



Phase I Geoenvironmental Site Assessment
Harrow Avenue, Rochdale

Reference: 17-039-R1-1
Date: July 2023



PHASE I GEOENVIRONMENTAL SITE ASSESSMENT

Land off Harrow Avenue
Rochdale
OL11 4DS

Prepared for:
Cube Architecture and Design



Report Ref: 17-039-R1-1
Date Issued: July 2023

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EXECUTIVE SUMMARY

Site Address	Land off Harrow Avenue, Rochdale, OL11 4DS
Grid Reference	E 387517, N 412823
Site Area	0.2 Ha
Proposed Development	The client intends to construct three low-rise residential dwellings with associated gardens, car parking, infrastructure and an access road. Drawing 17-039-002 (Appendix IV) identifies the proposed development layout.
Current Site Use	The Site comprises a disused parcel of land that is located to the east of Harrow Avenue and to the south of Bury Road. No structures are present on Site. An asphalt access track is present in the northwest. The Site has recently been cleared of vegetation and levelled with compacted gravel and aggregate placed across the central and northern sectors. Reworked topsoil with brick is present across the southern sector. There is little topographic variance across the majority of the Site. A stream is present at the southeast boundary at a lower elevation. A mature tree is present in the south of the Site. Invasive plant species have been identified in the southern sector of the Site in the vicinity of the stream/brook.
Site History	A review of the pertinent Ordnance Survey mapping from 1851 suggests that the Site comprised agricultural land with a field boundary in the northwest. By 1959 a greenhouse was present in the centre of the Site, and the Site is segregated into garden areas for the residential properties to the north. A spring is recorded at the southern site boundary. The greenhouse is no longer present by 1992. By 2012 the field boundary in the northwest is no longer recorded, and a hard standing access track is present. A small structure is present in the north of the Site. The Site no longer appears to be split into different parcels and the majority of the Site is covered in dense vegetation. The majority of the Site was cleared of vegetation in 2023. The surface cover appears to be a combination of topsoil and gravel.

ENVIRONMENTAL SETTING

Geology	Drift Geology	Glaciofluvial Deposits – SAND and GRAVEL
	Bedrock Geology	Old Lawrence Road – SANDSTONE Pennine Lower Coal Measures (southern sector) – MUDSTONE, SILTSTONE, SANDSTONE
	Faults	The BGS mapping records an inferred normal fault on Site, trending northwest to southeast.
Hydrogeology	Secondary A drift and Secondary A bedrock aquifer recorded.	
	There are no groundwater/potable abstractions within 1 km.	
Hydrology	A stream runs adjacent to the southeast site boundary.	
	Unaffected by flooding from rivers.	
Utility Locations	Utility connections are likely to be available throughout the adjacent residential estates.	



Landfill Sites and Ground Gases	No landfill sites (current or historic) are located within 250 m of the Site.
Radon	Between 1-3% of houses above the 'Action Level' – no special precautions required.
Hazardous Installations	No hazardous installations that could potentially prejudice the proposed construction of highly sensitive residential dwellings have been identified within influencing distance of the subject Site.

PRELIMINARY CONTAMINATED LAND ASSESSMENT

Human Health	Due to the largely undeveloped nature of the Site, there are limited potential sources of contamination identified. Made Ground placed across the Site is a potential source of heavy metals, asbestos, Polycyclic Aromatic Hydrocarbons (PAHs), Total Petroleum Hydrocarbons (TPHs) and asbestos.
Controlled Waters	No significant source of mobile contamination has been identified. The presence of sand and gravel drift deposits will likely facilitate downward migration to the underlying aquifers and lateral migration to the adjacent stream. The sensitivity of the Secondary A aquifers is reduced, given there are no groundwater/potable abstractions within 1km.
Ground Gas	Made Ground and possible shallow coal workings are potential sources of hazardous ground gas, including methane and carbon dioxide. Off-site sources of hazardous ground gas include the former sewage works and mine shaft entries. However, the risk is reduced due to the distance from the Site. Carbon dioxide and methane have associated asphyxiation and explosive risks, respectively. If present, the risks can be appropriately mitigated through the careful design of building structures. A programme of ground gas monitoring is likely to be required to confirm the ground gas regime for the Site.

PRELIMINARY COAL MINING ASSESSMENT

Coal Mining/Land Stability	The southern sector of the Site is located in a Development High Risk Area. The Arley coal seam outcrops circa 35 m to the southeast of the Site and underground workings are recorded across the central and northern sectors of the Site in the Lower Mountain seam at 122 m. No mine entries are recorded within 100 m. The desk-based Coal Mining Risk Assessment (CMRA) confirms that known underground workings to the north of the fault are associated with the Lower Mountain coal seam at 122 m bgl. The Development High Risk Area is located in the south of the Site in the location of the proposed garden areas. The proposed plots are located to the north of the fault, outside of the high risk area, therefore there is a low risk with respect to shallow workings associated with the Arley coal seam.
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PRELIMINARY GEOTECHNICAL ASSESSMENT

Geological	A volume change potential assessment may be required and given that the Site is lined by mature and semi-mature trees, consideration of the potential water demand of trees affecting foundations should be considered. Localised organic deposits may be present in the location of infilled field boundaries and adjacent to the stream along the southeast boundary.
Civil and Structural	No significant underground obstructions are anticipated. A gabion wall is present along the northern site boundary and concrete retaining blocks are present along the eastern and western site boundaries.
Abnormal Foundations	An abnormal engineering solution may be required where there is a significant thickness of Made Ground, tree influence, loose granular soils or soft cohesive and organic deposits.

CONCLUSIONS AND RECOMMENDATIONS

A geotechnical investigation may be required for building control and foundation design. Boreholes would be required if any structures are proposed within the Development High Risk Area.

Ground gas protection measures will be required in accordance with Characteristic Situation 2 if ground gas monitoring is not completed.

Validation testing of soils placed within the proposed garden cover system will be required to confirm suitability for use.



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Drawing List

17-039-001 - Site Location Plan
17-039-002 - Proposed Development Plan
17-039-003 - Historical Features Plan
17-039-004 - Site Features Plan
17-039-011 - Coal Mining Issues Plan



1. INTRODUCTION

1.1. BACKGROUND

E3P has been commissioned by Cube Architecture and Design to undertake a detailed Phase I Geoenvironmental Site Assessment for land off Harrow Avenue in Rochdale; herein referred to as the Site.

This report is required to determine potentially contaminated land and geotechnical liabilities for the proposed residential development.

1.2. PROPOSED DEVELOPMENT

The client intends to construct three low-rise residential dwellings with associated gardens, car parking, infrastructure and an access road. Drawing 17-039-002 (Appendix IV) identifies the proposed development layout.

A snapshot of the proposed development layout is indicated in Figure 1.1.

FIGURE 1.1 SNAPSHOT OF THE PROPOSED DEVELOPMENT



1.3. OBJECTIVES

The objectives of the geoenvironmental site assessment are as follows:

- ✿ Review historical plans, geology, hydrogeology, site sensitivity, floodplain issues, mining records and any local authority information available in order to complete a desk study in line with Environment Agency (EA) document *Land Contamination: Risk Management (LCRM) (2021b)*.
- ✿ Assess the implications of any potential environmental risks, liabilities and development constraints associated with the Site concerning the Site's future use and in relation to off-site receptors.
- ✿ Assess the desk study information and, where possible, provide preliminary recommendations concerning foundations, pavement construction, general geotechnical issues, floor slabs and coal mining related issues.
- ✿ Provide recommendations regarding future works required.

1.4. SOURCES OF INFORMATION

- ✿ Groundsure Enviro+Geo Insight Search Reference GS-UXW-2DD-BHL-1SL;
- ✿ Historical mapping dated 1851 - 2023. A selection of historical maps are reproduced in Appendix VI;
- ✿ Online planning records held by Rochdale Borough Council;
- ✿ Consultations with representatives of Rochdale Borough Council;
- ✿ Coal Authority Consultants Report (Reference 51003364149001);
- ✿ Magic Map Groundwater Vulnerability Map;
- ✿ Radon: Guidance on protective measures for new buildings (BRE Document BR 211, 2007);
- ✿ British Geological Survey Map and Borehole Records;
- ✿ UXO - <https://zeticauxo.com/downloads-and-resources/risk-maps/>; and,
- ✿ Flood Risk - <https://flood-map-for-planning.service.gov.uk/>

1.5. LIMITATIONS

The limitations of this report are presented in Appendix I.

1.6. RISK CLASSIFICATION

The description of risk classification and the likely action required as set out in CIRIA C552 are included in Appendix III.



1.7. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such consent.



2. SITE SETTING

2.1. SITE DETAILS

Site Address	Land off Harrow Avenue, Rochdale, OL11 4DS
National Grid Reference	E 387517, N 412823
Site Area	0.2 Ha

The Glossary presented in Appendix II defines all acronyms used within this report.

A site location map is presented in Appendix IV as Drawing 17-039-001.

2.2. CURRENT SITE USE

A site walkover was completed by an E3P representative on 3rd July 2023 with the full details included in Table 2.1.

TABLE 2.1 SITE DESCRIPTION

Occupancy/Use	The Site comprises a disused parcel of land that is located to the east of Harrow Avenue and the south of Bury Road.	
Surface Cover (%)	Buildings	0 %
	Hardstand	70 %
	Soft Cover	30 %
Structures	No structures are present.	
Retaining Structures	A gabion wall is present along the northern site boundary and concrete retaining blocks are present along the eastern and western site boundaries.	
Access	Vehicular and pedestrian access is present via an asphalt access track off Harrow Avenue to the northwest of the Site.	
Slope	There is little topographic variance across the majority of the Site. A stream is present to the southeast of the Site at a lower elevation.	
Vegetation/Ecology	A vegetation clearance has recently been completed. However, a mature tree is present in the south of the Site.	
	Invasive plant species, including Himalayan Balsam, Giant Hogweed and Japanese Knotweed, have been identified in the southern sector of the Site in the vicinity of the stream/brook.	
Hazardous Material Storage	None identified.	
Asbestos-Containing Material (ACM)	None were identified; however, asbestos fibres may be present within the Made Ground on Site.	
Polychlorinated Biphenyls (PCBs)	No equipment that may contain PCBs, such as transformers or electric substations, are identified on the Site. A substation is located circa 15 m north.	
PFAS/PFOA	No potential sources were identified.	



Waste Storage	None known within the site boundary and no licenced waste activities are identified within data searches on-site.
Drainage	No manholes were identified during the site walkover. A drainage pipe was noted entering the stream in the south of the Site.

2.3. SURROUNDING AREA

The surrounding area land uses are summarised in Table 2.2.

TABLE 2.2 SURROUNDING LAND USES

DIRECTION	LAND USE
North	Residential dwellings.
East	Open space, stream, residential dwellings.
South	Residential dwellings, open space, River Roch
West	Residential dwellings.

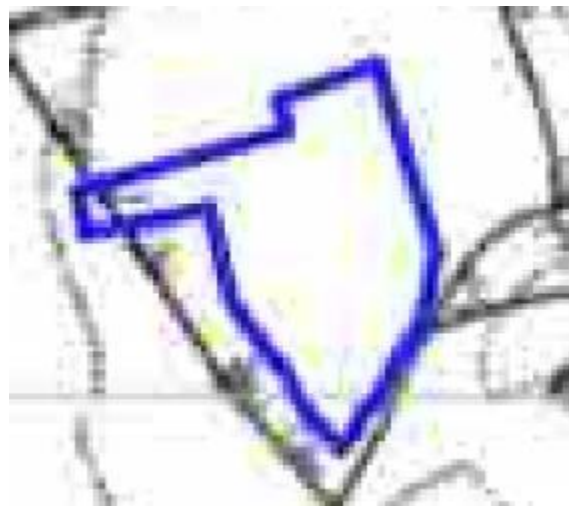


3. SITE HISTORY

3.1. ON-SITE HISTORICAL DEVELOPMENT

A review of historical mapping and historical aerial imagery pertinent to the Site is summarised in Table 3.1. In addition, historical site features are presented on Drawing 17-039-003 in Appendix IV.

TABLE 3.1 HISTORICAL DEVELOPMENT

MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1851 1:10,560	The Site is undeveloped agricultural land with a field boundary in the northwest.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1890-1891 1:2,500	A stream is present along the southeast site boundary, with sporadic trees.	
1930 1:2,500	There are no changes to the subject site. Residential properties have been constructed adjacent to the west of the Site.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1956-1959 1:1,250	A glasshouse (greenhouse) is recorded in the centre of the Site and the Site appears to be segregated into garden areas for the residential properties to the north. A spring is recorded at the southern site boundary.	
1992 1:1,250	The greenhouse is no longer recorded.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
2012 Aerial Photograph	The field boundary in the northwest is no longer recorded and a hard standing access track is present. A small structure is present in the north of the Site. The Site no longer appears to be split into different parcels. The majority of the Site is covered in dense vegetation.	
2019 Aerial Photograph	Further trees are shown in the north and northwest of the Site.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
2023 Google Earth Image	The majority of the Site has been cleared of vegetation. The surface cover appears to be a combination of topsoil and gravel.	 An aerial photograph showing a residential neighborhood. A red outline highlights a specific area, likely the site of interest. The area within the outline is mostly cleared, showing a mix of brown and tan colors, which corresponds to the text description of topsoil and gravel. Surrounding the site are green trees and other residential buildings.



3.1.1. SUMMARY OF ON-SITE HISTORICAL DEVELOPMENT

The following summary points have been highlighted after a detailed review of the historical mapping series.

POTENTIAL HISTORICAL CONTAMINATION ISSUES

- ✿ Made Ground placed across the Site may contain contaminants.
- ✿ PCBs may be present associated with the substation located 15 m northwest.

POTENTIAL HISTORICAL GEOTECHNICAL ISSUES

- ✿ A volume change potential assessment may be required and given that the Site is lined by mature and semimature trees, consideration of the potential water demand of trees affecting foundations should be considered.
- ✿ Localised organic deposits may be present in the location of infilled field boundaries and adjacent to the stream along the southeast boundary.

3.2. OFF-SITE HISTORICAL DEVELOPMENT

A review of potentially contaminative uses identified on historical Ordnance Survey maps within a 150 m radius of the Site is summarised in Table 3.2.

TABLE 3.2 SURROUNDING HISTORICAL DEVELOPMENT

SURROUNDING FEATURE	DISTANCE	DATES	DIRECTION
Electricity Substation	15 m	Pre 1990 – Present	North
Sewage Works (Filter Beds) ...then marked as Old Filter Beds	90 m	Pre 1910 – Pre 1959 Pre 1959 – Present	South
Old Shaft ...then no longer recorded	130 m	Pre 1891 – Pre 1910 Pre 1910 – Present	North

3.3. PLANNING HISTORY

E3P has undertaken a review of Rochdale Metropolitan Borough Council planning website which has identified the following previous applications for the subject site.

APPLICATION NUMBER	YEAR	PROPOSAL	DECISION
05/D45295	2005	Erection Of One Detached Dwelling Detached Double Garage With Access From Harrow Avenue (Revised Proposal D44225)	Grant subject to conditions
05/D45825	2005	Erection Of One Dwelling, Detached Double Garage And Construction Of Gabion Wall And 1.8m Fencing (Partly Retrospective)	Grant subject to conditions



APPLICATION NUMBER	YEAR	PROPOSAL	DECISION
05/D46251	2005	Erection Of 2 Detached Dwellings And Repositioning Of Previously Approved Dwelling (D45825)	Grant subject to conditions

No further information is available.



4. ENVIRONMENTAL SETTING

4.1. GEOLOGY AND HYDROGEOLOGY

The British Geological Survey (BGS) map for the Site, (Sheet 76) and online records indicate the Site is underlain by the geological sequence presented in Table 4.1.

TABLE 4.1 SUMMARY OF UNDERLYING GEOLOGY

GEOLOGICAL UNIT	CLASSIFICATION	DESCRIPTION	AQUIFER CLASSIFICATION
Drift	Glaciofluvial Deposits	SAND & GRAVEL	Secondary A Aquifer
Solid	Old Lawrence Road	SANDSTONE	Secondary A Aquifer
	Pennine Lower Coal Measures (Southern sector)	MUDSTONE, SILTSTONE, SANDSTONE	Secondary A Aquifer

There are no BGS boreholes within 250 m.

The BGS mapping records an inferred normal fault on Site, trending northwest to southeast.

4.2. HYDROGEOLOGY

The Groundsure report indicates that the Site is not located within a groundwater source protection zone. Furthermore, there are no groundwater/potable abstractions within 1 km of the Site.

A spring is located at the southern site boundary.

4.3. NATURAL LANDFORM AND GEOMORPHOLOGY

Based on the initial geological assessment, a review of available topographic data and pertinent mapping, E3P has undertaken a preliminary geomorphological evaluation of the landform and its possible mechanism for formation.

A review of relevant records indicates that the Site has not been subject to significant anthropogenic changes with the current site topography broadly representing the natural landform. The Site has recently been cleared of vegetation and levelled.

A stream flows along the southeast site boundary at a lower elevation.



FIGURE 4.1 SURFACE LIDAR DATA (HOUSEPRICES.IO)



4.4. RADON RISK POTENTIAL

The Groundsure report indicates that the Site is situated in an area where between 1% and 3% of homes are above the “Action Level” and that the BGS reports that protective measures are not necessary for the construction of new dwellings or extensions.

4.5. HYDROLOGY

Surface water features within 250 m of the subject site are summarised in Table 4.2 below.

TABLE 4.2 SURFACE WATER FEATURES

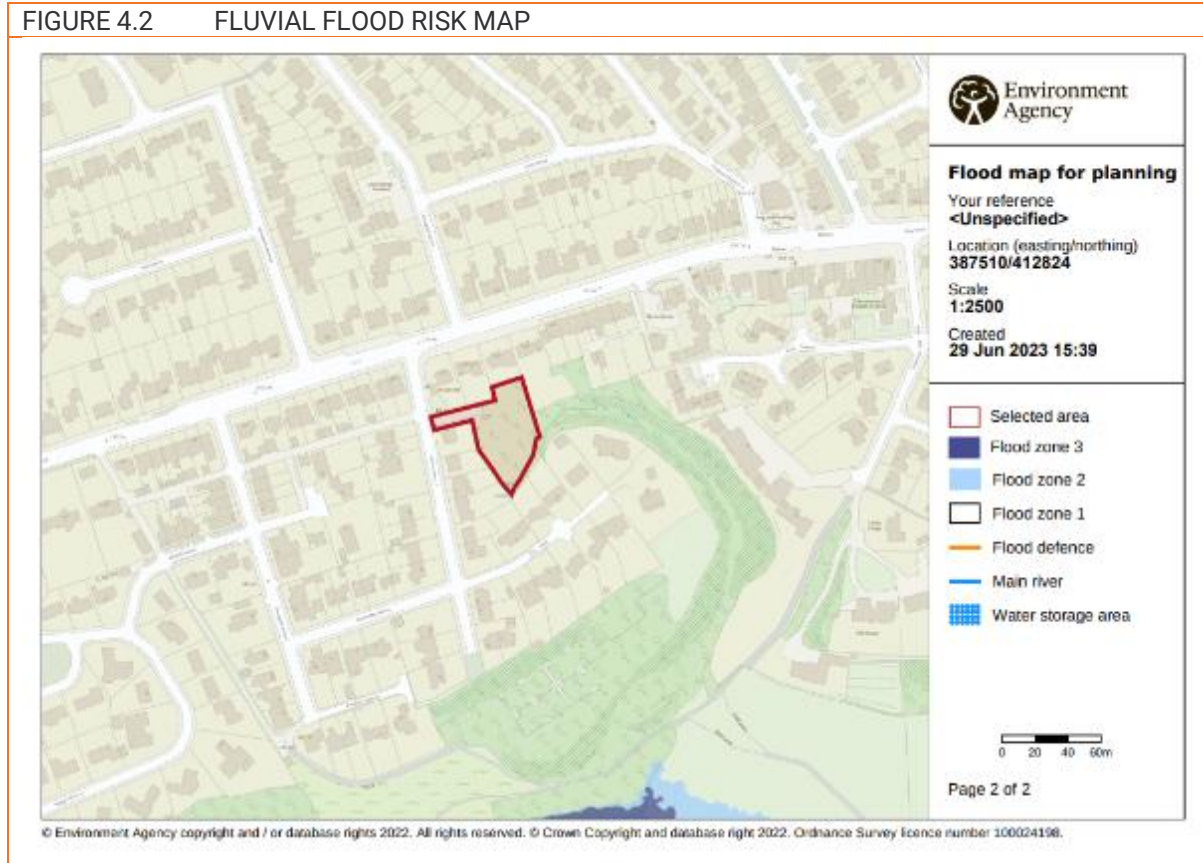
SURFACE WATER FEATURE	QUALITY	DISTANCE (m)	DIRECTION
Inland River	Unknown	0	South
Inland River	Unknown	189	South East
River Roch	Unknown	208	South

The Site is located within a currently defined “Flood Risk Zone 1”; defined as land assessed as having less than 1 in 1,000 annual probability of river or sea flooding (< 0.1%), and as such is considered to be unaffected by river flooding. The Fluvial Flood Risk Map is presented in Figure 4.2.

The Site is located within an area at low risk from groundwater flooding.



FIGURE 4.2 FLUVIAL FLOOD RISK MAP



Source - <https://flood-map-for-planning.service.gov.uk/>

4.6. LANDFILL SITES AND WASTE TREATMENT SITES

There are no landfill sites or waste treatment sites within 500 m.

4.6.1. WASTE MANAGEMENT LICENSES & ENVIRONMENTAL PERMITS

No Waste Management Licenses or Environmental Permits have been identified in the environmental database for the Site and surrounding area.

4.7. UNEXPLODED ORDNANCE

The regional unexploded bomb risk map from Zetica (2014) indicates that the Site is in an area at low risk from possible unexploded ordnance (UXO) resulting from the Second World War. The Zetica UXO Risk Map is presented in Figure 4.3.

FIGURE 4.3 ZETICA UXO RISK MAP



Source - <https://zeticauxo.com/downloads-and-resources/risk-maps/>

4.8. INDUSTRIAL LAND USES

There are four active industrial land uses within 250 m of the site boundary as summarised in Table 4.3.

TABLE 4.3 INDUSTRIAL LAND USES

COMPANY	ACTIVITY	DISTANCE (m)	DIRECTION
Gas Governor Station	Gas Features	2 m	North West
Electricity Substation	Electrical Features	15 m	North West
Electricity Substation	Electrical Features	200 m	East
Electricity Substation	Electrical Features	206 m	West



4.9. SITE SENSITIVITY ASSESSMENT

The Site is assessed to be located within a “Moderate” sensitivity setting as discussed within Table 4.4 overleaf.

TABLE 4.4 SITE SENSITIVITY ASSESSMENT

SENSITIVITY PROFILE	DISCUSSION	RATING
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	None identified.	Low
Distance to the Closest Groundwater Abstraction Point	None identified within 1km.	Low
Aquifer Classification in Superficial Drift Deposits	Secondary A	Moderate
Aquifer Classification in Bedrock	Secondary A	Moderate
Is the Site Underlain by Low-Permeability Drift to Depths in Excess of 10 m?	Sand and gravel are likely to be present.	High
Is the Site Located Within 50 m of a Surface Watercourse?	A stream is located adjacent to the southeast site boundary.	High
Sensitive Land Uses Within Close Proximity (e.g. Residential, School, Nursery, Local Nature Reserves)	The closest residential properties are located adjacent to the Site. The Site is located within a SSSI Impact Risk Zone. An area of designated ancient woodland is also located 219 m southwest at River Rock Wood.	High
OVERALL SITE ENVIRONMENTAL SENSITIVITY		Moderate

4.10. REGULATORY DATABASE

The information summarised in Table 4.5 has been obtained from a commercially available environmental database. The summary table only includes records from within 250 m of the subject site and not otherwise detailed in the report.



TABLE 4.5 SUMMARY OF ENVIRONMENTAL DATA

RECORD	ENTRIES WITHIN 250 m	DETAILS
Contaminated Land Register Entries and Notices	0	None Identified.
Authorised Industrial Processes (IPC/IPPC/LAPPC)	0	None Identified.
Fuel Stations Entries	0	None Identified.
Licensed Radioactive Substances	0	None Identified.
Enforcements, Prohibitions or Prosecutions	0	None Identified.
Discharge Consents	2	217 m S – Sewage discharges (revoked) 221 m SE – Sewage discharges (historic)
Pollution Incidents	0	None Identified.
Consents Issued Under the Planning (Hazardous Substances) Act 1990	0	None Identified.
Control of Major Accident Hazard (COMAH) Sites	0	None Identified.

4.11. REGULATORY CONSULTATIONS

E3P contacted the Environmental Health Department at Rochdale Borough Council. Michael Moore P, the Environmental Health Senior Officer confirmed the following:

- ✳ The Site is not registered as contaminated land.
- ✳ No current information would suggest that the Site would be considered as contaminated land in the future. An investigation is required to confirm this.
- ✳ The Site would be conditioned for an investigation if an application was made.



5. PRELIMINARY COAL MINING ASSESSMENT

5.1. COAL MINING

The Groundsure report states the Site is in an area that may be affected by coal mining.

A CA mining report was obtained (Ref: 51003364149001) dated June 2023.

The CA operates a risk-based approach to the assessment of potential instability issues associated with future development of land located within the predefined CA consultation areas. This risk-based approach subdivides the potential risk into “low” and “high” risk categories.

The risk categories can be defined as:

Low-Risk Sites – Deemed to be land where coal mining has taken place, however, it was at such depth not to pose a risk to new development and it, therefore, contains no known recorded risks and as such no further assessment is required.

For low-risk sites, the CA categorically states:

*If your proposed development is within the Development Low Risk Area, **there is no need for you to submit any coal mining information with your planning application** and The Coal Authority will not be consulted by the LPA. The LPA will include our Standing Advice as an informative note within the decision notice.*

High-Risk Sites – Deemed to be landholdings located within an area known to contain legacy risks that include:

- ✿ Mine entries (shaft or adit);
- ✿ Shallow coal workings (recorded and probable);
- ✿ Workable coal seam outcrops;
- ✿ Mine gas sites and areas;
- ✿ Recorded coal-mining-related hazards;
- ✿ Geological features (fissures and break lines); and
- ✿ Former surface mining sites (sometimes using historic opencast extraction methods).

5.2. COAL MINING INFORMATION

Prior to the enactment of the Coal Mines Regulation Act (1872), which came into force on the 1st of January 1883, there was no statutory requirement to record the extent of abandoned mine workings and as such the CA has no knowledge of extensive workings throughout the UK Coal Fields where shallow workings are present at a depth that could result in a subsidence event in the future (through successive cavitation) associated with failure of support mechanism.

To determine if a site may have unrecorded or recorded coal mine workings requires the consideration of a wide range of information and E3P has completed a review of relevant information in relation to potential coal mining activities.



In the first instance, E3P has reviewed the Coal Authority Online Viewer and an excerpt of this is presented as Figure 5.1. This map shows an area of probable workings in the south of the Site which is noted to be within a Development High Risk Area. Underground workings are recorded across the majority of the Site in the central and northern sector. A coal outcrop is recorded to the southeast of the site and mine entries are shown to the north and south of the Site.

FIGURE 5.1 EXCERPT OF THE COAL AUTHORITY ONLINE VIEWER



As the Site is within an area affected by Coal Mining E3P has obtained a Coal Authority Consultant Coal Mining Report for the Site (ref: 51003364149001).

Table 5.1 provides a summary of pertinent coal mining information with this report.

TABLE 5.1 COAL MINING INFORMATION

SOURCES OF INFORMATION	SUMMARY							
Known Past Underground Mining	SEAM	MINERAL	DEPTH (M)	DIRECTION TO WORKING	DIPPING RATE OF SEAM WORKED	DIPPED DIRECTION OF SEAM WORKED	EXTRACTION THICKNESS	YEAR LAST MINED
	LOWER MOUNTAIN	COAL	122	BENEATH PROPERTY	8.7	SOUTH	60	1873
Probable Unrecorded workings	Yes							
Spine Roadways at Shallow Depth	No							



SOURCES OF INFORMATION	SUMMARY						
Mine Entries within 100m of the Site	None within 100 m						
Mine Abandonment plans	Yes						
Known outcrops	SEAM NAME	MINERAL	SEAM WORKABLE	DISTANCE TO OUTCROP (M)	DIRECTION TO OUTCROP	BEARING OF OUTCROP	
	ARLEY	COAL	YES	32.9	EAST	174	
Faults / Fissures	A fault is located in the southern sector of the Site, trending northwest to southeast.						
Opencast mines	None within 500 m						
Coal Authority Managed Tips	None within 500 m						
Remediated Sites	None within 50 m						
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 within 500 m						
Mine Water	None within 500 m						
Future Underground Mining	None recorded						
Coal Authority Development Advice	The Site is within an area of historical coal mining activity.						
British Geological Survey Mapping	The 1:10,000 plan for the Site shows the Arley coal outcrop to the southeast of the subject Site. The strata appear to dip to the northwest beneath the Site. This seam may therefore pose a risk to the subject site.						
	The on-site fault is shown with the downthrow to the southwest.						
Historical Ordnance Survey Mapping	A review of the 1:10,000 Ordnance Survey mapping from circa 1850, which has records of mine workings that predate the Mining & Regulation Act of 1872, identified the following features indicative of historical mine workings in proximity to the application site:						
	 Old Shaft – 130 m E.						
Historical Site Investigations	In consideration of the historical mining features in proximity to the Site and potential for coal close to the surface it is considered possible that coal extraction has occurred, underlying the Site at relatively shallow depths; further investigation would be required to determine the extent and depth of any worked seams.						
	E3P has not been provided with any historic site investigation reports.						



5.3. COAL AUTHORITY PLAN

The Coal Authority plan referenced: MR-LARGE-PLOT-51003364149001 shows the fault on Site and a conjectured outcrop located circa 35 m to the southeast.

FIGURE 5.2 COAL AUTHORITY PLAN FOR THE SITE

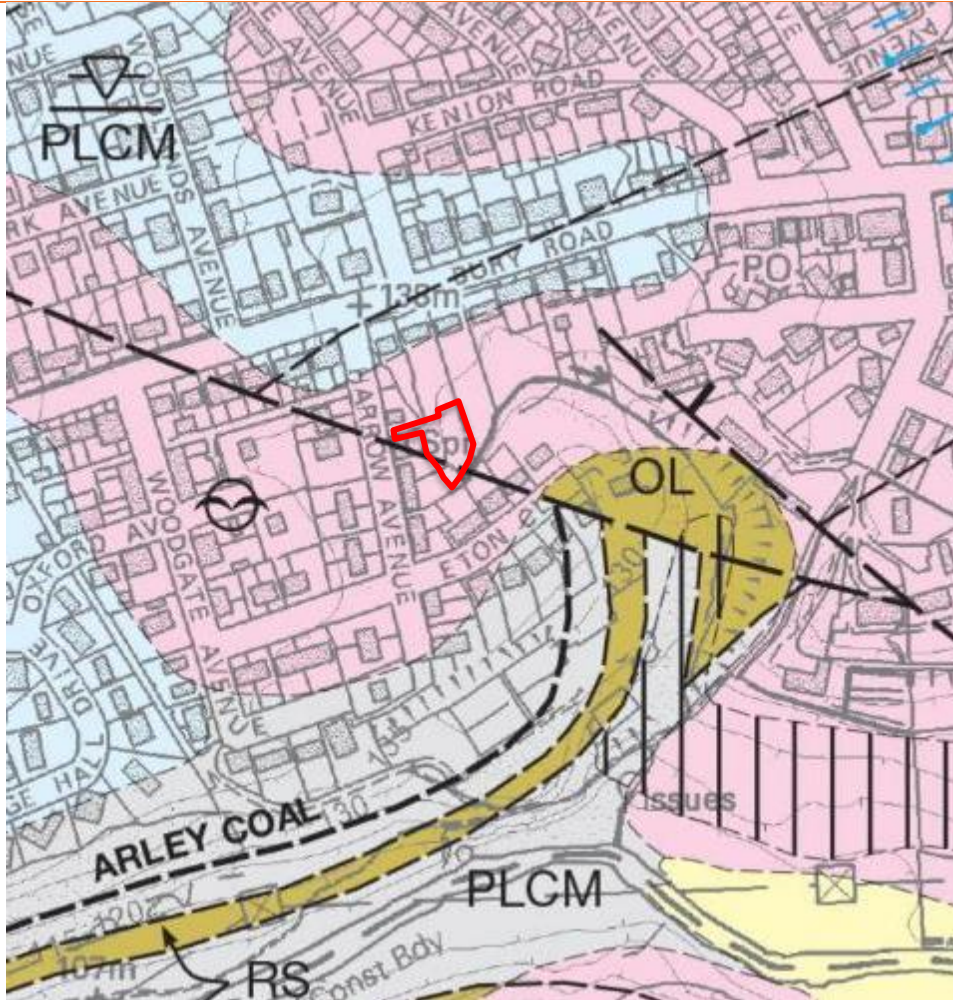


5.4. COAL MINING GEOLOGY

Figure 5.3 is a photograph of the 1:10,000 plan for the Site which shows the Arley coal outcrop to the southeast of the subject Site. The strata appear to dip to the northwest beneath the Site. This seam may therefore pose a risk to the subject site.

The on-site fault is shown with the downthrow to the southwest.

FIGURE 5.3 PHOTOGRAPH OF THE 10,000 PLAN FOR THE SITE



5.5. PRELIMINARY MINE GAS ASSESSMENT

If coal mining is present below the Site, this may be a potential source of ground gas that could pose a risk to site end users. A preliminary mine gas assessment is provided in Table 5.2.

TABLE 5.2 PRELIMINARY MINE GAS ASSESSMENT

SCENARIO	DISCUSSION	RATING
Are there known coal seams beneath the Site?	Yes – one known coal seam below the Site.	Moderate
Are there coal seams within 150m of the top of bedrock?	Yes	Moderate
Are there any known workings below the Site?	Yes – there are known workings at 122 m	Low
Are the underlying drift deposits impermeable?	Not known – BGS mapping records sand and gravel	Low
Are there any mine entrances within the site boundary or within 50m of the Site?	No	Low



SCENARIO	DISCUSSION	RATING
Are there any faults below the Site or in close proximity?	Yes – there is a fault beneath the Site.	High
Is there any records of mine gas emission on or within 50m of the Site	No	Low
Is there any record of historical mine stabilisation works?	No	Low
Evidence of rising groundwater in flooded mine workings?	Not known	Moderate
OVERALL MINE GAS RISK (IF MODERATE/ HIGH THEN FURTHER ASSESSMENT IS REQUIRED)		Moderate
Conclusions:		
Source: The Site is underlain by known coal workings at 122 m. Potential shallow workings are present which may be a source of ground gas.		
Pathway: A fault is present beneath the Site which could create a preferential pathway for mine gasses to reach the ground surface.		
Recommendations: Further assessment is required to assess the potential for mine gas to migrate up faults to the ground surface.		

5.6. COAL MINING RISK ASSESSMENT

This risk assessment comprises a desk-based review of all available information on coal mining issues that are relevant to the application site deemed to be located within a high-risk area. This includes:

- ✚ Interpretation of information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues;
- ✚ Setting out appropriate mitigation measures to address the coal mining legacy issues affecting the Site, including any necessary remedial works and/or demonstrating how coal mining issues have influenced the proposed development; and
- ✚ Demonstrating 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.

The coal mining risk assessment is summarised in Table 5.3.



TABLE 5.3 SUMMARY OF COAL MINING RISK ASSESSMENT

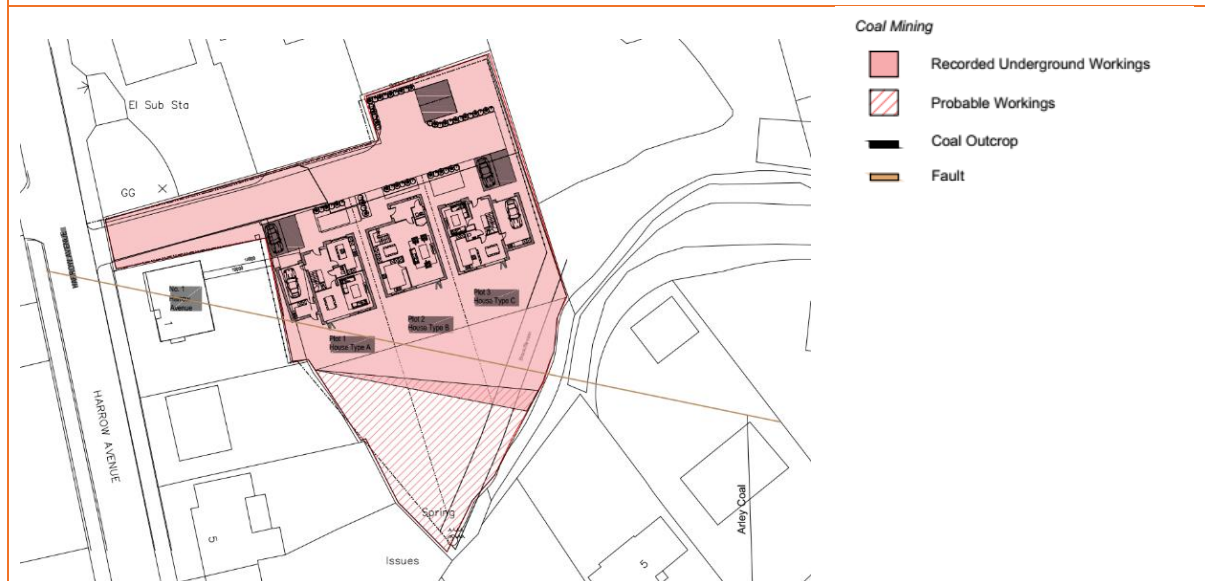
COAL MINING RISK ASSESSMENT	YES/NO	RISK ASSESSMENT
Recorded Underground Coal Mining at Shallow Depth (< 30 m)	No	Low
Recorded Underground Coal Mining at Depth (> 30 m)	Yes	Low
Evidence of Unrecorded Surface Extraction of Coal Outcrop	No	Low
Unrecorded Underground Coal Mining at Shallow Depth (< 30 m)	Yes	High
Mine Entries (Shaft/Adits)	No	Low
Coal Mining Geology – Fractures/Fissures	Yes	Low
Recorded Gas Emissions	No	Low
Recorded Mining Surface Hazard	No	Low
Surface Mining (Opencast)	No	Very Low/Low

The desk-based Coal Mining Risk Assessment (CMRA) confirms that known underground workings to the north of the fault are associated with the Lower Mountain coal seam at 122 m bgl.

The Development High Risk Area is located in the south of the Site in the location of the proposed garden areas. The proposed plots are located to the north of the fault, outside of the high risk area, therefore there is a low risk with respect to shallow workings associated with the Arley coal seam.

Figure 5.4 shows that the shallow mine workings risk from the coal sub-crop does not affect the proposed structures.

FIGURE 5.4 SNAPSHOT OF COAL MINING ISSUES AND PROPOSED LAYOUT



5.6.1. OPEN CAST MINING

There are no records of open-cast mining related to the Site.

5.7. BRINE WORKINGS

The Site is not situated within the Cheshire Salt Field and is not within an area deemed to be at risk from historic brine workings or rock salt extraction.



6. PRELIMINARY GEOTECHNICAL ASSESSMENT

6.1. GEOTECHNICAL DATA

Geotechnical data presented within a commercially available environmental database is summarised in Table 6.1.

TABLE 6.1 SUMMARY OF GEOTECHNICAL DATA

HAZARD	DESIGNATION
Shrink-Swell Clay	Very low risk
Landslides	Very low risk
Ground Dissolution	No hazard
Compressible Ground	No hazard
Collapseable Deposits	Very low risk
Running Sand	Very low risk

6.2. PRELIMINARY GEOTECHNICAL ASSESSMENT

Based on the desk-study information, the following geotechnical assessment has been made:

- Given the predominantly undeveloped nature of the Site, it is likely there will be limited Made Ground fill deposits and obstructions.
- A volume change potential assessment may be required and given that the Site is lined by mature and semimature trees, consideration of the potential water demand of trees affecting foundations should be considered.
- Localised organic deposits may be present in the location of infilled field boundaries and adjacent to the stream along the southeast boundary.



6.3. PRELIMINARY GEOTECHNICAL RISK REGISTER

POTENTIAL CONSTRAINT	ABNORMAL	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Remediation of contaminated soils		All	TBC	Ground investigation is required to confirm.
Bedrock		TBC	TBC	Ground investigation is required to confirm the depth of bedrock. There are no BGS boreholes within 250 m.
Cohesive Stratum overlying shallow Bedrock (<3.00m)		TBC	TBC	Granular soils are likely to be present.
Obstructions		TBC	10	Significant obstructions are not anticipated.
Artificially levelled and filled platforms		All	100	The Site has been cleared of vegetation and levelled.
Retaining walls		North East West	30	A gabion wall is present along the northern site boundary and concrete retaining blocks are present along the eastern and western site boundaries.
Trench collapse		TBC	100	Excavations may be unstable in deep Made Ground or granular soils.
Mature trees		South Periphery	10	A mature tree is present in the south of the Site. Trees are present to the east and north of the Site.
Volume change potential clay		TBC	TBC	Granular soils are likely to be present. If clay soils are present an assessment will be required.
Peat		TBC	TBC	Peat is unlikely to be present and is not mapped on Site.
Running sands		N/A	N/A	-
Ground dissolution		N/A	N/A	-
Concrete design		TBC	TBC	Ground investigation required to confirm.
Low-permeability ground		TBC	TBC	Granular soils are likely to be present.
Services/sensitive structures		TBC	TBC	No manholes were identified during the site walkover. However services may be present associated with the adjacent residential properties.
Abnormal foundation solutions		TBC	TBC	Ground investigation required to confirm.
Surface water features		Southeast	10	A stream is located along the southeast site boundary.
Current ponds to be filled		N/A	N/A	
Historically infilled pond		N/A	N/A	-



POTENTIAL CONSTRAINT	ABNORMAL	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Quarry high wall		N/A	N/A	-
Mining		TBC	TBC	Possible shallow mine workings are present.
Slope		N/A	N/A	-
Brine Workings		N/A	N/A	-
Open Cast Mine Workings		N/A	N/A	-



7. INITIAL CONCEPTUAL SITE MODEL

Under EA LCRM (2021b) and BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land), and BS EN ISO 21365:2021 (Soil Quality – Conceptual models for potentially contaminated sites), E3P has developed a Tier 1 Risk Assessment comprising an initial conceptual site model (CSM) to identify potential contamination sources, migration pathways and receptors within the study area. An initial screening of the on and potential off-site sources of contamination has been undertaken in Table 7.1, with the more detailed initial CSM included overleaf as Table 7.2.

TABLE 7.1 INITIAL CONTAMINANT SOURCE SCREENING

SOURCE	SOIL	GROUNDWATER	GROUND GAS
ON-SITE			
Made Ground	Asbestos, Polycyclic Aromatic Hydrocarbons (PAHs), Total Petroleum Hydrocarbons (TPH), Heavy Metals	Unlikely	Carbon dioxide & methane
OFF-SITE			
Electricity Substation (15 m N)	PCBs – limited due to distance	Unlikely	Unlikely
Former Sewage Works (90 m S)	Heavy Metals, inorganic compounds	Unlikely	Carbon dioxide & methane – limited due to distance
Old Coal Shaft (130 m N)	Unlikely	Unlikely	Carbon dioxide & methane – limited due to distance



7.1. INITIAL CONCEPTUAL SITE MODEL

Upon assessment of the information collated for the Phase 1 desk study, the initial conceptual site model shown in Table 7.2 has been prepared for the Site.

TABLE 7.2 INITIAL CONCEPTUAL MODEL

CONTAMINANT LINKAGE			PLAUSIBLE LINKAGE?	COMMENTARY AND PROPOSED RESPONSE
SOURCES	MIGRATION PATHWAYS	RECEPTORS		
SOIL				
Made Ground Heavy Metals, PAHs	Accidental ingestion and/or dermal contact with contaminated soil and/or leachate. PL1/PL2	Human Health – site personnel	Yes	Made Ground is a potential source of heavy metals and PAHs. Site personnel have a greater chance of coming into contact with contaminated soils. Particularly during excavation and soil recovery works. Recommendation: Construction works are to be completed with appropriate PPE and welfare facilities.
	Inhalation of contaminated dust. PL3	Human Health – end users	No	Hard-standing and engineered clean cover system shall break migration pathways to end users. Recommendation: Intrusive investigation and assessment will determine the requirement for a cover system in gardens and landscaped areas.
Made Ground Hydrocarbons, volatile PAHs (naphthalene)	Inhalation of vapours. PL4	Human Health – end users	No	No significant sources of volatile contamination have been identified. Made Ground is a potential source of hydrocarbon compounds and volatile PAHs.
	Migration through permeable strata and preferential pathways.	Human Health – Off-site receptors	No	Recommendation: Intrusive investigation and assessment will be required to determine the level of mitigation measures and/or remediation.



CONTAMINANT LINKAGE			PLAUSIBLE LINKAGE?	COMMENTARY AND PROPOSED RESPONSE
SOURCES	MIGRATION PATHWAYS	RECEPTORS		
Made Ground Asbestos (Asbestos containing materials (ACM) and loose fibres)	Inhalation (of fibres). Construction works disturbing bound material and releasing fibres. PL3	Human Health - Site personnel, end land users, and users of adjacent sites	Yes	ACM may be present in Made Ground. Risk of inhalation of fibres during Ground Investigation and construction works. Disturbance of ACMs and dust derivatives from construction would increase the risk to adjacent sites. Recommendation: Intrusive investigation will be required to determine the presence of ACMs and develop appropriate mitigation measures. Construction works to be completed with appropriate PPE and welfare facilities.
Made Ground Sulphate from potential ash within the Made Ground.	Sulphate attack on concrete. PL6	Building concrete	Yes	Sulphate in ash deposits (associated with Made Ground) may impact the proposed building concrete. Recommendation: Intrusive investigation will be required to assess the concrete classification. Construction works are to be completed with appropriate PPE and welfare facilities.
Made Ground Organic contaminants such as hydrocarbons	Ingestion of tainted water supply. PL7	Human Health – End Users Water pipeline	Yes	Made Ground may contain organic contaminants such as hydrocarbons which pose a risk to future site users through the ingestion of tainted water supply. The risk is considered to be low. Recommendation: Intrusive investigation required.
Made Ground Phytotoxic contaminants	Direct contact (plant uptake). PL8	Flora	Yes	Contamination is considered possible due to the presence of Made Ground deposits, which may be taken up by flora in soft landscaping/gardens. Recommendation: Intrusive investigation required.



CONTAMINANT LINKAGE			PLAUSIBLE LINKAGE?	COMMENTARY AND PROPOSED RESPONSE
SOURCES	MIGRATION PATHWAYS	RECEPTORS		
CONTROLLED WATERS				
Mobile contaminants	Leaching of contaminants from Made Ground through infiltration and percolation of rainwater. PL5	Controlled waters, underlying Secondary A bedrock aquifer	Yes	No significant source of mobile contamination has been identified. The presence of sand and gravel drift deposits will likely facilitate downward migration to the underlying aquifers and lateral migration to the adjacent stream. The sensitivity of the Secondary A aquifers is reduced given there are no groundwater/potable abstractions within 1km.
		Infrastructure and services	No	Infrastructure and services shall be designed to resist chemical attack and ingress.
Groundwater	Contact with contaminated groundwater. PL2	Human Health – site personnel	No	Groundwater is likely to be below construction level and as such, is expected to not rise above ground level or the final level of the road.
	Contaminants leached from the Made Ground and off-site sources may be mobilised to greater distances through advective flow. PL5	Human Health – end users	Yes	Impacted groundwater could transport contaminants vertically and horizontally through permeable strata.



CONTAMINANT LINKAGE			PLAUSIBLE LINKAGE?	COMMENTARY AND PROPOSED RESPONSE
SOURCES	MIGRATION PATHWAYS	RECEPTORS		
GROUND GAS				
Ground gases (methane and carbon dioxide in Made Ground)	Inhalation of ground gas. PL4	Human Health – site personnel	Yes (limited)	During excavation work removal of confining strata may expose workers to volumes of pocketed gas. Protective measures during the works required.
	Accumulation of ground gas in confined spaces (asphyxiation or explosion)	Human Health – end users	Yes	Ground gas protection measures will be required in accordance with Characteristic Situation 2 if ground gas monitoring is not completed.
		Infrastructure and services	No	Service conduits likely to be designed with passive venting systems.

Main exposure pathways:

PL1 = soil ingestion, PL2 = dermal contact and ingestion, PL3 = dust inhalation; PL4 = Vapour/Gas Inhalation; PL5 = Vertical / Lateral Migration; PL6 = Corrosion of concrete; PL7=Tainting of water supply; PL8 = Uptake by plants.



8. CONCLUSIONS

8.1. SITE SUMMARY

Current Site Use	The Site comprises a disused parcel of land that is located to the east of Harrow Avenue and to the south of Bury Road. No structures are present on Site. A asphalt access track is present in the northwest. The Site has recently been cleared of vegetation and levelled with compacted gravel and aggregate placed across the central and northern sectors. Reworked topsoil with brick is present across the southern sector. There is little topographic variance across the majority of the Site. A stream is present at the southeast boundary at a lower elevation. A mature tree is present in the south of the Site. Invasive plant species have been identified in the southern sector of the Site in the vicinity of the stream/brook.
Historical Site Use	A review of the pertinent Ordnance Survey mapping from 1851 suggests that the Site comprised agricultural land with a field boundary in the northwest. By 1959 a greenhouse is present in the centre of the Site and the Site is segregated into garden areas for the residential properties to the north. A spring is recorded at the southern site boundary. The greenhouse is no longer present by 1992. By 2012 the field boundary in the northwest is no longer recorded and a hard standing access track is present. A small structure is present in the north of the Site. The Site no longer appears to be split into different parcels and the majority of the Site is covered in dense vegetation. The majority was cleared of vegetation in 2023. The surface cover appears to be a combination of topsoil and gravel.
Site Sensitivity	The closest residential properties are located adjacent to the Site. The Site is located within a SSSI Impact Risk Zone. An area of designated ancient woodland is also located 219 m southwest at River Rock Wood.

8.2. CONTAMINATED LAND ASSESSMENT

Human Health	Due to the largely undeveloped nature of the Site, there are limited potential sources of contamination identified. The placed Made Ground is a potential source of heavy metals, PAHs, TPH and ACM.
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Controlled Waters	No significant source of mobile contamination has been identified. The presence of sand and gravel drift deposits will likely facilitate downward migration to the underlying aquifers and lateral migration to the adjacent stream. The sensitivity of the Secondary A aquifers is reduced given there are no groundwater/potable abstractions within 1 km.
Ground Gas	Made Ground and possible shallow coal workings are potential sources of hazardous ground gas. Off-site sources of hazardous ground gas include the former sewage works and mine shaft entries, however, the risk is reduced due to the distance from the Site. Carbon dioxide and methane have associated asphyxiation and explosive risks, respectively. If present, the risks can be appropriately mitigated through the careful design of building structures. A programme of ground gas monitoring is likely to be required to confirm the ground gas regime for the Site
Potable Water	No significant sources of contamination have been identified that would pose a significant risk to the proposed potable water supply, however, this will need to be confirmed following intrusive investigation.

8.3. COAL MINING

Coal Mining	The southern sector of the Site is located in a development high-risk area. The Arley coal seam outcrops circa 35 m to the southeast of the Site and underground workings are recorded across the central and northern sectors of the Site in the Lower Mountain seam at 122 m. No mine entries are recorded within 100 m. The desk-based Coal Mining Risk Assessment (CMRA) confirms that known underground workings to the north of the fault are associated with the Lower Mountain coal seam at 122 m bgl. The Development High Risk Area is located in the south of the Site in the location of the proposed garden areas. The proposed plots are located to the north of the fault, outside of the high risk area, therefore there is a low risk with respect to shallow workings associated with the Arley coal seam.
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8.4. GEOTECHNICAL ASSESSMENT

Geological	A volume change potential assessment may be required and given that the Site is lined by mature and semimature trees, consideration of the potential water demand of trees affecting foundations should be considered. Localised organic deposits may be present in the location of infilled field boundaries and adjacent to the stream along the southeast boundary.
Civil and Structural	No significant underground obstructions are anticipated. A gabion wall is present along the northern site boundary and concrete retaining blocks are present along the eastern and western site boundaries.
Abnormal Foundations	An abnormal engineering solution may be required where there is a significant thickness of Made Ground, tree influence, loose granular soils or soft cohesive and organic deposits.



END OF REPORT



APPENDIX I

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.2.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the Site may be available from other sources. When using the information, it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the Site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the Site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. E3P 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 in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is 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 E3P in this connection without their explicit written agreement there to by E3P.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



APPENDIX II

GLOSSARY

TERMS

ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
CA	Coal Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation
MCV	Moisture condition value	WRAP	Waste and Resources Action Programme



MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)		



APPENDIX III

RISK CLASSIFICATION

RISK CLASSIFICATION

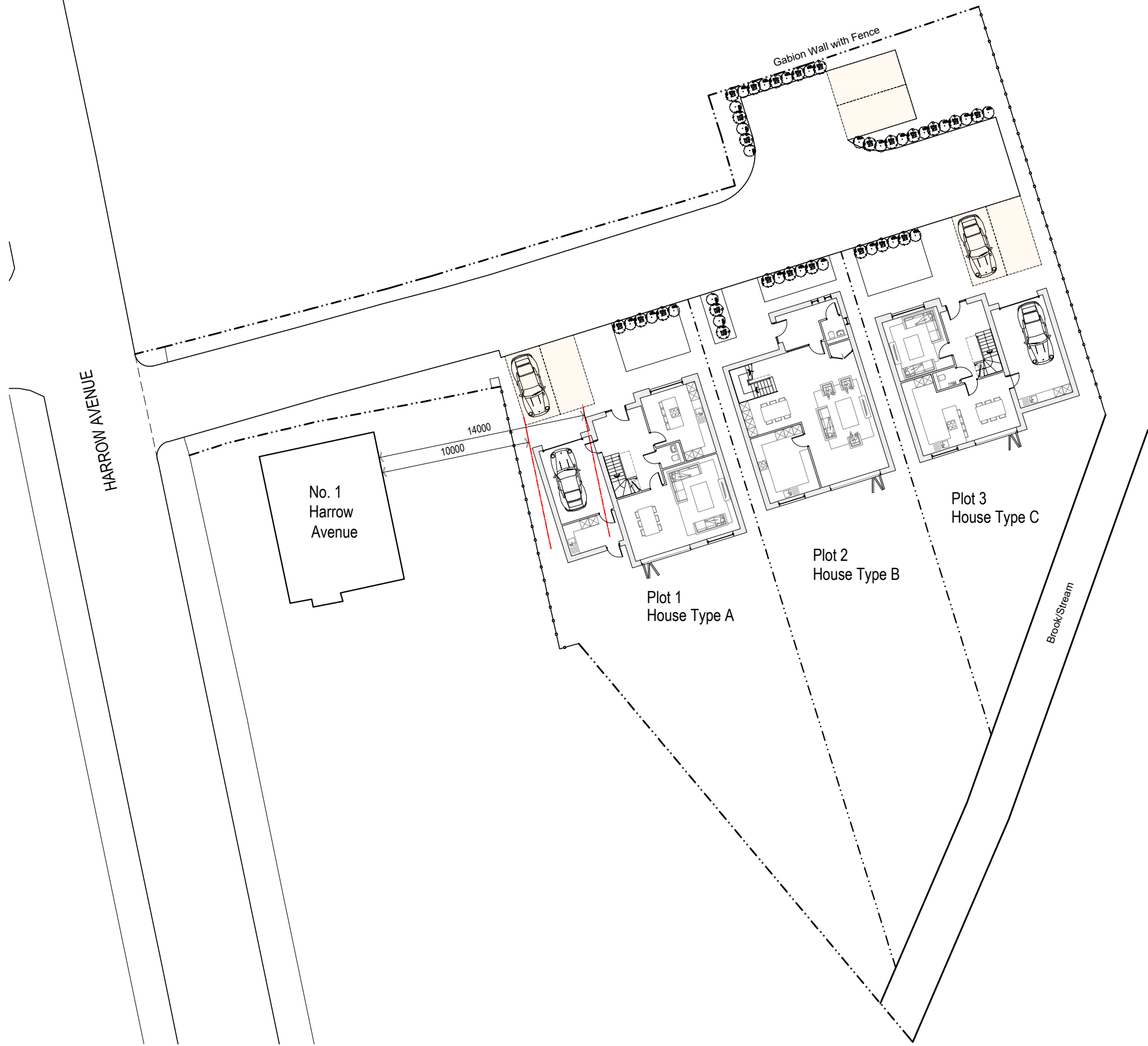
RISK	DEFINITION
Low	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property.
Low Moderate	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property with regard to the proposed use. However, minor issues may require further consideration in the event of future redevelopment of the Site.
Moderate	Some potential contaminated land liabilities/geotechnical constraints are likely to affect the property as a result of historical and/or current activities. The risks identified are unlikely to pose an immediate significant issue but the purchaser/developer may wish to make further enquiries of the vendor or undertake further environmental improvements. Redevelopment of the Site will likely require further site investigation.
Moderate High	Some potentially significant contaminated land liabilities/geotechnical constraints have been identified at the property that requires further assessment, including intrusive ground investigations.
High	Significant potential contaminated land liabilities/geotechnical constraints have been identified at the property. Further assessment including intrusive ground investigation will be required to determine the level of risk and associated liability.



APPENDIX IV DRAWINGS

DRAWING 17-039-001 – SITE LOCATION PLAN





Notes:				
P1	REVA	05.07.2023	OW	NS
Phase	Issue	Date	Drawn	Checked

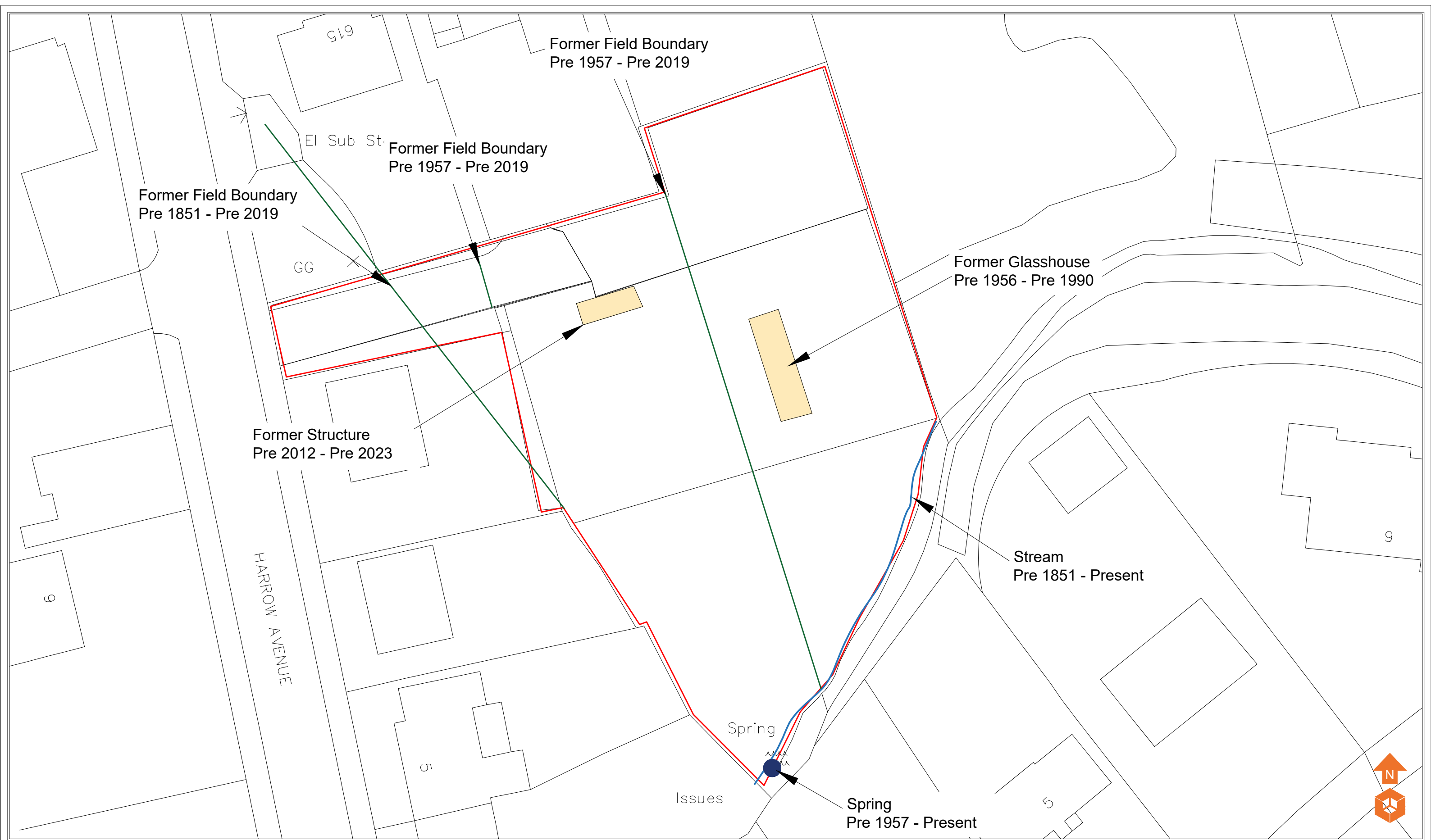
Client:	Cube Architecture and Design
	Job Title: Harrow Avenue

Job No:	17-039	Date:	05.07.2023
Drawing No:	002	Scale:	1:1000 @ A3
Drawing Title:		Proposed Development Plan	



Environmental Engineering
Partnership Ltd
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
Website: www.e3p.co.uk

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Historical Features

- Former Building
- Stream
- Spring
- Former Field Boundary

Notes:				
P1	REVB	06.07.2023	OW	NS
P1	REVA	05.07.2023	OW	NS
Phase	Issue	Date	Drawn	Checked

Client:	
Cube Architecture and Design	

Job No:	17-039
Drawing No:	003

Date:	06.07.2023
Scale:	1:1000 @ A3

Environmental Engineering Partnership Ltd
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
Website: www.e3p.co.uk

Job Title:	Harrow Avenue
------------	---------------

Drawing Title:	Historical Features Plan
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Site Features

	Asphalt Compacted Gravel		Concrete Retaining Blocks
	Asphalt Hardstanding		
	Levelled Made Ground Compacted Crush		
	Made Ground Peaty Soil with Brick Crush		
	Japanese/Hogweed/Himalayan Balsam		
	Tree		
	Slope to Brook		
	Retaining Wall		

Notes:

P1	REVC	07.07.2023	EB	NS
P1	REVB	06.07.2023	OW	NS
P1	REVA	05.07.2023	OW	NS
Phase	Issue	Date	Drawn	Checked

Client:

Cube Architecture and Design

Job Title:

Harrow Avenue

Job No:

17-039

Drawing No:

004

Date:

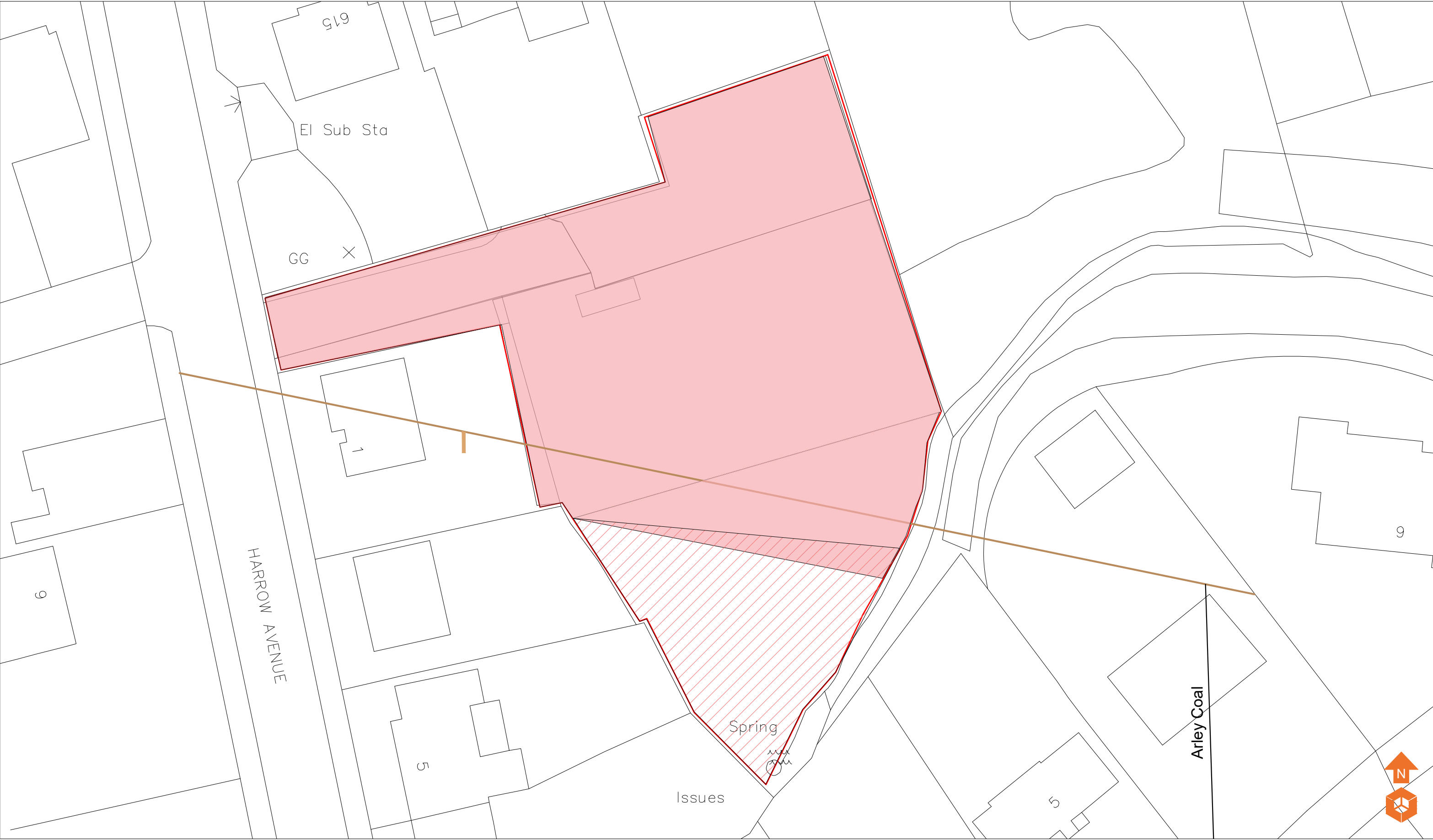
07.07.2023

Scale:

NTS@ A3

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Coal Mining

- Recorded Underground Workings
- Probable Workings
- Coal Outcrop
- Fault

Notes:

P1	REVB	07.07.2023	EB	NS
P1	REVA	05.07.2023	OW	NS
Phase	Issue	Date	Drawn	Checked

Client:

Cube Architecture and Design

Job Title:

Harrow Avenue

Job No:

17-039

Drawing No:

011

Date:

07.07.2023

Scale:

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Environmental Engineering Partnership Ltd
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APPENDIX V

PHOTOGRAPHS

PLATE 1 ACCESS FROM HARROW AVENUE



PLATE 2 EMBANKMENT TO STREAM ALONG THE SOUTHEAST BOUNDARY



PLATE 3 VIEW OF SITE FACING NORTH



PLATE 4 GABION WALL – NORTHERN BOUNDARY



PLATE 5 CONCRETE RETAINING BLOCKS – WESTERN BOUNDARY



PLATE 6 CONCRETE RETAINING BLOCKS



PLATE 7 MATURE TREE – SOUTHERN BOUNDARY



PLATE 8 DRAINAGE PIPE TO BROOK



APPENDIX VI

HISTORICAL MAPS

Site Details:

1, HARROW AVENUE,
ROCHDALE, OL11 4DS

Client Ref: 005342
Report Ref: GS-N3P-RC4-MAT-L4D
Grid Ref: 387510, 412824

Map Name: County Series

Map date: 1890-1891

Scale: 1:2,500

Printed at: 1:2,500



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Revised 1890
Edition N/A
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Surveyed 1891
Revised 1891
Edition N/A
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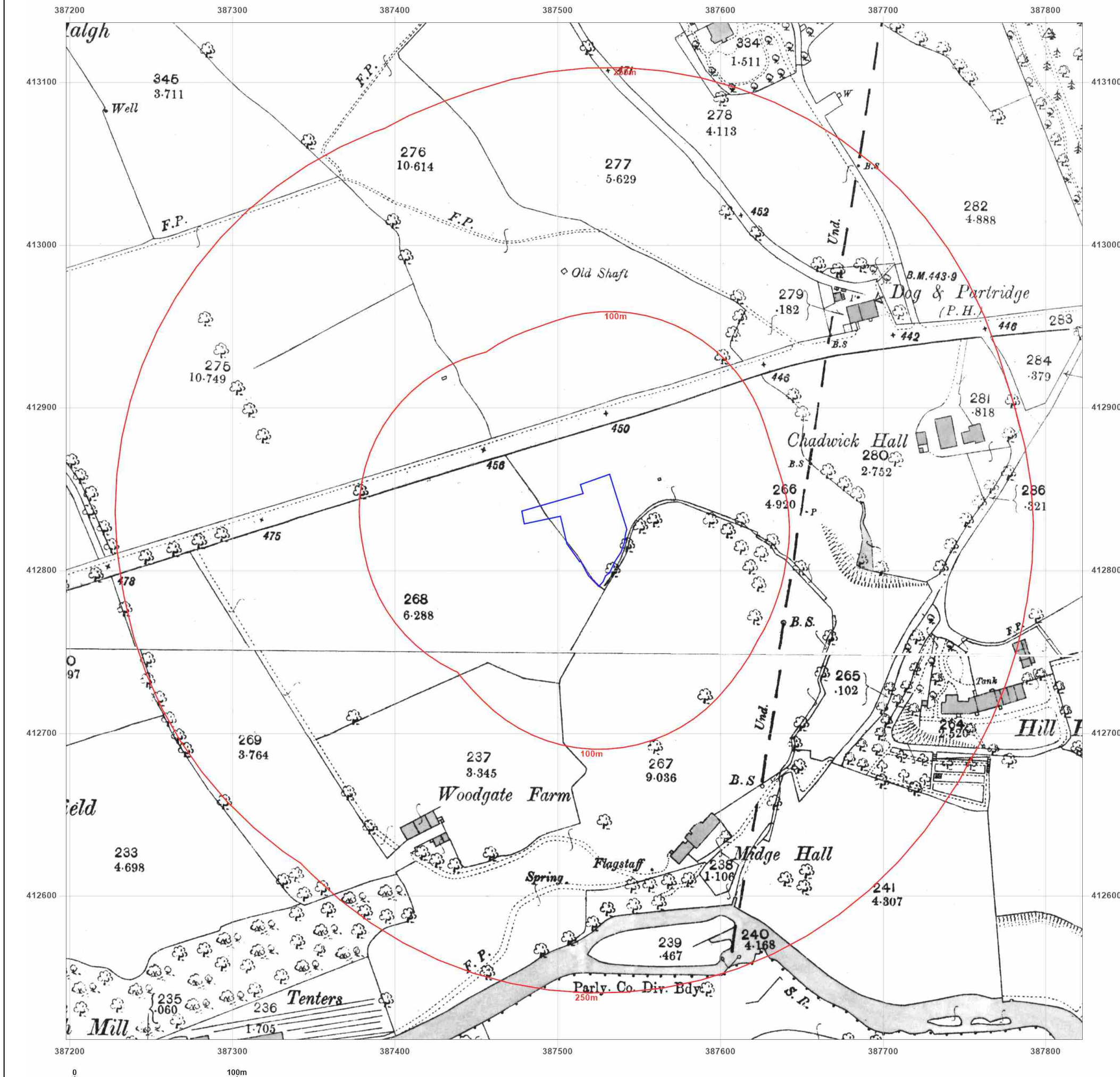


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Site Details:

1, HARROW AVENUE,
ROCHDALE, OL11 4DS

Client Ref: 005342
Report Ref: GS-N3P-RC4-MAT-L4D
Grid Ref: 387510, 412824

Map Name: County Series

Map date: 1910

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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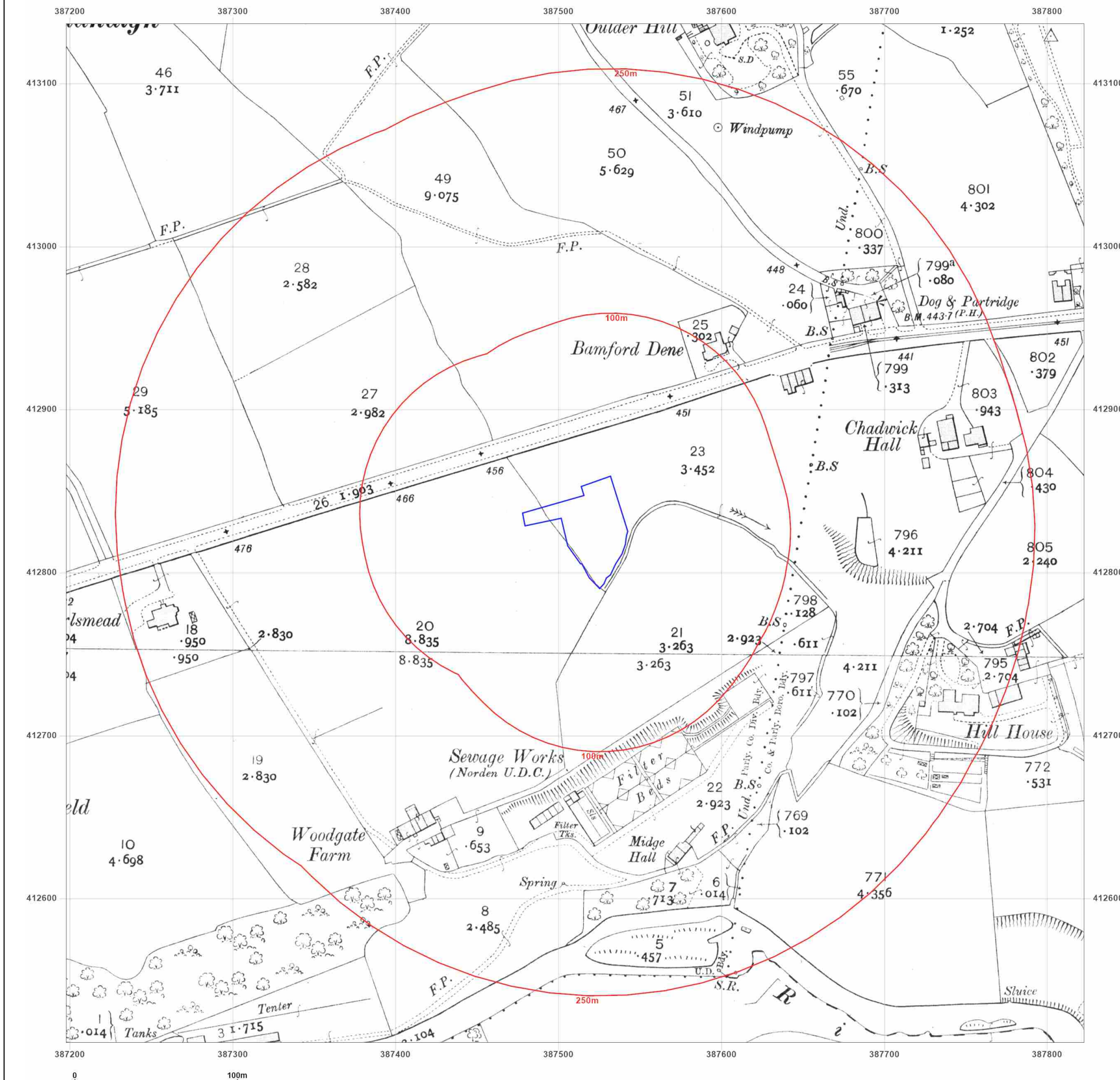


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Production date: 29 June 2023

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Site Details:

1, HARROW AVENUE,
ROCHDALE, OL11 4DS

Client Ref: 005342
Report Ref: GS-N3P-RC4-MAT-L4D
Grid Ref: 387510, 412824

Map Name: County Series

Map date: 1930

Scale: 1:2,500

Printed at: 1:2,500



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Site Details:

1, HARROW AVENUE,
ROCHDALE, OL11 4DS

Client Ref: 005342
Report Ref: GS-N3P-RC4-MAT-L4D
Grid Ref: 387510, 412824

Map Name: National Grid

Map date: 1956-1959

Scale: 1:1,250

Printed at: 1:2,000



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Site Details:

1, HARROW AVENUE,
ROCHDALE, OL11 4DS

Client Ref: 005342
Report Ref: GS-N3P-RC4-MAT-L4D
Grid Ref: 387510, 412824

Map Name: National Grid

Map date: 1958-1960

Scale: 1:2,500

Printed at: 1:2,500



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Edition 1958
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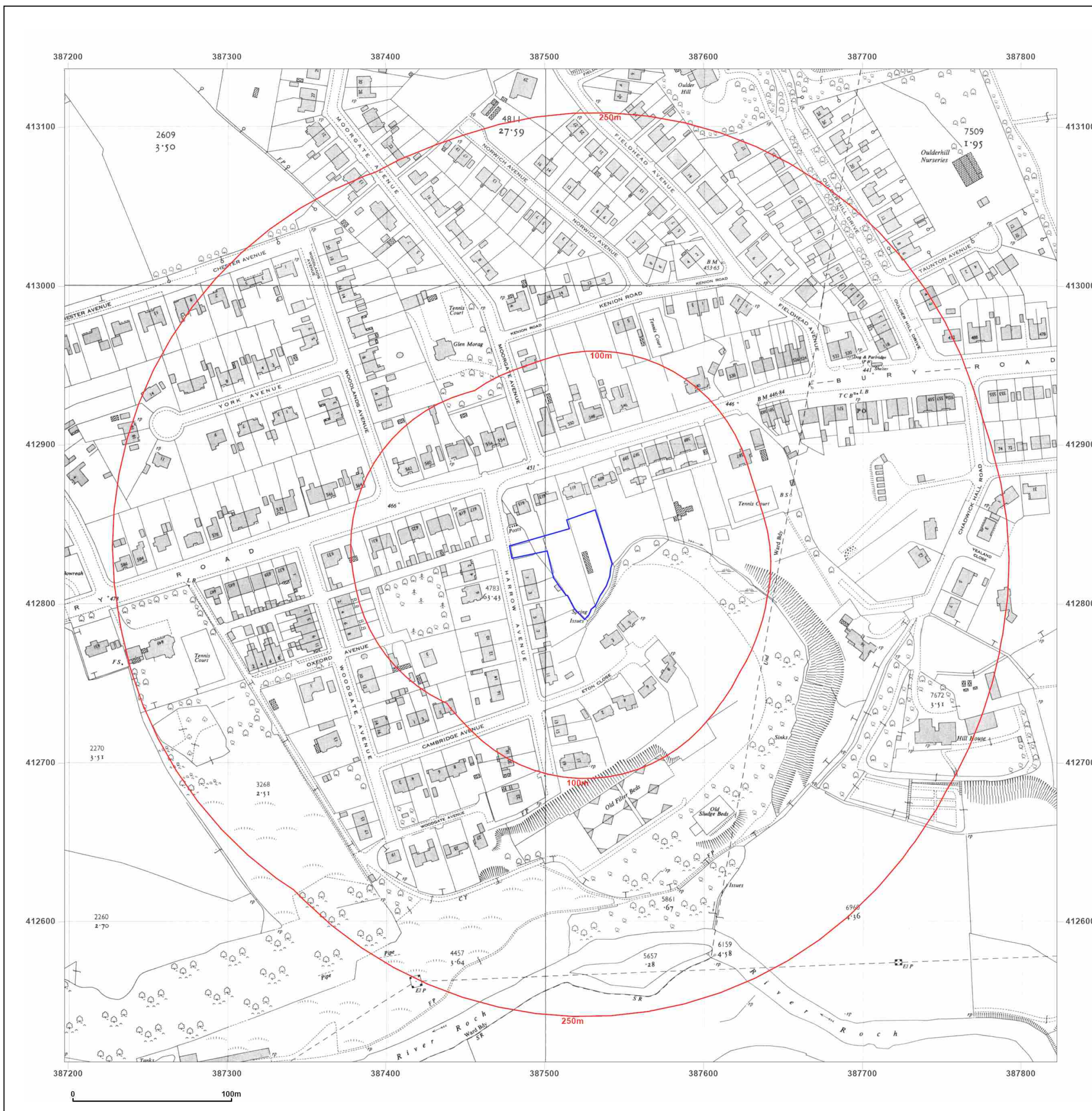


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Production date: 29 June 2023

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Site Details:

1, HARROW AVENUE,
ROCHDALE, OL11 4DS

Client Ref: 005342
Report Ref: GS-N3P-RC4-MAT-L4D
Grid Ref: 387510, 412824

Map Name: National Grid

Map date: 1966

Scale: 1:1,250

Printed at: 1:2,000



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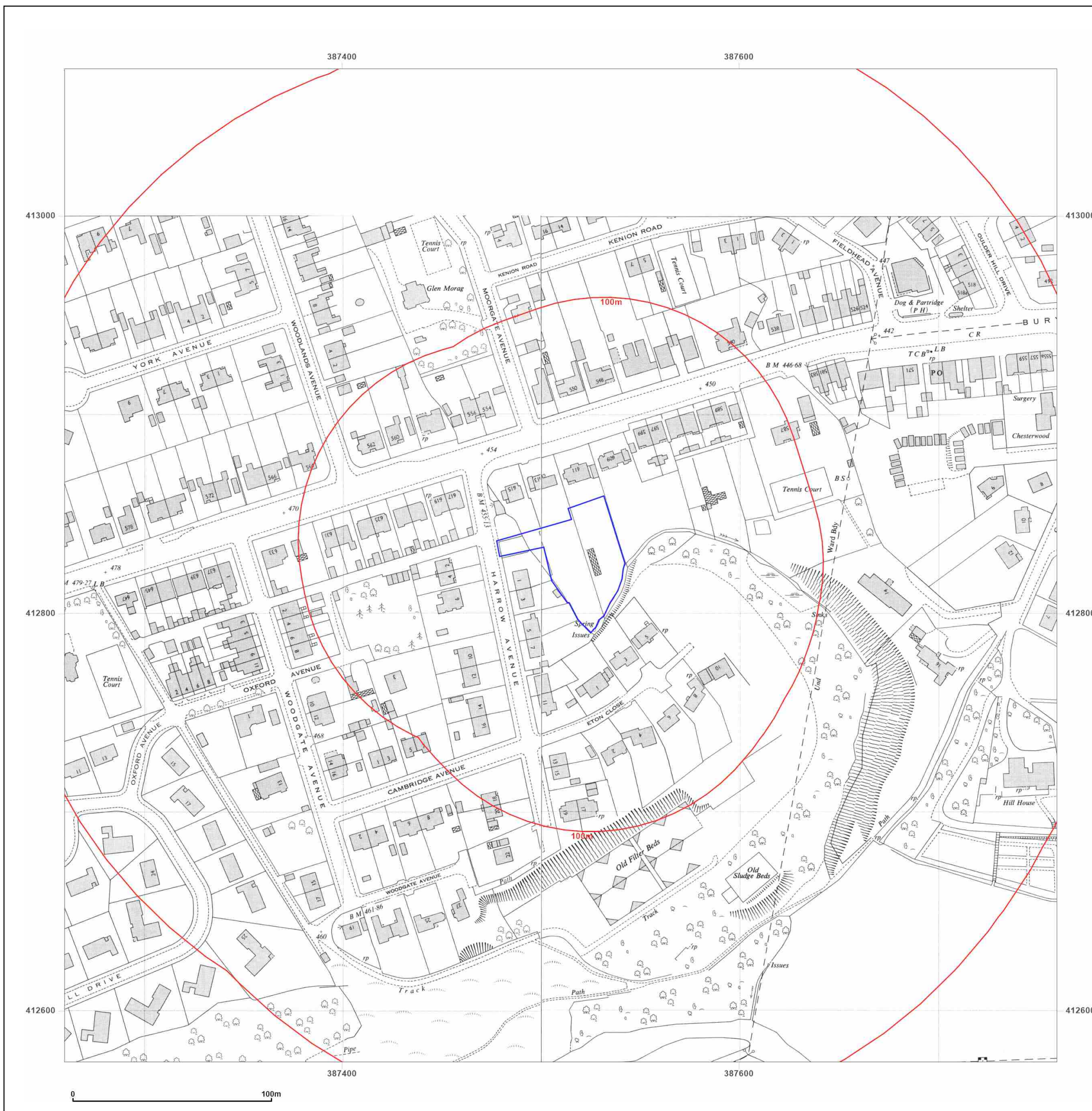


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Site Details:

1, HARROW AVENUE,
ROCHDALE, OL11 4DS

Client Ref: 005342
Report Ref: GS-N3P-RC4-MAT-L4D
Grid Ref: 387510, 412824

Map Name: National Grid

Map date: 1985-1990

Scale: 1:1,250

Printed at: 1:2,000



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Revised 1985
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Production date: 29 June 2023

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Site Details:

1, HARROW AVENUE,
ROCHDALE, OL11 4DS

Client Ref: 005342
Report Ref: GS-N3P-RC4-MAT-L4D
Grid Ref: 387510, 412824

Map Name: National Grid

Map date: 1992

Scale: 1:1,250

Printed at: 1:2,000



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Edition N/A
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Site Details:

1, HARROW AVENUE,
ROCHDALE, OL11 4DS

Client Ref: 005342
Report Ref: GS-N3P-RC4-MAT-L4D
Grid Ref: 387510, 412824

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



2003



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APPENDIX VII

COAL AUTHORITY REPORT



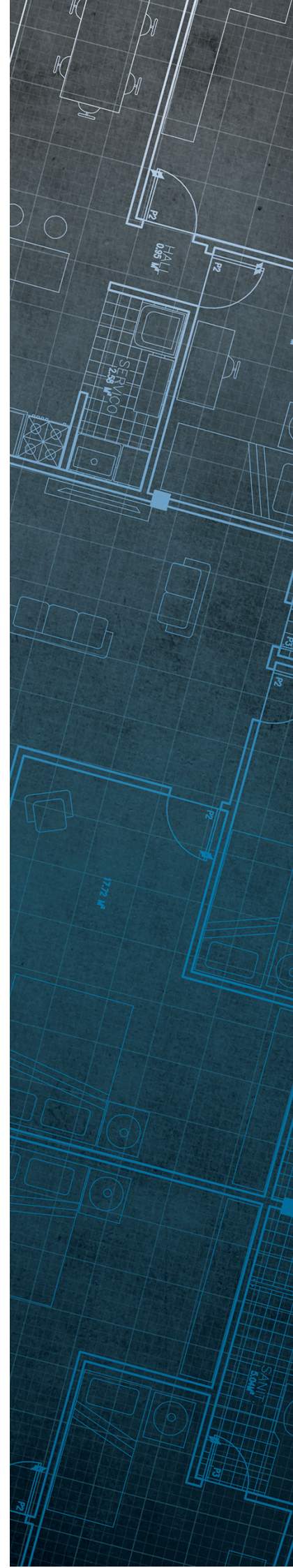
The Coal
Authority

Consultants Coal Mining Report

Land To Rear Of Harrow Ave
Rochdale
Rochdale
OL11 4DS

Date of enquiry:	29 June 2023
Date enquiry received:	29 June 2023
Issue date:	29 June 2023

Our reference:	51003364149001
Your reference:	005351/NS



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

E3P

Enquiry address

Land To Rear Of Harrow Ave
Rochdale
Rochdale
OL11 4DS

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

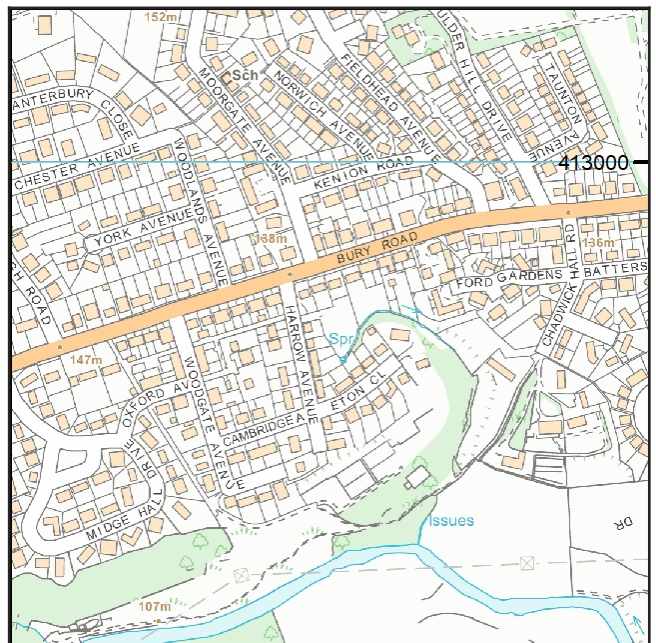
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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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	LOWER MOUNTAIN	Coal	3XSF	122	Beneath Property	8.7	South	60	1873

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:

NW156	0	16820
PO0	2139	

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
ARLEY	Coal	Yes	32.9	East	174

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

None recorded within 50 metres of the enquiry boundary.

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.

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.

