PHASE I DESK STUDY

AT

STONE PIT HALL, HORN LANE
NEW MILL, HOLMFIRTH, HD9 7DH

FOR

MR S SYKES

REPORT REF: MSS 3522

Engineering Geologists and Environmental Scientists



Ashton Bennett

North: Bridge Mills, Huddersfield Road,
West Yorkshire, Holmfirth HD9 3TW

South: 4 Blomfield Road,
London, W9 1AH

Tel: 0300 088 2003

email: geoenviro@ashton-bennett.co.uk
www.ashton-bennett.com

PHASE I DESK STUDY

AT

Stone Pit Hall, Horn Lane
New Mill, Holmfirth, HD9 7DH

FOR

MR S SYKES

REPORT REF: MSS 3522

ASHTON BENNETT CONSULTANCY

Engineering Geologists & Environmental Scientists

AUGUST 2023

Ashton Bennett Limited Co Reg No: 3318828 is a member of the Ashton Bennett Consultancy group of companies

CONTENTS

FIGURES

APPENDICES

QUALITY MANAGEMENT FOR REPORT

Project	Stone Pit Hall, Horn Lane, New Mill, Holmfirth, HD9 7DH		
Client	Mr S Sykes		
Date	August 2023		
Version	Issue 1		
Prepared by	Frances A Bennett	BSc (Hons), CGeol, FGS, FIMMM, C.WEM, MCIWEM, CEnv, AIEMA, MIEnvSci	Director Ashton Bennett Ltd
	Tristan Bennett	BSc (Hons)	Engineer

1. INTRODUCTION

This report describes the results of a Phase 1 Desk Study undertaken on the site of Stone Pitt Hall, Horn Lane, New Mill, Holmfirth, HD9 7DH. The work was commissioned by Mr S Sykes and was carried out by the Ashton Bennett Consultancy.

It is proposed to construct an extension on the west side of the existing property and to demolish three store sheds and construct one large garage on a similar footprint. The Kirklees Planning Application Number is 2021/93034.

The purpose of this Phase 1 Study was to collate and assess information on the site including geological, hydrogeological and mining information, archival maps and historical review to determine past use, a database review, environmental data on water and soil, and to undertake a site reconnaissance to enable a desk top assessment of pathways of migration and potentially sensitive receptors, and to determine solutions to any geotechnical, environmental and mining concerns to the extension of the property for continued residential use.

This report describes the research work carried out, presents the results of the desk study and from the conceptual model of the site makes recommendations for solutions to any environmental, geotechnical and mining concerns to the proposed development.

1.1 The Proposals

The proposals are to add an extension to the house and to demolish existing sheds and replace with a garage and hard standing in the area to the east of the house.

1.2 The Author

This report was prepared by Frances A Bennett an engineering geologist who has a degree in Geology, a postgraduate qualification in Soil Mechanics and is a Chartered Geologist CGeol, Chartered Environmentalist CEnv and Chartered Water and Environmental Manager C.WEM and FIMMM with 45 years of experience in the fields of geology, geotechnical engineering, hydrogeology, contamination, mining, slope stability and waste disposal.

1.3 Sources of Information

The following data have been referenced in relation to compiling this Report:

- Geological mapping from British Geological Survey 1:50,000
- Geological mapping from British Geological Survey 1:10,000
- Karl Terzaghi, Ralph B Peck and Gholamreza Mesri, Soil Mechanics in Engineering Practice, John Wiley and Sons Inc., Third Edition (1996).
- M. J. Tomlinson, Foundation Design and Construction, Longman Scientific and Technical, Seventh Edition, (2017).
- BS 5930:2015, Code of Practice for Ground Investigations, British Standards Institute
- NHBC Part 4 Foundations, Chapter 4.4 Strip and Trench Fill Foundations,(2010 and 2020).
- Stroud, M. A., The Standard Penetration Test in insensitive clays and soft rocks, Proceedings of the European Symposium on Penetration Testing, 2, 367-375 (1975).

The information for this report is also from sources recommended by the Institute of Civil Engineers (ICE), the Association of Geotechnical and Geoenvironmental Specialists (AGS), Construction Industry Research and Information Association (CIRIA) and the Department of the Environment Transport and the Regions (DETR). The report has been compiled in accordance with the latest ICE, DETR, Department of Environment, Food and Rural Affairs (DEFRA), British Standard Draft Documents and British Standards, CIRIA, CLR 11 & other CLEA Reports and Eurocode 7.

In addition, the scope of the investigation has used the extensive knowledge and experience of the staff of Ashton Bennett Consultancy to assess the data and to interpret the findings.

2. THE SITE
2.1 Site Description

The site lies to the north of the Penistone and Holmfirth Road, the A635, which runs west to east between Holmfirth and Wakefield in West Yorkshire. The site sits on Horn Lane immediately north of the A635 and south of Arce Lane.

The site is bounded to the north, east and west by trees and bushes with open land beyond. The site is bounded to the south by a low stone wall and bushes with Horn Lane beyond.

The site comprises a house and garden and three store sheds lying to the east of the house.

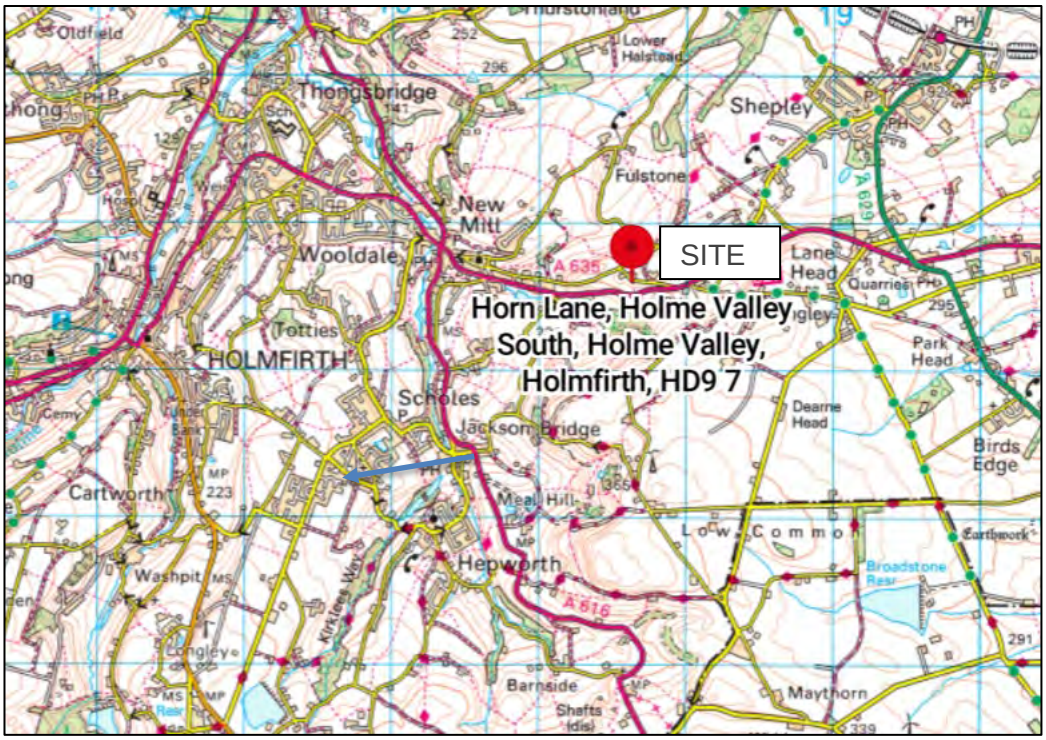


Figure 1A Site Location Plan

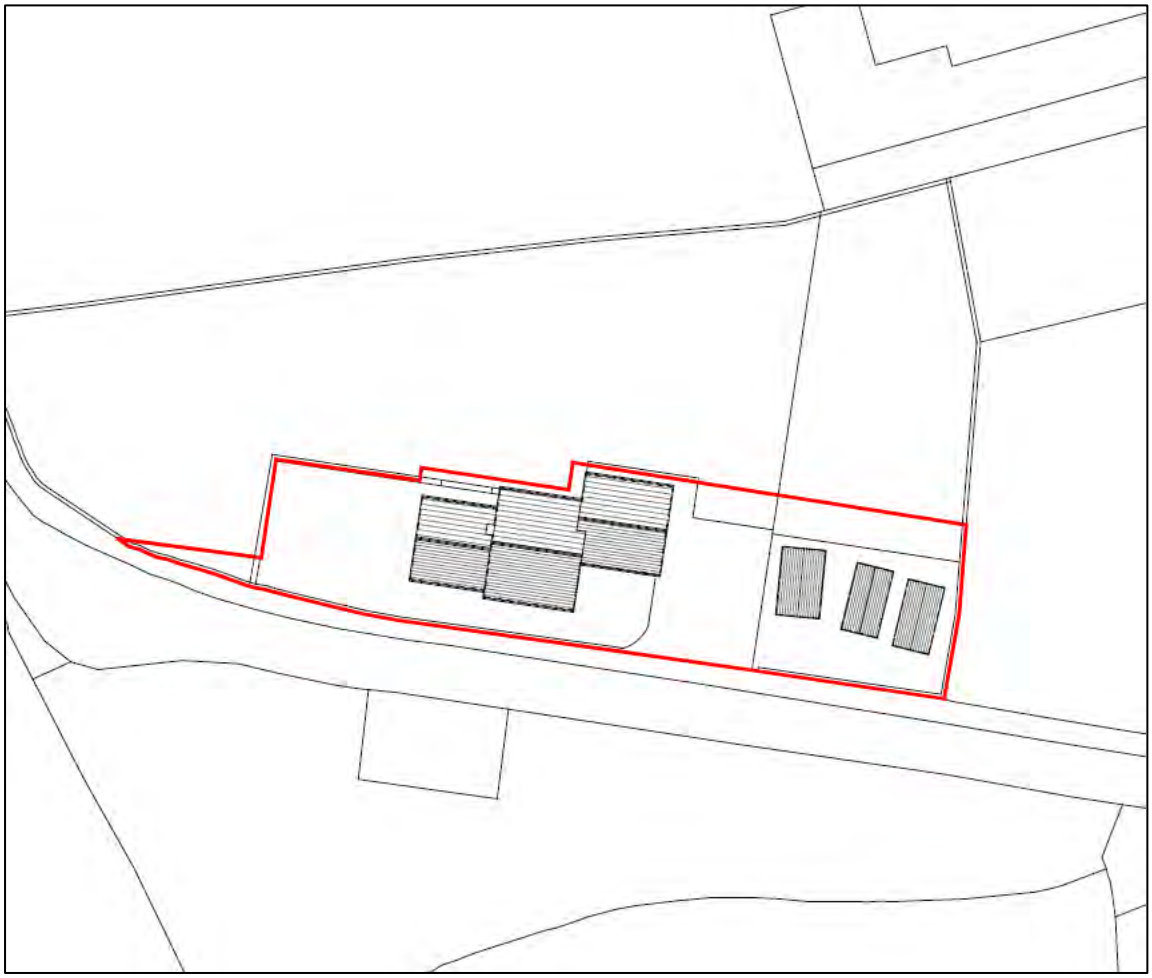


Figure 1B Detailed Site Location Plan

The site lies around National Grid Reference 417648E 408615N at a height of around 268m above Ordnance Datum. A Site Location Plan is presented as Figure 1A and a Detailed Site Location Plan as Figure 1B. A Proposed Development Plan is presented as Figure 2. Historic Industrial Land use is presented as Figure 3, Waste and Landfill Sites as Figure 4 and Artificial and Made Ground as Figure 5 and Current Industrial Land Use as Figure 6. Environmental Sensitive Sites as Figure 7.

A Geological Faults and Bedrock Geology Plan is presented as Figure 8. A Hydrology Plan is presented as Figure 9. A Hydrogeology of Bedrock is presented as Figure 10 and a Source Protection Zones and Abstractions Plan is presented as Figure 11. A Trial Pit Location Plan is presented as Figure 12.

Archival Maps are presented in Appendix A and photographs are presented in Appendix B. A Coal Authority Report is presented in Appendix C, a Conceptual Model as Appendix D and the Environmental Test Results are presented in Appendix E.

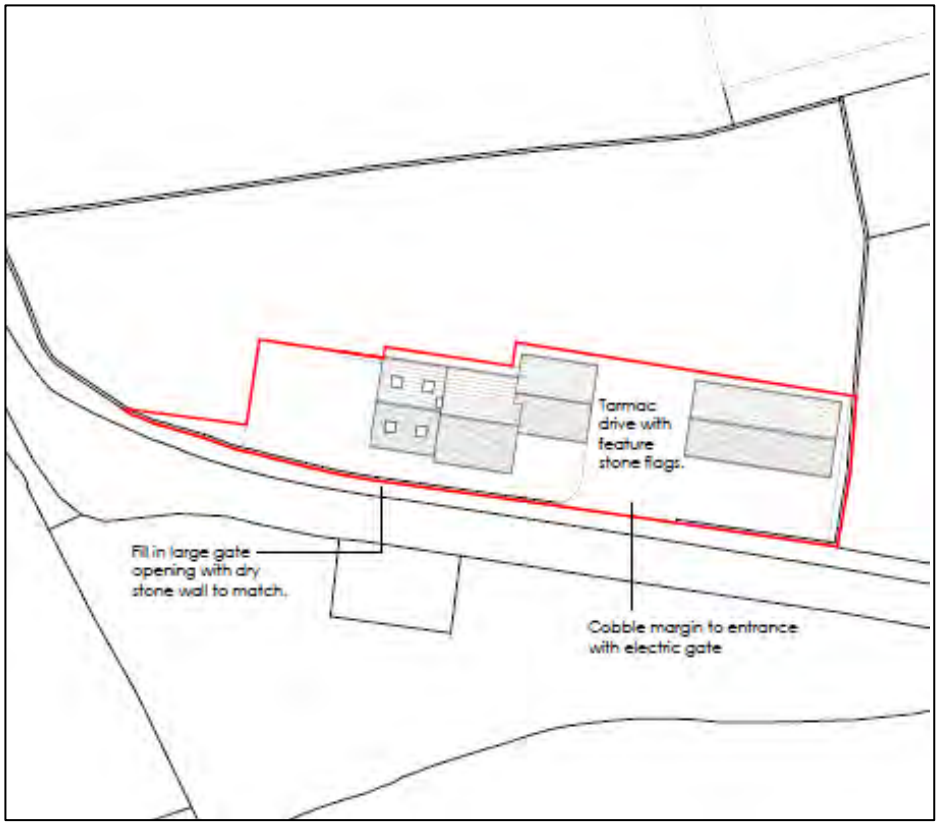


Figure 2 Proposed Development Plan

3 SITE HISTORY, HISTORIC and CURRENT LAND USE

3.1 Historic Mapping

The following maps and plans were inspected to assess the history of the site and its past environments. The archival Ordnance Survey maps are presented in Appendix A.

TABLE 1
Historical Maps Inspected

DATE	SCALE	DESCRIPTION	
		SITE	SURROUNDING AREA
1854 1888-92 & 1893	1:10.560 & 1:2,500	It is unclear whether any features exist on site during 1854 although Stonepit Hall may be annotated. Buildings are evident on site from 1888 although it is not annotated.	The surrounding area shows a quarry(Thorn Hill Quarries) to the west of site and surrounding roads and buildings, including Sunday school. A well is annotated to the south of site. Snowgate Head Colliery is shown to the south of site circa 100m distant including a mine shaft and overflow pond. The remaining surrounding area is agricultural land.
1903-4 & 1906	1:2,500 & 1:10,560	During this time the site appears unchanged.	The surrounding area largely unchanged. The colliery to the south of site is now annotated as disused. The colliery spoil remains.
1929-33 1948-9 & 1955	1:2,500 & 1:10,560	The site area remains unchanged during this time.	The surrounding area is largely unchanged, Huddersfield Water Works is annotated to the east of site. Sude Hill Dike is annotated to the south west of site, running east to west becoming Holme House Dike, a mine shaft is annotated in the location where the dikes meet, to the south west of site. Hill End Quarry annotated as shown as disused to the south east of site. By 1955 Horn Hill Quarries to the west of site is also disused.

DATE	SCALE	DESCRIPTION	
		SITE	SURROUNDING AREA
1964 & 1970	1:10,560 & 1:2,500	The site, still occupied by the residential dwelling now also has two sheds in the east of site with accompanying access roads.	The Water Works to the north east of site is no longer annotated. Colliery spoil tip is shown.
1980 & 1992	1:2,500 & 1;10,000	The site area remains unchanged during this time.	The surrounding area is largely unchanged during this time.
2001 & 2003	1:10,000 & 1:1,250	The extension to the west of the building on site is no longer shown. The remainder of the site is unchanged.	The surrounding area is largely unchanged during this time.
2010 & 2023	1:10,000	This map indicates no change to the site.	This map indicates no change to the immediate surrounding area.

In summary, the area is shown on the OS maps to have been open land prior to the existing property being constructed, likely prior to 1854. The immediate surrounding area has only been residential and open land while quarries and a colliery and a sewage works and a colliery spoil tip have existed to the far surrounding area of site.

3.2 Historic Industrial Land Use

The site area had previously been unoccupied prior to residential development.

In the surrounding area there has historically been a colliery 79m to south east circa 1855. A disused colliery is listed circa 1904 83m to the south east up to 103m to the south east. An unspecified pump was located 88m to the east of site circa 1854 and an unspecified tank 104m to the south east circa 1933. A chimney was located 106m to the south east circa 1970-80. Unspecified heaps are listed 110 to 175m to the south and south east of site circa 1888 to 1980 and some disused quarries, unspecified, between 179m and 210m from site. A further colliery is annotated 262 and 327m to the south west of site circa 1948/1955.

Zero historical tank areas existed within 250m of site.

There are zero historical energy features within 250m of the site.

There are no surrounding historical petrol stations within 250m of the site area.

There has been no historical military land within 500m surrounding the site area.

The historic land uses are unlikely to have detrimentally affected the nature of the site.

Figure 3 Historic Industrial Land Use Plan

Figure 4 Waste and Landfill Sites

There are zero active or recent landfill sites within 500m of the site.

The BGS records and the LA/mapping indicate zero historical landfill within 500m of the site. There are zero historical EA/NRW landfills or historical or recently closed waste sites within 500m of site.

Seventy-eight(78) waste exemption licences exist within 250m of the site area. The closest is located 180m to the west of site at Ebson House Farm for storage of sludge. All exemptions within 250m are located at Ebson House Farm 221m and 236m distant to the north east. The exemptions include deposit of waste from dredging of inland waters, burning waste in the open, burning waste at a port under a Plant Health notice, storage of waste in secure containers, cleaning, washing, spraying or coating relevant waste, aerobic composting and associated prior treatment, treatment of sheep dip for disposal, preparatory treatments(bailing, sorting, shredding), screening and blending of waste, treatment of waste wood and waste plant matter by chipping, shredding, cutting and pulverising, recovery of scrap metal, use of

waste in construction, spreading waste on agricultural land to confer benefit, use of mulch, incorporation of ash into soil, use of depolluted end of life vehicles for vehicle parts, use of baled end of life tyres in construction, burning of waste as a fuel in a small appliance, use of sludge for the purpose of reseeding a waste water treatment plant and use of effluent to clean a highway gravel bed.

Infilled ground is evident 83m to the south east annotated as made ground, artificial deposit and represents the former colliery spoil tip. Artificial or made ground is not shown to be within the site area although made ground may be present.

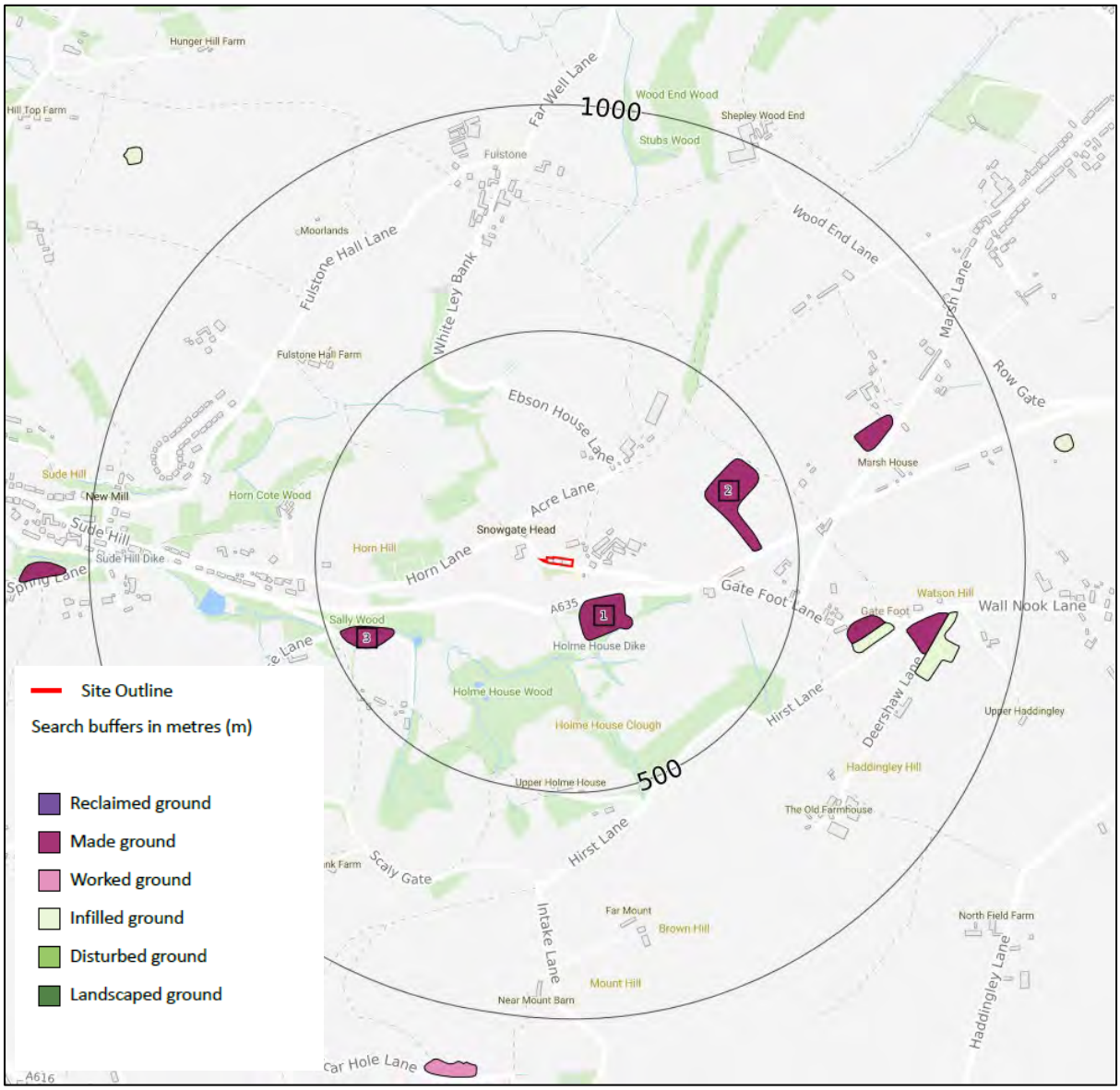


Figure 5 Artificial and Made Ground

3.3 Current Industrial Land Use

The site area is currently residential.

There are no sites determined as Contaminated Land within 500m of the site.

Potentially contaminating industrial land use within 250m of the site area consist of a chimney located 113m to the south east of site.

Current industrial land uses beyond 100m are unlikely to detrimentally affect the site.

There are no local current petrol or fuel stations, sites determined as contaminated land, National Grid High Voltage underground electricity transmission cables or high pressure gas transmission pipelines on, or within 250m of the site.

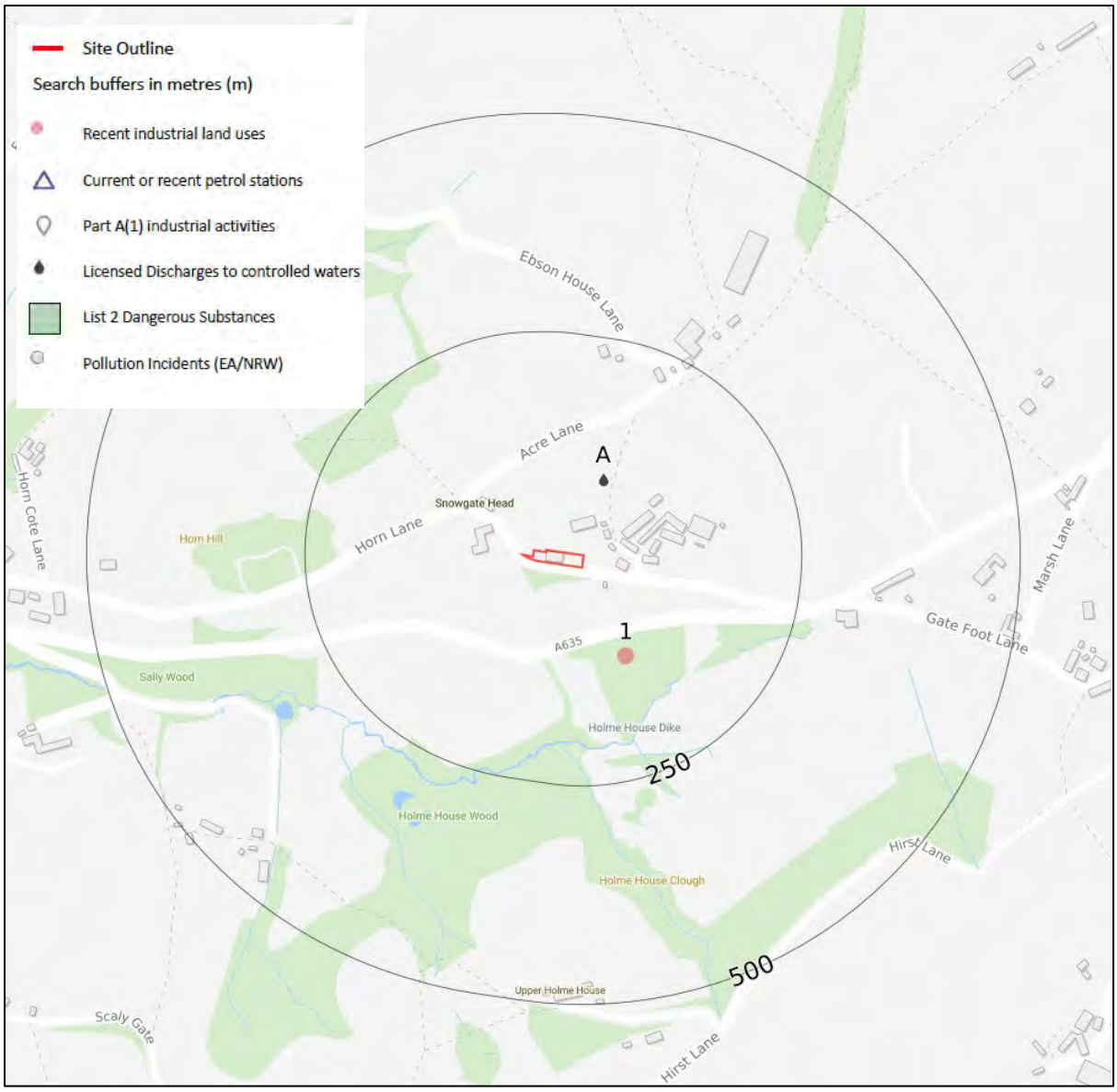


Figure 6 Current Industrial Land Use Plan

4. REGULATED INDUSTRIES AND INFRASTRUCTURE

4.1 Authorisations, Incidents and Registers

Results of searches for regulated industries are presented in Table 2.

TABLE 2
Authorisations, Incidents and Registers

	On SITE	Within 250m	DETAILS
Potentially Contaminative Uses identified in mapping	No	25	79m, 83m, 103m SE, Colliery, 88m E Unspecified Pump. 104m, 175m SE Tank. 110m-163m S/SE Unspecified Heap. 106m, 175m SE Chimney. 179m, 186m, 201m, 210m W Quarries
Historical Tanks	None	None	
Historical Energy Features	None	None	
Historical Petrol/Fuel Site	None	None	
Historical Garage/Motor Vehicle Repair	None	None	
Potentially infilled land	None	Yes	83m SE Made Ground – Artificial Deposit
Historic IPC Authorisations	None	None	
Part A(1) and IPPC Authorised Activities	None	None	
Records of Red List Discharge Consents	None	None	
Records of List 1 Dangerous Substances Inventory Sites	None	None	
Records of List 2 Dangerous Substances Inventory Sites	None	None	
Records of Part A(2) and Part B activities and enforcements	None	None	
Records of Category 3 or 4 Radioactive Consents	None	None	
Records of Licensed Discharge Consents	None	2	89m NE. Sewage Discharges-Final/treated Effluent. Receiving water: Land adjacent to farm. Permit Version 1 & 2.
Records of Planning Hazardous Substance Consents and Enforcements	None	None	
Records of COMAH and NIHHS sites	None	None	
Records of National Incidents Recording System List 2	None	None	
Records of National Incidents Recording System List 1	None	None	
Records of sites determined as contaminated land under Section 78R of EPA 1990	None	None	
Records from EA landfill Data	None	None	
Records of Operational Landfill Sites	None	None	
Records of EA historic landfill sites	None	None	
Records of non operational landfill sites	None	None	
Records of local authority landfill sites	None	None	
Records of operational and non operational waste treatment, transfer, exemptions or disposal sites	None	78	Detailed in Section 4
Records of EA licensed waste sites	None	None	
Current Industrial Land Use	None	1	Detailed in Section 4
Petrol and Fuel Sites	None	None	
Underground High Pressure Oil and Gas Pipelines	None	None	

	On SITE	Within 250m	DETAILS
Residential Property (within 250m)	Yes	Yes	Yes, residential properties on site and within 250m of the site.
Radon Protection Required	No	No	The property is not in a Radon Affected Areas as less than 1% of properties are above action level within the site area. Radon protection is not required according to BR211 by the Building Research Establishment.
Registered as Contaminated Land under Part IIA EPA 1990	No	No	-

Results of searches for regulated industries, pollution incidents and registered authorisations are presented in Table 2 above and indicate that the site is unlikely to be affected by current off-site activity.

Radon is a radioactive gas derived from naturally occurring uranium found in small quantities in soils and rock. The National Radiological Board recommends that where radon concentration exceeds the Action level of 200 Bqm^{-3} the householder should take measures to reduce it.

According to the BGS the site is in an area where basic radon protection measures are not required in new buildings. According to the National Radiological Protection Board, the site lies within an area where less than 1% of houses lie above the action level.

5. ENVIRONMENTALLY SENSITIVE SITES

The site does not lie within or within 2000m of a National Nature Reserve, a RAMSAR site, a World Heritage Site, an Environmentally Sensitive Area, an Area of Outstanding Natural Beauty, a Local Nature Reserve, Special Areas of Conservation, Special Protection Areas or a Nitrate Sensitive Area.

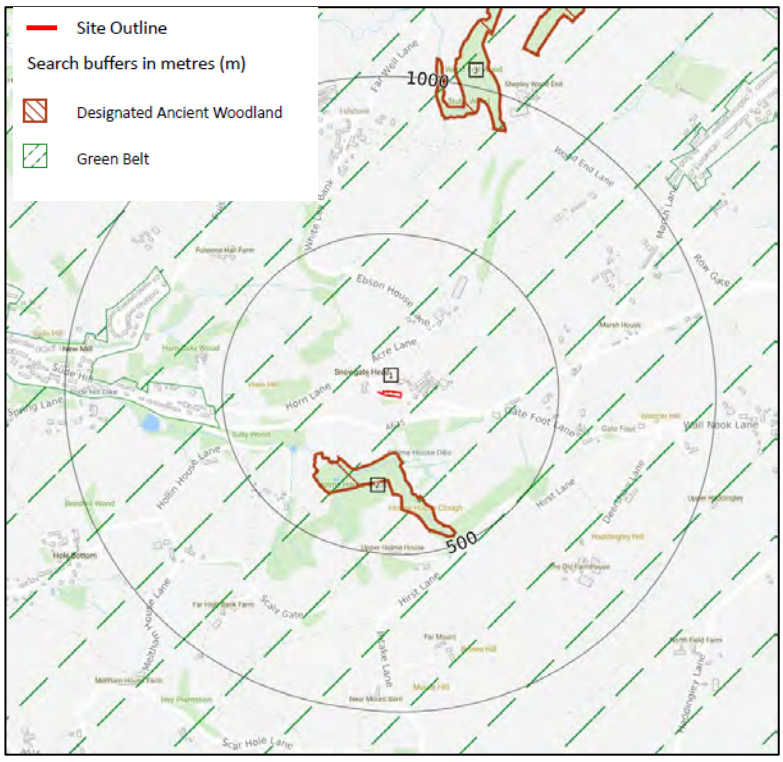


Figure 7 Environmentally Sensitive Sites

Green Belt Land exists on site and 1710m to the south east of site. Ancient Woodland exists 178m to the south of site, Holme House Wood, 884m to the north of site, Wood End Wood, 1158m to the north east, 1832m to the north and 1973m to the north east, Shepley Mill Wood, 1312m north of site, Hallstead Wood and 1949m to the north west of site, Sinking Wood. A Nitrate Vulnerable Zone exists 832m to the south east of site in the form of the River Dearne surface water.

The site does lie within an SSSI Impact Zone The site is unlikely to detrimentally affect these environmentally sensitive areas due to distance.

6. POTENTIAL CONTAMINATION

The site has been, and is used, as residential dwelling with garden and with three separate sheds with hard covered floors.

Potential contamination is unlikely based on the past uses of the site. If the sheds were used as garages there may be hydrocarbons present close to the sheds.

7. SITE GEOLOGY

7.1 Geology

The published British Geological Survey Map (BGS) at a scale of 1:10,000 shows the site to be underlain by sandstones, mudstones and siltstones of the Pennine Lower Coal Measures Formation. Immediately underlying the site is the Grenoside Formation sandstone in the centre and east of the site. The west of the site is immediately underlain by mudstones and siltstones of the Pennine Lower Coal Measures Formation. The Greenmoor Rock Sandstone outcrops to the west and north east of site and the 80 Yard Rock Sandstone outcrops to the south east of site, divided by a geological fault.

Superficial drift deposits are not shown to overlie the solid strata.

The site geology is presented in Figure 8.

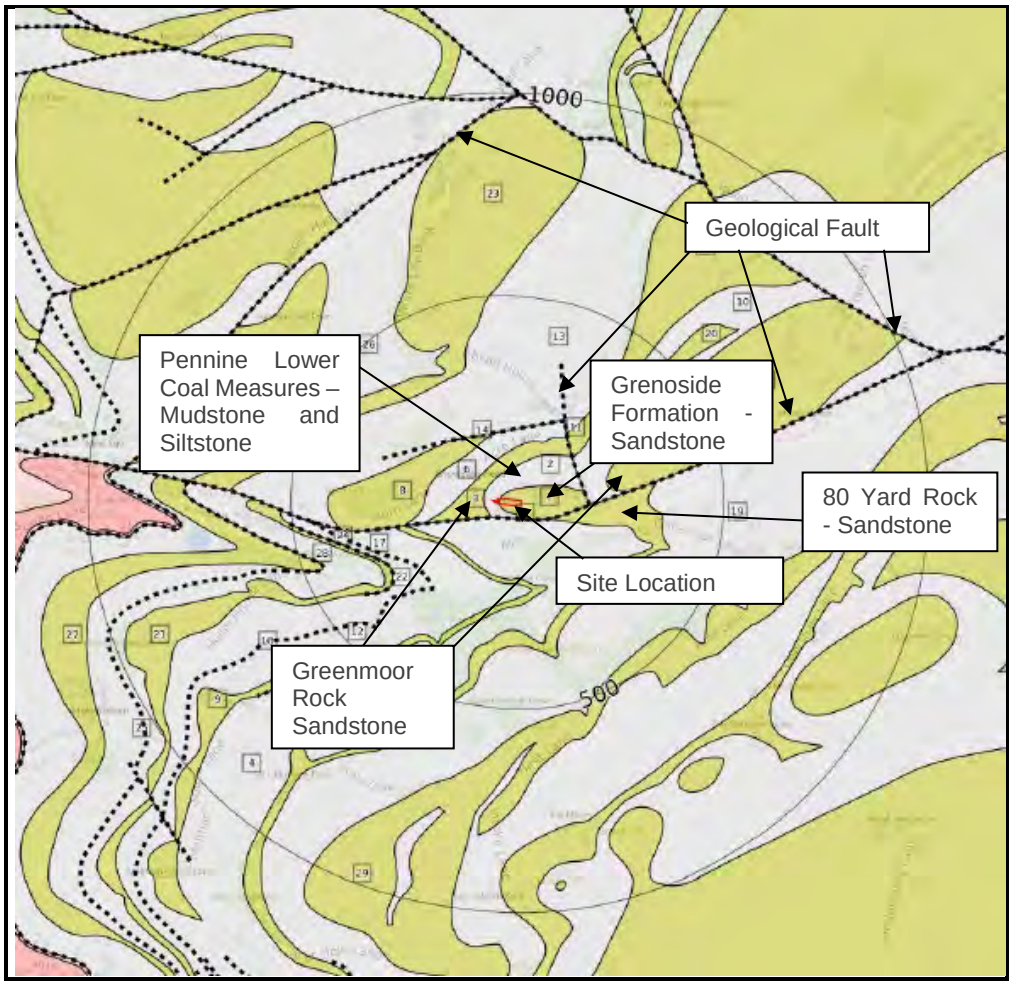


Figure 8 Geological Faults and Bedrock Geology Plan

7.2 Geological Faults

The BGS maps do not indicate the presence of any geological faults crossing the site. The maps show the presence of faults trending west to east to the south of the site. It is possible that smaller faults sub parallel to this may exist in the strata causing fissuring and fracturing to the rock. Due to the cessation of tectonic activity in the area, faulting is unlikely to detrimentally affect the stability of the site.

7.3 Engineering Geology

Made ground may be present on the site. The strata of the Pennine Lower Coal Measures mudstone and siltstone and the Grenoside Formation Sandstone provides good bearing strata where unweathered and unfaulted for carrying the bearing pressures imposed by low rise development without undue settlement.

7.4 Geological Hazards

According to the British Geological Survey there is a very low risk of a shrink and swell hazard from clays and collapsible deposits. There is a negligible risk of running sands, ground dissolution of soluble rocks and compressible deposits. There is a low risk of landslides. This is based on the geology and excludes made ground.

7.5 Previous Boreholes

No previous boreholes exist within 500m of the site area.

8. HYDROLOGY AND HYDROGEOLOGY

8.1 Hydrology

The rainfall over the area of the site will drain into land drains on the site. The closest surface water feature and surface water river network, manmade watercourse for water transfer, is located 167m to the south east of site as shown on Figure 9. This is an inland river not influenced by normal tidal actions named as Holme House Dike. Further inland rivers exist 169-225m distant from site named as Holme House Dike and unnamed.

The site is on land designated as WFD Surface Water body catchment for the New Mill Dike from sources to River Holme and WFD Groundwater bodies for the Aire and Calder Carb Limestone/Millstone Grit/Coal Measures, overall rated 'poor'.

The site is shown by the Environment Agency to not lie within a fluvial Flood Zone, flooding is unlikely to occur. There are no areas benefitting from flood storage within 250m of the site. There is no risk according to RoFRaS of flooding from rivers and seas.

There are four(4) recorded surface water abstractions within 2000m of the site. The closest two are located 1490m to the south west of site for general use relating to Secondary Category taking water from Jackson Bridge Dyke.

It is important that any contamination found on site is not allowed to detrimentally affect any watercourses or ponds. It is unlikely, due to distance, that the site could be detrimentally affecting water courses.

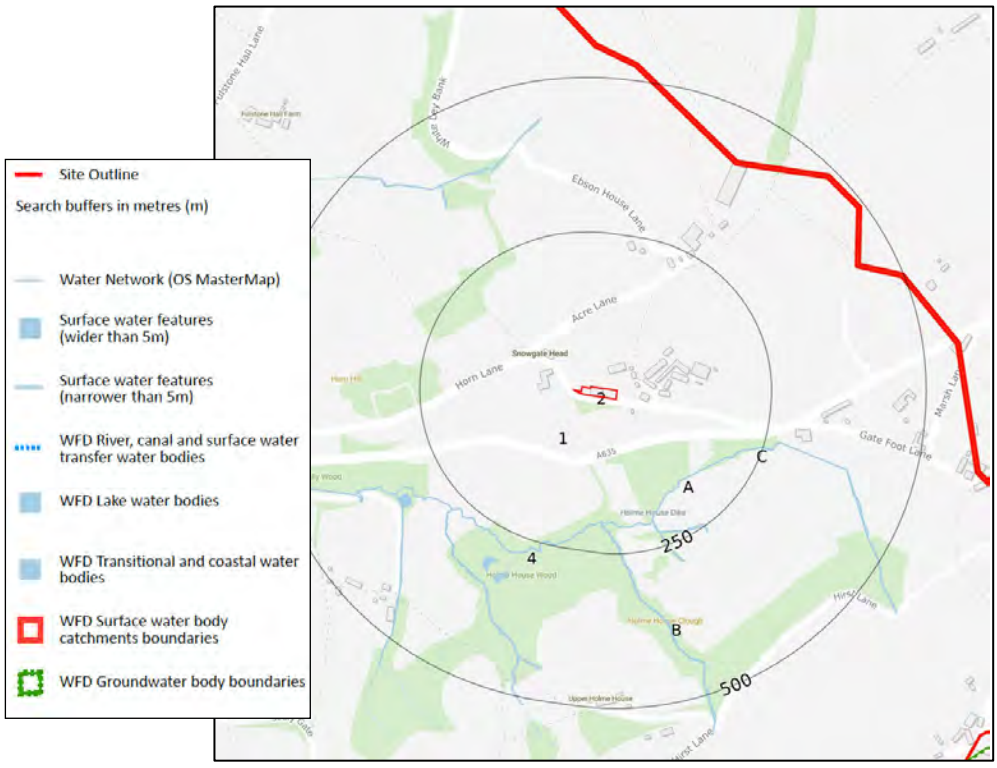


Figure 9 Hydrology Plan

8.2 Hydrogeology

The geological maps produced by the BGS indicate the site to be underlain by the Grenoside Formation Sandstone. The bedrock is not overlain by superficial deposits. A Secondary A Aquifer is held within the sandstone bedrock beneath the site. This is predominantly permeability 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.

There are zero potable water abstractions within 2000m of the site.

The site is shown to not lie within a Source Protection Zone Outer catchment or an Inner Catchment. There are 23 recorded groundwater abstractions within 2000m of the site. The closest two abstractions are located 1208m to the west of site used for boiler feeds, sourcing water from a spring. Further abstractions are located 1300-1800m from site sourcing waters from boreholes, occasionally in the Millstone Grit.

Other unrecorded or unlicensed wells may be present close to the site. Historic wells may exist within 500m of the site. As the local groundwater may be utilised for abstraction from old unlicensed wells, it is important that it is protected from pollution. It is an offence to pollute the groundwater, whether or not it is used for abstraction.

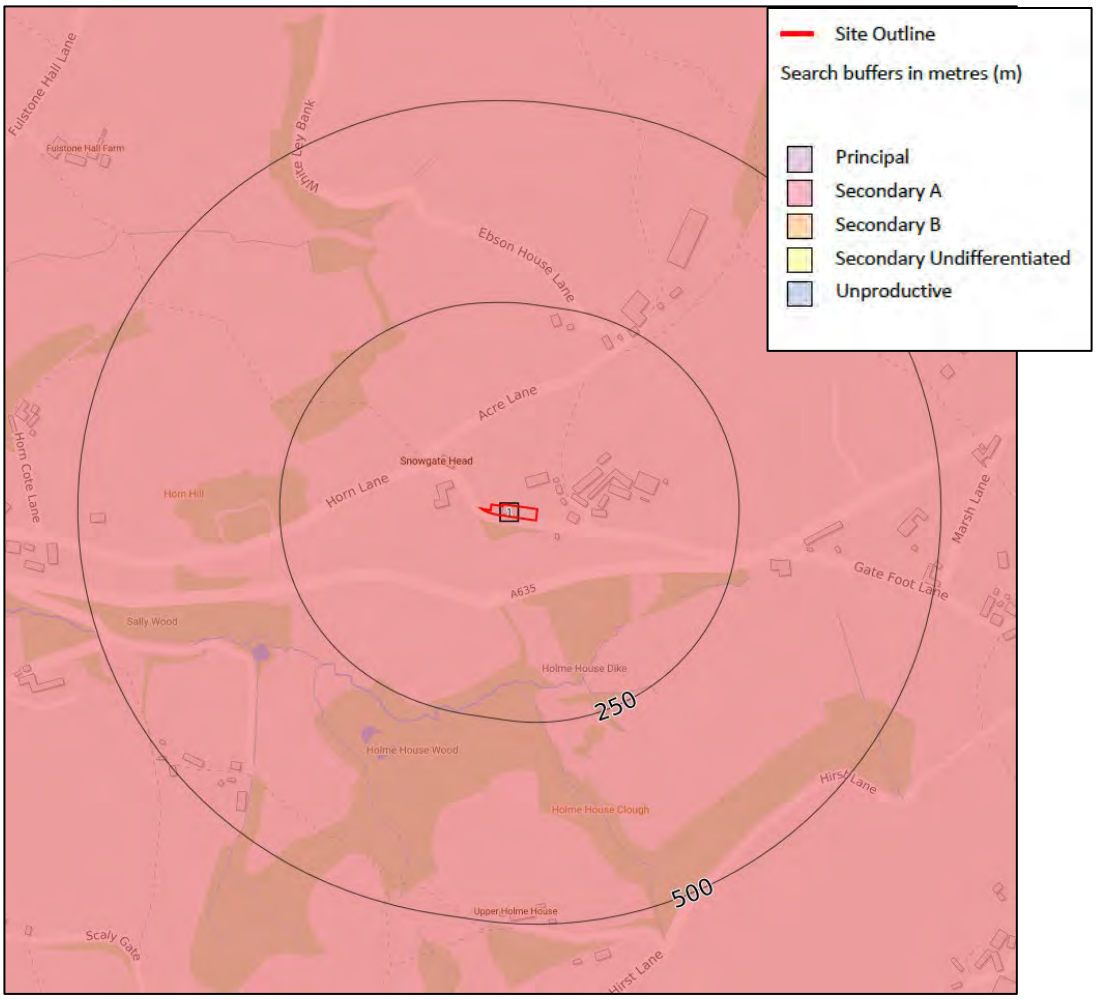


Figure 10 Hydrogeology of Bedrock

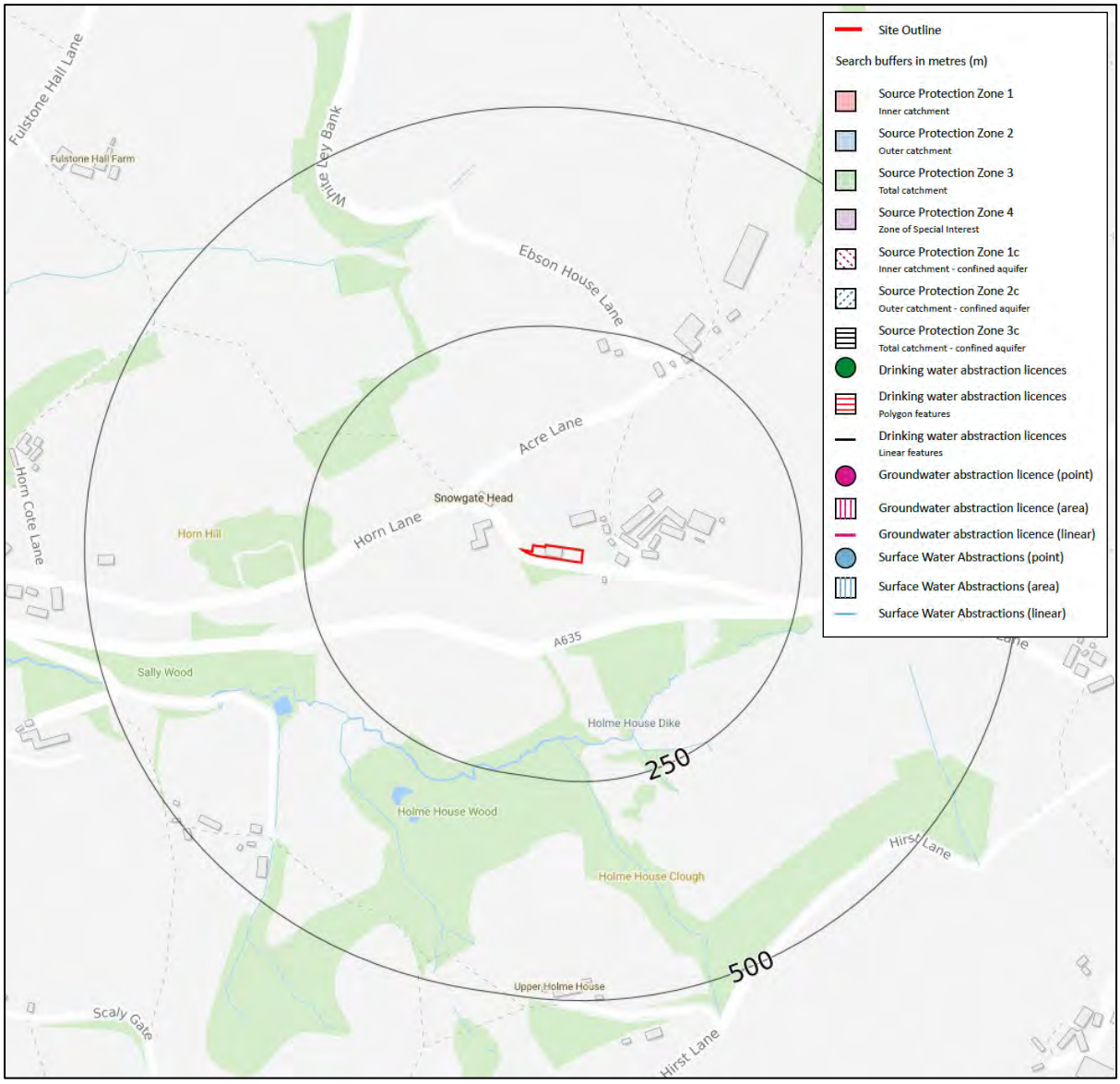


Figure 11 Source Protection Zones and Abstractions

9. QUARRYING AND MINING

9.1 Quarrying

The British Geological Survey Mines and Quarries Survey 1998 does not indicate any existing quarries on or within 250m of the site. Horn Hill Quarries existed at >250m North west of the site and are now disused.

9.2 Coal Mining

The property is within a surface area that could be affected by underground mining in 1 seam of coal at 80m depth, and last worked in 1942. Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.

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

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

However, reserves of coal exist in the local area which could be worked at some time in the future. No notices have been given, under Section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

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

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

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

There are no licence requests outstanding to remove coal by opencast methods within 800metres of the boundary. The property is not within 800metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50metres of the enquiry boundary, since October 31st 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 have been, made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

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

The Coal Authority Report is presented in Appendix C.

10. ENVIRONMENTAL RISK ASSESSMENT

10.1 Environmental Risk

10.1.1 General

Sources of contamination were investigated through the desk study. The environmental liabilities of the site and risk assessments have been undertaken for continued residential use. If the site use changes then a further risk assessment may be required.

Environmental risk considerations on the site have been assessed by adopting a site specific qualitative approach to identify the risk, if any, of environmental harm. In accordance with the DETR Draft Statutory Guidance on Contaminated Land the approach is by identifying a hazardous source and establishing possible links between the source via exposure pathways to a potential receptor.

The hazard is a contaminant or potentially polluting substance that is in, on or under the land and which has the potential to cause harm or to cause pollution to controlled waters. The

receptor is a living organism or organisms, an ecological system or piece of property, which is being harmed, interfered with or polluted by the contaminant. The pollutant linkage is by means of the pathway which is one or more routes by or through which that receptor is being, or could be, exposed to, or affected by, that contaminant. Thus the presence of a hazard on a site does not necessarily mean that there are risks unless pathways and receptors are present and are receptive to being affected by that specific hazard or contaminant.

- SOURCE - release of pollutant - eg. oil spills
- PATHWAY - route to receptor - eg. permeable strata
- RECEPTOR eg. - river

The likelihood of contamination affecting the environment depends on the migration and persistence of contaminants which varies with the nature of the contaminant and the ground and groundwater conditions, and the presence of sensitive receptors.

The following tables (Tables 3, 4, 5 and 6) which are extracted from CIRIA C552 'Contaminated Land Risk Assessment – A Guide to Good Practice' have been used to assess the risk to sensitive receptors from site contamination.

Any category which shows as medium risk or above may require investigation and if high risk is proven, remediation may be required following investigation.

TABLE 3
Risk Matrix – Comparison of Consequence and Probability

Risk = Probability x Consequences		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

TABLE 4
Classification of Probability

Probability Classification	Definition
High Likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

TABLE 5
Classification of Consequence

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem or organisation forming part of such ecosystem (note: the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. **Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).**
Medium	Chronic damage to Human Health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem or organism forming part of such ecosystem, (note: the definitions of ecological systems within Draft Circular on Contaminated Land, DETR, 2000).	Concentration of a contaminant from site exceeds the generic or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve. **Lesser toxic and asphyxiate effects of carbon dioxide**
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm" as defined in the Draft Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discoloration of concrete.

TABLE 6
Classification of Risks and Likely Action Required

Risk Classification	Definition
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard OR there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe. If any harm were to occur, it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

Any category which shows as moderate risk or above may require investigation and possibly subsequent remediation.

10.1.2 Sources of Contamination

It is a low risk that contamination exists on the site based on its past use as residential and open land. There is a risk that hydrocarbons may be present around the sheds if they were used as garages.

10.1.3 Potential Pathways for Migration

a) *Ingestion of and/or skin contact with contamination in the soil*
Low Likelihood to Unlikely – There is a low potential for ingestion/skin contact with any contamination in soil due lack of historical industrial site usage and lack of contamination expected. There may be a risk to workmen which could be mitigated by appropriate use of Personal Protective Equipment. The risk is low provided the area around the sheds is checked for hydrocarbon, metal and asbestos contamination and proven not to be a risk to humans for skin contact.

b) *Ingestion of contamination and uptake of contamination in plants/vegetables/animals/pets*
Low likelihood to Unlikely - Vegetables and plants may be grown on the site. It is considered that animals in the food chain and pets will not be present on site. It is unlikely that there will be any uptake, due to lack of expected contamination from site history, of contamination in plants that could detrimentally affect site occupants in gardens / landscaped areas. Plants will not be grown in the area of the sheds as this will be covered by a new garage building with tarmac surround.

c) *Ingestion of contaminated drinking water through leaching of contamination into groundwater flowing to underlying aquifers/water abstractions*
Low Likelihood to Unlikely – Leaching of any contamination is unlikely to detrimentally affect groundwater. The site does not lie within a Source Protection Zone for potable groundwater abstractions. There are no groundwater/potable water abstractions within 1000m of the site. The site is unlikely to detrimentally affect potable water due to distance of local abstractions and the abstractions are from strata stratigraphically below the strata beneath the site.

d) *Inhalation of vapours produced by landfill/radon/hydrocarbons/old mines*
Likely to Unlikely – There are no recorded landfill sites within 250m of the site. There is a colliery spoil tip 100m to the south recorded as infilled land. It lies at a significantly lower elevation than the site and is unlikely to detrimentally affect the site as it has been infilled since 1992, indicating any methane / carbon dioxide from refuse would have dissipated by now. There is also a geological fault between the tip and the site which would have presented a preferred exit for any toxic gases. The site does not lie within a radon protection area. Old mines are not recorded beneath the site. It would be prudent to incorporate a methane membrane in new construction due to the local infilled ground.

e) *Inhalation of contaminated airborne dust*
Low Likelihood to Unlikely – The appropriate safety measures must be exercised to protect both the workers and the local residents from dust during construction. Provided this work is carried out diligently, the ongoing risk is low.

f) *Contamination of controlled waters*
Low Likelihood to Unlikely – Leaching of contamination from the site into the closest surface water on site is unlikely due to expected lack of contamination from previous site use. Surface water exists >100m from site. There is a low potential for leaching of any contaminates into groundwater and underlying Secondary A aquifer within the bedrock.

10.1.4 Potential Sensitive Receptors

Potential Sensitive Receptors to any undetected contamination on the site could include workmen.

10.2 Summary of Environmental Risk

By considering where a viable pathway exists which connects a source to a receptor, this assessment will identify where pollutant linkages may exist. If there is no pollutant linkage, then theoretically there is no risk. Therefore, only where a viable pollutant linkage is established does this assessment go on to consider the level of risk. On this site there is unlikely to be contamination and a low potential for undetected contamination to be present due to its lack of past industrial use. The site will be used in the future for the high sensitivity land use scenario of continued residential use with gardens. The eastern area of the site will be hard covered with a new garage and hard covered tarmac surround.

The risk is assessed by the combination of the probability of the risk and the severity of the risk in line with CIRIA recommendations and the risks are presented in Table 7. If any material is likely to be removed from site for development, then waste categorisation and Waste Acceptance Criteria Tests will be required to categorise the soils.

TABLE 7
Risk Assessment for a Residential Site Use

Pathways	Receptors	Perceived Risk	Probability of Risk	Consequence of Risk	RISK
Environmental					
Inhalation of vapours such as methane from landfill and hydrocarbons from ground contamination	Existing/future occupants of the buildings and workmen.	Methane & Carbon Dioxide	Low Likelihood to Unlikely	Severe-Methane can be explosive in air. Carbon dioxide can be fatal. Hydrocarbon can have long term health effects.	Moderate – colliery spoil / infilled land within 250m Garage area requires testing for hydrocarbons, metals and asbestos to check risk No mining. Reduced to Low if mitigating measures employed in construction
Ingestion of and/or skin contact from contaminated soil	Existing/future occupants of the building and workmen	Contaminated Soil	Low Likelihood To Unlikely	Mild	Low – Due to lack of likely contamination due to past land use as open ground and residential. Provided garage area is tested and is not a risk.
Ingestion of contaminated drinking water	Local abstraction wells	Contamination of potable water	Low likelihood to Unlikely	Medium-prosecution can occur if site is affecting controlled waters	Low - Potable boreholes located >1250m. Site does not lie in a source protection zone for potable water abstracted from strata below strata on site.

Transportation by surface and/or groundwater	Groundwater Surface Water	Contamination of shallow groundwater by hydrocarbons Contamination of surface water	Low Likelihood to Unlikely Unlikely	Medium- prosecution can occur if site is affecting controlled waters.	Low - It is unlikely that contamination could be affecting groundwater. Closest groundwater abstraction >1000m Low- Due to expected lack of contamination Surface water >100m from site
Ingestion and uptake of contamination in plants/animals/ vegetables.	Future occupants	Ingestion of contamination via home grown produce	Low Likelihood to Unlikely	Medium	Low – vegetables and plants may be grown on garden area. Vegetables and plants will not be grown in proposed hard covered area of garage.
Inhalation of airborne dust	Workmen, occupants of building, neighbouring users	Dust during any future demolition or construction.	Low likelihood to Unlikely	Medium	Low - provided good construction practice on site.
Irradiation	Humans	Radon gas	Unlikely	Mild	Low-Radon protection not required in buildings
Geotechnical					
Settlement or Heave	Buildings and car park	Damage to hard surface and buildings	Unlikely	Medium	Low – provided foundations placed on high strength sandstone
Landslip	Buildings	Level site	Unlikely	Severe	Low risk – site is level.
Chemical attack	Buildings	Sulphate can, under certain conditions, attack concrete.	Low to medium likelihood	Medium	Low - sulphate resisting concrete is not required for underground construction unless made ground is encountered
Groundwater	Buildings	Rising groundwater	Unlikely	Medium	Low
Mining					
Shallow Mining	Land and Structures	Damage to hard surface and buildings	Unlikely	Medium	Low – No shallow mining <30m bgl. .
Deep Mining	Buildings	Damage to hard surface and buildings	Unlikely	Severe	Low risk – Coal mined at 80m bgl to south of site and due to geological faulting this coal lies at greater depth beneath the site.

The potential sensitive receptors on the site which could be detrimentally affected by any contamination, mining and geotechnical risks are assessed in Table 7.

The risk assessment has been based on the future use of the site for continued residential use with garden and with hard cover in the east around the proposed new garage. If the site is to be used for any other purpose a reassessment of the risk may be necessary.

In line with CIRIA, a risk assessment has indicated that there is a low risk of the contamination detrimentally affecting humans or the environment. Due to the depth to groundwater and the distance to surface water, increased hard cover, the site is unlikely to detrimentally affect controlled waters.

Workmen should always take the usual precaution of wearing gloves when handling soil.

Due to the possibility of the presence of hydrocarbons, metals and / or asbestos in the area of the existing sheds, trial pits were excavated in this area and soil samples were collected for environmental testing and results are presented below and in Appendix E.

10.3 Environmental Assessment Guidelines

There are no definitive legal standards for contaminated land in the United Kingdom, although the Government Department of the Environment in the late 1970's published guidance on a restricted number of contaminants. Further guidance was published in March 2002 as the Contaminated Land Exposure Assessment (CLEA) by the Department of Environment, Food and Rural Affairs (DEFRA). These were withdrawn in August 2008 and new guidelines for some compounds were released in 2009. The UK Risk Assessment Framework is based on a tiered approach, Tier 1 being a risk screening or qualitative risk assessment, Tier 2 is a generic quantitative risk assessment and Tier 3 is a detailed quantitative risk assessment. Where the Tier 2 identifies a potentially unacceptable risk to human health either a Tier 3 Detailed Quantitative Risk Assessment (DQRA) is undertaken or risk management action recommended to remove the pathway and the risk.

For this site both a Tier 1 and Tier 2 assessment have been undertaken using generic assessment criteria and site specific assessment criteria based on CLEA 2009 and ATRISK 2019 which are based on the new CLEA guidance 2008 and 2009 (SC050021/SR3 (the CLEA Report) and SC050021/SR2 (the TOX report), SC050021/SR4, CLEA Software version 1.071 (2015) and toxicological reports and SGV technical notes (2009)). The figures used for assessment of lead are from DEFRA(2014b), Category 4 Screening Levels, which are based on the 'low level of toxicological concern (LLTC)'. C4SLs are 'estimates of contamination concentration in soil that present acceptable risk within the context of Part 2A'. In addition, assessment has used the LQM/CIEH S4ULs (2015) for Human Health Risk Assessment. The S4ULs are based on the principles of 'minimal' or 'tolerable' risk enshrined in SR2 (EA2009A), which has not been withdrawn and are based on the EA software. The guidance set out in these documents has been used to establish a conceptual model of the risks on the site.

The site of the existing sheds and proposed new garage will be used for residential use without plant uptake or landscaped ground. The risk assessment has used a scenario of residential use without plant uptake as the model for assessment as this area will be completely hard covered by building and tarmac surround. In deriving the SSVs a adult has been chosen as the critical receptor with exposure over a lifetime being the most appropriate and conservative scenario.

The assessment of the risks to users on the site has been undertaken within the framework set out in guidance published by DEFRA and the Environment Agency for the assessment of risks to human health associated with chronic long term exposure to contaminated soils. The guidance set out in this documentation has been used to establish a conceptual model of the risks on the site following redevelopment.

The Contaminated Land Exposure Assessment (CLEA) model provides a means of establishing concentrations of contamination in soils at a site. If results exceed these

concentrations, then further assessment or intervention by mitigation or remediation may be required to reduce risks to human health.

It should be noted that the approach adopted herein has been to derive C4SLs for BaP as a surrogate marker for genotoxic PAHs, in line with the relevant HPA Contaminated Land Information Sheet (HPA 2010). This approach enables land contamination risk assessors to consider the combined carcinogenic risk associated with all genotoxic PAHs that might be present at a site, despite the absence of toxicological information for many of them, on an individual basis. Further information on the surrogate marker approach, including how and when it should be used, is provided in HPA.

HPA, Table 2.5: Profile of the genotoxic PAHs relative to BaP in the Culp et al study along with the order of magnitude upper and lower limits.

PAH	Mean ratio to BaP	Lower limit	Upper limit
Benz[a]anthracene	1.24	0.12	12.43
Chrysene	1.16	0.12	11.61
Benzo[b]fluoranthene	1.08	0.11	10.85
Benzo[k]fluoranthene	0.37	0.04	3.72
Dibenz[ah]anthracene	0.14	0.01	1.38
Indeno[123-cd]pyrene	0.73	0.07	7.27
Benzo[ghi]perylene	0.82	0.08	8.22

10.4 Environmental Test Results

On August 9th 2023, 3 samples(T1, T2 & B) of material were collected from front of, around and behind the existing sheds. The laboratory tested the samples for heavy metals, speciated PAH USEPA16, TPH CWG UK, pH and sulphate and one sample was tested for asbestos. The Trial Pit Locations are shown in Figure 12.

Figure 12 Trial Pit Location Plan

Results of tests on the samples collected are given in Tables 8, 9 and 10 and in Appendix D.

TABLE 8
Results of Tests for Heavy Metals

Metals	Units	Minimum Value	Maximum Value	ATRISK Contaminated Land Screening Values (SSV)
				Residential without plant uptake in mg/kg
Boron	mg/kg	0.7	1.0	290
Mercury	mg/kg	0.1	0.3	1.44
Nickel	mg/kg	21.2	30.3	188
Copper	mg/kg	34.2	74.8	9060
Selenium	mg/kg	<1	<1	595
Zinc	mg/kg	99.7	375	47,000
Chromium VI	mg/kg	<0.04	<0.04	20.5
Arsenic	mg/kg	25.3	44.4	39.9
Cadmium	mg/kg	0.2	0.5	149
Lead	mg/kg	70.4	234	313
Asbestos	NAD	NAD	NAD	NAD
pH	units	6.9	7.1	5-9
Sulphate	mg/l	26	37	500

NAD = No asbestos detected

All tests undertaken for heavy metals were within guidelines for residential use of the site without plant uptake with the exemption of the arsenic test results for T2 which was very slightly elevated. It is considered, based on the soil, that the arsenic derives from ash from coal fires deposited on the ground behind the sheds in the past. No asbestos fibres were detected.

TABLE 9
Results of Tests for Polyaromatic Hydrocarbons (PAH)

Polyaromatic Hydrocarbons	Units	Minimum Value	Maximum Value	ATRISK Contaminated Land Screening Values (SSV)
				Residential without plant uptake in mg/kg
Naphthalene	mg/kg	0.02	0.09	13.1
Acenaphthylene	mg/kg	<0.02	0.51	920
Acenaphthene	mg/kg	<0.02	0.45	6730
Fluorene	mg/kg	<0.02	0.36	4860
Phenanthrene	mg/kg	0.21	5.06	440
Anthracene	mg/kg	0.04	1.15	37,700
Fluoranthene	mg/kg	0.44	9.20	5050
Pyrene	mg/kg	0.41	7.69	3780
Benzo(a)anthracene	mg/kg	0.21	4.04	b(a)p**
Chrysene	mg/kg	0.28	4.54	b(a)p**
Benzo(b)fluoranthene	mg/kg	0.30	5.11	b(a)p**
Benzo(k)fluoranthene	mg/kg	0.11	2.10	b(a)p**

Benzo(a)pyrene	mg/kg	0.22	4.17	5.34
Indeno(1,2,3-cd) pyrene	mg/kg	0.16	2.97	b(a)p**
Dibenzo(a,h)anthracene	mg/kg	0.03	0.65	b(a)p**
Benzo(ghi)perylene	mg/kg	0.14	2.48	b(a)p**
TOTAL PAH	mg/kg	2.57	50.6	

** Assessment undertaken as acceptable ratio of benzo(a)pyrene.

All PAHs results were within government guidelines for use of the site for residential houses without plant uptake.

TABLE 10
Results of Tests for Total Petroleum Hydrocarbons (TPH)

Total Petroleum Hydrocarbons		Minimum Values In mg/kg	Maximum Values In mg/kg	ATRISK Contaminated Land Screening Values (SSV)	Samples Exceeding SSV
				Residential Use Without Plant Uptake in mg/kg	
Aromatic Hydrocarbons (mg/kg)	>C5-C7	<0.01	<0.01	3.32	
	>C7-C8	<0.01	<0.01	3860	
	>C8-C10	<0.01	<0.01	332	
	>C10-C12	<10	<10	1550	
	>C12-C16	<10	<10	2710	
	>C16-C21	<1	14	1930	
	>C21-C35	<1	18	1930	
	>C35-C44	<1	<1	-	
Aliphatic Hydrocarbons (mg/kg)	>C5-C6	<0.1	<0.1	371	
	>C6-C8	<0.1	<0.1	1240	
	>C8-C10	<0.1	<0.1	205	
	>C10-C12	<6	<6	1190	
	>C12-C16	<6	<6	2710	
	>C16-C35	<15	<15	212,000	
	>C35-C44	<10	<10		

All TPHs results were within guidelines for use of the site for residential use without plant uptake.

Tests on soil samples for TPH all fell within guidelines for residential use without plant uptake of the site. The results indicate the soils tested are not contaminated by hydrocarbons. There was no odour of hydrocarbons on the site or within the trial pits during excavation.

Asbestos was not encountered in the samples tested.

11. ASSESSMENT AND RECOMMENDATIONS

11.1 Introduction

A Desk Study has been undertaken to assess the geotechnical, mining and environmental conditions for the proposed development of the site for continued residential use.

The desk study has been sufficient to allow an assessment of the site conditions for the residential house and gardens. Due to the existence of sheds in the east part of the site that may have been used as garages, three trial pits were excavated and soil samples were collected and tested for the presence of hydrocarbons, heavy metals and asbestos.

This section of the report provides an interpretation of the findings in the form of a ground model, and provides advice and recommendations with respect to the proposed development.

11.2 Geology and Groundwater

The site is underlain by sandstone which weathers close to the surface as clay bound sandstone fragments.

If any made ground is encountered it is likely to be highly compressible unsuitable for foundations. The underlying sandstone has a high strength where unweathered.

It is not expected that groundwater will be a concern during development, and any water during and after heavy rainfall could be dealt with by sump pumping. Any softened ground due to water ingress should be removed prior to pouring of concrete for foundations or services.

11.3 Mining

The Coal Authority mining report states that the site is within a surface area that could be affected by underground mining in one seam of coal at 80m bgl. Any movement in the ground due to coal mining activity within these workings should have stopped by now.

The colliery lay at a lower elevation than the site and due to a geological fault between the site and the colliery, and the stratigraphical succession, the coal mentioned is unlikely to exist beneath the site.

The Coal Authority Report is presented in Appendix C and should be read in full.

11.4 Contamination and Toxic Gas

Ordnance Survey maps inspected indicated the site has been occupied by open land and residential buildings with sheds in the east part of the site.

There is a low risk of any detected or undetected contamination detrimentally affecting humans. Due to the depth to groundwater and the distance to surface water and lack of contamination found the site is unlikely to detrimentally affect controlled waters. A well to the south of the site is on land owned by Mr S Sykes and is unused. Based on the lack of contamination detected it is unlikely that the well could be detrimentally affected by the site conditions.

There are no recorded abstraction licences which could be detrimentally affected by the site. The underlying aquifer of the permeable strata within the Coal Measures is present at such depth beneath the site that it is unlikely to be detrimentally affected by the site.

The area of the existing sheds was tested for hydrocarbons, heavy metals and asbestos and was found to be uncontaminated with the exception of one test for arsenic. As this area of the site will be hard covered by a new garage and tarmac surround, the arsenic will not have a pathway to detrimentally affect humans or the environment.

As a precaution all builders should also use gloves when handling soil for Health and Safety and work in accordance with HSE and CIRIA guidelines.

A colliery spoil tip and infilled land exists within 150m and it would be prudent to install a 1200 gauge methane resistant membrane in construction of any new extensions to the house and also to the proposed garage if it is to be used as a workshop as well as car storage.

Basic radon protection measures are not required on this site according to BRE BR211.

11.5 Excavations

Excavations for services could be achieved by mechanical excavator. All excavations for foundations and services will require temporary support for construction in the short and long term.

Groundwater may be encountered especially during and after heavy rainfall. If rainwater falls into the excavations it is expected to be easily dealt with by sump pumping. If this occurs, the softened surface of the strata should be removed prior to any pouring of concrete.

11.6 Underground Concrete

If made ground is encountered on site then tests should be undertaken for soluble sulphate to determine any special precautions for design of underground concrete. If sandstone is encountered, then no special consideration will be required for underground concrete.

11.7 Waste Disposal

Any spoil arising from excavations or landscaping works will need to be disposed of to a licensed tip in accordance with the EP (Duty of Care) Regs 1991 and Landfill (England and Wales) Regulations (2002) amended. Under the European Waste Directive landfills are classified as accepting inert non-hazardous or hazardous wastes in accordance with the EU Waste Directive.

The local waste regulation department of the Environment Agency (EA) should be contacted to obtain details of tips that are licensed to accept the soil represented by the test results. The tips will be able to provide costs for disposing of this material if provided with the waste categorisation.

11.8 Foundation Recommendations

It is proposed to construct an extension on the existing property and a new garage.

Any made ground encountered is unsuitable material on which to construct foundations due to its low strength and variable nature both laterally and vertically.

It is recommended that foundations are placed on the high strength sandstone bedrock at depths of at least 1.00m bgl with a bearing capacity of 150kN/m2.

If during and after heavy rainfall the surface of excavations in the weathered sandstone are softened, then the softened material should be removed before pouring of concrete.

Care should be taken to ensure foundations are constructed on similar strata.

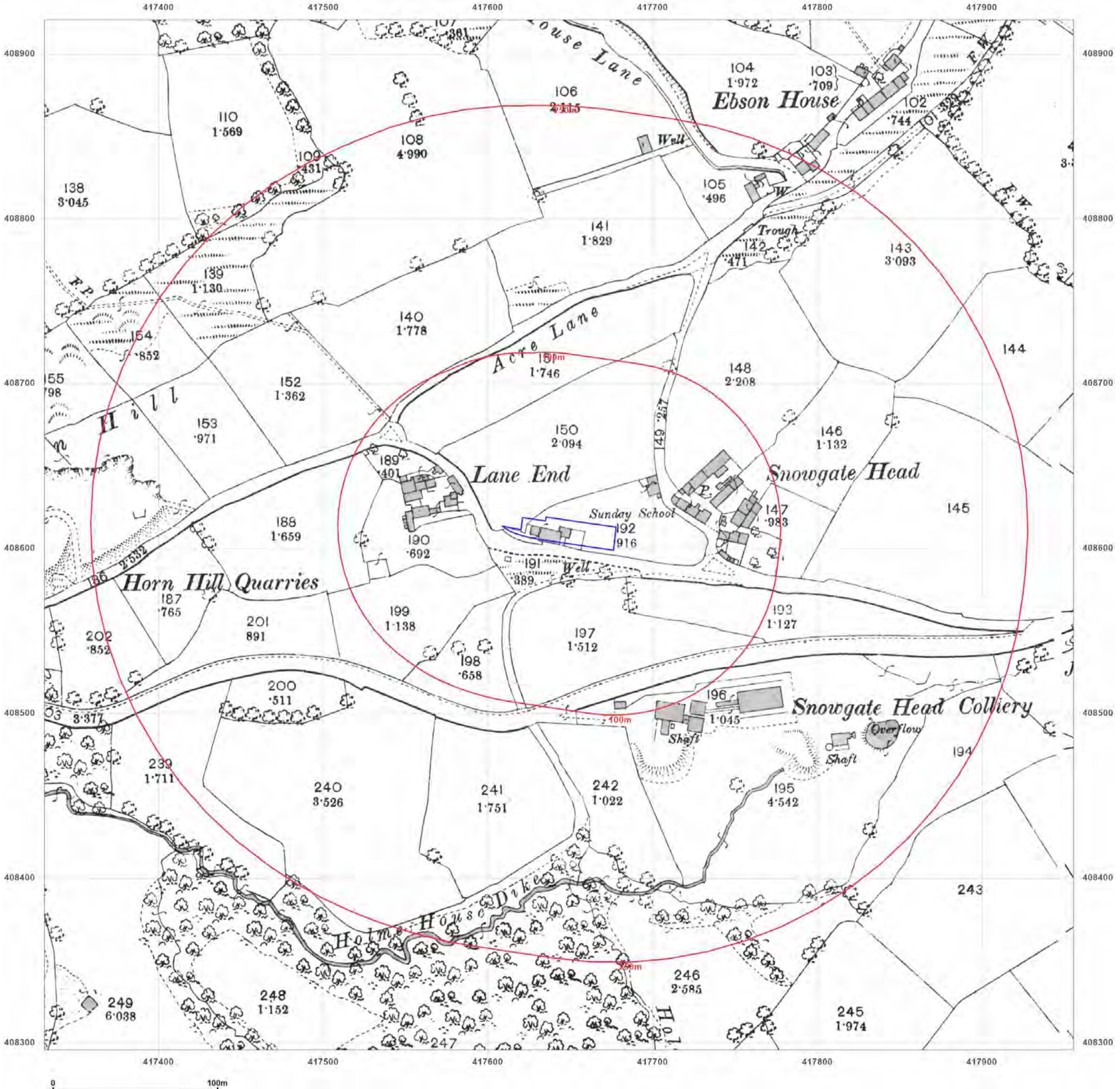
12. GENERAL REMARKS

This report truly reflects the conditions found during the desk study. Whilst the desk study was undertaken in a professional manner taking due regard of additional information which became available as a result of ongoing research, the results portrayed only pertain to the information attained, and it is possible that other undetected information and undetected ground and gas conditions, undetected mining conditions and undetected contamination may exist. The desk study was only undertaken within the site boundaries and should not be used for interpretation purposes elsewhere. These conclusions are only a brief summary of the report, and it is recommended that the report is read in full to ensure that all recommendations have been understood.

Tristan T A Bennett
BSc

Frances A Bennett
BSc, Creole, FGS, FIMMM, C.WEM, MCIWEM, CEnv, AIEMA, MIEnvSci.

Appendix **A**



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

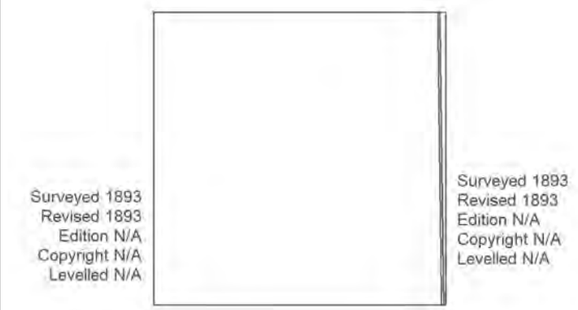
Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

Map Name: County Series
Map date: **1893**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S



Groundsure INSIGHTS

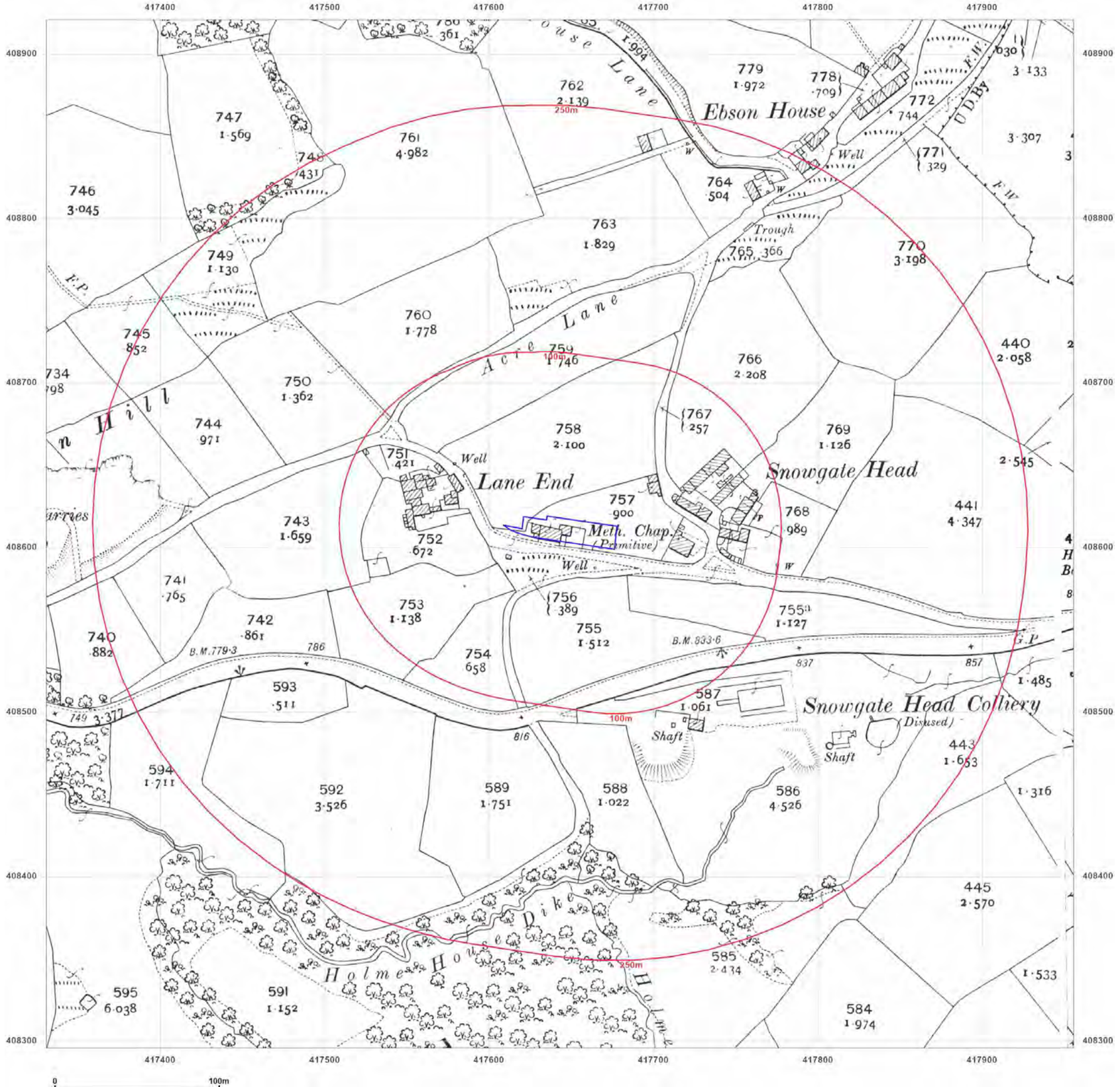
Produced by
Groundsure Insights
www.groundsure.com

Powered by

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

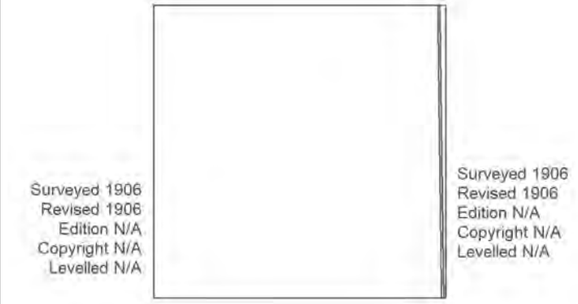
Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

Map Name: County Series
Map date: **1906**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S



Groundsure INSIGHTS

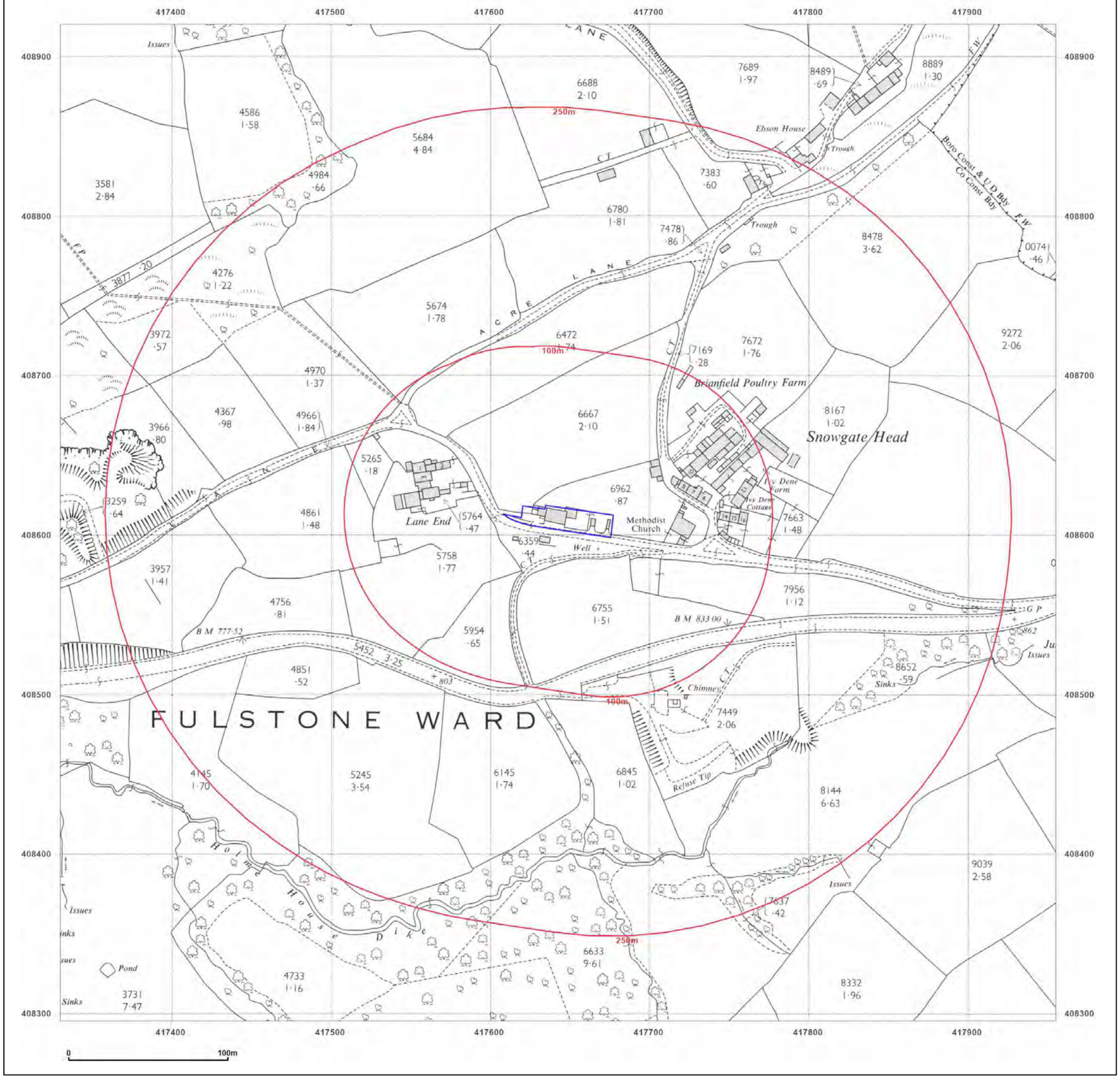
Powered by

Produced by
Groundsure Insights
www.groundsure.com

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

Map Name: National Grid

Map date: **1964**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1963
Revised 1963
Edition N/A
Copyright 1964
Levelled 1959

Groundsure INSIGHTS

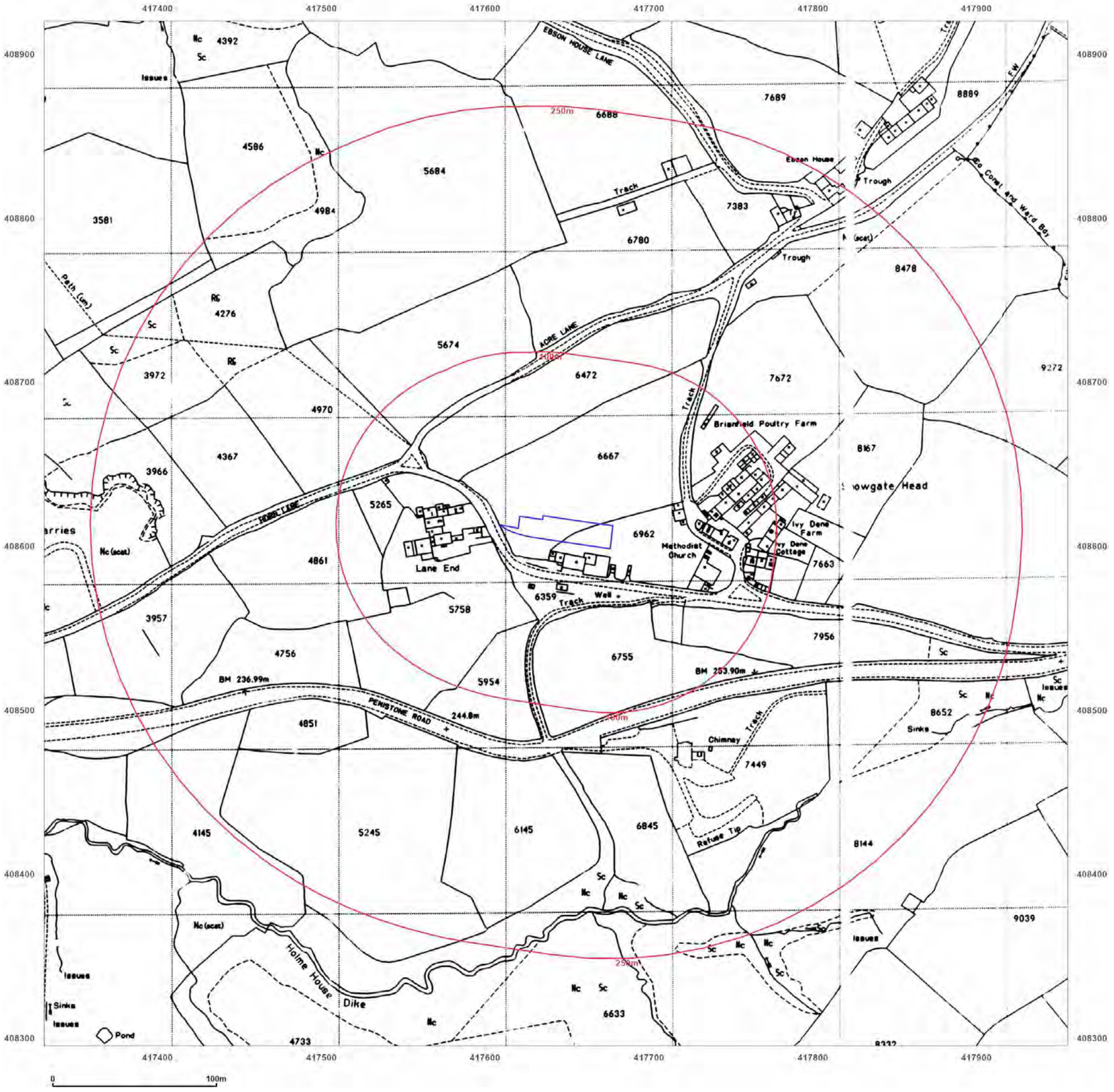
Produced by
Groundsure Insights
www.groundsure.com

Powered by

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

Map Name: National Grid
Map date: 1992
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

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

Groundsure INSIGHTS

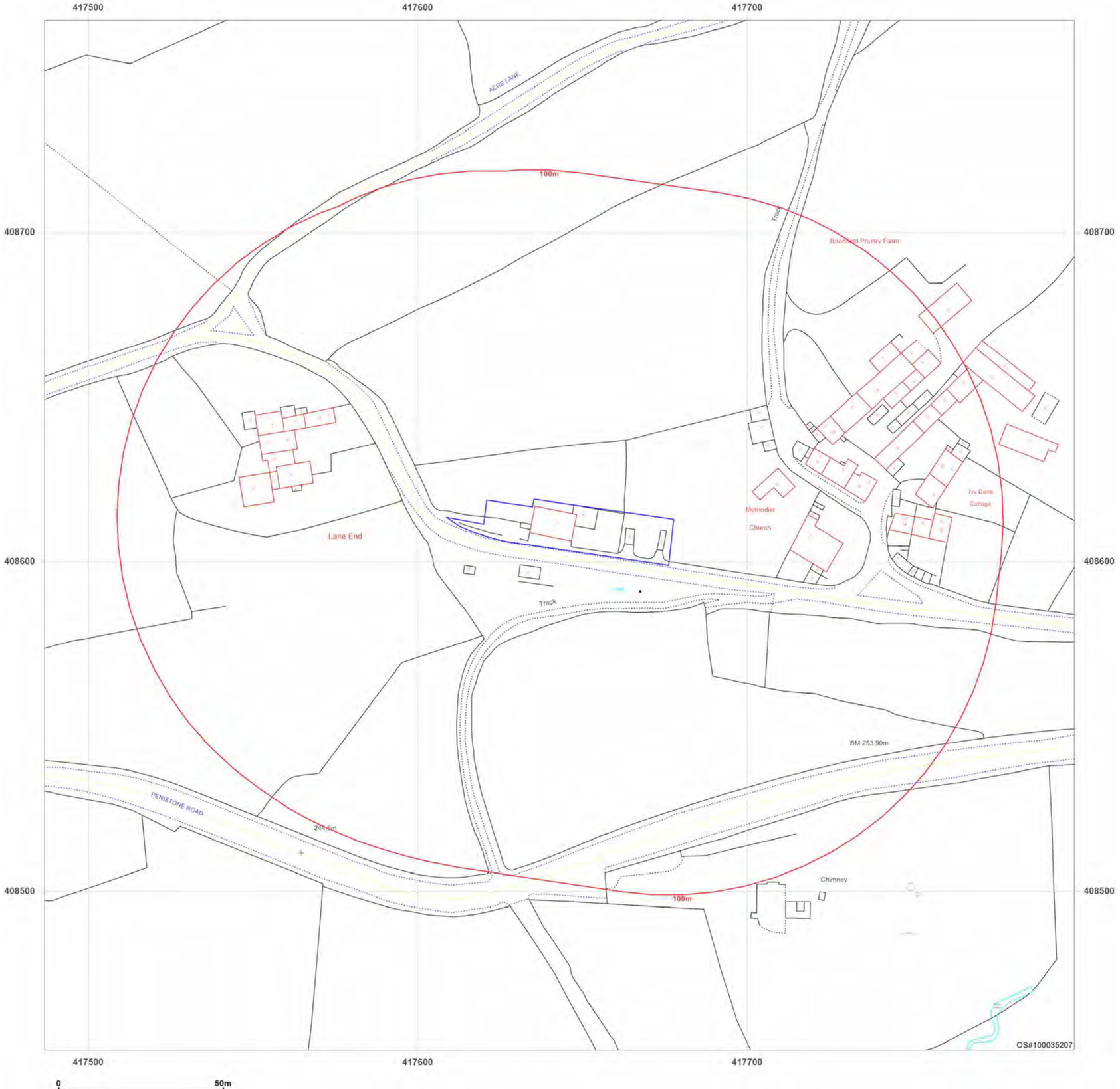
Produced by
Groundsure Insights
www.groundsure.com

Powered by

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

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

N
W E
S

Groundsure INSIGHTS

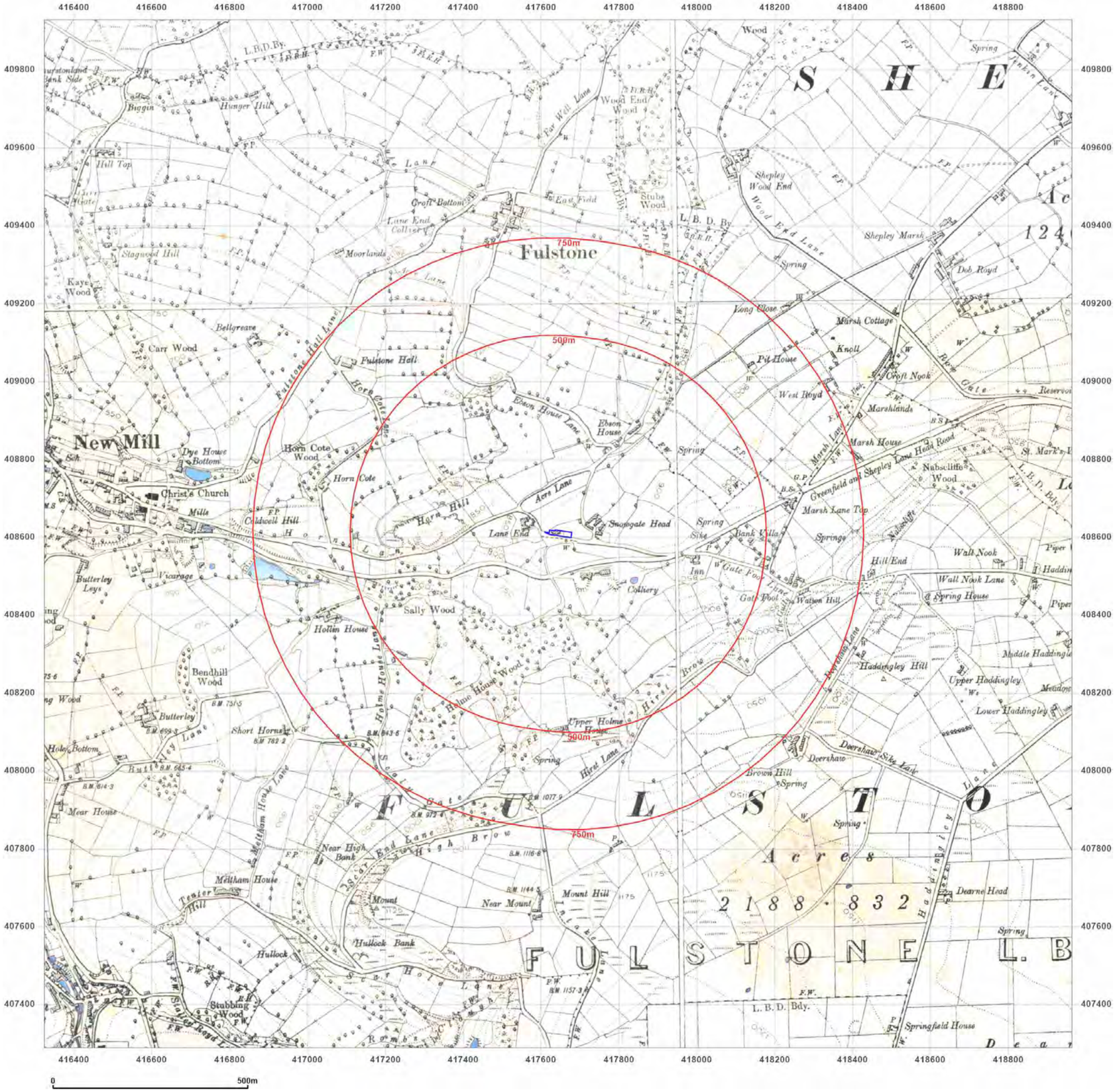
Powered by

Produced by
Groundsure Insights
www.groundsure.com

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

Map Name: County Series
Map date: **1888-1892**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
S

Surveyed 1888
Revised 1888
Edition N/A
Copyright N/A
Levelled N/A

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

Surveyed 1888
Revised 1888
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

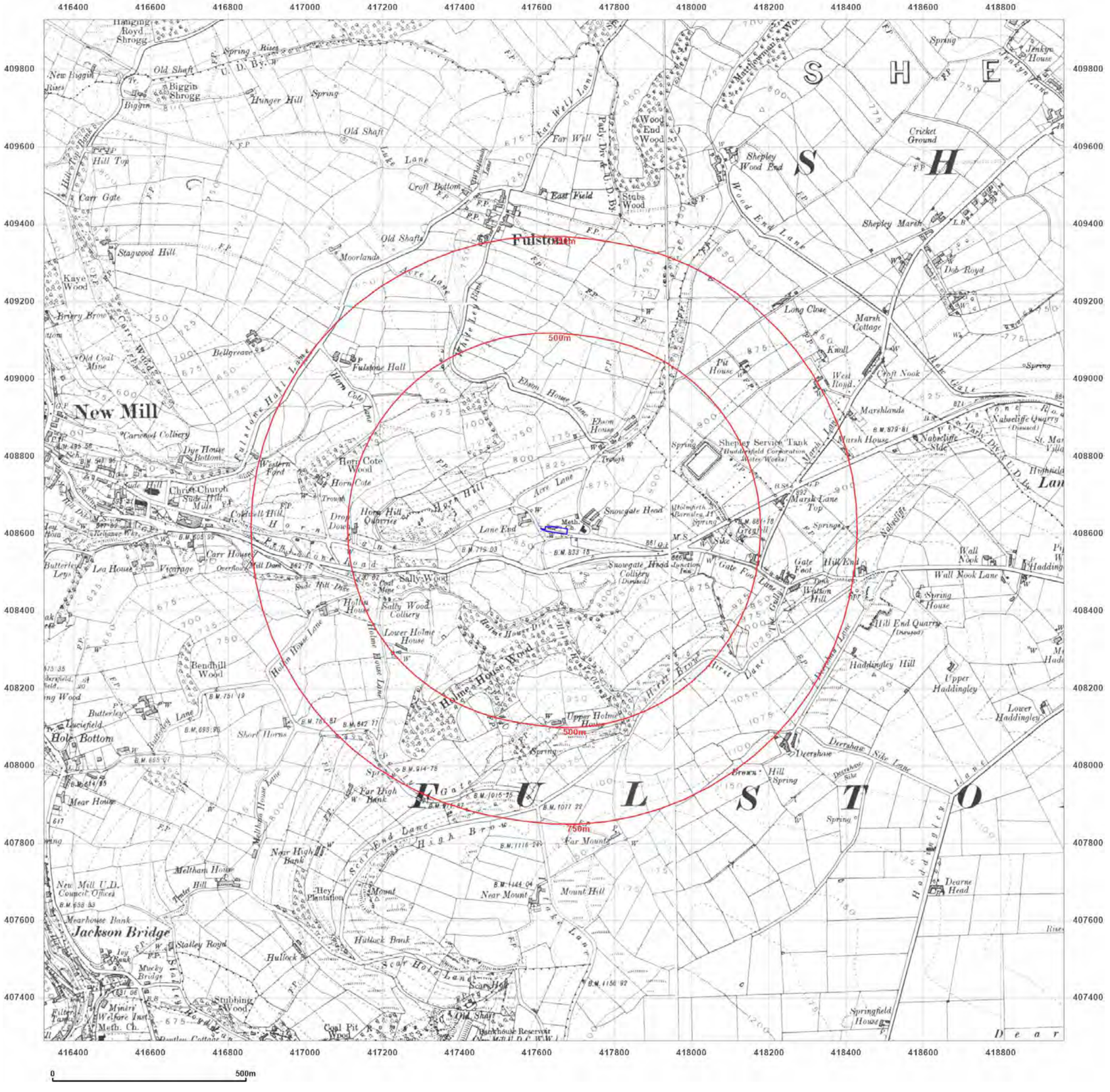
Powered by OS

Produced by
Groundsure Insights
www.groundsure.com

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

Map Name: County Series
Map date: **1929-1933**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
S

Surveyed 1851
Revised 1929
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1851
Revised 1932
Edition 1932
Copyright N/A
Levelled N/A

Surveyed 1851
Revised 1933
Edition 1933
Copyright N/A
Levelled N/A

Surveyed 1851
Revised 1933
Edition 1933
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

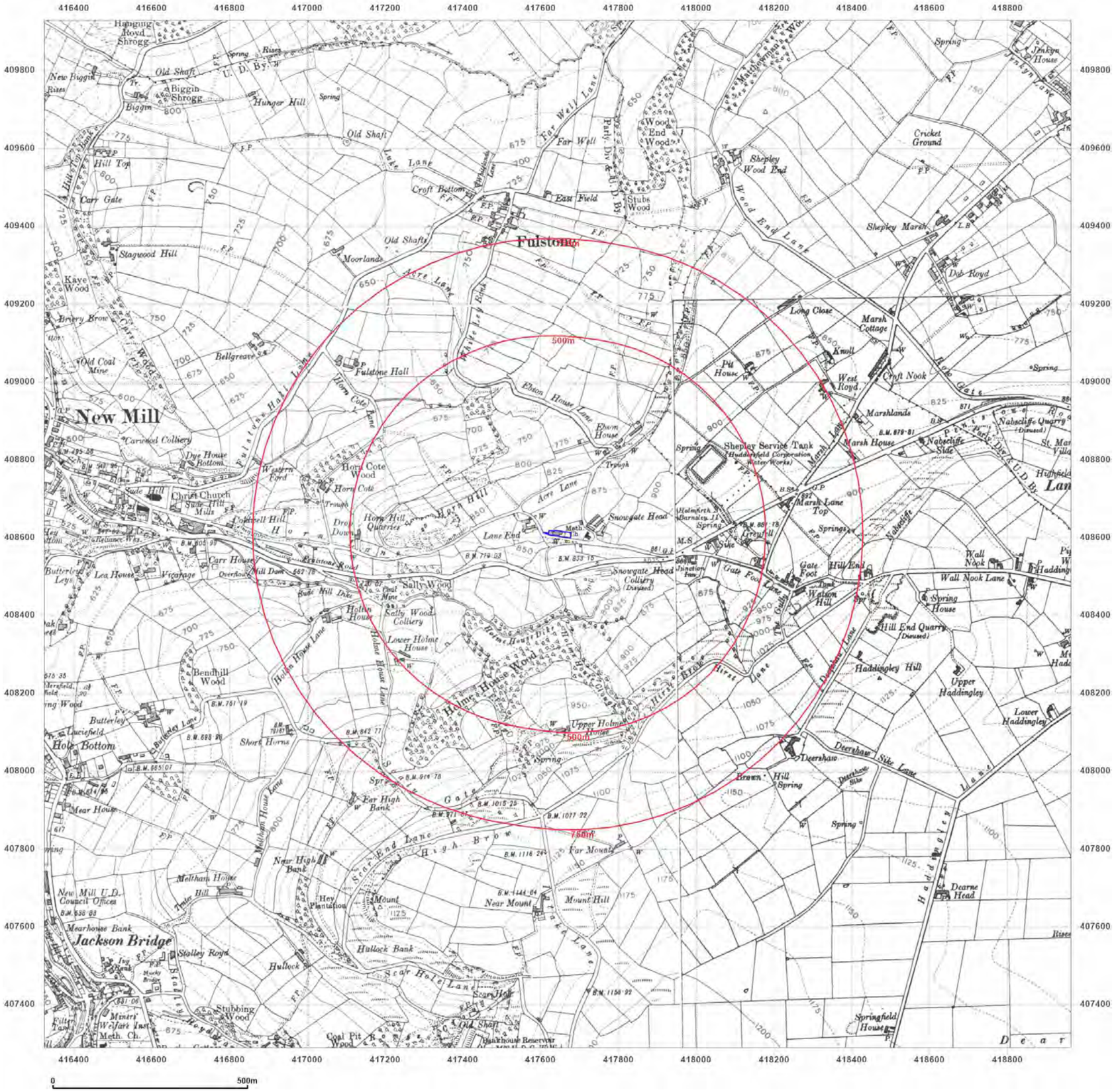
Powered by

Produced by
Groundsure Insights
www.groundsure.com

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

Map Name: County Series

Map date: **1948-1949**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1851
Revised 1949
Edition N/A
Copyright N/A
Levelled N/A

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

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

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

Groundsure INSIGHTS

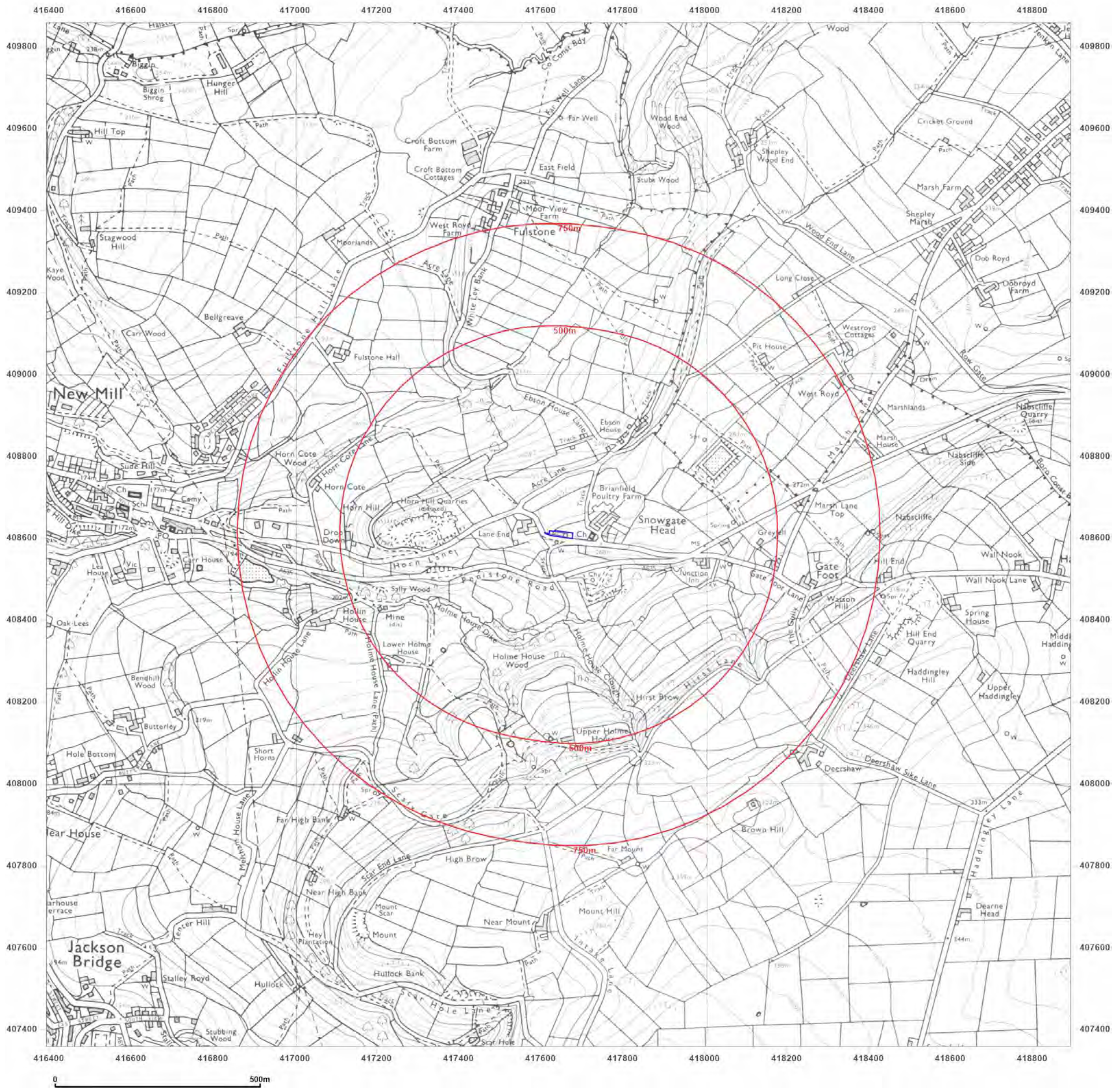
Powered by

Produced by
Groundsure Insights
www.groundsure.com

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

Map Name: National Grid

Map date: **1980**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

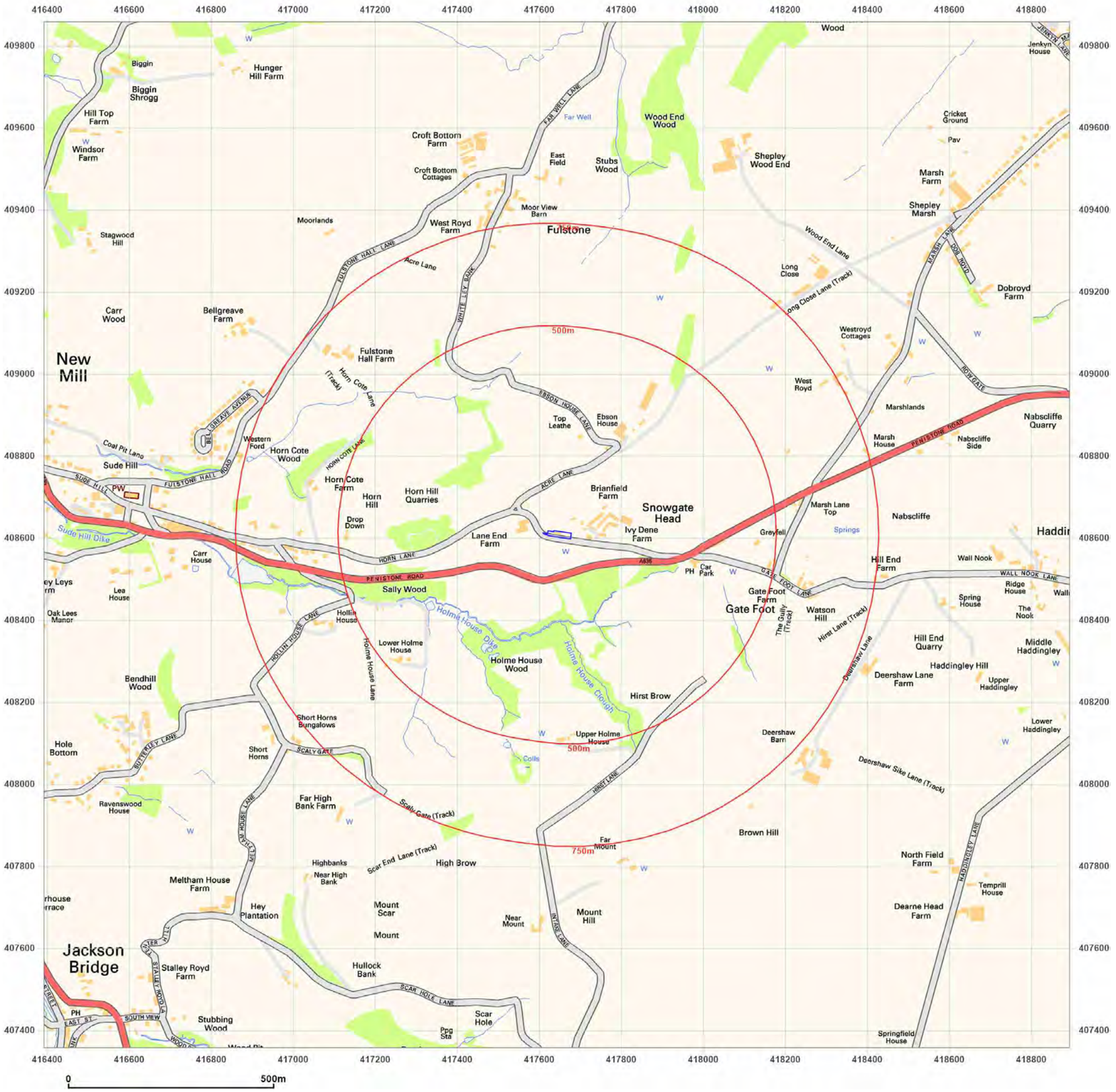
Surveyed 1976
Revised 1980
Edition N/A
Copyright N/A
Levelled N/A

Produced by
Groundsure Insights
www.groundsure.com

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

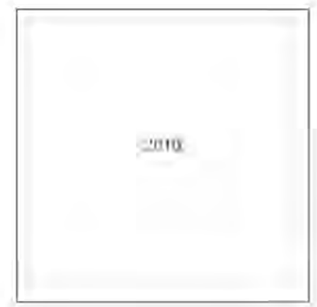
Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

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

N
W E
S



Groundsure INSIGHTS

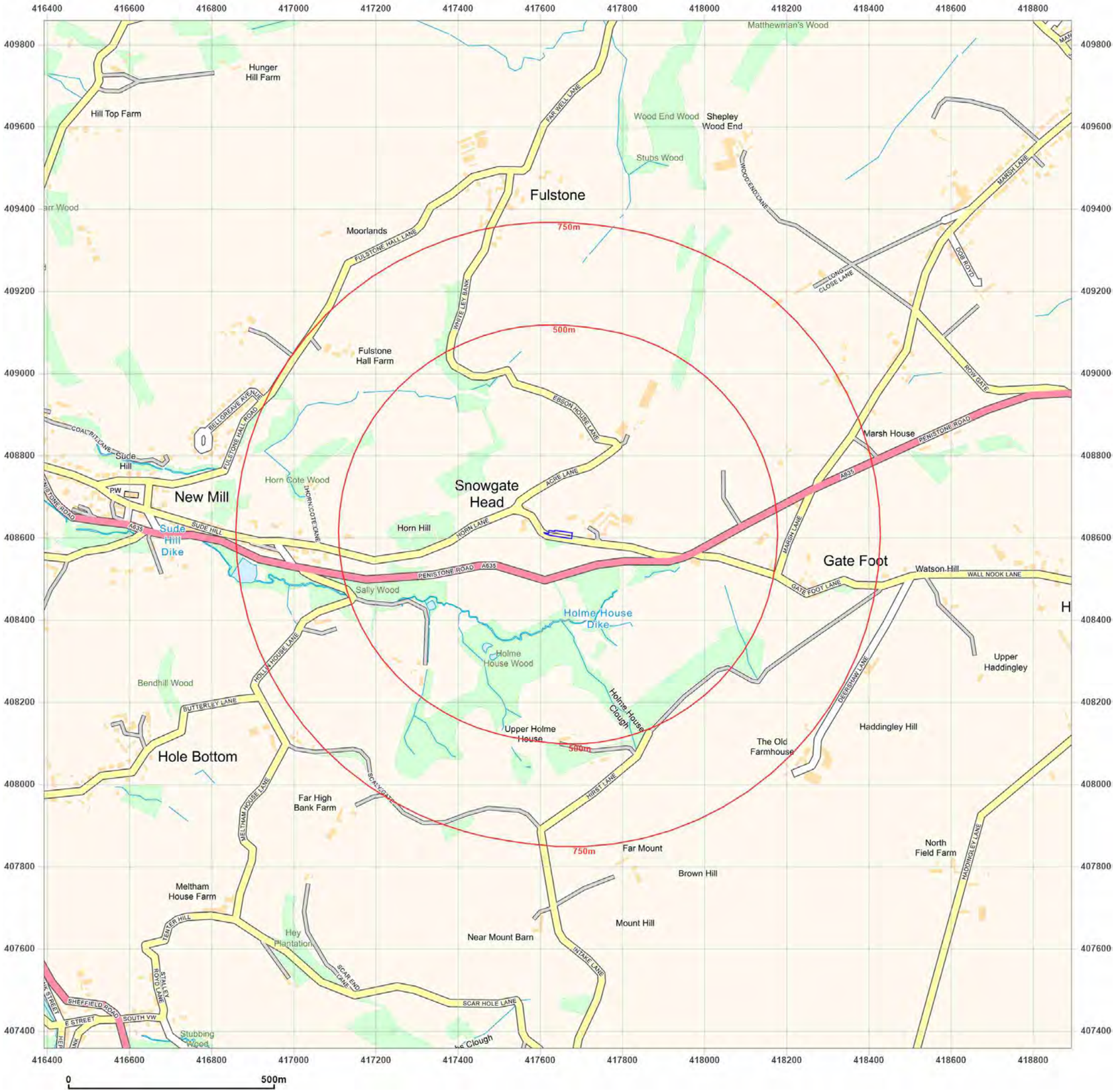
Produced by
Groundsure Insights
www.groundsure.com

Powered by

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Stone Pit Hall Snowgate Head Lane, New Mill, Holmfirth, HD9 7DH

Client Ref: CMAPS-CM-1118528-4873-030823
Report Ref: CMAPS-CM-1118528-4873-030823HIS
Grid Ref: 417643, 408608

Map Name: National Grid
Map date: **2023**
Scale: 1:10,000
Printed at: 1:10,000

N
W E
S

Groundsure INSIGHTS

Produced by
Groundsure Insights
www.groundsure.com

Powered by

Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 03 August 2023

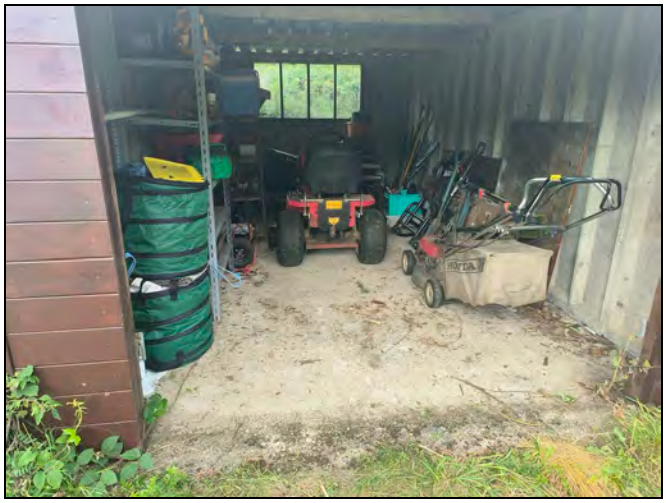
Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

Appendix **B**

View from Horn Lane showing two garages.

View from front of garages showing land between

Slabbed drive to hard covered parking area to immediate wet of garages



Hard covered interior of garage

View of site area from Horn Lane and locations of T1 and T2

Sample B from rear of external hard covered parking area

Sample T1 from in front of garage in grassed area

Appendix C

The Coal Authority

CON29M
coal mining report

STONE PIT HALL, SNOWGATE HEAD LANE, NEW MILL, HOLMFIRTH, KIRKLEES HD9 7DH

Known or potential coal mining risks

Further action

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

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

Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. It is unlikely that these features will impact on the stability of the enquiry boundary.

Your reference: 3522
Our reference: 51003370721001
Date: 3 August 2023

Client name: ASHTON BENNETT CONSULTANCY

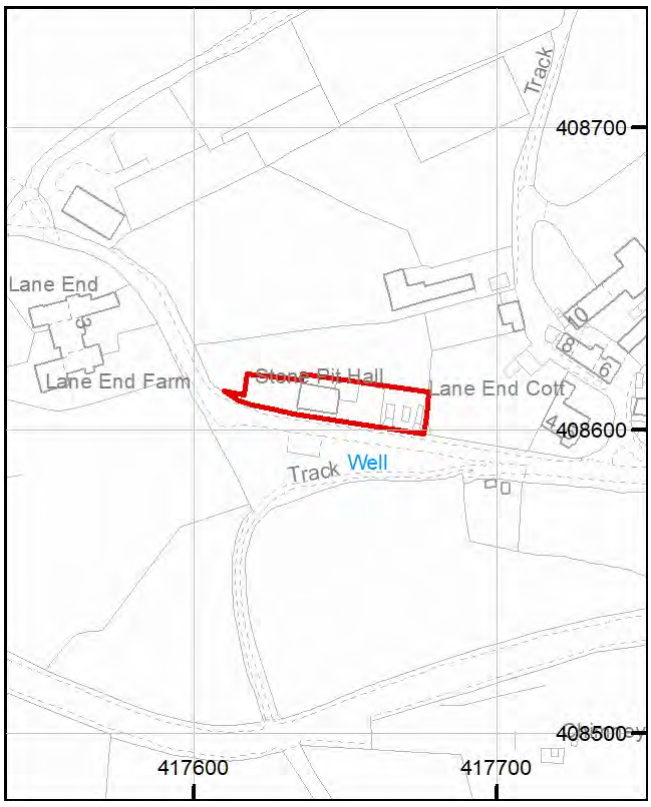
If you require any further assistance please contact our experts on:
0345 762 6848
groundstability@coal.gov.uk

The Law Society

Enquiry boundary

Key

Approximate position of enquiry boundary shown



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

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

Accessibility

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

What if this information changes?

If this report is for a residential property, insurance is included to cover any loss in property value caused by any changes in the information contained in this report. Please see the attached certificate of insurance for the terms and conditions of this insurance. The insurance does not cover non-residential property or further action reports.

Professional opinion

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 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.

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

Detailed findings

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

1 Past underground coal mining

The property is in a surface area that could be affected by underground mining in 1 seam of coal at 80m depth, and last worked in 1942.

Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.

2 Present underground coal mining

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

3 Future underground coal mining

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

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

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

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

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

4 Mine entries

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

5 Coal mining geology

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

6 Past opencast coal mining

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

7 Present opencast coal mining

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

8 Future opencast coal mining

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

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

9 Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10 Mine gas

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

11 Hazards related to coal mining

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

Statutory cover

Coal mining subsidence

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

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

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

Coal mining hazards

Our public safety and subsidence team provide a 24 hour a day, 7 days a week hazard reporting service, to help protect the public from hazards caused by past coal workings, such as a mine shaft or shallow working collapse. To report any hazards please call 0800 288 4242. Further information can be found on our website: www.gov.uk/coalauthority.

On behalf of the insurer

Coal Mining Report Insurance Policy Schedule

Policy number: 30260633

The insurer: Liberty Legal Indemnities – underwritten by Liberty Mutual Insurance Europe SE

Binding Authority contract number: RNMFP2303841

Property: STONE PIT HALL, SNOWGATE HEAD LANE, NEW MILL, HOLMFIRTH, KIRKLEES, HD9 7DH

Report reference number: 51003370721001

Limit of cover: £50,000.00

Dated: 3 August 2023

This policy and schedule shall be read together and any word or expression to which a specific meaning has been attached in either shall bear such meaning wherever it may appear.

Where a Coal Mining Report has been obtained in connection with a sale of the property, cover is provided for the benefit of a purchaser and their lender; in the case of a re-mortgage or where the existing owner chooses to obtain a Coal Mining Report, cover is provided for the benefit of the owner and their lender.

The policy offers protection against loss sustained by the owner of the property if any new problems or adverse entries are revealed in a subsequent Coal Mining Report which were not revealed by the original report to which the policy was attached.

The insured shall at all times comply with the requirements of the Conditions of this Policy.

Coal Mining Report Terms and Conditions can be viewed online at this link:
https://www.groundstability.com/insurance/terms/20190404/terms.html

Glossary

Key terms

adit - horizontal or sloped entrance to a mine

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

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

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

coal seams - bed of coal of varying thickness

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

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

mine entries - collective name for shafts and adits

mine gas - reports of alleged mine gas emissions received by the Coal Authority within 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

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

shaft - vertical entry into a mine

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

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

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

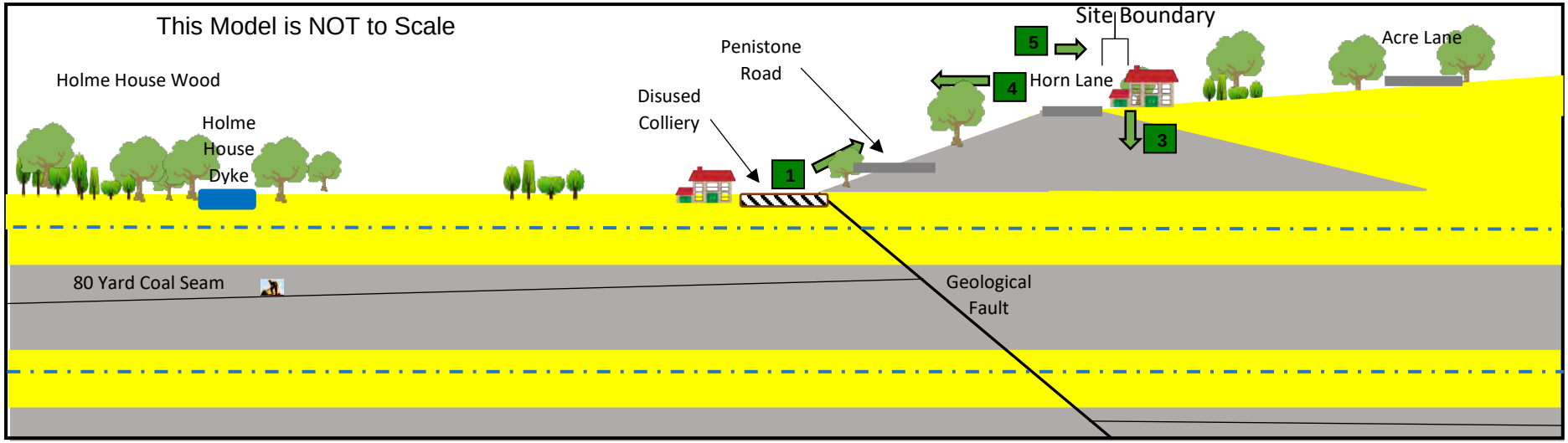
withdrawal of support - a historic notice informing landowners that the coal beneath their property was going to be worked

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

Appendix D

Conceptual Model

STONE PIT HALL, HORN LANE, HOLMFIRTH – Residential



Sources	Pathways		Receptors	Risk
Historical Use As Residential Open land **Current Use As** Open land Residential Car Parking **Off Site** Residential Agricultural	1	Inhalation of vapours from infilled ground	Workmen / Future site users / adjacent land users	**Low** – Infilled land to south. No radon Methane resistant membrane recommended
	2	Ingestion and/or skin contact	Workmen / Future site users / adjacent land users	**Low**- Site residential with garden and hard cover garages, no contam detected
	3	Ingestion of drinking water/ leaching to groundwater	Local abstraction wells.	**Low**- abstraction wells >1000m distant. Lack of detected contamination.
	4	Leaching to surface water	Surface Water>100m from site	**Low**- Due to distance and lack of detected contamination
	5	Inhalation of dust	Workmen / adjacent land users	**Low**- Provided appropriate measures during construction.
	6	Slope failure	Future land users	**Low**- BGS indicates low risk
	7	Ingestion of contamination in plants and vegetables	Neighboring land users	**Low**- Lack of contamination detected

Geology

Infilled/Made Ground

Worked Coal Seam

Sandstone

Mudstone

Groundwater

Job No 3522

Appendix **E**

ANALYTICAL TEST REPORT

Contract no:	125807
Contract name:	ABC
Client reference:	-
Clients name:	Ashton Bennett
Clients address:	131 Huddersfield Road Holmfirth West Yorkshire HD9 3TW
Samples received:	15 August 2023
Analysis started:	15 August 2023
Analysis completed:	23 August 2023
Report issued:	23 August 2023

Key		
	U	UKAS accredited test
	M	MCERTS & UKAS accredited test
	$	Test carried out by an approved subcontractor
	I/S	Insufficient sample to carry out test
	N/S	Sample not suitable for testing
	NAD	No Asbestos Detected

Approved by: E. McCulloch

Ellis McCulloch

Senior Reporting Administrator

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
125807-1	B	-	Loamy Clay with Gravel & Roots	-	-	27.7
125807-2	T1	-	Loam with Gravel & Roots	-	-	19.7
125807-3	T2	-	Loam with Gravel & Roots	-	-	21.6

Chemtech Environmental Limited

SOILS

Lab number			125807-1	125807-2	125807-3
Sample id			B	T1	T2
Depth (m)			-	-	-
Date sampled			09/08/2023	09/08/2023	09/08/2023
Test	Method	Units			
Boron (water soluble)	CE063 U	mg/kg B	1.0	0.7	0.8
Chromium (VI)	CE263	mg/kg CrVI	<0.04	<0.04	<0.04
Arsenic	$ M	mg/kg	25.3	32.0	44.4
Cadmium	$ M	mg/kg	0.2	0.4	0.5
Chromium	$ M	mg/kg	34.9	35.4	42.3
Copper	$ M	mg/kg	34.2	58.6	74.8
Lead	$ M	mg/kg	70.4	197	234
Mercury	$ M	mg/kg	0.1	0.2	0.3
Nickel	$ M	mg/kg	30.3	21.2	27.4
Selenium	$ M	mg/kg	< 1.0	< 1.0	< 1.0
Zinc	$ M	mg/kg	99.7	375	285
pH	CE004 M	units	7.0	7.1	6.9
Sulphate (2:1 water soluble)	CE061 U	mg/l SO_4	37	26	27
PAH					
Naphthalene	CE087 M	mg/kg	0.02	0.06	0.09
Acenaphthylene	CE087 M	mg/kg	<0.02	0.06	0.51
Acenaphthene	CE087 M	mg/kg	<0.02	0.06	0.45
Fluorene	CE087 U	mg/kg	<0.02	0.06	0.36
Phenanthrene	CE087 M	mg/kg	0.21	1.16	5.06
Anthracene	CE087 U	mg/kg	0.04	0.29	1.15
Fluoranthene	CE087 M	mg/kg	0.44	3.73	9.20
Pyrene	CE087 M	mg/kg	0.41	3.49	7.69
Benzo(a)anthracene	CE087 U	mg/kg	0.21	2.24	4.04
Chrysene	CE087 M	mg/kg	0.28	2.19	4.54
Benzo(b)fluoranthene	CE087 M	mg/kg	0.30	3.29	5.11
Benzo(k)fluoranthene	CE087 M	mg/kg	0.11	1.34	2.10
Benzo(a)pyrene	CE087 U	mg/kg	0.22	2.56	4.17
Indeno(123cd)pyrene	CE087 M	mg/kg	0.16	1.88	2.97
Dibenz(ah)anthracene	CE087 M	mg/kg	0.03	0.45	0.65
Benzo(ghi)perylene	CE087 M	mg/kg	0.14	1.67	2.48
PAH (total of USEPA 16)	CE087	mg/kg	2.57	24.5	50.6

Chemtech Environmental Limited

SOILS

Lab number			125807-1	125807-2	125807-3
Sample id			B	T1	T2
Depth (m)			-	-	-
Date sampled			09/08/2023	09/08/2023	09/08/2023
Test	Method	Units			
TPH					
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	13	14
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<1	16	18
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	<1	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10	<10
Subcontracted Analysis					
Asbestos (qualitative)	$	-	NAD	-	-

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE063	Boron (water soluble)	Hot water extract, ICP-OES	Dry	U	1	mg/kg B
CE263	Chromium (VI)	Discrete Analyser	Dry			mg/kg CrVI
$^{M}	Arsenic	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg
$^{M}	Cadmium	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg
$^{M}	Chromium	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
$^{M}	Copper	Aqua regia digest, ICP-MS	Dry	M	4	mg/kg
$^{M}	Lead	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
$^{M}	Mercury	Aqua regia digest, ICP-MS	Dry	M	0.1	mg/kg
$^{M}	Nickel	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
$^{M}	Selenium	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
$^{M}	Zinc	Aqua regia digest, ICP-MS	Dry	M	4.5	mg/kg
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO_4
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.01	mg/kg
CE250	EPH Aromatic (>EC10-EC12)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC12-EC16)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC16-EC21)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC21-EC35)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC35-EC44)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.1	mg/kg
CE250	EPH Aliphatic (>C10-C12)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C12-C16)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C16-C35)	Solvent extraction, GCxGC-FID	As received		15	mg/kg

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE250	EPH Aliphatic (>C35-C44)	Solvent extraction, GCxGC-FID	As received		10	mg/kg
$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
125807-1	B	-	N	
125807-2	T1	-	N	
125807-3	T2	-	N	

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis