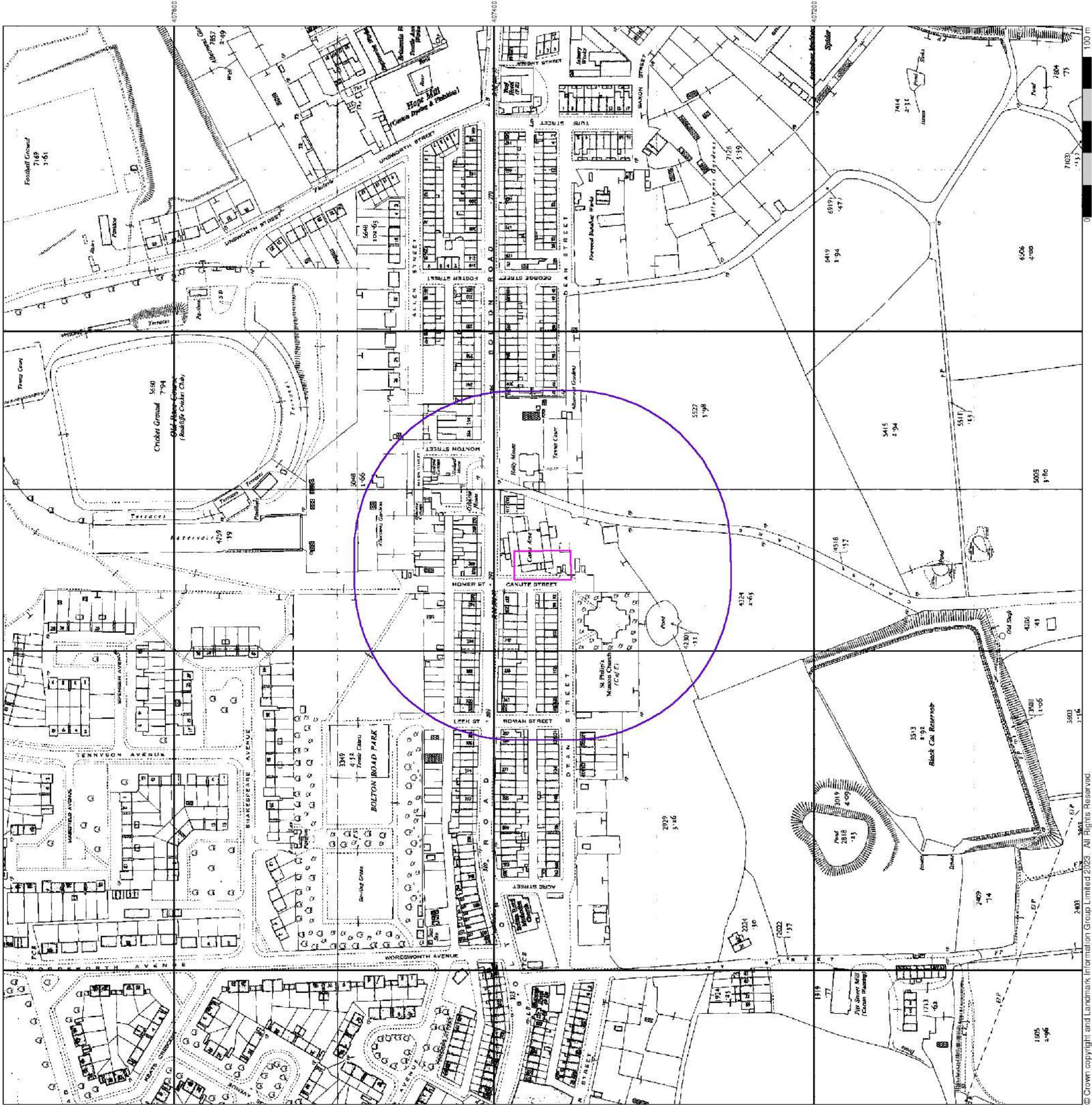


Order Details

Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE



Ordinance Survey Plan

Published 1964 - 1976

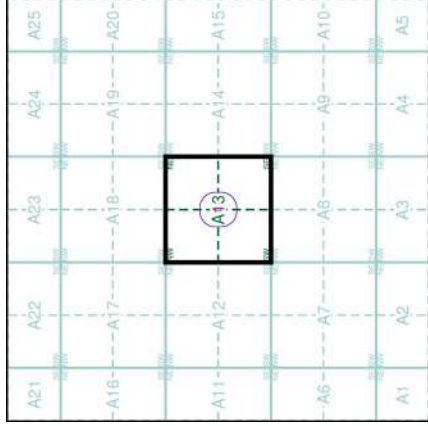
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

SD7707NW	SD7707NE
1964	1964
1:1,250	1:1,250
SD7707SW	SD7707SE
1976	1972
1:1,250	1:1,250

Historical Map - Segment A13



Order Details

Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE

Large-Scale National Grid Data

Published 1992

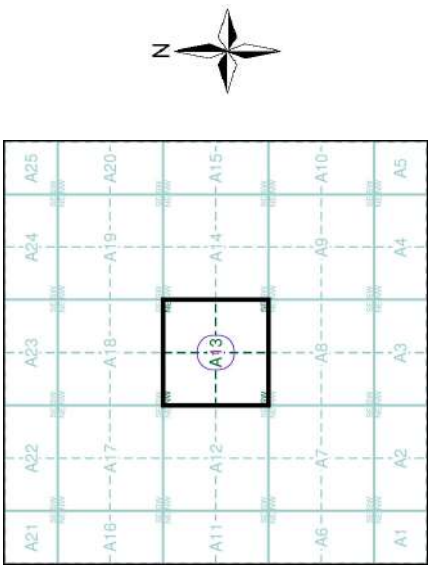
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

SD7707NW	SD7707NE
1992	1992
1:1,250	1:1,250
SD7707SW	SD7707SE
1992	1992
1:1,250	1:1,250

Historical Map - Segment A13



Order Details

Order Number: 315792024_1_1
Customer Ref: Bolton Road
National Grid Reference: 377450, 407370
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

, 92, Higher Dean Street, Radcliffe, Manchester, M26 3TE