Phase 1 Geoenvironmental Risk Assessment and Coal Mining Risk Assessment

SHAWCROSS HOUSE
HORACE WALLER VC PARADE
DEWSBURY

for

H S Components Limited

Report Number 4377

April 2024

Michael D Joyce Associates LLP
Geotechnical and Geoenvironmental Consultants
Charnock Court 6 South Parade Wakefield West Yorkshire WF1 1LR UK
T +44(0)1924 360458 **E** mdja@geoenvironmental.co.uk **W** www.geoenvironmental.co.uk

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SHAWCROSS HOUSE, HORACE WALLER VC PARADE, DEWSBURY

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1 INTRODUCTION

1.1 At the request of Martin Walsh Architectural Limited, acting on behalf of H S Components Limited, a Phase I Geoenvironmental and Geotechnical Assessment (Desk Study) and Coal Mining Risk Assessment have been carried out of Shawcross House on Horace Waller VC Parade in Dewsbury. It is proposed to extend the present car-parking, and to construct a small extension to the rear of the building.

1.2 The purpose of the desk study was to review and assess information on the site including geological, mining and hydrogeological data, to review the past history of the site and its environmental setting, and to determine if there are any geotechnical or geoenvironmental hazards that may impair its safe and economic development.

1.3 The study has not included checks on services on or adjacent to the site, and no structural or asbestos surveys have been carried out.

2 THE SITE

2.1 Shawcross House is located to the south side of Horace Waller VC Parade, approximately 1½km northeast of the centre of Dewsbury. It is part of Shawcross Business Park. The Ordnance National Survey Grid Reference is E426140, N422725. Figure 1 shows the general site location, whilst figure 2 shows the site in more detail.

2.2 The site was inspected on 26th April 2024. The present building comprises a light industrial unit with office accommodation. It occupies much of the site and was constructed approximately 25 years ago, although extended to the southwest sometime between 2003 and 2010. To the northwestern elevation there is tarmac hardstanding used for car-parking.

View of front of building looking to the south

View of front of building looking to the east

2.3 To the northeastern elevation there is a grassed area, with shrubs, which extends along the southeastern elevation of the building. Whilst the site is relatively flat-lying, the groundlevel does drop down considerably, just beyond the southeastern boundary.

Area adjacent to southeastern boundary

Area adjacent to northeastern boundary

2.4 This sloped area beyond the boundary is overgrown and inaccessible from the site. However, there is a headwall to a drain or culvert visible. As discussed in Section 3, there was once an open drain running through the northeastern part of the site, and which was subsequently culverted. There is also a manhole adjacent to the easternmost corner of the building.

2.5 At this stage, it is reasonable to assume that the level of the headwall/drain represents the original groundlevel. This would mean that groundlevel at the site has been raised considerably. The implications of this are discussed in more detail later.

View down to headwall and ditch beyond

View of area adjacent to southeastern boundary with slope down in left of plate

2.6 The area adjacent to the southwestern boundary is used for general storage, in particular drums of new engine oil. There are also two skips for waste materials.

Area adjacent to southwestern boundary

Area adjacent to southwestern boundary

2.7 According to Mr. Starling of H S Components Limited, the only Control of Substances Hazardous to Health (COSHH) on site are aerosols, which are kept in a locked cupboard. The primary business of H S Components Limited is the sale and distribution of new vehicle parts.

3 SITE HISTORY

3.1 The following archival Ordnance Survey maps have been examined to trace the past development of the site. These are reproduced in Appendix 2 with the current site boundary superimposed on them. The apparent displacement on the older maps is due to a change in Ordnance Survey co-ordinates.

Scale and Year of Publication			
6" to 1 mile	1855	1:2500	1893
	1892		1907
	1894		1922
	1905		1933
	1932		1956
	1938		1967
	1939		1985
	1948		1992
	1957		1995
			2003
1:10,000	1974	1:1250	2003
	1981		
	1992		
	2001		
	2010		
	2024		

3.2 The earliest map to show the site in detail dates from 1893. It records the site as undeveloped agricultural land. A railway cutting and bridge is shown, approximately

50m to the east, with Shaw Cross Lane just beyond. Shaw Cross Colliery is also shown, approximately 240m to the southeast.

3.3 By 1922, the colliery had expanded considerably on what appears to be colliery spoil that had been tipped, just to the southeast of the site. As the colliery expanded further, tipping of spoil took place, such that by the 1950's it now occupied the easternmost part of the site. The map of 1955 also shows a stream running through the easternmost part of the site. A subsequent map shows a "sink" on the site, where the stream went underground.

3.4 By the 1980's, the colliery had been demolished and the railway cutting had been infilled. The colliery spoil heaps are also no longer shown. Although not recorded on the historical map, the land to the north, east and south of the site was a landfill site with tipping taken place between 1983 and 1991. This is discussed further in Section 6.

3.5 The map of 1995 no longer shows the drain/watercourse on the site, but does record it immediately to the south. This is believed to be due to groundlevel having been raised considerably. The site itself remained undeveloped, although a part of Horace Waller VC Parade had been constructed at the entrance to the business park. It therefore appears that the area was being prepared for development. Dewsbury Rugby League Ground had also been constructed, just to the southeast of the site by this time.

3.6 By 2001, most of the business park had been constructed. This included Shawcross House, although it was subsequently extended shortly after.

3.7 Due to time and cost constraints, it has not been possible to consult with local history journals and newspapers. This can be carried out if requested at additional cost, but is unlikely to provide any significant additional information.

3.8 The site is unlikely to be of archaeological interest. However, it may be prudent to make enquiries with West Yorkshire Archaeology Service.

4 GEOLOGY AND MINING

4.1 Geology

4.1.1 Maps of the British Geological Survey (BGS), show the site to be underlain by the Thornhill Rock Sandstone of the Carboniferous Lower Pennine Middle Coal Measures.

4.1.2 There are no drift deposits shown on the geological maps, which also show the site to be free of faulting.

4.2 Coal Mining Risk Assessment

4.2.1 A mining report has been obtained from the Coal Authority, and is reproduced in full in Appendix 3. It states that there has been recorded mining beneath the site in seven seams of coal between 84m and 323m depth, with the last date of working being 1949. Under normal circumstances, ground movement should have ceased by now.

4.2.2 The report makes no mention of shallow workings being present or that shallow unrecorded workings might be present. The Coal Authority considers that the probability of unrecorded shallow workings is “none”.

4.2.3 No shaft or adits are reported on, or within 100m of the site boundary. Although old unrecorded mine entries might be present on the site, these are considered unlikely but cannot be entirely precluded. No past, present or future opencasts are reported within the vicinity of the site.

4.2.4 In addition, the mining report states that none of the following are recorded;

- Spine roadways
- Outcrops
- Geological faults, fissures or breaklines
- Coal Authority managed tips
- Site investigations
- Remediated sites
- Coal mining subsidence
- Mine gas
- Mine Water Treatment Schemes
- Future underground mining
- Coal mining licencing
- Court Orders
- Section 46 Notice
- Withdrawal of Support Notices
- Payment to owner of former copyhold land

4.2.5 In conclusion, the site is not at risk from previous underground mining.

4.3 GroundSure Geo-Insight

4.3.1 A GroundSure Geo-Insight Report has been obtained for the site and is reproduced in Appendix 1. The report is based on the British Geological Survey (BGS) geological maps, GroundSure data and miscellaneous other geological sources.

4.3.2 Based on the historical mapping, GroundSure considers there to be surface ground workings on the site, consisting of a disused colliery, refuse heap and unspecified disused workings. However, it is considered that the discussion of the historical mapping given in Section 6 is more applicable.

4.3.3 None of the following are recorded beneath the site.

Geology 1:50,000 scale
Superficial geology (50k) Superficial permeability (50k) Landslip (50k) Landslip permeability (50k)

Mining, Ground Workings and Natural Cavities
Natural Cavities BritPits Historical Mineral Planning Areas Non-coal mining Mining cavities JPB mining areas Brine areas Gypsum areas Tin mining Clay mining

In respect of natural ground subsidence, the BGS reports the following risk ratings.

Natural Ground Subsidence	**Risk**
Shrink-Swell Clay	Negligible
Running Sand	Negligible
Compressible Deposits	Negligible
Collapsible Deposits	Very Low
Landslide	Very Low
Ground Dissolution of Soluble Rocks	Negligible

4.3.4 A number of boreholes have been sunk in the wider vicinity of the site and their records could probably be obtained if necessary. However, soil variability in the area would render them of limited use. In terms of determining the actual ground conditions on the site there is no substitute for a site specific intrusive ground investigation.

5 HYDROGEOLOGY AND FLOODING

Hydrogeology

5.1 The Coal Measures occur throughout the heavily industrialised areas of West and South Yorkshire. They comprise a thick sequence of faulted rocks characterised by the repeated sequence of mudstone, siltstone, sandstone, seatearth and coal.

5.2 The Coal Measures, though classed as a minor aquifer, may provide good borehole yields from sandstones and many industrial supplies rely on them. However, groundwater flow is extensively affected by the faulting and fissuring of the rocks, and also by the results of coal mining and associated dewatering activities. Due to the complex, and often poorly understood hydrogeology, it is impossible to subdivide the Coal Measures into aquifers and non-aquifers except on a very detailed level and the whole sequence must therefore be considered in general terms as an aquifer.

5.3 Since April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive.

5.4 The aquifer within the bedrock deposits is designated as Secondary A. This is described as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

5.5 Details provided by the Environment Agency in the GroundSure Enviro-Insight Report, indicate there to be no licensed surface water or groundwater abstraction points within at least 1km of the site.

Flooding

5.6 According to data supplied by the Environment Agency in the GroundSure Enviro-Insight report, the site is not at risk from fluvial flooding.

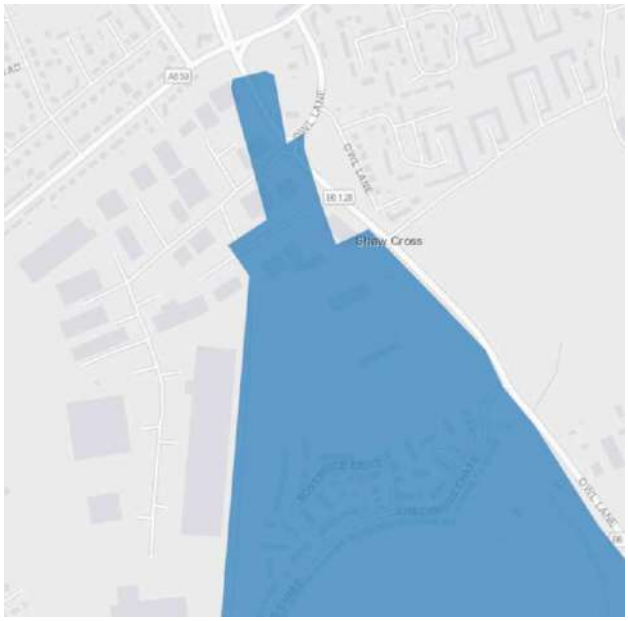
5.7 Ambiental Risk Analytics consider there is the possibility of shallow surface water flooding (1 in 30 years) affecting the northwestern corner of the site, equivalent to less than 300mm. However, the actual ground slope is such that any surface water would run-off in a southeasterly direction towards the boundary. The risk of groundwater flooding is recorded as “Negligible”.

6 GROUNDSURE ENVIRO-INSIGHT REPORT

6.1 A GroundSure Enviro-Insight Report has also been commissioned for this site. The following features are recorded within 250m of the site and full details are given in Appendix 1.

6.2 Historical Landfill

The easternmost part of the site is recorded as being part of which extended northeast and southeast of the site. The landfill was licensed to West Yorkshire Waste Management Limited and is recorded as "Shaw Cross Landfill Site". It accepted inert, household and commercial waste between 1983 and 1991. Further details are provided on the Catchment Based Approach Data Hub (CBADH). This records that the landfill incorporates 'gas control' measures.



This also shows the study site just beyond the site boundary, although the GroundSure Report suggests that the northeasternmost part of the site was part of the landfill. In any event, these plans are invariably approximations.

.3 Licensed Pollutant Release

Nobia UK Limited on the business park has a current permit associated with "Timber Manufacture".

6.4 Environment Agency Recorded Pollution Incidents

In 2001, a pollution incident occurred at a point 36m to the east. The pollutant is not identified and the impact is recorded as "No Impact". As such, this is very unlikely to have affected the study site.

6.5 Contemporary Trade Entries

The GroundSure Enviro-Insight Report lists various trade entries in the vicinity of the site. It should be noted that these lists are rarely complete.

6.6 Others

None of the following are recorded within 250m of the centre of the study site.

Current Industrial Land Use
Current or recent petrol stations Electricity cables Gas pipelines Sites determined as Contaminated Land Control of Major Accident Hazards (COMAH)

Regulated explosive sites
Hazardous substance storage/usage
Historical licensed industrial activities (IPC)
Licensed industrial activities (Part A(1))
Radioactive Substance Authorisations
Licensed Discharges to controlled waters
Pollutant release to surface waters (Red List)
Pollutant release to public sewer
List 1 Dangerous Substances
List 2 Dangerous Substances
Pollution inventory substances
Pollution inventory waste transfers
Pollution inventory radioactive waste

Environmental Designations
Site of Special Scientific Interest (SSSI)
Conserved wetland sites (Ramsar sites)
Special Areas of Conservation (SAC)
Special Protection Areas (SPA)
National Nature Reserves (NNR)
Local Nature Reserves (LNR)
Designated Ancient Woodland
Biosphere Reserves
Forest Parks
Marine Conservation Zones
Green Belt
Proposed Ramsar sites
Possible Special Areas of Conservation (pSAC)
Potential Special Protection Areas (pSPA)
Nitrate Sensitive Areas
Nitrate Vulnerable Zones
SSSI Units

Visual and Cultural Designations
World Heritage Sites
Areas of Outstanding Natural Beauty
National Parks
Listed Buildings
Conservation Areas
Scheduled Ancient Monuments
Registered Parks and Gardens

Agricultural Designations

Open Access Land Tree Felling Licences Environmental Stewardship Schemes Countryside Stewardship Schemes

Habitat Designations
Priority Habitat Inventory Habitat Networks Open Mosaic Habitat Limestone Pavement Orders

Railway Infrastructure and Projects
Underground railways (Non-London) Railway tunnels Royal Mail tunnels Crossrail 1 Crossrail 2 HS2

6.7 The GroundSure Enviro-Insight Report is based upon known, published information and may not comprise a complete record of all features of relevance. An explanation of the datasets is provided in the report in Appendix 1.

6.8 It should be noted that due to time constraints the Local Authority has not been contacted.

7 CONTAMINATED LAND AND INVASIVE PLANTS

7.1 There is no visibly contaminated material on the surface of the site, nor is there any distressed vegetation suggestive of significant or serious contamination.

7.2 The inspection of the site did not indicate any obvious invasive plants. However, the identification of such is outside the expertise of this consultancy and appropriate advice should be sought, if considered necessary.

8 RADON

8.1 According to the GroundSure Geo-Insight Report the site lies in an area where between 5% and 10% of properties are above the action level recommended by UK Health Security Agency (UKHSA).

8.2 Basic radon protective measures are therefore not necessary for the extension according to the BGS data provided in the GroundSure Report, UKHSA and BRE Report BR211 (2023 Edition) “Guidance on protective measures for new buildings” (including supplementary advice for extensions, conversions and refurbishment projects).

9 GEOENVIRONMENTAL RISK ASSESSMENT

Conceptual Site Model

9.1 A quantitative health and environmental risk assessment has been carried out as part of this assessment. The process of risk assessment is set out in Part IIA of the Environment Protection Act 1990 and amended in part by The Water Act 2003. This defines contaminated land as "*any land which appears to the local authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that there is a significant possibility of significant harm being caused, or that significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused".*

9.2 The Act introduces the concept of a pollution linkage. This linkage consists of a pollution (contaminative) source or hazard and a receptor, together with an established pathway between the two. For land to be contaminated, a pollution linkage (hazard-pathway-receptor) must exist. This forms a so-called 'conceptual model' of the site.

9.3 Examples of pathways and effects from land contamination (after PPS 23) are given below, and these are illustrated on figure 3.

9.3.1 Human Health (Pathways 1-5, Receptors A – C)

Uptake of contaminants by food plants grown in contaminated soil - Uptake will depend on concentration in soil, its chemical form, soil pH, plant species and prominence in diet.

Ingestion and inhalation - Substances may be ingested directly by young children playing on contaminated soil, by eating plants which have absorbed metals or are contaminated with soil or dust. Ingestion may also occur via contaminated water supplies. Metals, some organic materials and radioactive substances may be inhaled from dusts and soils.

Skin contact - Soil containing tars, oils and corrosive substances may cause irritation to the skin through direct contact. Some substances (e.g. phenols) may be absorbed into the body through the skin or through cuts and abrasions.

Irradiation - As well as being inhaled and absorbed through the skin, radioactive materials emitting gamma rays can cause a radiation response.

Fire and explosion - Materials such as coal, coke particles, oil, tar, pitch, rubber, plastic and domestic waste are all combustible. Both underground fires and biodegradation of organic materials may produce toxic or flammable gases. Methane and other gases may explode if allowed to accumulate in confined spaces.

9.3.2 Buildings (Pathways 7 and 8)

Fire and explosion - Underground fires may cause ground subsidence and cause structural damage. Accumulations of flammable gases in confined space leads to a risk of explosion. Underground fires may damage services.

Chemical attack on building materials and services - Sulphates may attack concrete structures. Acids, oils and tarry substances may accelerate corrosion of metals or attack plastics, rubber and other polymeric materials used in pipework and service conduits or as jointing seals and protective coatings to concrete and metals.

Physical - Blast-furnace and steel-making slag (and some natural materials) may expand. Degradation of fills may cause settlement and voids in buried tanks and drums may collapse as corrosion occurs or under loading.

9.3.3 Natural Environment (Pathway 6, Receptors D - E)

Phytotoxicity (prevention/inhibition of plant growth) - Some metals essential for plant growth at low levels are phytotoxic at higher concentrations. Methane and other gases may give rise to phytotoxic effects.

Contamination of water resources - Soil has a limited capacity to absorb, degrade or attenuate the effects of pollutants. When this is exceeded, polluting substances may enter into surface and groundwaters.

Ecotoxological effects - Contaminants in soil may affect microbial, animal and plant populations. Ecosystems or individual species on the site, in surface waters or areas affected by migration from the site may be affected.

9.4 For any contaminant source identified, judgement is used regarding the probability of a pollution linkage occurring and the potential consequences of that linkage. Based on the probability and likely consequences, the overall risk (significance) can be established. The definitions that have been used for this purpose are given in Standard Appendix B. The probability of a hazard, combined with its consequences, can be used to assess risk. This forms the so-called Conceptual Site Model.

Sources

9.5 The site has had no previously recorded commercial or industrial use recorded on the historical maps prior to the current development. As such, no specific potential contaminants have been identified. There is some discrepancy as to whether the site fell within the boundary of Shaw Cross (Owl Lane) Landfill. On balance, the site is more likely to be outside the boundary, but in a worse-case scenario, only the easternmost part of the site did.

9.6 The site inspection does suggest strongly that the original groundlevel has been raised considerably, possibly by as much as 8m in places, although this is very much a visual estimationonly. This is assumed due to the fact that the drain just beyond the southeastern boundary lies at a considerably lower level.

9.7 This is considered most likely to be due to the tipping of colliery waste whilst the former Shaw Cross Colliery was in operation. However, in the absence of actual ground investigation data, this must inevitably be speculative.

9.8 Nevertheless, this raises the possibility that the existing building is constructed on piled foundations, since in the absence of ground treatment, any ground bearing structures would be subject to significant surface settlement. There is some evidence of settlement of paving around the building.

9.9 The risk of ground gases from the former landfill is considered to be low. The reason for this is threefold. Firstly, the landfill ceased tipping in 1991, and as such the potential for gas generation from any biodegradable materials will be coming to an end. Secondly, the landfill incorporated gas control measures, presumably designed to vent excess gases to the atmosphere. Thirdly, in recent years a large housing development has been constructed on the area of the landfill, and it is reasonable to assume that this would not have been carried out if there was ongoing active gas generation.

9.10 Furthermore, the extension requires basic gas protection measures, and it is recommended that the radon membrane chosen should also provide protection against landfill gases, in particular methane and carbon dioxides.

9.11 If the building is constructed on piles due to the presence of a significant thickness of Made Ground, it may be necessary to construct the extension also on piled foundations.

9.12 It is therefore recommended that an intrusive borehole investigation is carried out to confirm whether this is indeed required. This should include a limited contamination investigation of the sub-soils. It would also be prudent to install gas monitoring standpipes as part of the investigation to identify if any elevated landfill/ground gases are present.

Risk Assessment based on Conceptual Site Model

Summary of Hazards, Pathways and Receptors

Source	Potential Pollutant	Pathways	Receptor	Risk
No specific sources of soil contamination identified. **Colliery spoil.**	Typically inert.	1 - 5	A. Present Occupants.	**Low Risk.**
			B. Groundworkers.	**Low Risk** involved with excavation work, providing personnel adopt suitable precautions, together with washing facilities.
			C. Future Occupants.	**Low Risk** where site will be extended for commercial purposes.
		6	D. Controlled Waters.	**Low Risk.**
			E. Ecosystems.	**Low Risk**.
		7	F. Building Materials and Services.	**Low Risk.** Install pipes in clean bedding materials. Adequate precautions to be taken in respect of buried concrete.
Organic/Landfill/ Radon.	Landfill Gases, Radon, VOCs, SVOCs.	8	A - F	**Low Risk.** Basic gas protection measures are recommended in respect of radon, methane and carbon dioxide.

Pathways and Receptors

9.13 Although not part of this assessment, a drain/watercourse appears to have been culverted below the site. It is therefore recommended that the course of this culvert is identified to ensure that it does not affect/impact upon the proposed extension.

9.14 The principal receptors are groundworkers, future users and controlled water (Receptors B, C and D). Based on the past history of the site, the probability of contamination being present sufficient to affect the identified receptors is considered to be a low risk.

9.15 The overall risk from soil contamination is assessed to be low. The risk from ground gases is also considered to be low to moderate.

9.16 With any site, the possibility of contaminants being present, sufficient to cause significant harm cannot be entirely precluded without intrusive investigation, sampling and testing since it is not always possible to determine if contaminants have been tipped on the site, or have seeped into the ground, or have migrated below the ground onto the site from adjacent pieces of land. This is however considered unlikely.

A D Joyce

BSc MSc ARSM CEng CGeol CEnv MICE FGS SiLC SQP

April 2024

Procedure Notes

The desk study and/or ground investigation have been carried out using reasonable skill and care, primarily in accordance with the principles of BS5930: 2015 + A1: 2020: Code of Practice for Site Investigations and BS10175: 2011 + A1: 2017: Code of Practice for the Investigation of Potentially Contaminated Sites, and the terms of the client's brief. The report has been prepared for the specific purposes notified at the time of the initial enquiry.

By its very nature any ground investigation only encounters and samples a small percentage of the ground. Consequently changes in ground conditions, soil properties and contamination can occur between any two exploratory points, for example local features such as soft ground, pockets of contamination and faults. This is also true of the exploration of mineworkings and such features can extend beneath parts of the site not investigated. Unrecorded bell pits and shafts can also exist between exploratory points. The ground investigation is designed to minimize such risks with budgetary constraints.

Conclusions and recommendations are based on the information presented in this report, but unforeseen features may exist. No liability can be accepted for ground conditions not revealed by the exploratory holes or for contamination not sampled or tested for. Therefore, actual ground conditions should be noted during construction and further advice sought if they differ from those predicted. Michael D. Joyce Associates LLP reserves the right to amend the conclusions and recommendations in the light of further information. Actual methods of construction or alternative designs should be notified to Michael D. Joyce Associates LLP, such that the recommendations made can be reconsidered in the light of any changes.

Further investigation can be carried out to reduce uncertainty further and risk but ultimately these risks cannot be eliminated. Similarly a desk study normally only considers readily available information and further information could be held by other sources. In commissioning further research or investigation the cost/benefit of doing so must be considered.

It is assumed that groundlevels will not change significantly from those at present. The groundwater conditions are based on observations made at the time of the investigation, unless stated otherwise. It should be noted that the observations are subject to the method of the boring or excavation, and that groundwater levels will vary due to seasonal or other effects.

Where buildings are present on a site, structural and asbestos surveys of the buildings have not been carried out, unless specifically stated. An Unexploded Ordnance (UXO) Survey has not been carried out unless specifically stated. Furthermore, the positive identification of intrusive plants is beyond the expertise of this practice. In relevant situations it would be prudent to commission surveys in respect of UXO and invasive plants.

Where information has been obtained from Third Parties, no liability can be accepted for the accuracy or completeness of this information. Where anecdotal evidence or speculations are presented, they must be treated as such and cannot be relied upon.

Shawcross House, Horrace Waller VC Parade, Dewsbury

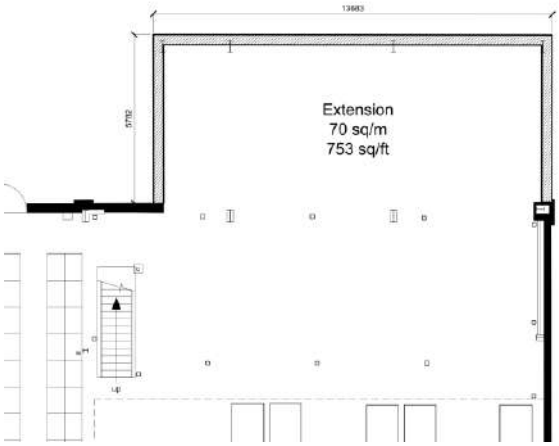
Site Location

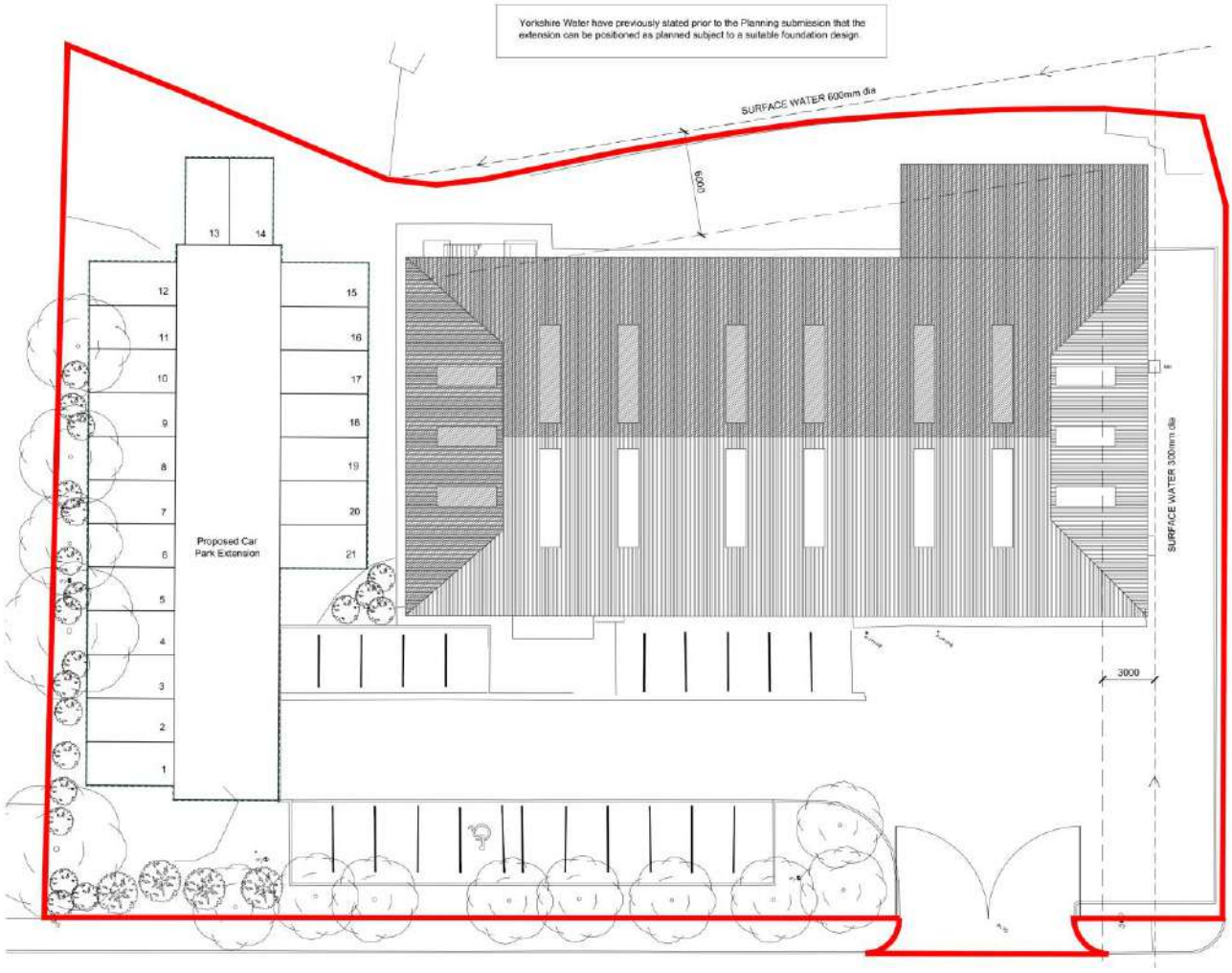
Michael D Joyce Associates LLP

Geotechnical and Geoenvironmental Consultants

Scale: NTS

Figure: 1



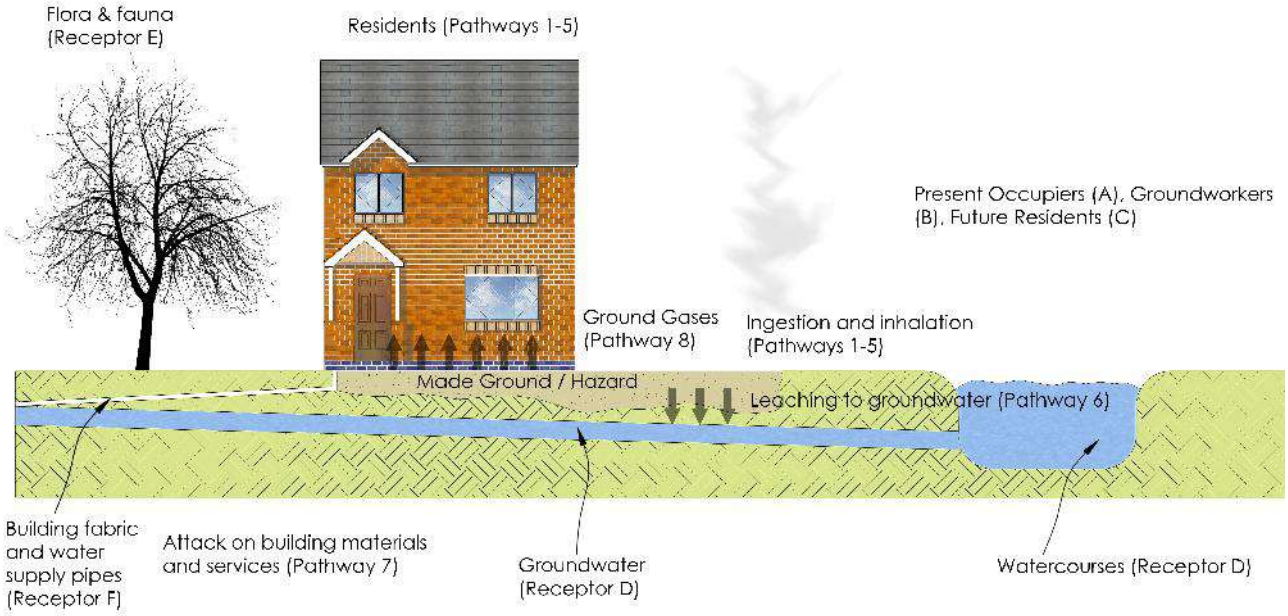


Shawcross House, Horrace Waller VC Parade, Dewsbury
Development Proposals

Michael D Joyce Associates LLP
Geotechnical and Geoenvironmental Consultants

Scale: NTS

Figure: 2



Pathways

1. Ingestion of contaminated soil/dust
2. Ingestion of contaminated food
3. Ingestion of contaminated water
4. Inhalation of contaminated vapours
5. Dermal contact with contaminated soil/dust or water
6. Pollution of controlled water and off site migration
7. Attack on building materials and services
8. Migration of landfill gases and radon

Receptors

A. Present site occupiers
B. Site development personnel
C. Future residents
D. Controlled waters
E. Flora and fauna
F. Building and services

Schematic Representation of Conceptual Site Model

Schematic Representation of Conceptual Site Model

Michael D Joyce Associates LLP

Geotechnical and Geoenvironmental Consultants

Figure: 3

Appendix 1

GroundSure Enviro-Insight and Geo-Insight Reports

Groundsure
LOCATION INTELLIGENCE

Enviro+Geo Insight

Shawcross House, Horrace Waller VC Parade, Dewsbury

Order Details

Date: 24/04/2024

Your ref: Shawross House, Horrace Waller VC

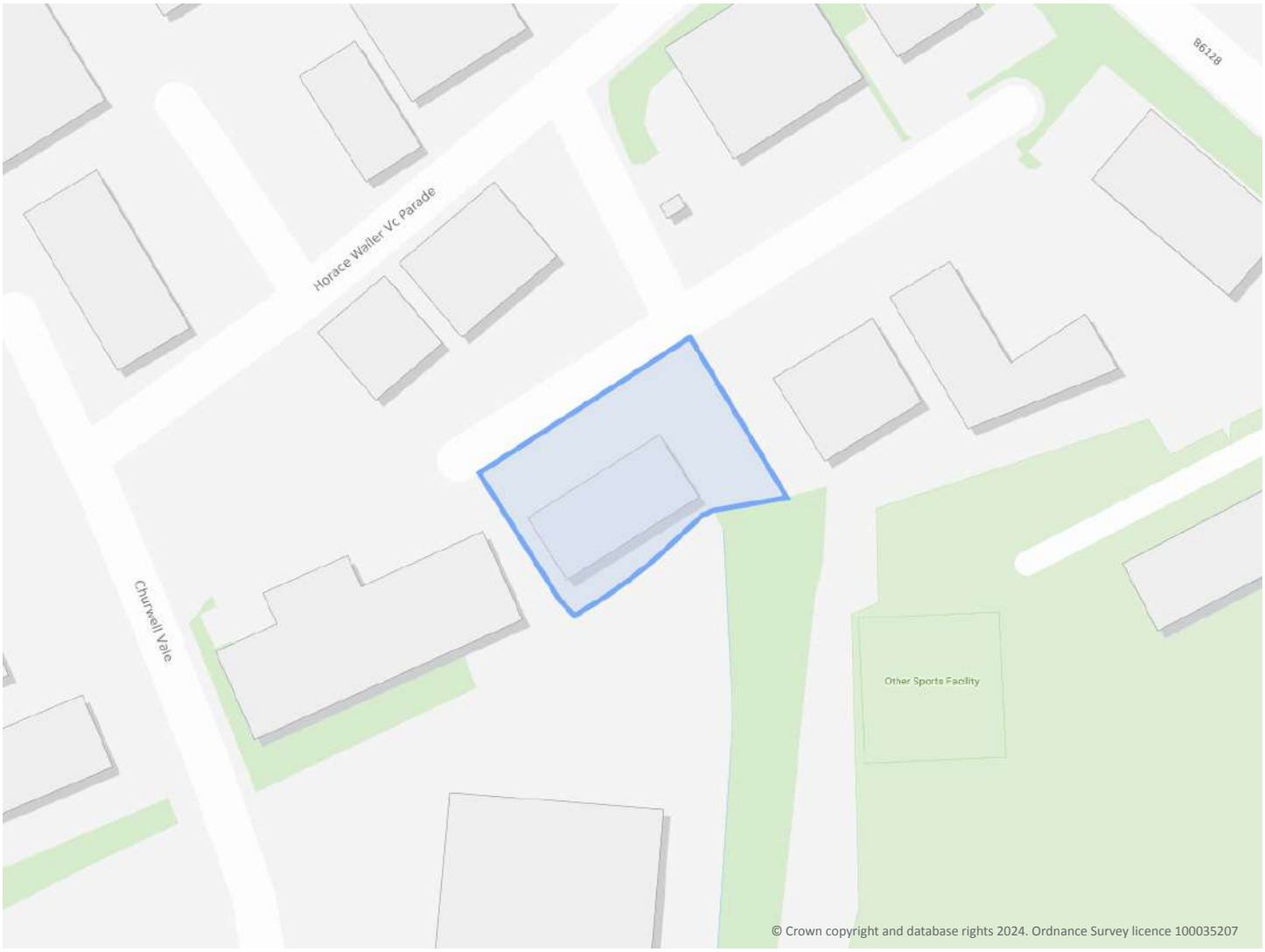
Our Ref: GS-WRE-2TE-C84-24F

Site Details

Location: 426151 422726

Area: 0.3 ha

Authority: Kirklees Council ↗



Contact us with any questions at:
info@groundsure.com ↗
01273 257 755

Certified B Corporation

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
14 >	1.1 >	Historical industrial land uses >	14	13	26	22	-
17 >	1.2 >	Historical tanks >	0	0	10	0	-
18 >	1.3 >	Historical energy features >	0	1	4	8	-
19	1.4	Historical petrol stations	0	0	0	0	-
19 >	1.5 >	Historical garages >	0	0	0	3	-
20	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
21 >	2.1 >	Historical industrial land uses >	10	14	36	31	-
25 >	2.2 >	Historical tanks >	0	0	11	0	-
26 >	2.3 >	Historical energy features >	0	1	4	16	-
27	2.4	Historical petrol stations	0	0	0	0	-
27 >	2.5 >	Historical garages >	0	0	0	5	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
28	3.1	Active or recent landfill	0	0	0	0	-
28	3.2	Historical landfill (BGS records)	0	0	0	0	-
29 >	3.3 >	Historical landfill (LA/mapping records) >	0	0	0	5	-
29 >	3.4 >	Historical landfill (EA/NRW records) >	1	0	0	1	-
30 >	3.5 >	Historical waste sites >	0	0	0	3	-
31 >	3.6 >	Licensed waste sites >	0	0	0	5	-
32 >	3.7 >	Waste exemptions >	0	2	5	5	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
34 >	4.1 >	Recent industrial land uses >	0	6	25	-	-
37 >	4.2 >	Current or recent petrol stations >	0	0	0	2	-
37	4.3	Electricity cables	0	0	0	0	-
37	4.4	Gas pipelines	0	0	0	0	-
37	4.5	Sites determined as Contaminated Land	0	0	0	0	-

37	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
38	4.7	Regulated explosive sites	0	0	0	0	-
38	4.8	Hazardous substance storage/usage	0	0	0	0	-
38	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
38	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
38 >	**4.11 >**	**Licensed pollutant release (Part A(2)/B) >**	0	0	1	3	-
39	4.12	Radioactive Substance Authorisations	0	0	0	0	-
39 >	**4.13 >**	**Licensed Discharges to controlled waters >**	0	0	0	4	-
40	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
40	4.15	Pollutant release to public sewer	0	0	0	0	-
41	4.16	List 1 Dangerous Substances	0	0	0	0	-
41	4.17	List 2 Dangerous Substances	0	0	0	0	-
41 >	**4.18 >**	**Pollution Incidents (EA/NRW) >**	0	1	0	1	-
41	4.19	Pollution inventory substances	0	0	0	0	-
42	4.20	Pollution inventory waste transfers	0	0	0	0	-
42	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
43	5.1	Superficial aquifer	None (within 500m)				
44 >	**5.2 >**	**Bedrock aquifer >**	Identified (within 500m)				
45 >	**5.3 >**	**Groundwater vulnerability >**	Identified (within 50m)				
46	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
46	5.5	Groundwater vulnerability- local information	None (within 0m)				
47 >	**5.6 >**	**Groundwater abstractions >**	0	0	0	0	14
51 >	**5.7 >**	**Surface water abstractions >**	0	0	0	0	1
51	5.8	Potable abstractions	0	0	0	0	0
52	5.9	Source Protection Zones	0	0	0	0	-
52	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	**Hydrology >**	On site	0-50m	50-250m	250-500m	500-2000m
53 >	**6.1 >**	**Water Network (OS MasterMap) >**	0	1	0	-	-

54 >	6.2 >	Surface water features >	0	1	0	-	-
54 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
54 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
55 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding >	On site	0-50m	50-250m	250-500m	500-2000m
56 >	7.1 >	Risk of flooding from rivers and the sea >	High (within 50m)				
57	7.2	Historical Flood Events	0	0	0	-	-
57	7.3	Flood Defences	0	0	0	-	-
57	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
57	7.5	Flood Storage Areas	0	0	0	-	-
58 >	7.6 >	Flood Zone 2 >	Identified (within 50m)				
59 >	7.7 >	Flood Zone 3 >	Identified (within 50m)				
Page	Section	Surface water flooding >					
60 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
62 >	9.1 >	Groundwater flooding >	Negligible (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
63	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
64	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
64	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
64	10.4	Special Protection Areas (SPA)	0	0	0	0	0
64	10.5	National Nature Reserves (NNR)	0	0	0	0	0
65	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
65 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	4
65	10.8	Biosphere Reserves	0	0	0	0	0
66	10.9	Forest Parks	0	0	0	0	0
66	10.10	Marine Conservation Zones	0	0	0	0	0
66 >	10.11 >	Green Belt >	0	0	0	4	2
66	10.12	Proposed Ramsar sites	0	0	0	0	0

67	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
67	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
67	10.15	Nitrate Sensitive Areas	0	0	0	0	0
67	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
68 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
69	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
70	11.1	World Heritage Sites	0	0	0	-	-
70	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
70	11.3	National Parks	0	0	0	-	-
70	11.4	Listed Buildings	0	0	0	-	-
71	11.5	Conservation Areas	0	0	0	-	-
71	11.6	Scheduled Ancient Monuments	0	0	0	-	-
71	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
72 >	12.1 >	Agricultural Land Classification >	Urban (within 250m)				
73	12.2	Open Access Land	0	0	0	-	-
73	12.3	Tree Felling Licences	0	0	0	-	-
73	12.4	Environmental Stewardship Schemes	0	0	0	-	-
73	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
75	13.1	Priority Habitat Inventory	0	0	0	-	-
75	13.2	Habitat Networks	0	0	0	-	-
75	13.3	Open Mosaic Habitat	0	0	0	-	-
75	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
76 >	14.1 >	10k Availability >	Identified (within 500m)				
77 >	14.2 >	Artificial and made ground (10k) >	1	1	0	1	-
78	14.3	Superficial geology (10k)	0	0	0	0	-

78	14.4	Landslip (10k)	0	0	0	0	-
79 >	14.5 >	Bedrock geology (10k) >	1	1	0	10	-
80 >	14.6 >	Bedrock faults and other linear features (10k) >	0	0	0	8	-
Page	Section	**Geology 1:50,000 scale >**	On site	0-50m	50-250m	250-500m	500-2000m
81 >	15.1 >	50k Availability >	Identified (within 500m)				
82 >	15.2 >	Artificial and made ground (50k) >	1	0	0	0	-
83 >	15.3 >	Artificial ground permeability (50k) >	1	0	-	-	-
84	15.4	Superficial geology (50k)	0	0	0	0	-
84	15.5	Superficial permeability (50k)	None (within 50m)				
84	15.6	Landslip (50k)	0	0	0	0	-
84	15.7	Landslip permeability (50k)	None (within 50m)				
85 >	15.8 >	Bedrock geology (50k) >	1	3	0	9	-
86 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
86 >	15.10 >	Bedrock faults and other linear features (50k) >	0	0	0	8	-
Page	Section	**Boreholes >**	On site	0-50m	50-250m	250-500m	500-2000m
88 >	16.1 >	BGS Boreholes >	0	2	31	-	-
Page	Section	**Natural ground subsidence >**					
91 >	17.1 >	Shrink swell clays >	Very low (within 50m)				
92 >	17.2 >	Running sands >	Very low (within 50m)				
94 >	17.3 >	Compressible deposits >	Very low (within 50m)				
96 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
97 >	17.5 >	Landslides >	Very low (within 50m)				
98 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	**Mining and ground workings >**	On site	0-50m	50-250m	250-500m	500-2000m
100 >	18.1 >	BritPits >	0	0	1	1	-
101 >	18.2 >	Surface ground workings >	10	11	21	-	-
103 >	18.3 >	Underground workings >	2	1	9	0	17
104	18.4	Underground mining extents	0	0	0	0	-
104	18.5	Historical Mineral Planning Areas	0	0	0	0	-

105	18.6	Non-coal mining	0	0	0	0	0
105	18.7	JPB mining areas	None (within 0m)				
105	18.8	The Coal Authority non-coal mining	0	0	0	0	-
105	18.9	Researched mining	0	0	0	0	-
106	18.10	Mining record office plans	0	0	0	0	-
106	18.11	BGS mine plans	0	0	0	0	-
106 >	**18.12 >**	**Coal mining >**	Identified (within 0m)				
106	18.13	Brine areas	None (within 0m)				
107	18.14	Gypsum areas	None (within 0m)				
107	18.15	Tin mining	None (within 0m)				
107	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
108	19.1	Natural cavities	0	0	0	0	-
108	19.2	Mining cavities	0	0	0	0	0
108	19.3	Reported recent incidents	0	0	0	0	-
108	19.4	Historical incidents	0	0	0	0	-
109	19.5	National karst database	0	0	0	0	-
Page	Section	**Radon >**					
110 >	**20.1 >**	**Radon >**	Between 5% and 10% (within 0m)				
Page	Section	**Soil chemistry >**	On site	0-50m	50-250m	250-500m	500-2000m
112 >	**21.1 >**	**BGS Estimated Background Soil Chemistry >**	1	3	-	-	-
112	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
113	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	**Railway infrastructure and projects >**	On site	0-50m	50-250m	250-500m	500-2000m
114	22.1	Underground railways (London)	0	0	0	-	-
114	22.2	Underground railways (Non-London)	0	0	0	-	-
115	22.3	Railway tunnels	0	0	0	-	-
115 >	**22.4 >**	**Historical railway and tunnel features >**	0	3	29	-	-
116	22.5	Royal Mail tunnels	0	0	0	-	-

116 >	22.6 >	Historical railways >	0	0	1	-	-
117	22.7	Railways	0	0	0	-	-
117	22.8	Crossrail 1	0	0	0	0	-
117	22.9	Crossrail 2	0	0	0	0	-
117	22.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 30/05/2021

Site Area: 0.3ha

Recent site history - 2018 aerial photograph

Capture Date: 02/07/2018

Site Area: 0.3ha

Recent site history - 2012 aerial photograph

Capture Date: 26/03/2012

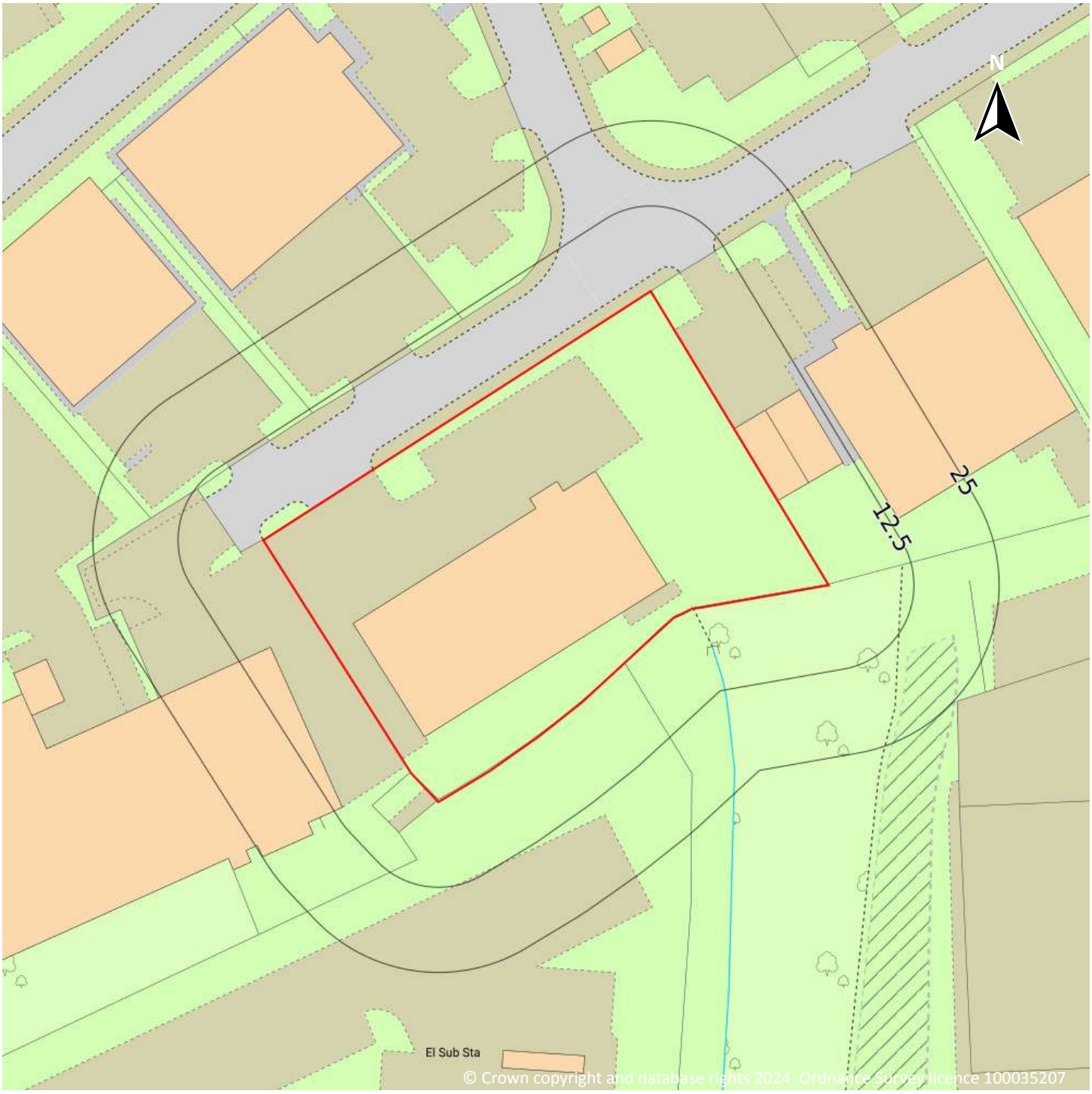
Site Area: 0.3ha

Recent site history - 1999 aerial photograph

Capture Date: 10/07/1999

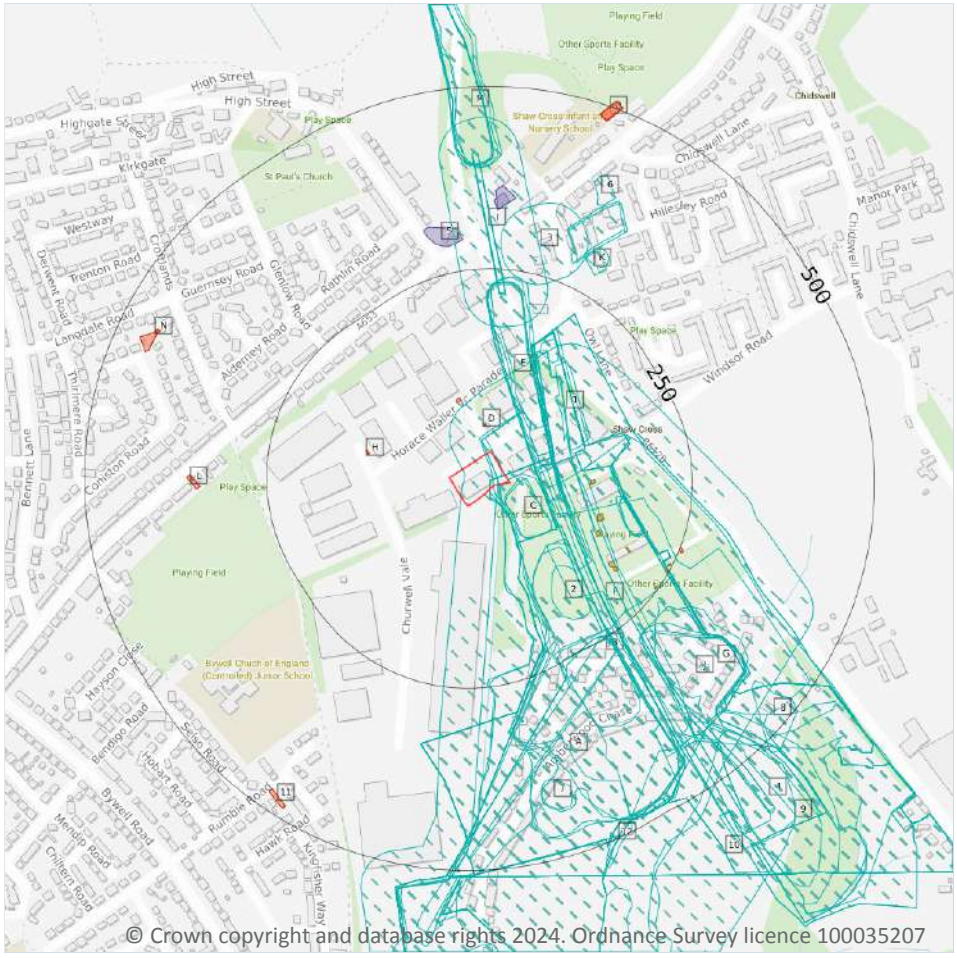
Site Area: 0.3ha

OS MasterMap site plan



Site Area: 0.3ha

1 Past land use



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

1.1 Historical industrial land uses

Records within 500m	75

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14 >**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Disused Colliery**	**1971**	**1431719**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Refuse Heap**	**1971**	**1494775**
B	**On site**	**Unspecified Disused Workings**	**1992**	**1455955**
B	**On site**	**Colliery**	**1948**	**1458238**
B	**On site**	**Colliery**	**1938**	**1458239**
B	**On site**	**Colliery**	**1948**	**1458240**
B	**On site**	**Colliery**	**1931**	**1458241**
B	**On site**	**Colliery**	**1948**	**1458242**
B	**On site**	**Colliery**	**1938**	**1458243**
B	**On site**	**Colliery**	**1931**	**1458244**
B	**On site**	**Refuse Heaps**	**1948**	**1485283**
B	**On site**	**Refuse Heap**	**1948**	**1527029**
B	**On site**	**Refuse Heap**	**1957**	**1532745**
B	**On site**	**Unspecified Disused Tip**	**1971 - 1980**	**1547701**
C	7m E	Unspecified Ground Workings	1931	1414253
C	10m E	Unspecified Heap	1931	1417463
B	39m E	Railway Sidings	1931	1458335
B	39m E	Railway Sidings	1948	1458336
B	39m E	Railway Sidings	1948	1458337
B	39m E	Railway Sidings	1931	1458338
E	39m E	Cuttings	1948	1543415
E	40m E	Cuttings	1931	1458526
F	43m E	Railway Sidings	1905	1531402
C	43m E	Cuttings	1892 - 1905	1460393
E	44m E	Cuttings	1892 - 1931	1498350
E	44m E	Cuttings	1948	1533923
B	49m E	Colliery	1905	1473278
E	52m E	Cuttings	1971 - 1980	1533065
E	61m NE	Cuttings	1957	1539739

ID	Location	Land use	Dates present	Group ID
G	64m E	Unspecified Mine	1957	1466306
G	64m E	Railway Sidings	1971	1498404
G	64m E	Colliery	1971	1500627
F	66m E	Railway Sidings	1948	1527916
F	67m E	Railway Sidings	1931	1502064
F	68m E	Railway Sidings	1892	1486506
1	94m E	Refuse Heap	1971 - 1980	1528269
B	100m SE	Refuse Heap	1931	1537253
B	108m SE	Refuse Heaps	1931	1468895
2	131m SE	Refuse Heap	1905	1502863
F	147m E	Unspecified Heap	1905	1482593
E	148m NE	Unspecified Pit	1980	1452084
F	153m E	Unspecified Heap	1948	1479518
F	153m E	Unspecified Heap	1931	1510305
I	171m N	Tunnel	1957	1500817
I	214m N	Tunnel	1892 - 1931	1496897
I	216m N	Tunnel	1948	1502250
I	216m N	Tunnel	1931	1481626
3	236m N	Smithy	1905	1456923
B	237m SE	Colliery	1892	1547692
A	243m SE	Tramway Sidings	1905	1495889
B	243m SE	Refuse Heap	1905	1474854
A	245m SE	Tramway Sidings	1931 - 1948	1494337
B	248m SE	Refuse Heap	1892	1527929
4	261m SE	Refuse Heap	1957 - 1971	1532522
J	273m SE	Refuse Heap	1948	1497121
G	274m SE	Refuse Heap	1905	1490679
J	276m SE	Refuse Heap	1931	1551777

ID	Location	Land use	Dates present	Group ID
K	280m NE	Refuse Heap	1892	1437425
K	280m NE	Disused Brick Works	1931	1479926
K	284m NE	Disused Brick Works	1905 - 1931	1503491
G	287m SE	Refuse Heap	1892	1535157
K	291m NE	Unspecified Heap	1905	1417464
6	368m NE	Unspecified Heap	1892	1417465
M	389m N	Cuttings	1971 - 1992	1494482
M	389m N	Cuttings	1957	1487299
7	392m S	Refuse Heap	1931	1546175
M	392m N	Cuttings	1931	1538127
M	393m N	Cuttings	1905 - 1931	1473418
M	393m N	Cuttings	1892	1500700
M	393m N	Cuttings	1948	1555713
M	394m N	Cuttings	1948	1486549
8	432m SE	Unspecified Pit	1992	1452066
9	438m SE	Refuse Heap	1957	1481508
10	451m SE	Refuse Heap	1992	1486153
12	478m SE	Unspecified Heap	1948	1417462

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	10

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14 >**

ID	Location	Land use	Dates present	Group ID
F	110m E	Unspecified Tank	1955	223845
F	128m E	Tanks	1955	230631
F	135m SE	Unspecified Tank	1933	223846
F	175m SE	Unspecified Tank	1938	223847
F	182m SE	Unspecified Tank	1955	223851
F	184m SE	Unspecified Tank	1938	223852
F	240m SE	Unspecified Tank	1907	223850
F	243m SE	Tanks	1955	230632
F	244m SE	Tanks	1955	230629
F	245m SE	Unspecified Tank	1922 - 1933	248018

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	**13**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14 >**

ID	Location	Land use	Dates present	Group ID
D	36m N	Electricity Substation	1996	129174
D	81m N	Gas Governor	1996	131871
H	114m W	Electricity Substation	1996	129108
H	117m W	Electricity Substation	1997	129109
F	249m E	Electricity Substation	1955	129107
L	342m W	Electricity Substation	1954 - 1997	143637
L	350m W	Electricity Substation	1956	140706
N	445m NW	Electricity Substation	1992	133879

ID	Location	Land use	Dates present	Group ID
N	445m NW	Electricity Substation	1971	132920
N	446m NW	Electricity Substation	1997	132695
11	472m SW	Electricity Substation	1961 - 1995	146447
O	479m N	Electricity Substation	1969	144339
O	480m N	Electricity Substation	1962 - 1996	137260

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	3

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14 >**

ID	Location	Land use	Dates present	Group ID
5	287m N	Garage	1962 - 1981	45643
I	331m N	Garage	1965	43968
I	332m N	Garage	1962 - 1981	46042

This data is sourced from Ordnance Survey / Groundsure.

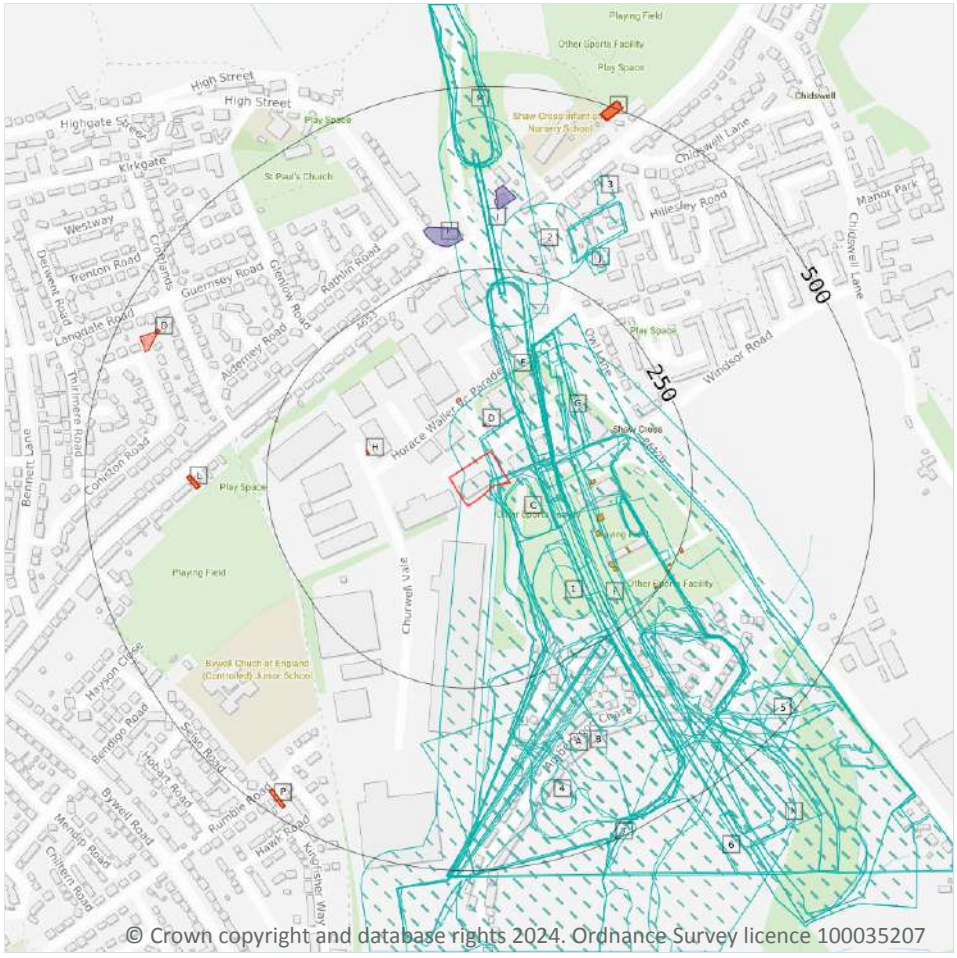
1.6 Historical military land

Records within 500m	0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped



2.1 Historical industrial land uses

Records within 500m	91

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 21 >**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Disused Colliery**	**1971**	**1431719**
A	**On site**	**Refuse Heap**	**1971**	**1494775**
B	**On site**	**Refuse Heap**	**1957**	**1532745**

ID	Location	Land Use	Date	Group ID
B	**On site**	**Unspecified Disused Workings**	**1992**	**1455955**
B	**On site**	**Refuse Heap**	**1948**	**1527029**
B	**On site**	**Colliery**	**1948**	**1458238**
B	**On site**	**Colliery**	**1931**	**1458244**
B	**On site**	**Refuse Heaps**	**1948**	**1485283**
B	**On site**	**Colliery**	**1948**	**1458242**
B	**On site**	**Unspecified Disused Tip**	**1980**	**1547701**
C	7m E	Unspecified Ground Workings	1931	1414253
C	10m E	Unspecified Heap	1931	1417463
B	39m E	Railway Sidings	1931	1458335
E	39m E	Cuttings	1948	1543415
B	40m E	Railway Sidings	1948	1458336
E	40m E	Cuttings	1931	1458526
F	43m E	Railway Sidings	1905	1531402
C	43m E	Cuttings	1905	1460393
E	44m E	Cuttings	1948	1533923
E	44m E	Cuttings	1905	1498350
E	44m E	Cuttings	1892	1498350
E	44m E	Cuttings	1931	1498350
C	45m E	Cuttings	1892	1460393
B	49m E	Colliery	1905	1473278
E	52m E	Cuttings	1980	1533065
E	52m E	Cuttings	1971	1533065
E	61m NE	Cuttings	1957	1539739
B	64m E	Unspecified Mine	1957	1466306
B	64m E	Unspecified Mine	1957	1466306
B	64m E	Colliery	1971	1500627
B	64m E	Railway Sidings	1971	1498404

ID	Location	Land Use	Date	Group ID
F	66m E	Railway Sidings	1948	1527916
F	67m E	Railway Sidings	1931	1502064
F	68m E	Railway Sidings	1892	1486506
B	80m SE	Colliery	1931	1458241
G	94m E	Refuse Heap	1971	1528269
G	94m NE	Refuse Heap	1980	1528269
B	100m SE	Refuse Heap	1931	1537253
B	108m SE	Refuse Heaps	1931	1468895
1	131m SE	Refuse Heap	1905	1502863
F	147m E	Unspecified Heap	1905	1482593
E	148m NE	Unspecified Pit	1980	1452084
F	153m E	Unspecified Heap	1948	1479518
F	153m E	Unspecified Heap	1931	1510305
F	155m E	Unspecified Heap	1948	1479518
F	155m E	Unspecified Heap	1931	1510305
I	171m N	Tunnel	1957	1500817
I	214m N	Tunnel	1931	1496897
I	216m N	Tunnel	1948	1502250
I	216m N	Tunnel	1948	1502250
I	216m N	Tunnel	1905	1496897
I	216m N	Tunnel	1892	1496897
I	216m N	Tunnel	1931	1481626
2	236m N	Smithy	1905	1456923
B	237m SE	Colliery	1892	1547692
A	243m SE	Tramway Sidings	1905	1495889
B	243m SE	Refuse Heap	1905	1474854
A	245m SE	Tramway Sidings	1948	1494337
A	246m SE	Tramway Sidings	1931	1494337

ID	Location	Land Use	Date	Group ID
B	248m SE	Refuse Heap	1892	1527929
A	252m SE	Railway Sidings	1948	1458337
A	255m SE	Railway Sidings	1931	1458338
B	261m SE	Refuse Heap	1957	1532522
B	273m SE	Refuse Heap	1948	1497121
B	274m SE	Refuse Heap	1905	1490679
B	274m SE	Refuse Heap	1948	1497121
B	276m SE	Refuse Heap	1931	1551777
B	276m SE	Refuse Heap	1931	1551777
J	280m NE	Refuse Heap	1892	1437425
J	280m NE	Disused Brick Works	1931	1479926
J	284m NE	Disused Brick Works	1905	1503491
J	284m NE	Disused Brick Works	1931	1503491
B	287m SE	Refuse Heap	1892	1535157
J	291m NE	Unspecified Heap	1905	1417464
3	368m NE	Unspecified Heap	1892	1417465
M	389m N	Cuttings	1980	1494482
M	389m N	Cuttings	1992	1494482
M	389m N	Cuttings	1971	1494482
M	389m N	Cuttings	1957	1487299
4	392m S	Refuse Heap	1931	1546175
M	392m N	Cuttings	1931	1538127
M	393m N	Cuttings	1948	1555713
M	393m N	Cuttings	1905	1473418
M	393m N	Cuttings	1892	1500700
M	394m N	Cuttings	1931	1473418
M	394m N	Cuttings	1948	1486549
N	419m SE	Refuse Heap	1971	1532522

ID	Location	Land Use	Date	Group ID
5	432m SE	Unspecified Pit	1992	1452066
N	438m SE	Refuse Heap	1957	1481508
6	451m SE	Refuse Heap	1992	1486153
7	478m SE	Unspecified Heap	1948	1417462

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	**11**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 21 >**

ID	Location	Land Use	Date	Group ID
F	110m E	Unspecified Tank	1955	223845
F	128m E	Tanks	1955	230631
F	135m SE	Unspecified Tank	1933	223846
F	175m SE	Unspecified Tank	1938	223847
F	182m SE	Unspecified Tank	1955	223851
F	184m SE	Unspecified Tank	1938	223852
F	240m SE	Unspecified Tank	1907	223850
F	243m SE	Tanks	1955	230632
F	244m SE	Tanks	1955	230629
F	245m SE	Unspecified Tank	1922	248018
F	245m SE	Unspecified Tank	1933	248018

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	**21**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 21 >**

ID	Location	Land Use	Date	Group ID
D	36m N	Electricity Substation	1996	129174
D	81m N	Gas Governor	1996	131871
H	114m W	Electricity Substation	1996	129108
H	117m W	Electricity Substation	1997	129109
F	249m E	Electricity Substation	1955	129107
L	342m W	Electricity Substation	1954	143637
L	342m W	Electricity Substation	1971	143637
L	343m W	Electricity Substation	1992	143637
L	343m W	Electricity Substation	1997	143637
L	350m W	Electricity Substation	1956	140706
O	445m NW	Electricity Substation	1992	133879
O	445m NW	Electricity Substation	1971	132920
O	446m NW	Electricity Substation	1997	132695
P	472m SW	Electricity Substation	1995	146447
P	473m SW	Electricity Substation	1961	146447
Q	479m N	Electricity Substation	1969	144339
Q	480m N	Electricity Substation	1981	137260
Q	480m N	Electricity Substation	1962	137260
Q	481m N	Electricity Substation	1995	137260
Q	481m N	Electricity Substation	1995	137260
Q	481m N	Electricity Substation	1996	137260

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	5

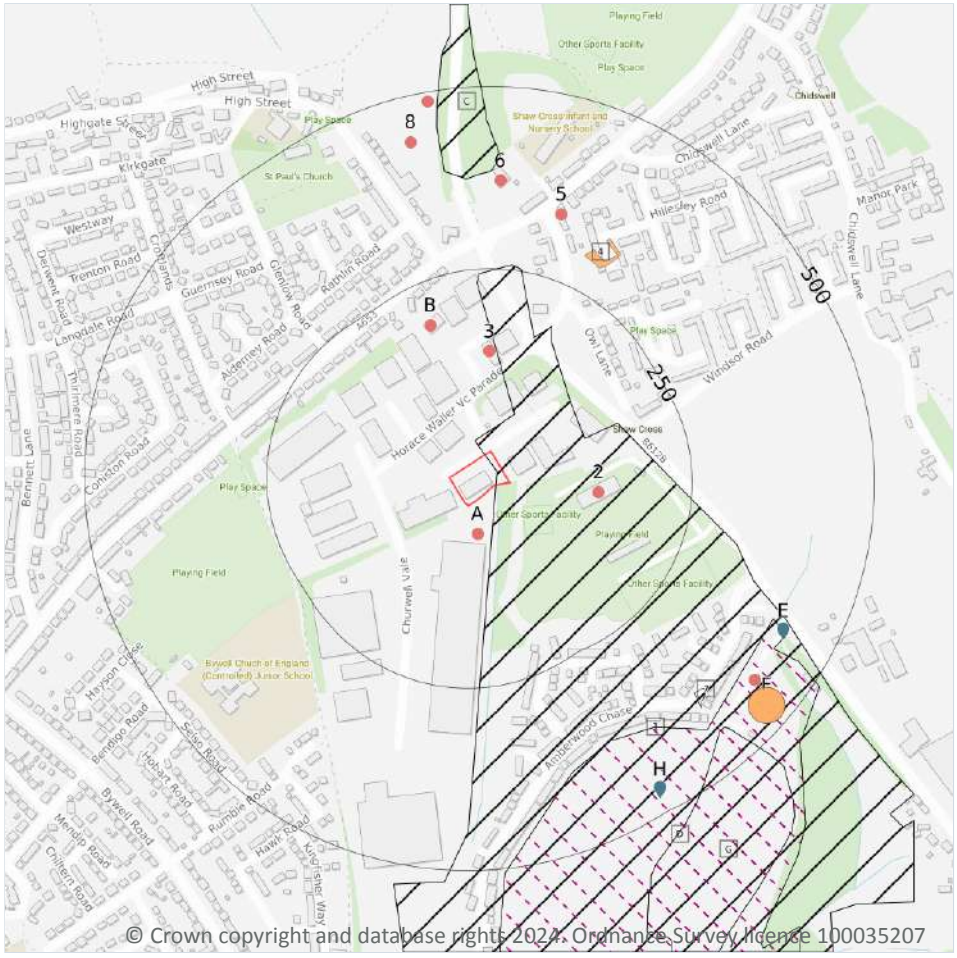
Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 21 >**

ID	Location	Land Use	Date	Group ID
K	287m N	Garage	1981	45643
K	287m N	Garage	1962	45643
I	331m N	Garage	1965	43968
I	332m N	Garage	1981	46042
I	332m N	Garage	1962	46042

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



3.1 Active or recent landfill

Records within 500m	0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	5

Landfill sites identified from Local Authority records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 28 >**

ID	Location	Site address	Source	Data type
D	377m SE	Refuse Tip	1995 mapping	Polygon
D	377m SE	Refuse Tip	1996 mapping	Polygon
7	383m SE	Refuse Tip	1967 mapping	Polygon
G	446m SE	Refuse Tip	1985 mapping	Polygon
G	446m SE	Refuse Tip	1992 mapping	Polygon

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	2

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on **page 28 >**

ID	Location	Details		
1	**On site**	**Site Address: Shaw Cross Landfill Site, Owl Lane, Dewsbury, West Yorkshire** **Licence Holder Address: Chantry House, 123 Kirkgate, Wakefield, West Yorkshire**	**Waste Licence: -** **Site Reference: 4700/WY119, 1088** **Waste Type: Inert, Industrial, Commercial, Household** **Environmental Permitting Regulations (Waste) Reference: -** **Licence Issue: -** **Licence Surrender: -**	**Operator: West Yorkshire Waste Management Limited** **Licence Holder: West Yorkshire Waste Management Limited** **First Recorded 01/01/1983** **Last Recorded: 31/12/1991**
C	374m N	Site Address: Railway Cutting to the North of Leeds Road, Leeds Road, Chidswell, Dewsbury Licence Holder Address: -	Waste Licence: - Site Reference: - Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded - Last Recorded: -

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	3

Waste site records derived from Local Authority planning records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 28 >**

ID	Location	Address	Further Details	Date
4	292m NE	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1893
F	440m SE	Site Address: Shaw Cross Waste Disposal & Re, Owl Lane, OSSETT, West Yorkshire, WF5 9AU	Type of Site: Recycling Facility Planning application reference: 11/01763/RPP Description: Scheme comprises temporary upgrade of household waste recycling centre, 2 storey staff facilities building, 3m high fence, weighbridge and temporary provision of a new transfer loading station building. Construction - fencing site works. An applicationre f: 11/01763/RPP) for detailed planning permission was granted by Wakefield C.C. A detailed planning application has been granted. Data source: Historic Planning Application Data Type: Point	28/03/2012
F	440m SE	Site Address: Shaw Cross Waste Disposal & Re, Owl Lane, OSSETT, West Yorkshire, WF5 9AU	Type of Site: Recycling Centre Planning application reference: 09/00509/FUL Description: Scheme comprises temporary upgrade of household waste recycling centre, 2 storey staff facilities building, 3m high fence, weighbridge and temporary provision of a new transfer loading station building. Construction - fencing site works. An applicationre f: 09/00509/FUL) for detailed planning permission was granted by Wakefield C.C. Start date and contract period are a guideline only. Please note the addition of the Architect. Detail plans approved. Data source: Historic Planning Application Data Type: Point	-

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m	5

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

Features are displayed on the Waste and landfill map on **page 28 >**

ID	Location	Details		
E	426m SE	Site Name: Shawcross Household Waste Site Site Address: Shaw Cross H W S, Owl Lane, Ossett, Wakefield, West Yorkshire, WF5 9AU Correspondence Address: -	Type of Site: Household Waste Amenity Site Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA115 EPR reference: EA/EPR/EB3137WJ/T001 Operator: Shanks Waste Management Waste Management licence No: 61066 Annual Tonnage: 7499	Issue Date: 01/04/1996 Effective Date: 25/02/2013 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred
E	426m SE	Site Name: Shawcross Household Waste Site Site Address: Shaw Cross H W S, Owl Lane, Ossett, Wakefield, West Yorkshire, WF5 9AU Correspondence Address: -	Type of Site: Household Waste Amenity Site Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: 645017 EPR reference: EA/EPR/EB3137WJ Operator: Renewi Uk Services Limited Waste Management licence No: 61066 Annual Tonnage: 0	Issue Date: 01/04/1996 Effective Date: 01/04/1996 Modified: - Surrendered Date: 01/04/1996 Expiry Date: - Cancelled Date: - Status: Surrendered
H	468m SE	Site Name: Shaw Cross Household Waste Site Site Address: Shaw Cross Hws, Owl Lane, Ossett, Wakefield, West Yorkshire, WF5 9AU Correspondence Address: Council Of The City Of Wakefield, County Hall, Wakefield, West Yorkshire, WF1 2QW	Type of Site: Household Waste Amenity Site Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WES008 EPR reference: - Operator: The Council Of The City Of Wakefield Waste Management licence No: 61066 Annual Tonnage: 0	Issue Date: 01/04/1996 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued

ID	Location	Details		
H	468m SE	Site Name: Ossett Household Waste Recycling Centre Site Address: Shaw Cross Hws, Owl Lane, Ossett, Wakefield, West Yorkshire, WF5 9AU Correspondence Address: -	Type of Site: Household Waste Amenity Site Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WES008 EPR reference: EA/EPR/BP3391LH/A001 Operator: Wakefield Council Waste Management licence No: 61066 Annual Tonnage: 7499	Issue Date: 01/04/1996 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
H	468m SE	Site Name: Ossett Household Waste Recycling Centre Site Address: Shaw Cross Hws, Owl Lane, Ossett, Wakefield, West Yorkshire, WF5 9AU Correspondence Address: Wakefield Transfer Loading Station, Derby Dale Road, Wakefield, West Yorkshire, WF2 7AH	Type of Site: Household Waste Amenity Site Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WES008 EPR reference: - Operator: The Council Of The City Of Wakefield Waste Management licence No: 61066 Annual Tonnage: 7499	Issue Date: 01/04/1996 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m **12**

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

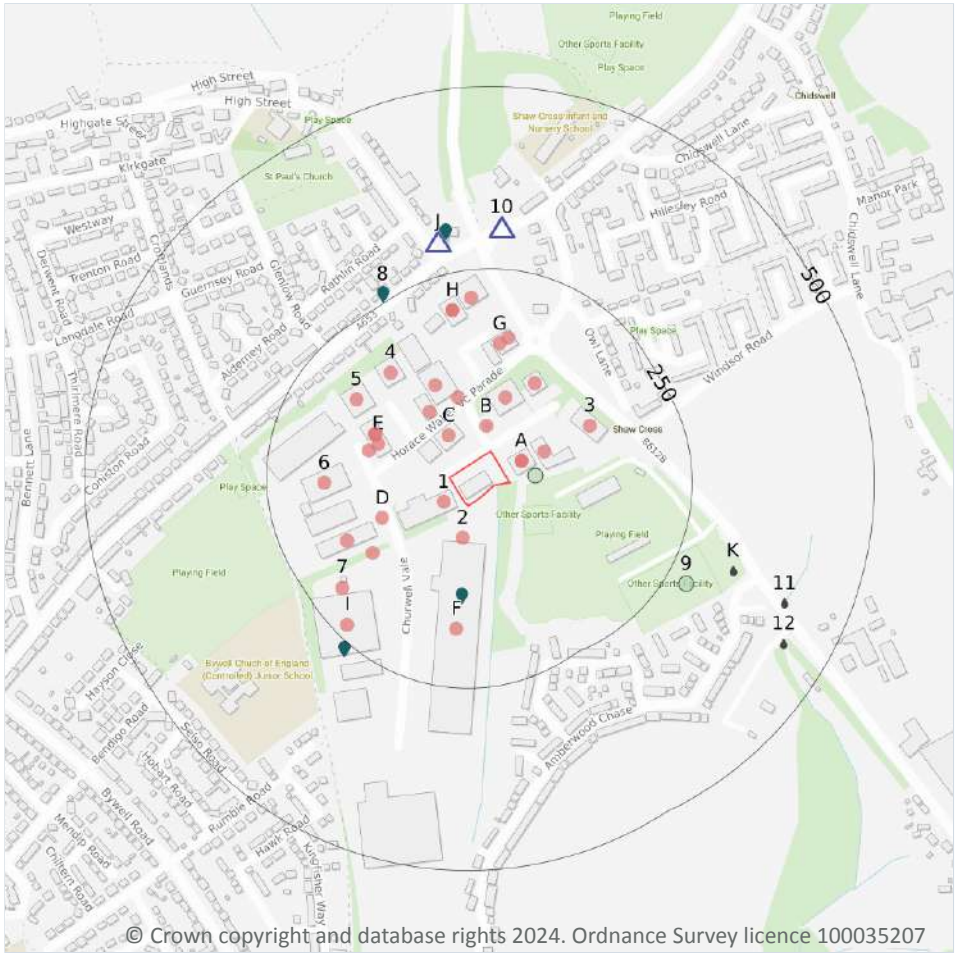
Features are displayed on the Waste and landfill map on **page 28 >**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	41m S	-	WEX023493	Using waste exemption	Not on a farm	Use of waste in construction
A	41m S	-	WEX008634	Using waste exemption	Not on a farm	Use of waste in construction
2	122m E	Harron Homes, Owl Lane, Dewsbury, WF12 7RH	WEX083383	Using waste exemption	Not on a farm	Use of waste in construction

ID	Location	Site	Reference	Category	Sub-Category	Description
3	136m N	4 Nelson Court Flaghsip Square Dewsbury Kirklees WF12 7TH	EPR/PF0635VR/A001	Treating waste exemption	Both agricultural and non-agricultural waste	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	191m N	4 Nelson Court Dewsbury Yorkshire WF12 7TH	EPR/GF0506LY/A001	Storing waste exemption	Both agricultural and non-agricultural waste	Storage of waste in a secure place
B	191m N	4 Nelson Court Dewsbury Yorkshire WF12 7TH	EPR/GF0506LY/A001	Treating waste exemption	Both agricultural and non-agricultural waste	Preparatory treatments (baling, sorting, shredding etc)
B	191m N	4 Nelson Court Dewsbury Yorkshire WF12 7TH	EPR/GF0506LY/A001	Treating waste exemption	Non-Agricultural Waste Only	Recovery of textiles
5	338m N	Northern Domestics Ltd, 762, LEEDS ROAD, Dewsbury, WF127QL	WEX361920	Storing waste exemption	Not on a farm	Storage of waste in a secure place
6	370m N	-	WEX356304	Using waste exemption	Not on a farm	Use of waste in construction
F	431m SE	Harron Homes Ltd Owl Lane West Yorkshire WF5 9AU	EPR/ME5244CE/A001	Using waste exemption	Non-Agricultural Waste Only	Use of waste in construction
8	437m N	-	WEX348943	Using waste exemption	Not on a farm	Use of waste in construction
C	487m N	-	WEX363164	Using waste exemption	Not on a farm	Use of waste in construction

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use



4.1 Recent industrial land uses

Records within 250m	31

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Company	Address	Activity	Category
1	24m SW	Extractly Ltd	Unit 9a Shaw Cross Business Park, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Cooling and Refrigeration	Industrial Products
A	29m NE	Extreme Products	Unit 2 Shaw Cross Business Park, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Seals, Tapes, Taps and Valves	Industrial Products

ID	Location	Company	Address	Activity	Category
A	29m NE	Perfect Finishing Solutions Ltd	Unit 2 Shaw Cross Business Park, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Plate Makers, Print Finishers and Type Setters	IT, Advertising, Marketing and Media Services
B	35m N	Electricity Sub Station	West Yorkshire, WF12	Electrical Features	Infrastructure and Facilities
2	45m S	Electricity Sub Station	West Yorkshire, WF12	Electrical Features	Infrastructure and Facilities
C	49m NW	E V 2 Sportswear	Unit 4, Horace Waller Vc Parade, Shaw Cross Business Park, Dewsbury, West Yorkshire, WF12 7RF	Clothing, Components and Accessories	Consumer Products
A	63m E	Comet Fluid Power	Shaw Cross Business Park, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Industrial Repairs and Servicing	Repair and Servicing
B	77m N	Auto Vaux	Shaw Cross Business Park, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Vehicle Parts and Accessories	Motoring
C	86m N	Electricity Sub Station	West Yorkshire, WF12	Electrical Features	Infrastructure and Facilities
C	91m NW	G M I Power	Unit 8 Shaw Cross Business Court, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Electrical Equipment Repair and Servicing	Repair and Servicing
D	107m W	Electricity Sub Station	West Yorkshire, WF12	Electrical Features	Infrastructure and Facilities
E	108m W	Record UK	Unit 2 Shaw Cross Court, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	General Construction Supplies	Industrial Products
B	111m NE	Mount Packaging Systems Ltd	Shaw Cross Business Park, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Packaging	Industrial Products
C	117m NW	Joalpe International UK	5, Flagship Square, Shaw Cross, Dewsbury, West Yorkshire, WF12 7TH	Distribution and Haulage	Transport, Storage and Delivery
E	117m W	Electricity Sub Station	West Yorkshire, WF12	Electrical Features	Infrastructure and Facilities
E	118m NW	Industrial Door Systems	Unit 3 Shaw Cross Court, Horace Waller V C Parade, Shaw Cross Business Park, Dewsbury, West Yorkshire, WF12 7RF	General Construction Supplies	Industrial Products

ID	Location	Company	Address	Activity	Category
E	119m NW	H S Components	Unit 3 Shaw Cross Court, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Vehicle Parts and Accessories	Motoring
3	134m NE	Forkway Group Ltd	Unit A, Horace Waller V C Parade, Shaw Cross Business Park, Dewsbury, West Yorkshire, WF12 7RF	Lifting and Handling Equipment	Industrial Products
D	143m SW	Electricity Sub Station	West Yorkshire, WF12	Electrical Features	Infrastructure and Facilities
G	148m N	E M S- F P & S	Unit 2 Flagship Court, Flagship Square, Shaw Cross, Dewsbury, West Yorkshire, WF12 7TH	Vehicle Parts and Accessories	Motoring
G	157m N	Dormeuil Manufacturing	Unit 1 Flagship Court, Flagship Square, Shaw Cross, Dewsbury, West Yorkshire, WF12 7TH	Textiles, Fabrics, Silk and Machinery	Industrial Products
D	165m SW	Scaffolding Access Solutions	Richard Alan House, Shaw Cross Business Park, Churwell Vale, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RD	Construction and Tool Hire	Hire Services
4	165m NW	Forktruck Solutions	C Perkin Shaw Cross Business Park, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Industrial Repairs and Servicing	Repair and Servicing
5	167m NW	Y C R Distribution	Unit 5 Shaw Cross Court, Horace Waller V C Parade, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RF	Office and Shop Equipment	Industrial Products
F	169m S	Magnet C K S	Shaw Cross Business Park, Churwell Vale, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RD	General Construction Supplies	Industrial Products
6	172m W	Encore Envelope	Churwell Vale, Shaw Cross Business Park, Dewsbury, West Yorkshire, WF12 7RD	Printing Related Machinery	Industrial Products
H	200m N	Fenner Drives	4, Flagship Square, Shaw Cross, Dewsbury, West Yorkshire, WF12 7TH	General Construction Supplies	Industrial Products
H	200m N	Elk Motors	4, Flagship Square, Shaw Cross, Dewsbury, West Yorkshire, WF12 7TH	New Vehicles	Motoring
7	205m SW	Tank	West Yorkshire, WF12	Tanks (Generic)	Industrial Features
H	212m N	Pumps & Gear Boxes Ltd	Unit 3 Flagship Court, Flagship Square, Shaw Cross Business Park, Dewsbury, West Yorkshire, WF12 7TH	Vehicle Components	Industrial Products
I	232m SW	Parker Hannifin Plc	Shaw Cross Business Park, Churwell Vale, Shaw Cross, Dewsbury, West Yorkshire, WF12 7RD	Industrial Repairs and Servicing	Repair and Servicing

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	2

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Company	Address	LPG	Status
J	296m N	SHELL	Leeds Road, Shaw Cross, Batley, West Yorkshire, WF12 7HP	No	Open
10	307m N	OBSOLETE	639, Leeds Road, Shaw Cross, Dewsbury, West Yorkshire, WF12 7HP	Not Applicable	Obsolete

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m	0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	4

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Address	Details	
F	123m S	Nobia UK Ltd, Churwell Vale, Shaw Cross Business Park, Dewsbury, WF12 7RB	Process: Timber Manufacture Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
I	260m SW	Parker Hannifin UK Ltd, Churwell Vale, Shaw Cross Business Park, Shaw Cross, Dewsbury, WF12 7RD	Process: Coating Processes Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
8	261m NW	Mercury Motors, 639 Leeds Rd, Shawcross, Dewsbury, WF12 7HP	Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
J	307m N	Shaw Cross Service Station, Leeds Road, Shaw Cross, Dewsbury, WF12 7HD	Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	4

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Address	Details	
K	328m E	OWL LANE CSO, OWL LANE, SHAW CROSS, DEWSBURY, WEST YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: WADC1215 Permit Version: 2 Receiving Water: TRIBUTARY OF THE RIVER CALDER	Status: SURRENDERED UNDER EPR 2010 Issue date: 14/04/2009 Effective Date: 14/04/2009 Revocation Date: 09/01/2017
K	328m E	OWL LANE CSO, OWL LANE, SHAW CROSS, DEWSBURY, WEST YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: WADC1215 Permit Version: 1 Receiving Water: TRIBUTARY OF THE RIVER CALDER	Status: TRANSFERRED FROM WATER ACT 1989 Issue date: 18/09/1989 Effective Date: 18/09/1989 Revocation Date: 13/04/2009
11	411m E	CHIDSWELL, OWL LANE, DEWSBURY, YORKSHIRE, WF12 7SY	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE Permit Number: EPRXB3597AT Permit Version: 1 Receiving Water: TRIB OF RIVER CALDER	Status: NEW ISSUED UNDER EPR 2010 Issue date: 27/03/2023 Effective Date: 27/03/2023 Revocation Date: -
12	435m SE	SHAW CROSS LANDFILL SITE, OWL LANE, OSSETT, DEWSBURY	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT Permit Number: WRA6708 Permit Version: 1 Receiving Water: CHICKENLEY BECK	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 30/07/1992 Effective Date: 30/07/1992 Revocation Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	**0**

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	**0**

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m	2

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Details	
A	36m E	Incident Date: 22/10/2001 Incident Identification: 38218 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
9	278m SE	Incident Date: 08/05/2002 Incident Identification: 77257 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

Records within 500m	0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer

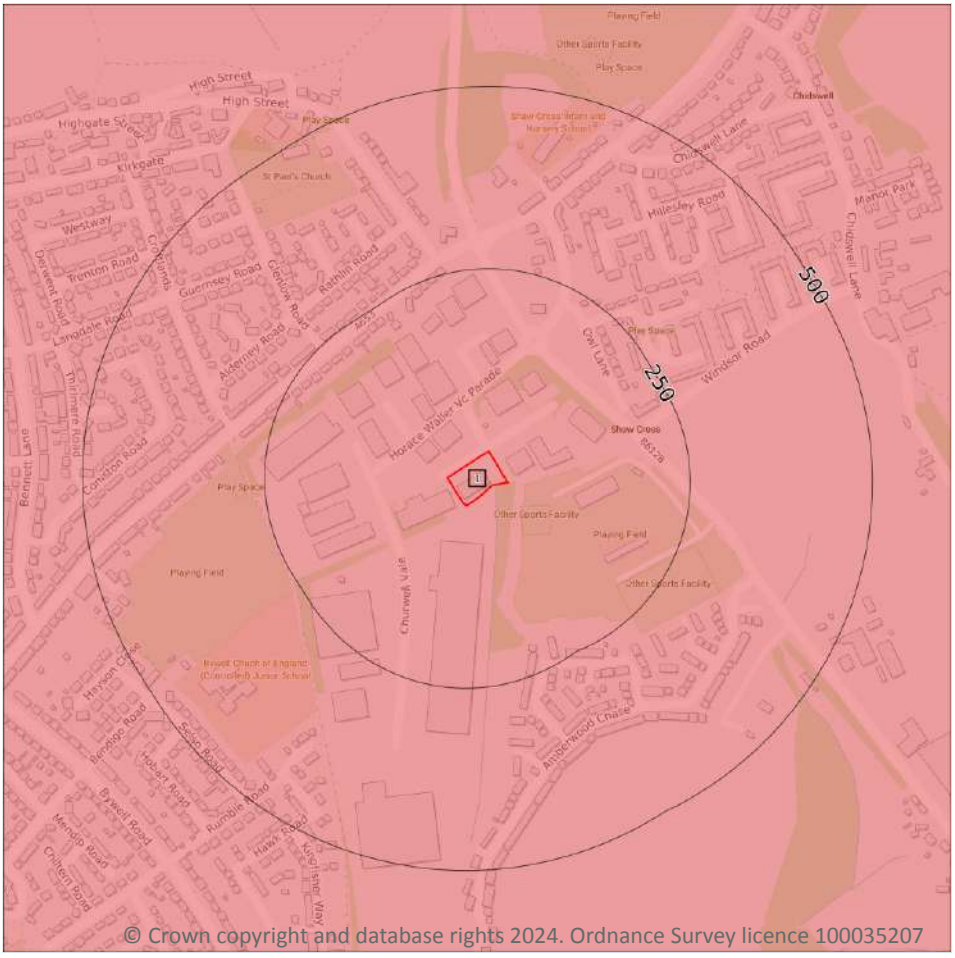
5.1 Superficial aquifer

Records within 500m	0

Aquifer status of groundwater held within superficial geology.

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m	1

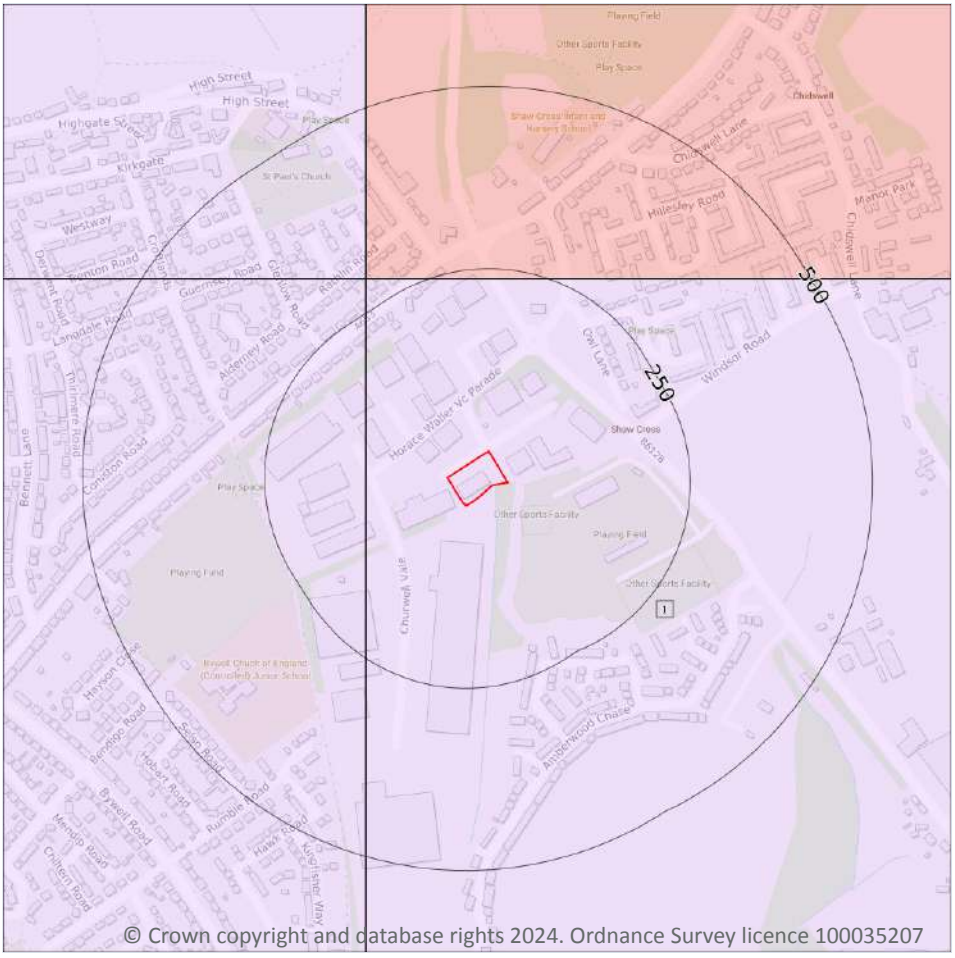
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 44 >**

ID	Location	Designation	Description
1	On site	Secondary A	**Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers**

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	1

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 45 >**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	**Summary Classification: Secondary bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year**	**Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures**

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

Records on site	0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk ↗.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones

Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m	14

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 47 >**

ID	Location	Details	
-	1065m NW	Status: Historical Licence No: 2/27/13/143 Details: General use relating to Secondary Category (High Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: WHARFEDALE FINANCE COMPANY Easting: 425500 Northing: 423600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 27/09/1977 Expiry Date: - Issue No: 100 Version Start Date: 21/05/1990 Version End Date: -
-	1065m NW	Status: Historical Licence No: 2/27/13/143 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: WHARFEDALE FINANCE COMPANY Easting: 425500 Northing: 423600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 27/09/1977 Expiry Date: - Issue No: 100 Version Start Date: 21/05/1990 Version End Date: -
-	1065m NW	Status: Historical Licence No: 2/27/13/143 Details: General use relating to Secondary Category (High Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - BATLEY Data Type: Point Name: WHARFEDALE FINANCE COMPANY Easting: 425500 Northing: 423600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 27/09/1977 Expiry Date: - Issue No: 100 Version Start Date: 21/05/1990 Version End Date: -
-	1065m NW	Status: Historical Licence No: 2/27/13/143 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - BATLEY Data Type: Point Name: WHARFEDALE FINANCE CO Easting: 425500 Northing: 423600	Annual Volume (m^3): 227000 Max Daily Volume (m^3): 621.92 Original Application No: - Original Start Date: 27/09/1977 Expiry Date: - Issue No: 100 Version Start Date: 21/05/1990 Version End Date: -

ID	Location	Details	
-	1795m SW	Status: Active Licence No: 2/27/13/169 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - DEWSBURY Data Type: Point Name: THOMAS CHADWICK & SONS LTD Easting: 425000 Northing: 421300	Annual Volume (m^3): 140000 Max Daily Volume (m^3): 576 Original Application No: 6451 Original Start Date: 26/01/1993 Expiry Date: - Issue No: 100 Version Start Date: 25/04/1997 Version End Date: -
-	1795m SW	Status: Historical Licence No: 2/27/13/169 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: THOMAS CHADWICK & SONS LIMITED Easting: 425000 Northing: 421300	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 26/01/1993 Expiry Date: - Issue No: 100 Version Start Date: 25/04/1997 Version End Date: -
-	1816m W	Status: Historical Licence No: 2/27/13/046 Details: General use relating to Secondary Category (High Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: JOSHUA ELLIS & COMPANY LIMITED Easting: 424300 Northing: 422600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/10/1997 Version End Date: -
-	1816m W	Status: Historical Licence No: 2/27/13/046 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: JOSHUA ELLIS & COMPANY LIMITED Easting: 424300 Northing: 422600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/10/1997 Version End Date: -

ID	Location	Details	
-	1816m W	Status: Historical Licence No: 2/27/13/046 Details: Process water Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: JOSHUA ELLIS & COMPANY LIMITED Easting: 424300 Northing: 422600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/10/1997 Version End Date: -
-	1816m W	Status: Historical Licence No: 2/27/13/046 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - DEWSBURY Data Type: Point Name: JOSHUA ELLIS & COMPANY LIMITED Easting: 424300 Northing: 422600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/10/1997 Version End Date: -
-	1816m W	Status: Historical Licence No: 2/27/13/046 Details: General use relating to Secondary Category (High Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - DEWSBURY Data Type: Point Name: JOSHUA ELLIS & COMPANY LIMITED Easting: 424300 Northing: 422600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/10/1997 Version End Date: -
-	1816m W	Status: Historical Licence No: 2/27/13/046 Details: Process water Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - DEWSBURY Data Type: Point Name: JOSHUA ELLIS & COMPANY LIMITED Easting: 424300 Northing: 422600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/10/1997 Version End Date: -
-	1935m SW	Status: Active Licence No: 2/27/13/169 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - DEWSBURY Data Type: Point Name: THOMAS CHADWICK & SONS LTD Easting: 424900 Northing: 421200	Annual Volume (m^3): 140000 Max Daily Volume (m^3): 576 Original Application No: 6451 Original Start Date: 26/01/1993 Expiry Date: - Issue No: 100 Version Start Date: 25/04/1997 Version End Date: -

ID	Location	Details	
-	1935m SW	Status: Historical Licence No: 2/27/13/169 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: THOMAS CHADWICK & SONS LIMITED Easting: 424900 Northing: 421200	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 26/01/1993 Expiry Date: - Issue No: 100 Version Start Date: 25/04/1997 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m	**1**

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 47 >**

ID	Location	Details	
-	1508m NW	Status: Historical Licence No: 2/27/13/206 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: BATLEY BECK Data Type: Point Name: CULLINGWORTH SUMMERS & CO LTD Easting: 424810 Northing: 423490	Annual Volume (m^3): 11500 Max Daily Volume (m^3): 60 Original Application No: - Original Start Date: 21/08/2001 Expiry Date: 31/03/2015 Issue No: 2 Version Start Date: 23/05/2005 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	**0**

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

Records within 500m	0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology

Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	1

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 53 >**

ID	Location	Type of water feature	Ground level	Permanence	Name
A	5m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	1

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 53 >**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 53 >**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**River**	**Calder from River Colne to River Chald**	**GB104027062631**	**Calder Lower**	**Aire and Calder**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	1

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 53 >**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	731m SE	River	Calder from River Colne to River Chald	GB104027062631 ↗	Moderate	Fail	Moderate	2019

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	**1**

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 53 >**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
2	**On site**	**Aire & Calder Carb Limestone / Millstone Grit / Coal Measures.**	**GB40402G700400 ↗**	**Poor**	**Poor**	**Good**	**2019**

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding

Site Outline

Search buffers in metres (m)

River and coastal flooding:

- High
- Medium
- Low
- Very Low
- Historical Flood Events
- Areas Used for Flood Storage
- Areas Benefiting from Flood Defences
- Flood Defences

7.1 Risk of flooding from rivers and the sea

Records within 50m	1

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

Features are displayed on the River and coastal flooding map on **page 56 >**

Distance	Flood risk category
On site	**N/A**
0 - 50m	High

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	**0**

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	**0**

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	**0**

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	**0**

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones

Site Outline

Search buffers in metres (m)

Flood zone 2

Flood zone 3

7.6 Flood Zone 2

Records within 50m	1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 56 >**

Location	Type
26m SE	Zone 2 - (Fluvial /Tidal Models)

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m	1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on **page 56 >**

Location	Type
26m SE	Zone 3 - (Fluvial Models)

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding

Site Outline

Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site	**1 in 30 year, 0.1m - 0.3m**
Highest risk within 50m	**1 in 30 year, 0.3m - 1.0m**

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 60 >**

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.1m and 0.3m
1 in 250 year	Between 0.1m and 0.3m
1 in 100 year	Between 0.1m and 0.3m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding

9.1 Groundwater flooding

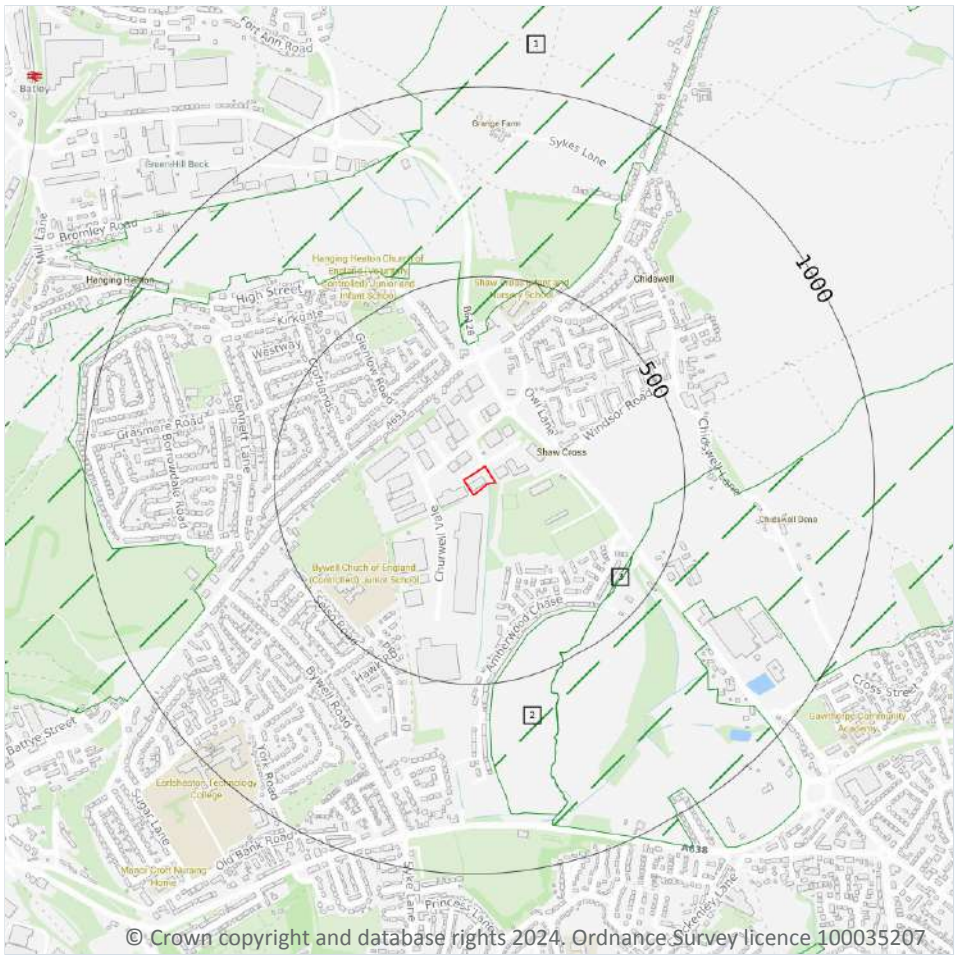
Highest risk on site	**Negligible**
Highest risk within 50m	**Negligible**

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 62 >**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Designated Ancient Woodland

Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	0

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	0

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m	4

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 63 >**

ID	Location	Name	Woodland Type
-	1602m E	Dogloitch Wood	Ancient Replanted Woodland
-	1664m NE	Dum Wood	Ancient Replanted Woodland
-	1773m N	Soothill Wood	Ancient & Semi-Natural Woodland
-	1903m NE	Scargill Wood	Ancient & Semi-Natural Woodland

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m	0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m	0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m	6

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 63 >**

ID	Location	Name	Local Authority name
1	324m N	South and West Yorkshire	Kirklees
2	378m SE	South and West Yorkshire	Kirklees
3	408m SE	South and West Yorkshire	Kirklees
4	409m SE	South and West Yorkshire	Wakefield
-	1461m SE	South and West Yorkshire	Kirklees
-	1816m S	South and West Yorkshire	Kirklees

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m	0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

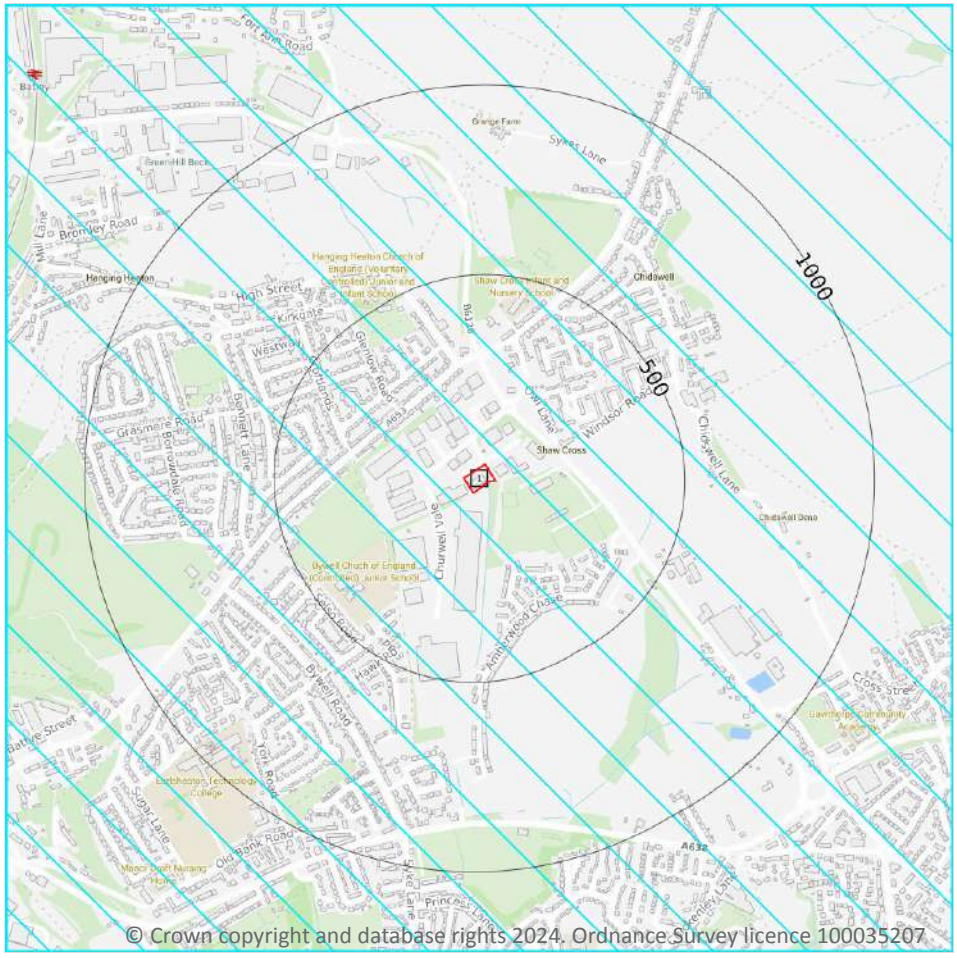
10.16 Nitrate Vulnerable Zones

Records within 2000m	0

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units



10.17 SSSI Impact Risk Zones

Records on site	1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 68 >**

ID	Location	Type of developments requiring consultation
1	On site	**Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 4000m². Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.**

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	0

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m	0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m	0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m	0

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m	0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

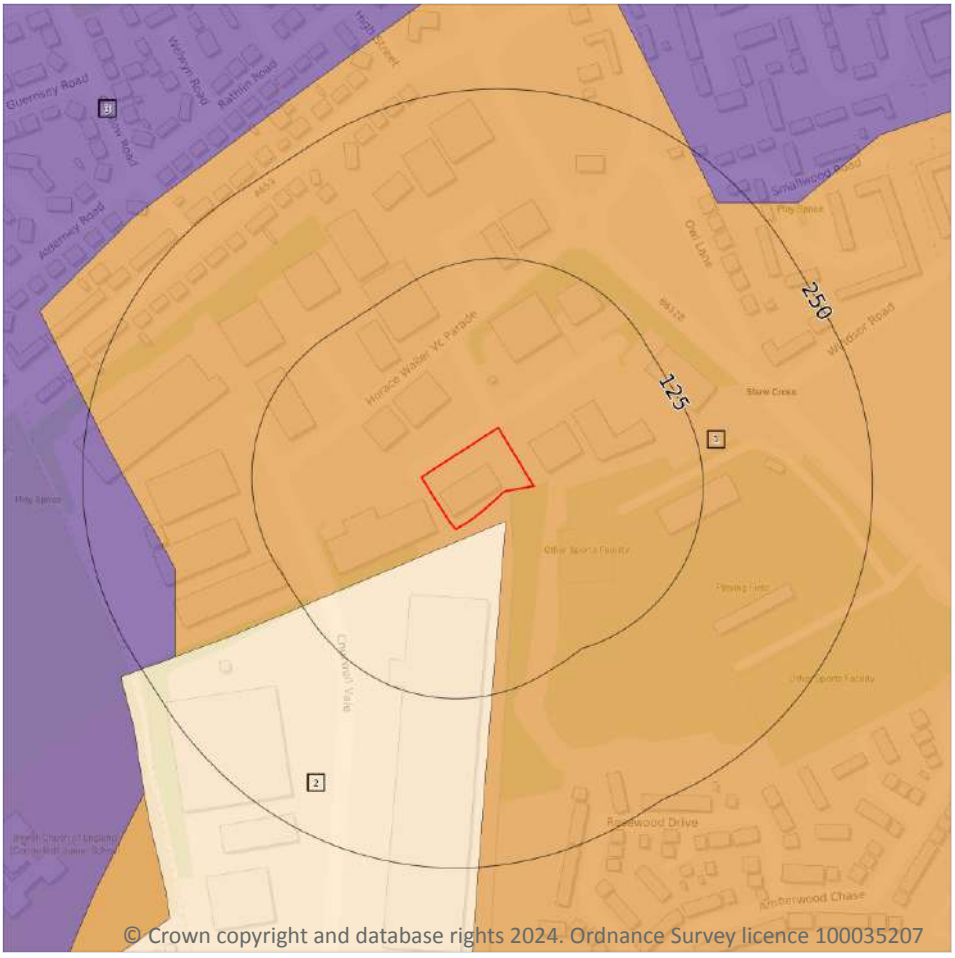
11.7 Registered Parks and Gardens

Records within 250m	0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



12.1 Agricultural Land Classification

Records within 250m	3

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 72 >**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

ID	Location	Classification	Description
2	9m S	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.
3	194m W	Urban	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m	0

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

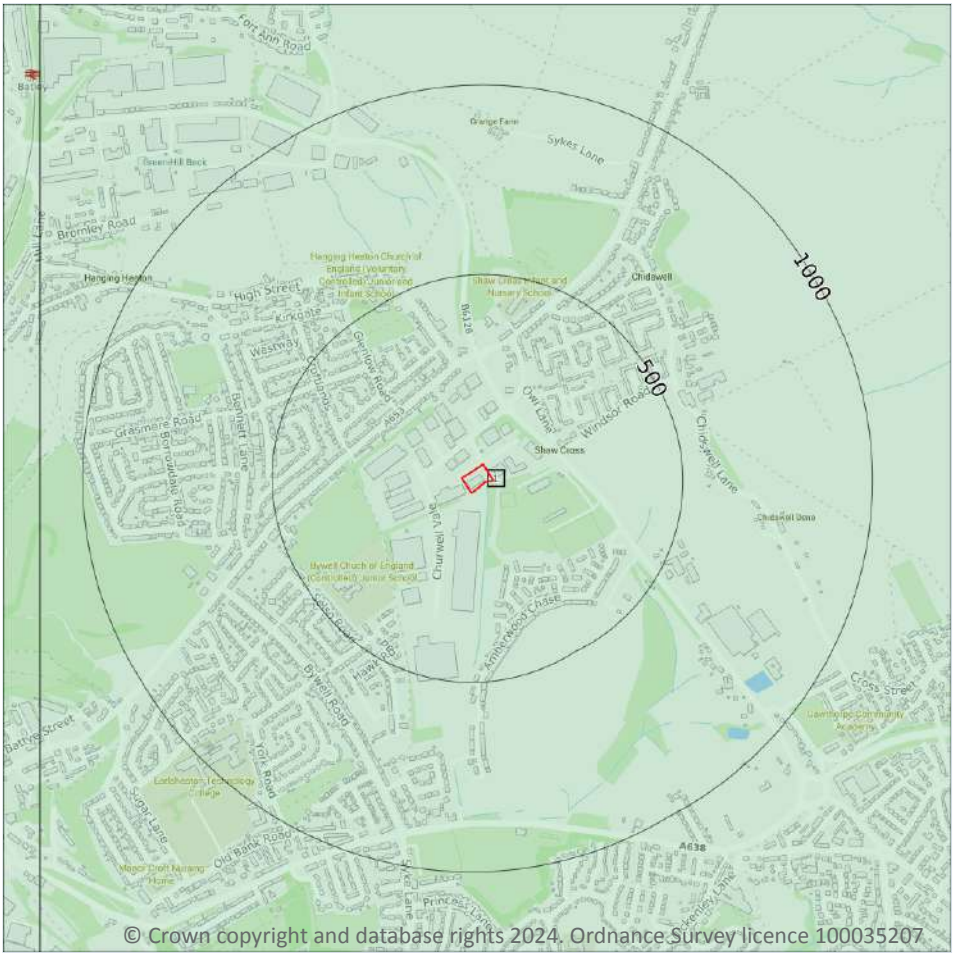
13.4 Limestone Pavement Orders

Records within 250m	0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability



Site Outline

Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m	1

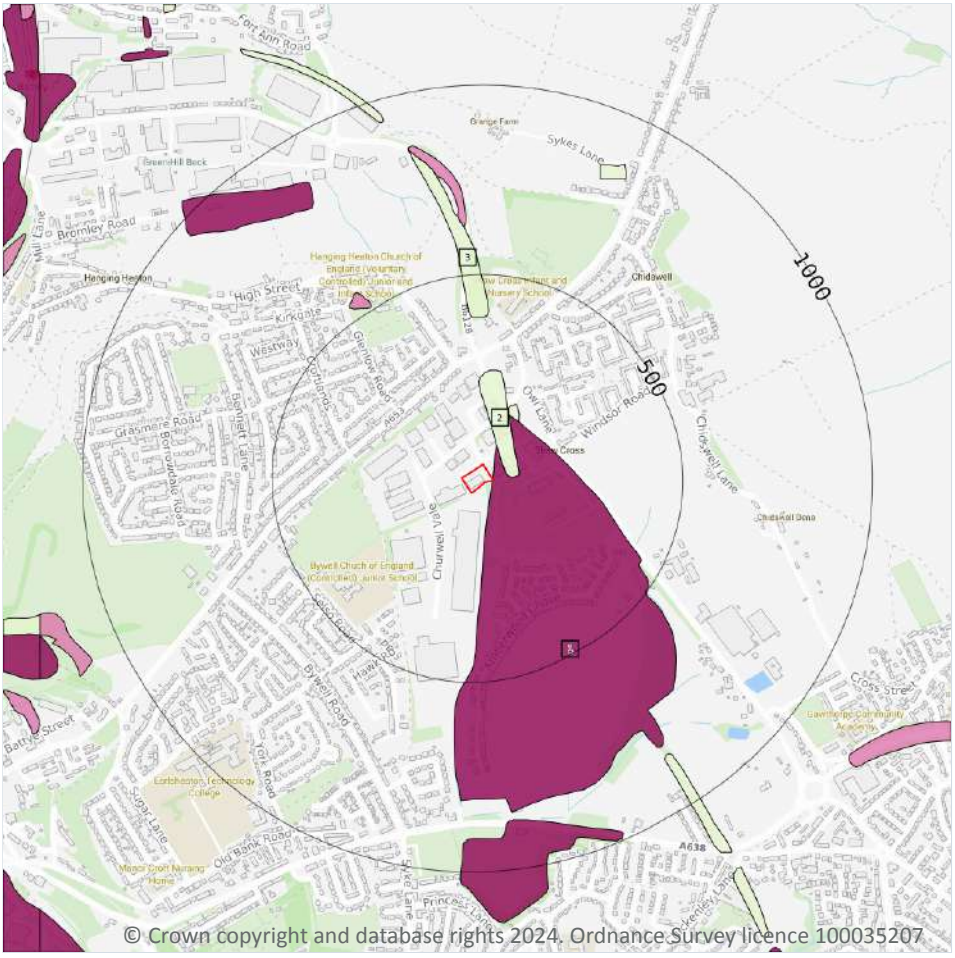
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 76 >**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**SE22SE**

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground



14.2 Artificial and made ground (10k)

Records within 500m **3**

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 77 >**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**MGR-ARTDP**	**Made Ground (Undivided)**	**Artificial Deposit**
2	40m E	WMGR-ARTDP	Infilled Ground	Artificial Deposit
3	387m N	WMGR-ARTDP	Infilled Ground	Artificial Deposit

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m	0

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

This data is sourced from the British Geological Survey.

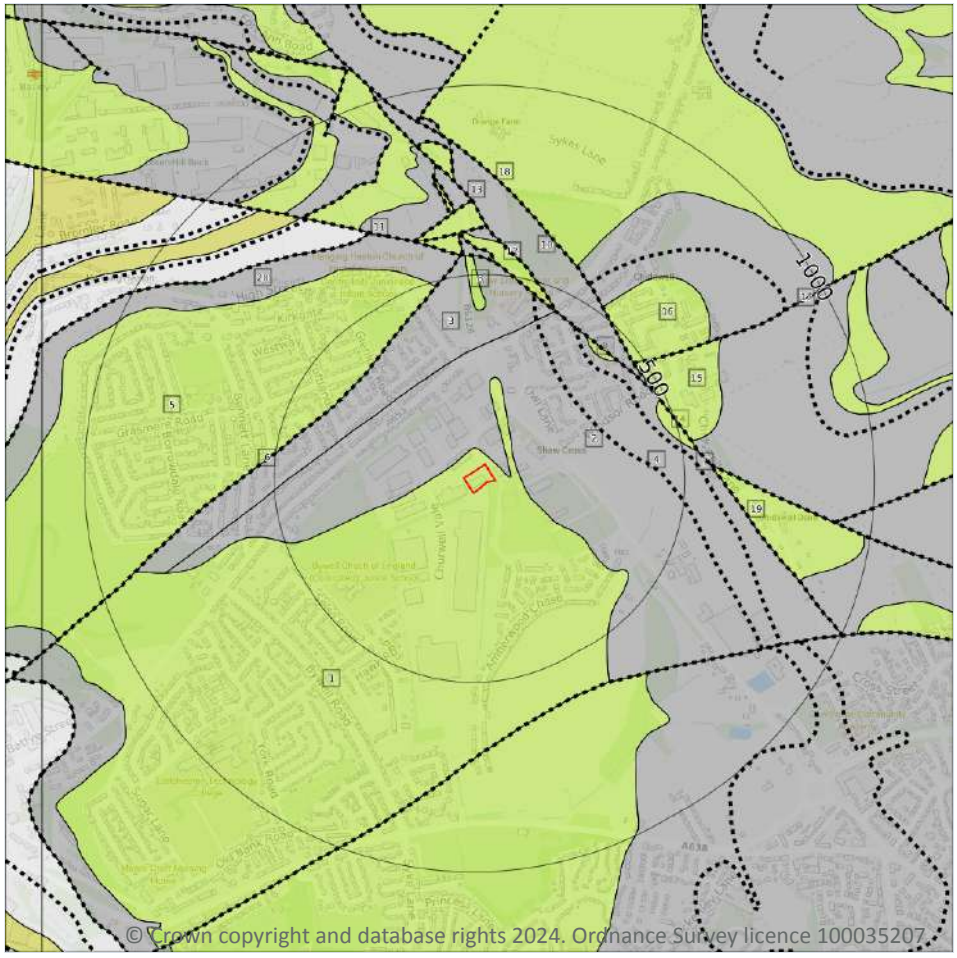
14.4 Landslip (10k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m **12**

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 79 >**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**TR-SDST**	**Thornhill Rock - Sandstone**	**Duckmantian Sub-age**
2	20m NE	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
3	273m NW	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age

ID	Location	LEX Code	Description	Rock age
5	377m NW	TR-SDST	Thornhill Rock - Sandstone	Duckmantian Sub-age
8	407m N	TR-SDST	Thornhill Rock - Sandstone	Duckmantian Sub-age
9	411m NE	HMR-SDST	Haigh Moor Rock - Sandstone	Duckmantian Sub-age
10	431m NE	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age
12	444m NE	HRR-SDST	Horbury Rock - Sandstone	Duckmantian Sub-age
14	461m E	HMR-SDST	Haigh Moor Rock - Sandstone	Duckmantian Sub-age
15	472m NE	HRR-SDST	Horbury Rock - Sandstone	Duckmantian Sub-age
16	472m NE	HRR-SDST	Horbury Rock - Sandstone	Duckmantian Sub-age
20	486m N	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	**8**

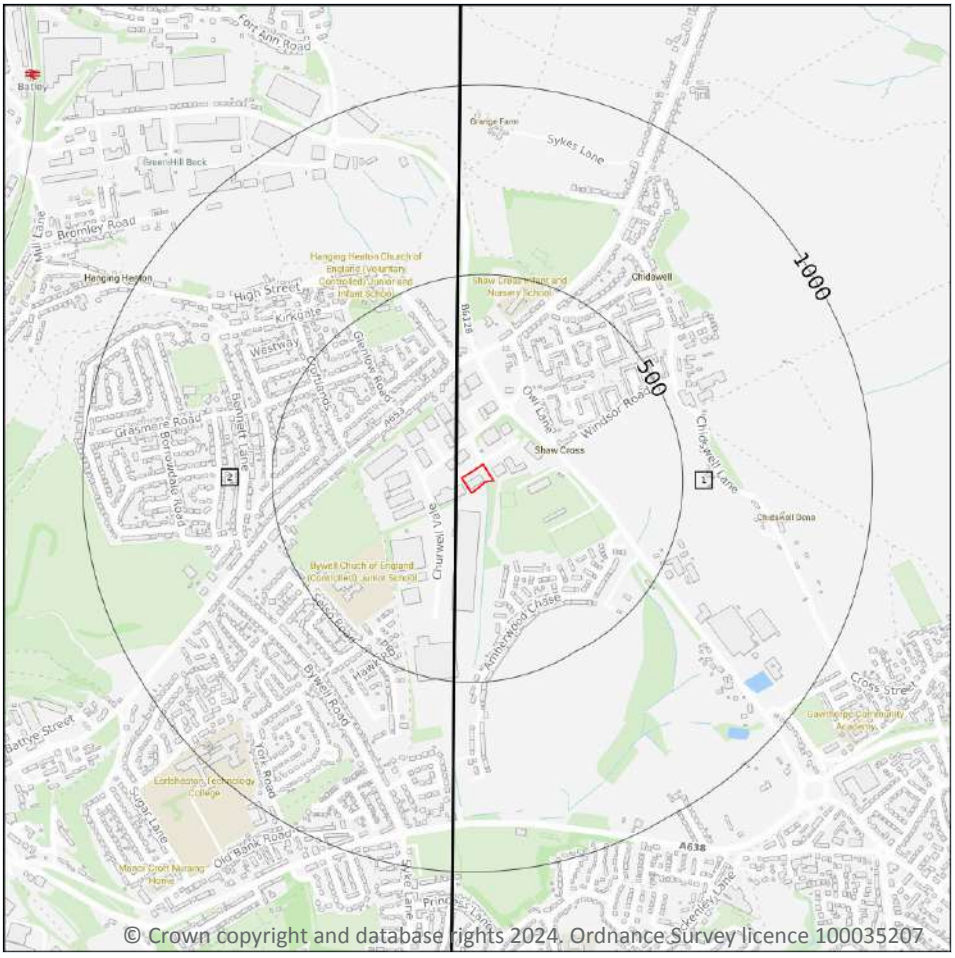
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 79 >**

ID	Location	Category	Description
4	288m NE	ROCK	Coal seam, inferred
6	377m NW	FAULT	Normal fault, inferred
7	385m NE	ROCK	Coal seam, inferred
11	431m NE	FAULT	Normal fault, inferred
13	444m NE	FAULT	Normal fault, inferred
17	472m NE	FAULT	Normal fault, inferred
18	472m NE	FAULT	Normal fault, inferred
19	482m NE	FAULT	Normal fault, inferred

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



15.1 50k Availability

Records within 500m	2

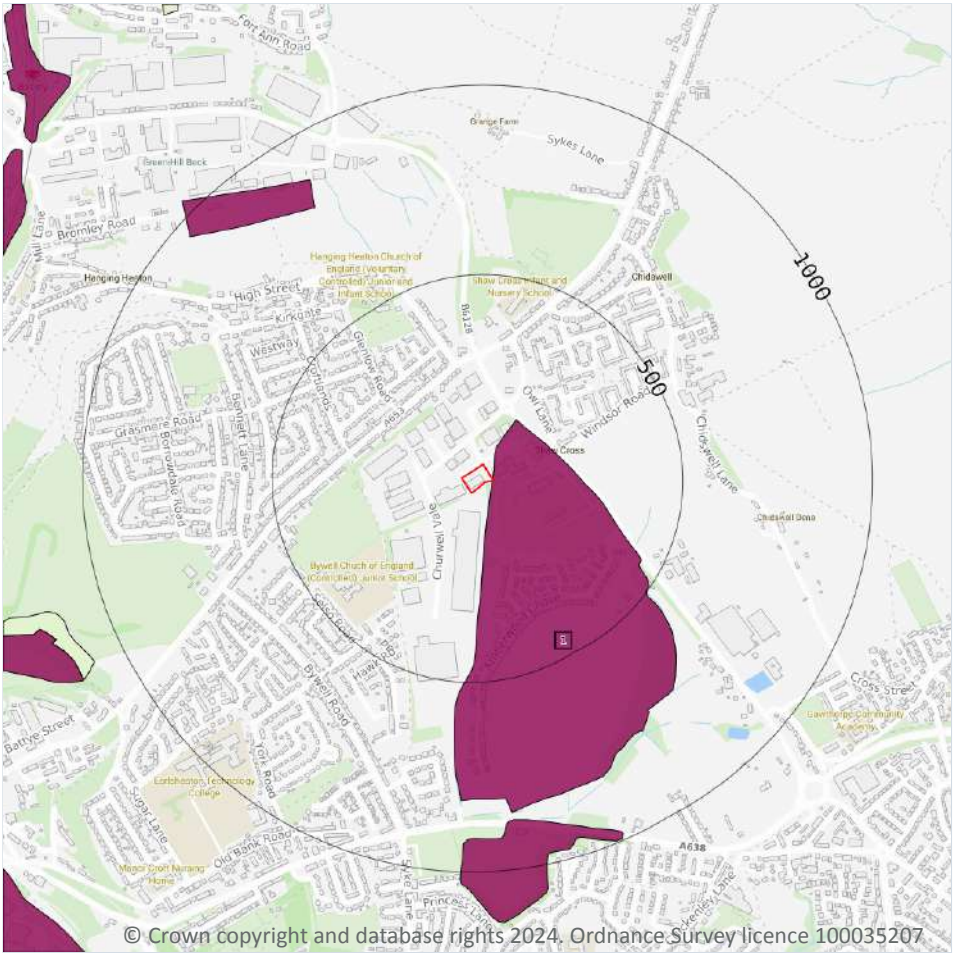
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 81 >**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**EW078_wakefield_v4**
2	15m W	Full	Full	Full	Full	EW077_huddersfield_v4

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Artificial and made ground



Site Outline

Search buffers in metres (m)

- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m	1

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 82 >**

ID	Location	LEX Code	Description	Rock description
1	On site	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m	1

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**Very High**	**Low**

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial

15.4 Superficial geology (50k)

Records within 500m	0

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

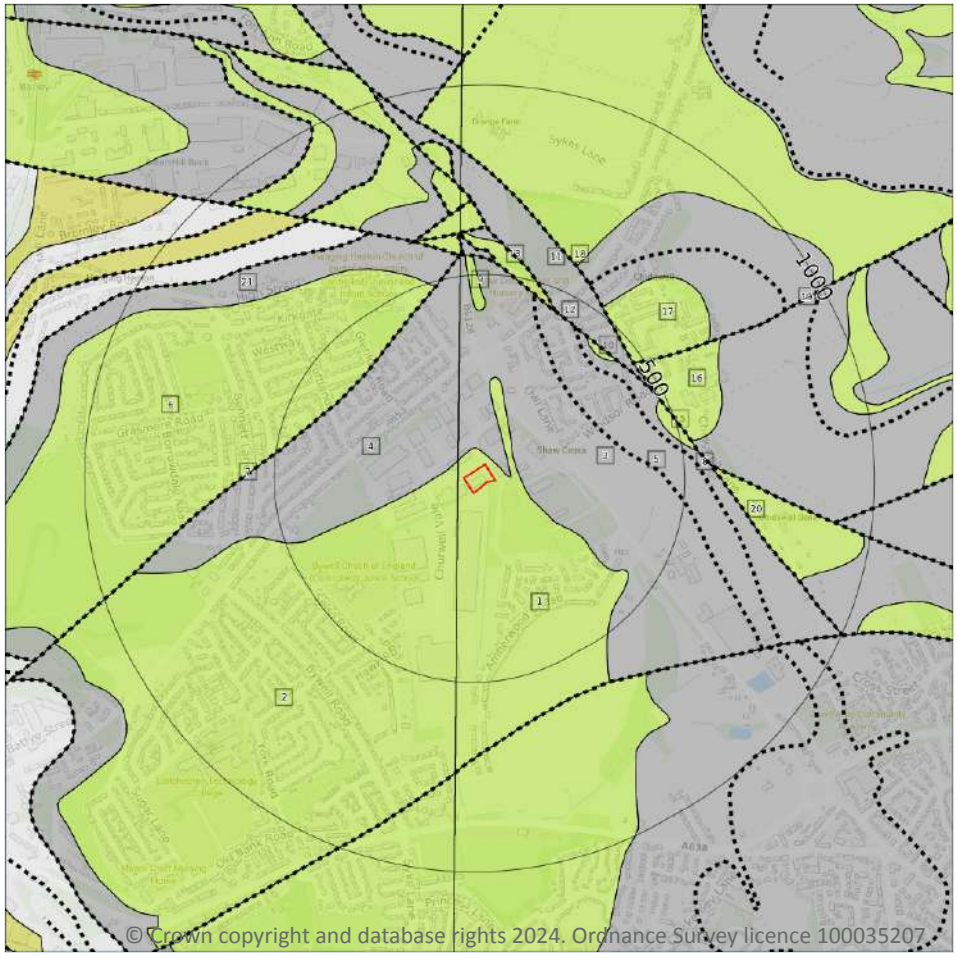
15.7 Landslip permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m	13

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 85 >**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**TR-SDST**	**THORNHILL ROCK - SANDSTONE**	**WESTPHALIAN**
2	15m W	TR-SDST	THORNHILL ROCK - SANDSTONE	WESTPHALIAN
3	20m NE	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

ID	Location	LEX Code	Description	Rock age
4	45m NW	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
6	377m NW	TR-SDST	THORNHILL ROCK - SANDSTONE	WESTPHALIAN
9	406m N	TR-SDST	THORNHILL ROCK - SANDSTONE	WESTPHALIAN
10	411m NE	HMR-SDST	HAIGH MOOR ROCK - SANDSTONE	WESTPHALIAN
11	431m NE	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
13	444m NE	HRR-SDST	HORBURY ROCK - SANDSTONE	WESTPHALIAN
15	461m E	HMR-SDST	HAIGH MOOR ROCK - SANDSTONE	WESTPHALIAN
16	472m NE	HRR-SDST	HORBURY ROCK - SANDSTONE	WESTPHALIAN
17	472m NE	PMCM-SDST	PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
21	486m N	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m **2**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Fracture**	**High**	**Moderate**
20m NE	Fracture	Moderate	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m **8**

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 85 >**

ID	Location	Category	Description
5	288m NE	ROCK	Coal seam, inferred
7	377m NW	FAULT	Fault, inferred
8	385m NE	ROCK	Coal seam, inferred
12	431m NE	FAULT	Fault, inferred, displacement unknown
14	444m NE	FAULT	Fault, inferred
18	472m NE	FAULT	Fault, inferred
19	472m NE	FAULT	Fault, inferred
20	482m NE	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.

16 Boreholes

Site Outline

Search buffers in metres (m)

Confidential

0 - 10m

10 - 30m

30m+

Unknown

16.1 BGS Boreholes

Records within 250m	33

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

Features are displayed on the Boreholes map on **page 88 >**

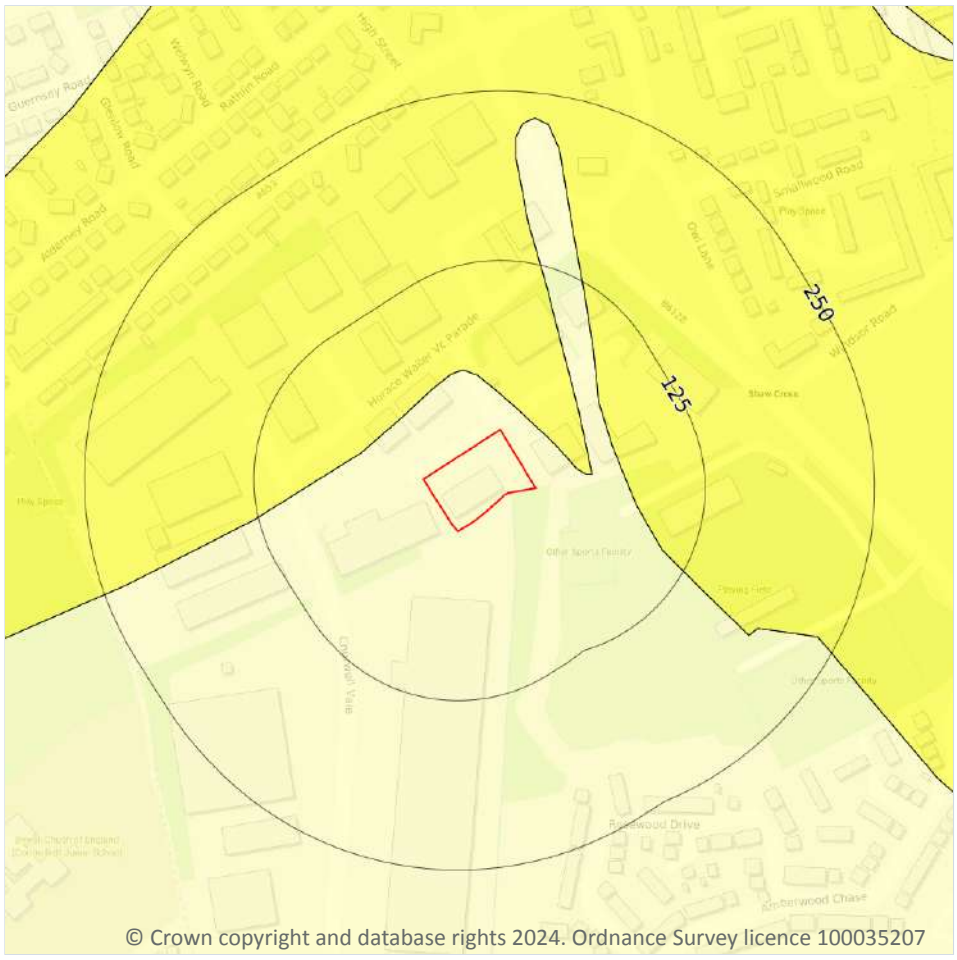
ID	Location	Grid reference	Name	Length	Confidential	Web link
A	40m SE	426220 422690	OWL LANE DEWSBURY 3	-	Y	N/A
A	50m E	426240 422700	OWL LANE DEWSBURY 2	-	Y	N/A
A	62m SE	426230 422670	OWL LANE DEWSBURY 4	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	76m E	426270 422720	OWL LANE DEWSBURY 1	-	Y	N/A
2	77m SE	426260 422680	OWL LANE DEWSBURY 14	-	Y	N/A
3	93m SE	426240 422640	OWL LANE DEWSBURY 5	-	Y	N/A
B	104m SE	426270 422650	OWL LANE DEWSBURY 13	-	Y	N/A
B	125m SE	426280 422630	OWL LANE DEWSBURY 12	-	Y	N/A
4	127m E	426320 422700	OWL LANE DEWSBURY 27	-	Y	N/A
C	129m SE	426260 422610	OWL LANE DEWSBURY 6	-	Y	N/A
B	131m SE	426310 422660	OWL LANE DEWSBURY 16	-	Y	N/A
B	133m SE	426300 422640	OWL LANE DEWSBURY 15	-	Y	N/A
C	151m SE	426270 422590	OWL LANE DEWSBURY 7	-	Y	N/A
C	154m SE	426290 422600	OWL LANE DEWSBURY 11	-	Y	N/A
D	156m E	426350 422710	OWL LANE DEWSBURY 26	-	Y	N/A
C	160m SE	426300 422600	SHAW CROSS COLLIERY	-1.0	N	105231 ↗
E	164m E	426350 422670	OWL LANE DEWSBURY 17	-	Y	N/A
F	169m SE	426330 422620	OWL LANE DEWSBURY 21	-	Y	N/A
F	172m SE	426340 422630	SHAW CROSS COLLIERY CHIDSWELL	379.0	N	104727 ↗
E	173m E	426360 422670	OWL LANE DEWSBURY 18	-	Y	N/A
D	176m E	426370 422720	OWL LANE DEWSBURY 25	-	Y	N/A
F	180m SE	426350 422630	OWL LANE DEWSBURY 22	-	Y	N/A
5	182m SE	426280 422560	OWL LANE DEWSBURY 8	-	Y	N/A
C	182m SE	426310 422580	OWL LANE DEWSBURY 9	-	Y	N/A
C	188m SE	426330 422590	OWL LANE DEWSBURY 10	-	Y	N/A
F	193m E	426370 422640	OWL LANE DEWSBURY 23	-	Y	N/A
G	198m E	426390 422690	OWL LANE DEWSBURY 19	-	Y	N/A
6	198m E	426380 422790	BATLEY WEST END COLLIERY	164.92	N	105233 ↗
G	208m E	426400 422690	OWL LANE DEWSBURY 20	-	Y	N/A
7	214m E	426400 422660	OWL LANE DEWSBURY 24	-	Y	N/A
H	227m N	426190 422990	GRANGE RD IMPRO BATLEY 5	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
8	245m SE	426300 422500	SHAW CROSS COLLIERY	-1.0	N	105230 ↗
H	248m N	426183 423011	OWL LANE, SAWCROSS BUSINESS PARK DEWSBURY 2	4.0	N	18932432 ↗

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m	2

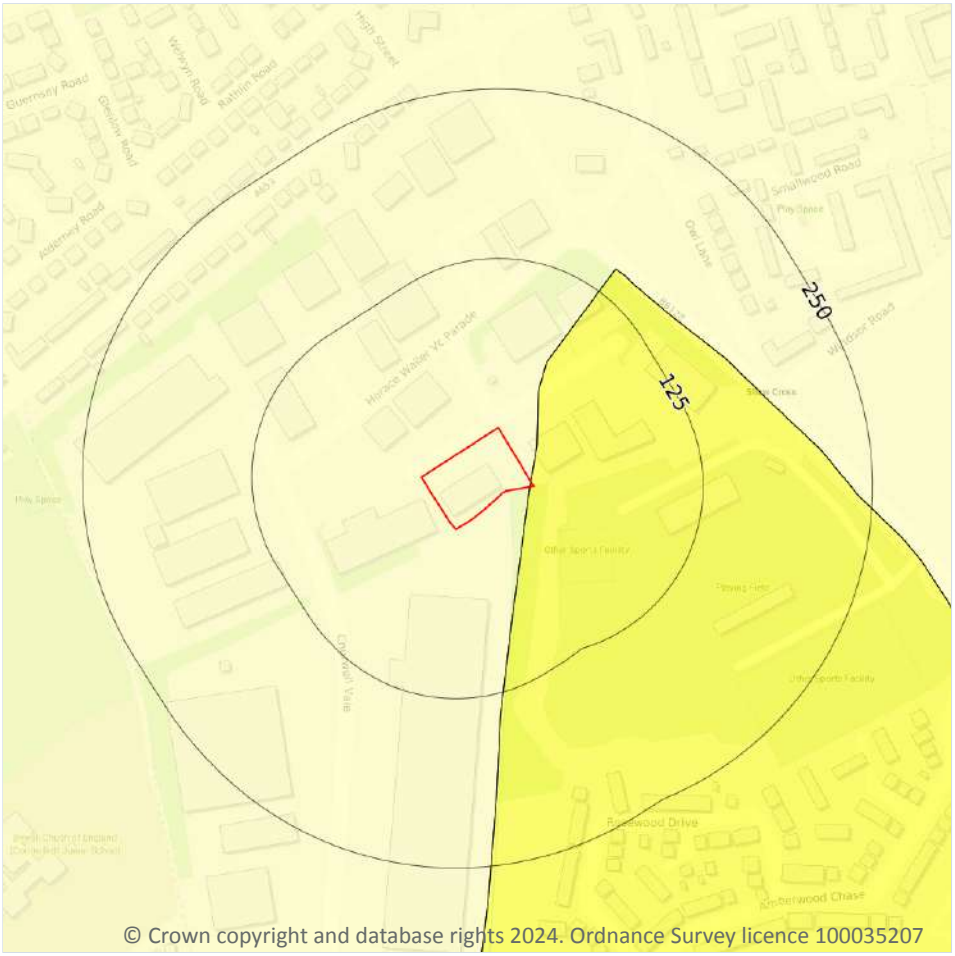
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 91 >**

Location	Hazard rating	Details
On site	**Negligible**	**Ground conditions predominantly non-plastic.**
20m NE	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.2 Running sands

Records within 50m	2

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

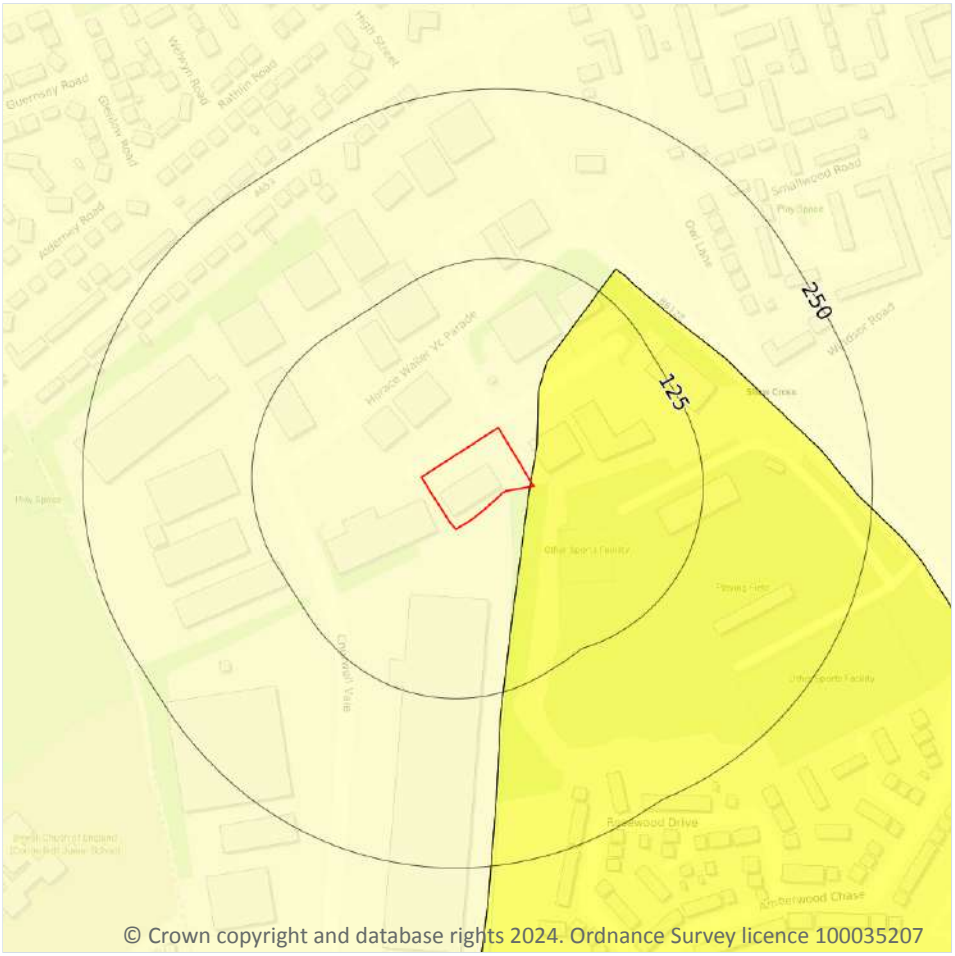
Features are displayed on the Natural ground subsidence - Running sands map on **page 92 >**

Location	Hazard rating	Details
On site	**Negligible**	**Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.**

Location	Hazard rating	Details
On site	**Very low**	**Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m	2

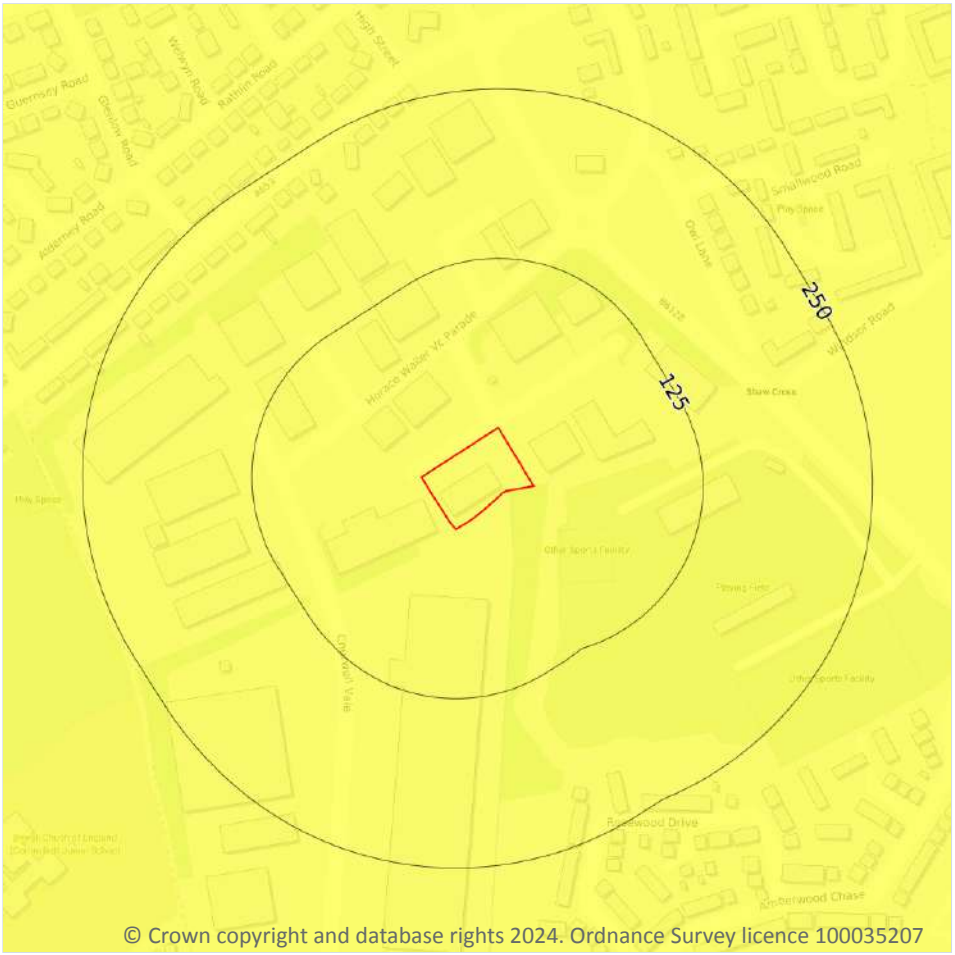
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 94 >**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**
On site	**Very low**	**Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



17.4 Collapsible deposits

Records within 50m	1

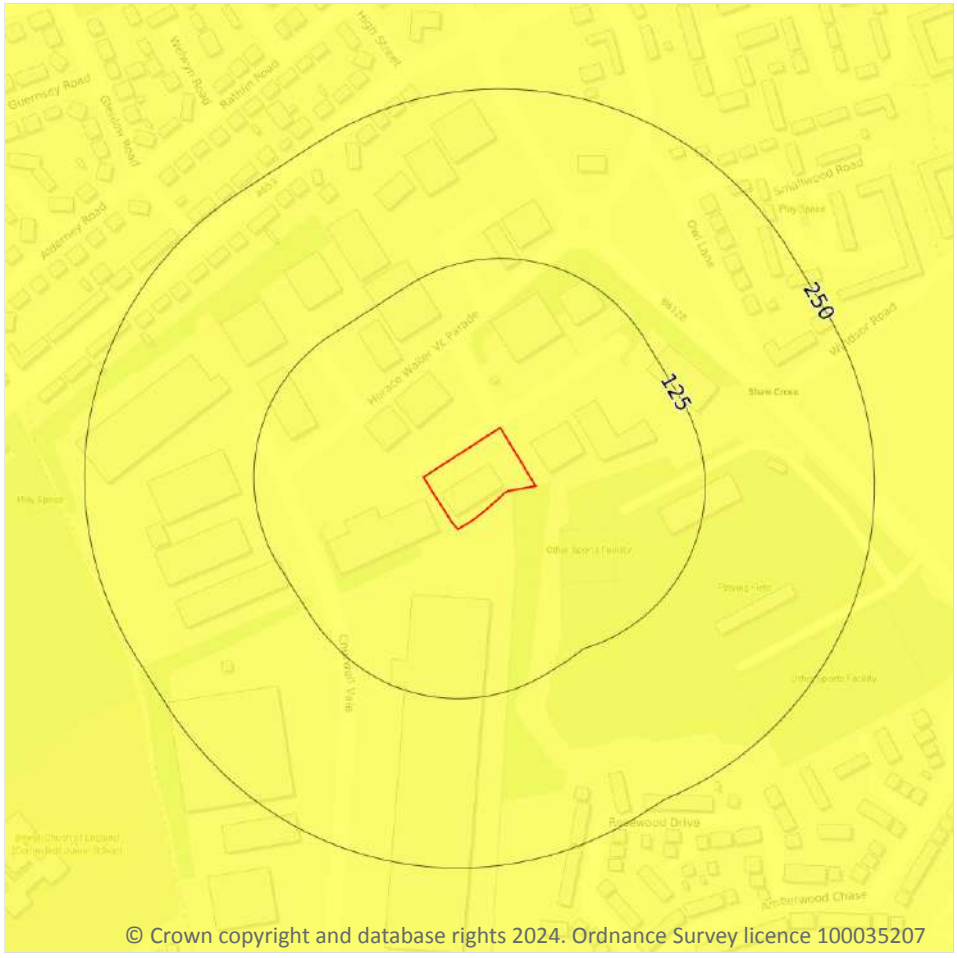
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 96 >**

Location	Hazard rating	Details
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.5 Landslides

Records within 50m	1

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 97 >**

Location	Hazard rating	Details
On site	**Very low**	**Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks

Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.6 Ground dissolution of soluble rocks

Records within 50m	1

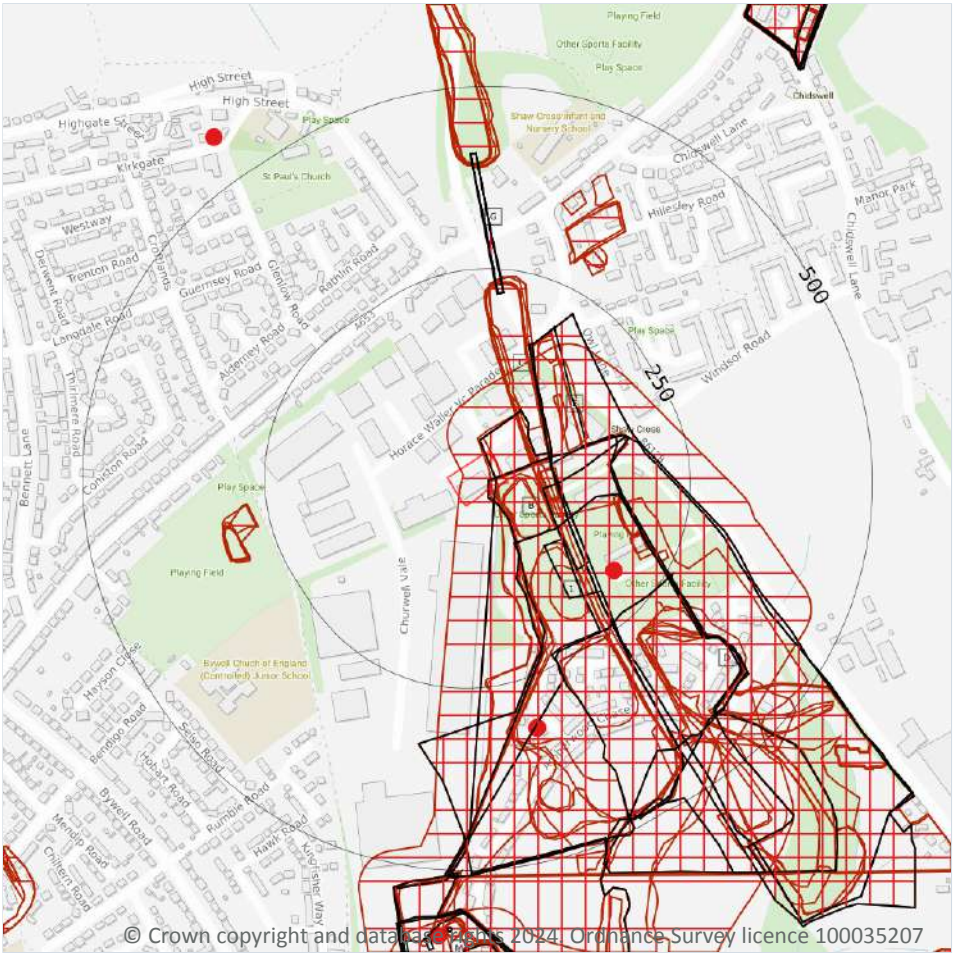
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 98 >**

Location	Hazard rating	Details
On site	**Negligible**	**Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.**

This data is sourced from the British Geological Survey.

18 Mining and ground workings



Site Outline

Search buffers in metres (m)

BritPits

Surface ground workings

Underground workings

Underground mining extents

Historical mineral planning areas

TCA non-coal mining

Non Coal Mining

Sporadic underground mining of restricted extent possible

Localised small scale underground mining possible

Small scale mining possible

Underground mining known or likely within or in close proximity

Underground mining known within or in very close proximity

18.1 BritPits

Records within 500m	2

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining and ground workings map on **page 100 >**

ID	Location	Details	Description
F	189m SE	Name: Shaw Cross Colliery Address: Shaw Cross, DEWSBURY, West Yorkshire Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
A	319m S	Name: Shaw Cross OCCS Address: Shaw Cross, DEWSBURY, West Yorkshire Commodity: Coal, Surface Mined Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m **42**

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining and ground workings map on **page 100 >**

ID	Location	Land Use	Year of mapping	Mapping scale
A	**On site**	**Disused Colliery**	**1971**	**1:10000**
A	**On site**	**Refuse Heap**	**1971**	**1:10000**
A	**On site**	**Refuse Heap**	**1957**	**1:10560**
A	**On site**	**Unspecified Disused Workings**	**1992**	**1:10000**
A	**On site**	**Refuse Heaps**	**1948**	**1:10560**
A	**On site**	**Colliery**	**1948**	**1:10560**
A	**On site**	**Unspecified Disused Tip**	**1980**	**1:10000**
A	**On site**	**Refuse Heap**	**1948**	**1:10560**
A	**On site**	**Colliery**	**1948**	**1:10560**
A	**On site**	**Colliery**	**1931**	**1:10560**
B	7m E	Unspecified Ground Workings	1931	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
B	10m E	Unspecified Heap	1931	1:10560
C	39m E	Cuttings	1948	1:10560
C	40m E	Cuttings	1931	1:10560
B	43m E	Cuttings	1905	1:10560
C	44m E	Cuttings	1931	1:10560
C	44m E	Cuttings	1948	1:10560
C	44m E	Cuttings	1905	1:10560
C	44m E	Cuttings	1892	1:10560
B	45m E	Cuttings	1892	1:10560
A	49m E	Colliery	1905	1:10560
C	52m E	Cuttings	1971	1:10000
C	52m E	Cuttings	1980	1:10000
C	61m NE	Cuttings	1957	1:10560
D	64m E	Colliery	1971	1:10000
A	80m SE	Colliery	1931	1:10560
E	94m E	Refuse Heap	1971	1:10000
E	94m NE	Refuse Heap	1980	1:10000
A	100m SE	Refuse Heap	1931	1:10560
A	108m SE	Refuse Heaps	1931	1:10560
1	131m SE	Refuse Heap	1905	1:10560
F	147m E	Unspecified Heap	1905	1:10560
C	148m NE	Unspecified Pit	1980	1:10000
F	153m E	Unspecified Heap	1948	1:10560
F	153m E	Unspecified Heap	1931	1:10560
F	155m E	Unspecified Heap	1948	1:10560
F	155m E	Unspecified Heap	1931	1:10560
F	184m E	Reservoir	1948	1:10560
F	185m E	Reservoir	1931	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
A	237m SE	Colliery	1892	1:10560
A	243m SE	Refuse Heap	1905	1:10560
A	248m SE	Refuse Heap	1892	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m	**29**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining and ground workings map on **page 100 >**

ID	Location	Land Use	Year of mapping	Mapping scale
A	**On site**	**Disused Colliery**	**1971**	**1:10000**
A	**On site**	**Colliery**	**1948**	**1:10560**
A	49m E	Colliery	1905	1:10560
D	64m E	Unspecified Mine	1957	1:10560
D	64m E	Unspecified Mine	1957	1:10560
D	64m E	Colliery	1971	1:10000
A	80m SE	Colliery	1931	1:10560
G	216m N	Tunnel	1948	1:10560
G	216m N	Tunnel	1905	1:10560
G	216m N	Tunnel	1892	1:10560
G	216m N	Tunnel	1931	1:10560
A	237m SE	Colliery	1892	1:10560
M	503m S	Colliery	1948	1:10560
M	554m S	Colliery	1892	1:10560
M	557m S	Unspecified Mine	1957	1:10560
M	557m S	Colliery	1905	1:10560
M	578m S	Unspecified Shafts	1948	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
M	593m S	Unspecified Shafts	1948	1:10560
P	674m NE	Unspecified Mine	1957	1:10560
P	675m NE	Colliery	1948	1:10560
P	676m NE	Colliery	1905	1:10560
P	676m NE	Colliery	1931	1:10560
P	689m NE	Colliery	1892	1:10560
-	753m NE	Unspecified Shaft	1931	1:10560
-	755m NE	Unspecified Shaft	1948	1:10560
-	917m S	Colliery	1892	1:10560
-	940m S	Unspecified Old Shaft	1948	1:10560
-	940m S	Unspecified Old Shafts	1905	1:10560
-	967m S	Unspecified Old Shafts	1905	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m	0

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	0

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site	0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.8 The Coal Authority non-coal mining

Records within 500m	0

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m	0

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m	0

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m	0

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.12 Coal mining

Records on site	1

Areas which could be affected by past, current or future coal mining.

Location	Details
On site	**The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.**

This data is sourced from the Coal Authority.

18.13 Brine areas

Records on site	0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.14 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.16 Clay mining

Records on site	0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Ground cavities and sinkholes

19.1 Natural cavities

Records within 500m	0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m	0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m	0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m	0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.

This data is sourced from Groundsure.

19.5 National karst database

Records within 500m	0

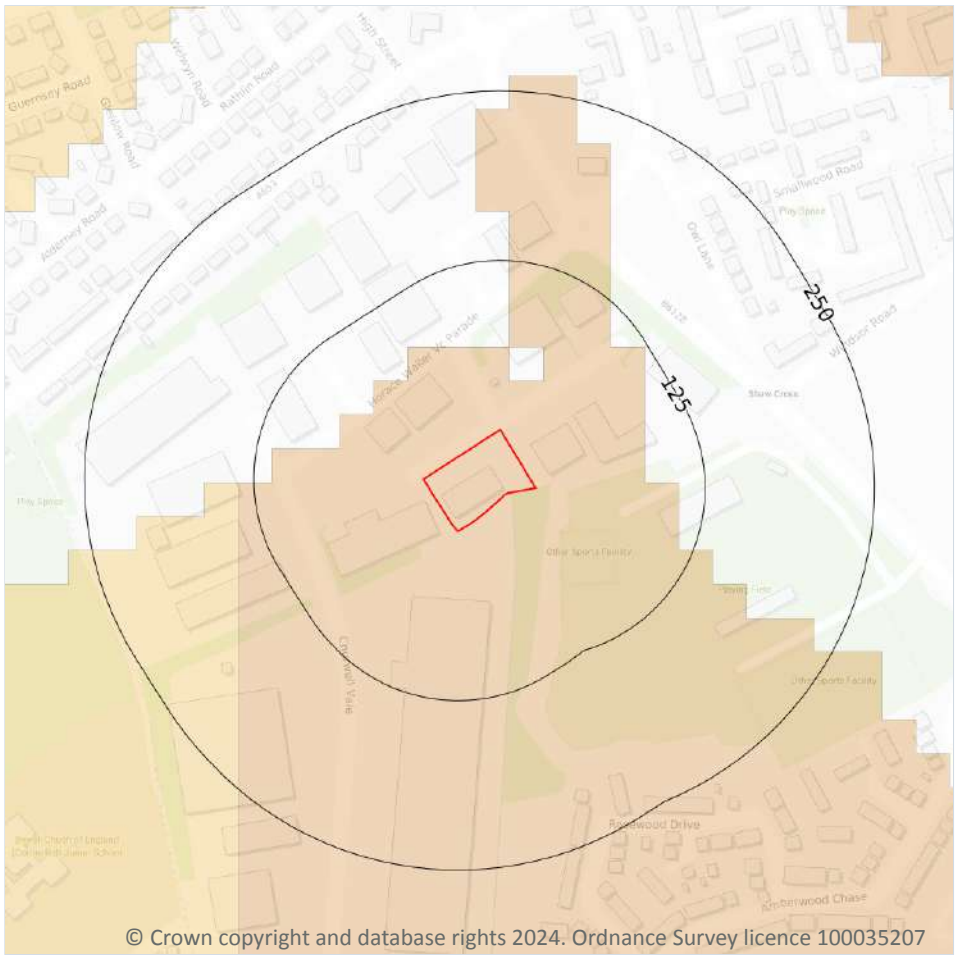
This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.

20 Radon



Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

20.1 Radon

Records on site	1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on **page 110 >**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Between 5% and 10%**	**Basic**

This data is sourced from the British Geological Survey and UK Health Security Agency.

21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m	4

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**90 - 120 mg/kg**	**15 - 30 mg/kg**
15m W	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
20m NE	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
45m NW	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m	0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2).

This data is sourced from the British Geological Survey.

21.3 BGS Measured Urban Soil Chemistry

Records within 50m	0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

This data is sourced from the British Geological Survey.

22 Railway infrastructure and projects

Site Outline

Search buffers in metres (m)

- Crossrail 1 Stations
- Crossrail 1 Route
- Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

22.1 Underground railways (London)

Records within 250m	0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m	32

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 114 >**

Location	Land Use	Year of mapping	Mapping scale
39m E	Railway Sidings	1931	10560
40m E	Railway Sidings	1948	10560
43m E	Railway Sidings	1905	10560
64m E	Railway Sidings	1971	10000
66m E	Railway Sidings	1948	10560
67m E	Railway Sidings	1933	2500
67m E	Railway Sidings	1931	10560
68m E	Railway Sidings	1922	2500
68m E	Railway Sidings	1892	10560
69m E	Railway Sidings	1907	2500
70m E	Railway Sidings	1893	2500
76m E	Railway Sidings	1967	2500
82m E	Mineral Railway Sidings	1955	2500
171m N	Tunnel	1957	10560
214m N	Tunnel	1931	10560
216m N	Tunnel	1907	2500
216m N	Tunnel	1893	2500

Location	Land Use	Year of mapping	Mapping scale
216m N	Tunnel	1922	2500
216m N	Tunnel	1933	2500
216m N	Tunnel	1948	10560
216m N	Tunnel	1948	10560
216m N	Tunnel	1905	10560
216m N	Tunnel	1892	10560
216m N	Tunnel	1931	10560
220m N	Tunnel	1955	2500
220m N	Tunnel	1967	2500
236m N	Tunnel	1965	2500
237m N	Disused Tunnel	1962	2500
237m N	Disused Tunnel	1981	2500
243m SE	Tramway Sidings	1905	10560
245m SE	Tramway Sidings	1948	10560
246m SE	Tramway Sidings	1931	10560

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m	1

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

Features are displayed on the Railway infrastructure and projects map on **page 114 >**

Location	Description
60m E	Dismantled

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m	0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 1

Records within 500m	0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

22.9 Crossrail 2

Records within 500m	0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

22.10 HS2

Records within 500m	0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference ↗.

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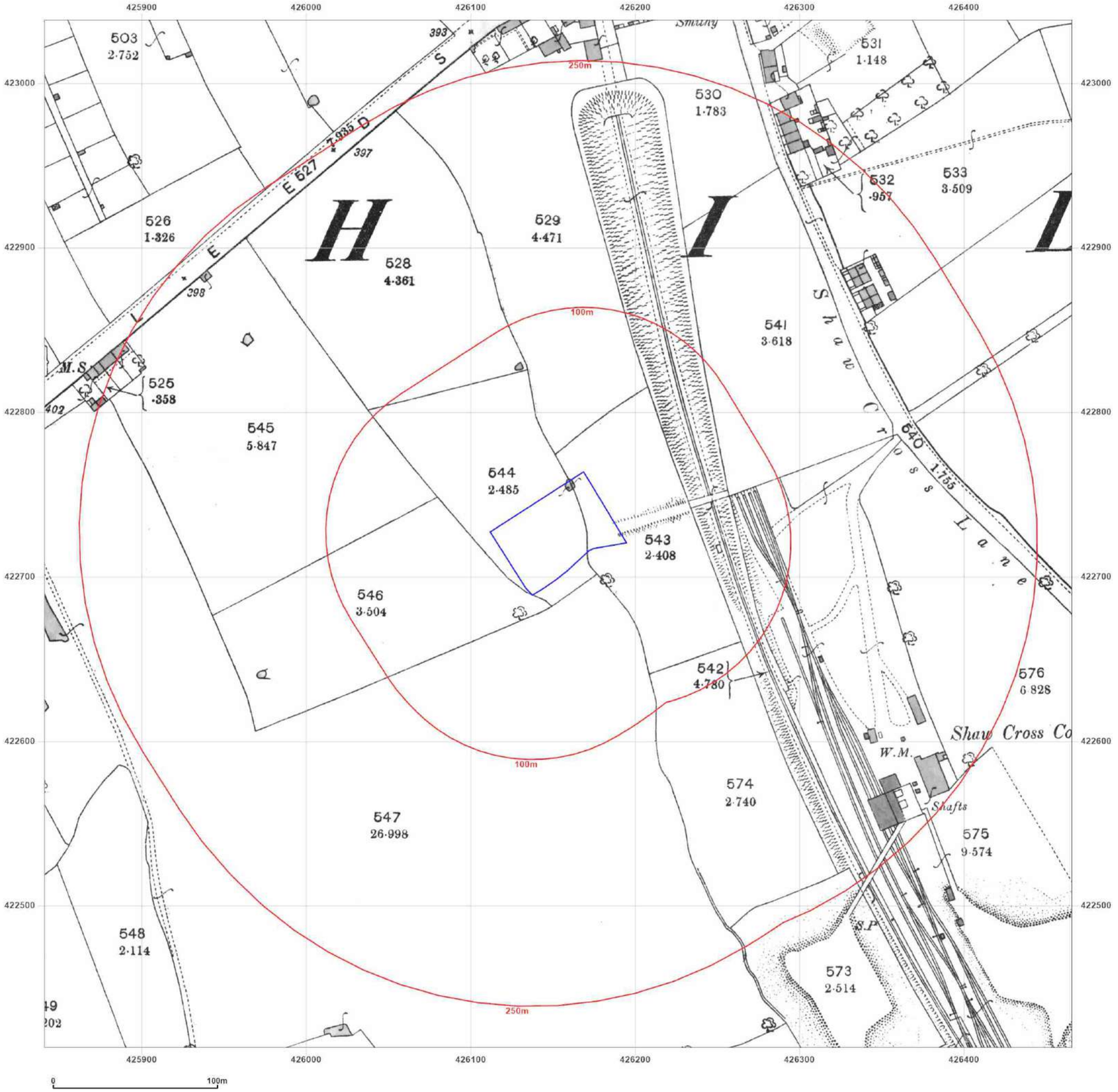
Appendix 2

Historical Maps



Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1893**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1893
Revised 1893
Edition N/A
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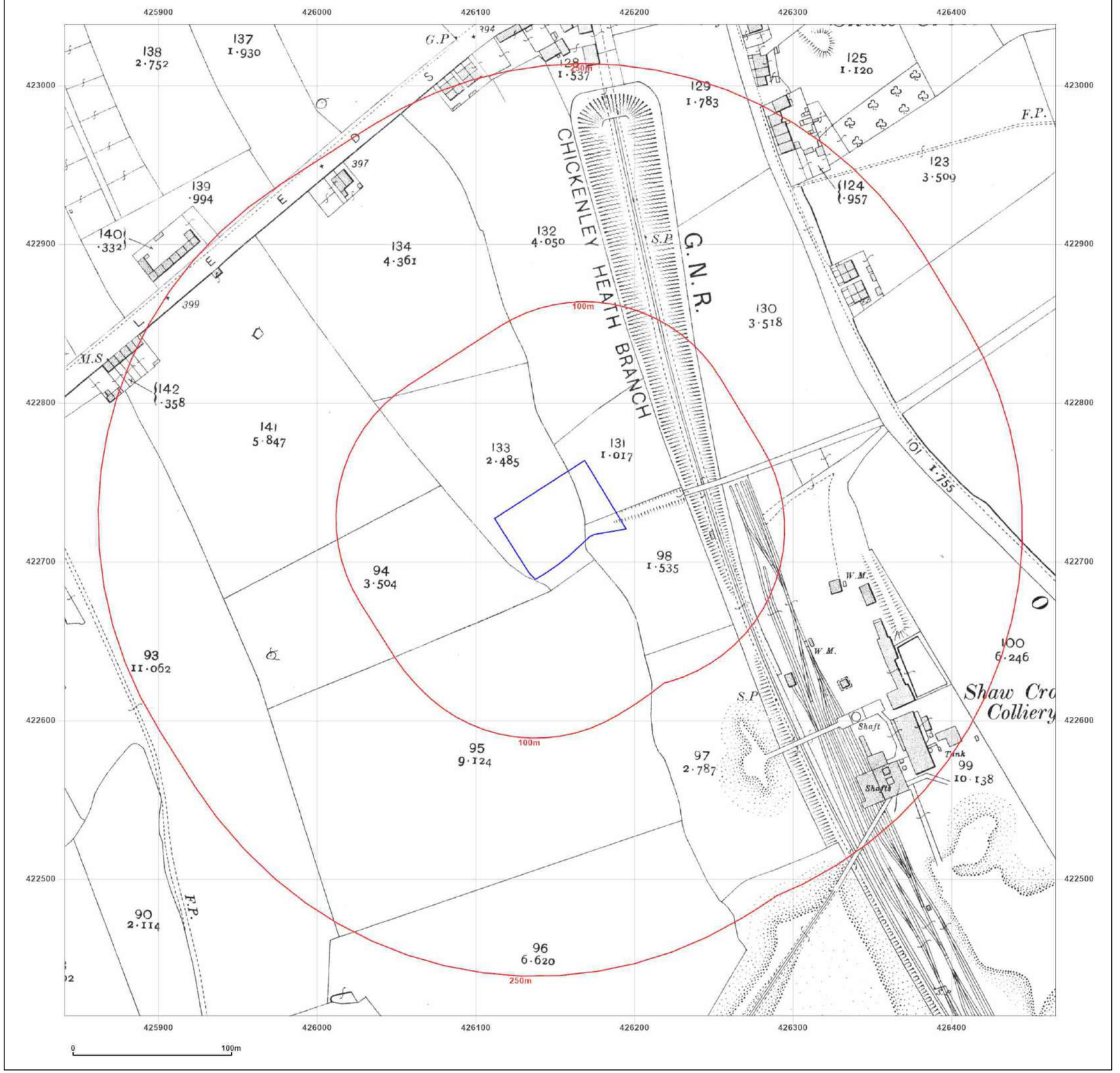

Site Details:

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Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1907**

Scale: 1:2,500

Printed at: 1:2,500

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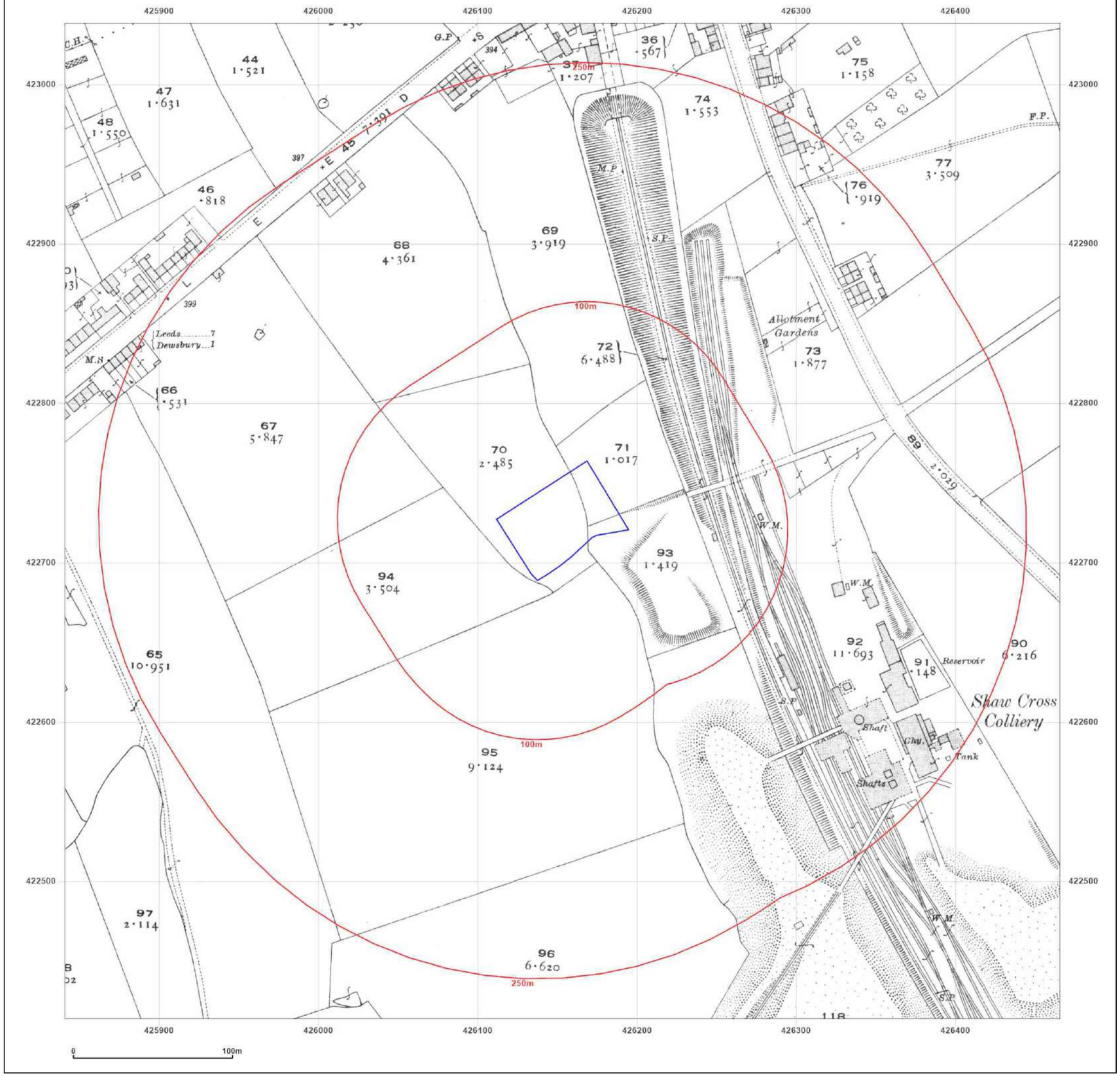

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Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1922**

Scale: 1:2,500

Printed at: 1:2,500

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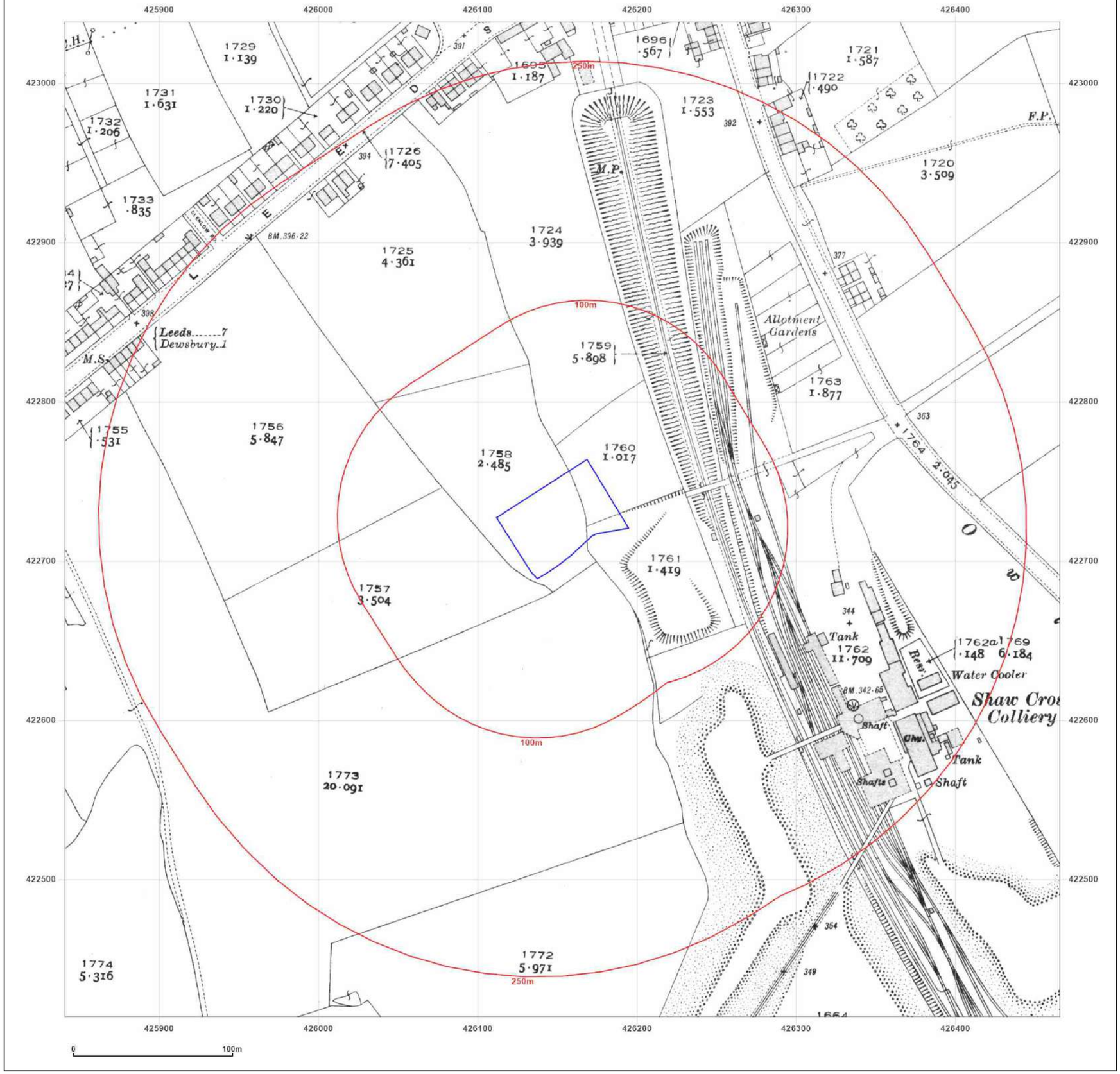

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Site Details:

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Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1933**

Scale: 1:2,500

Printed at: 1:2,500

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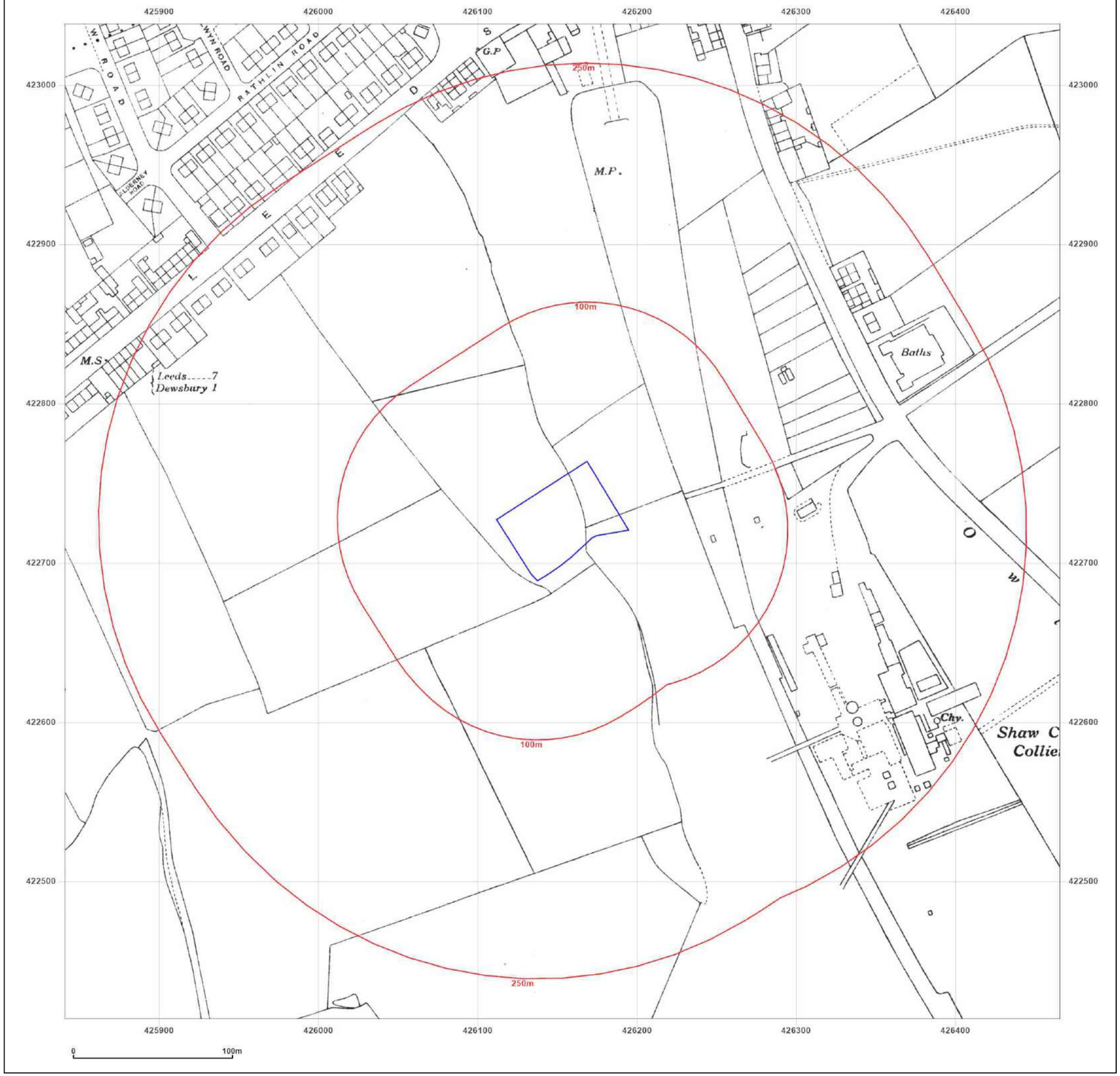

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Site Details:

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Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1938**

Scale: 1:2,500

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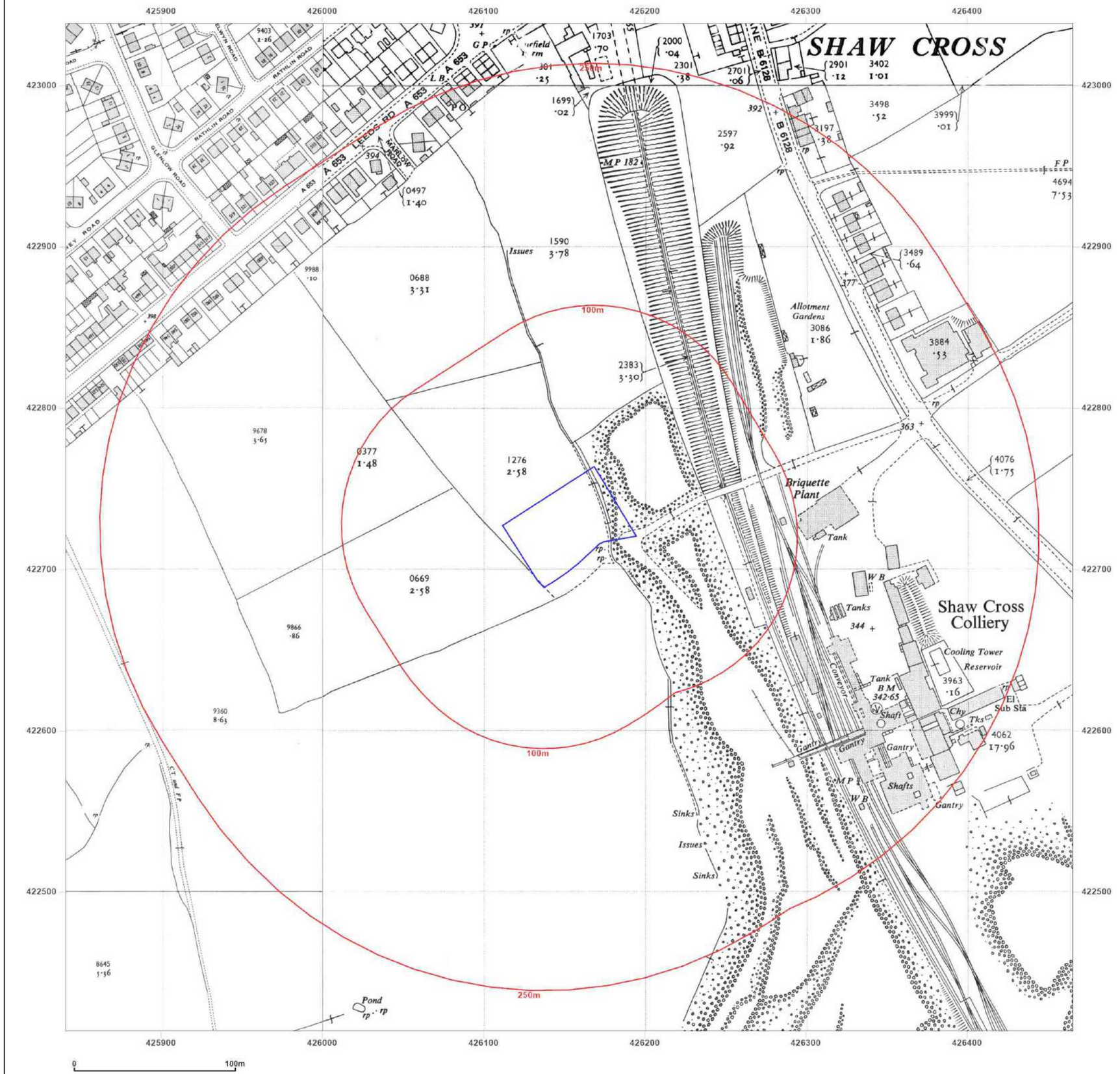

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Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid

Map date: **1955-1956**

Scale: 1:2,500

Printed at: 1:2,500

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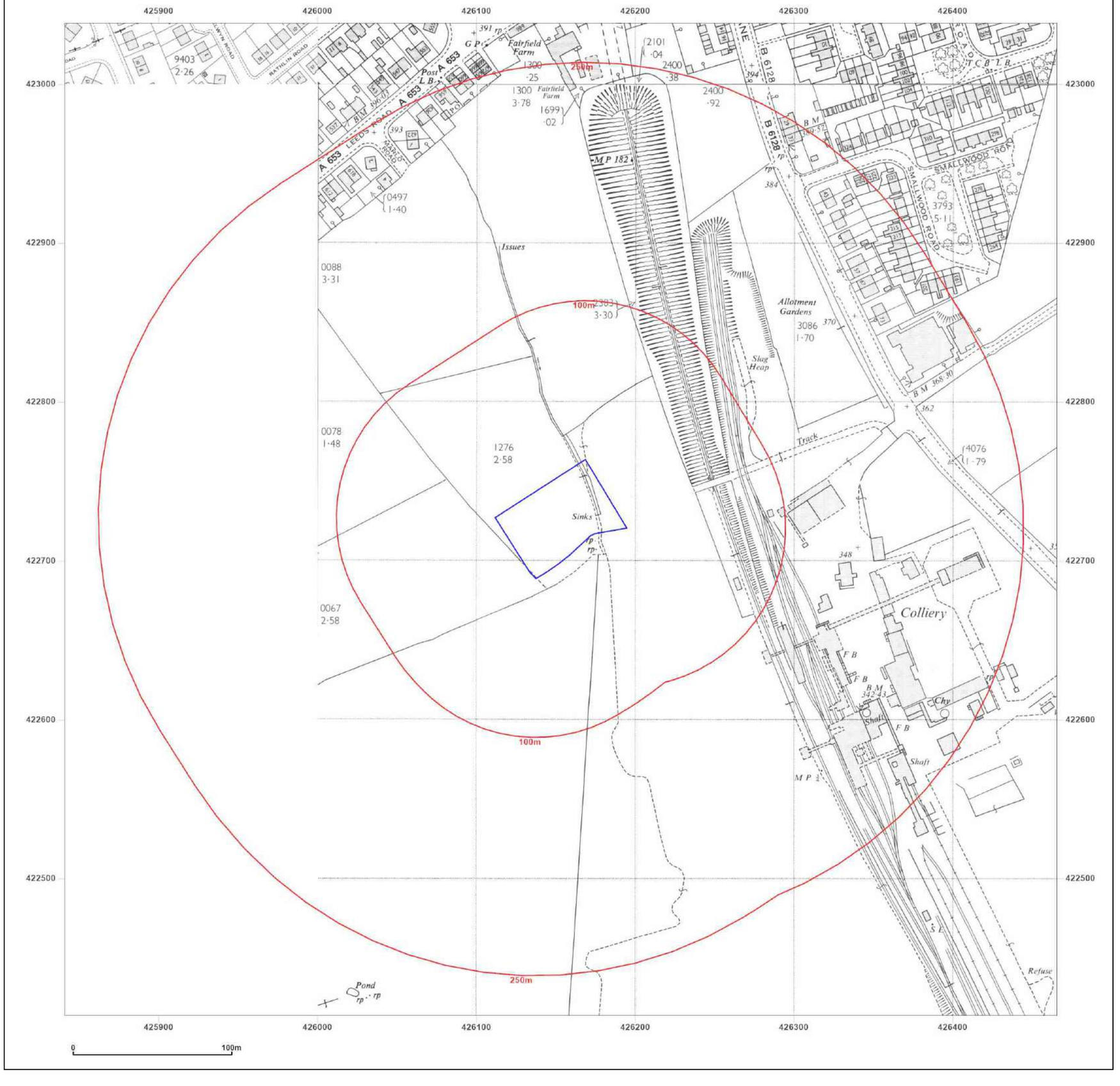

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Site Details:

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Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid

Map date: **1965-1967**

Scale: 1:2,500

Printed at: 1:2,500

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Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid

Map date: **1981-1985**

Scale: 1:2,500

Printed at: 1:2,500

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Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid

Map date: **1992**

Scale: 1:2,500

Printed at: 1:2,500

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Edition N/A
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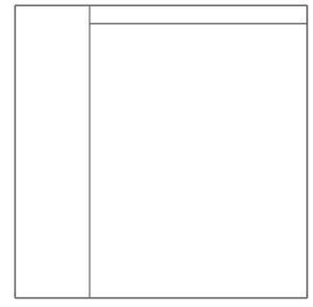

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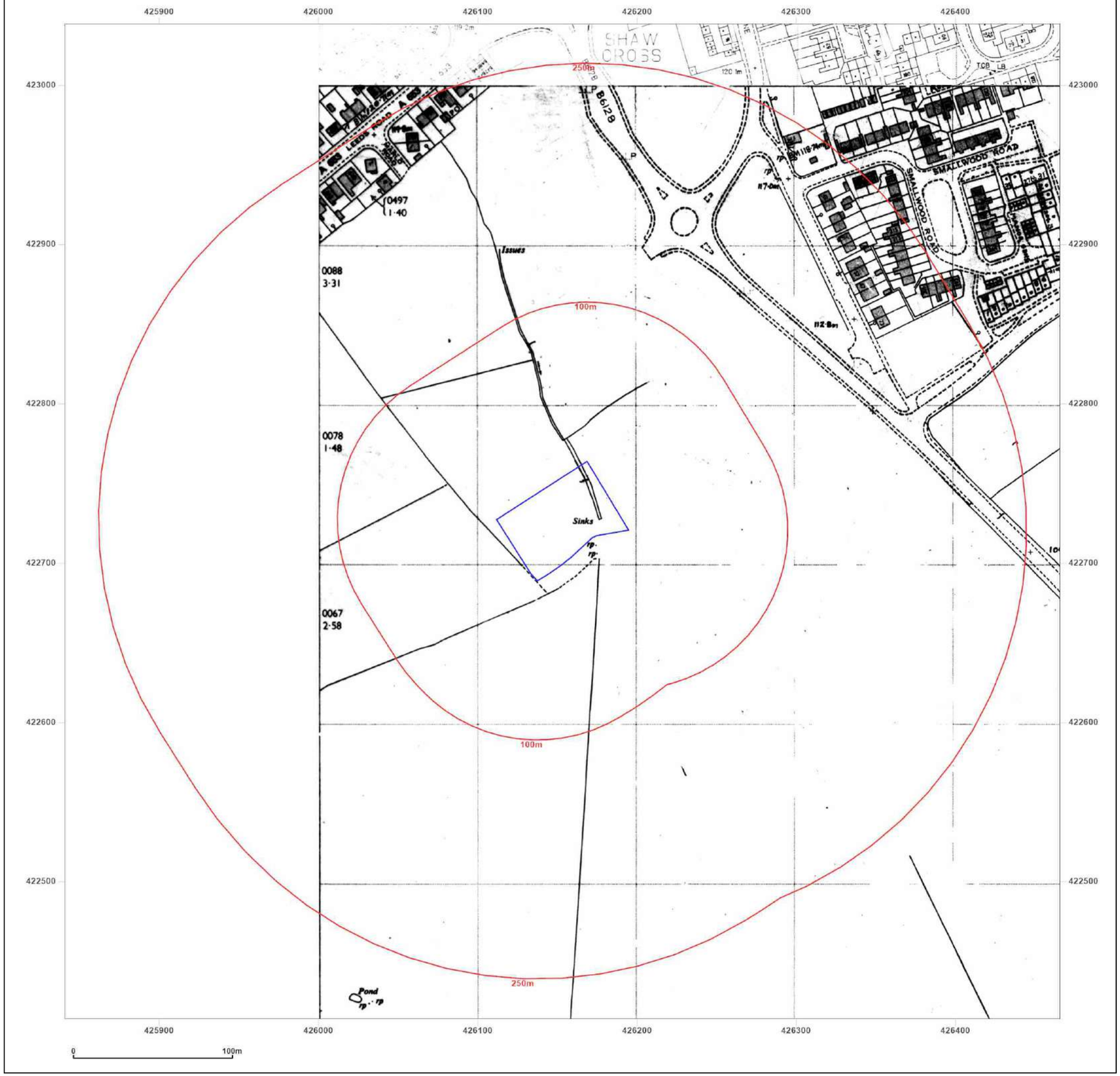

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
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Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid

Map date: **1992-1995**

Scale: 1:2,500

Printed at: 1:2,500

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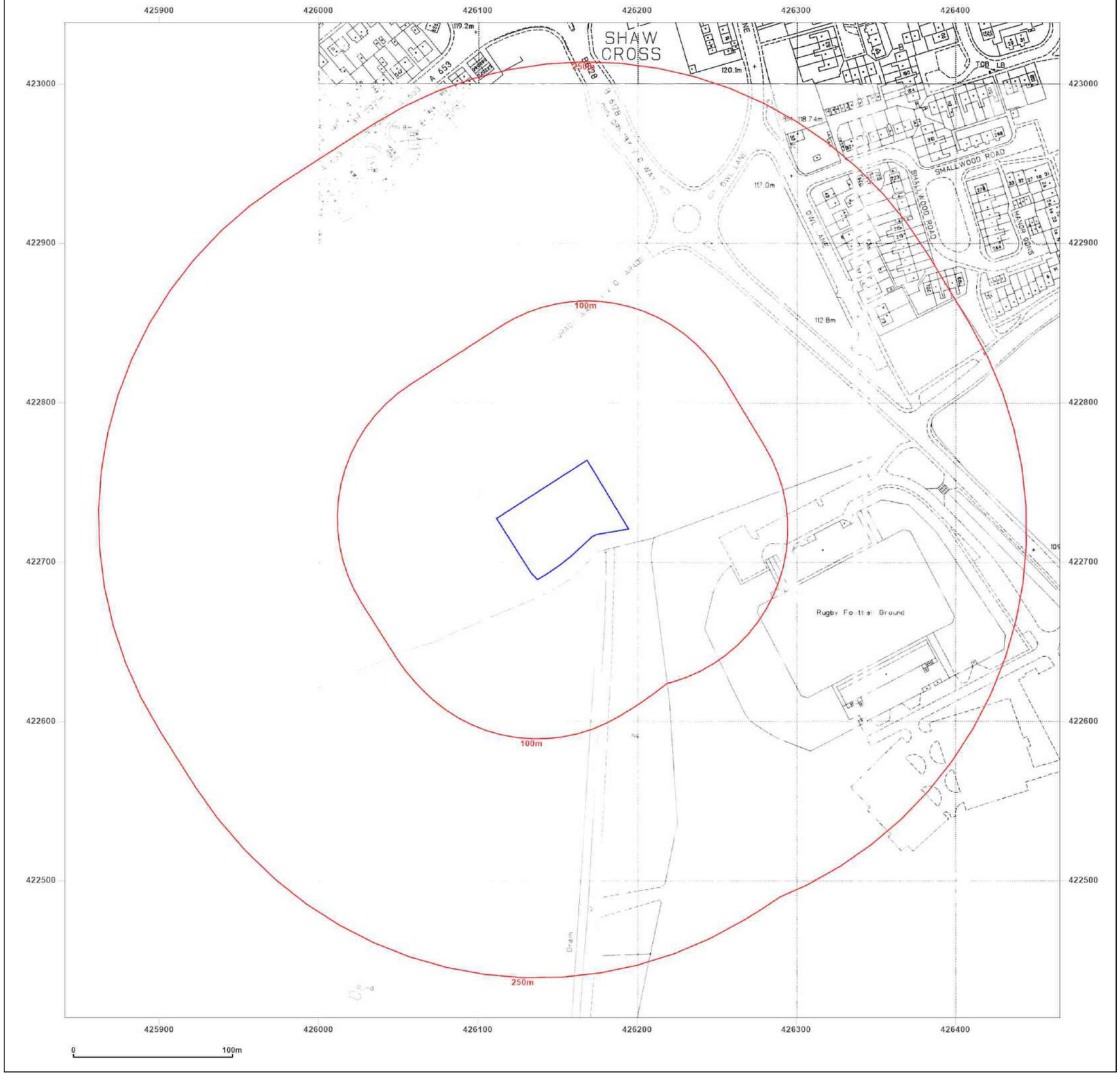

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Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid
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Printed at: 1:2,500

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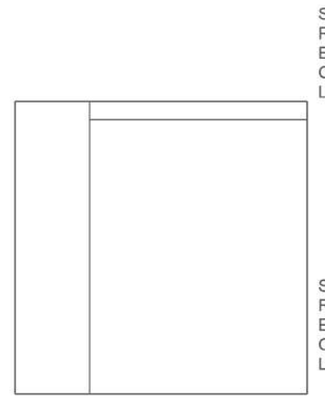

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Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

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Printed at: 1:2,500

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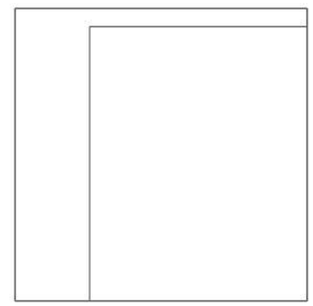

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Site Details:

Shawcross House, Horrace Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

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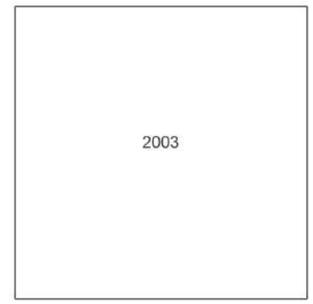

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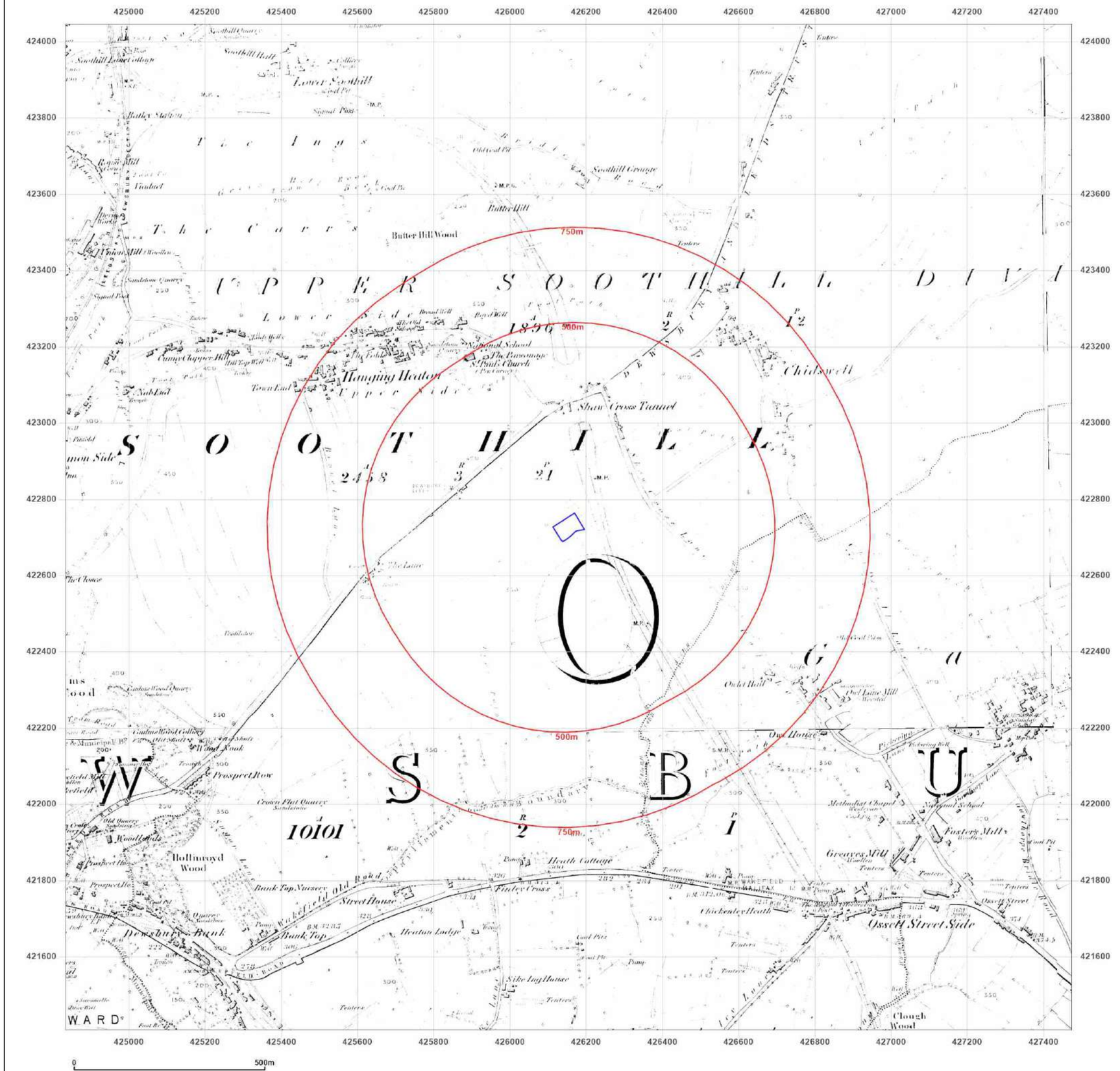

Groundsure INSIGHTS

Site Details:

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Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series
Map date: **1854-1855**
Scale: 1:10,560
Printed at: 1:10,560

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Revised N/A
Edition 1854
Copyright N/A
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Revised N/A
Edition 1854
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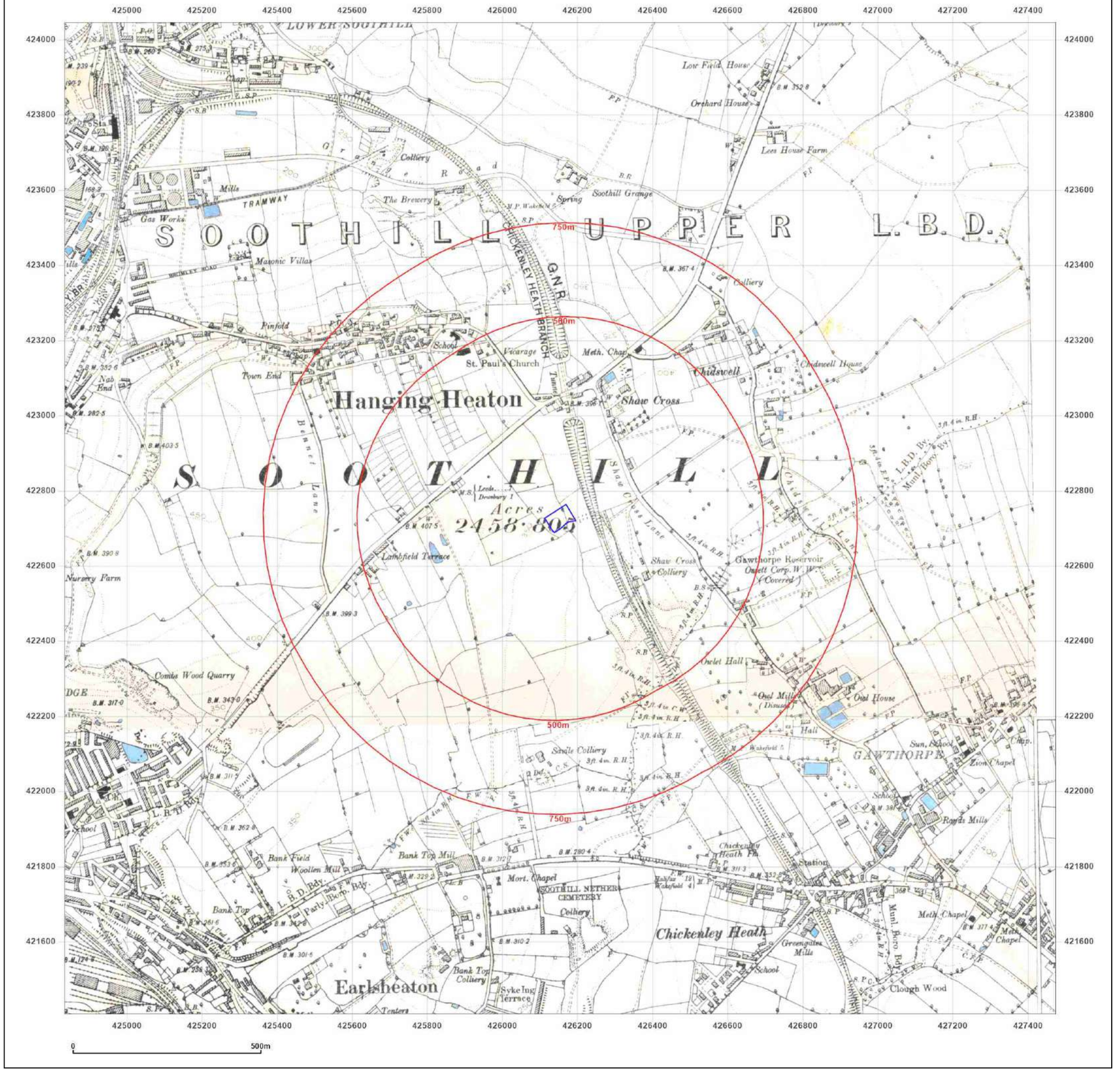

Groundsure INSIGHTS

Site Details:

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Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1890-1892**

Scale: 1:10,560

Printed at: 1:10,560

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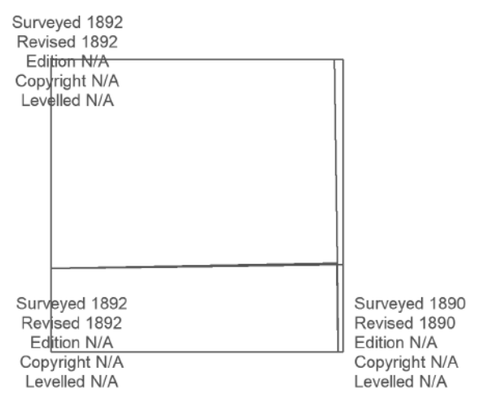

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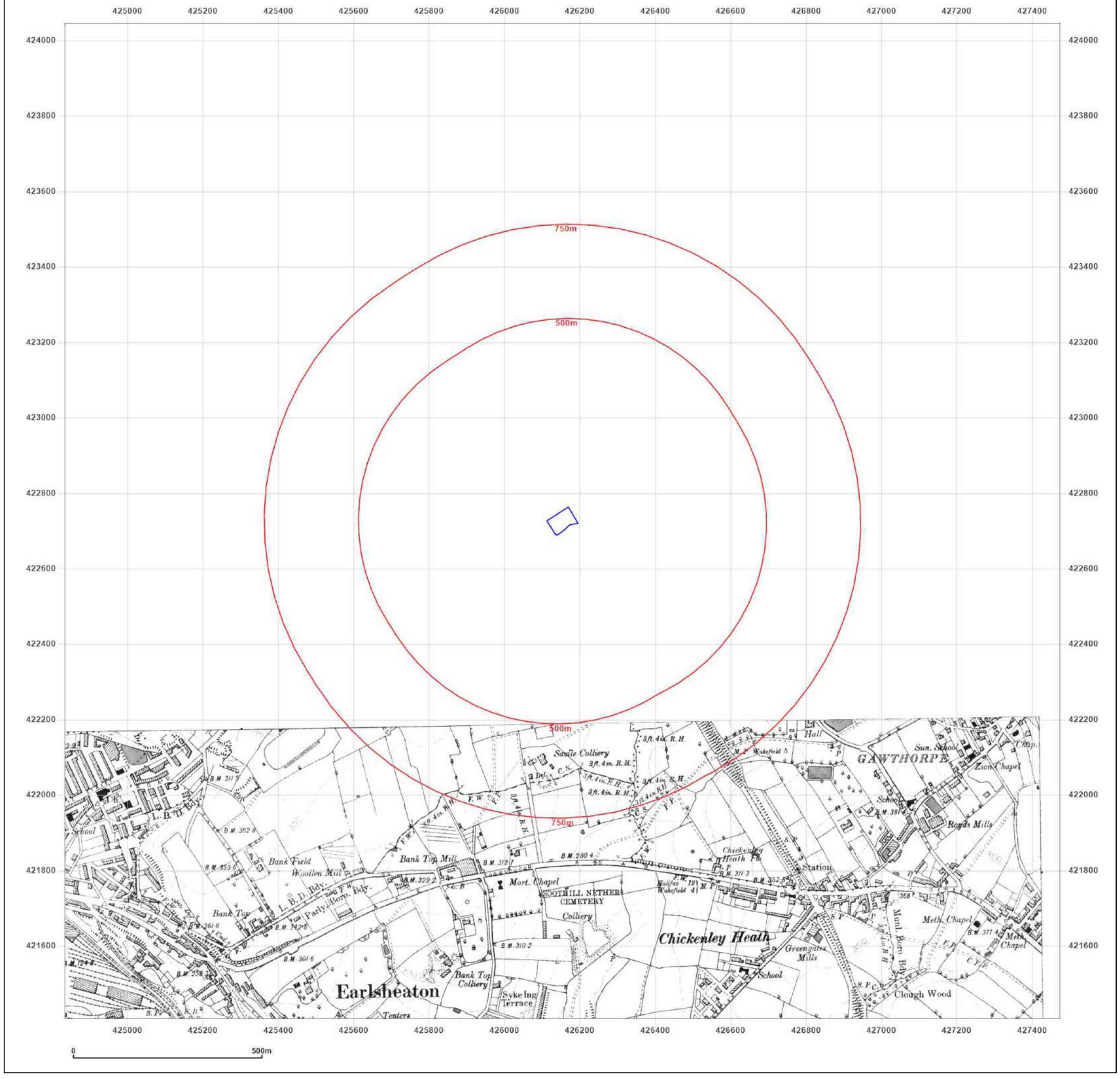

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series
Map date: **1894**
Scale: 1:10,560
Printed at: 1:10,560

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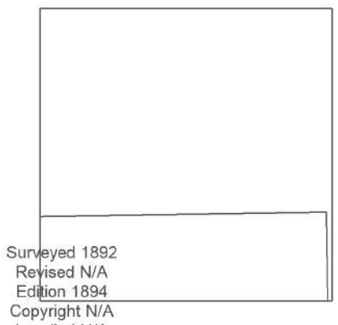

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Production date: 24 April 2024

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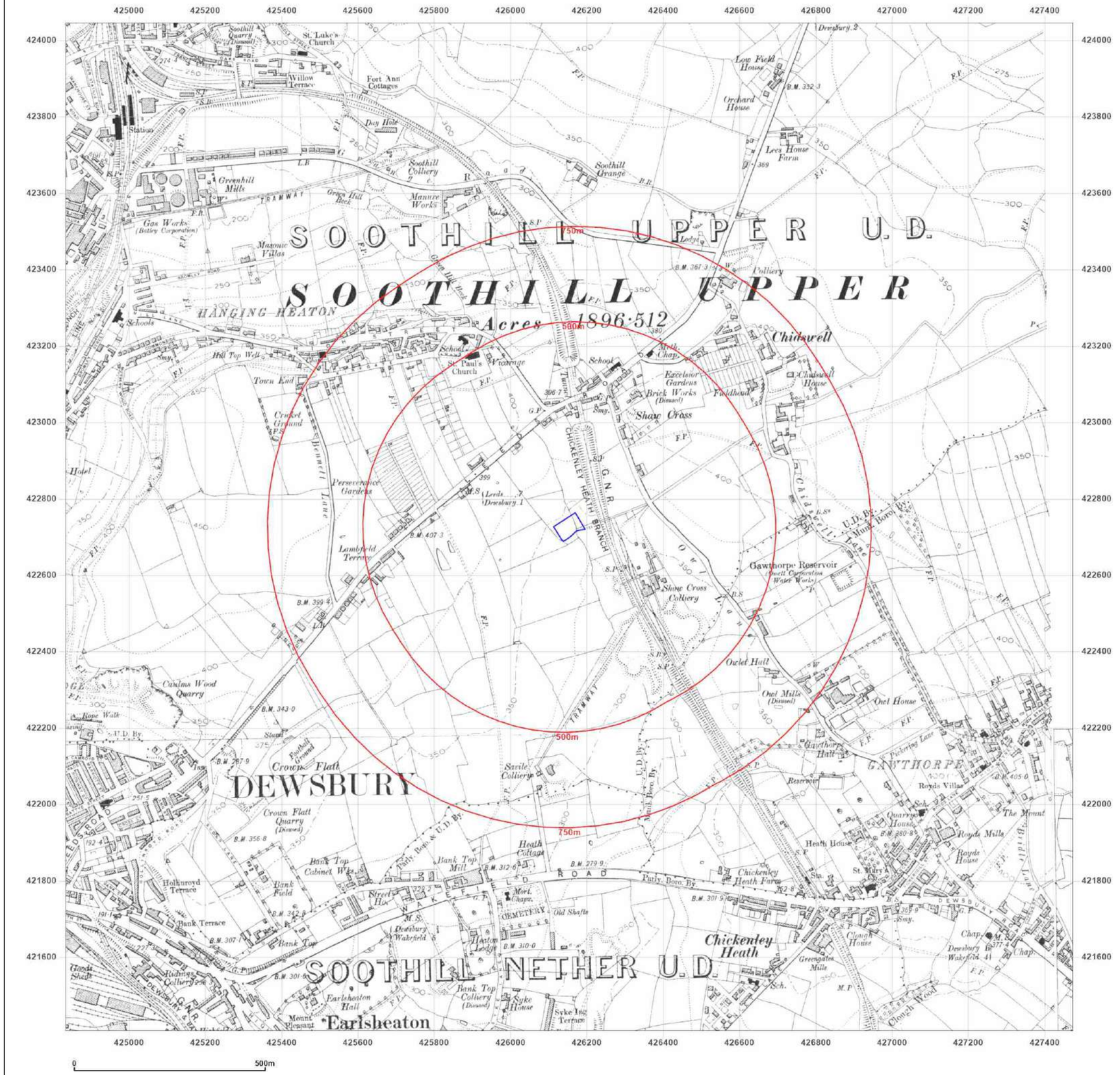

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1905**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1889
Revised 1905
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1892
Revised 1905
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1890
Revised 1905
Edition N/A
Copyright N/A
Levelled N/A

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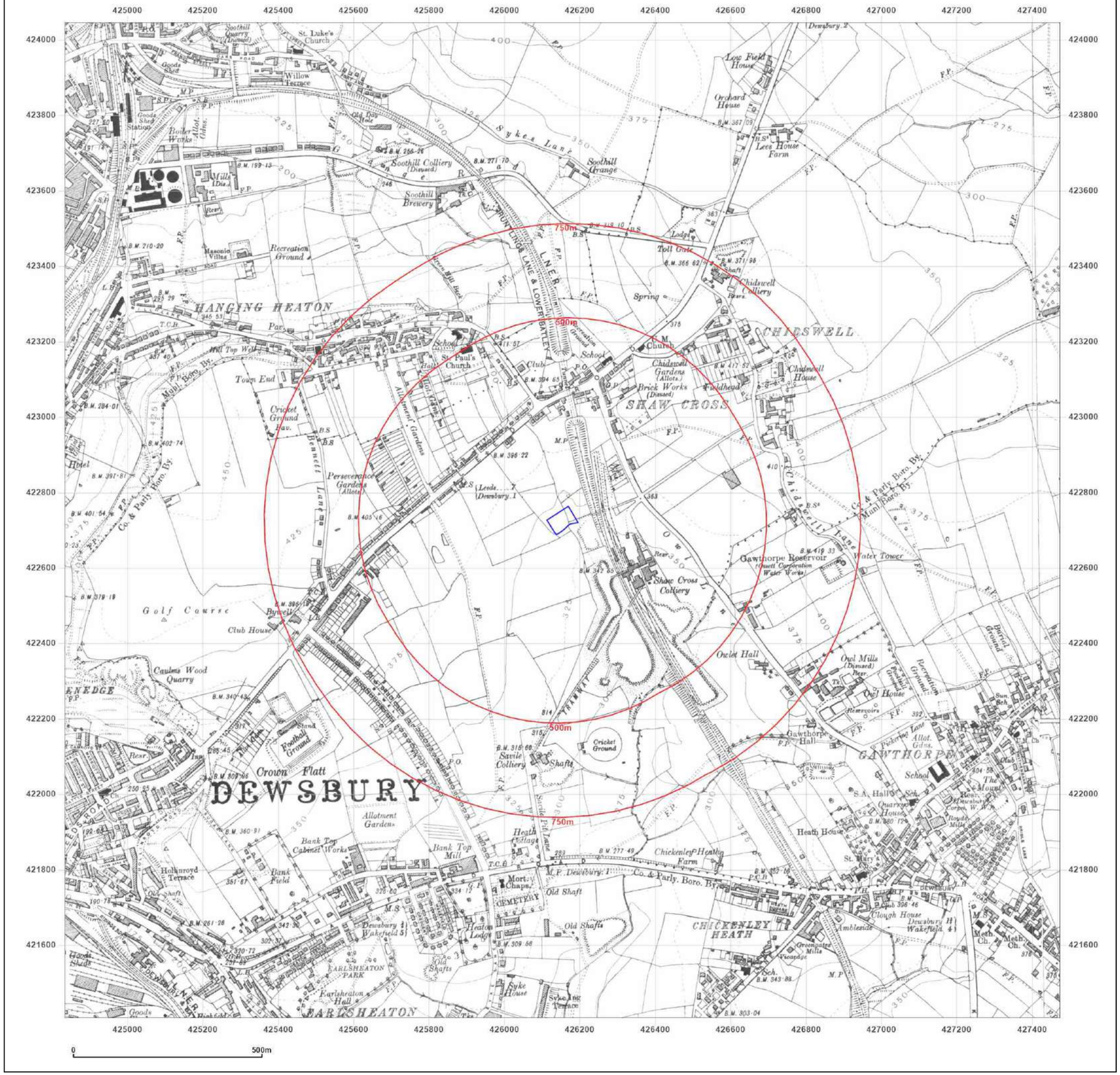

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1931-1932**

Scale: 1:10,560

Printed at: 1:10,560

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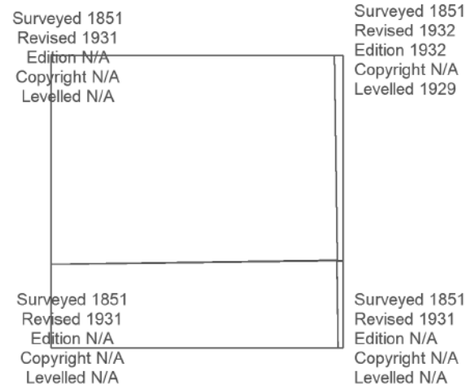

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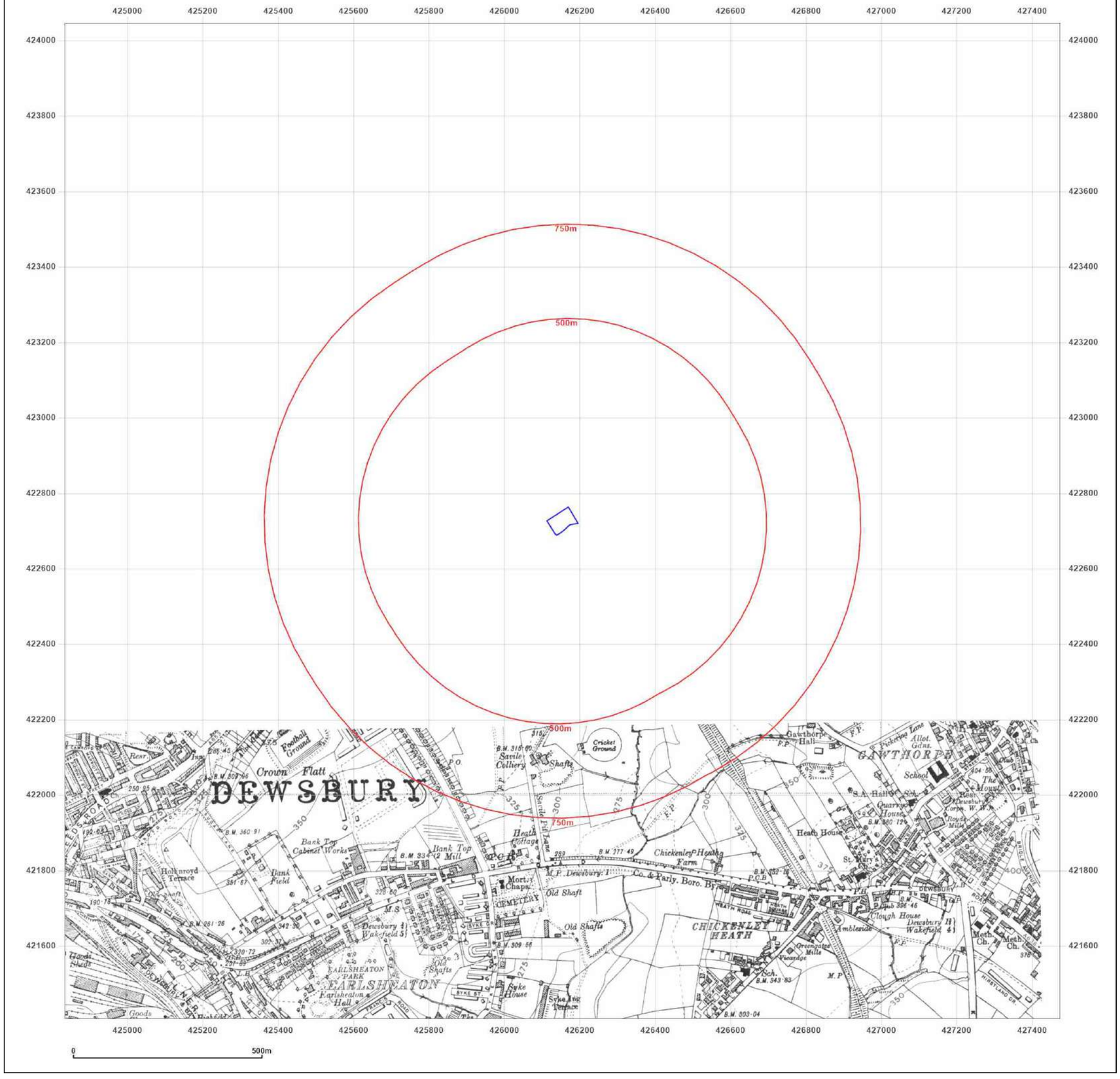

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

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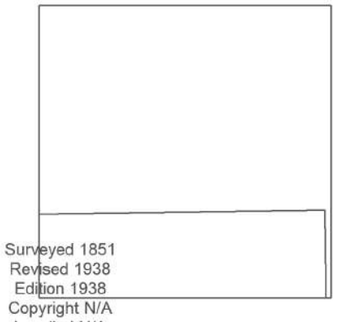

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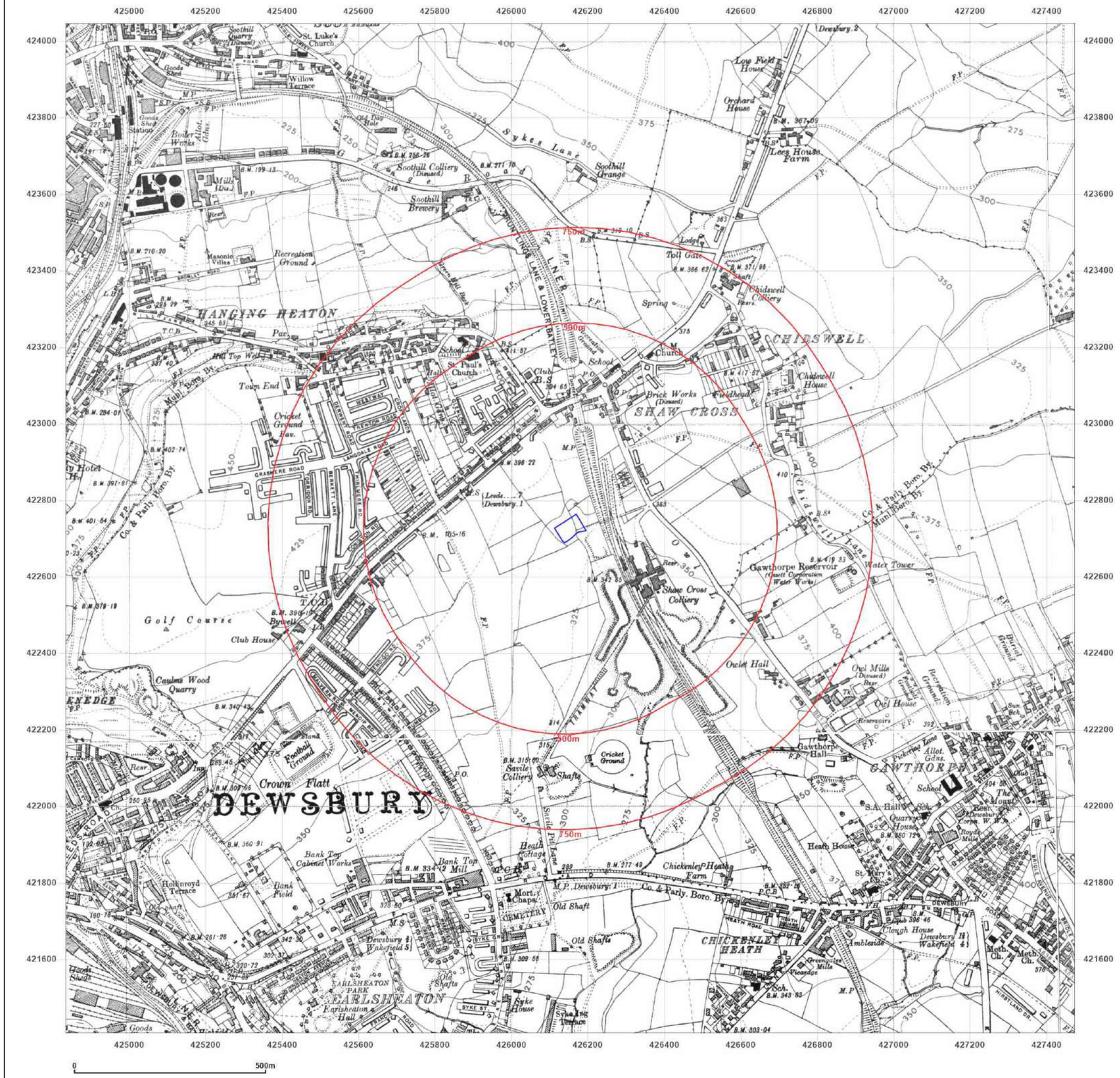

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1938-1939**

Scale: 1:10,560

Printed at: 1:10,560

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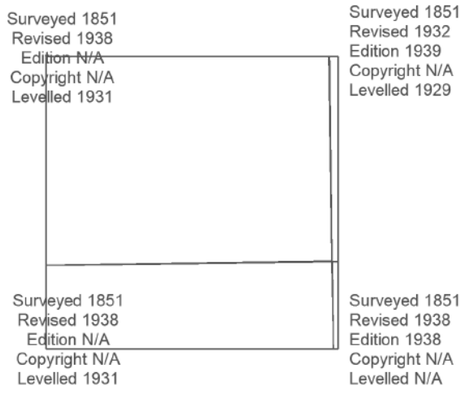

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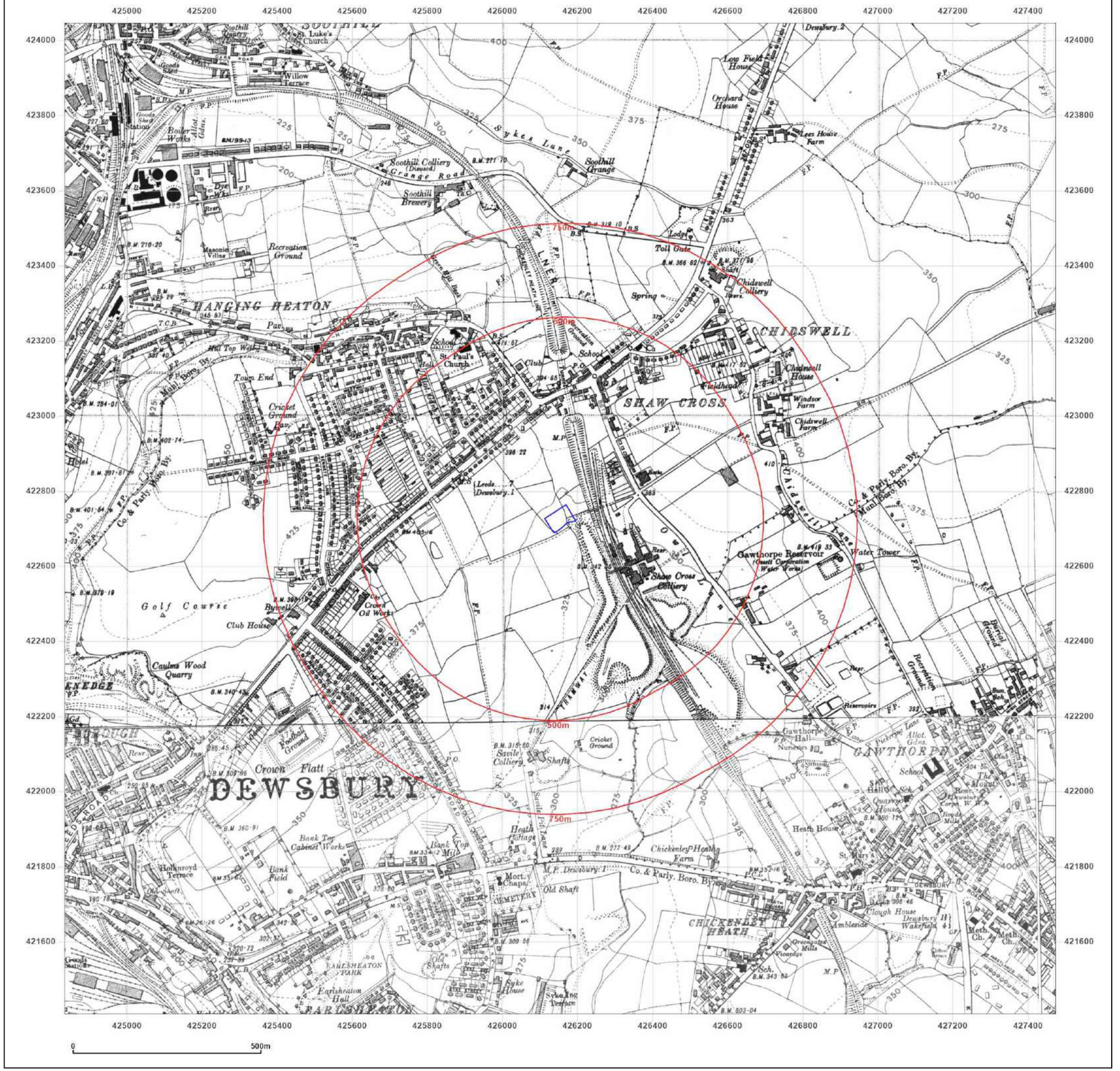

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

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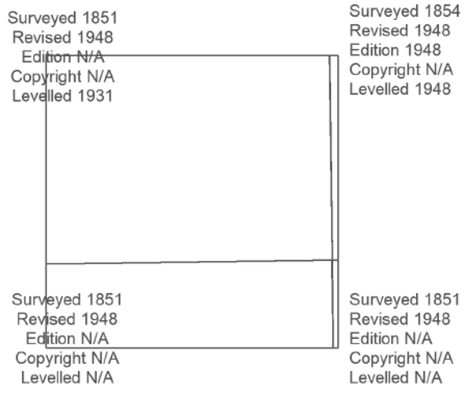

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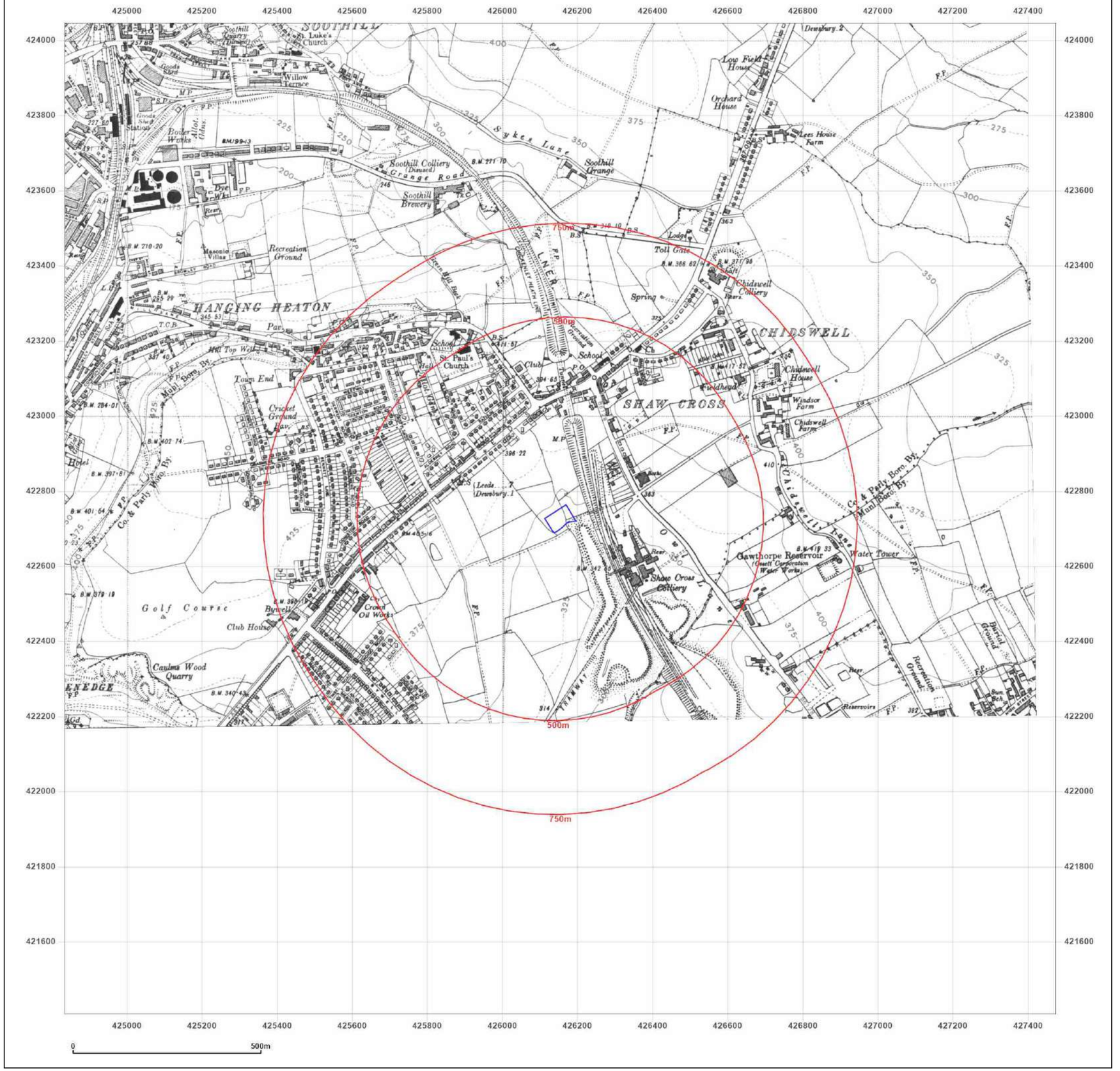

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

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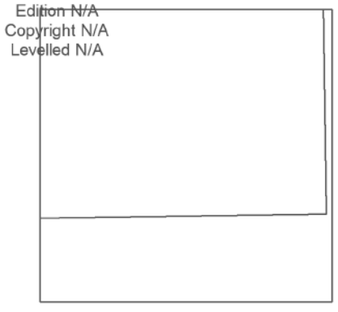
Surveyed 1851
Revised 1948
Edition N/A
Copyright N/A
Levelled N/A



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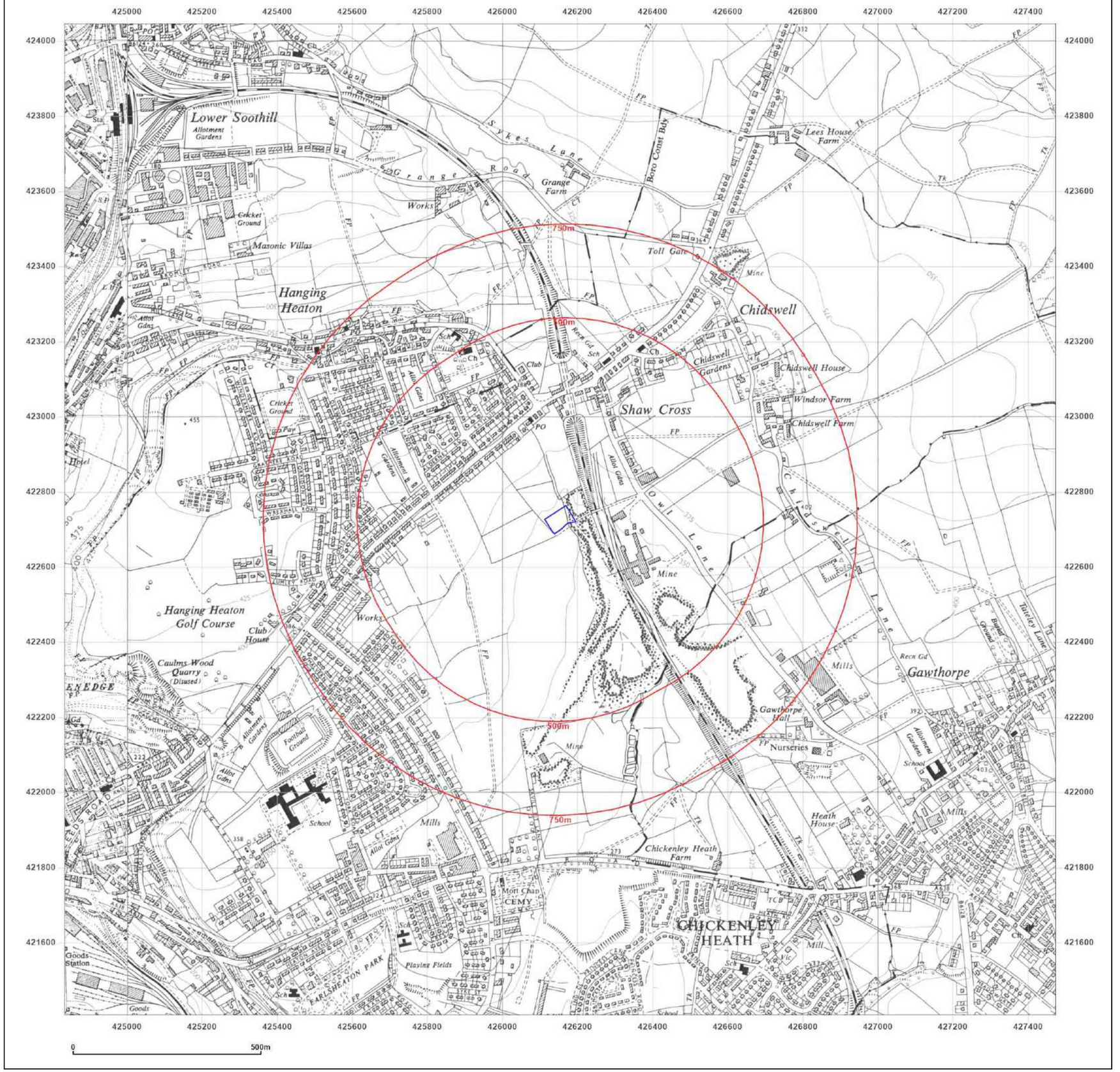

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: Provisional

Map date: **1955-1957**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1951
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1957
Revised 1957
Edition N/A
Copyright N/A
Levelled N/A

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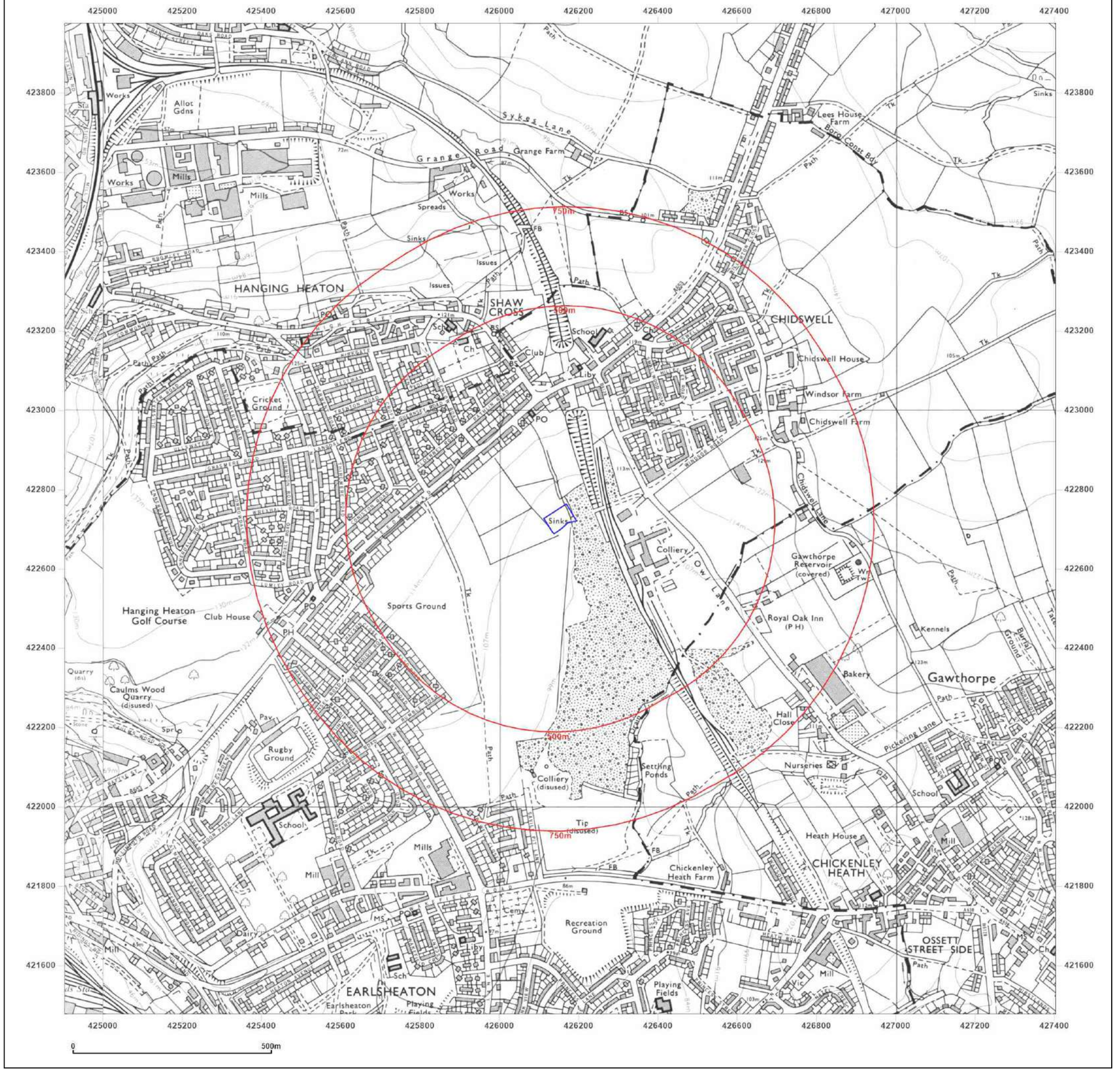

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid

Map date: **1971-1974**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1974
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1971
Revised 1971
Edition N/A
Copyright N/A
Levelled N/A

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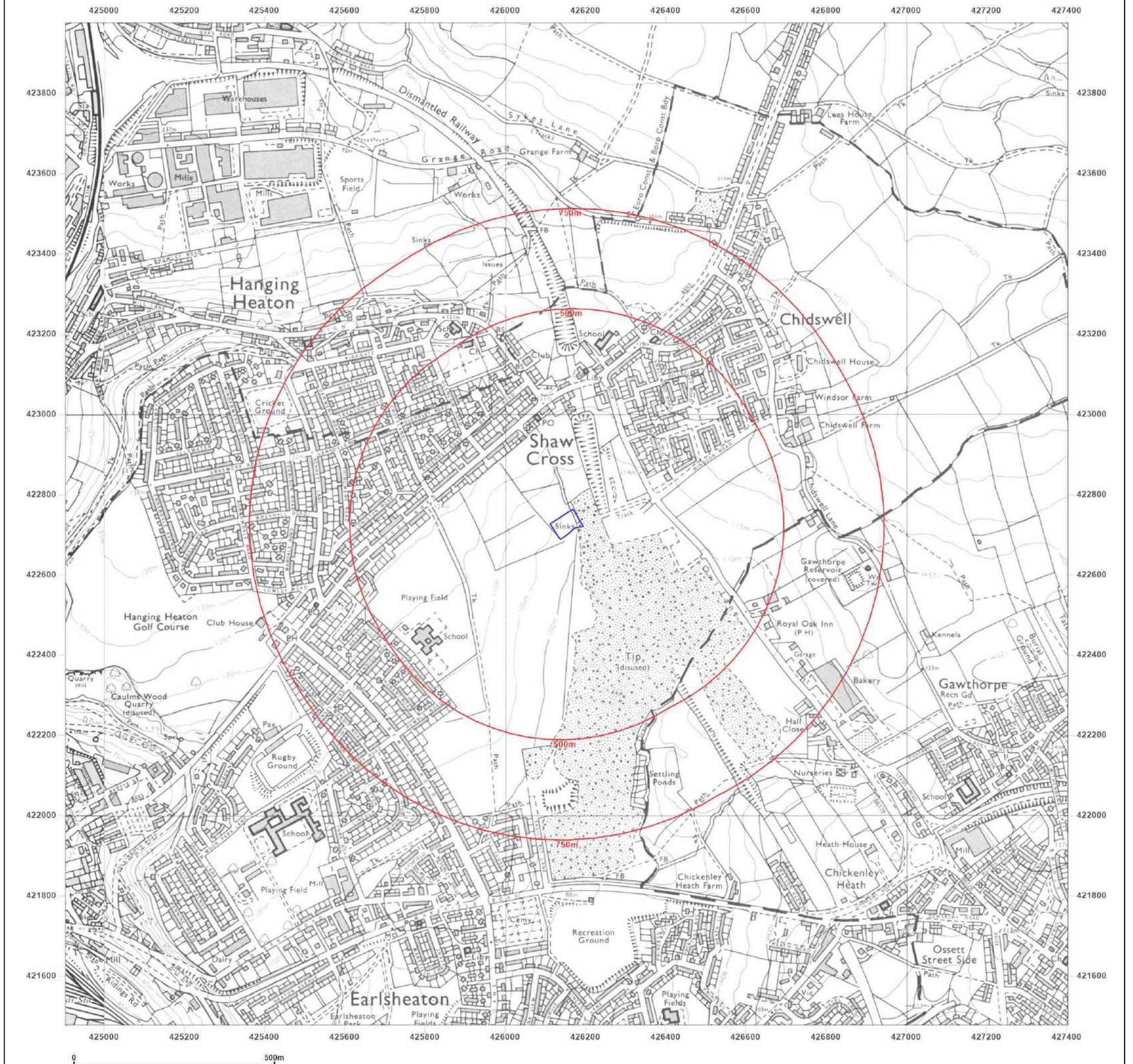

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid

Map date: **1980-1981**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1977
Revised 1981
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1979
Revised 1980
Edition N/A
Copyright N/A
Levelled N/A

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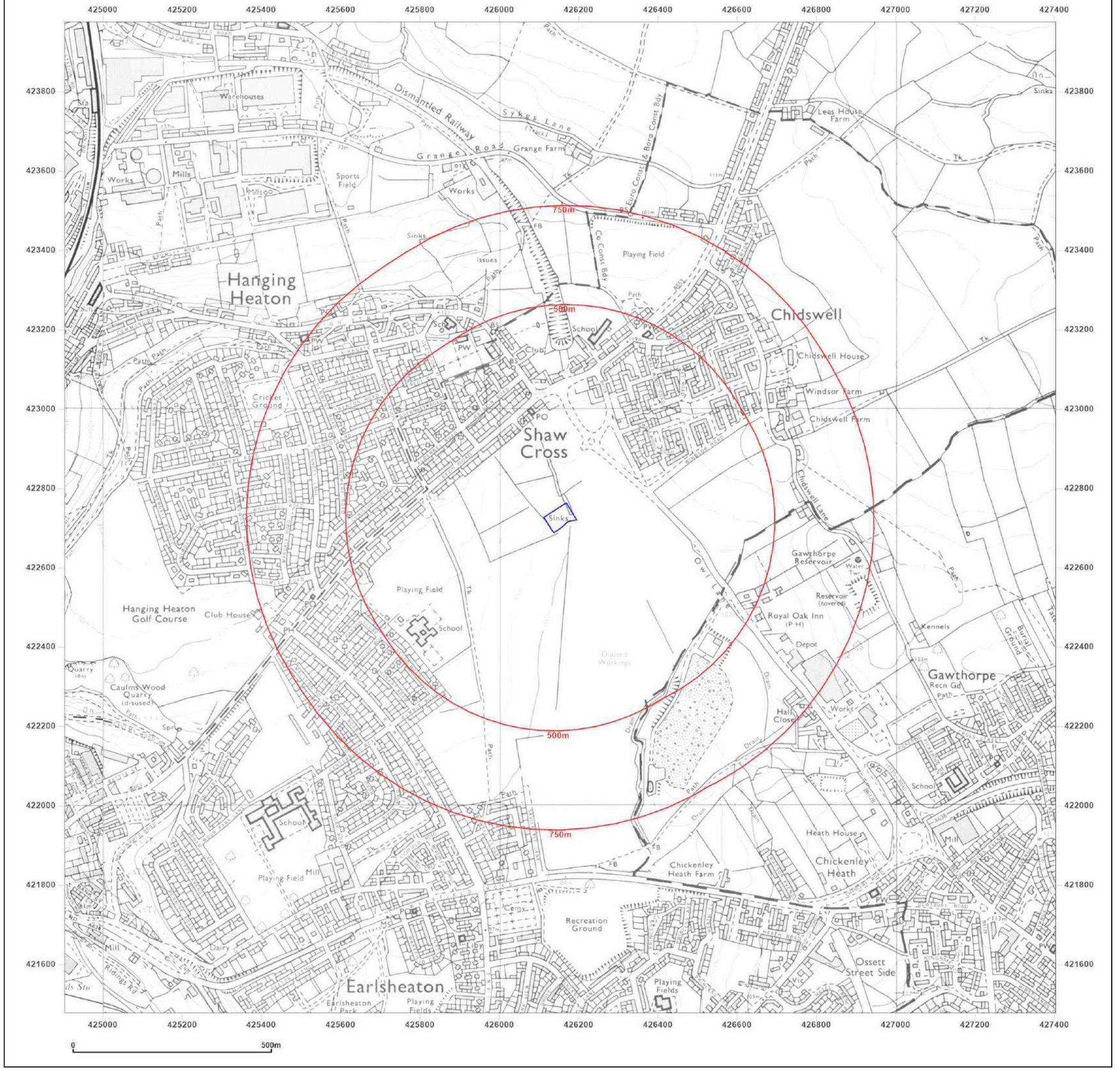

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid

Map date: **1988-1992**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1985
Revised 1988
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1989
Revised 1992
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 24 April 2024

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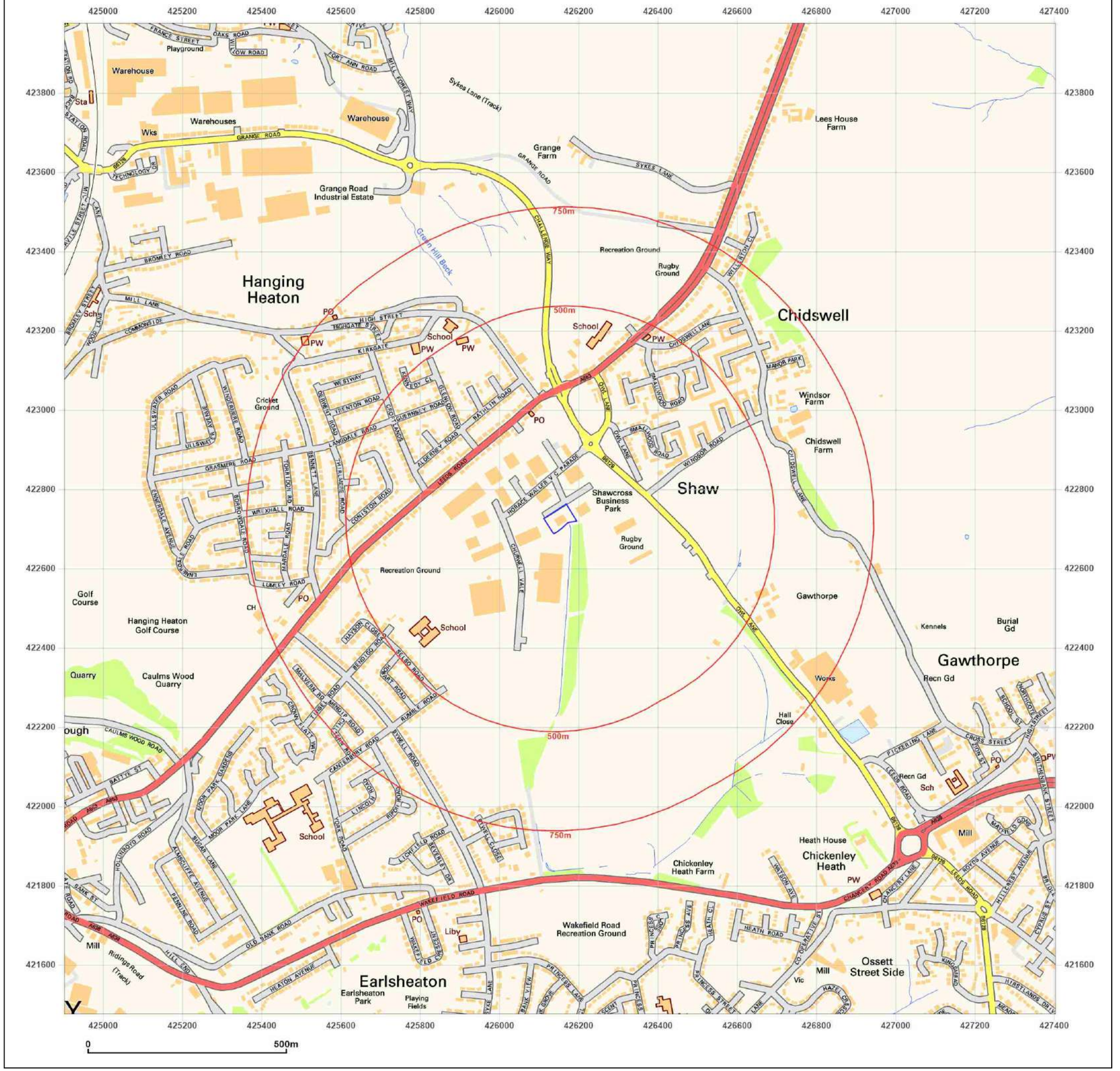

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid
Map date: **2001**
Scale: 1:10,000
Printed at: 1:10,000

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Production date: 24 April 2024

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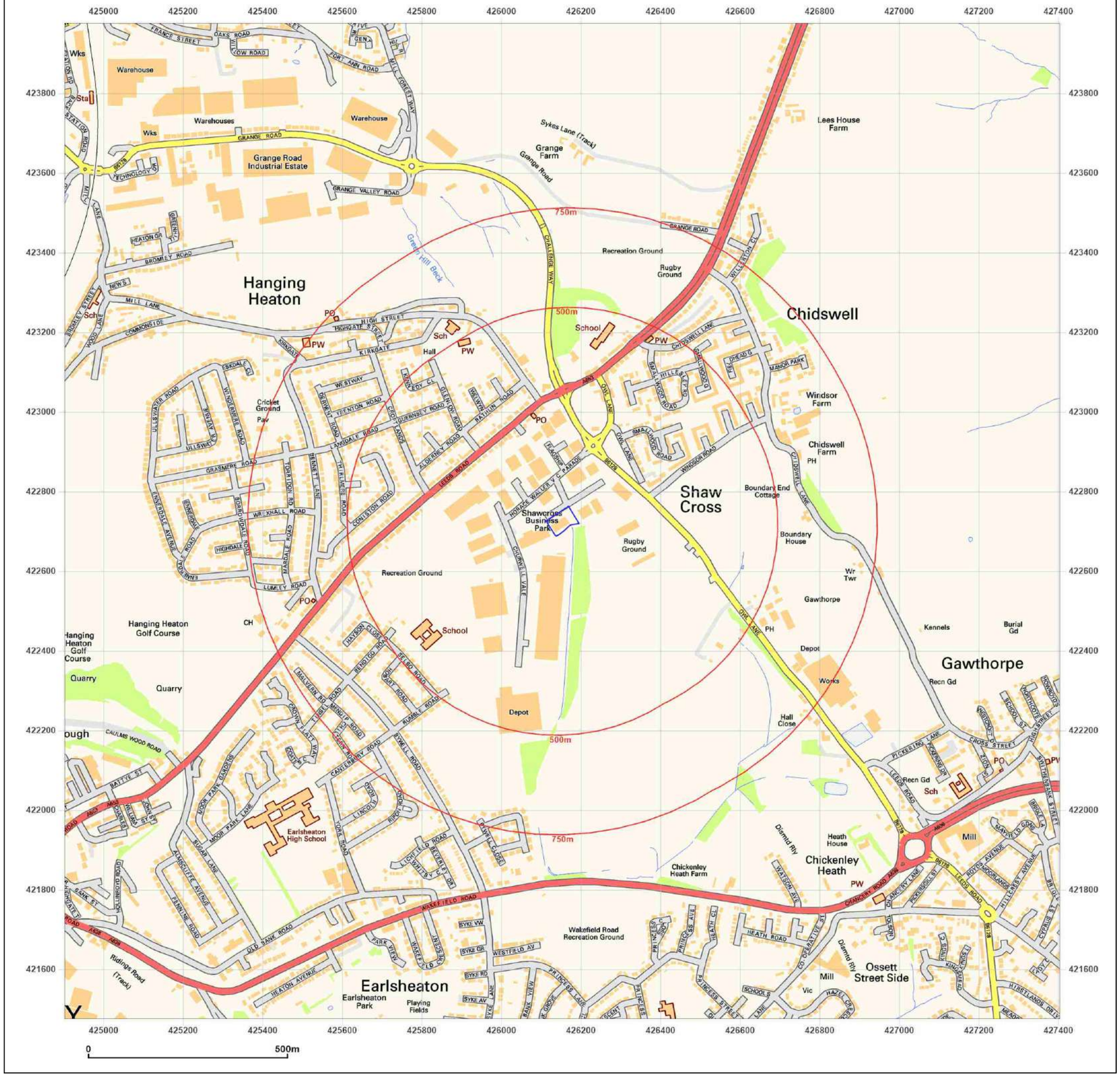

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid
Map date: **2010**
Scale: 1:10,000
Printed at: 1:10,000

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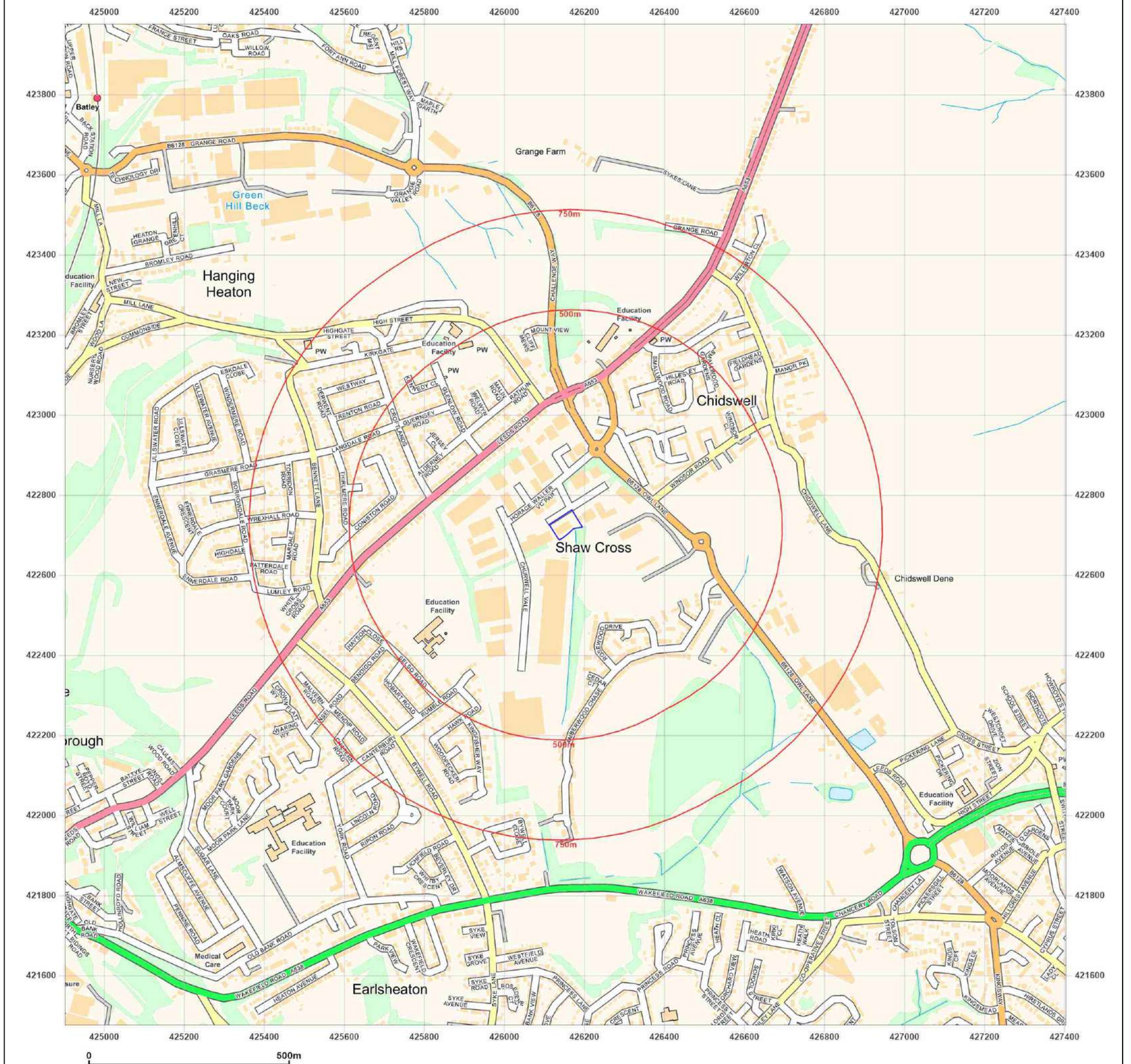

Groundsure INSIGHTS

Site Details:

Shawcross House, Horrace
Waller VC Parade, Dewsbury

Client Ref: Shawross House, Horrace Waller VC
Report Ref: GS-WMP-2M7-22X-5QK
Grid Ref: 426153, 422726

Map Name: National Grid
Map date: **2024**
Scale: 1:10,000
Printed at: 1:10,000

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Production date: 24 April 2024

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Appendix 3

Coal Authority Mining Report

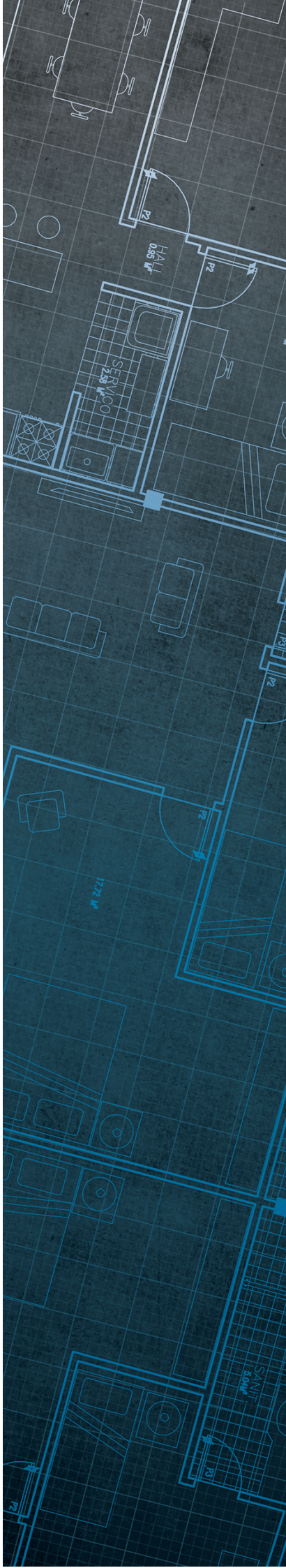
The Coal Authority

Consultants

Coal Mining Report

Shawcross House, Horrace Waller
Vc Parade, Dewsbury
West Yorkshire

Date of enquiry:	**24 April 2024**
Date enquiry received:	**24 April 2024**
Issue date:	**24 April 2024**
Our reference:	**51003420056001**
Your reference:	**GS-K8E-2QO-FIQ-OLE**



Consultants

Coal Mining Report

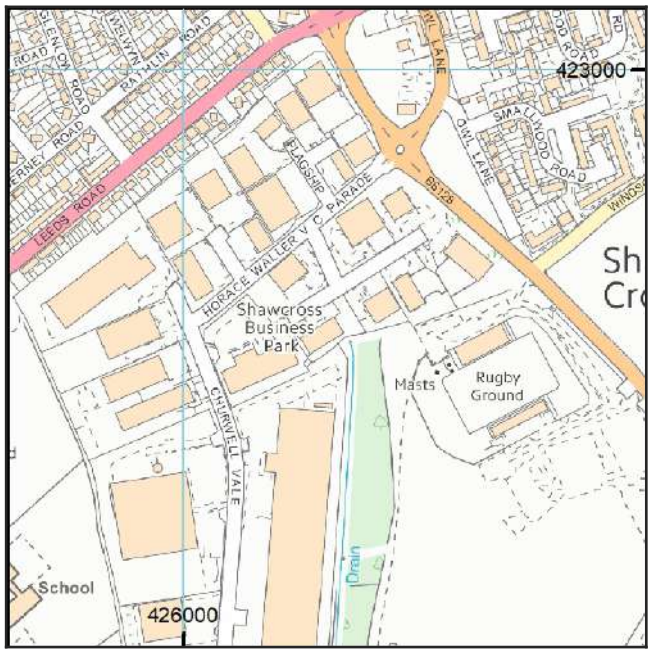
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

GROUNDSURE LIMITED

Enquiry address

Shawcross House, Horrace Waller Vc Parade,
Dewsbury
West Yorkshire



Approximate position of property

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

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	FLOCKTON THICK	Coal	6L46	59	West	2.6	East	84	1907
unnamed	FLOCKTON THICK	Coal	69E5	67	Beneath Property	2.6	East	84	1907
unnamed	FLOCKTON THIN	Coal	69E5	73	Beneath Property	2.3	South-East	66	1907
unnamed	MIDDLETON MAIN	Coal	69EB	146	Beneath Property	0.8	East	53	1921
unnamed	WHEATLEY LIME	Coal	69EE	163	Beneath Property	1.4	South-East	71	1949
unnamed	MIDDLE ELEVEN YARDS	Coal	6NID	170	West	2.3	South-East	65	1954
unnamed	WHEATLEY LIME	Coal	6NHD	172	West	2.2	East	66	1949
unnamed	MIDDLE ELEVEN YARDS	Coal	660M	174	Beneath Property	1.7	South-East	66	1946
unnamed	SILKSTONE	Coal	69EF	174	Beneath Property	1.6	South-East	66	1946
unnamed	TOP BEESTON	Coal	6NKD	232	West	2.4	South-East	75	1913
unnamed	TOP BEESTON	Coal	69EH	243	Beneath Property	1.4	South	69	1900
unnamed	BLACK BED	Coal	6NLD	314	West	2.1	South-East	69	1910
unnamed	BLACK BED	Coal	6HZB	315	North	3.2	South-East	76	1924
unnamed	BLACK BED	Coal	69EJ	323	Beneath Property	2.0	South-East	76	1918

Probable unrecorded shallow workings

None.

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:

NE629	14165	PO0
8026	11245	NE640
NE641	8652	NEST5

Our records show we have more plans than those shown above which could affect the enquiry boundary.

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

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines 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.

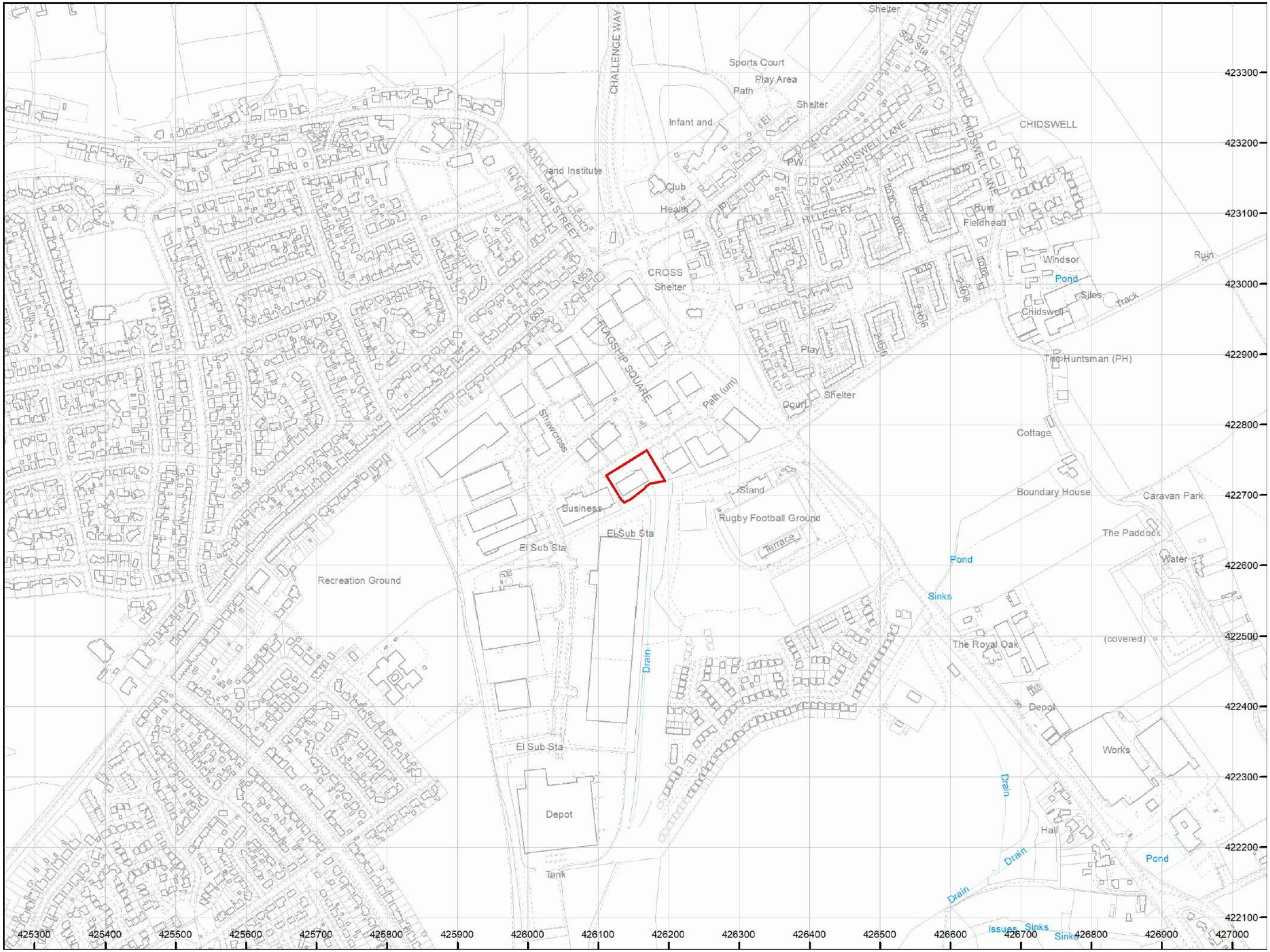
The Coal Authority

Summary of findings

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



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

Standard Appendices

A and B

STANDARD APPENDIX A

NOTES ON SITE INVESTIGATION PROCEDURE (June 2021)

1. **GENERAL.** The ground investigation has been carried out in accordance with the requirements of BS5930: 2015 and BS10175: 2011+A1: 2020. By its very nature, any ground investigation only samples a small percentage of the ground. Consequently, changes in ground conditions and soil properties can occur between any two exploratory points, for example local features such as soft ground, pockets of contamination and faults. This is also true of the exploration of mineworkings and such features can extend beneath parts of the site not investigated. Unrecorded bell pits and shafts can also exist between exploratory points. The ground investigation is designed to minimise such risks but they cannot be eliminated.

2. **GROUND INVESTIGATION.**

2.1 **BOREHOLE AND TRIAL PIT RECORDS.** These illustrate the ground conditions only at the location of the particular borehole or trial pit. Correlation between boreholes is for guidance only and its accuracy cannot be guaranteed.

2.2 **SHELL AND AUGER BORING.** This technique uses a tripod winch and an essentially percussive action using a variety of tools. Disturbed and undisturbed samples can be taken. This is the most suitable method for soft ground investigation, enabling the maximum amount of information to be obtained. However, minor changes in lithology may be overlooked unless continuous undisturbed sampling is used.

2.3 **GROUNDWATER**. Groundwater levels vary seasonally and the details given on the borehole logs relate only to the dates and the conditions described in the borehole records. The rate of boring may not have allowed an equilibrium water level to be established and the use of casing may seal off certain seepages.

2.4 **SAMPLING.** Disturbed samples of soils are taken for identification and classification purposes. In cohesive soils 'undisturbed' samples 100mm in diameter are taken by open drive sampler for laboratory testing of strength, permeability and consolidation characteristics.

2.5 **STANDARD PENETRATION TESTS**. S.P.T tests are used in granular and cohesive materials and in soft or weathered rocks. Difficulties in obtaining true 'N' values mean they must only be used as a guide and not as an absolute value in foundation design.

2.6 **ROTARY DRILLING.** Two main types of rotary drilling are carried out in rock. Rock coring using diamond or tungsten carbide tipped core bits provides samples and information on rock types, fissuring and weathering. Openhole drilling only produces small particles for identification purposes and the information gained is therefore limited. The latter is, however, useful as a quick method for detecting major strata changes and for the location of coal seams and old workings. Water, air, foam or drilling muds may be used as the flushing medium in either case.

2.7 **PERMEABILITY TESTS.** These can be carried out in boreholes or trial pits and gives a good indication of in-situ permeability.

2.8 **TRIAL PITTING.** This enables soil conditions to be closely examined at any specific point and samples taken. It also gives useful information on the stability of excavations and ingress of water.

2.9 **WINDOW SAMPLING**. Window sampling consists of driving a series of 1m-long tubes into the ground using a dropping weight. On completion of each 1m run, the tube is withdrawn. The next tube is then inserted and the process repeated to provide a continuous profile of the ground. On each run the tube diameter is reduced in order to assist in its recovery.

2.10 **GAS MONITORING.** This is routinely carried out in trial pits or probe holes to check for elevated levels of methane and carbon dioxide or oxygen deficiency, particularly since risks can exist from natural gases, landfill sites and rising groundwater levels in mine workings below ground. Longer term monitoring is carried out with gas monitoring standpipes.

3. **SOIL DESCRIPTION.** Samples from borings or trial pits are described as specified in the standard procedure outlined in the British Standards. The description includes colour, consistency, structure, weathering, lithological type, inclusions and origin. All descriptions are based on visual and manual identification.

Fire Soils (Cohesive Soils)

The following field terms are used:

Soil Type	Description
Very soft	Exudes between fingers
Soft	Moulded by light finger pressure
Firm	Cannot be moulded by the fingers but can be rolled in hand to 3mm threads.
Stiff	Crumbles and breaks when rolled to 3mm threads but can be remoulded to a lump.
Very stiff	No longer moulded but crumbles under pressure. Can be indented with thumbs.

The following terms are used in accordance with the results of laboratory and field tests.

Description	Undrained Shear Strength Cu (kPa)
Extremely Low	<10
Very Low	10 - 20
Low	20 - 40
Medium	40 - 75
High	75 - 150
Very High	150 - 300
Extremely High	>300

Fine soils can also be classified according to their sensitivity, which is the ratio between undisturbed and remoulded undrained shear strength.

Sensitivity	Ratio
Low	8
Medium	8 - 30
High	>30
Quick	>50

Granular Soils (Non-Cohesive)

The following descriptions are used for granular soils.

Description	Normalised Blow Count (N_1) 60
Very Loose	0 - 3
Loose	3 - 8
Medium	8 - 25
Dense	25 - 42
Very Dense	42 - 58

4. **NATURAL OR IN-SITU MOISTURE CONTENT**. The natural or in-situ moisture content of a soil is defined as the weight of water contained in the pore space, expressed as a percentage of the dry weight of solid matter present in the soil. Soil properties are greatly affected by the moisture content and the test can help to give an indication of likely engineering behaviour.

5. **LIQUID AND PLASTIC LIMITS**. Two simple classification tests are known as the liquid and plastic limits. If a cohesive soil is remoulded with increasing amounts of water, a point will be reached at which it ceases to behave as a plastic material and becomes essentially a viscous fluid. The moisture content corresponding to this change is arbitrarily determined by the liquid limit test. 'Fat' clays, which have high contents of colloidal particles, have high liquid limits; 'lean' clays, having low colloidal particle contents have correspondingly low liquid limits. An increase in the organic content of a clay is reflected by an increase in the liquid and plastic limits.

   If a cohesive soil is allowed to dry progressively, a point is reached at which it ceases to behave as a plastic material, which can be moulded in the fingers, and it becomes friable. The moisture content of the soil at this point is known as the 'plastic limit' of the soil.

   The range of water content over which a cohesive soil behaves plastically, i.e. the range lying between the liquid and plastic limits, is defined as the plasticity index.

   A cohesive soil with a natural water content towards its liquid limit will, in general, be an extremely soft material whereas a cohesive soil with a natural water content below its plastic limit will tend to be a stiff material.

6. **PARTICLE-SIZE DISTRIBUTION.** A knowledge of particle-size distribution is used to classify soils and to indicate likely engineering behaviour. British Standards define soils in relation to their particle-size as shown below:-

Boulders	>200mm	Coarse Sand	2.0 to 0.63mm
Cobbles	200 to 63mm	Medium Sand	0.63 to 0.2mm
		Fine Sand	0.2 to 0.063mm
Coarse Gravel	63 to 20mm	Coarse Silt	0.063 to 0.02mm
Medium Gravel	20 to 6.3mm	Medium Silt	0.02 to 0.0063mm
Fine Gravel	6.3 to 2mm	Fine Silt	0.0063 to 0.002mm
		Clay	<0.002mm

7. **BULK DENSITY.** The bulk density of a material is the weight of that material per unit volume and includes the effects of voids whether filled with air or water. The 'dry density' of a soil is defined as the weight of solids contained in a unit volume of the soil.

8. **PERMEABILITY.** The permeability of a material is defined as the rate at which water flows through it per unit area of soil under unit hydraulic gradient.

9. **CONSOLIDATION CHARACTERISTICS.** When subjected to pressure, a soil tends to consolidate as the air or water in the pore space is forced out and the grains assume a denser state of packing. The decrease in volume per unit of pressure is defined as the 'compressibility' of the soil, and a measure of the rate at which consolidation proceeds is given by the 'coefficient of consolidation' of the soil. These two characteristics Mv and Cv are determined in the consolidation test and the results are used to determine settlement of structures or earthworks.

10. **STRENGTH CHARACTERISTICS.** The strength of geological materials is generally expressed as the maximum resistance that they offer to deformation or fracture by applied shear or compressive stress. The strength characteristics of geological materials depend to an important degree on their previous history and on the conditions under which they will be stressed in practice. Consequently, it is necessary to simulate in the laboratory tests the conditions under which the material will be stressed in the field.

In general, the only test carried out on hard rocks is the determination of their compressive strength but consideration must be given to fissuring, jointing and bedding planes.

The tests at present in use for soils and soft rocks fall into two main categories. Firstly, those in which the material is stressed under conditions of no moisture content change, and secondly those in which full opportunity is permitted for moisture content changes under the applied stresses. Tests in the first category are known as undrained (immediate or quick) tests, while those in the second category are known as drained (slow or equilibrium) tests. The tests are normally carried out in the triaxial compression apparatus but granular materials may be tested in the shear box apparatus.

The undrained triaxial test gives the apparent cohesion C_u and the angle of shearing resistance $\emptyset_u$. In dry sands, $C_u = 0$ and $\emptyset_u$ is equal to the angle of internal friction whereas with saturated non-fissured clays $\emptyset u$ tends to 0 and the apparent cohesion C_u is equal to one-half the unconfined compression strength qu. On site the vane test gives an approximate measure of shear strength.

For some stability problems use is made of a variant of the undrained triaxial test in which the specimen is allowed to consolidate fully under the hydrostatic pressure and is then tested to failure under conditions of no moisture content change. This is known as the consolidated undrained triaxial test. Pore water pressures may be measured during this test or a fully drained test may be carried out. In either case the effective shear strength parameters C' and $\emptyset$' can be obtained which can be used to calculate shear strength at any given pore water pressure.

11. **COMPACTION.** The density at which any soil can be placed in an earth dam, embankment or road depends on its moisture content and on the amount of work which is used in compaction. The influence of these two factors can be studied in compaction tests, which can determine the maximum dry density (MDD) achievable at a certain optimum moisture content (OMC).

12. **CALIFORNIA BEARING RATIO TEST.** In flexible pavement design a knowledge of the bearing capacity of the subgrade is necessary to enable the thickness of pavement for any particular combination of traffic and site conditions to be determined. The quality of the subgrade can be assessed by means of the California Bearing Ratio Test or approximately by the MEXE cone penetrometer.

13. **ROCK DESCRIPTION.** This is based on;

i. Colour (minor then principal colour).
ii. Grain Size.

Description	Predominate Grain Size (mm)
Very Coarse - grained	>63
Coarse - grained	63 - 2
Medium - grained	2 - 0.063
Fine - grained	0.063 - 0.002
Very Fine - grained	<0.002

iii. Matrix.
iv. Weathering.

Term	Description
Fresh	No visible sign of weathering/alteration of the rock material.
Discoloured	The colour of the original fresh rock material is changed and is evidence of weathering/alteration. The degree of change from the original colour should be indicated. If the colour change is confined to particular mineral constituents, this should be mentioned.
Disintegrated	The rock material is broken up by physical weathering, so that bonding between grains is lost and the rock is weathered/altered towards the condition of a soil in which the original material fabric is still intact. The rock material is friable but the grains are not decomposed.
Decomposed	The rock material is weathered by the chemical alteration of the mineral grains to the condition of a sol in which the original material fabric is still intact; some or all of the grains are decomposed.

v. Carbonate Content.
vi. Stability of Rock Material.

Stable indicates no changes when sample left in water for 24 hours. Fairly stable indicates fissuring and crumbling of surfaces. Unstable indicates complete disintegration of the sample.

vii. Unconfined Compressive Strength.

Term	Field Identification	Unconfined Compressive Strength (MPa)
Extremely Weak[a]	Indented by thumbnail.	Less than 1
Very Weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife.	1 to 5
Weak	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer.	5 to 25
Medium Strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer.	25 to 50
Strong	Specimen required more than one blow of geological hammer to fracture it.	50 to 100
Very Strong	Specimen requires many blows of geological hammer to fracture it.	100 to 250
Extremely Strong	Specimen can only be chipped with geological hammer.	Greater than 250

[a] Some extremely weak rocks will behave as soils and should be described as soils.

viii. Structure.

Sedimentary	Metamorphic	Igneous
Bedded	Cleaved	Massive
Interbedded	Foliated	Flowbanded
Laminated	Schistose	Folded
Folded	Banded	Lineated
Massive	Lineated	
Graded	Gneissose	
	Folded	

ix. Discontinuities.
x. Discontinuity Spacing, persistence and roughness, infilling and seepage.
xi. Weathering of the Rock Mass.

Term	Description	Grades
Fresh	No visible sign of rock material weathering; perhaps slight discolouration on major discontinuity surfaces.	0
Slightly weathered	Discolouration indicates weathering of rock material and discontinuity surfaces.	1
Moderately weathered	Less than half of the rock material is decomposed or disintegrated. Fresh or discoloured rock is present either as a continuous framework or as core stones.	2
Highly weathered	More than half of the rock material is decomposed or disintegrated. Fresh or discoloured rock is present either as a continuous framework or as core stones.	3
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.	4
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soils has not been significantly transported.	5

xii. Rock Mass Permeability

14. **CHEMICAL TESTS.** A knowledge of total soluble sulphate content and pH of soils and groundwater is important in determining the protection required for concrete or steel in contact with the ground. Other specialist tests may be carried out on sites suspected of being contaminated by toxic materials (see standard appendix B).

15. **REFERENCES**

BS5930: 2015+A1:2020 British Standard Code of Practice for Site Investigations
BS10175: 2011+A2:2017 British Standard Code of Practice for the Investigation of Potentially Contaminated Sites

STANDARD APPENDIX B

NOTES ON CONTAMINATION INVESTIGATION PROCEDURE (June 2021)

1. **GENERAL.** The desk study and/or intrusive ground investigation is typically carried out in accordance with the Environment Agency's "Land Contamination Risk Management (LCRM) documents and the requirements of BS5930: 2015 and BS10175: 2011+A1: 2020. In relation to contamination the desk study is referred to as the preliminary investigation in BS10175 and the intrusive ground investigation is referred to as the Exploratory Investigation. This appendix briefly describes the nature of the work carried out and explains the standards against which contamination data has been assessed. The nature of any contamination investigation is such that only a small percentage of the ground, and therefore potential contamination, is sampled. Consequently variations in both ground conditions and contaminant levels can occur between any two sampling positions. The contamination investigation is designed to minimise such risks, but they cannot be eliminated.

2. **REVIEW OF CONTAMINATION ISSUES –** The National Planning Policy Framework (NPPF) and Part 2A of the Environmental Protection Act 1990 create a new regime for the identification and remediation of contaminated land. It introduced a definition of contaminated land described in Section 78A(2) of the Act of:

"any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that

(a) significant harm is being caused or there is a significant possibility of such harm being caused; or

(b) significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused:

Both Part 2A and the planning regime embrace the "suitable for use" approach. In the context of Part IIA, action is necessary only where there are unacceptable risks to health or to the environment, taking into account the current use of the land and its environmental setting.

For humans, significant harm is defined as "death, disease, serious injury ". Specifically, disease is taken to mean an unhealthy condition of the body or part of it. "Significant possibility of significant harm" is described as health effects arising from the intake of a contaminant or other direct bodily contact with the contaminant where the intake or exposure is unacceptable. The assessment should also take into account the total intake from all sources, the relative contribution of the pollutant linkage in question, and the duration of intake or exposure. The various statutory definitions are given overleaf.

The presence of unnatural substances does not automatically constitute a risk unless there is a link or pathway between the contamination (the hazard) and the receptor (the target) be it humans, the environment or property. Therefore the assessment needs to determine whether a hazard is present and whether the necessary pathway exists the so-called "pollution linkage" or "conceptual site model".

The effect of any hazard on a site depends primarily on the site use and groundwater conditions since these determine who and what may be at risk and the routes by which they may be exposed to the hazard. Site uses can include allotments, domestic gardens on residential developments, amenity and recreational areas, public open space and industrial and commercial buildings. On any site, the potential contaminants have to be identified together with the potential receptors. The pathway for that contaminant to reach its target has then to be considered.

3. **PRELIMINARY INVESTIGATION.** The preliminary Phase I Geoenvironmental Assessment (desk study) report normally considers the following key sections:

Introduction	
The Site	Contaminated Land
Site History	Radon
Geology and Mining	Geoenvironmental Risk Assessment
Hydrogeology	Geotechnical Assessment
Groundsure Geo-Insight and Enviro-Insight	Ground Investigation (Recommendations)

The report will summarise the findings and also relate our opinions to the potential for a site to be geoenvironmentally impaired, at levels likely to warrant mitigation or further consideration appropriate to the current or future use. Findings are based on information obtained and described during the desk study and site inspection without intrusive ground investigation. It is possible that further information exists. The absence of indicators of impairment does not mean that such impairment does not exist. Additional investigation including intrusive methods can reduce the risks but cannot eliminate them and may not be cost effective. We can advise on the additional research opportunities, their cost and their possible impact on mitigating risk. Recommendations are normally given based on the redevelopment proposals for the site.

Type of Receptor	Description of harm that is to be regarded as significant harm	Conditions For There Being A Significant Possibility Of Significant Harm
1. Human beings	Death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction or extensive skin ailments. Mental dysfunction is included only insofar as it is attributable to the effects of a pollutant on the body of the person concerned.	If the amount of the pollutant in the pollutant linkage represents an unacceptable intake or direct bodily contact, assessed on the basis of relevant information on the toxicological properties of that pollutant. Such an assessment should take into account: • the likely total intake of, or exposure to, the substance or substances which form the pollutant, from all sources including that from the pollutant linkage in question; • the relative contribution of the pollutant linkage in question to the likely aggregate intake of, or exposure to, the relevant substance or substances; and • the duration of intake or exposure resulting from the pollutant linkage in question. The question of whether an intake or exposure is unacceptable is independent of the number of people who might experience or be affected by that intake or exposure. Toxicological properties should be taken to include carcinogenic, mutagenic, teratogenic, pathogenic, endocrine-disrupting and other similar properties.
2. All other human health effects (particularly by way of explosion or fire)		If the probability, or frequency, of significant harm of that description is unacceptable. The pollutant linkage might cause "significant harm which" • would be irreversible or incapable of being treated; • would affect a substantial number of people; • would result from a single incident such as a fire or an explosion; or • would be likely to result from a short-term (lees than 24-hour) exposure to the pollutant.
3. Any ecological system, or living organism forming part of such a system, within a location which is protected.	For any protected location: • harm which results in an irreversible adverse change, or in some other substantial adverse change, in the functioning of the ecological system within any substantial part of that location; or • harm which affects any species of special interest within that location and which endangers the long-term maintenance of the population of that species at that location.	If either: • significant harm of that description is more likely than not to result from the pollutant linkage; or • there is a reasonable possibility of significant harm of that description being caused, and if that harm were to occur, it would result in such a degree of damage to features of special interest at the location in question that they would be beyond any practicable possibility of restoration.
4. Property in the form of: • crops, including timber; • produce grown domestically, or on allotments, for consumption; • livestock; • other owned or domesticated animals; • wild animals which are the subject of shooting or fishing rights.	For crops, a substantial diminution in yield or other substantial loss in the value resulting from death, disease or other physical damage. For domestic pets, death, serious disease or serious physical damage. For other property in this category, a substantial loss in its value resulting from death, disease or other serious physical damage.	If significant harm of that description is more likely than not to result from the pollutant linkage in question.
5. Property in the form of buildings.	Structural failure, substantial damage or substantial interference with any right of occupation.	If significant harm of that description is more likely than not to result from the pollutant linkage in question during the expected economic life of the building.
6. Controlled waters.		

4. **INTRUSIVE INVESTIGATION.** BS10175 describes this as an exploratory investigation. Intrusive ground investigation is described in Standard Appendix A. During the investigation representative or indicative samples are obtained for testing by an accredited laboratory. The aim is to determine (with a degree of confidence appropriate to the objectives), the presence, concentration and distribution of contaminants in respect of those points investigated. The extent of any necessary intrusive investigation will depend on the size of the site and any hazards, either known or suspected.

5. **ASSESSMENT OF CONTAMINATION.** The assessment of contaminated land under the terms of Part II A of the Environmental Protection Act 1990 is based upon pollution linkage (source - pathway - receptor model) and the principles of the Environment Agency's "Contamination Land Risk Management" documentation.

DEFRA previously issued "Outcome of the Way Forward Exercise on Soil Guideline Values". This document was intended to provide guidance to determine if there is a Significant Possibility of Significant Harm (SPOSH) i.e. whether land meets the legal trigger of being contaminated land.

In the context of Part 2A, a risk assessor using an SGV would conclude the following (DEFRA, 2008).

- At a representative average soil concentration at or below an SGV, it is very unlikely that there will be a *significant possibility of significant harm (SPOSH)*.

- At a representative average soil concentration above an SGV, there *might* be a *significant possibility of significant harm* with the significance linked to the margin of exceedance, the duration and frequency of exposure, and other site-specific factors that the enforcing authority may wish to take into account. Further investigation and/or detailed evaluation will usually be required.

It should be stressed that where there is any uncertainty as to whether or not there is a SPOSH, it was the policy of this practice to adopt a conservative approach, particularly in the adoption of clean cover systems.

In April 2012, Defra both published new Statutory Guidance which forms a major part of their contaminated land regimes under Part 2A of the Environment Protection Act 1990. The regime provides a means of dealing with contaminated land which poses a significant risk to human health or the environment where there is no alternative solution. It also works alongside planning rules and building regulations to help ensure that affected land is made suitable for use when it is redeveloped.

Since the regime was introduced in 2000 there has been considerable uncertainty over how to decide when land is, and is not contaminated land on grounds of the legal test of *significant possibility of significant harm to human health or the environment*.

To help address this, one of the main changes set out in the new Statutory Guidance, is the introduction of a new four category test to help decide when land is, and is not, contaminated land on grounds of *significant possibility of significant harm to human health*. Under the new four category test:

- Category 1 describes land that is clearly contaminated land, for example because similar land is known to have caused significant harm in the past.

- Categories 2 and 3 cover less straightforward land where more detailed consideration is needed before the regulator can decide either: (a) that there is a strong case for regulatory action, in which case the land would be in Category 2 and be classified as contaminated land under Part 2A; or (b) that such a case does not exist, in which case the land would be in Category 3 and not be classified as contaminated land under Part 2A.

- Category 4 describes land that is clearly not contaminated land, as discussed below.

One of the main purposes of including the Categories in the Statutory Guidance is to provide a legal framework against which new technical tools can be developed by the land contamination sector to describe the Categories in more detail with regard to specific substances and/or situations.

The new Category 4 test is particularly important in terms of reducing uncertainty over when land is definitely not caught by the regime.

The new Statutory Guidance makes clear what land should be placed into Category 4, for example:

(a) Land where no relevant contaminant linkage has been established.

(b) Land where there are only normal levels of contaminants in soil (as explained in Section 3 of the guidance), unless there is a particular reason to consider otherwise. In other words land with normal background concentrations in the soil.

(c) Land that has been excluded from the need for further inspection and assessment under Part 2A because contaminant levels do not exceed relevant generic assessment criteria in accordance with Section 3 of the guidance, or relevant technical tools or advice that may be developed in accordance with paragraph 3.30 of the guidance, e.g. Category 4 Screening Levels.

(d) Land where estimated levels of exposure to contaminants in soil are likely to form only a small proportion of what a receptor might be exposed to anyway through other sources of environmental exposure (e.g. in relation to average estimated national levels of exposure to substances commonly found in the environment, to which receptors are likely to be exposed to in the normal course of their lives).

The guidance clarifies how generic assessment criteria (including the currently available SGVs/GACs) should and should not be used. It states that:

3.27 It is common practice in contaminated land risk assessment to use "generic assessment criteria" (GACs) as screening tools in generic quantitative human health risk assessment to help assessors decide when land can be excluded from the need for further inspection and assessment, or when further work may be warranted.

3.28 Local authorities may use GACs and other technical tools to inform certain decisions under the Part 2A regime, provided: (i) they understand how they were derived and how they can be used appropriately; (ii) they have been produced in an objective, scientifically robust and expert manner by reputable organizations; and (iii) they are only used in a manner that is in accordance with Part 2A and this Guidance.

3.29 GACs relating to human health risk assessment represent cautious estimates of levels of contaminants in soil at which there is considered to be no risk to health or, at most, a minimal risk to health. With regard to such GACs:

(a) They may be used to indicate when land is very unlikely to pose a significant possibility of significant harm to human health. This is on the basis that they are designed to estimate levels of contamination at which risks are likely to be negligible or minimal and far from posing a significant possibility of significant harm to human health.

(b) They should not be used as direct indicators of whether a significant possibility of significant harm to human health may exist. Also, the local authority should not view the degree by which GACs are exceeded (in itself) as being particularly relevant to this consideration, given that the degree of risk posed by land would normally depend on many factors other than simply the amount of contaminants in soil.

(c) They should not be seen as screening levels which describe the boundary between Categories 3 and 4 in terms of Section 4 (i.e. the two Categories in which land would not be contaminated land on grounds of risks to human health). In the very large majority of cases, these SGVs/GACs describe levels of contamination from which risks should be considered to be comfortably within Category 4.

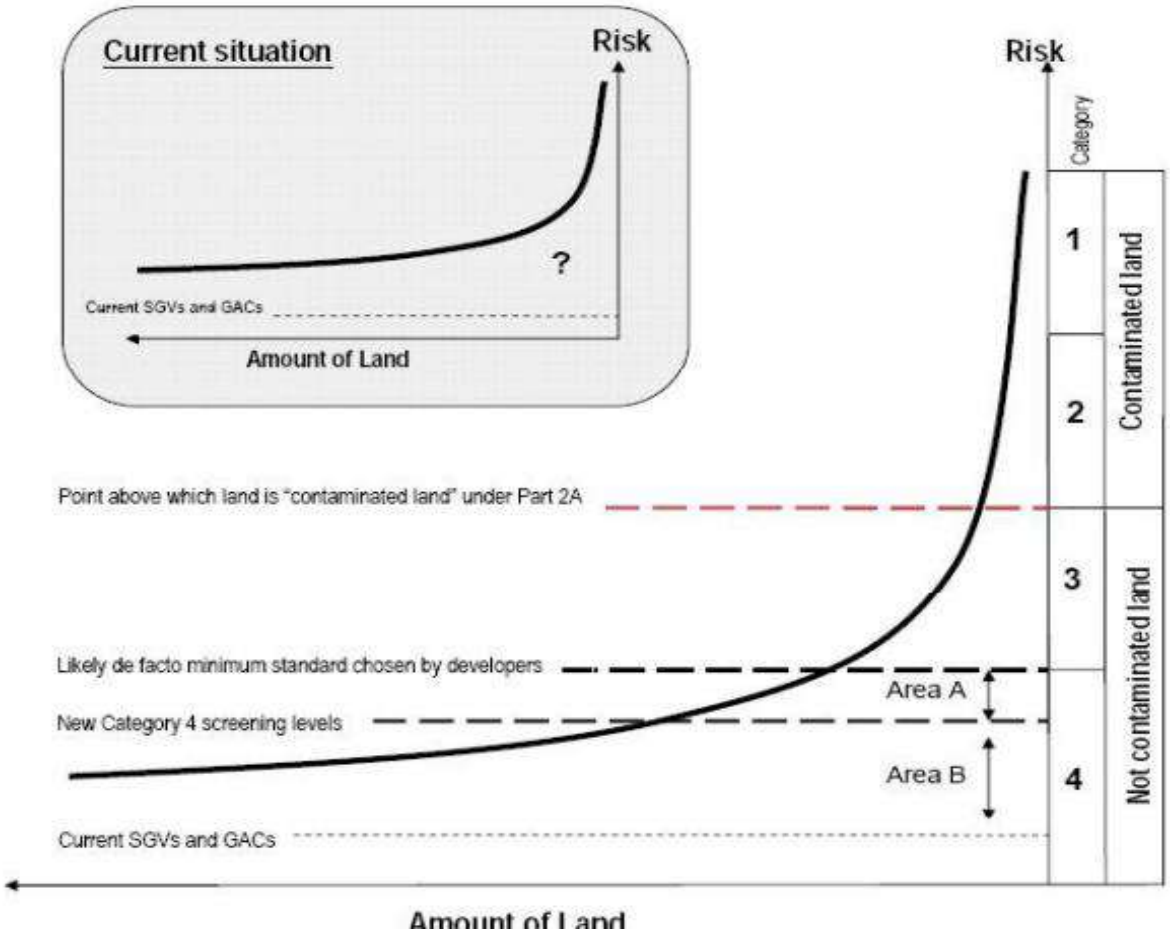
(d) They should not be viewed as indicators of levels of contamination above which detailed risk assessment would automatically be required under Part 2A.

(e) They should not be used as generic remediation targets under the Part 2A regime. Nor should they be used in this way under the planning system, for example in relation to ensuring that land affected by contamination does not meet the Part 2A definition of contaminated land after it has been developed.

The way in which the new four category system is intended to operate and the place of the C4SLs within that system, was explained in detail in the Impact Assessment which accompanied the Statutory Guidance. Please note that although the detail of the Impact Assessment is included here to provide clarity on the job expected of C4SLs, the Statutory Guidance, itself, sets out the regime that needs to be delivered under Part 2A.

Paragraph 47 of the Impact Assessment describes the diagram in detail. Of particular relevance to this project is the description of the overall diagram (sub-paragraph a), description of category 4 (sub-paragraphs c (part iv) and h) and the description of how the monetised benefits of the new system will be realised (sub-paragraph h). These sub-paragraphs are reproduced below.

Diagram showing the new Category 1-4 system (compared to current situation)



The diagram above seeks to illustrate, in a simplified manner, broadly what the changes to the statutory guidance on significant possibility of significant harm to human health are intended to achieve. To explain:

(a) The curved line and axes illustrate the spectrum of risk presented by land contamination. The idea is to show that a very large amount of land is low risk, and only a small amount of land would pose sufficient risk to be contaminated land in the legal sense. The axes and lines in the diagrams are not to scale, and they have been compressed for the purposes of illustration (in reality the risks on Category 1 land would probably be orders of magnitude above Category 4 risks, and vastly more land would be in Category 4 compared to the other Categories).

(b) The smaller diagram summarizes the current situation. In the area below the SGV/GACs there is near certainty that land is not contaminated land, however, above the line there is increasing uncertainty. As explained above, currently remediation usually occurs to just below the SGV/GAC level because they are perceived as offering the only cast-iron guarantee of when land is definitely not contaminated land. Sometimes consultants are employed to justify remediating to levels above the SGV/GACs, however the further they go away from the SGV/GACs the more legal risk they and their clients are exposed to.

(c) The new statutory guidance will end the current situation, and it would not be legally possible e.g. for individual regulators to ignore the changes being made. For example, as explained above, the new statutory guidance will specifically say:

(i) that Part 2A cannot be used to force remediation to below a point where it ceases to be contaminated land in the legal sense i.e. the Category 2/3 border in terms of the diagram), although responsible parties can choose to go further;

(ii) that SGV/GACs cannot be used as one size fits all remediation thresholds under either Part 2A of the planning system;

(iii) that normal background levels of contamination are not caught by Part 2A; and

(iv) that SGV/GACs are well into Category 4, sometimes by only a few times and sometimes by orders of magnitude. These changes and others also provide the legal backing for the development e.g. of Category 4 screening levels, as discussed below.

(d) The new Category 1-4 system divides the spectrum of risk posed by contaminated land into four different categories, and the statutory guidance will explain how to decide when land falls into each Category. This is more sophisticated than the current statutory guidance, which in effect has only two categories (contaminated land or not) and does not explain how to decide which category land falls into. The new Category 1-4 system

reflects what assessors find when they investigate real sites i.e. some are clearly contaminated land (Category 1) ; some clearly are not (Category 4) and some are less-straightforward and need some level of detailed assessment before a decision can be taken as to whether or not they are contaminated land (Categories 2 and 3).

(e) In the case of Category 2 and 3 sites, the regulator will have flexibility to take decisions within the parameters set by the new Guidance. There would be less flexibility for Category 2 and 3 sites that clearly pose either a high or low risk. However, the regulator will have considerable flexibility for sites closer to the Category 2/3 border to judge which side of the border a site would fall (e.g. taking account of their understanding of the risks, uncertainties and the interests of the local community). These are often complex decisions which need to be taken case-by-case given the many factors involved.

(f) In the case of Categories 1 and 4 the regulator will have far less flexibility. For example, if a regulator claimed that a site matching the Category 1 description was not contaminated land, or that a site matching the Category 4 description was contaminated land, they would be acting directly against the statutory guidance which the Act requires that they follow, and decisions could be challenged (e.g. in a law court) with a high chance that the challenge would be successful. Among other things, the intention of doing this is to create far more legal certainty around when land is definitely not contaminated land in the legal sense. With the specific wording of the new statutory guidance, and the supporting tools such as the new Category 4 screening levels, it would be very difficult for a regulator e.g. to threaten landowners with the Part 2A regime, and if they tried to determine land as contaminated land they would be operating in direct opposition to the statutory guidance.

(g) In the many consultation meetings held in developing the Category 1-4 system, all the developers, landowners and consultants we spoke to were strongly of the view that they would want the ensure their land is safely within Category 4 (even though in theory they could remediate to a level within Category 3 and still satisfy Part 2A and planning rules). They would do this for various reasons, including the fact that the flexibility granted to regulators in Categories 2 and 3 means that the further into Category 3 a site gets, the greater the risk that the regulator might decide it is in Category 2. Also they would want to be in Category 4 for reasons of marketability, future proofing etc. So developers and others would have a strong incentive to seek the regulatory certainty of being safely within Category 4. Thus, as far as development taking place under the planning system is concerned, Category 3 would, in effect, normally be a buffer which provides added reassurance that development falling within Category 4 will not be caught by the Part 2A regime.

(h) The new statutory guidance will bring about a situation where the current SGV/GACs are replaced with more pragmatic (but still strongly precautionary) Category 4 screening levels (C4SLs) which will provide a higher simple test for deciding that land is suitable for use and definitely not contaminated land. Above the C4SLs, in Area A on the diagram, there will be much stronger legal backing for experts to use their judgement to make sensible and precautionary decisions on when land should be considered to be towards the top end of Category 4, without fear that land may be caught as contaminated land. This recognizes that the generic C4SLs will not be able to describe the Category 3/4 border itself because they are generic and would therefore have to err on the side of caution whilst a detailed site specific assessment would be able to push further by looking at specific circumstances relating to a specific site.

(i) The very large majority of the monetized benefits of the changes to the regime discussed in this Impact Assessment manifest themselves in Category 4, and in particular in Areas A and B on the diagram. The main effects of moving to the new system would include Low risk land falling within Area B (pre-development) on the diagram would no longer have to be remediated because it would fall below the new C4SLs. Similarly land which is in Area A pre-development would no longer need to be remediated if justified by a detailed site-specific assessment. For these sites the cost of remediation would be removed altogether. The cost of remediating land which is initially in Categories 3, 2 or 1 would fall because it would be remediated to the new C4SL levels (or somewhere within Area A if there has been a detailed assessment) rather than the SGV/GAC level. This will have the overall effect of reducing the cost of remediation, with the effect varying according to specific site circumstances, the type of remediation etc. Generally the cost of remediation would fall for many affected brownfield land sites. This would have the general effect of making such land more economically viable for development. It would also mean that some land that is not currently economically viable to develop becomes reduce pressure to develop Greenfield land in some cases. The C4SLs will also speed up regulatory decisions on the reuse of brownfield land by providing a simple remediation standard.

The C4SLs are intended as "*relevant technical tools*" (in relation to Paragraph 4.2.1(c)) provides to help local authorities and others when deciding to stop further assessment of a site, on the grounds that it falls within Category 4 (Human Health).

The Impact Assessment (IA), which accompanied the revised SG (Defra, 2012b) provides further information on the nature and potential role of the C4SLs. Paragraph 47(h) of the IA states that:

> *"The new statutory guidance with bring about a situation where the current SGVs/GACs are replaced with more pragmatic (but still strongly precautionary) Category 4 screening levels (C4SLs) which will provide a higher simple test for deciding that land is suitable for use and definitely not contaminated land".*

A key distinction between the Soil Guideline Values (SGVs) and the C4SLs is the level of risk that they describe. As described by the Environment Agency (2009a):

> *"SGVs are guidelines on the level of long-term human exposure to individual chemicals in soils that, unless stated otherwise, are tolerable or pose a minimal risk to human health".*

C4SLs, therefore, should not be viewed as "SPOSH levels" and they should not be used as a legal trigger for the determination of land under Part 2A.

CL:AIRE (Contaminated Land: Application in Real Environments) has published "*Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination*". In it a series of C4SLs were proposed as follows;

Analyte	Residential (with home grown produce) (mg/kg)	Residential (without home grown produce) (mg/kg)	Allotments (mg/kg)	Commercial (mg/kg)	POS (mg/kg)
Arsenic	37	40	49	640	79
Benzene	0.87	3.3	0.18	98	140
Benzo(a)Pyrene	5	5.3	5.7	77	10
Cadmium	22	150	3.9	410	880
Chromium (vi)	21	21	170	49	21
Lead	200	310	80	2300	630

Where C4SL's are not available, Generic Assessment Criteria have been used as follows;

Generic Assessment Criteria for Human Health Risk Assessment Comparison
METALS/CYANIDE

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and based on 6% soil organic matter (SOM)
Values are expressed in mg/kg

	S4UL						C4SL						EA SGV			EIC/AGS/CL:AIRE or *ATRISKSOIL		
	Residential with homegrown produce	Residential without homegrown produce	Allotment	Commercial	POSresi	POSpark	Residential with homegrown produce	Residential without homegrown produce	Allotment	Commercial	POSresi	POSpark	Residential	Allotment	Commercial	Residential without consumption of homegrown produce	Allotment	Commercial
Antimony[1]																550	ND	7500
Arsenic (6% SOM)	37	40	43	640	79	170	37	40	49	640	79	170	32	43	640			
Barium[1]																1300	ND	22000
Beryllium (6% SOM)	1.7	1.7	35	12	2.2	63												
Boron (6% SOM)	290	11000	45	240000	21000	46000												
Cadmium (6% SOM)	11	85	1.9	190	120	560	22	150	3.9	410	220	880	10	1.8	230			
Chromium (III) (6% SOM)	910	910	18000	8600	1500	33000												
Chromium (VI) (6% SOM)	6	6	1.8	33	7.7	220	21	21	170	49	21	250						
Copper (6% SOM)	2400	7100	520	68000	12000	44000												
Cyanide (AtriskSoil)																34*	34*	34*
Lead (6% SOM)							200	310	80	2300	630	1300						
Nickel (6%SOM)	130	180	53	980	230	800												
Mercury (Elemental) (6% SOM)	1.2	1.2	21	58	16	30							1.0	26	26			
Mercury (Inorganic) (6% SOM)	40	56	19	1100	120	240							170	80	3600			
Mercury (Methyl) (6% SOM)	11	15	6	320	40	68							11	8	410			
Molybdbenum[1]																670	ND	17000
Selenium (6% SOM)	250	430	88	12000	1100	1800							350	120	13000			
Vanadium (6% SOM)	410	1200	91	9000	2000	5000												
Zinc (6% SOM)	3700	40000	620	730000	81000	170000												

Additional notes for EIC/AGS/CL:AIRE GAC

1 Due to the limitations in time and scope of the EIC/AGS/CL:AIRE project, plant uptake factors were not derived for metals and therefore the metals GAC have only been produced for residential without consumption of homegrown produce and commercial land-uses. Note that the derived GAC are not dependent on SOM.

PETROLEUM HYDROCARBONS

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and 1%, 2.5% and 6% soil organic matter (SOM).
SGVs based on 6% SOM, at a lower SOM the SGV may not be sufficiently protective.
Generic assessment criteria for Petroleum Hydrocarbons will vary according to SOM for all land values
Values are expressed in mg/kg
GACs assume that free phase contamination is not present
GACs are based on sub-surface soil to indoor air correction factor of 10

	S4UL						C4SL						EA SGV			EIC/AGS/CL:AIRE			
Compound	**Residential with homegrown produce**	**Residential without homegrown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential with homegrown produce**	**Residential without homegrown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential**	**Allotment**	**Commercial**	**Residential with consumption of homegrown produce**	**Residential without consumption of homegrown produce**	**Allotment**	**Commercial**
Aliphatic EC 5-6 (1% SOM)	42	42	730	3200 (340)	570000 (304)	95000 (304)													
Aliphatic EC 5-6 (2.5% SOM)	78	78	1700	5900 (558)	590000	130000 (558)													
Aliphatic EC 5-6 (6% SOM)	160	160	3900	12000 (1150)	600000	18000 (1550)													
Aliphatic EC>6-8 (1% SOM)	100	100	2300	7800 (144)	600000	150000 (144)													
Aliphatic EC>6-8 (2.5% SOM)	230	230	5600	17000 (322)	610000	220000 (322)													
Aliphatic EC>6-8 (6% SOM)	530	530	13000	40000 (736)	620000	320000 (736)													
Aliphatic EC>8-10 (1% SOM)	27	27	320	2000 (78)	13000	14000 (78)													
Aliphatic EC>8-10 (2.5% SOM)	65	65	770	4800 (190)	13000	18000 (190)													
Aliphatic EC>8-10 (6% SOM)	150	150	1700	11000 (451)	13000	21000 (451)													
Aliphatic EC>10-12 (1% SOM)	130 (48)	130 (48)	2200	9700 (48)	13000	21000 (48)													
Aliphatic EC>10-12 (2.5% SOM)	330 (118)	330 (118)	4400	23000 (118)	13000	23000 (118)													
Aliphatic EC>10-12 (6%SOM)	760 (283)	770 (283)	7300	47000 (283)	13000	24000 (283)													
Aliphatic EC>12-16 (1% SOM)	1100 (24)	1100 (24)	11000	59000 (24)	13000	25000 (24)													
Aliphatic EC>12-16 (2.5% SOM)	2400 (59)	2400 (59)	13000	82000 (59)	13000	25000 (59)													
Aliphatic EC>12-16 (6% SOM)	4300 (142)	4300 (142)	13000	90000 (142)	13000	26000 (142)													
Aliphatic EC>16-35 (1% SOM)	65000 (8.48)	65000 (8.48)	260000	1600000	250000	450000													
Aliphatic EC>16-35 (2.5% SOM)	92000 (21)	92000 (21)	270000	1700000	250000	480000													
Aliphatic EC>16-35 (6% SOM)	110000	110000	270000	1800000	250000	490000													
Aliphatic EC>35-44 (1% SOM)	65000 (8.48)	65000 (8.48)	260000	1600000	250000	450000													
Aliphatic EC>35-44 (2.5% SOM)	92000 (21)	92000 (21)	270000	1700000	250000	480000													
Aliphatic EC>35-44 (6% SOM)	110000	110000	270000	1800000	250000	490000													
Aromatic EC 5-7 (1% SOM)	70	370	13	26000 (1220)	56000	76000 (1220)													
Aromatic EC 5-7 (2.5% SOM)	140	690	27	46000 (2260)	56000	84000 (2260)													
Aromatic EC 5-7 (6% SOM)	300	1400	57	86000 (4710)	56000	92000 (4710)													
Aromatic EC>7-8 (1% SOM)	130	860	22	56000 (869)	56000	87000 (869)													
Aromatic EC>7-8 (2.5% SOM)	290	1800	51	110000 (1920)	56000	95000 (1920)													
Aromatic EC>7-8 (6% SOM)	660	3900	120	180000 (4360)	56000	100000 (4360)													
Aromatic EC>8-10 (1% SOM)	34	47	8.6	3500 (613)	5000	7200 (613)													
Aromatic EC>8-10 (2.5% SOM)	83	110	21	8100 (1500)	5000	8500 (1500)													
Aromatic EC>8-10 (6% SOM)	190	270	51	17000 (3580)	5000	9300 (3580)													
Aromatic EC>10-12 (1% SOM)	74	250	13	16000 (364)	5000	9200 (364)													
Aromatic EC>10-12 (2.5% SOM)	180	590	31	28000 (899)	5000	9700 (899)													
Aromatic EC>10-12 (6% SOM)	380	1200	74	34000 (2150)	5000	10000													
Aromatic EC>12-16 (1% SOM)	140	1800	23	36000 (169)	5100	10000													
Aromatic EC>12-16 (2.5% SOM)	330	2300 (419)	57	37000	5100	10000													
Aromatic EC>12-16 (6% SOM)	660	2500	130	38000	5000	10000													
Aromatic EC>16-21 (1% SOM)	260	1900	46	28000	3800	7600													
Aromatic EC>16-21 (2.5% SOM)	540	1900	110	28000	3800	7700													
Aromatic EC>16-21 (6% SOM)	930	1900	260	28000	3800	7800													
Aromatic EC>21-35 (1% SOM)	1100	1900	370	28000	3800	7800													
Aromatic EC>21-35 (2.5% SOM)	1500	1900	820	28000	3800	7800													
Aromatic EC>21-35 (6% SOM)	1700	1900	1600	28000	3800	7900													
Aromatic EC>35-44 (1% SOM)	1100	1900	370	28000	3800	7800													
Aromatic EC>35-44 (2.5% SOM)	1500	1900	820	28000	3800	7800													
Aromatic EC>35-44 (6% SOM)	1700	1900	1600	28000	3800	7900													
Aliphatic + Aromatic EC>44-70 (	1600	1900	1200	28000	3800	7800													
Aliphatic + Aromatic EC>44-70 (	1800	1900	2100	28000	3800	7800													
Aliphatic + Aromatic EC>44-70 (	1900	1900	3000	28000	3800	7800													

	S4UL						C4SL						EA SGV			EIC/AGS/CL:AIRE			
Compound	**Residential with homegrown produce**	**Residential without homegrown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential with homegrown produce**	**Residential without homegrown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential**	**Allotment**	**Commercial**	**Residential with consumption of homegrown produce**	**Residential without consumption of homegrown produce**	**Allotment**	**Commercial**
Benzene (1% SOM)	0.087	0.38	0.017	27	72	90													
Benzene (2.5% SOM)	0.17	0.7	0.034	47	72	100													
Benzene (6% SOM)	0.37	1.4	0.075	90	73	110	0.87	3.3	0.18	98	140	230	0.33	0.07	95				
Toluene (1% SOM)	130	880 (869)	22	56000 (869)	56000	87000 (869)													
Toluene (2.5% SOM)	290	1900	51	110000 (1920)	56000	95000 (1920)													
Toluene (6% SOM)	660	3900	120	180000 (4360)	56000	100000 (4360)							610	120	$4.4x10^3$				
Ethyl benzene (1% SOM)	47	83	16	5700 (518)	24000	17000 (518)													
Ethyl benzene (2.5% SOM)	110	190	39	13000 (1220)	24000	22000 (1220)													
Ethyl benzene (6% SOM)	260	440	91	27000 (2840)	25000	27000 (2840)							350	90	$2.8x10^3$				
o-xylene (1%SOM)	60	88	28	6600 (478)	41000	17000 (478)													
o-xylene (2.5% SOM)	140	210	67	15000 (1120)	42000	24000 (1120)													
o-xylene (6% SOM)	330	480	160	33000 (2620)	43000	33000 (2620)							250	160	$2.6x10^3$				
m-xylene (1% SOM)	59	82	31	6200 (625)	41000	17000 (625)													
m-xylene (2.5% SOM)	140	190	74	14000 (1470)	42000	24000 (1470)													
m-xylene (6% SOM)	320	450	170	31000 (3460)	43000	32000 (3469)							240	180	$3.5x10^3$				
p-xylene (1% SOM)	56	79	29	5900 (576)	41000	17000 (478)													
p-xylene (2.5% SOM)	130	180	69	14000 (1350)	42000	23000 (1350)													
p-xylene (6% SOM)	310	430	160	30000 (3170)	43000	31000 (3170)							230	160	$3.2x10^3$				
Methyl tert-butyl ether (1% SOM)																49	73	23	7900
Methyl tert-butyl ether (2.5% SOM)																84	120	44	13000
Methyl tert-butyl ether (6% SOM)																160	220	90	24000

Additional Notes for LQM/CIEH Generic Assessment Criteria

1 For residential land use the inhalation of vapours indoors exposure pathway is the most significant exposure pathway for the lighter end aliphatic and aromatic fractions (up to aliphatic EC>12-16 and aromatic EC>10-12). The ingestion of soil and indoor dust and consumption of homegrown produce exposure pathways are the most significant for the higher end fractions (aliphatics EC>16-35 and EC>35-44; aromatics EC>12-16, EC16-21, EC>21-35, EC>35-44 and EC44-70).

2 For the allotment land use the consumption of homegrown produce exposure pathway is the most significant for the aromatic and lighter end aliphatic fractions. The ingestion of soil and and indoor dust is the most significant exposure pathway for the higher end aliphatics EC>12-16, EC>16-35 and EC35-44.

3 For the commercial land use the indoor inhalation of vapour exposure pathway is a significant exposure pathway for the lighter end aliphatic and aromatic fractions (up to aliphatic EC>12-16 and aromatic EC>10-12.

4 Background exposure represents a significant proportion of the total exposure for all fractions expect aromatic fractions EC>5-7 and EC>7-8 in all land uses.

Notes for SGVs

1 Based on a sandy loam as defined in Environment Agency (2009b) and 6% SOM. At a lower SOM, SGVs may not be sufficient protective.
2 Generic assessment criteria will vary according to SOM for all land uses.
3 SGVs assume that free phase contamination is not present.
4 SGVs based on a sub-surface soil to indoor air correction air correction factor of 10.
5 SGV presented for Toluene Commercial based on the vapour saturation limit.
6 SGV presented for Ethylbenzene Allotment and Xylene Allotment - in applying the rules for non-soil background, the inhalation background ADE is limited to being no larger than the contribution of the inhalation soil ADE.
7 Exposure of all isomers of xylene should be considered together, because the HCV applied is based on intake of total xylene and not an individual isomer in isolation.

Notes for EIC/AGS/CL:AIRE Generic Assessment Criteria

1 GAC have been derived for 4 generic land uses; residential with consumption of homegrown produce, residential without consumption of homegrown produce, allotments and commercial land-use.

POLYAROMATIC HYDROCARBONS

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and 1%, 2.5% and 6% soil organic matter (SOM)
Generic assessment criteria for Polycyclic Aromatic Hydrocarbons will vary according to SOM for all land values
Values are expressed in mg/kg
GACs assume that free phase contamination is not present
GACs are based on sub-surface soil to indoor air correction factor of 1

	LQM/CIEH						C4SL					
Compound	**Residential with home grown produce**	**Residential without home grown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential with home grown produce**	**Residential without home grown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**
Acenaphthene (1% SOM)	210	3000 (57)	34	84000 (57)	15000	29000						
Acenaphthene (2.5% SOM)	510	4700 (141)	85	97000 (141)	15000	30000						
Acenaphthene (6% SOM)	1100	6000 (336)	200	100000	15000	30000						
Acenaphthylene (1% SOM)	170	2900 (86.1)	28	83000 (86.1)	15000	29000						
Acenaphthylene (2.5% SOM)	420	4600 (212)	69	97000 (212)	15000	30000						
Acenaphthylene (6% SOM)	920	6000 (506)	160	100000	15000	30000						
Anthracene (1% SOM)	2400	31000 (1.17)	380	520000	74000	150000						
Anthracene (2.5% SOM)	5400	35000	950	540000	74000	150000						
Anthracene (6% SOM)	11000	37000	2200	540000	74000	150000						
Benz(a)anthracene (1% SOM)	7.2	11	2.9	170	29	49						
Benz(a)anthracene (2.5% SOM)	11	14	6.5	170	29	56						
Benz(a)anthracene (6% SOM)	13	15	13	180	29	62						
Benzo(a)pyrene (1% SOM)	2.2	3.2	0.97	35	5.7	11						
Benzo(a)pyrene (2.5% SOM)	2.7	3.2	2.0	35	5.7	12						
Benzo(a)pyrene (6% SOM)	3.0	3.2	3.5	36	5.7	13	5.0	5.3	5.7	77	10	21
Benzo(b)fluoranthene (1% SOM)	2.6	3.9	0.99	44	7.1	13						
Benzo(b)fluoranthene (2.5% SOI	3.3	4.0	2.1	44	7.2	15						
Benzo(b)fluoranthene (6% SOM)	3.7	4.0	3.9	45	7.2	16						
Benzo(ghi)perylene (1% SOM)	320	360	290	3900	640	1400						
Benzo(ghi)perylene (2.5% SOM)	340	360	470	4000	640	1500						
Benzo(ghi)perylene (6% SOM)	350	360	640	4000	640	1600						
Benzo(k)fluoranthene (1% SOM)	77	110	37	1200	190	370						
Benzo(k)fluoranthene (2.5% SOI	93	110	75	1200	190	410						
Benzo(k)fluoranthene (6% SOM)	100	110	130	1200	190	440						
Chrysene (1% SOM)	15	30	4.1	350	57	93						
Chrysene (2.5% SOM)	22	31	9.4	350	57	110						
Chrysene (6% SOM)	27	32	19	350	57	120						
Dibenzo(ah)anthracene (1% SOI	0.24	0.31	0.14	3.5	0.57	1.1						
Dibenzo(ah)anthracene (2.5% S	0.28	0.32	0.27	3.6	0.57	1.3						
Dibenzo(ah)anthracene (6% SOI	0.3	0.32	0.43	3.6	0.58	1.4						
Fluoranthene (1% SOM)	280	1500	52	23000	3100	6300						
Fluoranthene (2.5% SOM)	560	1600	130	23000	3100	6300						
Fluoranthene (6% SOM)	890	1600	290	23000	3100	6400						
Fluorene (1% SOM)	170	2800 (30.9)	27	63000 (30.9)	9900	20000						
Fluorene (2.5% SOM)	400	3800 (76.5)	67	68000	9900	20000						
Fluorene (6% SOM)	860	4500 (183)	160	71000	9900	20000						
Indeno(123cd)pyrene (1% SOM)	27	45	9.5	500	82	150						
Indeno(123cd)pyrene (2.5% SOI	36	46	21	510	82	170						
Indeno(123cd)pyrene (6% SOM)	41	46	39	510	82	180						
Naphthalene (1% SOM)	2.3	2.3	4.1	190 (76.4)	4900	1200 (76.4)						
Naphthalene (2.5% SOM)	5.6	5.6	10	460 (183)	4900	1900 (183)						
Naphthalene (6% SOM)	13	13	24	1100 (432)	4900	3000						
Phenanthrene (1% SOM)	95	1300 (36)	15	22000	3100	6200						
Phenanthrene (2.5% SOM)	220	1500	38	22000	3100	6200						
Phenanthrene (6% SOM)	440	1500	90	22000	3100	6300						
Pyrene (1% SOM)	620	3700	110	54000	7400	15000						
Pyrene (2.5% SOM)	1200	3800	270	54000	7400	15000						
Pyrene (6% SOM)	2000	3800	620	54000	7400	15000						
Coal Tar (BaP as surrogate marl	0.79	1.2	0.32	15	2.2	4.4						
Coal Tar (BaP as surrogate marl	0.98	1.2	0.67	15	2.2	4.7						
Coal Tar (BaP as surrogate marl	1.1	1.2	1.2	15	2.2	4.9						

CHLOROALCANES AND ALKANES

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and 1%, 2.5% and 6% soil organic matter (SOM)
Generic assessment criteria will vary according to SOM for all land values
Values are expressed in mg/kg
GACs assume that free phase contamination is not present
GACs are based on sub-surface soil to indoor air correction factor of 1

	S4UL						EIC/AGS/CL:AIRE			
Compound	**Residential with home grown produce**	**Residential without home grown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential with consumption of homegrown produce**	**Residential without consumption of homegrown produce**	**Allotment**	**Commercial**
1,1-Dichloroethane (1% SOM)							2.4	2.5	9.2	280
1,1-Dichloroethane (2.5% SOM)							3.9	4.1	17	450
1,1-Dichloroethane (6% SOM)							7.4	7.7	35	850
1,2-Dichloroethane (1% SOM)	0.0071	0.0092	0.0046	0.67	29	21				
1,2-Dichloroethane (2.5% SOM)	0.011	0.013	0.0083	0.97	29	24				
1,2-Dichloroethane (6% SOM)	0.019	0.023	0.016	1.7	29	28				
1,1,1-Trichloroethane (1% SOM)	8.8	9	48	660	140000	57000 (1425)				
1,1,1-Trichloroethane (2.5% SOI	18	18	110	1300	140000	76000 (2915)				
1,1,1-Trichloroethane (6% SOM)	39	40	240	3000	140000	100000 (6392)				
1,1,2-Trichloroethane (1% SOM)							0.6	0.88	0.28	94
1,1,2-Trichloroethane (2.5% SOM)							1.2	1.8	0.61	190
1,1,2-Trichloroethane (6% SOM)							2.7	3.9	1.4	400
1,1,1,2-Tetrachloroethane (1% S	1.2	1.5	0.79	110	1400	1500				
1,1,1,2-Tetrachloroethane (2.5%	2.8	3.5	1.9	250	1400	1800				
1,1,1,2-Tetrachloroethane (6% S	6.4	8.2	4.4	560	1400	2100				
1,1,2,2-Tetrachloroethane (1%SI	1.6	3.9	0.41	270	1400	1800				
1,1,2,2-Tetrachloroethane (2.5%	3.4	8.0	0.89	550	1400	2100				
1,1,2,2-Tetrachloroethane (6%SI	7.5	17	2.0	1100	1400	2300				
1,1-Dichloroethene (1% SOM)							0.23	0.23	2.8	26
1,1-Dichloroethene (2.5% SOM)							0.40	0.41	5.6	46
1,1-Dichloroethene (6% SOM)							0.82	0.82	12	92
Tetrachloroethene (1% SOM)	0.18	0.18	0.65	19	1400	810 (424)				
Tetrachloroethene (2.5% SOM)	0.39	0.40	1.5	42	1400	1100 (951)				
Tetrachloroethene (6% SOM)	0.9	0.92	3.6	95	1400	1500				
Tetrachloromethane (1% SOM)	0.026	0.026	0.45	2.9	890	190				
Tetrachloromethane (2.5% SOM	0.056	0.056	1.0	6.3	920	270				
Tetrachloromethane (6% SOM)	0.13	0.13	2.4	14	950	400				
Trichloroethene (1% SOM)	0.016	0.017	0.041	1.2	120	70				
Trichloroethene (2.5% SOM)	0.034	0.036	0.091	2.6	120	91				
Trichloroethene (6% SOM)	0.075	0.080	0.21	5.7	120	120				
Trichloromethane (1% SOM)	0.91	1.2	0.42	99	2500	2600				
Trichloromethane (2.5% SOM)	1.7	2.1	0.83	170	2500	2800				
Trichloromethane (6% SOM)	3.4	4.3	1.7	350	2500	3100				
Vinyl Chloride (1% SOM)	0.00064	0.00077	0.00055	0.059	3.5	4.8				
Vinyl Chloride (2.5% SOM)	0.00087	0.0010	0.0010	0.077	3.5	5.0				
Vinyl Chloride (6% SOM)	0.0014	0.0015	0.0018	0.12	3.5	5.4				
Chloroethane (1% SOM)							8.3	8.4	110	960
Chloroethane (2.5% SOM)							11	11	200	1300
Chloroethane (6% SOM)							18	18	380	2100
1,2-Dichloropropane (1% SOM)							0.024	0.024	0.62	3.3
1,2-Dichloropropane (2.5% SOM)							0.042	0.042	1.2	5.9
1,2-Dichloropropane (6% SOM)							0.084	0.085	2.6	12
2-Chloronaphthalene (1% SOM)							3.7	3.8	40	390
2-Chloronaphthalene (2.5% SOM)							9.2	9.3	98	960
2-Chloronaphthalene (6% SOM)							22	22	230	2200
Bromodichloromethane (1% SOM)							0.016	0.019	0.016	2.1
Bromodichloromethane (2.5% SOM)							0.030	0.034	0.032	3.7
Bromodichloromethane (6% SOM)							0.061	0.07	0.068	7.6
Chloromethane (1% SOM)							0.0083	0.0085	0.066	1
Chloromethane (2.5% SOM)							0.0098	0.0099	0.13	1.2
Chloromethane (6% SOM)							18	18	380	2100

	S4UL						EIC/AGS/CL:AIRE			
Compound	**Residential with home grown produce**	**Residential without home grown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential with consumption of homegrown produce**	**Residential without consumption of homegrown produce**	**Allotment**	**Commercial**
cis -1,2 Dichloroethene (2.5% SOM)							0.19	0.20	0.50	24
cis -1,2 Dichloroethene (6% SOM)							0.37	0.39	1.0	47
trans -1,2 Dichloroethene (1% SOM)							0.19	0.19	0.93	22
trans -1,2 Dichloroethene (2.5% SOM)							0.34	0.35	1.9	40
trans -1,2 Dichloroethene (6% SOM)							0.70	0.71	4.0	81
Dichloromethane (1% SOM)							0.58	2.1	0.1	270
Dichloromethane (2.5% SOM)							0.98	2.8	0.19	360
Dichloromethane (6% SOM)							1.7	4.5	0.34	560
Hexachloroethane (1% SOM)							0.2	0.22	0.27	22
Hexachloroethane (2.5% SOM)							0.48	0.54	0.67	53
Hexachloroethane (6% SOM)							1.1	1.3	1.6	120

Notes for EIC/AGS/CL:AIRE Generic Assessment Criteria

1 GAC have been derived for 4 generic land uses; residential with consumption of homegrown produce, residential without consumption of homegrown produce, allotments and commercial land-use.

EXPLOSIVES

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and 1%, 2.5% and 6% soil organic matter (SOM)
Generic assessment criteria will vary according to SOM for all land values
Values are expressed in mg/kg
GACs assume that free phase contamination is not present
GACs are based on sub-surface soil to indoor air correction factor of 1

	S4UL					
Compound	**Residential with home grown produce**	**Residential without home grown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**
RDX (1% SOM)	120	13000	17	210000	210000	210000
RDX (2.5% SOM)	250	13000	38	210000	26000	49000 (18.7)
RDX (6% SOM)	540	13000	85.0	210000	27000	53000
HMX (1% SOM)	5.7	6700	0.86	110000	13000	23000 (0.35)
HMX (2.5% SOM)	13	6700	1.9	110000	13000	23000 (0.39)
HMX (6% SOM)	26	6700	3.9	110000	13000	24000 (0.48)

PESTICIDES

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and 1%, 2.5% and 6% soil organic matter (SOM)
Generic assessment criteria will vary according to SOM for all land values
Values are expressed in mg/kg
GACs assume that free phase contamination is not present
GACs are based on sub-surface soil to indoor air correction factor of 1

Compound	S4UL Residential with home grown produce	Residential without home grown produce	Allotment	Commercial	POSresi	POSpark
Aldrin (1% SOM)	5.7	7.3	3.2	170	18	30
Aldrin (2.5% SOM)	6.6	7.4	6.1	170	18	31
Aldrin (6% SOM)	7.1	7.5	9.6	170	18	31
Dieldrin (1% SOM)	0.97	7	0.17	170	18	30
Dieldrin (2.5% SOM)	2	7.3	0.41	170	18	30
Dieldrin (6% SOM)	3.5	7.4	0.96	170	18	31
Atrazine (1% SOM)	3.3	610	0.5	9300	1200	2300
Atrazine (2.5% SOM)	7.6	620	1.2	9400	1200	2400
Atrazine (6% SOM)	17.4	620	2.7	9400	1200	2400
Dichlorovos (1% SOM)	0.032	6.4	0.0049	140	16	26
Dichlorovos (2.5% SOM)	0.066	6.5	0.010	140	16	26
Dichlorovos (6% SOM)	0.14	6.6	0.022	140	16	27
Alpha-Endosulfan (1% SOM)	7.4	160 (0.003)	1.2	5600 (0.003)	1200	2400
Alpha-Endosulfan (2.5% SOM)	18	280 (0.007)	2.9	7400 (0.007)	1200	2400
Alpha-Endosulfan (6% SOM)	41	410 (0.016)	6.8	8400 (0.016)	1200	2500
Beta-Endosulfan (1% SOM)	7	190 (0.00007)	1.1	6300 (0.00007)	1200	2400
Beta-Endosulfan (2.5% SOM)	17	320 (0.0002)	2.7	7800 (0.0002)	1200	2400
Beta-Endosulfan (6% SOM)	39	440 (0.0004)	6.4	8700	1200	2500
Alpha-Hexachlorocyclohexanes (	0.23	6.9	0.035	170	24	47
Alpha-Hexachlorocyclohexanes (	0.55	9.2	0.087	180	24	48
Alpha-Hexachlorocyclohexanes (	1.2	11	0.21	180	24	48
Beta-Hexachlorocyclohexanes (1	0.085	3.7	0.013	65	8.1	15
Beta-Hexachlorocyclohexanes (2	0.2	3.8	0.032	65	8.1	15
Beta-Hexachlorocyclohexanes (6	0.46	3.8	0.077	65	8.1	16
Gamma-Hexachlorocyclohexane	0.06	2.9	0.0092	67	8.2	14
Gamma-Hexachlorocyclohexane	0.14	3.3	0.023	69	8.2	15
Gamma-Hexachlorocyclohexane	0.33	3.5	0.054	70	8.2	15

CHLOROBENZENES & METHYLBENZENES

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and 1%, 2.5% and 6% soil organic matter (SOM)
Generic assessment criteria will vary according to SOM for all land values
Values are expressed in mg/kg
GACs assume that free phase contamination is not present
GACs are based on sub-surface soil to indoor air correction factor of 1

	S4UL						EIC/AGS/CL:AIRE			
Compound	**Residential with homegrown produce**	**Residential without homegrown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential with consumption of homegrown produce**	**Residential without consumption of homegrown produce**	**Allotment**	**Commercial**
Chlorobenzene (1% SOM)	0.46	0.46	5.9	56	11000	1300 (675)				
Chlorobenzene (2.5% SOM)	1.0	1.0	14	130	13000	2000 (1520)				
Chlorobenzene (6% SOM)	2.4	2.4	32	290	14000	2900				
1,2-Dichlorobenzene (1% SOM)	23	24	94	2000 (571)	90000	24000 (571)				
1,2-Dichlorobenzene (2.5% SOM	55	57	230	4800 (1370)	95000	36000 (1370)				
1,2-Dichlorobenzene (6% SOM)	130	130	540	11000 (3240)	98000	51000 (3270)				
1,3-Dichlorobenzene (1% SOM)	0.40	0.44	0.25	30	300	390				
1,3-Dichlorobenzene (2.5% SOM	1.0	1.1	0.6	73	300	440				
1,3-Dichlorobenzene (6% SOM)	2.3	2.5	1.5	170	300	470				
1,4-Dichlorobenzene (1% SOM)	61	61	15	4400 (224)	17000	36000 (224)				
1,4-Dichlorobenzene (2.5% SOM	150	150	37	10000 (540)	17000	36000 (540)				
1,4-Dichlorobenzene (6% SOM)	350	350	88	25000 (1280)	17000	36000 (1280)				
1,2,3-Trichlorobenzene (1% SOI	1.5	1.5	4.7	102	1800	770 (134)				
1,2,3-Trichlorobenzene (2.5% S(	3.6	3.7	12	250	1800	110 (330)				
1,2,3-Trichlorobenzene (6% SOI	8.6	8.8	28	590	1800	1600 (789)				
1,2,4-Trichlorobenzene (1% SOI	2.6	2.6	55	220	15000	1700 (318)				
1,2,4-Trichlorobenzene (2.5% S(	6.4	6.4	140	530	17000	2600 (786)				
1,2,4-Trichlorobenzene (6% SOI	15	15	320	1300	19000	400 (1880)				
1,3,5-Trichlorobenzene (1% SOI	0.33	0.33	4.7	23	1700	380 (36.7)				
1,3,5-Trichlorobenzene (2.5% S(	0.81	0.81	12	55	1700	580 (90.8)				
1,3,5-Trichlorobenzene (6% SOI	1.9	1.9	28	130	1800	860 (217)				
1,2,3,4-Tetrachlorobenzene (1%	15	24	4.4	1700 (122)	830	1500 (122)				
1,2,3,4-Tetrachlorobenzene (2.5	36	56	11	3080 (304)	830	1600				
1,2,3,4-Tetrachlorobenzene (6%	78	120	26	4400 (728)	830	1600				
1,2,3,5-Tetrachlorobenzene (1%	0.66	0.75	0.38	49 (39.4)	78	110 (39)				
1,2,3,5-Tetrachlorobenzene (2.5	1.6	1.9	0.90	120 (98.1)	79	120				
1,2,3,5-Tetrachlorobenzene (6%	3.7	4.3	2.2	240 (235)	79	130				
1,2,4,5-Tetrachlorobenzene (1%	0.33	0.73	0.06	42 (19.7)	13	25				
1,2,4,5-Tetrachlorobenzene (2.5	0.77	1.7	0.16	72 (49.1)	13	26				
1,2,4,5-Tetrachlorobenzene (6%	1.6	3.5	0.37	96	13	26				
Pentachlorobenzene (1% SOM)	5.8	19	1.2	640 (43.0)	100	190				
Pentachlorobenzene (2.5% SOM	12	30	3.1	770 (107)	100	190				
Pentachlorobenzene (6% SOM)	22	38	7.0	830	100	190				
Hexachlorobenzene (1% SOM)	1.8 (0.20)	4.1 (0.20)	0.47	110 (0.20)	16	30				
Hexachlorobenzene (2.5% SOM)	3.3 (0.50)	5.7 (0.50)	1.1	120	16	30				
Hexachlorobenzene (6% SOM)	4.9	6.7 (1.2)	2.5	120	16	30				
1,2,4-Trimethylbenzene (1% SOM)							0.35	0.41	0.38	42
1,2,4-Trimethylbenzene (2.5% SOM)							0.85	0.99	0.93	99
1,2,4-Trimethylbenzene (6% SOM)							2	2.3	2.2	220
Isopropyl benzene (1% SOM)							11	12	32	1400
Isopropyl benzene (2.5% SOM)							27	28	79	3300
Isopropyl benzene (6% SOM)							64	67	190	7700
Propylbenzene (1% SOM)							34	40	34	4100
Propylbenzene (2.5% SOM)							82	97	83	9700
Propylbenzene (6% SOM)							190	230	200	21000
Styrene (1% SOM)							8.1	35	1.6	3300
Styrene (2.5% SOM)							19	78	3.7	6500
Styrene (6% SOM)							43	170	8.7	11000

PHENOLS AND CHLOROPHENOLS

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and 1%, 2.5% and 6% soil organic matter (SOM)
Generic assessment criteria will vary according to SOM for all land values
Values are expressed in mg/kg
GACs assume that free phase contamination is not present
GACs are based on sub-surface soil to indoor air correction factor of 1

	LQM/CIEH						EA SGV			EIC/AGS/CL:AIRE			
Compound	**Residential with home grown produce**	**Residential without home grown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential**	**Allotment**	**Commercial**	**Residential with consumption of homegrown produce**	**Residential without consumption of homegrown produce**	**otm**	**Commercial**
Phenol (1% SOM)	120	440 (460)	23	440 (26000)	440 (10000)	440 (7600)							
Phenol (2.5% SOM)	200	690	42	690 (30000)	690 (10000)	690 (8300)							
Phenol (6% SOM)	380	1200	83	1300 (34000)	1300 (10000)	1300 (9300)	420	280	3200 (38000)				
Chlorophenol (1% SOM)	0.87	94	0.13	3500	620	1100							
Chlorophenol (2.5% SOM)	2.0	150	0.30	4000	620	1100							
Chlorophenol (6% SOM)	4.5	210	0.70	4300	620	1100							
Pentachlorophenol (1% SOM)	0.22	27 (16.7)	0.03	400	60	110							
Pentachlorophenol (2.5% SOM)	0.52	29	0.08	400	60	120							
Pentachlorophenol (6% SOM)	1.2	31	0.19	400	60	120							
2,4-Dimethylphenol (1% SOM)										19	210	3	16000
2,4-Dimethylphenol (2.5% SOM)										43	410	7	24000
2,4-Dimethylphenol (6%SOM)										97	730	17	30000
Total Cresols (2-Methylphenol, 3-methylphenol, 4-methylphenol) (1%SOM)										80	3700	12	160000
Total Cresols (2-Methylphenol, 3-methylphenol, 4-methylphenol) (2.5%SOM)										180	5400	27	180000
Total Cresols (2-Methylphenol, 3-methylphenol, 4-methylphenol) (6%SOM)										400	6900	63	180000

PHTHALATES

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and 1%, 2.5% and 6% soil organic matter (SOM)
Generic assessment criteria will vary according to SOM for all land values
Values are expressed in mg/kg
GACs assume that free phase contamination is not present
GACs are based on sub-surface soil to indoor air correction factor of 1

	EIC/AGS/CL:AIRE			
Compound	**Residential with consumption of homegrown produce**	**Residential without consumption of homegrown produce**	**Allotment**	**Commercial**
Bis (2-ethylhexyl) phthalate (1%	280	2700	47	85000
Bis (2-ethylhexyl) phthalate (2.5%	610	2800	120	86000
Bis (2-ethylhexyl) phthalate (6%	1100	2800	280	86000
Butyl benzyl phthalate (1% SOM	1400	42000	220	940000
Butyl benzyl phthalate (2.5% SO	3300	44000	550	940000
Butyl benzyl phthalate (6% SOM	7200	44000	1300	950000
Diethyl Phthalate (1% SOM)	120	1800	19	1500000
Diethyl Phthalate (2.5% SOM)	260	3500	41	220000
Diethyl Phthalate (6% SOM)	570	6300	94	290000
Di-*n*-butyl phthalate (1% SOM)	13	450	2	15000
Di-*n*-butyl phthalate (2.5% SOM)	31	450	5	15000
Di-*n*-butyl phthalate (6% SOM)	67	450	12	15000
Di-*n*-octyl phthalate (1% SOM)	2300	3400	940	89000
Di-*n*-octyl phthalate (2.5% SOM)	2800	3400	2100	89000
Di-*n*-octyl phthalate (6% SOM)	3100	3400	3900	89000

OTHER ORGANICS

Based on sandy loam soil as defined in SR3 (Environment Agency, 2009) and 1%, 2.5% and 6% soil organic matter (SOM)
Generic assessment criteria will vary according to SOM for all land values
Values are expressed in mg/kg
GACs assume that free phase contamination is not present
GACs are based on sub-surface soil to indoor air correction factor of 1

	S4UL						EIC/AGS/CL:AIRE			
Compound	**Residential with home grown produce**	**Residential without home grown produce**	**Allotment**	**Commercial**	**POSresi**	**POSpark**	**Residential with consumption of homegrown produce**	**Residential without consumption of homegrown produce**	**Allotment**	**Commercial**
Carbon disulphide (1% SOM)	0.14	0.14	4.8	11	11000	1300				
Carbon disulphide (2.5% SOM)	0.29	0.29	10	22	11000	1900				
Carbon disulphide (6% SOM)	0.62	0.62	23	47	12000	2700				
Hexachloro-1,3-butadiene (1% S	0.29	0.32	0.25	31	25	48				
Hexachloro-1,3-butadiene (2.5%	0.70	0.78	0.61	66	25	50				
Hexachloro-1,3-butadiene (6% S	1.6	1.8	1.4	120	25	51				
Tributyl tin oxide (1% SOM)							0.25	1.4	0.042	130
Tributyl tin oxide (2.5% SOM)							0.59	3.1	0.1	180
Tributyl tin oxide (6% SOM)							1.3	5.7	0.24	200
Biphenyl (1% SOM)							66	220	14	18000
Biphenyl (2.5% SOM)							160	500	35	33000
Biphenyl (6% SOM)							360	980	83	48000
2,4-Dinitrotoluene (1% SOM)							1.5	170	0.22	3700
2,4-Dinitrotoluene (2.5% SOM)							3.2	170	0.49	3700
2,4-Dinitrotoluene (6% SOM)							7.2	170	1.1	3800
2,6-Dintrotoluene (1% SOM)							0.78	78	0.12	1900
2,6-Dintrotoluene (2.5% SOM)							1.7	84	0.27	1900
2,6-Dintrotoluene (6% SOM)							3.9	87	0.61	1900
Bromoform (1% SOM)							2.8	5.2	0.95	760
Bromoform (2.5% SOM)							5.9	11	2.1	1500
Bromoform (6% SOM)							13	23	4.6	3100

6. GEOENVIRONMENTAL RISK ASSESSMENT

6.1 **Potential Hazard Sources.** Ground contamination can occur through several causes, particularly from historical use of the site and is often linked to the processes of waste disposal, underground storage, open storage, process pipework, leaks, spillages, tanks, site filling and various other reasons. The contamination can either arise from site sources or be the result of migration from other sources off site.

6.2 **Potential Migratory Pathways.** The primary pathways are considered to be laterally or vertically downward through underlying strata or upward to the ground surface. Such pathways also provide the potential for contaminants to migrate towards local watercourses and groundwater.

6.3 **Potential Targets At Risk.** Potential environmental liabilities related to current legislation associated with contaminated land with regard to existing ownership and redevelopment are summarised.

The probability of a hazard, linked with its consequences, can be used to assess risk in accordance with the tables below for use in decision making.

Consequence of Pollution Linkage

Severe	Damage to human health. Substantial pollution of controlled waters. Significant change in ecosystem population. Irreparable damage to property.
Moderate	Non-permanent damage to human health. Minor pollution of controlled waters. Change in ecosystem. Damage to property.
Mild	Short term health effects. Slight pollution of controlled waters. Slight effect on ecosystem. Minor repairable damage to property.
Near Zero	No noticeable effect on human health. No significant pollution to controlled waters. No measurable effect on ecosystem densities. Non-structural cosmetic damage to property.

Decision Making

Probability of a hazard and an associated linkage	**Consequences of a pollution linkage (hazard-pathway-target)**			
	Severe	Moderate	Mild	Near Zero
High	High	High	Medium/low	Negligible
Medium	High	Medium	Low	Negligible
Low	High/medium	Medium/low	Low	Negligible
Unlikely	High/medium/low	Medium/low	Low	Negligible

Final overall risk is based on an assessment of probability of a hazard and its consequences. Risk categories are shown shaded in the table above and defined below.

Risk	**Description**
High	Site probably or certainly unsuitable for present use or environmental setting. Contamination probably or certainly present and likely to have an unacceptable impact on key targets. Urgent action needed.
Medium/ Moderate	Site may not be suitable for present use or environmental setting. Contamination may be present, and likely to have unacceptable impact on key targets. Action may be needed on the medium term.
Low	Site considered suitable for present use and environmental setting. Contamination may be present but unlikely to have unacceptable impacts on key targets. Action unlikely to be needed in present use.
Negligible	Site considered suitable for present use and environmental setting. Contamination may be present but unlikely to have unacceptable impacts on key targets. No action needed while site remains in present use.

The review of the information from the exploratory investigation may be such that a decision is made that there is no need for further investigation. Alternatively, it may be necessary to carry out a further main investigation.

The Environment Agency has set out guidance as to the classification of waste arising from construction sites in its document "The Definition of Waste" dated April 2006. This document outlines how waste is to be handled

The following activities are not regarded as a waste management activity requiring licencing.

1) Construction activities carried out for the purpose of producing a suitably engineered soil e.g. lime stabilisation, vibro-replacement and piling.

2) Uncontaminated materials produced on site (including excavated soils and materials from demolition) which can be reused without further treatment. Examples include site regrading and footing excavations.

   These must be done in accordance with the Planning Permission. Demolition material must be used in accordance with the quality protocols for the production of aggregates from inert waste, subject to appropriate testing and the lack of any harmful constituents. Uses include pipe bedding, backfill and sub-base.

3) Contaminated soils can be moved on-site providing they do not require treatment or containment. There should be no risk to the environment i.e. non-leachable and in accordance with Planning Permission. Relevant activities can include site regarding and use of materials below clean cover systems, capping, buildings and hardstanding.

Where contaminated materials have to be placed in an engineered cell to prevent pollution, then this would be classed as landfilling and require PPC permits. Any material taken off site is considered to be waste. However, this is under review. If material is waste, then there is a duty of care including ensuring material is transported by a registered carrier. The destination of material leaving the site should be regularly checked and Waste Transfer Notes kept.

Clean Cover Systems

According to the Environment Agency's Remediation Position Statements of May 2006, the placement of a cover system using "clean" material is not treatment of waste. Consequently, no licensing/permitting position statements are applicable to this type of remediation. If the cover system uses 'waste materials' in its construction, waste management licensing exemption paragraph 9A may be applicable to its installation. If the installation of the proposed cover system does not meet the criteria for registration of this exemption, the activity may be regulated through a waste management site license.

7. WASTE ACCEPTANCE CRITERIA (WAC)

The main objective of the Landfill Directive is to prevent or reduce as far as possible the negative effects of landfilling waste on the environment and on human health. It is intended to reduce the disposal of waste materials to landfills and to encourage more sustainable approaches to dealing with wastes. It bans the landfill of liquids and certain solid wastes, introduces requirements for the treatment of wastes prior to landfill and provides for the classification of landfills as sites for inert, hazardous or non-hazardous waste and prohibits co-disposal.

It sets out procedures for waste acceptance at landfills and the types of waste for each class of landfill as specified by Waste Acceptance Criteria (WAC). The WAC are predominantly lists of "limit values" for certain parameters obtained from standard leaching tests of wastes going to landfills. WAC are set out in the Landfill Directive itself. Full details can be found in the Environment Agency document "Waste Classification – Guidance on the classification and Assessment of Waste " Technical Guidance WM3 - 2015

8. MAIN REFERENCES

British Standards	BS3882: 2015 British Standard Specification for Topsoil BS5930: 2015+A1:2020 British Standard Code of Practice for Site Investigations BS8485: 2015 British Standard Code of Practice for the design and protective measures from methane and carbon dioxide ground gases for new buildings BS10175: 2011+A2:2017 British Standard Code of Practice for the Investigation of Potentially Contaminated Sites
BRE	Radon: Guidance on protective measures for new dwellings, BR211, 2015 Protective measures for housing on gas-contaminated land, BR414, 2015 Cover systems for land regeneration, 2004 Concrete in aggressive ground. Special Digest SD1, 3rd Edition, 2005 Soakaway Design (DG365)
CIEH	The LQM / CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Edition)
CIRIA	Assessing risks posed by hazardous ground gases to buildings, CIRIA C665 Asbestos in Soil and Made Ground: a guide to understanding and managing risks, CIRIAC733, 2014 Good Practice on the testing and verification of protection systems for buildings against hazardous ground gases. C735:2014
CL:AIRE	Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, SP1010, 2013
DEFRA	Contaminated Land Report CLR 11, 2002 (7-10 withdrawn) R & D Publications TOX 1 – 12, 14, 16 – 25 R & D Publications SGV 1, 3, 4, 5, 7, 8, 9, 10, 15 and 16 (withdrawn) Improvements to Contaminated Land Guidance - "Outcome of the "Way Forward", 2008 Exercise on Soil Guideline Values. July 2008 Guidance on the Legal Definition of Contaminated Land. July 2008 Simplification of the Contaminated Land Regime Impact Assessment No: Defra 1133
DETR	Circular 02/2000. Contaminated Land, 2000 Guidelines for Environmental Risk Assessment and Management, 2000
Environment Agency	Guidance for the Safe Development of Housing on Land Affected by Contamination, 2000 Protective measures for housing on gas-contaminated land Remediation Position Statements, May 2006 Guidance and monitoring of landfill leachate, groundwater and surface water Human health toxicological assessment of contaminants in soil (Science Report SC050021/SR2) 2008 Updated technical background in the CLEA model (Science Report SC0520021/SR3) Waste Classification – Guidance on the classification and Assessment of Waste - Technical Guidance WM3 (2015) Contaminated Land Risk Management (2021)
HMSO	Part 2A of the Environmental Protection Act Part 2A Statutory Guidance – April 2012 Contaminated Land (England) Regulations 2006 The Contaminated Land (England) (Amendment) Regulations 2012 The Water Act 2003 (Commencement No. 11) Order 2012
Institution of Civil Engineers	Contaminated Land: Investigation, Assessment and Remediation, 2nd Edition
NHBC	Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present, 2007

This list is not intended to be exhaustive.

Michael D Joyce Associates LLP

Geotechnical and Geoenvironmental Consultants

Charnock Court 6 South Parade Wakefield West Yorkshire WF1 1LR

Tel: 01924 360458

Web: www.geoenvironmental.co.uk Email: mdja@geoenvironmental.co.uk