
JNP GROUP
CONSULTING ENGINEERS

DOCUMENT CONTROL SHEET

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FOR AND ON BEHALF OF JNP GROUP

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Contents

EXECUTIVE SUMMARY

Site location	Prickleden Mills, Holmfirth, West Yorkshire, HD9 2NW	
Development scheme	Residential apartment blocks with limited softstanding landscaped areas.	
NGR	SE 13787 07894	
Current use	On-site: Disused.	Off-site: Commercial, industrial, agricultural, residential and road infrastructure.
Historical use And UXO	The earliest available historical maps show the site was occupied by Prickleden Mill (Woollen) in 1888. The mill buildings were spread across the northern portion of the site, with the River Holme flowing along the southern and south-eastern margins of the site, and the mill pond occupying the western half of the site. Subsequently, the eastern mill building was a laundry and then a sheet metal works (Holme Valley Sheet Metal ltd.), and the western building was a depot. An above ground tank and below ground interceptor tank were adjacent to the depot building. There was also a row of trees along the south-eastern margin of the site, on the south-eastern bank of the River Holme. There were no significant changes on the site until the mill buildings were demolished by 2021. A low UXO risk has been identified at the site.	
Geology (from desk study)	Alluvium. Millstone Grit Group.	
Hydrogeology	Secondary A Aquifers (Alluvium and Millstone Grit Group)	
Hydrology	The River Holme runs through the site.	
Geology (from previous GI by others)	Made ground. Alluvium. Millstone Grit Group.	
Groundwater (from previous GI by others)	Groundwater encountered at depths between 1m to 5m bgl. **Prudent to allow for groundwater control measures during construction particularly during wet periods.**	
Contamination (from previous GI by others)	**Risk to human health** from elevated concentrations of heavy metals and hydrocarbons.	
Ground gas (from previous GI by others)	**Characteristic situation 1 / Green –** no gas protection measures required (slightly elevated CO_2). Risk to construction workers during below ground works due to depleted O_2 levels. **No radon protection measures required.**	

1 INTRODUCTION

1.1 General

1.1.1 JNP Group was instructed by the client to undertake a desk study, and reassess the findings of an intrusive investigation undertaken by others in 2011, of:

Prickleden Mills,
Holmfirth,
West Yorkshire,
HD9 2NW

hereinafter referred to as 'the site'. This report is subject to the limitations presented in Appendix A.

1.1.2 It is understood that the site is a former mill site, and that the mill buildings have been demolished, leaving the site vacant. The proposed development comprises 61 age-restricted two- and three-bedroom apartments, with external residents' lounge, manager's office, resident and visitor parking, new bridge access, and a riverside walkway. The proposed apartments will be contained within five multi-storey blocks (A to E) with parking beneath some of the blocks and the central garden area, located to the east of the pond wall. The residents' lounge will be located to the west of the blocks, adjacent to the mill pond. The proposed redevelopment layout is shown on external drawing 2659 (100)10 A (April 2021), produced by Acumen Designers & Architects Ltd.

1.1.3 All comments given are based on the understanding that the proposed redevelopment will be as detailed above.

1.2 Objectives

1.2.1 The scope of work comprised non-intrusive (desk-based) research only, and an assessment of the intrusive investigation undertaken in 2008 and revised in 2011. This report contains details of the site, development of an initial conceptual model, a preliminary risk assessment regarding contaminated land issues, and an assessment of the previous intrusive investigation undertaken.

1.3 Methodology

1.3.1 This report has been compiled in accordance with the on-line Land contamination: risk management (LCRM) guidance produced by the Environment Agency (June 2019). This can be found on the UK government website: https://www.gov.uk/guidance/land-contamination-how-to-manage-the-risks.

1.3.2 Regarding geotechnical aspects, reference is also made to the requirements of BS EN 1997, Eurocode 7, Geotechnical Design, and associated standards.

1.3.3 This report has been prepared following review of three previous reports produced by ARC Environmental: "Phase 1 Desk Top Study Report" (January 2007), "Phase 2 Ground Investigation Report" (February 2008), and "Supplementary Ground Contamination Report and Remediation Strategy" (December 2011).

2 SITE DESCRIPTION

2.1.1 The site is located off Woodhead Road, in Holmfirth, West Yorkshire, approximately 0.45km west of Holmfirth town centre (see Figure 1 Key Plan). The centre of the site is located at National Grid Reference SE 13787 07894. The site covers an area of approximately 1.11 hectares.

2.1.2 The adjacent land uses are residential properties to the north, commercial properties and the River Holme to the east, agricultural land to the south, and residential properties to the west.

2.1.3 The site is located in the bottom of the valley with steep slopes to the north and south. The site itself is relatively flat. Two topographical surveys have been undertaken at the site in 2011 and 2020. The 2011 survey has a larger extent and includes some of the river features. Demolition has occurred on the site since 2011 so the levels recorded on the 2020 survey for the site are considered to accurately represent current conditions.

2.1.4 The western area is dominated by the mill pond which has an inlet from the River Holm in the far west with a mill race connecting this to the pond. The wall to the north of the mill race is 151.69m aOD or higher in this location and the bank to the south, between the mill race and the River Holm, is at 150.0m to 150.5m aOD. At the eastern end of the pond, the top pf the bank to the north is c. 150.5m aOD or higher and the pond wall in the east is at 149.9m aOD. The southern bank of the pond is at an elevation between c. 149.7m and 150.0m AOD.

2.1.5 The area to the east of the pond wall is lower, at an elevation down to 148.25m aOD. The ground then rises to the north and east.

2.1.6 The plot to the south of the river is at an elevation of c. 148.5m to 149.1m aOD, then rises very steeply to the south.

2.1.7 Aerial photographs taken after the demolition of the buildings across the site indicate that the site is largely softstanding, with some hardstanding tarmac areas leading into the site from the north-eastern corner of the site.

2.1.8 It is understood that buildings that previously occupied the site have been demolished.

2.1.9 Aerial photographs show that there was a row of mature trees along the eastern margin of the site, on the southern side of the River Holme.

2.1.10 The surrounding land uses are summarised in Table 2.1 below.

Table 2.1 Surrounding Land Use

Direction	Land Use
North	Residential, road infrastructure
East	Small industrial unit, River Holme
South	River Holme, agricultural land
West	Residential, road infrastructure

2.1.11 Reference should be made to reports produced by ARC Environmental Ltd. (Phase 1 Desk Top Study Report, Phase 2 Ground Investigation Report, and Supplementary Ground Contamination Report & Remediation Strategy, dated January 2007, February 2008, and

December 2011) for descriptions of the site at the time of the original Phase I report and intrusive investigations.

3 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

3.1 Geology

3.1.1 The geology of the site has been determined by reference to the 1:50,000 scale British Geological Survey (BGS) online Geoindex Tool (http://mapapps2.bgs.ac.uk/geoindex/home.html) as well as to the BGS 1:50,000 Series published geological map, Sheet 86 Glossop (Solid and Drift, dated 2012), accessed via the website (http://www.bgs.ac.uk/data/maps/home.html); these were both accessed on 02/12/2021.

3.1.2 No artificial or Made Ground is indicated to be present underlying the site, however, from a ground investigation undertaken on site in 2011, Made ground up to 3.2m thick was found. Demolition since then may have contributed to or removed some of this material.

3.1.3 The superficial geology of the site to be is indicated to be Alluvium – Silty Clay, which is described by the BGS as "*Normally soft to firm, consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present*".

3.1.4 The underlying "bedrock" geology is indicated to be strata of the Readycon Dean Flags of the Millstone Grit Group, which is described by the BGS as "*fine- to very coarse-grained feldspathic sandstones, interbedded with grey siltstones and mudstones, with subordinate marine shaly mudstone, claystone, coals, and seatearths*".

3.1.5 There is a north-east to south-west trending normal fault running along the north-western margin of the site.

3.1.6 The following Table 3.1 summarises the risk potentials of a range of geological hazards at the site as identified in a site-specific Groundsure Report, which has been obtained and is included in Appendix B.

Table 3.1 Geological Hazards

Hazard	Risk
Shrinking or swelling clay	Low
Landslide ground	Moderate
Ground dissolution	Negligible
Compressible soils	Moderate
Collapsible soils	Very low
Running sand	Low

3.1.7 Based upon the above, shrink/swell clays, ground dissolution, collapsible soils, and running sands, are not considered to pose a constraint to the proposed development. However, risks relating to landslide ground and compressible soils are indicated to be moderate and warrant further investigation/consideration.

3.2 BGS Borehole Records

3.2.1 There are no publicly available borehole records within 250m of the site.

3.3 Radon

3.3.1 The Groundsure Report states that the Health Protection Agency identified between 1% and 3% of homes above the action level. The British Geological Survey Information Services Group indicates that no radon protection measures are necessary for the intended development at the site.

3.3.2 BRE211 'Radon: guidance on protective measures for new dwellings' indicates that the site lies within an area where geological information indicates that basic radon protection may be required. Therefore, basic radon protection measures may be necessary for the proposed development.

3.3.3 However, a site-specific radon report was obtained by ARC Environmental Ltd. (dated 14/11/2011) and included in their Phase I desk study report. The radon report indicated that radon protection measures would not be require at the site.

3.4 Background Soil Chemical Concentrations

3.4.1 From a review of the Groundsure Report and the UK Soil Observatory map viewer (http://mapapps2.bgs.ac.uk/ukso/home.html) the following range of background metallic soil concentrations are anticipated at the site:

- Arsenic 20.77mg/kg
- Barium 183.51mg/kg
- Cadmium 0.40mg/kg
- Chromium 59.79mg/kg
- Copper 37.77mg/kg
- Lead 119.93mg/kg
- Nickel 20.56mg/kg
- Selenium 1.28mg/kg
- Vanadium 68.39mg/kg
- Zinc 82.92mg/kg

3.4.2 Therefore, naturally elevated concentrations of the foregoing elements are not anticipated at the site or within close proximity.

3.5 Mining, Mineral Extraction and Natural Cavities

- Historical surface ground workings:
    - On site: Pond (1888 – present)
    - 17m north: Sandstone quarry (1854)
    - 104m south-east: Cemetery (1888 – 1980)
    - 124m south-west: Water body (1888 – 1980)
    - 161m south-east: Mortuary (1965)
    - 173m south-east: Cemetery (1955)

- 214m south-west: Water body (1888 – 1970)
- 244m north-west: Sandstone quarry (1854)

- No historical underground workings are recorded within 1km of the site.
- The site is located within a coal mining area as identified by the Coal Authority; however, the site is on bedrock strata of the Millstone Grit Group, which generally does not contain coal seams thick enough to be considered economically viable for working, so coal mining is not considered likely to pose a risk to the proposed development.
- Non-coal mining for an unnamed vein mineral may have occurred at the site and within close proximity. However, the potential for difficult ground conditions is unlikely and localised and is at a level where it does not need to be considered.
- There are no natural cavities located within 1km of the site.
- No brine or gypsum extraction has occurred within 1km of the site.
- No tin or clay mining areas are located within 1km of the site.

3.6 Hydrogeology

3.6.1 The Aquifer Maps contained in the Groundsure Report indicates that the site is underlain by a Secondary A Aquifer underlain by another Secondary A Aquifer. The aquifer status refers to the Alluvium and Millstone Grit Group respectively.

3.6.2 The Environment Agency define a Secondary-A Aquifer as:

"Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers."

3.6.3 The Groundsure Report lists two licensed groundwater abstractions within 1km of the site: 398m south-east of the site (historical); 524m east of the site, at Holmfirth Dyers Ltd. (active).

3.6.4 The site's proximity to groundwater Source Protection Zones (SPZs) was determined by reference to Defra's Magic Map website (https://magic.defra.gov.uk/). These zones show the risk of contamination of major licensed groundwater abstractions from any activities that might cause pollution in the area, with the closer the activity, the greater the associated risk. The maps show four main zones (inner, outer, total catchment and special interest) to a groundwater source.

3.6.5 There are no SPZs identified within 1km of the site.

3.6.6 Note that not all abstractions are licensed and not all licensed abstractions have a SPZ. Abstractions could therefore still be at risk, and it is an offence to cause pollution to a controlled water anyway, whether contributing to an abstraction or not.

3.6.7 According to the Groundsure Report, the site is at negligible risk of groundwater flooding.

3.7 Hydrology

3.7.1 The nearest surface water feature is the River Holme, which flows eastwards through the south-ern portion of the site, and an associate mill pond in the western corner of the site. The River Holme is classified by the EA as a 'Main River'.

3.7.2 River quality data from the publicly available River Basin Management Plans implemented by the Water Framework Directive (http://environment.data.gov.uk/catchment-planning/) indicates that this section of the River Holme from source to New Mill Dike recorded a chemical quality of Good in 2016, but Fail in 2019, and ecological quality was reported to be Moderate in 2016 and Moderate in 2019. This has resulted in an overall river quality of Moderate in 2016 and 2019.

3.7.3 According to the Groundsure Report, the site lies in an area considered by the Environment Agency to be at high risk of fluvial flooding. The risk of surface water flooding is assessed as very low, low, or medium on-site.

3.7.4 The Groundsure Report lists one licensed surface water abstraction within 1km of the site, 660m east of the site, from the River Ribble, a tributary of the River Holme. The status of the water abstraction is unknown.

3.8 Pollution Incidents to Controlled Waters

3.8.1 Records held by the Environment Agency identified eight pollution incidents to controlled waters within 1km of the site. These were as follows:

Table 3.2 Summary of Pollution Incidents to Controlled Waters

Distance and direction from site	Date	Pollutant	Category
4m NW	May 2003	Sewage materials – grey water	3 (Minor)
152m SW	July 2014	Not identified	2 (Significant)
294m SW	July 2016	Organic chemicals/products – dyes and inks	2 (Significant)
318m SW	December 2014	Organic chemicals/products – dyes and inks, pesticides and biocides	2 (Significant)
371m SW	March 2006	Not identified	2 (Significant)
379m NE	June 2001	Contaminated water – suspended solids	3 (Minor)
459m E	June 2018	Contaminated water – firefighting run-off	1 (Major)
471m E	May 2002	Sewage materials	4 (No impact)

3.9 Discharge Consents

3.9.1 The Groundsure Report identifies five licensed discharge consents within 1km of the site, summarised as follows:

Table 3.3 Summary of Discharge Consents

Distance and direction from site	Receiving Water Body	Discharge	Issue date	Revocation date
217m north-east	River Holme	Sewer storm overflow – water company	September 2007	October 2019

Distance and direction from site	Receiving Water Body	Discharge	Issue date	Revocation date
422m north-east	River Holme	Sewer storm overflow – water company	February 2005	August 2020
422m north-east	River Holme	Sewer storm overflow – water company	August 2020	-
441m north-east	River Holme	Sewer storm overflow – water company	March 2005	March 2018
442m north-east	River Holme	Sewer storm overflow – water company	February 2018	-

4 SITE HISTORY

4.1 Historical Mapping

4.1.1 The history of the site and the surrounding area has been determined from a review of historical map extracts, obtained as part of the Groundsure report. Copies of these extracts are included Appendix B. The historical land uses on site and in close proximity to the site are summarised as follows in Table 4.1:

Table 4.1 Site Historical Summary

Date	On-site Historical Land Use	Off-site Historical Land Use
1888	The site was occupied by Prickleden Mill (Woollen). The mill buildings were spread across the northern portion of the site, with the River Holme flowing along the southern and south-eastern margins of the site, and the mill pond occupying the western half of the site. There was also a row of trees along the south-eastern margin of the site, on the south-eastern bank of the River Holme.	There were sandstone quarries 17m and 240m north of the site. There were several roads and lanes running roughly east to west between 10m to 250m north of the site. There were several mills, and a workhouse, between 200m to 300m north-east and east of the site. The village of Holmfirth was to the north-east of the site, containing residential, commercial, and industrial buildings. The land immediately south of the site was mostly agricultural land. There was a mill 700m east of the site, and another 800m south-east of the site. There was a mill with two mill ponds 300m south-west of the site, and another mill and mill pond 700m south-west of the site.
1893	No significant changes.	No significant changes.
1906	No significant changes.	No significant changes.
1929	No significant changes.	No significant changes.
1948	No significant changes.	No significant changes.
1955	No significant changes.	No significant changes.
1964	No significant changes.	No significant changes.
1970	The main mill building was relabelled as a depot.	No significant changes.
1980	No significant changes.	No significant changes.
2001	No significant changes.	The two mill ponds 300m south-west of the site had been infilled or drained.
2010	No significant changes.	No significant changes.
2021	The mill buildings had all been demolished.	No significant changes.

4.2 Unexploded Ordnance Review

4.2.1 Whilst JNP Group are not experts on this, according to online mapping provided by Zetica (https://zeticauxo.com/downloads-and-resources/risk-maps/) the site lies with an area of Low risk of unexploded ordnance (UXO).

4.3 Site Historical Summary

4.3.1 The earliest available historic maps show the site was occupied by Prickleden Mill (Woollen) in 1888. The mill buildings were spread across the northern portion of the site, with the River Holme flowing along the southern and south-eastern margins of the site, and the mill pond occupying the western half of the site. Subsequently, the eastern mill building was a laundry and then a sheet metal works (Holme Valley Sheet Metal ltd.), and the western building was a depot. An above ground tank and below ground interceptor tank were adjacent to the depot building. There was also a row of trees along the south-eastern margin of the site, on the south-eastern bank of the River Holme. There were no significant changes on the site until the mill buildings were demolished by 2021.

4.3.2 The area around the site was occupied by agricultural land and the village of Holmfirth, containing residential, commercial, and industrial developments, including several mills and associate mill ponds along the length of the River Holme. The area around the site has remained largely unchanged since 1888.

5 INFORMATION HELD BY STATUTORY AUTHORITIES

5.1 Summary

5.1.1 This section details any relevant information held in the registers maintained by statutory bodies as identified in the Groundsure Report Appendix B.

Table 5.1 Statutory Information Summary

	On-Site	0-250m	250-500m	Details
Waste				
Waste Management Facilities	0	0	0	None recorded within 500m of the site.
Landfills	0	0	0	None recorded within 500m of the site.
Historical Landfills	0	1	0	1m south: Perseverance Mill Site, inert commercial waste (likely when the two mill ponds 300m south-west of the site were infilled).
Environmental Permits, Incidents and Registers				
Part A(1) and IPPC Authorised Activities	0	0	0	None recorded within 500m of the site.
Part A(2) and Part B Activities and Enforcements	0	0	0	None recorded within 500m of the site.
COMAH & NIHHS Sites	0	0	0	None recorded within 500m of the site.
Industrial and Contaminative Premises				
Fuel Sites	0	0	0	None recorded within 500m of the site.
Historical industrial land uses	1	14	10	On site: Mill, 1854. 1m north-east: Mill, 1933. 17m north: Sandstone quarry, 1854. 61m east: Mill, 1888. 72m north-east: Woollen mill, 1854. 80m south-west: Woollen mill, 1854. 104m south-east: Cemetery, 1888. 139m east: Mill, 1888. 155m west: Iron works, 1965. 161m south-east: Mortuary, 1965. 173m south-east: Cemetery, 1955. 190m south-west: Garage, 1970. 192m east: Woollen mill, 1854. 225m east: Workhouse, 1888. 244m north-west: Sandstone quarry, 1854.

	On-Site	0-250m	250-500m	Details
Recent industrial land uses				38m north-west: Holme Valley Stained Glass. 68m north: Holmfirth Optical Company – photographic and optical equipment. 88m north-east: Electricity sub-station. 91m south-west: Electricity sub-station. 239m north-west: Electricity sub-station. 244m west: Electricity sub-station.

5.2 Environmentally Sensitive Areas

5.2.1 The sensitive land use map within the Groundsure Report identifies:

- Designated Ancient Woodland 339m south-west of the site: Malkin House Wood.
- Green Belt on site.

6 PREVIOUS INVESTIGATION DATA

6.1 Introduction

6.1.1 The site has been subject to previous ground investigation by ARC Environmental Ltd., outlined in a Phase 2 Ground Investigation Report (ref: 07-028, dated February 2008, revised November 2011), and a Supplementary Ground Contamination Report & Remediation Strategy (ref: 11-516, dated December 2011).

6.1.2 The scope of the investigative works and the findings are summarised in the following sections.

6.2 Site Work

6.2.1 The initial Phase 2 intrusive site work undertaken by ARC Environmental was undertaken in October 2007 and comprised two cable percussion boreholes (BH1 and BH2), twelve window sampling boreholes (WS1 – WS12), and two dynamic probes (DP2 and DP3). Three boreholes (WS2, WS5 and WS12) were completed with gas and groundwater monitoring standpipe installations. Six gas and groundwater monitoring visits were undertaken on 6th November 2007, 27th November 2007, 10th January 2008, 28th January 2008, 15th February 2008, and 29th February 2008, after the completion of the site works.

6.2.2 Subsequently, a programme of supplementary ground investigation works was undertaken to improve the coverage of the site. These works included internal boreholes within the existing buildings across the site, which were inaccessible during the initial works. The supplementary works, undertaken in November 2011, included eight window sampling boreholes (SH01 to SH08) and six mechanically excavated trial pits (TP01 to TP06).

6.3 Ground Conditions

6.3.1 The soil profile table presented in the Phase 2 Ground Investigation Report produced by ARC Environmental has been reproduced below. Copies of the ARC Environmental borehole and trial pit logs are included in Appendix C.

Table 6.1 Soil Profile from ARC Environmental Phase 2 Ground Investigation Report.

Strata	Depths Recorded (BGL)	Description & General Comments
Made Ground	From 0.00m up to c.0.40m and c.3.00m	Generally comprising loose, medium dense, and dense brick and sandstone gravel, with occasional 'ash' gravels and sandstone cobbles, intermixed with very soft 'reworked' clay, with brick, sandstone, and occasional 'ash'. Possible made ground, comprising very soft clay, was also recorded within WS4 to c.1.80m bcgl. A 'strong' hydrocarbon odour was noted within WS6, to 0.90m bcgl.
Drift Geology: Residual Soil & Alluvium	From c.0.40m and c.3.00m up to depths of between c.1.00m and c.5.80m	Variable drift deposits, comprising loose, medium dense, and dense sandy GRAVEL, intermixed with geotechnically 'poor' very soft CLAY, organic CLAY, and SILT, were recorded across most of the site. Across the north-western site area (WS4 & WS5) a thin band of loose to medium dense SAND, was also recorded, overlying the solid geology deposits.

Strata	Depths Recorded (BGL)	Description & General Comments
		An exception to this was WS9 where no drift deposits were recorded and the made ground was found to directly overly the bedrock within this area.
Solid Geology: Carboniferous Millstone Grit Group	From c.1.00m and c.5.80m up to a maximum recorded depth of c.6.23m	Solid geology deposits, generally comprising inter-bedded SANDSTONE and MUDSTONE (initially weathered), were recorded across the whole of the site, up to a maximum recorded depth of c.6.23m bcgl.

6.3.2 The soil profile table presented in the Supplementary Ground Contamination Report & Remediation Strategy produced by ARC Environmental has been reproduced below, showing the ground profile in the additional exploratory holes. Copies of the ARC Environmental borehole and trial pit logs are included in Appendix C.

Table 6.2 Soil Profile from ARC Environmental Supplementary Ground Contamination Report & Remediation Strategy.

Strata	Depths Recorded (BGL)	Description & General Comments
Made Ground	From GL up to c.0.18m to c.3.20m	Made ground generally comprising concrete and gravel surfacing, overlying variable bands of disturbed medium dense to dense gravel, dense sand, and demolition type rubble (i.e., brick, concrete) were noted below most of the site. An exception to this was noted across the south-western site area (i.e., adjacent to existing mill pond), where initial layers of black ash gravel were noted to depths of between c.0.30m and c.1.10m. An increase thickness of yellowish-brown sandstone gravel and cobbles was also noted at the locations of TP01 and SH02, sunk within the mill pond fill materials to the south-west of the anticipated mill dam wall, to depths of between c.2.00m and c.3.20m, respectively.
Drift Geology	From c.0.18m and c.3.20m up to c.3.10m and c.4.60m	Drift deposits generally comprising medium dense to very dense sandy GRAVEL, were identified below most of the site, from depths of between c.1.20m and c.4.10m. These deposits were overlain by occasional variable bands of geotechnically 'poor' very soft to soft organic CLAY and very clayey SAND / sandy CLAY (Alluvium). At the location of SH07 the GRAVEL drift deposits were underlain by very stiff gravelly CLAY deposits, from c.3.20m.
Solid Geology: (Millstone Grit)	From c.3.10m and c.3.80m up to a maximum recorded depth of c.4.02m	Solid deposits comprising weak dark grey MUDSTONE were identified at the locations of SH01 & SH03 (sunk across the central site area).

6.4 Groundwater

6.4.1 Groundwater strikes were recorded in all the boreholes during the intrusive investigation, at depths between 1m and 5m bgl; standing water was then recorded at depths between 1m and 4m bgl in all boreholes.

6.4.2 During the groundwater monitoring period, water levels in the three monitoring boreholes (WS2, WS5, and WS12), were recorded between 0.95m and 3.51m bgl

6.4.3 It was noted by ARC Environmental that the variation in the groundwater level across the site was due to the change in topography between installation locations, and that the groundwater was likely in hydraulic continuity with the adjacent River Holme.

6.5 Gas Conditions

6.5.1 Gas monitoring was undertaken by ARC Environmental on six occasions over a three-month period from November 2007 to February 2008. Gas monitoring involved the measurement of methane, carbon dioxide, and oxygen, along with gas flow rate. No significantly elevated levels of methane were recorded; however, carbon dioxide was recorded to a maximum concentration of 2.1%. The flow rates remained below the minimum detection limit of 0.1l/hr. A Gas Screening Value (GSV) of 0.0021l/hr was calculated for the site, indicating a site Characteristic Situation (CS) of CS1, as the GSV was less than 0.07l/hr, and the maximum CO_2 concentration was less than 5%.

6.6 Chemical Results Soil Analyses

6.6.1 A summary of the chemical tests scheduled as part of the Phase 2 Ground Investigation Report is shown below:

Soils:

- 15 soil samples tested for a generic contamination suite (arsenic, cadmium, copper, chromium, lead, mercury, nickel, selenium, free cyanide, free sulphur, total organic carbon (TOC), and zinc).
- 8 soil samples tested for speciated TPH (7 band).
- 8 soil samples tested for semi-volatile and volatile organic compounds (SVOCs and VOCs), including PAHs – USEPA 16.
- 6 soil samples tested for asbestos.

Leachate:

- 5 soil samples tested for a generic leachate suite (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, sulphate, boron, dree cyanide, and sulphide).
- 3 soil samples tested for leachable speciated TPHs (7 band).
- 2 soil samples tested for leachable speciated PAHs (USEPA 16).

6.6.2 The following areas of contamination were identified for the site in the Phase 2 Ground Investigation Report:

- Elevated concentrations of arsenic and nickel were recorded in the made ground across the whole site, posing a risk to human health based on a ‘residential without

plant uptake end use'. An isolated hotspot of lead was also recorded in the made ground around BH1.

- Elevated concentrations of TPH 'fuel' contamination were recorded in BH1, BH2, WS7, and WS8, while visual and olfactory evidence of hydrocarbon contamination was also noted in WS6.
- Elevated levels of PAH contamination were recorded within the made ground at the locations of BH1 and BH2, while elevated levels of SVOC contamination were noted at the locations of BH1, WS1, WS8, and WS10.
- From the results of the leachability testing, elevated leachable levels of arsenic and nickel were also recorded within the made ground below the site, while leachable levels of TPH (C12-C35) and PAH contamination were recorded at the locations of BH1, BH2, and WS8, which represent a potential risk to controlled waters and off-site migration.

6.6.3 A summary of the chemical tests scheduled as part of the Supplementary Ground Contamination & Remediation Strategy Report is shown below:

Soils:

- 4 soil samples tested for speciated TPH (8 band).
- 4 soil samples tested for speciated PAH (USEPA 16).

Groundwater:

- 8 water samples tested for select generic analytes (arsenic and nickel).
- 8 water samples tested for speciated TPH (8 band).
- 8 water samples tested for speciated PAH (USEPA 16).
- 2 water samples targeted for TPH Equivalent Carbon Bandings (Aliphatic / Aromatic Split).

6.6.4 The results of the supplementary contamination screening were combined with the results from the initial investigation and used to update the Level 1 GQRA for Human Health and Controlled Waters for the whole the site and complete a Level 2 Detailed Quantitative Controlled Waters Risk Assessment as part of the Remediation Strategy.

6.6.5 However, for the purposes of this review of the intrusive investigative works undertaken at the site, JNP Group have taken the results of the chemical testing scheduled by ARC Environmental and compared them with the C4SL and the LQM S4UL values for a 'residential without plant uptake end use'. These comparisons are summarised in the following tables.

6.6.6 Total Organic Carbon (TOC) tests were undertaken on 15 soil samples from the site. TOCs of between 0.9% and 6.5% were recorded; therefore, a SOM of 1% is applicable to the soils across the site.

Table 6.3 Comparison of Soil Chemical Test Results with Residential Without Plant Uptake Guideline Values

Determinant	Maximum Measured Concentration (mg/kg)	Background Concentration (mg/kg)	LQM/CIEH S4UL: Residential without plant uptake Value (mg/kg)			Number of tests	Number of exceedances
Arsenic	363	20.77	40			15	**4 (BH2 2.00-2.45m bgl – Made ground and organic CLAY) (WS2 0.2-0.7m bgl – Made ground) (WS8 1.3-2.0m bgl – Made ground) (WS9 0.5-1.0m bgl – Made ground)**
Cadmium	1.0	0.40	85			15	None
Chromium (total or trivalent)*	514	59.79	910			15	None
Copper	286	37.77	7100			15	None
Lead	1665	119 93	310**			15	**1 (BH1 0.0-0.1m – Made ground)**
Mercury (elemental)	0.6	-	1.2			15	None
Nickel	238	20.56	180			15	**2 (WS8 1.3-2.0m – Made ground) (WS9 0.5-1.0m – Made ground)**
Selenium	21.4	1.28	430			15	None
Zinc	264	82.92	40000			15	None
			1%	2.5%	6%		
Benzene	<0.01	-	0.38	0.7	1.4	8	None
Toluene	<0.01	-	880	1900	3900	8	None
Ethylbenzene	<0.01	-	83	190	440	8	None
p-xylene	<0.01	-	79	180	430	8	None
o-xylene	<0.01	-	88	210	480	8	None
Phenol	<0.1	-	750	1300	2300	8	None
Naphthalene	9.1	-	2.3	5.6	13	12	**1 (BH1 0.0-1.0m bgl – Made ground)**
Acenaphthylene	1.0	-	2900	4600	6000	12	None
Acenaphthene	769.7	-	3000	4700	6000	12	None
Fluorene	0.1	-	2800	3800	4500	12	None
Phenanthrene	2695.7	-	1300	1500	1500	12	**2 (BH1 0.0-1.0m bgl – Made ground) (BH2 2.00-2.45m bgl – Made ground and organic CLAY)**
Anthracene	233.1	-	31000	35000	37000	12	None
Fluoranthene	199.2	-	1500	1600	1600	12	None
Pyrene	181.5	-	3700	3800	3800	12	None

Determinant	Maximum Measured Concentration (mg/kg)	Background Concentration (mg/kg)	LQM/CIEH S4UL: Residential without plant uptake Value (mg/kg)			Number of tests	Number of exceedances
Benzo(a)anthracene	173.8	-	11	14	15	12	**1 (BH1 0.0-1.0m bgl – Made ground)**
Chrysene	2.3	-	30	31	32	12	None
Benzo(b)fluoranthene	49.9	-	3.9	4.0	4.0	12	**1 (BH1 0.0-1.0m bgl – Made ground)**
Benzo(k)fluoranthene	24.6	-	110	110	110	12	None
Benzo(a)pyrene	47.8	-	3.2	3.2	3.2	12	**1 (BH1 0.0-1.0m bgl – Made ground)**
Indeno(1,2,3-c,d)pyrene	35.2	-	45	46	46	12	None
Dibenzo(a,h)anthracene	6.9	-	0.31	0.32	0.32	12	**1 (BH1 0.0-1.0m bgl – Made ground)**
Benzo(g,h,i)perylene	0.5	-	360	360	360	12	None
TPH Aliphatic $C_5 – C_6$	<1	-	42	78	160	12	None
TPH Aliphatic $C_6 – C_8$	<1	-	100	230	530	12	None
TPH Aliphatic $C_8 – C_{10}$	5.0	-	27	65	150	12	None
TPH Aliphatic $C_{10} – C_{12}$	3.0	-	130	330	770	12	None
TPH Aliphatic $C_{12} – C_{16}$	60.0	-	1100	2400	4400	12	None
TPH Aliphatic $C_{16} – C_{35}$	12139.0	-	65000	92000	110000	12	None
TPH Aromatic $C_5 – C_7$	<1	-	370	690	1400	12	None
TPH Aromatic $C_7 – C_8$	<1	-	860	1800	3900	12	None
TPH Aromatic $C_8 – C_{10}$	5.0	-	47	110	270	12	None
TPH Aromatic $C_{10} – C_{12}$	3.0	-	250	590	1200	12	None
TPH Aromatic $C_{12} – C_{16}$	60.0	-	1800	2300	2500	12	None
TPH Aromatic $C_{16} – C_{35}$	12139.0	-	1900	1900	1900	12	**3 (BH1 0.0-1.0m bgl – Made ground) (BH2 2.00-2.45m bgl – Made ground and organic CLAY) WS8 1.3-2.0m bgl – Made ground)**
Asbestos	None found	-	Presence			6	None

*Assumes all chromium on site is in trivalent form
**provisional C4SL

6.7 Interpretation

6.7.1 The analyses recorded marginally elevated concentrations of some heavy metals (arsenic, lead, and nickel), PAHs (naphthalene, phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene), and TPH Aromatic C16-C35, with respect to the selected screening values. These occurrences are discussed in the following sections.

Heavy Metals

6.7.2 Elevated concentrations of arsenic were found in the made ground in BH2, WS2, WS8, and WS9; elevated concentrations of lead were found in the made ground in BH1; elevated concentrations of nickel were found in the made ground in WS8 and WS9. These boreholes

were located around the north-western corner of the large mill building which was just to the north-east of the mill pond.

Elevated PAH

6.7.3 Elevated concentrations of naphthalene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene, were found in the made ground in BH1; elevated concentrations of phenanthrene were found in the made ground in BH1 and BH2. These boreholes were located around the north-western corner of the large mill building which was just to the north-east of the mill pond.

Petroleum Hydrocarbons

6.7.4 Elevated concentrations of TPH aromatic C_{16}-C_{35} were found in the made ground in BH1, BH2, and WS8. These boreholes were located around the western corner of the large mill building which was just to the north-east of the mill pond.

6.8 Summary

6.8.1 Based on the chemical testing undertaken, JNP Group considers that a viable risk to human health exists from elevated concentrations of arsenic, lead, nickel, naphthalene, phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, and TPH aromatic C_{16}-C_{35}, in the made ground encountered across the area around the western corner of the large mill building to the north-east of the mill pond. Hence, remedial actions at the site are considered necessary in this area for the proposed development.

6.9 Leachate Results and Assessment

6.9.1 A total of five samples of made ground were submitted by ARC Environmental for leachate analysis to determine metal mobility as part of their Phase 2 Ground Investigation Report.

6.9.2 The following determinants were recorded at concentrations less than the limit of laboratory detection and hence have not been included in this assessment: cadmium, copper, lead, and mercury.

Table 6.1 Comparison of Leachate Chemical Test Results with Guideline Values

Determinant	Maximum Measured Concentration (µg/l)	Drinking Water Standard (µg/l)	Freshwater Environmental Quality Standard (µg/l)	No. of tests undertaken	No. of exceedances
Arsenic	68	10	50	5	**2 (WS2 0.2-0.7m bgl – Made ground) WS9 0.5-1.0m bgl – Made ground)**
Boron	80	1000	2000	5	None

Determinant	Maximum Measured Concentration (µg/l)	Drinking Water Standard (µg/l)	Freshwater Environmental Quality Standard (µg/l)	No. of tests undertaken	No. of exceedances
Chromium (total)	4	50	5-50*	5	None
Nickel	309	20	4**	5	**2 (WS8 1.3-2.0m bgl – Made ground) WS9 0.5-1.0m bgl – Made ground)**
Selenium	2	10	n/a	5	None
Zinc	49	3000	10.9**	5	None

* Dependent on hardness, salmonid receptor
** bioavailable EQS UK TAG

6.10 Interpretation – Leachate Chemistry

6.10.1 There were exceedances of the DWS for arsenic in samples of made ground from WS2 and WS9. There was also an exceedance of the EQS for arsenic in the sample of made ground from WS9.

6.10.2 There were exceedances of the DWS and EQS for nickel in the samples of made ground from WS8 and WS9.

6.11 Groundwater Results and Assessment

6.11.1 ARC Environmental submitted eight samples of groundwater from the supplementary exploratory holes from the Supplementary Ground Contamination Report & Remediation Strategy in November 2011 for arsenic, nickel, and speciated PAH testing, having identified leachable concentrations exceeding the EQS and DWS in their previous Phase 2 Ground Investigation Report.

6.11.2 All the speciated PAHs were at concentrations lower than the detection limit.

Table 6.2 Comparison of Groundwater Chemical Test Results with Guideline Values

Determinant	Maximum Measured Concentration (µg/l)	Drinking Water Standard (µg/l)	Freshwater Environmental Quality Standard (µg/l)	No. of tests undertaken	No. of exceedances
Arsenic	9	10	50	8	None
Nickel	8	20	4**	8	None

** bioavailable EQS UK TAG

6.12 **Interpretation – Groundwater Chemistry**

6.12.1 There were no exceedances of the DWS or EQS recorded for the groundwater samples.

6.13 **Soil Leachate and Groundwater Results Summary**

6.13.1 Based on the soil leachate testing and generic assessment undertaken, JNP Group considers there to be a significant risk to human and ecological receptors from leachable concentrations of arsenic and nickel in the made ground around WS2, WS8, and WS9.

6.13.2 The groundwater tests did not indicate that there is a risk to human or ecological receptors from arsenic or nickel dissolved in the groundwater around SH01, SH02, SH03, SH05, SH07, SH08, TP01, or TP03.

6.13.3 Based on the soil leachate and groundwater assessment undertaken JNP Group consider there to be a significant risk to controlled waters from leachable concentrations of arsenic and nickel in the made ground around WS2, WS8, and WS9.

6.14 **Conclusions on Land Quality made by ARC Environmental Ltd in the Phase 2 Ground Investigation Report**

6.14.1 Based on the soil chemical results the following conclusions were made by ARC Environmental:

- 'From the results of the contamination screening, carried out as part of the Level 1 Risk Assessment (Section 7.0), it can be seen that elevated levels of generic Arsenic and Nickel contamination have been recorded within the made ground below the whole of the site, which represents a potential risk to the proposed end users. In addition, an isolated 'hotspot' of generic Lead contamination has been recorded within the made ground around the location of BH1.'
- 'When considering the results of the targeted 'organic' screening, from both visual / olfactory evidence (i.e. a 'strong' hydrocarbon odour noted within WS6) and subsequent 'organic' screening carried out, elevated levels of TPH 'fuel' contamination (carbon bandings C16-C21 & C21-C35) were recorded at the locations of BH1, BH2, WS6, WS7 & WS8, which represent a potential risk to human health.'
- 'In addition, elevated levels of 'organic' PAH contamination were recorded within the made ground around the locations of BH1 and BH2, whilst elevated levels of semi-volatile 'organic' contamination (N-Nitrosodimethylamine, Hexachlorobenzene, Pentachlorophenol and Bis(2-ethylhexyl)phthalate (SVOC's)), were recorded around the locations of BH1, WS1, WS8 & WS10, which also represent a potential risk to human health.'
- 'When considering the potential risk to controlled waters, from the results of the targeted leachate screening, it can be seen that elevated levels of leachable generic Arsenic and Nickel have been recorded below areas of the site, which are considered to represent a potential risk. In addition, leachable levels of 'organic' TPH (C12-C35) and PAH contamination, have been recorded around the locations of BH1, BH2 & WS8, which also represent a risk.'
- 'When contemplating the potential sources of this contamination, whilst the elevated levels of generic (Arsenic and Nickel) and 'organic' SVOC contamination are felt to be attributable to previous site usage (i.e. mill, laundry and sheet metal works), the elevated levels of 'organic' hydrocarbon contamination (i.e. TPH and PAH) were

recorded within close proximity to the underground interceptor tank on site. Therefore, these levels could potentially be representative of residual hydrocarbon contamination, contained within the soils surrounding this area, which are subsequently gradually impacted the adjacent surrounding soils.'

- 'Alternatively, these levels could also potentially be representative of residual hydrocarbon contamination originating from below the former depot on site, as anecdotal evidence suggests the building was previously utilised for vehicle maintenance (Phase 1: DTS), and an in-filled maintenance bay is recorded within the building across this area of the site.'
- 'It is therefore recommended that, as the elevated hydrocarbon contamination could potentially originate from two sources (i.e. from below the existing building on site or the underground interceptor tank), further exploratory works be undertaken across this area of the site, to assess the nature of the potential source/s and determine the extent of the hydrocarbon contamination. This additional work should be undertaken upon completion of the demolition works and slab lift.'

6.15 **Conclusions on Land Quality made by ARC Environmental Ltd in the Supplementary Ground Contamination Report & Remediation Strategy**

6.15.1 Based on the soil chemical results the following conclusions were made by ARC Environmental:

Level 1 Human Health Risk Assessment:

- 'The maximum concentration (CM) and statistical upper confidence limit values (UCL0.95) for Arsenic, Chromium, Lead and Nickel exceed the chosen critical concentration values (CC) for this site.'
- 'None of the remaining CM or UCL0.95 values exceed the chosen CC values for this site.'
- 'The maximum concentration for Lead is recorded as an outlier and as such is considered to represent a statistical 'hot spot' at the location of BH1. This is confirmed by further statistical analysis, as the removal of this value from the statistical analysis sheet results in the statistical upper confidence limit value (UCL0.95) falling below the chosen critical concentration value (CC) for this site.'
- 'When considering these results it can be seen that an elevated levels of Arsenic, Chromium and Nickel have been identified within the made ground below the site as a whole, whilst an elevated 'hotspot' of Lead has been recorded at the location of BH01, which are considered to represent a potential risk to human health (i.e. proposed end users). Subsequently, delineation (further sampling and screening), removal, protection measures and/or detailed quantitative risk assessment (DQRA) will be necessary across this area of the site in order to protect end users in the future.'
- 'The maximum concentrations (CM) and statistical upper confidence limit values (UCL0.95) for Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(123cd)pyrene and Dibenz(ah)anthracene exceed the chosen critical concentration values (CC) for this site.'
- 'None of the CM or UCL0.95 values for any of the remaining Polycyclic Aromatic Hydrocarbons (PAH) analytes exceed the chosen CC values for this site.'

- 'The CM values for Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(123cd)pyrene and Dibenz(ah)anthracene represent statistical 'hot spots' at the location of BH1.'
- 'The CM value for Phenanthrene does not represent a statistical 'hot spot'. However, following further assessment it can be seen that the levels recorded at the locations of BH1 and BH2 clearly indicate that more than one soil population exists within the dataset, and as such these levels are felt to be representative of a larger 'hotspot' contained below the central site area.'
- 'From these results, it can be seen that elevated levels of Phenanthrene contamination have been recorded within the made ground materials below the central site area, which are considered to represent a risk to human health (i.e. the proposed end users), whilst an isolated 'hotspot' of Polycyclic Aromatic Hydrocarbon (PAH) contamination has been identified at the location of BH1.'
- 'The CM values for the carbon number bandings C16-C21 & C21-C35 exceed the chosen CT values for this site, with three of the twelve samples for each banding exceeding the CC value.'
- 'The CM values for the remaining TPH carbon number bandings do not exceed the chosen CC values for this site.'
- 'The results of the TPH screening have identified the presence of petroleum hydrocarbon contamination below the site that represents a potential risk to the end users, with elevated levels being recorded at the locations of BH1, BH2 and WS8. Olfactory evidence of hydrocarbon contamination (i.e. a 'strong' hydrocarbon odour) was also identified at the location of WS06 which is considered to represent a potential risk to human health.'
- 'The CM values for N-Nitrosodimethylamine, Hexachlorobenzene & Pentachlorophenol (SVOC's) exceed the chosen CC values for this site, with four of the eight samples for N-Nitrosodimethylamine exceeding the CC value.'
- 'The CM values for the remaining SVOC and VOC analytes screened (excluding the 16 USEPA PAH's) do not exceed the chosen CC values for this site.'
- 'From these results, it can be seen that elevated levels of N-Nitrosodimethylamine contamination have been recorded within the made ground materials below the majority of the site, which are considered to represent a risk to human health (i.e. the proposed end users), whilst an isolated area of Hexachlorobenzene & Pentachlorophenol contamination has been identified at the location of BH1.'

Level 1 Controlled Waters Risk Assessment (Leachate):

- 'The maximum concentrations (CM) for Arsenic and Nickel exceed the chosen CC values for this site.'
- 'The CM values for the 11 no. of the 16 USEPA Polycyclic Aromatic Hydrocarbons (PAH) exceed the chosen CC values for the site.'
- 'The CM values for the TPH equivalent carbon number bandings C12-C16, C16-C21 & C21-C35 exceed the chosen CC values for this site.'
- 'When considering these results, it can be seen that elevated levels of leachable generic and hydrocarbon contamination (TPH & PAH) have been identified for this site, which represent a potential risk to controlled waters.'

Level 2 Controlled Waters Risk Assessment (Groundwater):

- 'The Maximum Concentration (CM) values for Arsenic of Nickel do not exceed the chosen CC values for this site.'
- 'None of the CM values for the PAH analytes screened exceed the CC values chosen for this site.'
- 'The CM value for the TPH Aliphatic carbon banding EC16-EC35 marginally exceeds the chosen CC values for this site at the locations of BH07 and TP01.'
- 'None of the CM values for the remaining TPH equivalent carbon number bandings screened exceed the chosen CC values for this site.'
- 'From the results it can be seen that generally negligible levels of Nickel, Arsenic, PAH and TPH contamination have been identified within the groundwater samples screened from across the site, signifying that the levels of contaminants recorded during the Level 1 controlled waters risk assessment (leachate) are not sufficiently mobile to represent a significant risk to controlled waters. These results suggest that although the soils contain theoretical leachable contaminants, there have not impacted the shallow groundwater below the site.'
- 'Subsequently, from the results of this Level 2 Controlled Waters Risk Assessment it can be seen that all of the concentrations of Arsenic, Nickel, PAH and TPH contamination are anticipated to reduce to negligible levels before any potential off-site migration, and as such there is no significant risk is anticipated to potentially sensitive receptors, i.e. the adjacent watercourse (River Holme) or the wider Water Environment.'

6.16 **Land Quality Recommendations made by ARC Environmental Ltd.**

6.16.1 Based on their land quality conclusions, ARC Environmental made the following recommendations regarding remediation in their Phase 2 Ground Investigation Report:

- 'Therefore, due to the relatively sensitive nature of the site (i.e. residential development located within a moderate to highly sensitive environmental setting), the simplest form of remediation would be to remove the underground interceptor tank and subsequently delineate and remove all hydrocarbon (i.e. TPH's & PAH's) impacted material across this area of the site to a suitably licensed landfill.'
- 'Upon completion of this work, in order to protect the future end users from the remaining elevated levels of contamination, a suitably engineered clean cover system should then be implemented across the site, within all areas of soft landscaping (i.e. gardens, grassed verges, etc).'

6.16.2 Based on their land quality conclusions, ARC Environmental made the following recommendations regarding remediation in their Supplementary Ground Contamination Report & Remediation Strategy:

- 'When considering the nature of ground contamination present on this site, it can be seen that whilst the removal of the interceptor tank and infilled service pit would likely remove the existing source of Total Petroleum Hydrocarbon (TPH) contamination off-site, elevated levels of generic and SVOC contamination have been identified within the made ground across the site as a whole which represent a risk to human health.'
- 'Taking into account the above, whilst the removal of all contaminated materials from this site would completely remove any future risk, this option is considered to be the least practical and environmentally friendly (as well as being the least 'cost effective'

solution). Ideally, where possible, the removal of contaminated materials from site as a waste should be kept to a minimum, in order to avoid utilising limited landfill space, particularly when suitable alternatives are possible.'

- 'When considering the nature of the proposed development (i.e. retirement complex), combined with the variation in site levels, the most appropriate remediation technique for this site is felt to be the use of a combination of different barrier systems to effectively 'break' the pollutant linkage to the various receptors and therefore remove any future risk.'
- 'When considering the volatile hydrocarbons and organic compounds identified within the made ground below the site (i.e. Phenanthrene (PAH's) and N-Nitrosodimethylamine, Hexachlorobenzene & Pentachlorophenol (SVOC's)), the incorporation of a suitable hydrocarbon vapour barrier is recommended within all new structures to protect the end users from internal inhalation.'
- 'Combining the vapour barrier with a suitable clean cover system within all areas of soft landscaping (areas of hardcover will act as an adequate barrier) situated at ground level, will also provide the necessary level of protection to the end users.'
- 'From the proposed site development plan (attached within Appendix I), the development is shown to potentially incorporate a separate raised walkway and communal garden area, situated above the proposed car parking area. Providing the materials utilised for this feature do not come into contact with the made ground/fill materials on this site there will be no requirement for a clean cover system across this area.'
- 'At this stage, and following the results of the Level 1 and Level 2 Controlled Waters risk assessment, no significant risk is anticipated to controlled waters or adjacent sites associated with the levels of contaminants identified on this site, and as such no further remedial measures, removal or DQRA are considered necessary.'
- 'At this stage it is considered that the following items need to be addressed within the development area:
  - "Watching Brief" during slab lift and removal of the existing interceptor tank, including associated infrastructure (i.e. pipelines, etc) and infilled service pit, to confirm the absence of further 'unforeseen' hydrocarbon contamination.
  - Implementation of hydrocarbon vapour barrier within the proposed development.
  - Provision of an estimated 600mm clean cover on all landscaped areas of the site.'

6.17 **Geotechnical Recommendations made by ARC Environmental Ltd.**

6.17.1 Based on their geotechnical test results, ARC Environmental made the following foundation recommendation:

- 'Variable made ground and drift deposits have been recorded across the site. In addition, the proposed development potentially involves the removal of a large proportion of made ground and drift off site, thereby potentially reducing existing site levels by c.5m within areas. If this were to occur, dependent upon the degree of material to be removed, the use of conventional footings (i.e. strip or pad) could potentially prove

to be a viable option, based within the solid geology deposits, where a maximum allowable bearing pressure of 300 kN/m^2 is available.'

- 'This option could however potentially involve the utilisation of mass trench fill, and the 'breaking' out of the solid geology deposits, across areas of the site.'
- 'Alternatively, if proposed finished floor levels are significantly different, the utilisation of short piles, based within the underlying solid geology deposits, could also prove to be a viable option, and further comments regarding alternative foundation options could be provided upon receipt of a definitive proposed site layout plan.'

7 UK CONTAMINATED LAND LEGISLATIVE FRAMEWORK

7.1 General

7.1.1 Given that the site is being assessed with the potential for future development, the most applicable appraisal relates to the requirements of the Planning Regime as described in the National Planning Policy Framework.

7.1.2 To proceed with an assessment of contamination issues it is essential that there is compliance with UK guidance as detailed in the on-line Land contamination: risk management (LCRM) guidance produced by the Environment Agency (June 2019). This can be found on the UK government website: https://www.gov.uk/guidance/land-contamination-how-to-manage-the-risks.

7.1.3 Part IIA of the Environmental Protection Act, 1990, which was enacted by Section 57 of the Environment Act 1995, and the associated Contaminated Land (England) Regulations 2000 (SI 2000/227), was introduced on 1 April 2000. It created a new statutory regime for the identification and remediation of land where contamination poses an unacceptable risk to human health and the environment. The guidance was subject to a review by DEFRA in 2012, and a revision was published.

7.1.4 Part IIA provides a statutory definition of contaminated land:

7.1.5 *"any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is a significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused".*

7.1.6 Controlled waters are all groundwaters, inland surface waters, and estuarine and coastal waters.

7.1.7 To determine whether land falls under the Part IIA definition of contaminated land, the site should be evaluated in the context of a risk-based framework. The assessment of contaminated land is typically a two-phase process, which is initially based on a qualitative assessment of the likelihood of complete pollution linkages, with a quantitative element that seeks to determine the degree and the significance of the harm. Land is only defined as 'Contaminated Land' if a "significant pollutant linkage" is present.

7.1.8 A pollutant linkage must comprise the following:

- Source - a contaminant at a concentration capable of causing adverse health or environmental effects.
- Receptor - there must be a receptor (e.g. human, controlled waters, ecological, or property) present, which may be at risk of harm or impact from the source.
- Pathway - there must be an exposure pathway through which the receptor encounters the contamination source.

7.1.9 Each of these elements can exist independently, but they create risk only when they are linked together, so that a particular contaminant affects a particular receptor, through a particular pathway.

7.1.10 The responsible authority then needs to consider whether the identified pollution linkage:

- is resulting in significant harm being caused to the receptor in the pollutant linkage.
- presents a significant possibility of significant harm being caused to that receptor.
- is resulting in the pollution of controlled waters, which constitute the receptor; or is likely to result in such pollution.

7.1.11 If a pollutant linkage is demonstrated, then the Part IIA legislation provides powers for remedial action to be enforced by the Local Authority in whose area the contaminated land is situated.

7.1.12 In addition, JNP Group has undertaken a preliminary risk assessment based on the probability of receptor exposure to the identified source and the consequences of such exposure.

7.1.13 Risk management, which can include site surfacing, formal management systems, legal requirements; is then considered to provide an overall residual risk. The categories of environmental risk used by JNP Group are given in the table that follows.

Table 7.1 Risk Matrix

Environmental Risks		
HIGH		Issues within this category likely to provide a significant cost or liability. Further detailed investigation may be required to clarify the risk.
MEDIUM		It is possible that issues within this category may provide a cost or liability. Further investigation may be required to clarify the risk.
LOW		It is unlikely that issues within this category will provide a significant cost or liability. Basic investigation may be required to clarify the risk.
NONE		No source – pathway – receptor linkage present.

8 CONCEPTUAL SITE MODEL AND PRELIMINARY RISK ASSESSMENT

8.1 General

8.1.1 This section uses information from field observations and all the data sources presented herein to provide a conceptual model and qualitative assessment of the potential risks posed to human health and environmental receptors from potential on-site and off-site sources of contamination. The assessment is presented as a 'source-pathway-receptor' model in accordance with Part IIA of the Environmental Protection Act 1990.

8.1.2 The conceptual site model has been developed assuming that the site will be redeveloped for residential housing without private gardens.

8.2 Potential Sources of Contamination

8.2.1 Potential On-Site Sources of Contamination

- The site was occupied by Prickleden Mill – a woollen mill prior to the earliest available maps (1888). Subsequently, the site was occupied by a laundry, sheet metal works, and a depot.
- Heavy metals, hydrocarbons, VOCs, SVOCs, and soil gas associated with limited made ground materials may be present as a result of previous phases of development including imported and site generated fill materials.
- In accordance with C733 guidance, any structure built, refurbished, or modified during the Twentieth Century has the potential to contain asbestos containing materials (ACM). In addition, any demolition material either stockpiled or used as backfill on site also has the potential to contain asbestos containing materials (intact or broken up).
- Drainage runs including gullies are a potential source of contaminated material such as hydrocarbons and heavy metals.

8.2.2 Potential Off-Site Sources of Contamination

- There are several commercial and industrial developments around the site, including several other historic mills located on the River Holme upstream of the site. These are potential sources of heavy metals, hydrocarbons, VOCs, and SVOCs.
- Two mill ponds 300m south-west of the site were infilled around 2001. The backfill material used was likely inert commercial waste. Due to the type of fill material used, and the distance from the infilled ponds to the site, ground gas from these infilled ponds is not considered to pose a significant risk to the proposed development.

8.3 Receptors

8.3.1 The site is to be redeveloped for residential housing without private gardens. In addition, the site overlies two Secondary-A Aquifers (Alluvium and Millstone Grit Group). The primary receptors, considered to be potentially at risk from any identified contamination are as follows:

Human Health

- Construction workers during the redevelopment phase.
- Residential end users.

Controlled Waters

- The Alluvium and Millstone Grit Group beneath the site are classified as Secondary-A Aquifers. There are no SPZs within 500m of the site. There is a groundwater abstraction 524m east of the site, and a surface water abstraction 660m east of the site from the River Holme.
- The nearest controlled surface water is the River Holme, which flows through the site.

Ecological

- The site is not located within an environmentally designated sensitive area.
- Given the site setting sensitive species are considered unlikely to be present at the site (subject to any ecological survey undertaken).

Property / Infrastructure

- Concrete vulnerability to aggressive ground conditions.
- Build-up of gases with potential for explosion.
- Water supply pipework.

8.4 Pathways

8.4.1 Potential contaminant migration pathways considered relevant to the site are:

Human Health

- Ingestion of contaminated soils and dust particles.
- Direct physical contact with near surface soils and contaminated dust particles.
- Inhalation of wind-blown contaminated dust.
- Inhalation of vapours and gases, migrating vertically into the atmosphere.
- Inhalation of vapours and gases, migrating vertically into buildings and confined spaces.
- Consumption of contaminated potable water.

Controlled Waters

- Leaching of contaminants in made ground / natural ground into groundwater.
- Lateral migration of contaminated groundwater into the River Holme.
- Vertical migration of contaminated shallow groundwater impacting deeper groundwater in the aquifer sequence.
- Run-off of site-derived contamination into the River Holme during construction.

Ecological

- Migration of contamination through groundwater and subsequent uptake by plant roots.
- Direct contact between ecological receptors and contaminated surface water.
- Direct contact between ecological receptors and contaminated soils.

- Ingestion of contaminated soils/surface waters by ecological receptors.
- Inhalation of vapours or wind-blown dust by ecological receptors.

Property

- Direct physical contact with near surface soils.
- Migration of vapours and gases into buildings and confined spaces.

8.5 Pollutant Linkages

8.5.1 A 'pollutant linkage' describes the relationship between a contaminant, a pathway and a receptor, a 'pollutant' being the contaminant in a pollutant linkage. A contaminant, pathway and receptor must all be present for a pollutant linkage to exist, which forms the basis for determination that a piece of land is Contaminated Land. Potential sources, pathways and receptors have been assessed. The following Tables summarise the significant pollutant linkages potentially active at the site.

Table 8.1 Potential Source-Pathway-Receptor Linkages for Human Health Risk Assessment

Source	Pathway	Receptor
Contaminated soils and waters	Ingestion of soil	On-site female child: 0 - 6 yrs old
		On-site construction worker
	Ingestion of household dust	On-site female child: 0 - 6 yrs old
	Dermal contact	On-site female child: 0 - 6 yrs old
		On-site construction worker
	Dermal contact with household dust	On-site female child: 0 - 6 yrs old
	Inhalation of fugitive soil dust	On-site construction worker
		On-site female child: 0 - 6 yrs old
	Inhalation of fugitive household dust	On-site female child: 0 - 6 yrs old
	Inhalation of vapours in outdoor air	On-site female child: 0 - 6 yrs old
		On-site construction worker
	Inhalation of vapours in indoor air	On-site female child: 0 - 6 yrs old
	Consumption of contaminated potable water	On-site female child: 0 - 6 yrs old
Ground gas and landfill gas	Vertical and lateral migration	End users

Table 8.2 Source Pathway Receptor Linkages for Controlled Waters Risk Assessment

Source	Pathway	Receptor
Contaminated soils	Leaching mechanisms	Groundwater stored in the Alluvium and Millstone Grit Group
	Runoff during construction works	River Holme
Contaminated groundwater	Vertical migration	Groundwater stored in the Alluvium and Millstone Grit Group

Source	Pathway	Receptor
	Lateral and vertical migration (baseflow)	River Holme

Table 8.3 Potential Source-Pathway-Receptor Linkages for Ecological Risk Assessment

Source	Pathway	Receptor
Contaminated soils and waters	Migration of contamination through groundwater and subsequent uptake by plant roots;	Ecological receptors
	Direct contact between ecological receptors and contaminated surface water;	
	Direct contact between ecological receptors and contaminated soils;	
	Ingestion of contaminated soils/surface waters by ecological receptors;	
	Inhalation of vapours or wind-blown dust by ecological receptors.	
Ground gas and landfill gas	Inhalation of gases	

Table 8.4 Potential Source-Pathway-Receptor Linkages for Property Risk Assessment

Source	Pathway	Receptor
Contaminated soils	Contact with contaminated soils	Concrete
		Water supply pipe materials
Ground gas and landfill gas	Vertical and lateral migration and accumulation in voids	Residential housing / Commercial properties

8.6 Preliminary Risk Assessment

8.6.1 From the information obtained from the desk study JNP Group has undertaken a preliminary risk assessment.

Table 8.5 Preliminary Risk Assessment

Risk Receptor	Risk		Justification
HUMAN HEALTH	MEDIUM		Historical land use as a woollen mill, laundry, sheet metal works, and depot suggest potential sources of contamination present on site. Potential for direct contact / inhalation of vapours or gases with residential receptors.
GROUNDWATER	MEDIUM		The site is located on productive strata (Secondary Aquifer) and is not within a SPZ.
SURFACE WATER	HIGH		The nearest surface water course is the River Holme, which flows through the site.
ECOLOGY	NONE		Based on the assumption that there are no sensitive/ protected species on site (subject to any ecological survey undertaken).
PROPERTY & INFRASTRUCURE	MEDIUM		Historical land use as a woollen mill, laundry, sheet metal works, and depot suggest potential sources of contamination present on site. Potential for build-up of gases and vapours within buildings. residential receptors.

8.6.2 In line with BS ISO 18400-202:2018 based on the conceptual site model as above the site is considered to be probably contaminated.

9 CONCLUSIONS OF DESK STUDY

9.1 Conclusions

9.1.1 The desk-based research has identified that:

- The geological succession below the site comprises Alluvium overlying the Millstone Grit Group.
- It identifies that the site has had potentially contaminative uses as a woollen mill, laundry, sheet metal works, and depot.

Potential On-Site Sources of Contamination

- The site was occupied by Prickleden Mill – a woollen mill prior to the earliest available maps (1888). Subsequently, the site was occupied by a laundry, sheet metal works, and a depot.
- Heavy metals, hydrocarbons, VOCs, SVOCs, and soil gas associated with limited made ground materials may be present as a result of previous phases of development including imported and site generated fill materials.
- In accordance with C733 guidance, any structure built, refurbished, or modified during the Twentieth Century has the potential to contain asbestos containing materials (ACM). In addition, any demolition material either stockpiled or used as backfill on site also has the potential to contain asbestos containing materials (intact or broken up).
- Drainage runs including gullies are a potential source of contaminated material such as hydrocarbons and heavy metals.

Potential Off-Site Sources of Contamination

- There are several commercial and industrial developments around the site, including several other historic mills located on the River Holme upstream of the site. These are potential sources of heavy metals, hydrocarbons, VOCs, and SVOCs.
- Two mill ponds 300m south-west of the site were infilled around 2001. The backfill material used was likely inert commercial waste. Due to the type of fill material used, and the distance from the infilled ponds to the site, ground gas from these infilled ponds is not considered to pose a significant risk to the proposed development.

9.1.2 Radon protection measures are not required.

9.1.3 The site is at low to high risk of fluvial flooding, and very low to medium risk of surface water flooding.

9.1.4 Based on information contained within desk study and from the previous investigations undertaken by ARC Environmental, it is the opinion of JNP Group that the potential site conditions provide a MEDIUM environmental risk and hence further investigation, and assessment may be required.

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FIGURES / DRAWINGS

Figure 1

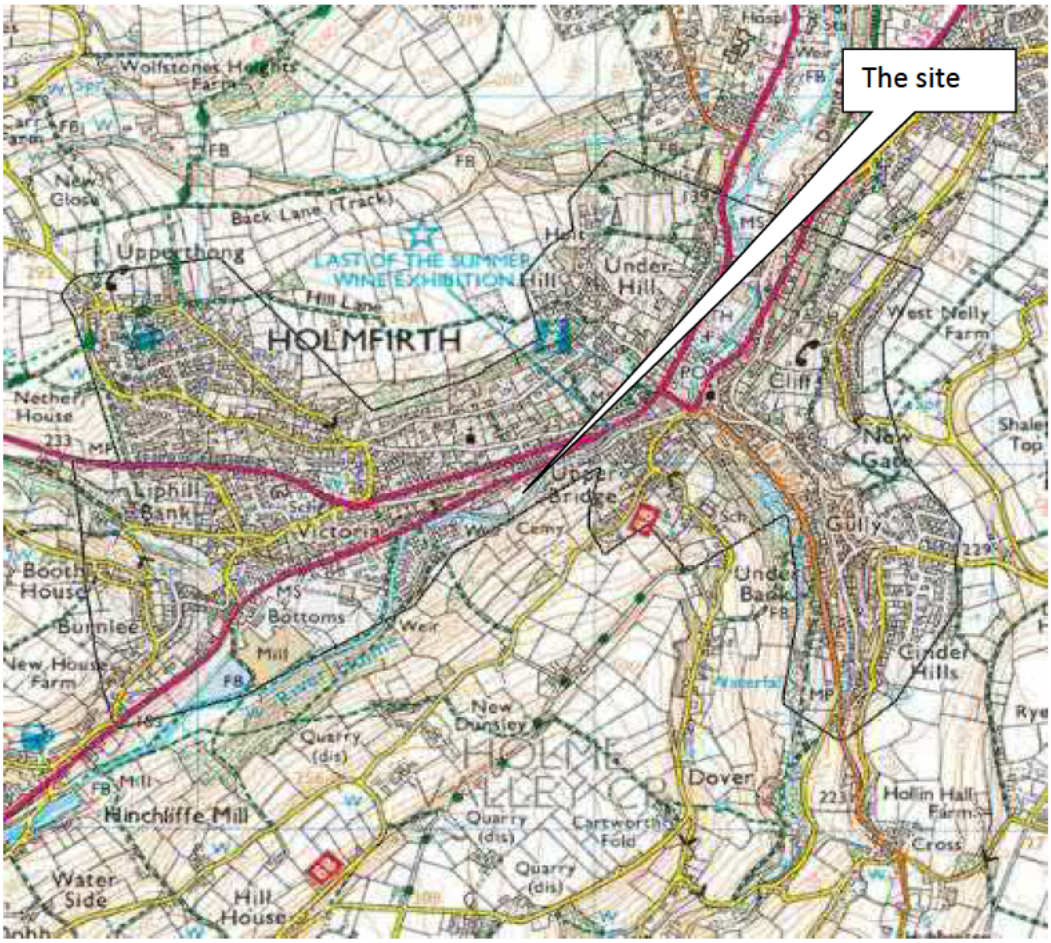
Site Location Plan

Project:

Prickleden Mill

Project No:

B24120



Appendix A **LIMITATIONS**

INTRODUCTION

This report is confidential and has been prepared solely for the benefit of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from JNP Group; a charge may be levied against such approval. JNP Group accepts no responsibility or liability for the consequences of this document being used for any purpose or project other than for which it was commissioned, and: this document to any third party with whom and agreement has not been executed.

Any comments given within this report are based on the understanding that the proposed works to be undertaken will be as described in the introduction and the information referred to and provided by others and will be assumed to be correct and will not have been checked by JNP Group and JNP Group will not accept any liability or responsibility for any inaccuracy in such information.

Any deviation from the recommendations or conclusions contained in this report should be referred to JNP Group in writing for comment and JNP Group reserve the right to reconsider their recommendations and conclusions contained within. JNP Group will not accept any liability or responsibility for any changes or deviations from the recommendations noted in this report without prior consultation and our full approval.

The details contained within this report reflect the site conditions prevailing at the time of investigation. JNP Group warrants the accuracy of this report up to and including that date. Additional information, improved practice or changes in legislation may necessitate this report having to be reviewed in whole or in part after that date. If necessary, this report should be referred to JNP Group for re-assessment and, if necessary, re-appraisal.

This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report. Whilst this report and the opinion made herein are correct to the best of JNP Group' belief, JNP Group cannot guarantee the accuracy or completeness of any information provided by third parties.

The report represents the finding and opinions of experience geotechnical and geo-environmental engineers. JNP Group does not provide legal advice and the advice of lawyers may also be required.

It should be noted that the following were not included as part of the agreed scope of works with the client: detailed ecological surveys and assessment; intrusive investigation; groundwater monitoring and sampling; geotechnical requirements etc.

JNP Group has provided advice and made recommendations based on the findings of the work undertaken, however this is subject to the approval / acceptance by the relevant Regulatory Authorities.

Objectives

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, JNP Group reserves the right to review such information and, if warranted, to modify the opinions accordingly. It should be noted

that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Appendix B **GROUNDSURE REPORT**

Groundsure LOCATION INTELLIGENCE

Enviro+Geo Insight

413784 407907

Order Details

Date: 02/12/2021

Your ref: G1342

Our Ref: GS-8375525

Client: JNP Group - Sheffield

Site Details

Location: 413795 407897

Area: 1.21 ha

Authority: Kirklees Council

Contact us with any questions at:
info@groundsure.com
08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
13	1.1	Historical industrial land uses	9	4	32	27	-
16	1.2	Historical tanks	0	0	5	2	-
17	1.3	Historical energy features	0	0	4	0	-
17	1.4	Historical petrol stations	0	0	0	0	-
18	1.5	Historical garages	0	0	4	3	-
18	1.6	Historical military land	0	0	0	0	-
Page	**Section**	**Past land use - un-grouped**	**On site**	**0-50m**	**50-250m**	**250-500m**	**500-2000m**
19	2.1	Historical industrial land uses	10	5	37	33	-
23	2.2	Historical tanks	0	0	11	3	-
23	2.3	Historical energy features	0	0	7	1	-
24	2.4	Historical petrol stations	0	0	0	0	-
24	2.5	Historical garages	0	0	5	3	-
Page	**Section**	**Waste and landfill**	**On site**	**0-50m**	**50-250m**	**250-500m**	**500-2000m**
26	3.1	Active or recent landfill	0	0	0	0	-
26	3.2	Historical landfill (BGS records)	0	0	0	0	-
27	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
27	3.4	Historical landfill (EA/NRW records)	0	1	0	0	-
27	3.5	Historical waste sites	0	0	0	0	-
27	3.6	Licensed waste sites	0	0	0	0	-
28	3.7	Waste exemptions	0	0	0	8	-
Page	**Section**	**Current industrial land use**	**On site**	**0-50m**	**50-250m**	**250-500m**	**500-2000m**
29	4.1	Recent industrial land uses	0	1	5	-	-
30	4.2	Current or recent petrol stations	0	0	0	0	-
30	4.3	Electricity cables	0	0	0	0	-
30	4.4	Gas pipelines	0	0	0	0	-
30	4.5	Sites determined as Contaminated Land	0	0	0	0	-

31	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
31	4.7	Regulated explosive sites	0	0	0	0	-
31	4.8	Hazardous substance storage/usage	0	0	0	0	-
31	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
31	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
32	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
32	4.12	Radioactive Substance Authorisations	0	0	0	0	-
32	**4.13**	**Licensed Discharges to controlled waters**	0	0	1	4	-
33	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
33	4.15	Pollutant release to public sewer	0	0	0	0	-
33	4.16	List 1 Dangerous Substances	0	0	0	0	-
34	**4.17**	**List 2 Dangerous Substances**	0	0	0	1	-
34	**4.18**	**Pollution Incidents (EA/NRW)**	0	1	1	8	-
35	4.19	Pollution inventory substances	0	0	0	0	-
35	4.20	Pollution inventory waste transfers	0	0	0	0	-
36	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
37	**5.1**	**Superficial aquifer**	Identified (within 500m)				
38	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
39	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
40	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
40	5.5	Groundwater vulnerability- local information	None (within 0m)				
41	**5.6**	**Groundwater abstractions**	0	0	0	2	19
46	**5.7**	**Surface water abstractions**	0	0	0	0	16
50	5.8	Potable abstractions	0	0	0	0	0
50	5.9	Source Protection Zones	0	0	0	0	-
51	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
52	**6.1**	**Water Network (OS MasterMap)**	2	1	0	-	-

53	6.2	Surface water features	1	0	3	-	-
53	6.3	WFD Surface water body catchments	1	-	-	-	-
54	6.4	WFD Surface water bodies	1	0	0	-	-
54	6.5	WFD Groundwater bodies	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
55	7.1	Risk of flooding from rivers and the sea	High (within 50m)				
56	7.2	Historical Flood Events	0	0	0	-	-
56	7.3	Flood Defences	1	0	1	-	-
56	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
57	7.5	Flood Storage Areas	0	0	0	-	-
58	7.6	Flood Zone 2	Identified (within 50m)				
59	7.7	Flood Zone 3	Identified (within 50m)				
Page	Section	Surface water flooding					
60	8.1	Surface water flooding	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding					
62	9.1	Groundwater flooding	Negligible (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
63	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
64	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
64	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
64	10.4	Special Protection Areas (SPA)	0	0	0	0	0
64	10.5	National Nature Reserves (NNR)	0	0	0	0	0
65	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
65	10.7	Designated Ancient Woodland	0	0	0	1	1
65	10.8	Biosphere Reserves	0	0	0	0	0
65	10.9	Forest Parks	0	0	0	0	0
66	10.10	Marine Conservation Zones	0	0	0	0	0
66	10.11	Green Belt	1	0	0	0	0
66	10.12	Proposed Ramsar sites	0	0	0	0	0

66	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
67	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
67	10.15	Nitrate Sensitive Areas	0	0	0	0	0
67	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
68	**10.17**	**SSSI Impact Risk Zones**	2	-	-	-	-
69	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
70	11.1	World Heritage Sites	0	0	0	-	-
71	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
71	11.3	National Parks	0	0	0	-	-
71	**11.4**	**Listed Buildings**	0	1	9	-	-
72	**11.5**	**Conservation Areas**	1	0	0	-	-
72	11.6	Scheduled Ancient Monuments	0	0	0	-	-
73	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
74	**12.1**	**Agricultural Land Classification**	Urban (within 250m)				
75	12.2	Open Access Land	0	0	0	-	-
75	12.3	Tree Felling Licences	0	0	0	-	-
75	12.4	Environmental Stewardship Schemes	0	0	0	-	-
75	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
76	**13.1**	**Priority Habitat Inventory**	0	0	2	-	-
77	13.2	Habitat Networks	0	0	0	-	-
77	13.3	Open Mosaic Habitat	0	0	0	-	-
77	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
78	**14.1**	**10k Availability**	Identified (within 500m)				
79	**14.2**	**Artificial and made ground (10k)**	1	0	1	3	-
81	**14.3**	**Superficial geology (10k)**	1	0	1	0	-

82	14.4	Landslip (10k)	0	0	2	1	-
83	14.5	Bedrock geology (10k)	2	4	6	11	-
85	14.6	Bedrock faults and other linear features (10k)	1	1	0	5	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
86	15.1	50k Availability	Identified (within 500m)				
87	15.2	Artificial and made ground (50k)	0	0	0	1	-
88	15.3	Artificial ground permeability (50k)	0	0	-	-	-
89	15.4	Superficial geology (50k)	1	0	1	0	-
90	15.5	Superficial permeability (50k)	Identified (within 50m)				
90	15.6	Landslip (50k)	0	0	1	0	-
90	15.7	Landslip permeability (50k)	None (within 50m)				
91	15.8	Bedrock geology (50k)	2	4	6	9	-
93	15.9	Bedrock permeability (50k)	Identified (within 50m)				
93	15.10	Bedrock faults and other linear features (50k)	1	1	0	4	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
94	16.1	BGS Boreholes	0	2	5	-	-
Page	Section	Natural ground subsidence					
96	17.1	Shrink swell clays	Low (within 50m)				
98	17.2	Running sands	Low (within 50m)				
100	17.3	Compressible deposits	Moderate (within 50m)				
102	17.4	Collapsible deposits	Very low (within 50m)				
103	17.5	Landslides	Moderate (within 50m)				
105	17.6	Ground dissolution of soluble rocks	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
107	18.1	Natural cavities	0	0	0	0	-
108	18.2	BritPits	0	1	0	5	-
109	18.3	Surface ground workings	11	1	26	-	-
110	18.4	Underground workings	0	0	0	0	0
111	18.5	Historical Mineral Planning Areas	0	0	0	0	-

111	**18.6**	**Non-coal mining**	1	0	0	0	0
111	18.7	Mining cavities	0	0	0	0	0
111	18.8	JPB mining areas	None (within 0m)				
112	**18.9**	**Coal mining**	Identified (within 0m)				
112	18.10	Brine areas	None (within 0m)				
112	18.11	Gypsum areas	None (within 0m)				
112	18.12	Tin mining	None (within 0m)				
112	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
113	**19.1**	**Radon**	Between 1% and 3% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
114	**20.1**	**BGS Estimated Background Soil Chemistry**	3	4	-	-	-
114	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
115	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-

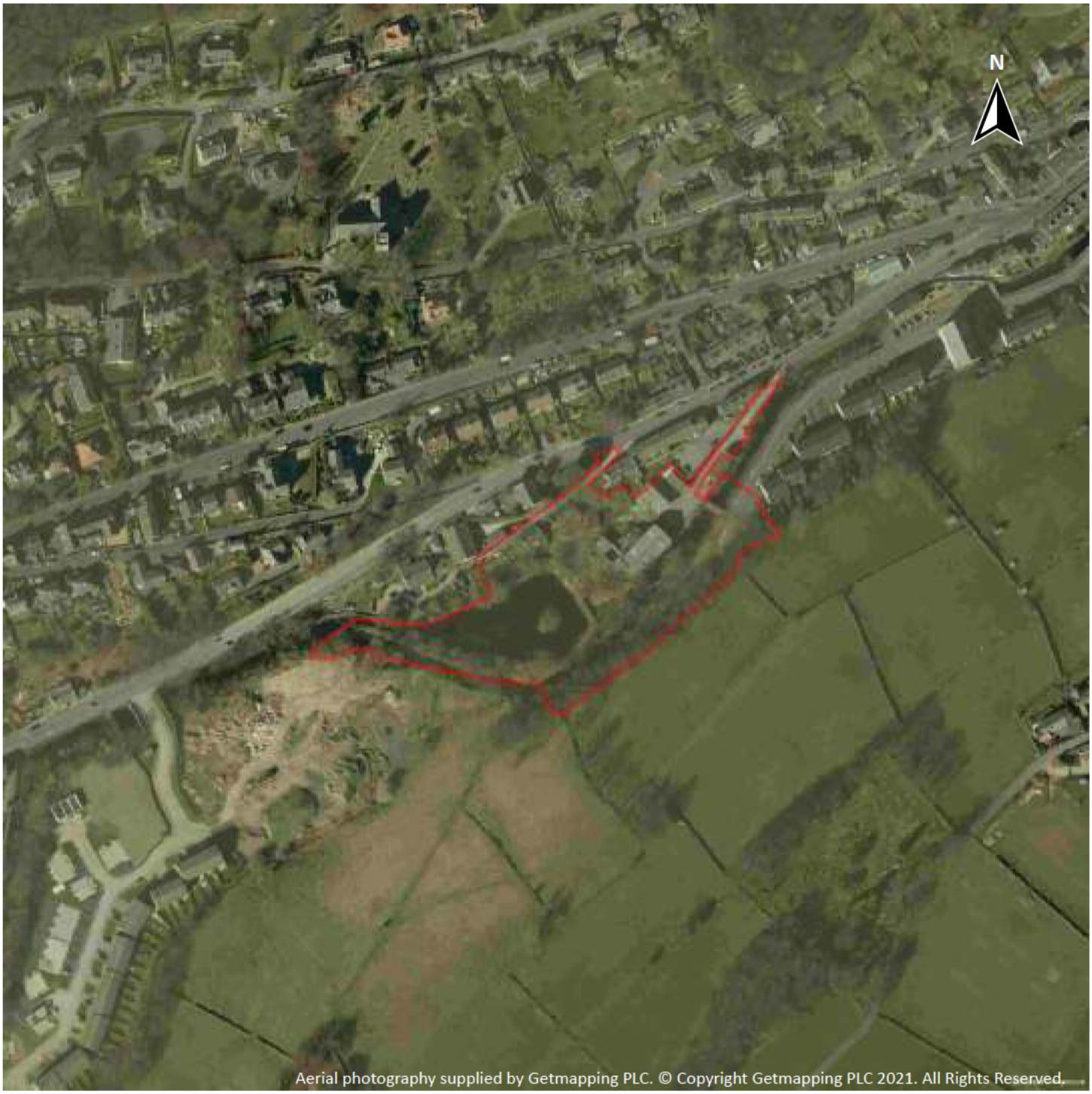
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
116	21.1	Underground railways (London)	0	0	0	-	-
116	21.2	Underground railways (Non-London)	0	0	0	-	-
116	21.3	Railway tunnels	0	0	0	-	-
116	21.4	Historical railway and tunnel features	0	0	0	-	-
116	21.5	Royal Mail tunnels	0	0	0	-	-
117	21.6	Historical railways	0	0	0	-	-
117	21.7	Railways	0	0	0	-	-
117	21.8	Crossrail 1	0	0	0	0	-
117	21.9	Crossrail 2	0	0	0	0	-
117	21.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 29/06/2018

Site Area: 1.21ha

Recent site history - 2012 aerial photograph



Capture Date: 26/03/2012

Site Area: 1.21ha

Recent site history - 2011 aerial photograph

Capture Date: 28/09/2011

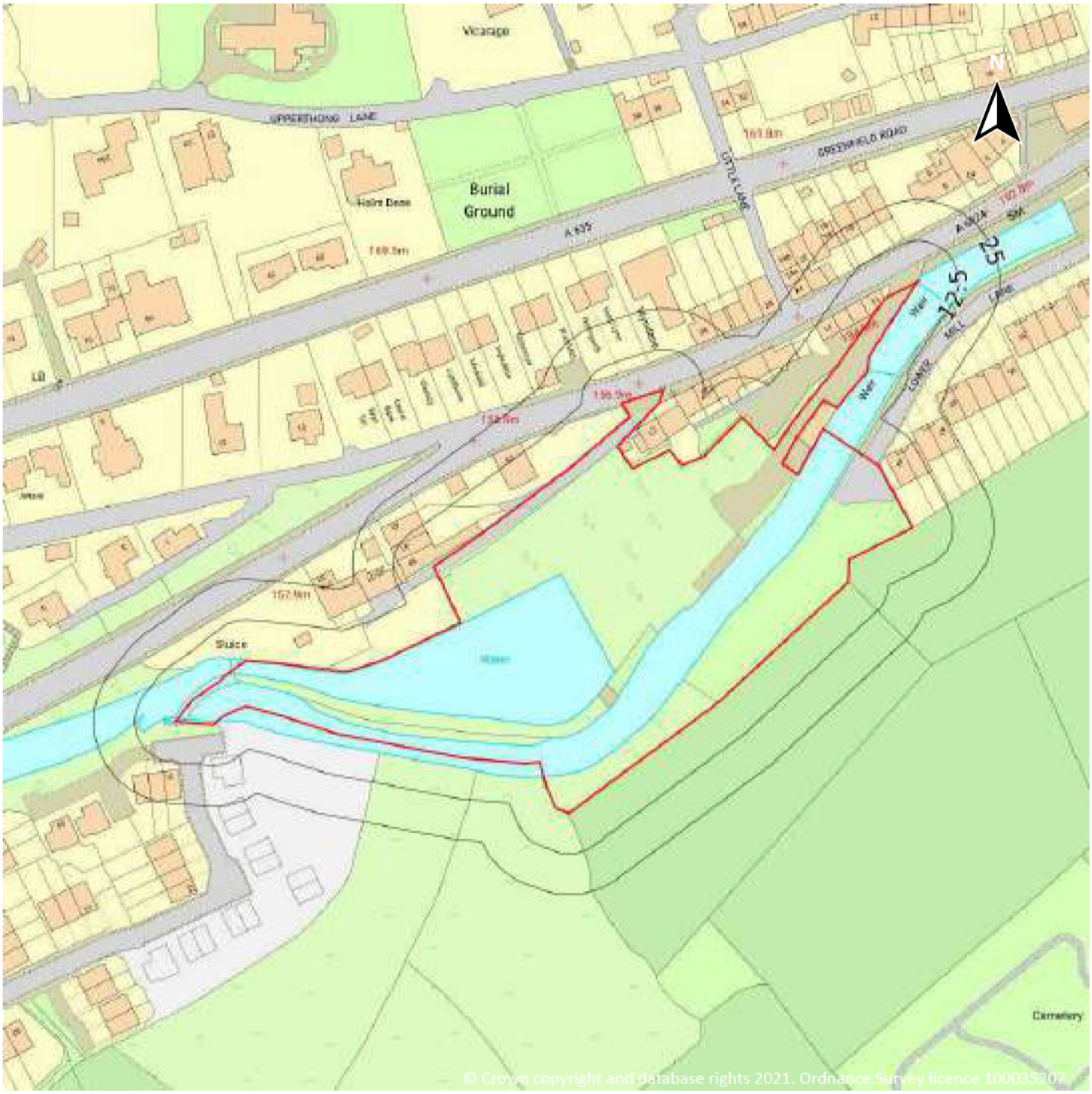
Site Area: 1.21ha

Recent site history - 2000 aerial photograph

Capture Date: 25/08/2000

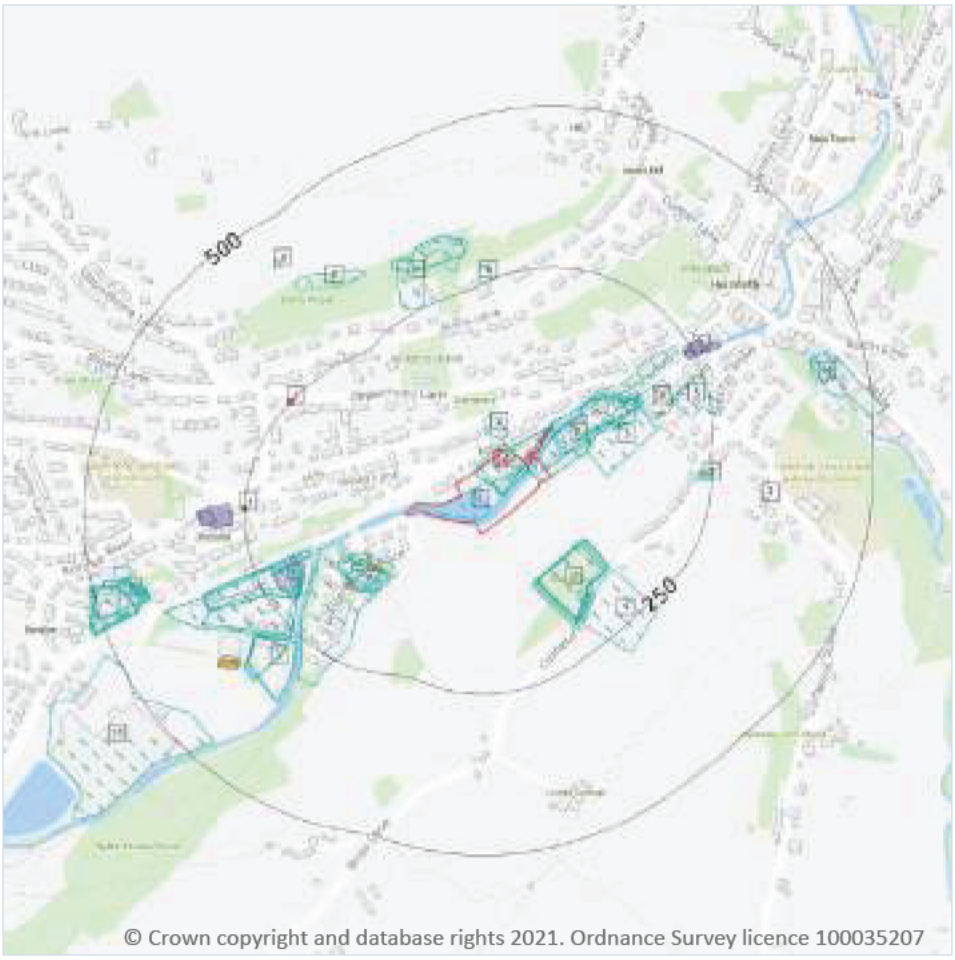
Site Area: 1.21ha

OS MasterMap site plan



Site Area: 1.21ha

1 Past land use



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

1.1 Historical industrial land uses

Records within 500m	72

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

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
1	On site	Unspecified Mill	1933	1501652

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Woollen Mill**	**1854**	**1431059**
A	**On site**	**Unspecified Disused Mill**	**1904**	**1435530**
A	**On site**	**Unspecified Mill**	**1888**	**1463483**
A	**On site**	**Unspecified Mill**	**1955 - 1965**	**1467111**
A	**On site**	**Unspecified Mill**	**1948**	**1472356**
B	**On site**	**Unspecified Mills**	**1948**	**1461992**
B	**On site**	**Unspecified Mills**	**1955**	**1479084**
B	**On site**	**Unspecified Mills**	**1904**	**1506532**
B	1m NE	Unspecified Mills	1933	1544050
B	8m SE	Unspecified Mill	1970 - 1980	1481809
B	10m SE	Unspecified Mills	1965	1479513
2	17m N	Sandstone Quarry	1854	1451006
3	61m E	Unspecified Mill	1888	1466225
B	72m NE	Woollen Mill	1854	1431060
C	80m SW	Woollen Mill	1854	1459659
C	90m S	Unspecified Mills	1965	1557247
C	92m S	Perseverance Mills	1955	1421167
C	94m S	Unspecified Mills	1933 - 1948	1502959
C	99m SW	Unspecified Mill	1970	1488308
C	99m SW	Unspecified Mills	1980	1539589
D	104m SE	Cemetery	1970 - 1980	1499278
D	107m SE	Cemetery	1933	1501925
D	107m SE	Cemetery	1955	1476269
D	107m SE	Cemetery	1965	1462973
D	108m SE	Cemetery	1948	1473011
D	108m SE	Cemetery	1888 - 1904	1477501
C	109m SW	Unspecified Disused Mill	1904	1435531
C	109m SW	Unspecified Mill	1888	1535082

ID	Location	Land use	Dates present	Group ID
E	139m E	Unspecified Mill	1888	1421206
F	155m W	Iron Works	1965	1483856
D	161m SE	Mortuary	1965	1439873
F	161m SW	Iron Works	1948	1481273
F	161m SW	Iron Works	1904	1484478
4	173m SE	Cemetery	1955	1457447
F	173m SW	Iron Works	1933	1528492
F	182m SW	Iron Works	1955	1465125
F	190m SW	Garage	1970	1457790
5	192m E	Woollen Mill	1854	1431063
F	197m SW	Unspecified Works	1980	1438180
F	204m SW	Unspecified Mill	1888	1421203
G	225m E	Unspecified Workhouse	1888 - 1904	1470925
G	225m E	Unspecified Workhouse	1948	1500407
G	229m E	Unspecified Workhouse	1933	1474670
6	244m NW	Sandstone Quarry	1854	1451017
K	251m NW	Unspecified Quarry	1904	1471032
L	256m SW	Unspecified Mills	1965	1535789
L	262m SW	Unidentified Mills	1955	1443353
L	268m SW	Unspecified Mills	1933	1499381
L	280m SW	Unspecified Mill	1888	1421204
L	280m SW	Unspecified Mills	1948	1508022
L	280m SW	Unspecified Mills	1904	1555056
K	302m NW	Unspecified Quarry	1965 - 1980	1547786
K	303m N	Unspecified Quarry	1955	1471572
7	333m E	Unspecified Pump	1854	1456501
L	338m SW	Unspecified Tanks	1980	1425755
8	341m NW	Unspecified Quarry	1965 - 1980	1516566

ID	Location	Land use	Dates present	Group ID
M	410m E	Unspecified Mill	1888 - 1904	1471715
M	413m E	Woollen Mill	1854	1431061
M	415m E	Unspecified Mills	1970 - 1980	1540551
N	418m W	Woollen Mill	1854	1431058
N	418m W	Unspecified Disused Mills	1965	1551392
N	418m W	Unspecified Mills	1904	1510600
N	418m W	Unspecified Mill	1888	1477990
N	418m W	Unspecified Disused Mills	1948	1501420
N	421m W	Unspecified Disused Mills	1955	1529441
N	422m W	Gasometer	1854	1420664
N	422m W	Unspecified Disused Mills	1933	1553363
9	427m NW	Sandstone Quarry	1854	1451018
N	441m W	Unspecified Mill	1970	1525103
N	441m W	Unspecified Mills	1980	1540821
10	454m SW	Unspecified Mill	1980	1459590

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m **7**

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

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
C	87m SW	Tanks	1988	245332
C	90m SW	Tanks	1975 - 1993	240754
C	137m SW	Unspecified Tank	1975 - 1993	238732

ID	Location	Land use	Dates present	Group ID
E	164m E	Tanks	1984 - 1996	249745
E	168m E	Tanks	1966	247746
L	343m SW	Tanks	1975 - 1993	233819
L	346m SW	Tanks	1988	249267

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	4

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

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
I	244m NW	Electricity Substation	1995	138768
I	245m NW	Electricity Substation	1963 - 1990	141409
J	247m W	Electricity Substation	1975	134457
J	247m W	Electricity Substation	1988 - 1993	139748

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0

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

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	7

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

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
F	182m SW	Garage	1962	41093
H	235m NE	Garage	1984 - 1988	45849
H	237m NE	Garage	1995	42063
H	238m NE	Garage	1966	43250
J	270m W	Garage	1975	42312
J	272m W	Garage	1988	42813
J	294m W	Garage	1962	42516

This data is sourced from Ordnance Survey / Groundsure.

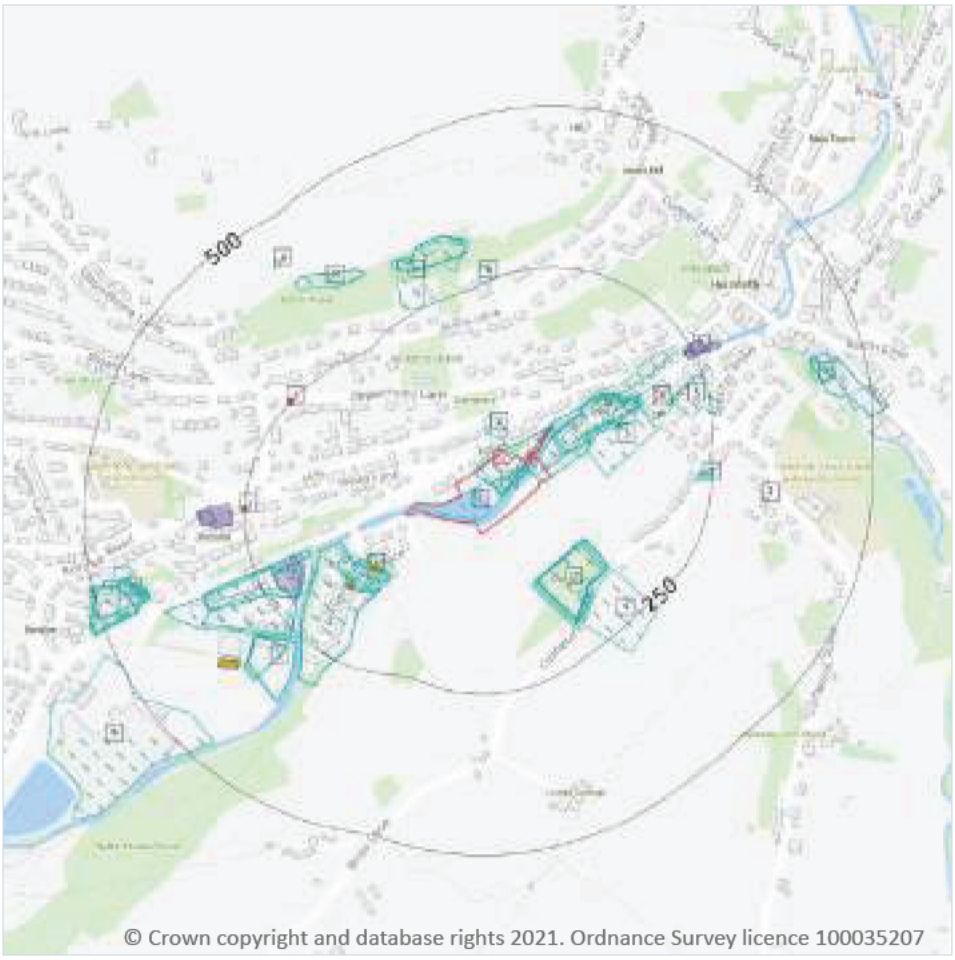
1.6 Historical military land

Records within 500m	0

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

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

2 Past land use - un-grouped



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

2.1 Historical industrial land uses

Records within 500m	85

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

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
1	On site	Unspecified Mill	1933	1501652
A	On site	Unspecified Mill	1965	1467111
A	On site	Unspecified Mill	1955	1467111

ID	Location	Land Use	Date	Group ID
A	**On site**	**Woollen Mill**	**1854**	**1431059**
A	**On site**	**Unspecified Mill**	**1948**	**1472356**
A	**On site**	**Unspecified Disused Mill**	**1904**	**1435530**
A	**On site**	**Unspecified Mill**	**1888**	**1463483**
B	**On site**	**Unspecified Mills**	**1955**	**1479084**
B	**On site**	**Unspecified Mills**	**1948**	**1461992**
B	**On site**	**Unspecified Mills**	**1904**	**1506532**
B	1m NE	Unspecified Mills	1933	1544050
B	8m SE	Unspecified Mill	1980	1481809
B	8m SE	Unspecified Mill	1970	1481809
B	10m SE	Unspecified Mills	1965	1479513
2	17m N	Sandstone Quarry	1854	1451006
3	61m E	Unspecified Mill	1888	1466225
B	72m NE	Woollen Mill	1854	1431060
C	80m SW	Woollen Mill	1854	1459659
C	90m S	Unspecified Mills	1965	1557247
C	92m S	Perseverance Mills	1955	1421167
C	94m S	Unspecified Mills	1933	1502959
C	97m S	Unspecified Mills	1948	1502959
C	98m SW	Woollen Mill	1854	1459659
C	99m SW	Unspecified Mills	1980	1539589
C	99m SW	Unspecified Mill	1970	1488308
D	104m SE	Cemetery	1980	1499278
D	104m SE	Cemetery	1970	1499278
D	107m SE	Cemetery	1933	1501925
D	107m SE	Cemetery	1955	1476269
D	107m SE	Cemetery	1965	1462973
D	108m SE	Cemetery	1948	1473011

ID	Location	Land Use	Date	Group ID
D	108m SE	Cemetery	1904	1477501
D	108m SE	Cemetery	1888	1477501
C	109m SW	Unspecified Disused Mill	1904	1435531
C	109m SW	Unspecified Mill	1888	1535082
E	139m E	Unspecified Mill	1888	1421206
F	155m W	Iron Works	1965	1483856
D	161m SE	Mortuary	1965	1439873
F	161m SW	Iron Works	1948	1481273
F	161m SW	Iron Works	1904	1484478
4	173m SE	Cemetery	1955	1457447
F	173m SW	Iron Works	1933	1528492
F	182m SW	Iron Works	1955	1465125
F	190m SW	Garage	1970	1457790
5	192m E	Woollen Mill	1854	1431063
F	197m SW	Unspecified Works	1980	1438180
F	204m SW	Unspecified Mill	1888	1421203
G	225m E	Unspecified Workhouse	1948	1500407
G	225m E	Unspecified Workhouse	1904	1470925
G	225m E	Unspecified Workhouse	1888	1470925
G	229m E	Unspecified Workhouse	1933	1474670
6	244m NW	Sandstone Quarry	1854	1451017
K	251m NW	Unspecified Quarry	1904	1471032
L	256m SW	Unspecified Mills	1965	1535789
L	262m SW	Unidentified Mills	1955	1443353
L	268m SW	Unspecified Mills	1933	1499381
L	280m SW	Unspecified Mills	1948	1508022
L	280m SW	Unspecified Mills	1904	1555056
L	280m SW	Unspecified Mill	1888	1421204

ID	Location	Land Use	Date	Group ID
K	302m NW	Unspecified Quarry	1980	1547786
K	303m N	Unspecified Quarry	1955	1471572
K	303m NW	Unspecified Quarry	1965	1547786
K	303m NW	Unspecified Quarry	1970	1547786
7	333m E	Unspecified Pump	1854	1456501
L	338m SW	Unspecified Tanks	1980	1425755
M	341m NW	Unspecified Quarry	1980	1516566
M	341m NW	Unspecified Quarry	1965	1516566
M	341m NW	Unspecified Quarry	1970	1516566
N	410m E	Unspecified Mill	1904	1471715
N	410m E	Unspecified Mill	1888	1471715
N	413m E	Woollen Mill	1854	1431061
N	415m E	Unspecified Mills	1980	1540551
N	415m E	Unspecified Mills	1970	1540551
O	418m W	Woollen Mill	1854	1431058
O	418m W	Unspecified Disused Mills	1965	1551392
O	418m W	Unspecified Disused Mills	1948	1501420
O	418m W	Unspecified Mills	1904	1510600
O	418m W	Unspecified Mill	1888	1477990
O	421m W	Unspecified Disused Mills	1955	1529441
O	422m W	Gasometer	1854	1420664
O	422m W	Unspecified Disused Mills	1933	1553363
8	427m NW	Sandstone Quarry	1854	1451018
O	441m W	Unspecified Mills	1980	1540821
O	441m W	Unspecified Mill	1970	1525103
9	454m SW	Unspecified Mill	1980	1459590

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	14

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

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
C	87m SW	Tanks	1988	245332
C	90m SW	Tanks	1975	240754
C	92m SW	Tanks	1993	240754
C	137m SW	Unspecified Tank	1975	238732
C	139m SW	Unspecified Tank	1993	238732
C	140m SW	Unspecified Tank	1988	238732
E	164m E	Tanks	1984	249745
E	164m E	Tanks	1988	249745
E	166m E	Tanks	1995	249745
E	166m E	Tanks	1996	249745
E	168m E	Tanks	1966	247746
L	343m SW	Tanks	1975	233819
L	344m SW	Tanks	1993	233819
L	346m SW	Tanks	1988	249267

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	8

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

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
I	244m NW	Electricity Substation	1995	138768
I	245m NW	Electricity Substation	1963	141409
I	246m NW	Electricity Substation	1985	141409
I	246m NW	Electricity Substation	1985	141409
I	246m NW	Electricity Substation	1990	141409
J	247m W	Electricity Substation	1993	139748
J	247m W	Electricity Substation	1975	134457
J	250m W	Electricity Substation	1988	139748

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0

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

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	8

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

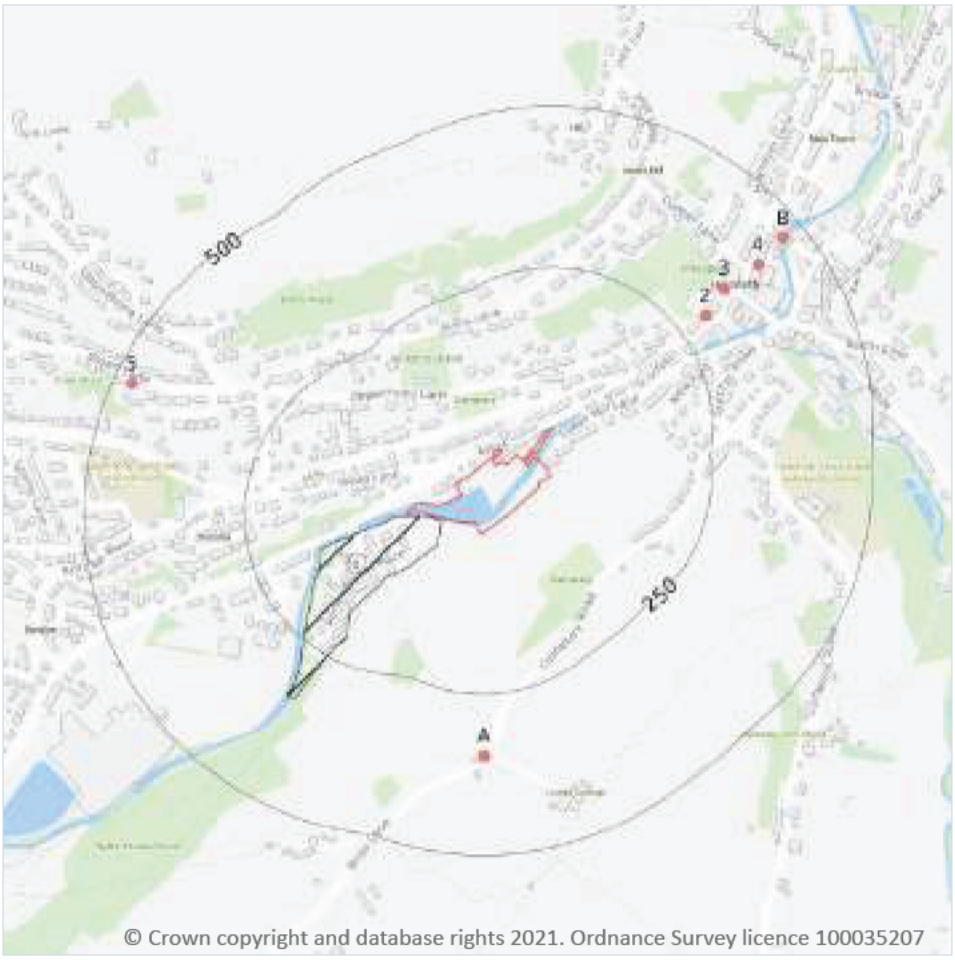
Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
F	182m SW	Garage	1962	41093
H	235m NE	Garage	1984	45849
H	235m NE	Garage	1988	45849
H	237m NE	Garage	1995	42063
H	238m NE	Garage	1966	43250

ID	Location	Land Use	Date	Group ID
J	270m W	Garage	1975	42312
J	272m W	Garage	1988	42813
J	294m W	Garage	1962	42516

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



Site Outline

Search buffers in metres (m)

Historical landfill (EA/NRW)

Waste exemptions

3.1 Active or recent landfill

Records within 500m	0

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

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

3.2 Historical landfill (BGS records)

Records within 500m	0

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

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0

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

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

3.4 Historical landfill (EA/NRW records)

Records within 500m	1

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

Features are displayed on the Waste and landfill map on **page 26**

ID	Location	Details		
1	1m S	Site Address: Perseverance Mill Site, Woodhouse Road / Woodhead Road, Holmfirth Licence Holder Address: Woodhouse Quarry, Woodhouse Lane, Holmbridge, Holmfirth, West Yorkshire	Waste Licence: - Site Reference: 4700/1510 Waste Type: Inert, Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: David C Wearmouth Licence Holder: David C Wearmouth First Recorded - Last Recorded: -

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

3.5 Historical waste sites

Records within 500m	0

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

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

3.6 Licensed waste sites

Records within 500m	0

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

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

3.7 Waste exemptions

Records within 500m	8

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

Features are displayed on the Waste and landfill map on **page 26**

ID	Location	Site	Reference	Category	Sub-Category	Description
2	296m NE	59, Huddersfield Road, Holmfirth, HD9 3JH	WEX070553	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
3	344m NE	59, HUDDERSFIELD ROAD, HOLMFIRTH, HD9 3JH	WEX070986	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
A	347m S	LANE BOTTOM FARM, ROYD LANE, HOLMFIRTH, HD9 2SX	WEX016728	Disposing of waste exemption	On a farm	Deposit of waste from a portable sanitary convenience
A	347m S	LANE BOTTOM FARM, ROYD LANE, HOLMFIRTH, HD9 2SX	WEX016728	Disposing of waste exemption	On a farm	Burning waste in the open
4	408m NE	Unit E Riverside Shopping Centre 90 Huddersfield Road HOLMFIRTH HD9 3AZ	EPR/CF0436EF/A001	Treating waste exemption	Non-Agricultural Waste Only	Sorting and de-naturing of controlled drugs for disposal
B	465m NE	RIVERSIDE SHOPPING CENTRE, UNIT 5, HUDDERSFIELD ROAD, HOLMFIRTH, HD9 3AZ	WEX255239	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
B	465m NE	RIVERSIDE SHOPPING CENTRE, UNIT 5, HUDDERSFIELD ROAD, HOLMFIRTH, HD9 3AZ	WEX111824	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
5	471m NW	1, BROAD LANE, UPPERTHONG, HOLMFIRTH, HD9 3JS	WEX099124	Disposing of waste exemption	Not on a farm	Burning waste in the open

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

4 Current industrial land use

Site Outline

Search buffers in metres (m)

Recent industrial land uses

Licensed Discharges to controlled waters

List 2 Dangerous Substances

Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m	6

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 29**

ID	Location	Company	Address	Activity	Category
2	38m NW	Holme Valley Stained Glass	Westfield, Woodhead Road, Holmfirth, West Yorkshire, HD9 2JX	Glass	Industrial Products
3	68m N	Holmfirth Optical Company	18, Greenfield Road, Holmfirth, West Yorkshire, HD9 2BG	Photographic and Optical Equipment	Consumer Products

ID	Location	Company	Address	Activity	Category
4	88m NE	Electricity Sub Station	West Yorkshire, HD9	Electrical Features	Infrastructure and Facilities
5	91m SW	Electricity Sub Station	West Yorkshire, HD9	Electrical Features	Infrastructure and Facilities
8	239m NW	Electricity Sub Station	West Yorkshire, HD9	Electrical Features	Infrastructure and Facilities
9	244m W	Electricity Sub Station	West Yorkshire, HD9	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	0

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0

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

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	0

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

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

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

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	0

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

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

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

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

4.10 Licensed industrial activities (Part A(1))

Records within 500m	0

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

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

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

Records within 500m	0

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

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0

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

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

4.13 Licensed Discharges to controlled waters

Records within 500m	5

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

Features are displayed on the Current industrial land use map on **page 29**

ID	Location	Address	Details	
7	217m NE	SCAR FOLD CSO, SCAR FOLD (R/O NO.34), HOLMFIRTH, HUDDERSFIELD, WEST YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: WRA9271 Permit Version: 1 Receiving Water: RIVER HOLME	Status: SURRENDERED UNDER EPR 2010 Issue date: 04/09/2007 Effective Date: 04/09/2007 Revocation Date: 15/10/2019
C	422m NE	COOPER LANE CSO, COOPER LANE (ADJ NO 19), HOLMFIRTH, HUDDERSFIELD, WEST YORKSHIRE, HD9 3BP	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: WRA8468 Permit Version: 1 Receiving Water: RIVER HOLME	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 28/02/2005 Effective Date: 31/03/2005 Revocation Date: 27/08/2020
C	422m NE	COOPER LANE CSO, COOPER LANE (ADJ NO 19), HOLMFIRTH, HUDDERSFIELD, WEST YORKSHIRE, HD9 3BP	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: WRA8468 Permit Version: 2 Receiving Water: RIVER HOLME	Status: VARIED UNDER EPR 2010 Issue date: 28/08/2020 Effective Date: 28/08/2020 Revocation Date: -

ID	Location	Address	Details	
C	441m NE	TOWNGATE HOLMFIRTH 2 CSO, TOWNGATE OPP PUBLIC HOUSE, HOLMFIRTH, HUDDERSFIELD, WEST YORKSHIRE, HD9 1HA	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: WRA8447 Permit Version: 1 Receiving Water: RIVER HOLME	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 18/03/2005 Effective Date: 18/03/2005 Revocation Date: 30/03/2018
C	442m NE	TOWNGATE HOLMFIRTH 2 CSO, TOWNGATE OPP PUBLIC HOUSE, HOLMFIRTH, HUDDERSFIELD, WEST YORKSHIRE, HD9 1HA	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: WRA8447 Permit Version: 2 Receiving Water: RIVER HOLME	Status: VARIED UNDER EPR 2010 Issue date: 26/02/2018 Effective Date: 31/03/2018 Revocation Date: -

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

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0

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

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

4.15 Pollutant release to public sewer

Records within 500m	0

Discharges of Special Category Effluents to the public sewer.

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

4.16 List 1 Dangerous Substances

Records within 500m	0

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

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

4.17 List 2 Dangerous Substances

Records within 500m	1

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

Features are displayed on the Current industrial land use map on **page 29**

ID	Location	Name	Status	Receiving Water	Authorised Substances
11	495m SW	Brook Dyeing Co Ltd,huddersfield,hd7 2pu	Not Active	Unknown	Sulcofuron

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m	10

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

Features are displayed on the Current industrial land use map on **page 29**

ID	Location	Details	
1	4m NW	Incident Date: 09/05/2003 Incident Identification: 157124 Pollutant: Sewage Materials Pollutant Description: Grey Water	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
6	152m SW	Incident Date: 26/07/2014 Incident Identification: 1261289 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
A	294m SW	Incident Date: 07/07/2016 Incident Identification: 1450767 Pollutant: Organic Chemicals/Products Pollutant Description: Dyes and Inks	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
A	318m SW	Incident Date: 10/12/2014 Incident Identification: 1300296 Pollutant: Organic Chemicals/Products Pollutant Description: Dyes and Inks	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
A	318m SW	Incident Date: 10/12/2014 Incident Identification: 1300296 Pollutant: Organic Chemicals/Products Pollutant Description: Pesticides and Biocides	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

ID	Location	Details	
10	371m SW	Incident Date: 22/03/2006 Incident Identification: 385406 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	379m NE	Incident Date: 26/06/2001 Incident Identification: 11573 Pollutant: Contaminated Water Pollutant Description: Suspended Solids	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	379m NE	Incident Date: 26/06/2001 Incident Identification: 11573 Pollutant: Contaminated Water Pollutant Description: Suspended Solids	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
D	459m E	Incident Date: 30/06/2018 Incident Identification: 1627545 Pollutant: Contaminated Water Pollutant Description: Firefighting Run-Off	Water Impact: Category 1 (Major) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
D	471m E	Incident Date: 11/05/2002 Incident Identification: 78082 Pollutant: Sewage Materials Pollutant Description: Other Sewage Material	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)

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

4.19 Pollution inventory substances

Records within 500m	0

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

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

4.20 Pollution inventory waste transfers

Records within 500m	0

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

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

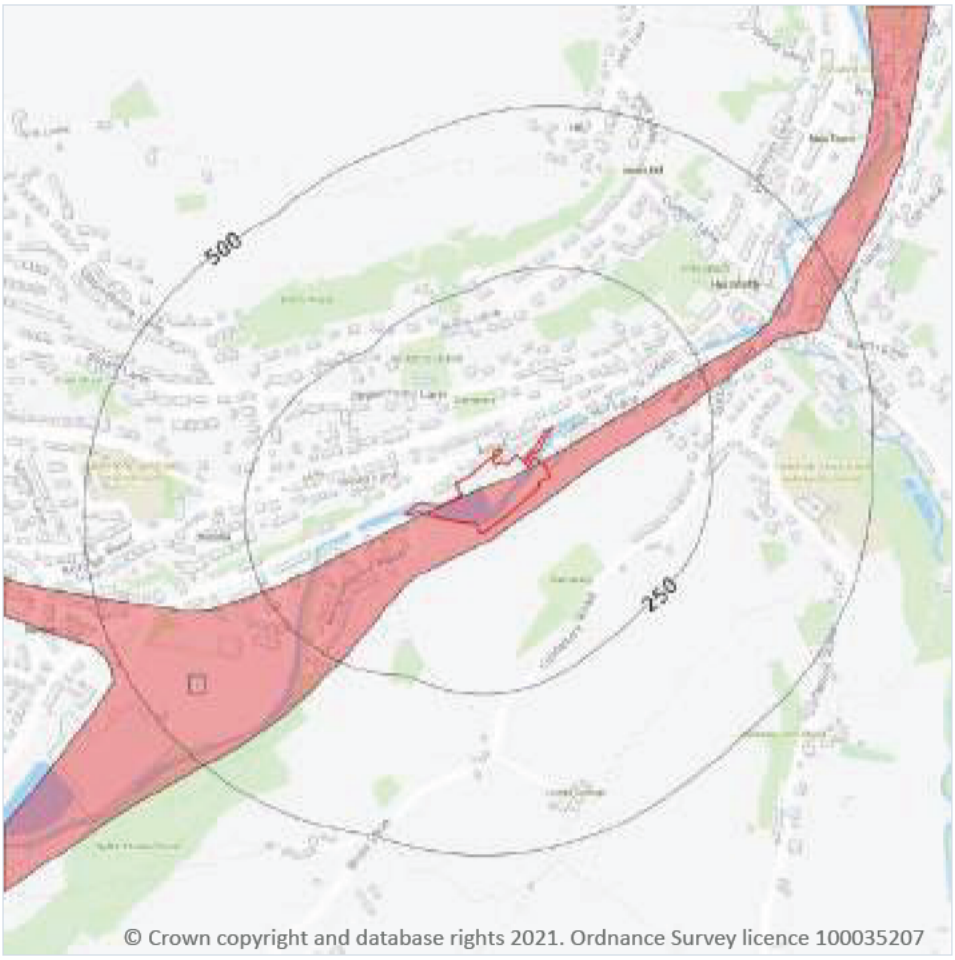
4.21 Pollution inventory radioactive waste

Records within 500m	0

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

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

5 Hydrogeology - Superficial aquifer



Site Outline

Search buffers in metres (m)

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

5.1 Superficial aquifer

Records within 500m	1

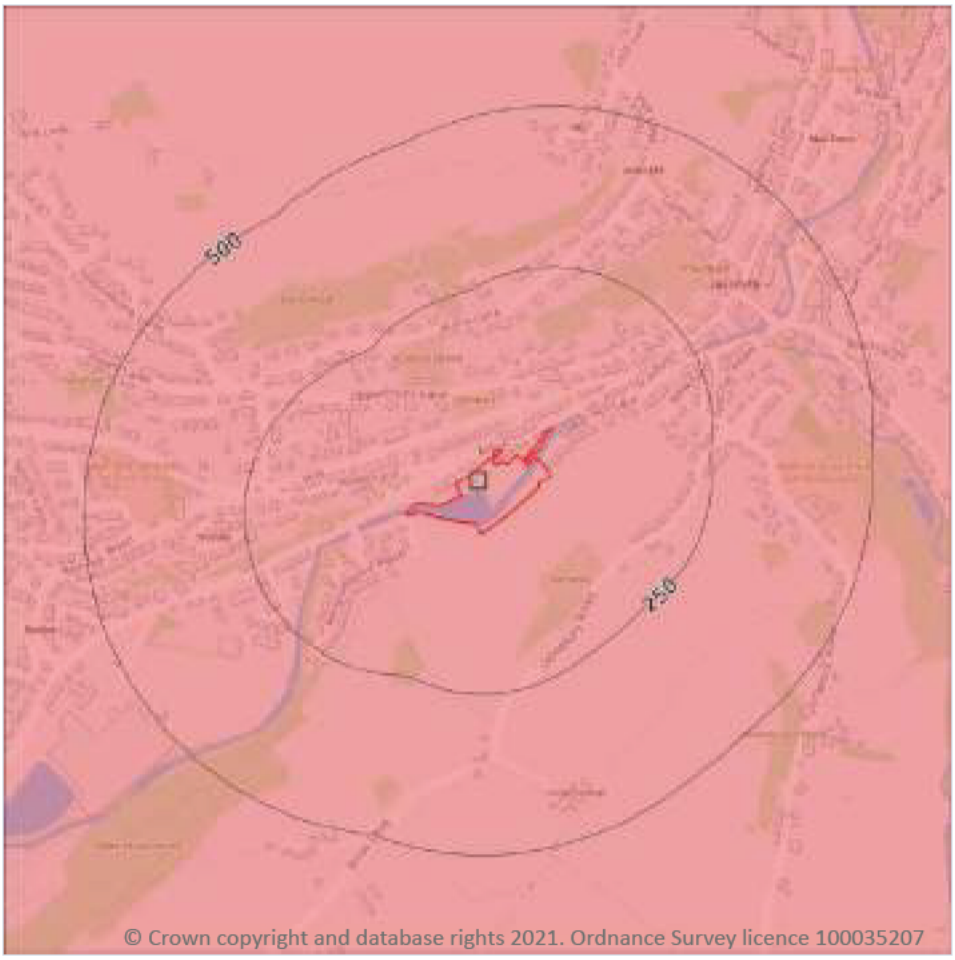
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 37**

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

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

Bedrock aquifer



Site Outline

Search buffers in metres (m)

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

5.2 Bedrock aquifer

Records within 500m	1

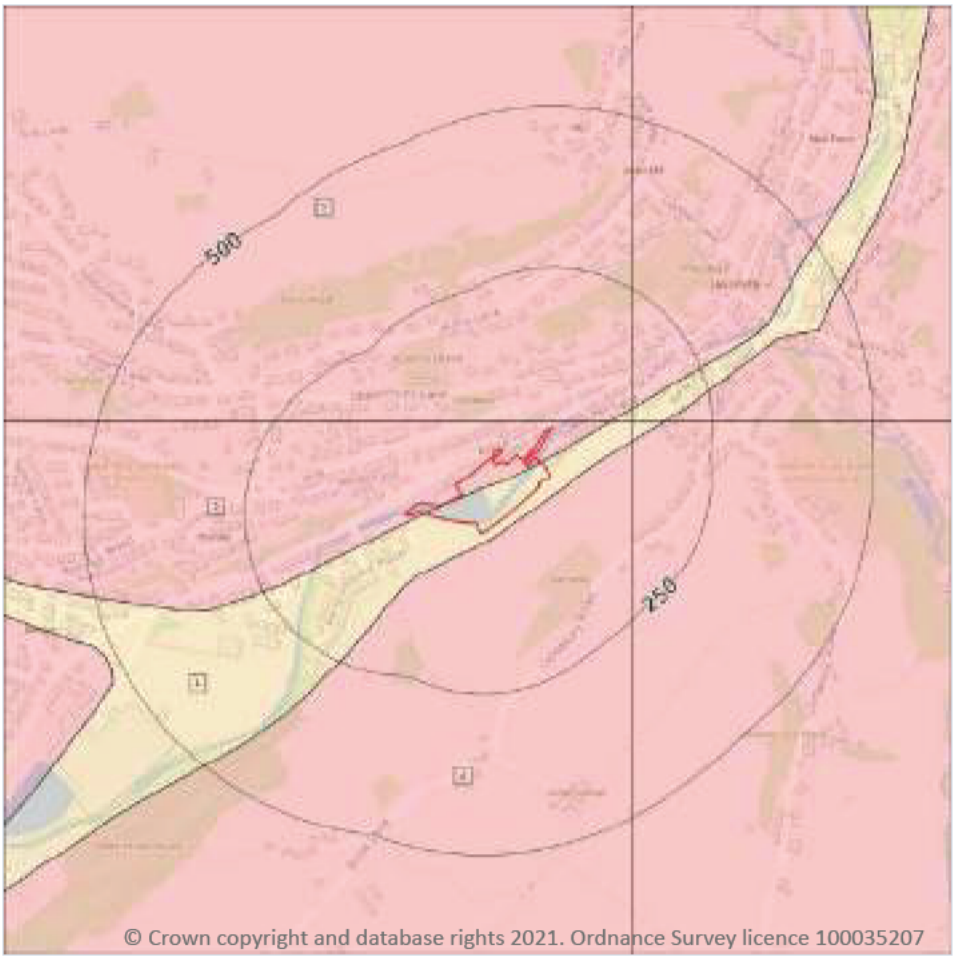
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 38**

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

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

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

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

Bedrock vulnerability

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

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	4

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

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

Features are displayed on the Groundwater vulnerability map on **page 39**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: High Infiltration value: >70% Dilution value: >550mm/year**	**Vulnerability: High Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures**
2	**On site**	**Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: High Infiltration value: >70% Dilution value: >550mm/year**	**Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures**
3	11m N	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
4	14m SE	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures

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

5.4 Groundwater vulnerability- soluble rock risk

Records on site	0

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

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

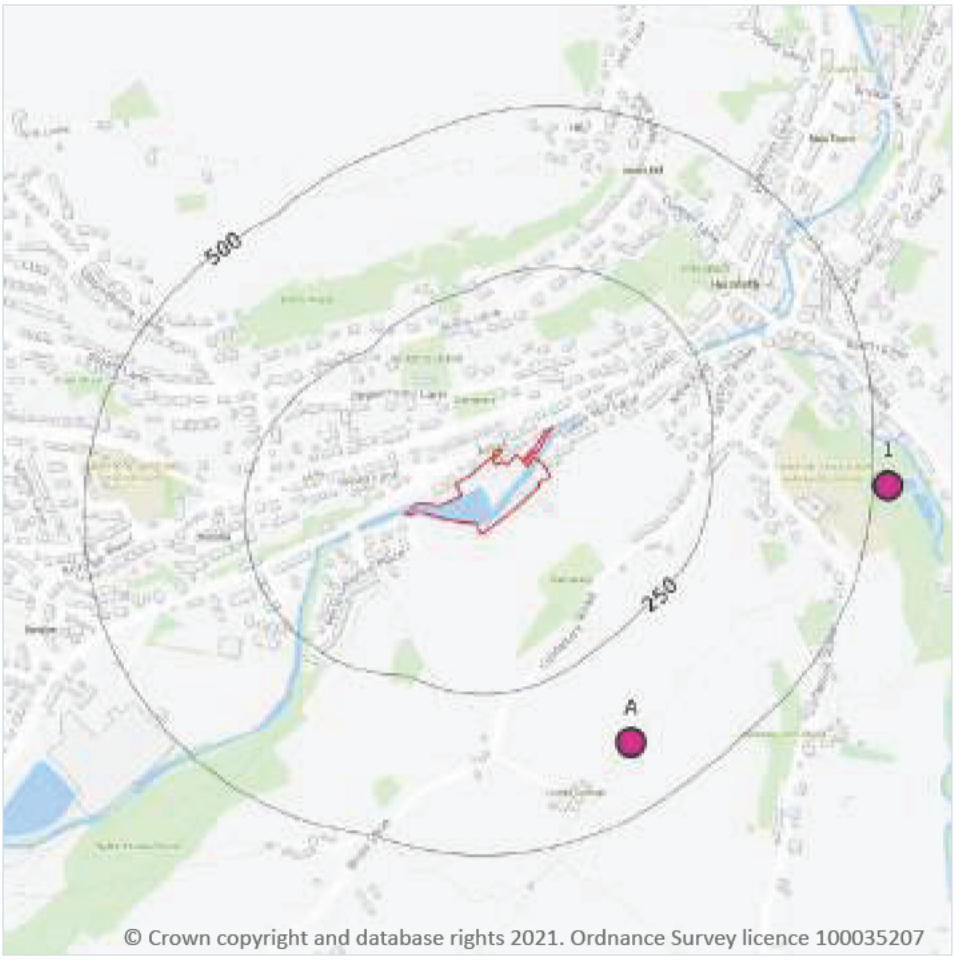
5.5 Groundwater vulnerability- local information

Records on site	0

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

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

Abstractions and Source Protection Zones



Site Outline

Search buffers in metres (m)

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

5.6 Groundwater abstractions

Records within 2000m	21

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 41**

ID	Location	Details	
A	398m SE	Status: Historical Licence No: 2/27/10/037 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL X3 Data Type: Point Name: MAZUREK Easting: 414000 Northing: 407500	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 13/12/1966 Version End Date: -
A	398m SE	Status: Historical Licence No: 2/27/10/037 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL X3 - MILLSTONE GRIT - HOLMFIRTH Data Type: Point Name: MAZUREK Easting: 414000 Northing: 407500	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 13/12/1966 Version End Date: -
1	524m E	Status: Active Licence No: 2/27/10/083 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - MILLSTONE GRIT - RIBBLEDEN DYEWORKS Data Type: Point Name: HOLMFIRTH DYERS LTD Easting: 414400 Northing: 407900	Annual Volume (m^3): 90,920 Max Daily Volume (m^3): 363.68 Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 101 Version Start Date: 13/03/2000 Version End Date: -
-	1038m SE	Status: Historical Licence No: 2/27/10/080 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELLS X3 Data Type: Point Name: BATTYE Easting: 414400 Northing: 407000	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/04/1966 Version End Date: -
-	1038m SE	Status: Historical Licence No: 2/27/10/080 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELLS X3 - MILLSTONE GRIT - CARTWORTH MOOR Data Type: Point Name: BATTYE Easting: 414400 Northing: 407000	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/04/1966 Version End Date: -

ID	Location	Details	
-	1095m NW	Status: Historical Licence No: 2/27/10/045 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: #NULL! Data Type: Poly3 Name: HALL Easting: 412700 Northing: 408400	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/08/1971 Version End Date: -
-	1095m NW	Status: Historical Licence No: 2/27/10/045 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL NUMBER 1 - MILLSTONE GRIT - HOLMFIRTH Data Type: Point Name: HALL Easting: 412700 Northing: 408400	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/08/1971 Version End Date: -
-	1127m S	Status: Historical Licence No: 2/27/10/113 Details: Raw Water Supply Direct Source: GROUNDWATERS Point: WELL Data Type: Point Name: WELLHOUSE PUMP BOARD Easting: 413700 Northing: 406700	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 24/07/1980 Expiry Date: - Issue No: 100 Version Start Date: 24/07/1980 Version End Date: -
-	1127m S	Status: Historical Licence No: 2/27/10/113 Details: Raw Water Supply Direct Source: GROUNDWATERS Point: WELL - MILLSTONE GRIT - CARWORTH MOOR HOLMFIRTH Data Type: Point Name: WELLHOUSES RESIDENT ASSOCIATION Easting: 413700 Northing: 406700	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 24/07/1980 Expiry Date: - Issue No: 101 Version Start Date: 09/09/2002 Version End Date: -
-	1232m W	Status: Historical Licence No: 2/27/10/045 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL NUMBER 3 - MILLSTONE GRIT - HOLMFIRTH Data Type: Point Name: HALL Easting: 412500 Northing: 408300	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/08/1971 Version End Date: -

ID	Location	Details	
-	1296m W	Status: Historical Licence No: 2/27/10/045 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL NUMBER 2 - MILLSTONE GRIT - HOLMFIRTH Data Type: Point Name: HALL Easting: 412400 Northing: 408200	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/08/1971 Version End Date: -
-	1587m SE	Status: Historical Licence No: 2/27/10/075 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: -- GRAVITY Data Type: Point Name: GARLICK Easting: 414900 Northing: 406700	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 26/05/1966 Expiry Date: - Issue No: 100 Version Start Date: 26/05/1966 Version End Date: -
-	1587m SE	Status: Historical Licence No: 2/27/10/075 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: SPRING Data Type: Point Name: GARLICK Easting: 414900 Northing: 406700	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 26/05/1966 Expiry Date: - Issue No: 100 Version Start Date: 26/05/1966 Version End Date: -
-	1669m NE	Status: Historical Licence No: 2/27/10/102 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL Data Type: Point Name: BROADHEAD Easting: 415330 Northing: 408810	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 26/05/1966 Expiry Date: - Issue No: 100 Version Start Date: 26/05/1966 Version End Date: -
-	1669m NE	Status: Historical Licence No: 2/27/10/102 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL - MILLSTONE GRIT - HOLMFIRTH Data Type: Point Name: BROADHEAD Easting: 415330 Northing: 408810	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 26/05/1966 Expiry Date: - Issue No: 100 Version Start Date: 26/05/1966 Version End Date: -

ID	Location	Details	
-	1775m SW	Status: Historical Licence No: 2/27/10/118 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: TINKER Easting: 412500 Northing: 406500	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 16/11/1995 Expiry Date: - Issue No: 100 Version Start Date: 16/11/1995 Version End Date: -
-	1775m SW	Status: Historical Licence No: 2/27/10/118 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE - MILLSTONE GRIT - HOLMFIRTH Data Type: Point Name: TINKER Easting: 412500 Northing: 406500	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 16/11/1995 Expiry Date: - Issue No: 100 Version Start Date: 16/11/1995 Version End Date: -
-	1926m S	Status: Historical Licence No: 2/27/10/057A Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL Data Type: Point Name: WALTERS Easting: 413700 Northing: 405900	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 20/01/1966 Version End Date: -
-	1926m S	Status: Historical Licence No: 2/27/10/057A Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL - MILLSTONE GRIT - CARWORTH MOOR HOLMFIRTH Data Type: Point Name: WALTERS Easting: 413700 Northing: 405900	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 20/01/1966 Version End Date: -
-	1966m S	Status: Historical Licence No: 2/27/10/085 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL Data Type: Point Name: TAYLOR Easting: 414500 Northing: 406000	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/04/1966 Version End Date: -

ID	Location	Details	
-	1966m S	Status: Historical Licence No: 2/27/10/085 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL - MILLSTONE GRIT - HADE EDGE HOLMFIRTH Data Type: Point Name: TAYLOR Easting: 414500 Northing: 406000	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/04/1966 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m **16**

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 41**

ID	Location	Details	
-	660m E	Status: Historical Licence No: 2/27/10/082 Details: Process water Direct Source: SURFACE WATER Point: RIVER RIBBLE - TRIBUTARY OF RIVER HOLME-RIBBLEDEN Data Type: Point Name: HOLMFIRTH DYERS LTD Easting: 414500 Northing: 407700	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 102 Version Start Date: 17/04/2002 Version End Date: -
-	660m E	Status: Active Licence No: 2/27/10/082 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: RIVER RIBBLE - TRIBUTARY OF RIVER HOLME-RIBBLEDEN Data Type: Point Name: HOLMFIRTH DYERS LTD Easting: 414500 Northing: 407700	Annual Volume (m^3): 85,000 Max Daily Volume (m^3): 355 Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 103 Version Start Date: 07/01/2015 Version End Date: -

ID	Location	Details	
-	1077m S	Status: Historical Licence No: 2/27/10/053 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: SPRING Data Type: Point Name: WESTWOOD YARNS LTD Easting: 414100 Northing: 406800	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 03/05/1991 Version End Date: -
-	1077m S	Status: Active Licence No: 2/27/10/053 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: SPRING - HOLMFIRTH Data Type: Point Name: WESTWOOD YARNS LTD Easting: 414100 Northing: 406800	Annual Volume (m^3): 9,092 Max Daily Volume (m^3): 45.46 Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
-	1157m SW	Status: Historical Licence No: 2/27/10/079 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: RIVER HOLME Data Type: Point Name: BROOK DYEING CO LTD Easting: 412730 Northing: 407150	Annual Volume (m^3): 250000 Max Daily Volume (m^3): 818 Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 02/07/1982 Version End Date: -
-	1157m SW	Status: Active Licence No: 2/27/10/079 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: RIVER HOLME - HOLMFIRTH Data Type: Point Name: Brook Group (Holdings) Limited Easting: 412730 Northing: 407150	Annual Volume (m^3): 95,000 Max Daily Volume (m^3): 360 Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 102 Version Start Date: 01/03/2021 Version End Date: -

ID	Location	Details	
-	1158m W	Status: Historical Licence No: 2/27/10/062 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: SPRING - BLK.SYKE Data Type: Point Name: ABEL WOODHEAD & SONS (CHEMICALS) LTD Easting: 412500 Northing: 408000	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 27/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 27/01/1966 Version End Date: -
-	1158m W	Status: Historical Licence No: 2/27/10/062 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: SPRING - BLK.SYKE Data Type: Point Name: ABEL WOODHEAD & SONS (CHEMICALS) LTD Easting: 412500 Northing: 408000	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 27/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 27/01/1966 Version End Date: -
-	1158m W	Status: Historical Licence No: 2/27/10/062 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: SPRING - BLK SYKE Data Type: Point Name: ABEL WOODHEAD & SONS (CHEMICALS) LTD Easting: 412500 Northing: 408000	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 27/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 27/01/1966 Version End Date: -
-	1322m SW	Status: Historical Licence No: 2/27/10/003 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: TRIBUTARY OF RIVER HOLMER Data Type: Point Name: BUTTERWORTH & ROBERTS LTD Easting: 412500 Northing: 407200	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 01/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 17/04/1975 Version End Date: -

ID	Location	Details	
-	1322m SW	Status: Historical Licence No: 2/27/10/003 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: TRIBUTARY OF RIVER HOLME Data Type: Point Name: MOXON HUDDERSFIELD Easting: 412500 Northing: 407200	Annual Volume (m^3): 40000 Max Daily Volume (m^3): 174 Original Application No: - Original Start Date: 01/12/1965 Expiry Date: - Issue No: 102 Version Start Date: 05/06/2003 Version End Date: -
-	1322m SW	Status: Historical Licence No: 2/27/10/003 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: TRIBUTARY OF RIVER HOLME - HOLMEBRIDGE Data Type: Point Name: MOXON (HUDDERSFIELD) LTD Easting: 412500 Northing: 407200	Annual Volume (m^3): 40000 Max Daily Volume (m^3): 174 Original Application No: - Original Start Date: 01/12/1965 Expiry Date: - Issue No: 102 Version Start Date: 05/06/2003 Version End Date: -
-	1366m S	Status: Historical Licence No: 2/27/10/052 Details: General Use Relating To Secondary Category (Low Loss) Direct Source: SURFACE WATER Point: RIVER RIBBLE - TRIBUTARY OF RIVER HOLME - HOLMFIRTH Data Type: Point Name: WESTWOOD YARNS LTD Easting: 414100 Northing: 406500	Annual Volume (m^3): 295496 Max Daily Volume (m^3): 1130 Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 101 Version Start Date: 12/10/2006 Version End Date: -
-	1366m S	Status: Historical Licence No: 2/27/10/052 Details: Process Water Direct Source: SURFACE WATER Point: RIVER RIBBLE - TRIBUTARY OF RIVER HOLME - HOLMFIRTH Data Type: Point Name: WESTWOOD YARNS LTD Easting: 414100 Northing: 406500	Annual Volume (m^3): 295496 Max Daily Volume (m^3): 1130 Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 101 Version Start Date: 12/10/2006 Version End Date: -

ID	Location	Details	
-	1366m SW	Status: Historical Licence No: 2/27/10/003 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: TRIBUTARY OF RIVER HOLME - HOLMEBRIDGE Data Type: Point Name: MOXON (HUDDERSFIELD) LTD Easting: 412447 Northing: 407203	Annual Volume (m^3): 40,000 Max Daily Volume (m^3): 174 Original Application No: - Original Start Date: 01/12/1965 Expiry Date: - Issue No: 103 Version Start Date: 09/10/2014 Version End Date: -
-	1432m SW	Status: Historical Licence No: 2/27/10/081 Details: General Farming & Domestic Direct Source: SURFACE WATER Point: DRIFT IN FIELD Data Type: Point Name: HORN Easting: 412800 Northing: 406700	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/04/1966 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m	0

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

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

5.9 Source Protection Zones

Records within 500m	0

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

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

5.10 Source Protection Zones (confined aquifer)

Records within 500m	0

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

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

6 Hydrology

Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	3

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

Features are displayed on the Hydrology map on **page 52**

ID	Location	Type of water feature	Ground level	Permanence	Name
1	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Holme

ID	Location	Type of water feature	Ground level	Permanence	Name
A	**On site**	**Inland river not influenced by normal tidal action.**	**On ground surface**	**Watercourse contains water year round (in normal circumstances)**	**-**
3	2m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Holme

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	4

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

Features are displayed on the Hydrology map on **page 52**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1

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

Features are displayed on the Hydrology map on **page 52**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	**On site**	**River**	**Holme from Source to New Mill Dike**	**GB104027057600**	**Colne and Holme**	**Aire and Calder**

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

6.4 WFD Surface water bodies

Records identified	1

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

Features are displayed on the Hydrology map on **page 52**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
2	**On site**	**River**	**Holme from Source to New Mill Dike**	**GB104027057600**	**Moderate**	**Fail**	**Moderate**	**2019**

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

6.5 WFD Groundwater bodies

Records on site	1

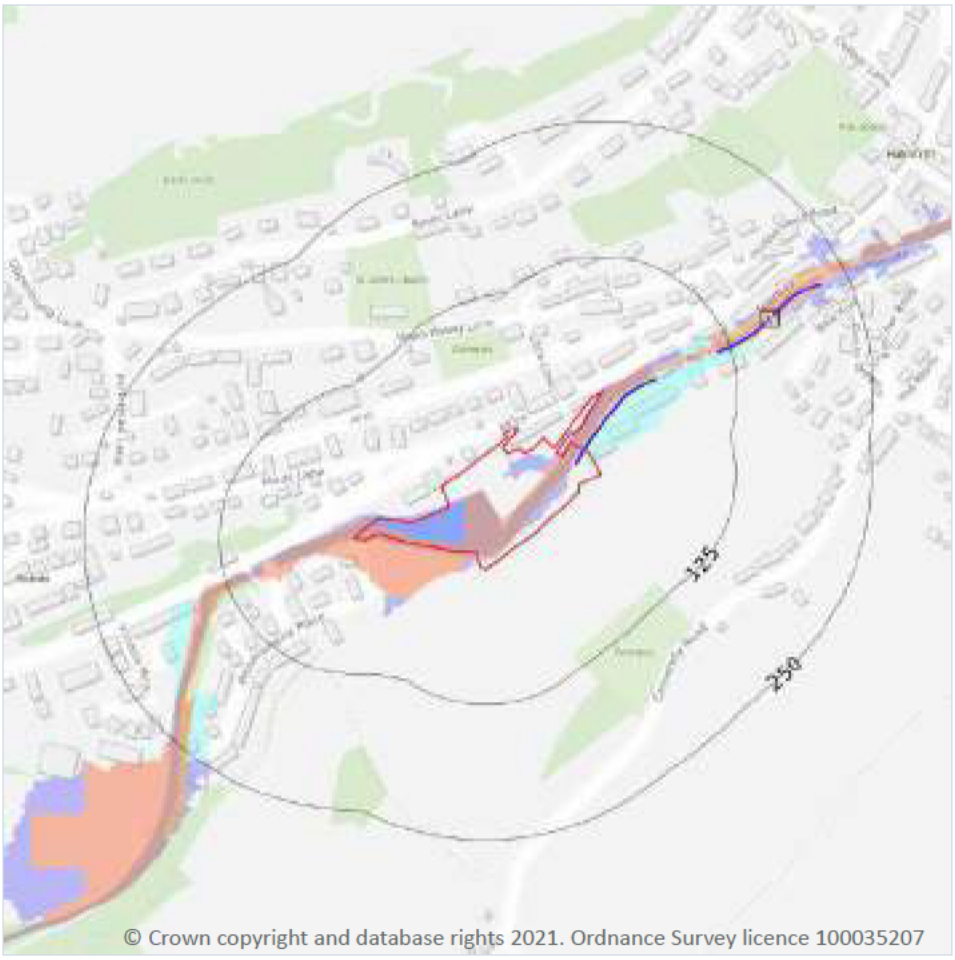
Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 52**

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

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

7 River and coastal flooding



Site Outline

Search buffers in metres (m)

River and coastal flooding:

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

7.1 Risk of flooding from rivers and the sea

Records within 50m	20

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

Features are displayed on the River and coastal flooding map on **page 55**

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

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

7.2 Historical Flood Events

Records within 250m	0

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

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

7.3 Flood Defences

Records within 250m	2

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

Features are displayed on the River and coastal flooding map on **page 55**

ID	Location	Update
B	**On site**	**01/09/2021**
E	113m E	01/09/2021

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

7.4 Areas Benefiting from Flood Defences

Records within 250m	0

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

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

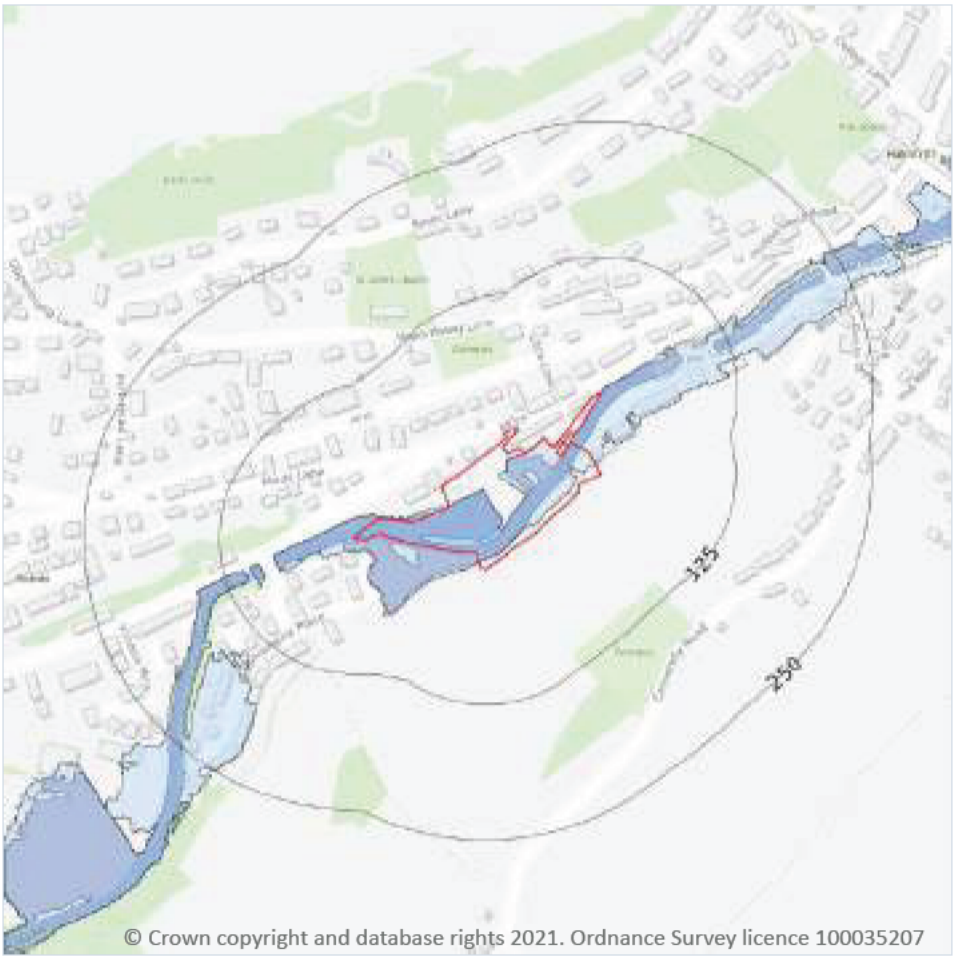
7.5 Flood Storage Areas

Records within 250m	0

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

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

River and coastal flooding - Flood Zones



Site Outline

Search buffers in metres (m)

Flood zone 2

Flood zone 3

7.6 Flood Zone 2

Records within 50m	1

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

Features are displayed on the River and coastal flooding map on **page 55**

Location	Type
On site	**Zone 2 - (Fluvial /Tidal Models)**

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

7.7 Flood Zone 3

Records within 50m	1

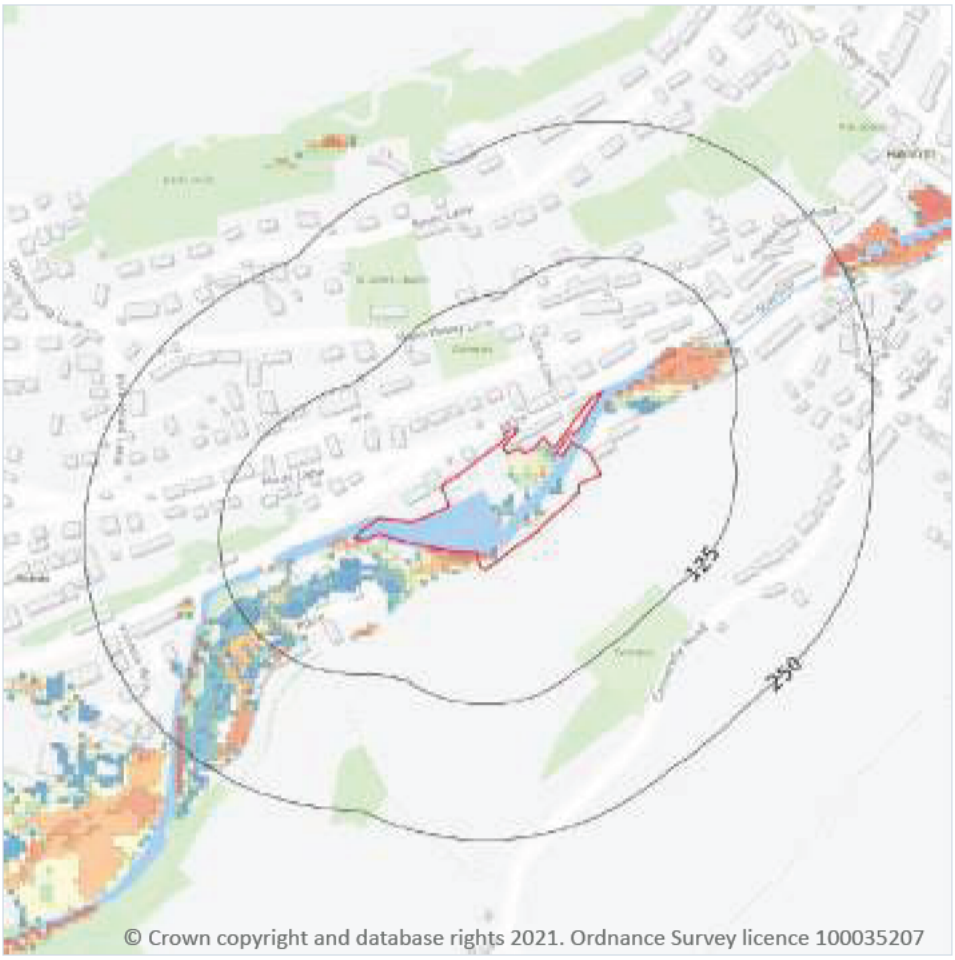
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on **page 55**

Location	Type
On site	**Zone 3 - (Fluvial Models)**

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

8 Surface water flooding



Site Outline
Search buffers in metres (m)

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

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

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

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

8.1 Surface water flooding

Highest risk on site	**1 in 30 year, Greater than 1.0m**
Highest risk within 50m	**1 in 30 year, Greater than 1.0m**

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

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

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

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

Return period	Maximum modelled depth
1 in 1000 year	Greater than 1.0m
1 in 250 year	Greater than 1.0m
1 in 100 year	Greater than 1.0m
1 in 30 year	Greater than 1.0m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding

9.1 Groundwater flooding

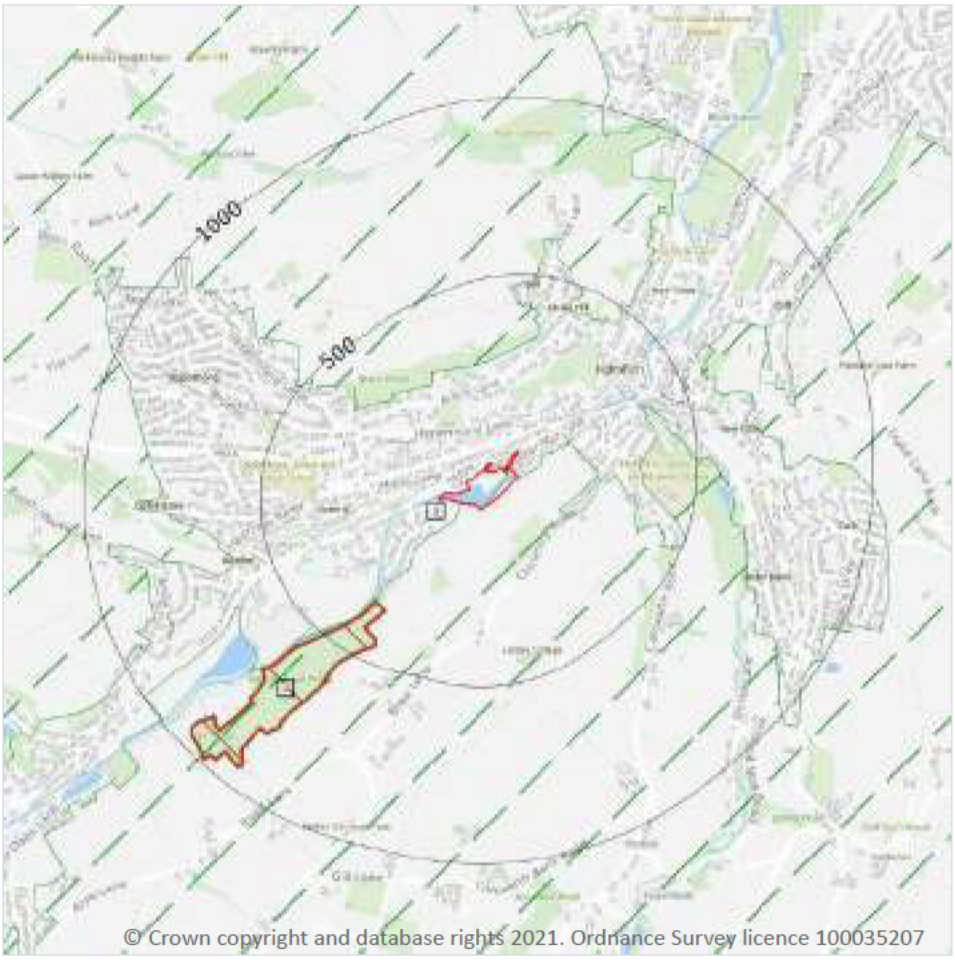
Highest risk on site	**Negligible**
Highest risk within 50m	**Negligible**

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

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

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Designated Ancient Woodland

Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	0

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

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

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0

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

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0

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

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

10.4 Special Protection Areas (SPA)

Records within 2000m	0

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

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

10.5 National Nature Reserves (NNR)

Records within 2000m	0

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

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

10.6 Local Nature Reserves (LNR)

Records within 2000m	0

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

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

10.7 Designated Ancient Woodland

Records within 2000m	2

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

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

ID	Location	Name	Woodland Type
2	339m SW	Malkin House Wood	Ancient Replanted Woodland
-	1935m N	Holmroyd Wood	Ancient & Semi-Natural Woodland

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

10.8 Biosphere Reserves

Records within 2000m	0

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

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

10.9 Forest Parks

Records within 2000m	0

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

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

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

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

10.11 Green Belt

Records within 2000m	1

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

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

ID	Location	Name	Local Authority name
1	**On site**	**South and West Yorkshire**	**Kirklees**

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

10.12 Proposed Ramsar sites

Records within 2000m	0

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

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

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

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

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

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

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

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

This data is sourced from Natural England.

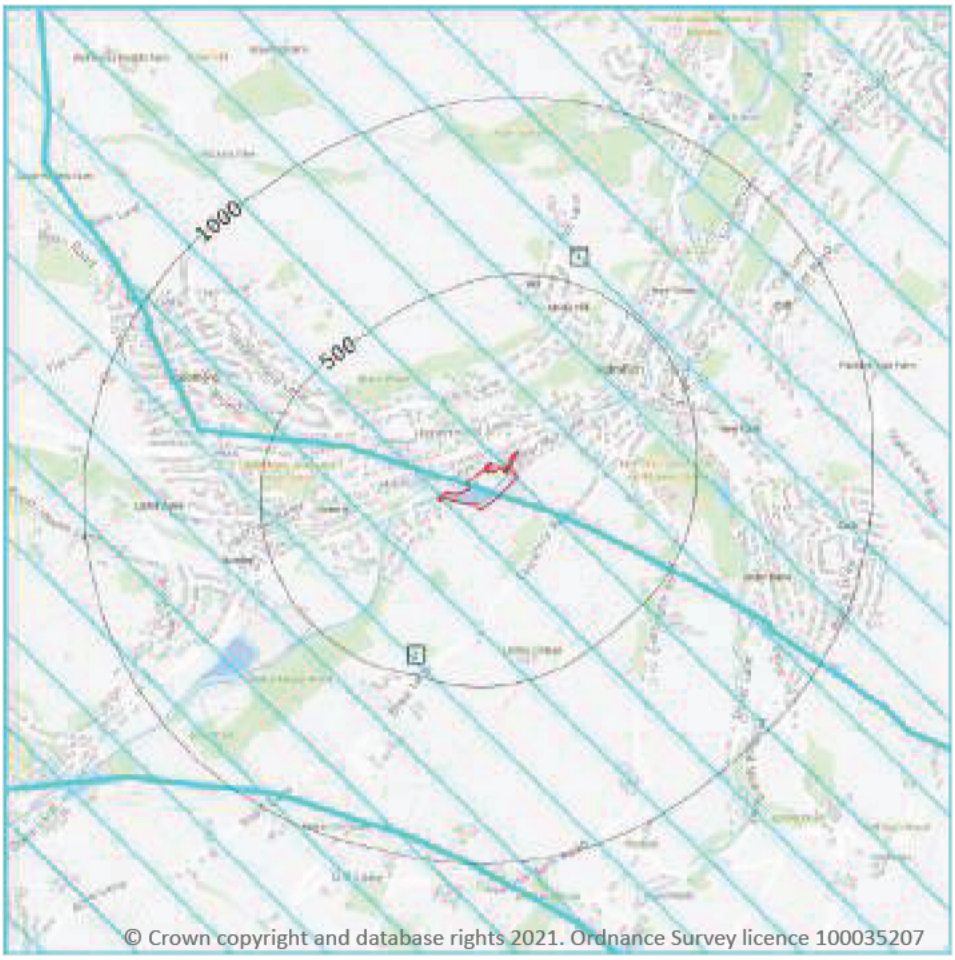
10.16 Nitrate Vulnerable Zones

Records within 2000m	0

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

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

SSSI Impact Zones and Units



Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

Not recorded

Favourable

Unfavourable - Recovering

Unfavourable - No change

Unfavourable - Declining

Partially destroyed

Destroyed

10.17 SSSI Impact Risk Zones

Records on site	2

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

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

ID	Location	Type of developments requiring consultation
1	On site	**Infrastructure - Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Oil & gas exploration/extraction. Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t). Combustion - General combustion processes >50mw energy input. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.**
2	On site	**Infrastructure - Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction. Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t). Combustion - General combustion processes >50mw energy input. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.**

This data is sourced from Natural England.

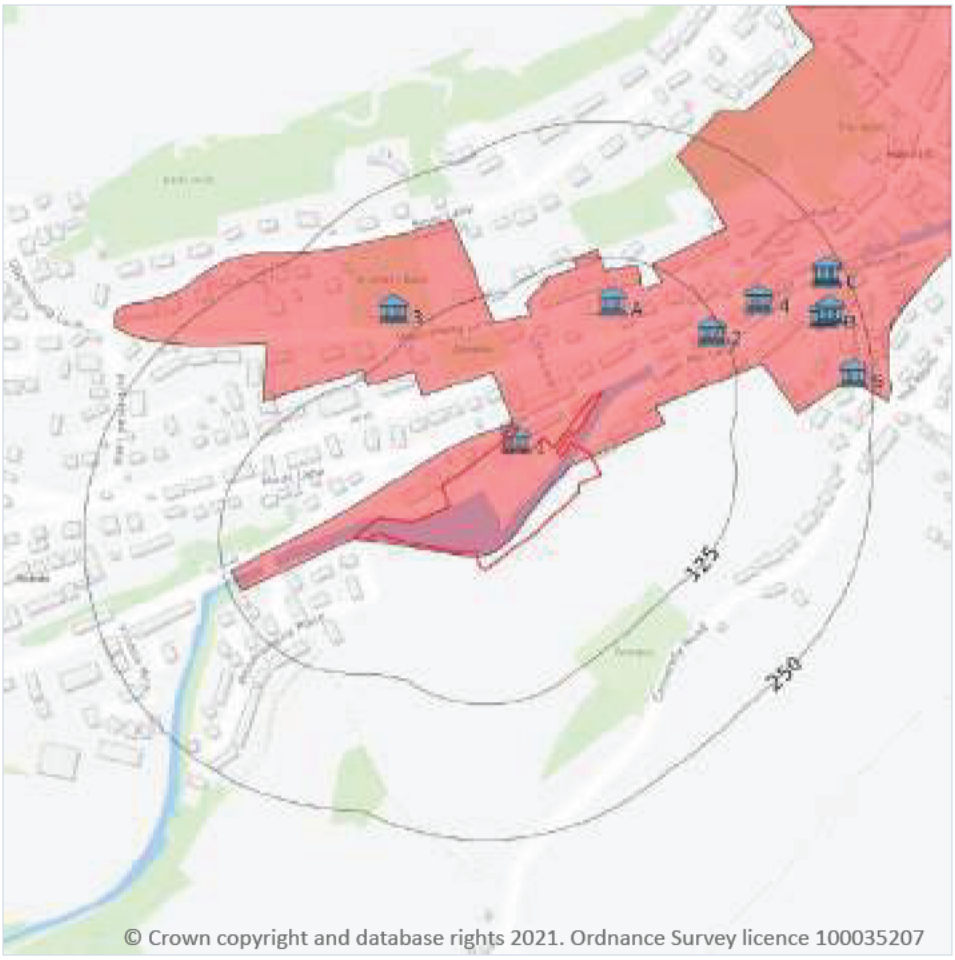
10.18 SSSI Units

Records within 2000m	0

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

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

11 Visual and cultural designations



Site Outline

Search buffers in metres (m)

Listed buildings

Conservation areas

Conservation areas - no data

National Parks

Areas of Outstanding Natural Beauty

Registered parks and gardens

Scheduled Monuments

World Heritage Sites

11.1 World Heritage Sites

Records within 250m	0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

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

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

11.3 National Parks

Records within 250m	0

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

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

11.4 Listed Buildings

Records within 250m	10

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

Features are displayed on the Visual and cultural designations map on **page 70**

ID	Location	Name	Grade	Reference Number	Listed date
1	4m SE	25, 27, Woodhead Road, Holme Valley, Kirklees, HD9	II	1134745	04/08/1983
A	85m N	11, 13, Upperthong Lane, Holme Valley, Kirklees, HD9	II	1134764	04/08/1983
2	116m NE	1, 3, 5, 7, 9, Woodhead Road, Holme Valley, Kirklees, HD9	II	1229721	04/08/1983
3	153m NW	Church Of St John, Holme Valley, Kirklees, HD9	II	1229162	04/08/1983
4	169m NE	10, 12, 14, Huddersfield Road, Holme Valley, Kirklees, HD9	II	1134847	04/08/1983
B	217m E	13, New Fold, Holme Valley, Kirklees, HD9	II	1228273	04/08/1983

ID	Location	Name	Grade	Reference Number	Listed date
B	223m E	12, New Fold, Holme Valley, Kirklees, HD9	II	1134830	04/08/1983
5	233m E	Troughs Opposite No29, Holme Valley, Kirklees, HD9	II	1134868	04/08/1983
C	234m NE	Hollowgate Bridge, Holme Valley, Kirklees, HD9	II	1134885	04/08/1983
C	236m NE	Mile Post, Hollowgate Bridge, Holme Valley, Kirklees, HD9	II	1227749	04/08/1983

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

11.5 Conservation Areas

Records within 250m	1

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

Features are displayed on the Visual and cultural designations map on **page 70**

ID	Location	Name	District	Date of designation
A	**On site**	**Holmfirth**	**Kirklees**	**05/06/1972**

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

11.6 Scheduled Ancient Monuments

Records within 250m	0

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

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

11.7 Registered Parks and Gardens

Records within 250m	0

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

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

12 Agricultural designations

Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m	2

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

Features are displayed on the Agricultural designations map on **page 74**

ID	Location	Classification	Description
1	On site	Grade 4	**Poor quality agricultural land. Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.**

ID	Location	Classification	Description
2	On site	Urban	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0

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

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

12.3 Tree Felling Licences

Records within 250m	0

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

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0

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

This data is sourced from Natural England.

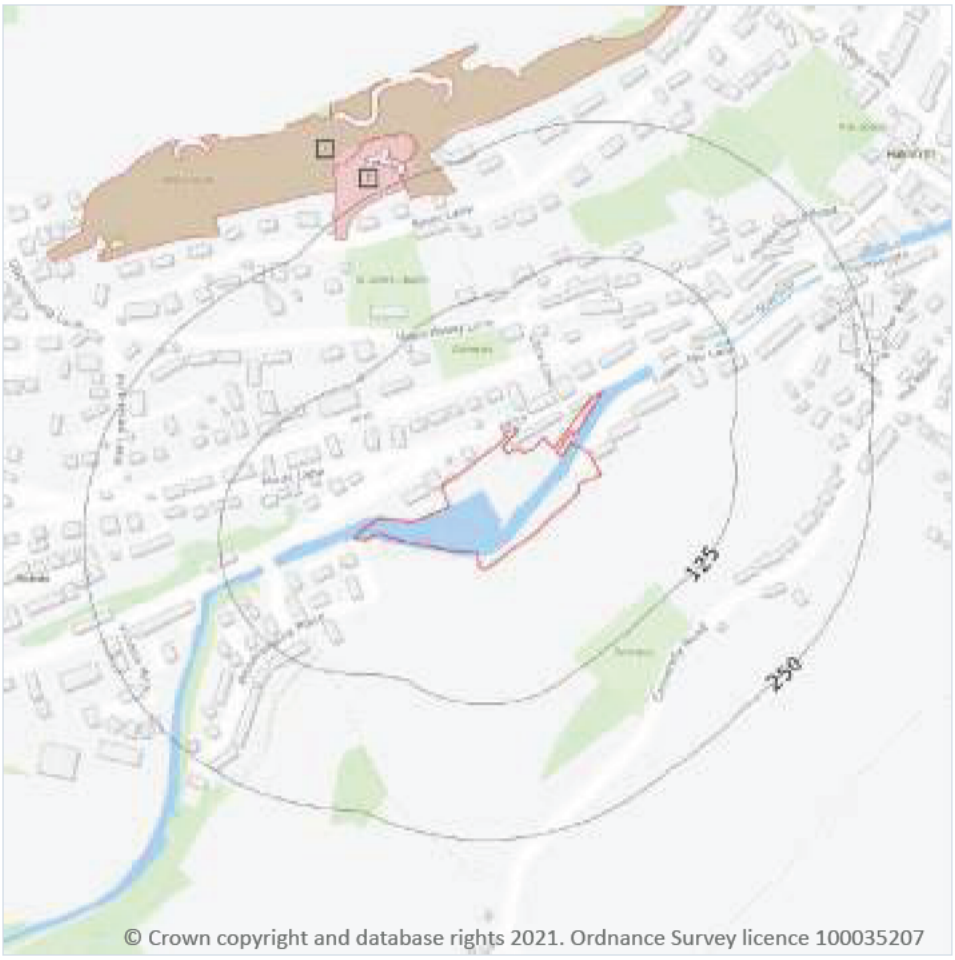
12.5 Countryside Stewardship Schemes

Records within 250m	0

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

This data is sourced from Natural England.

13 Habitat designations



Site Outline

Search buffers in metres (m)

Priority Habitat Inventory
Open Mosaic Habitat
Limestone Pavement Orders

Habitat Networks
Primary Habitat
Restorable Habitat
Associated Habitats
Habitat Restoration-Creation
Network Enhancement Zone 1
Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m	2

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

Features are displayed on the Habitat designations map on **page 76**

ID	Location	Main Habitat	Other habitats
1	225m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	230m NW	No main habitat but additional habitats present	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

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

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

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

This data is sourced from Natural England.

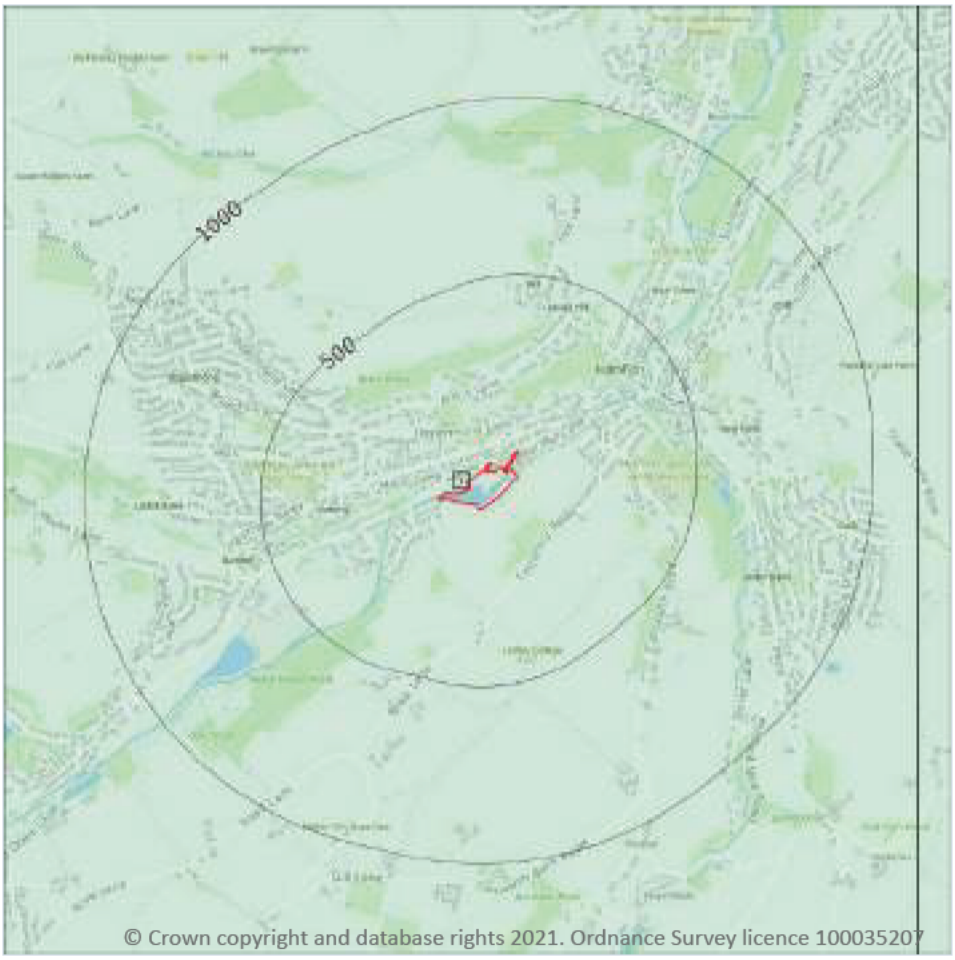
13.4 Limestone Pavement Orders

Records within 250m	0

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

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability



Site Outline

Search buffers in metres (m)

Full coverage

Partial coverage

No coverage

14.1 10k Availability

Records within 500m	1

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

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 78**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	SE10NW

This data is sourced from the British Geological Survey.

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

Site Outline

Search buffers in metres (m)

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

14.2 Artificial and made ground (10k)

Records within 500m	5

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

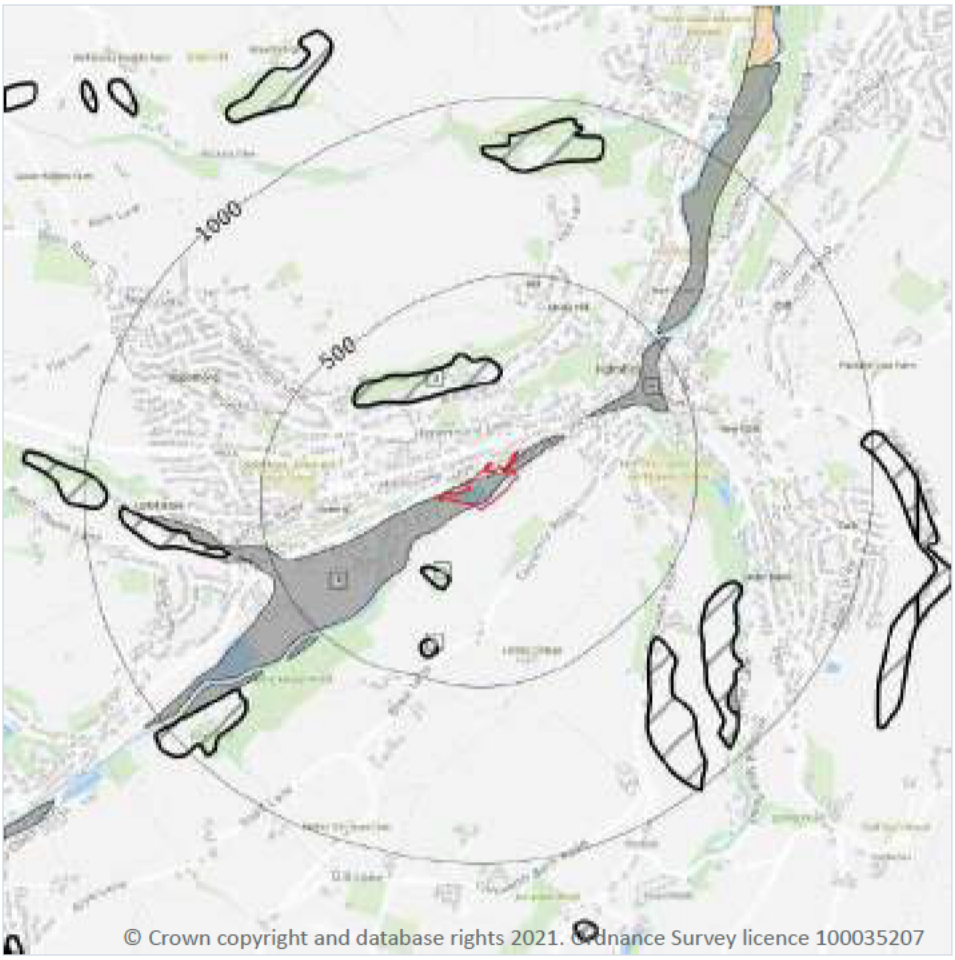
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 79**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**MGR-ARTDP**	**Made Ground (Undivided)**	**Artificial Deposit**
2	224m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3	282m NW	WGR-VOID	Worked Ground (Undivided)	Void
A	393m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
A	401m SE	WGR-VOID	Worked Ground (Undivided)	Void

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

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

14.3 Superficial geology (10k)

Records within 500m	2

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

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 81**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**ALV-CZ**	**Alluvium - Silty Clay**	**Clay, Silty**
4	212m NE	ALV-CZ	Alluvium - Silty Clay	Clay, Silty

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m	3

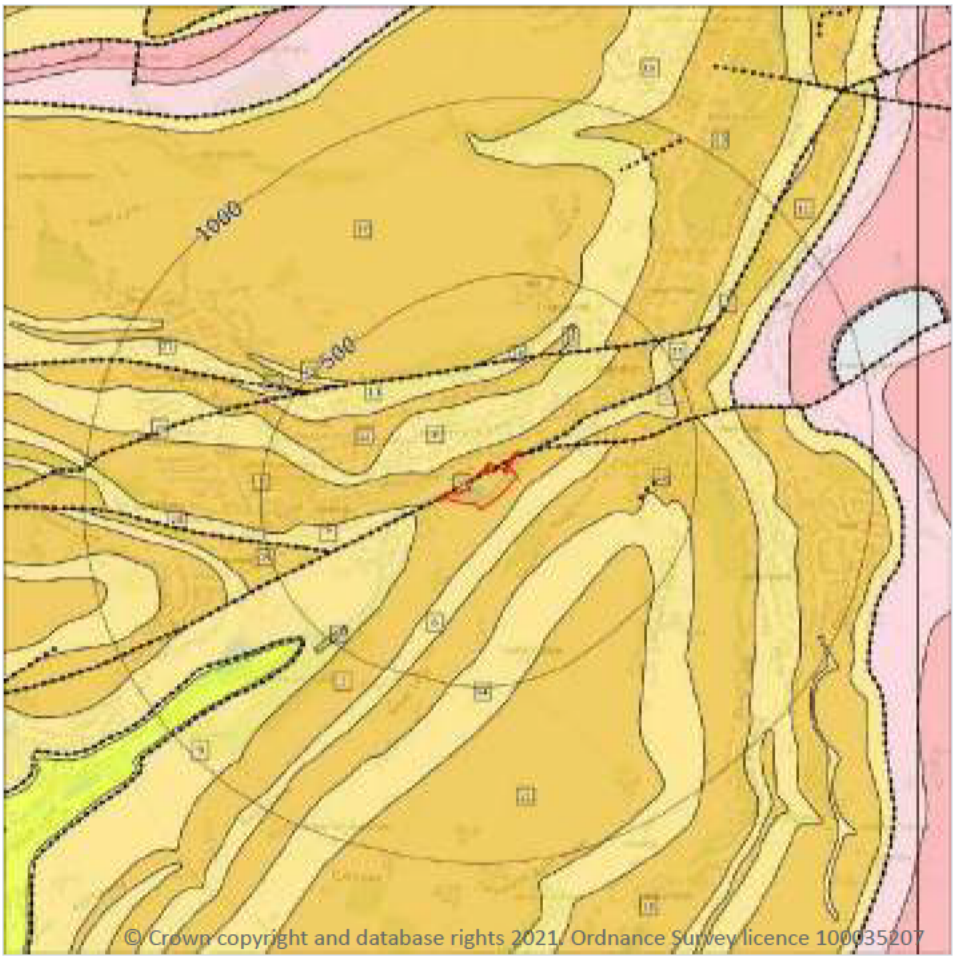
Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 81**

ID	Location	LEX Code	Description	Rock description
2	192m S	SLIP-UKNOWN	Landslide Deposits	Unknown/unclassified Entry
3	211m N	SLIP-UKNOWN	Landslide Deposits	Unknown/unclassified Entry
5	394m S	SLIP-UKNOWN	Landslide Deposits	Unknown/unclassified Entry

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

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

14.5 Bedrock geology (10k)

Records within 500m	23

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

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 83**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**RDG-SDST**	**Readycon Dean Flags - Sandstone**	**Marsdenian Sub-age**
3	**On site**	**MGG-SDST**	**Midgley Grit - Sandstone**	**Marsdenian Sub-age**
5	23m E	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age

ID	Location	LEX Code	Description	Rock age
6	36m SE	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
7	40m SW	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
8	43m N	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
9	81m SW	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
10	111m SE	MGG-SDST	Midgley Grit - Sandstone	Marsdenian Sub-age
11	156m E	HDW-SDST	Huddersfield White Rock - Sandstone	Marsdenian Sub-age
12	166m N	GSYG-SDST	Guiseley Grit - Sandstone	Marsdenian Sub-age
13	219m N	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
14	219m SE	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
15	259m N	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
17	271m NW	HDW-SDST	Huddersfield White Rock - Sandstone	Marsdenian Sub-age
18	275m N	HDW-SDST	Huddersfield White Rock - Sandstone	Marsdenian Sub-age
19	335m SW	RDG-SDST	Readycon Dean Flags - Sandstone	Marsdenian Sub-age
21	346m SE	HDW-SDST	Huddersfield White Rock - Sandstone	Marsdenian Sub-age
23	378m NE	GSYG-SDST	Guiseley Grit - Sandstone	Marsdenian Sub-age
24	381m NW	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
25	401m NE	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
26	446m SW	RDG-SDST	Readycon Dean Flags - Sandstone	Marsdenian Sub-age
27	473m NW	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age
30	481m NW	MARSD-MDSI	Marsden Formation - Mudstone And Siltstone	Marsdenian Sub-age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	7

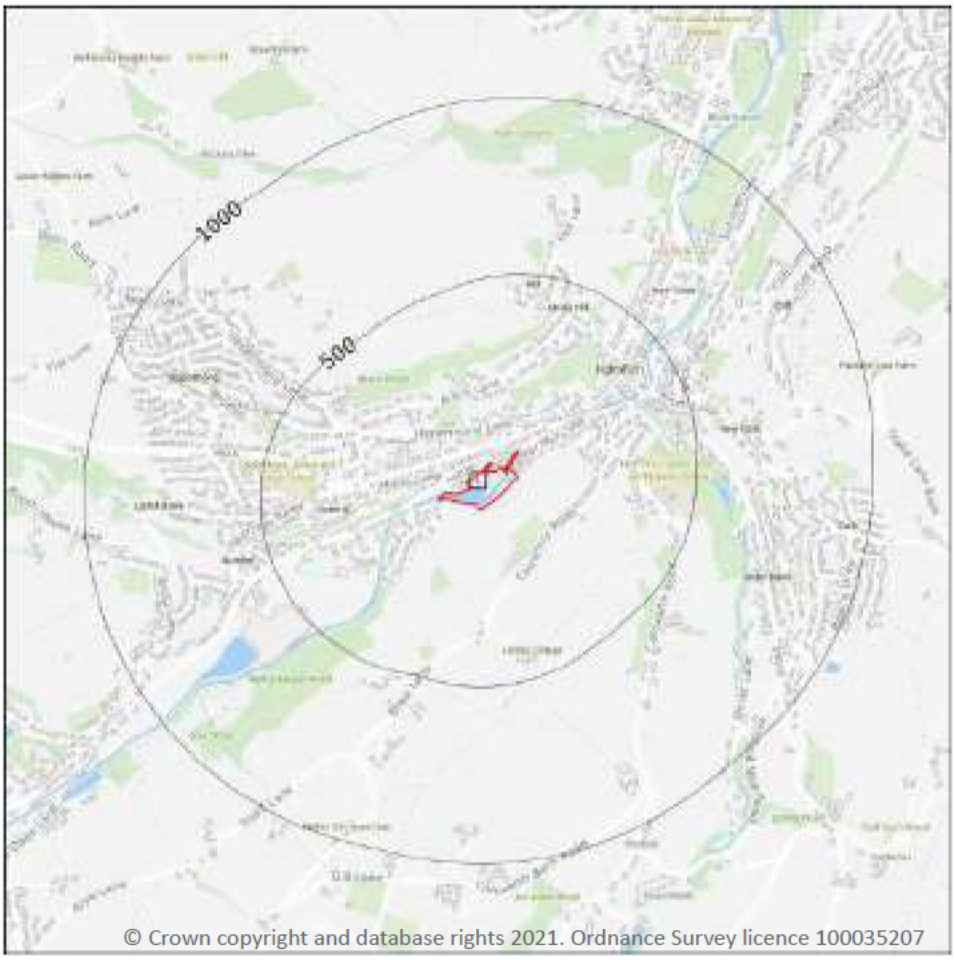
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 83**

ID	Location	Category	Description
2	**On site**	**FAULT**	**Normal fault, inferred; crossmarks on downthrow side**
4	23m E	FAULT	Normal fault, inferred; crossmarks on downthrow side
16	259m N	FAULT	Normal fault, inferred; crossmarks on downthrow side
20	335m SW	FAULT	Normal fault, inferred; crossmarks on downthrow side
22	349m E	ROCK	Coal seam, inferred ()
28	481m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side
29	481m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	1

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

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 86**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW086_glossop_v4

This data is sourced from the British Geological Survey.

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

Site Outline

Search buffers in metres (m)

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

15.2 Artificial and made ground (50k)

Records within 500m	1

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

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 87**

ID	Location	LEX Code	Description	Rock description
1	392m SE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

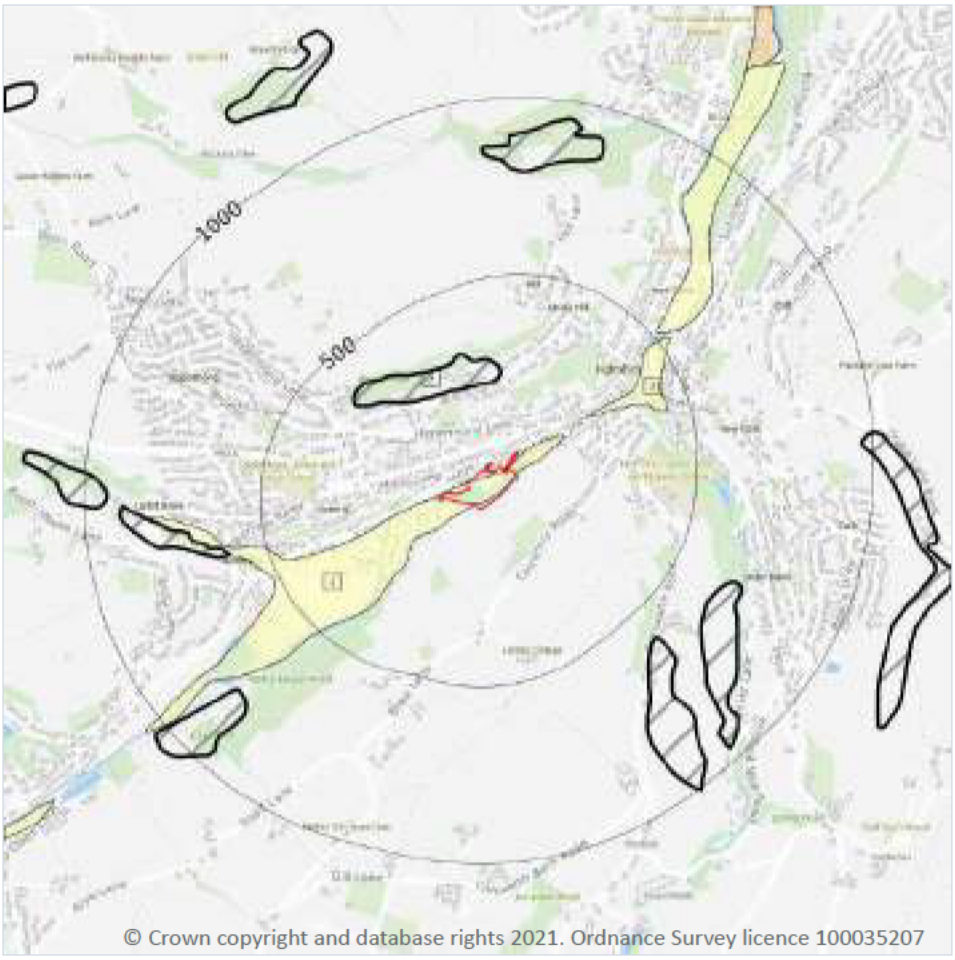
15.3 Artificial ground permeability (50k)

Records within 50m	0

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

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

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

15.4 Superficial geology (50k)

Records within 500m	2

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 89**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**ALV-XCZ**	**ALLUVIUM**	**CLAY AND SILT**
3	211m NE	ALV-XCZ	ALLUVIUM	CLAY AND SILT

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	1

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

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Intergranular**	**Low**	**Very Low**

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	1

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 89**

ID	Location	LEX Code	Description	Rock description
2	211m N	SLIP-UKNOWN	LANDSLIDE DEPOSITS	UNKNOWN/UNCLASSIFIED ENTRY

This data is sourced from the British Geological Survey.

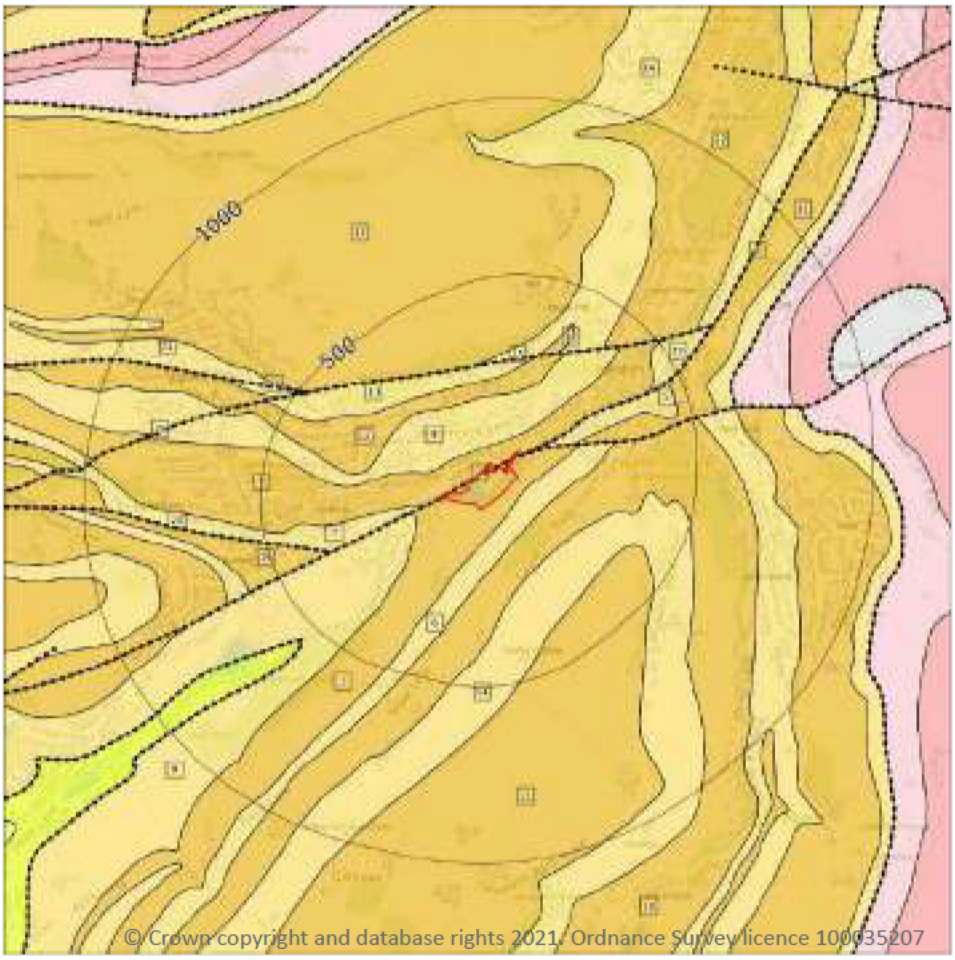
15.7 Landslip permeability (50k)

Records within 50m	0

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

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

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

15.8 Bedrock geology (50k)

Records within 500m	21

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

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 91**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**RDG-SDST**	**READYCON DEAN FLAGS - SANDSTONE**	**NAMURIAN**
3	**On site**	**MGG-SDST**	**MIDGLEY GRIT - SANDSTONE**	**NAMURIAN**
5	23m E	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN

ID	Location	LEX Code	Description	Rock age
6	35m SE	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
7	40m SW	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
8	44m N	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
9	81m SW	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
10	111m SE	MGG-SDST	MIDGLEY GRIT - SANDSTONE	NAMURIAN
11	155m E	HDW-SDST	HUDDERSFIELD WHITE ROCK - SANDSTONE	NAMURIAN
12	166m N	GSYG-SDST	GUISELEY GRIT - SANDSTONE	NAMURIAN
13	219m N	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
14	219m SE	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
16	260m N	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
17	271m NW	HDW-SDST	HUDDERSFIELD WHITE ROCK - SANDSTONE	NAMURIAN
18	275m N	HDW-SDST	HUDDERSFIELD WHITE ROCK - SANDSTONE	NAMURIAN
19	335m SW	RDG-SDST	READYCON DEAN FLAGS - SANDSTONE	NAMURIAN
21	346m SE	HDW-SDST	HUDDERSFIELD WHITE ROCK - SANDSTONE	NAMURIAN
22	378m NE	GSYG-SDST	GUISELEY GRIT - SANDSTONE	NAMURIAN
23	402m NE	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
24	472m NW	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
27	481m NW	MARSD-MDSI	MARSDEN FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	5

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

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Fracture**	**High**	**Moderate**
On site	**Fracture**	**High**	**Moderate**
23m NW	Fracture	Low	Low
35m S	Fracture	Low	Low
40m SW	Fracture	Low	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	6

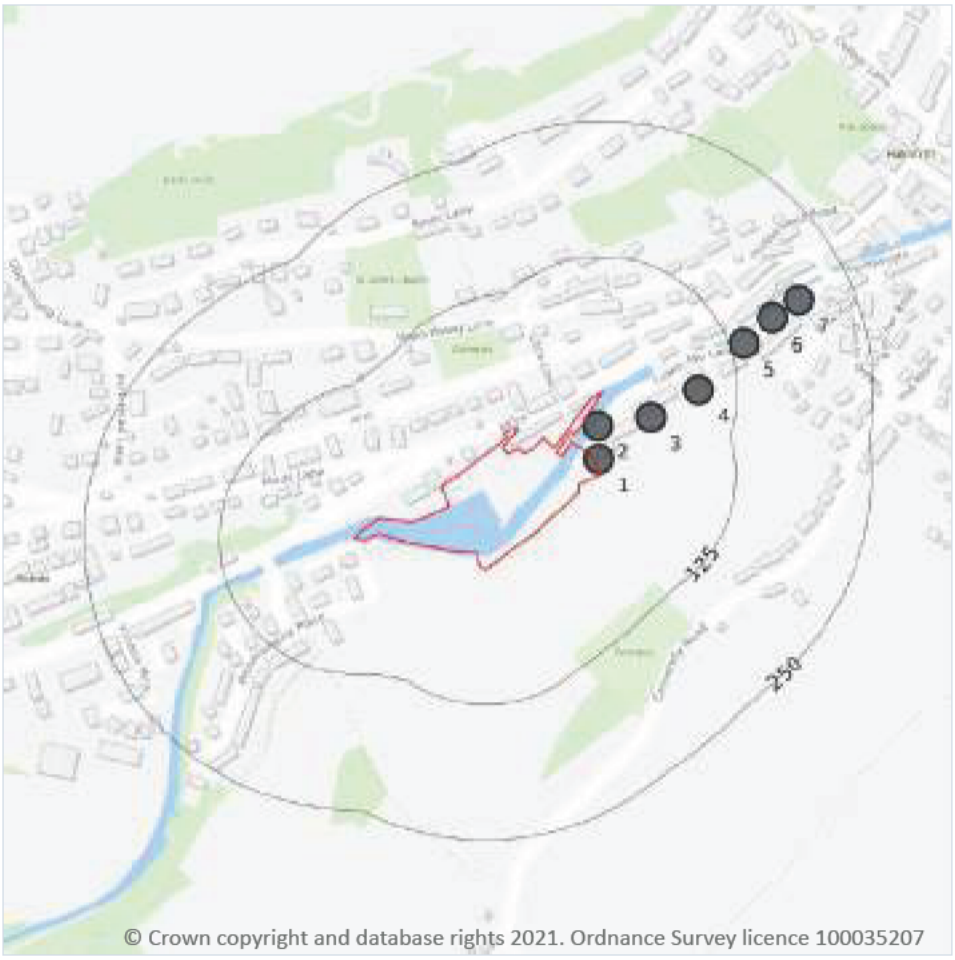
Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 91**

ID	Location	Category	Description
2	**On site**	**FAULT**	**Fault, inferred**
4	23m E	FAULT	Fault, inferred
15	260m N	FAULT	Fault, inferred
20	335m SW	FAULT	Fault, inferred
25	481m NW	FAULT	Fault, inferred
26	481m NW	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.

16 Boreholes



Site Outline

Search buffers in metres (m)

Confidential

0 - 10m

10 - 30m

30m+

Unknown

16.1 BGS Boreholes

Records within 250m	7

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

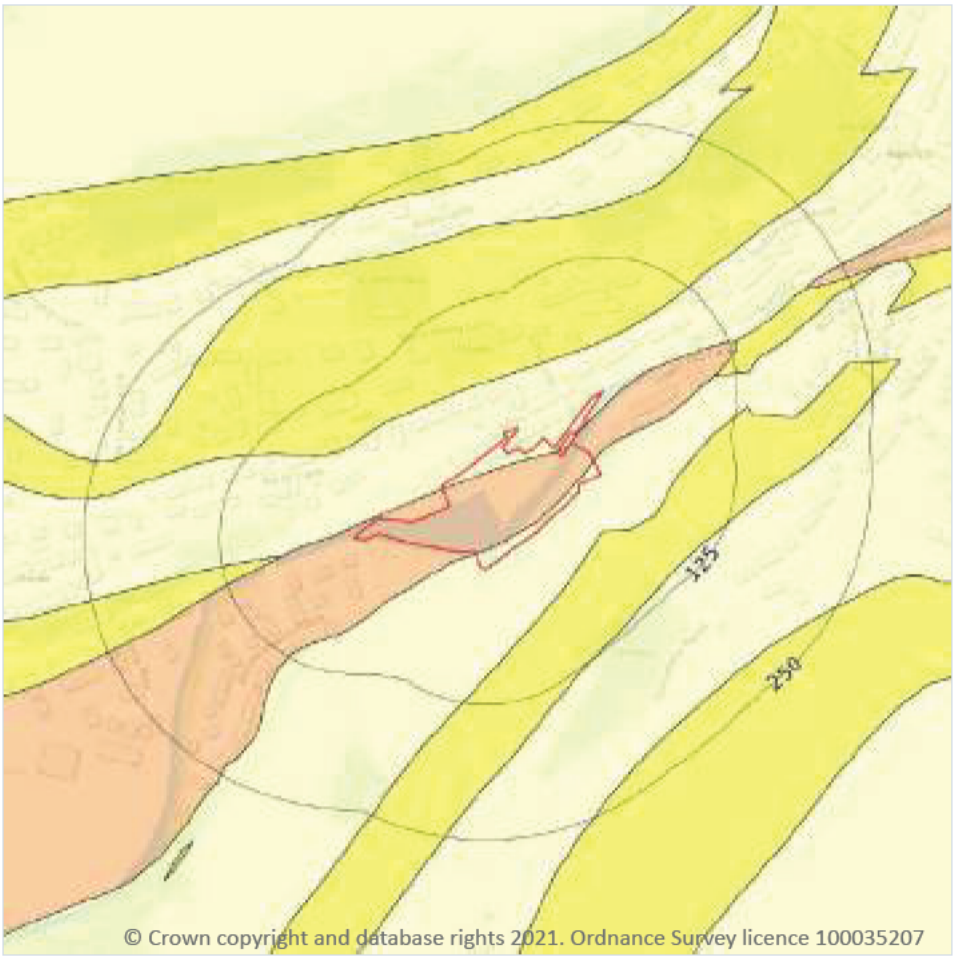
Features are displayed on the Boreholes map on **page 94**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	5m NE	413874 407927	HOMFIRTH HUDDERSFIELD 8	-	Y	N/A
2	12m E	413873 407958	HOMFIRTH HUDDERSFIELD 9	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
3	50m SE	413922 407966	HOMFIRTH HUDDERSFIELD 7	-	Y	N/A
4	89m E	413966 407991	HOMFIRTH HUDDERSFIELD 6	-	Y	N/A
5	139m E	414008 408034	HOMFIRTH HUDDERSFIELD 3	-	Y	N/A
6	171m NE	414034 408057	HOMFIRTH HUDDERSFIELD 2	-	Y	N/A
7	200m NE	414058 408074	HOMFIRTH HUDDERSFIELD 1	-	Y	N/A

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



Site Outline

Search buffers in metres (m)

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

17.1 Shrink swell clays

Records within 50m	3

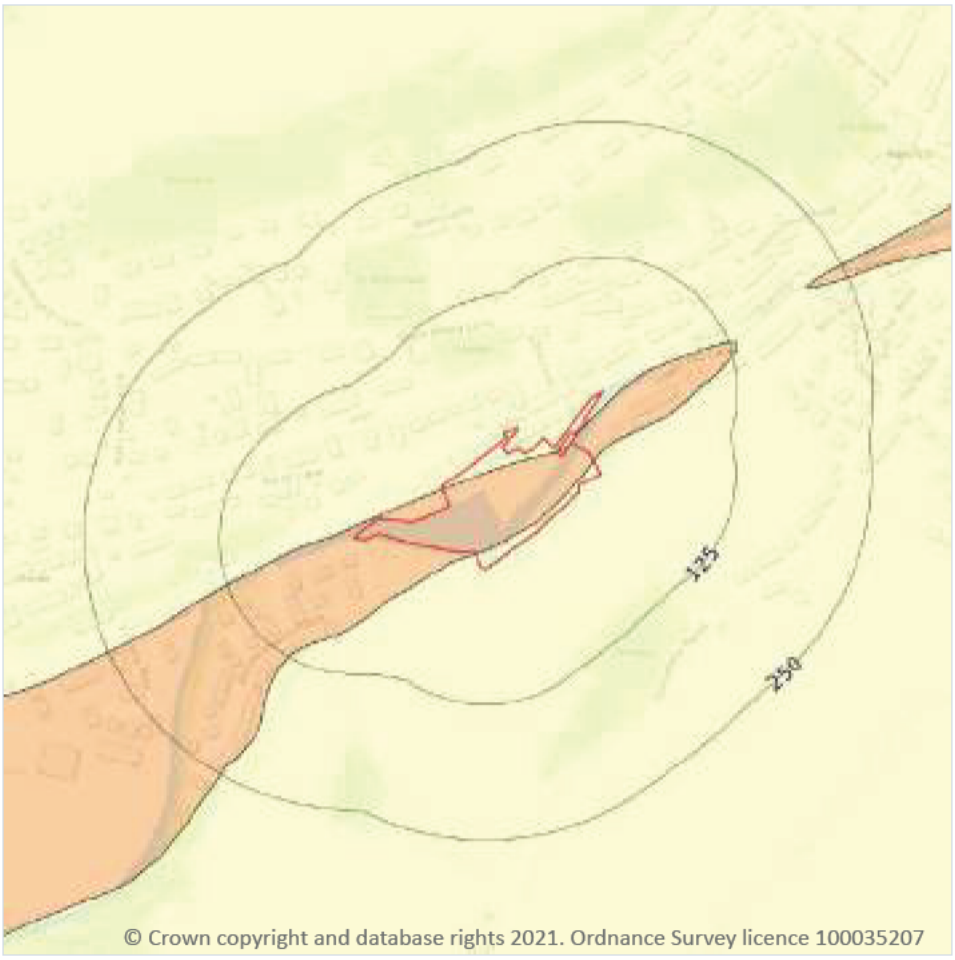
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 96**

Location	Hazard rating	Details
On site	**Negligible**	**Ground conditions predominantly non-plastic.**
On site	**Low**	**Ground conditions predominantly medium plasticity.**
41m SE	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

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

17.2 Running sands

Records within 50m	2

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

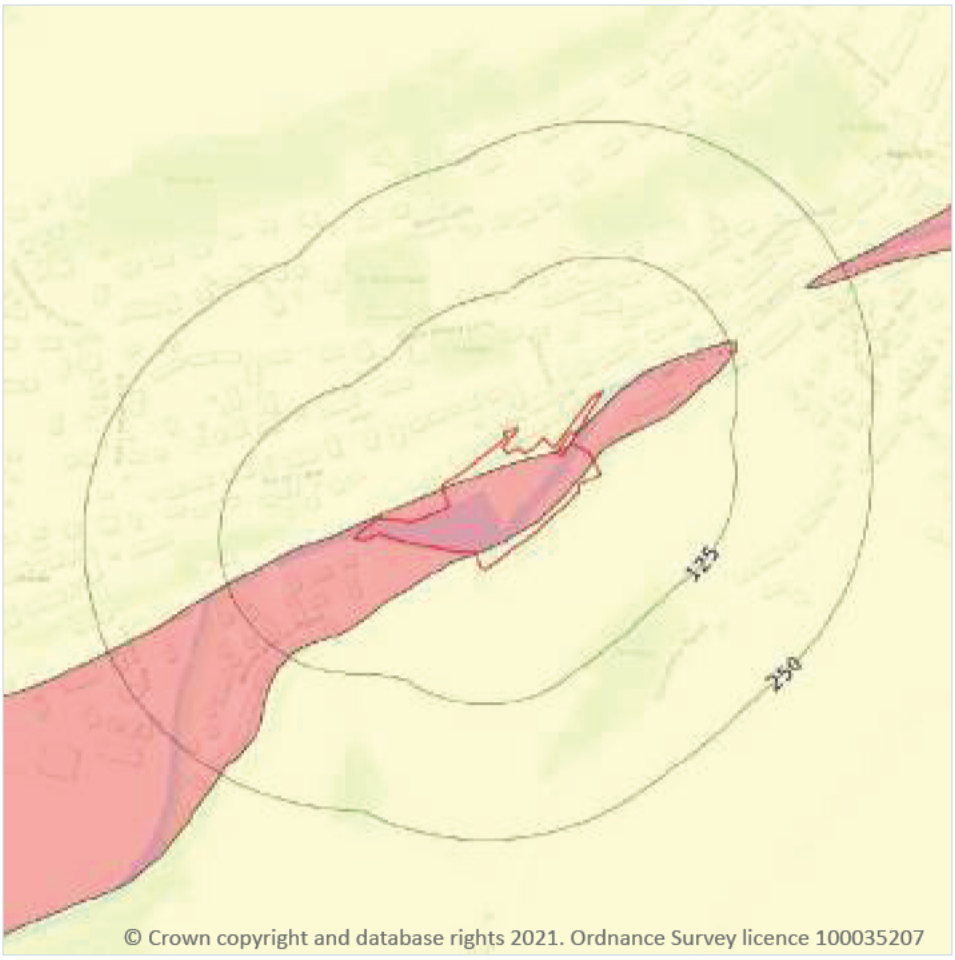
Features are displayed on the Natural ground subsidence - Running sands map on **page 98**

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

Location	Hazard rating	Details
On site	**Low**	**Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



Site Outline

Search buffers in metres (m)

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

17.3 Compressible deposits

Records within 50m	2

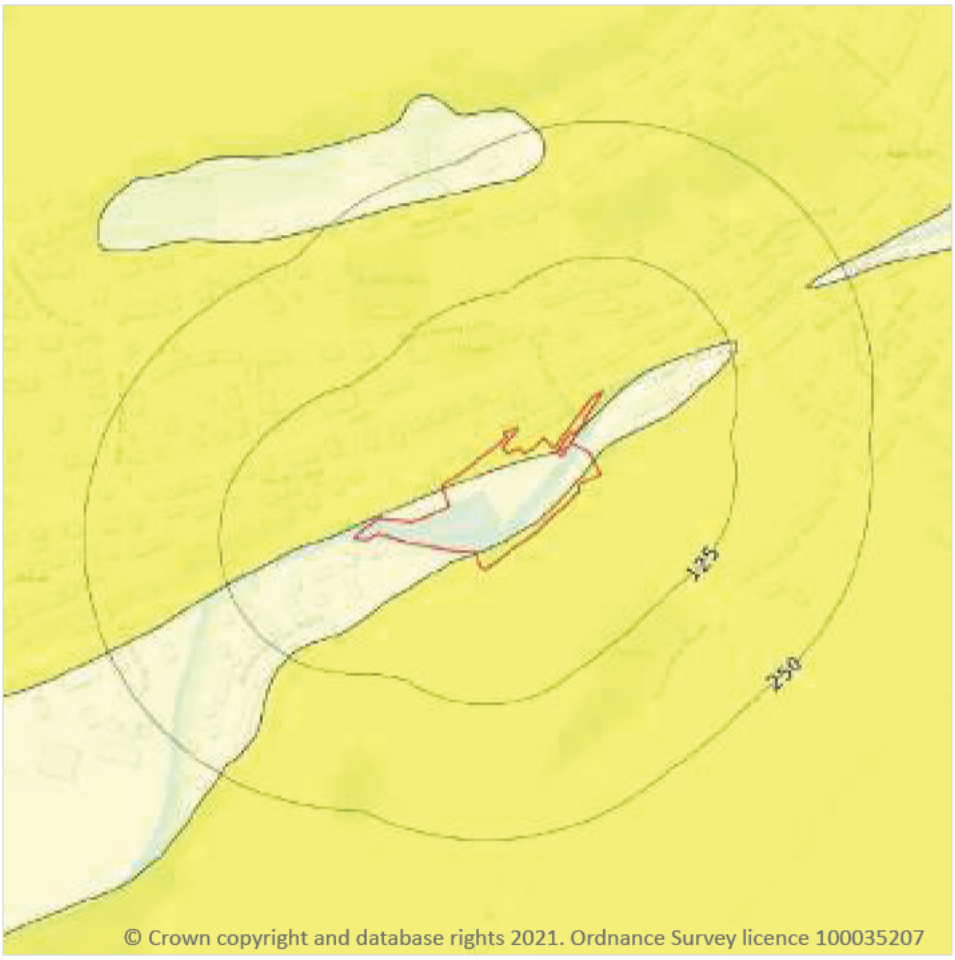
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 100**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**
On site	**Moderate**	**Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



Site Outline

Search buffers in metres (m)

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

17.4 Collapsible deposits

Records within 50m	2

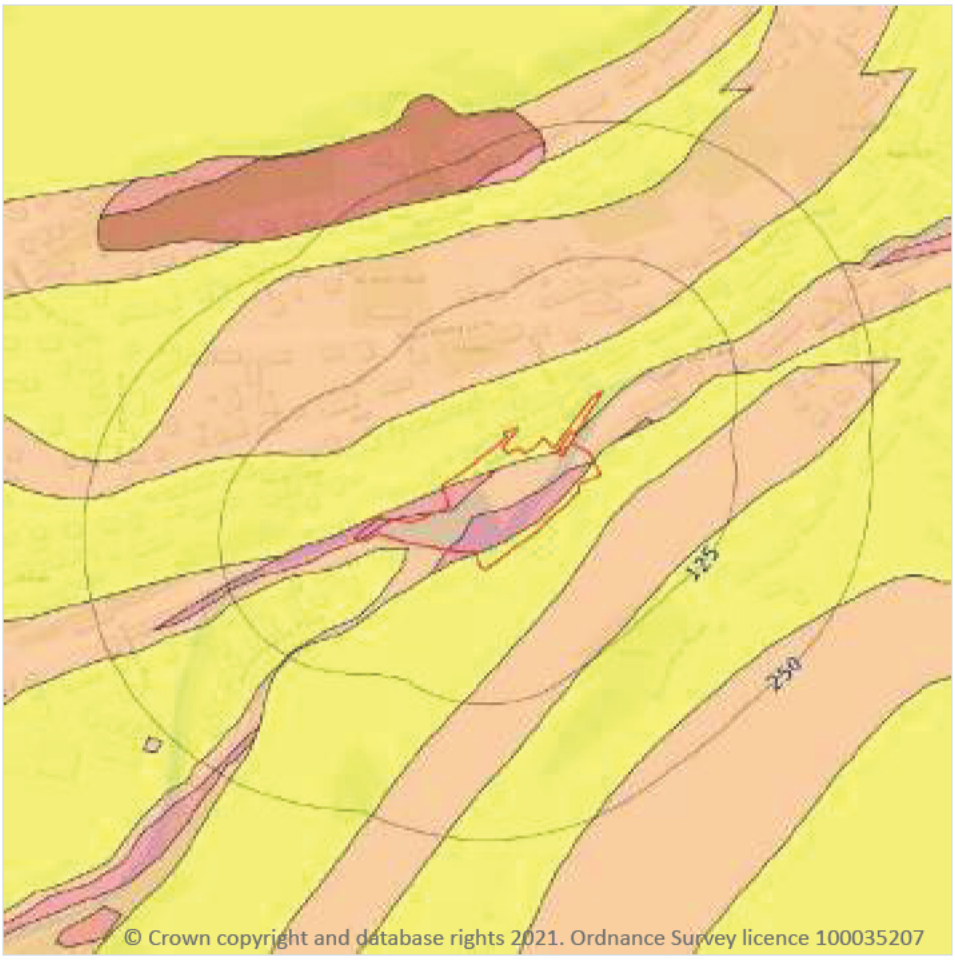
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 102**

Location	Hazard rating	Details
On site	**Negligible**	**Deposits with potential to collapse when loaded and saturated are believed not to be present.**
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

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

17.5 Landslides

Records within 50m	7

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

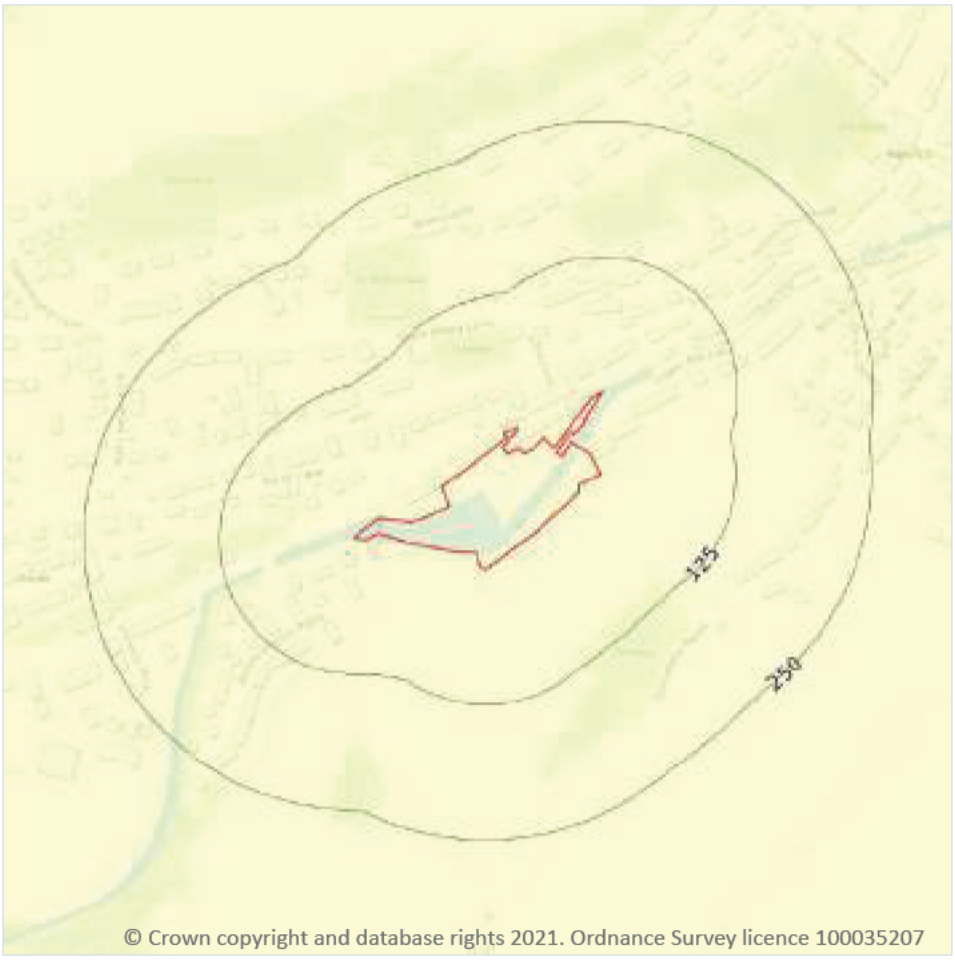
Features are displayed on the Natural ground subsidence - Landslides map on **page 103**

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

Location	Hazard rating	Details
On site	**Low**	**Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.**
On site	**Moderate**	**Slope instability problems are probably present or have occurred in the past. Land use should consider specifically the stability of the site.**
5m S	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.
28m NE	Moderate	Slope instability problems are probably present or have occurred in the past. Land use should consider specifically the stability of the site.
35m SE	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.
44m N	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



Site Outline

Search buffers in metres (m)

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

17.6 Ground dissolution of soluble rocks

Records within 50m	1

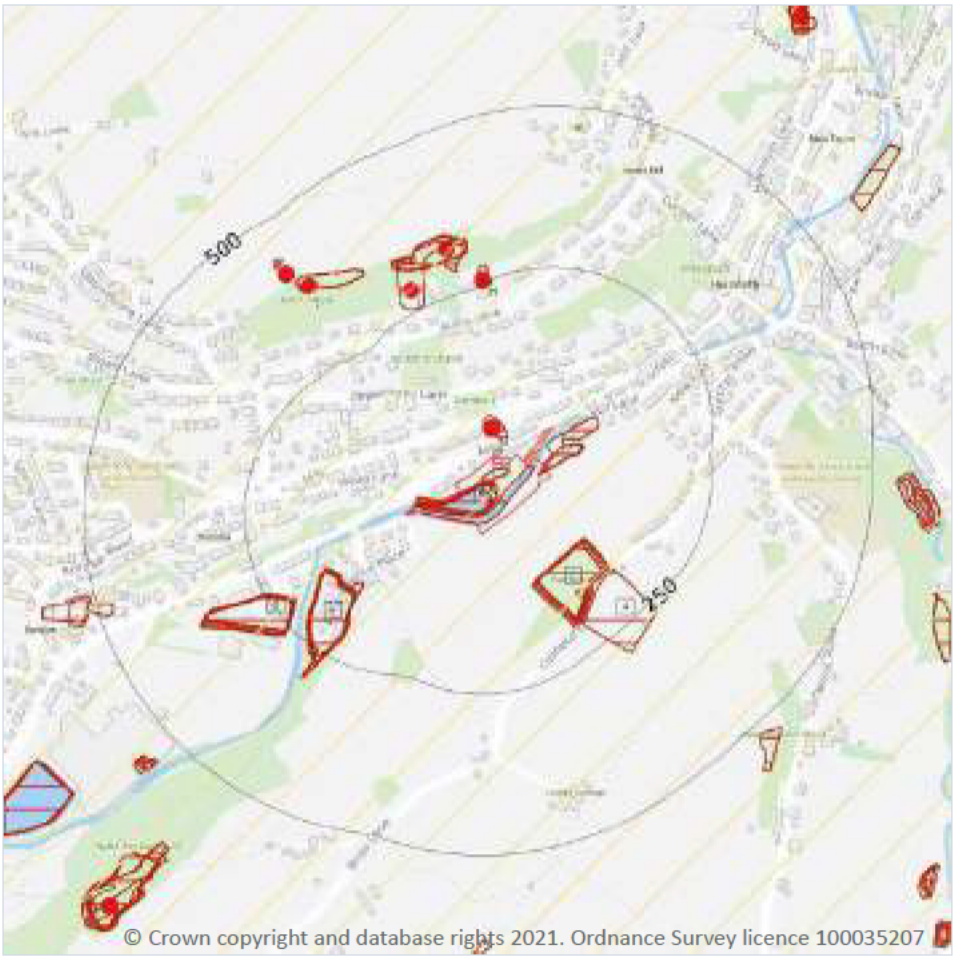
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 105**

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

This data is sourced from the British Geological Survey.

18 Mining, ground workings and natural cavities



Site Outline

Search buffers in metres (m)

Natural cavities (Area)

Natural cavities (Point)

BritPits

Surface ground workings

Underground workings

Historical Mineral Planning Areas

Mining Cavities

Non Coal Mining

Sporadic underground mining of restricted extent possible

Localised small scale underground mining possible

Small scale mining possible

Underground mining known or likely within or in close proximity

Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m	0

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

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m	6

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

Features are displayed on the Mining, ground workings and natural cavities map on **page 107**

ID	Location	Details	Description
D	35m N	Name: Prickleden Address: Upperthong, HOLMFIRTH, West Yorkshire Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
H	254m NW	Name: Binns Wood Address: Upperthong, HOLMFIRTH, West Yorkshire Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
I	282m NW	Name: Binns Wood Address: Upperthong, HOLMFIRTH, West Yorkshire Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
I	323m NW	Name: Binns Wood Quarry Address: HOLMFIRTH, West Yorkshire Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
J	377m NW	Name: Binns Wood Address: Upperthong, HOLMFIRTH, West Yorkshire Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

ID	Location	Details	Description
J	411m NW	Name: Binns Wood Address: Upperthong, HOLMFIRTH, West Yorkshire Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m **38**

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

Features are displayed on the Mining, ground workings and natural cavities map on **page 107**

ID	Location	Land Use	Year of mapping	Mapping scale
A	**On site**	**Pond**	**1904**	**1:10560**
A	**On site**	**Pond**	**1888**	**1:10560**
B	**On site**	**Pond**	**1970**	**1:10560**
B	**On site**	**Pond**	**1980**	**1:10000**
B	**On site**	**Water Body**	**1965**	**1:10560**
B	**On site**	**Water Body**	**1948**	**1:10560**
B	**On site**	**Water Body**	**1904**	**1:10560**
B	**On site**	**Water Body**	**1933**	**1:10560**
B	**On site**	**Water Body**	**1955**	**1:10560**
C	**On site**	**Pond**	**1904**	**1:10560**
C	**On site**	**Ponds**	**1888**	**1:10560**
D	17m N	Sandstone Quarry	1854	1:10560
E	104m SE	Cemetery	1970	1:10560
E	104m SE	Cemetery	1980	1:10000
E	107m SE	Cemetery	1933	1:10560
E	107m SE	Cemetery	1955	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
E	107m SE	Cemetery	1965	1:10560
E	108m SE	Cemetery	1948	1:10560
E	108m SE	Cemetery	1904	1:10560
E	108m SE	Cemetery	1888	1:10560
F	124m SW	Water Body	1904	1:10560
F	124m SW	Water Body	1888	1:10560
F	139m SW	Pond	1970	1:10560
F	139m SW	Pond	1980	1:10000
F	139m SW	Water Body	1965	1:10560
F	140m SW	Water Body	1955	1:10560
F	144m SW	Water Body	1933	1:10560
F	145m SW	Water Body	1948	1:10560
E	161m SE	Mortuary	1965	1:10560
1	173m SE	Cemetery	1955	1:10560
G	214m SW	Pond	1970	1:10560
G	214m SW	Water Body	1965	1:10560
G	218m SW	Water Body	1955	1:10560
G	221m SW	Water Body	1933	1:10560
G	224m SW	Water Body	1948	1:10560
G	224m SW	Water Body	1904	1:10560
G	224m SW	Pond	1888	1:10560
H	244m NW	Sandstone Quarry	1854	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	0

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

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	0

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

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	1

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

Features are displayed on the Mining, ground workings and natural cavities map on **page 107**

ID	Location	Name	Commodity	Class	Likelihood
B	**On site**	**Not available**	**Vein Mineral**	**A**	**Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered**

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	0

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

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site	0

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

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	1

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

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

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	0

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

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

18.11 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

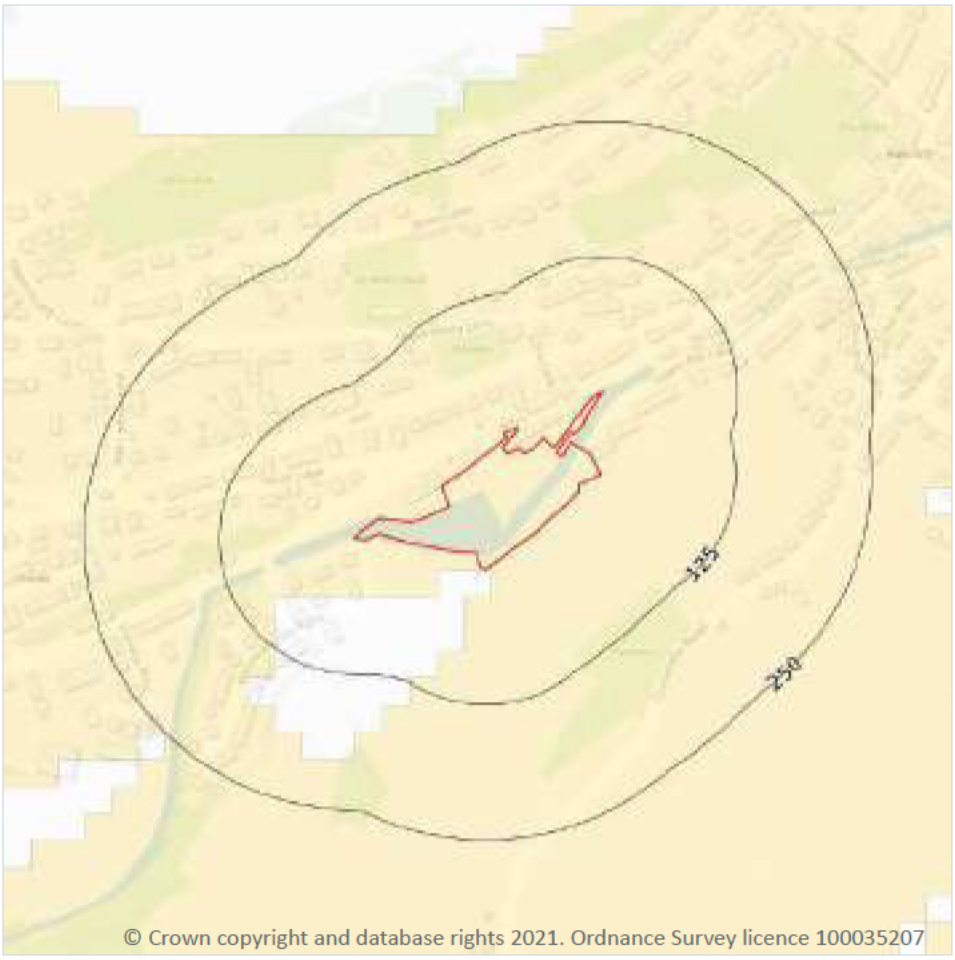
18.13 Clay mining

Records on site	0

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

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

19 Radon



Site Outline

Search buffers in metres (m)

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

19.1 Radon

Records on site	1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 113**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Between 1% and 3%**	**None**

This data is sourced from the British Geological Survey and Public Health England.

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m **7**

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

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 mg/kg**
11m NE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
11m NE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
14m S	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
46m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m **0**

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

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m	0

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

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects

21.1 Underground railways (London)

Records within 250m	0

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

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m	0

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

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	0

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

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	0

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

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	0

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

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	0

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

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	0

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

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	0

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

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	0

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

This data is sourced from HS2 ltd.

Data providers

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

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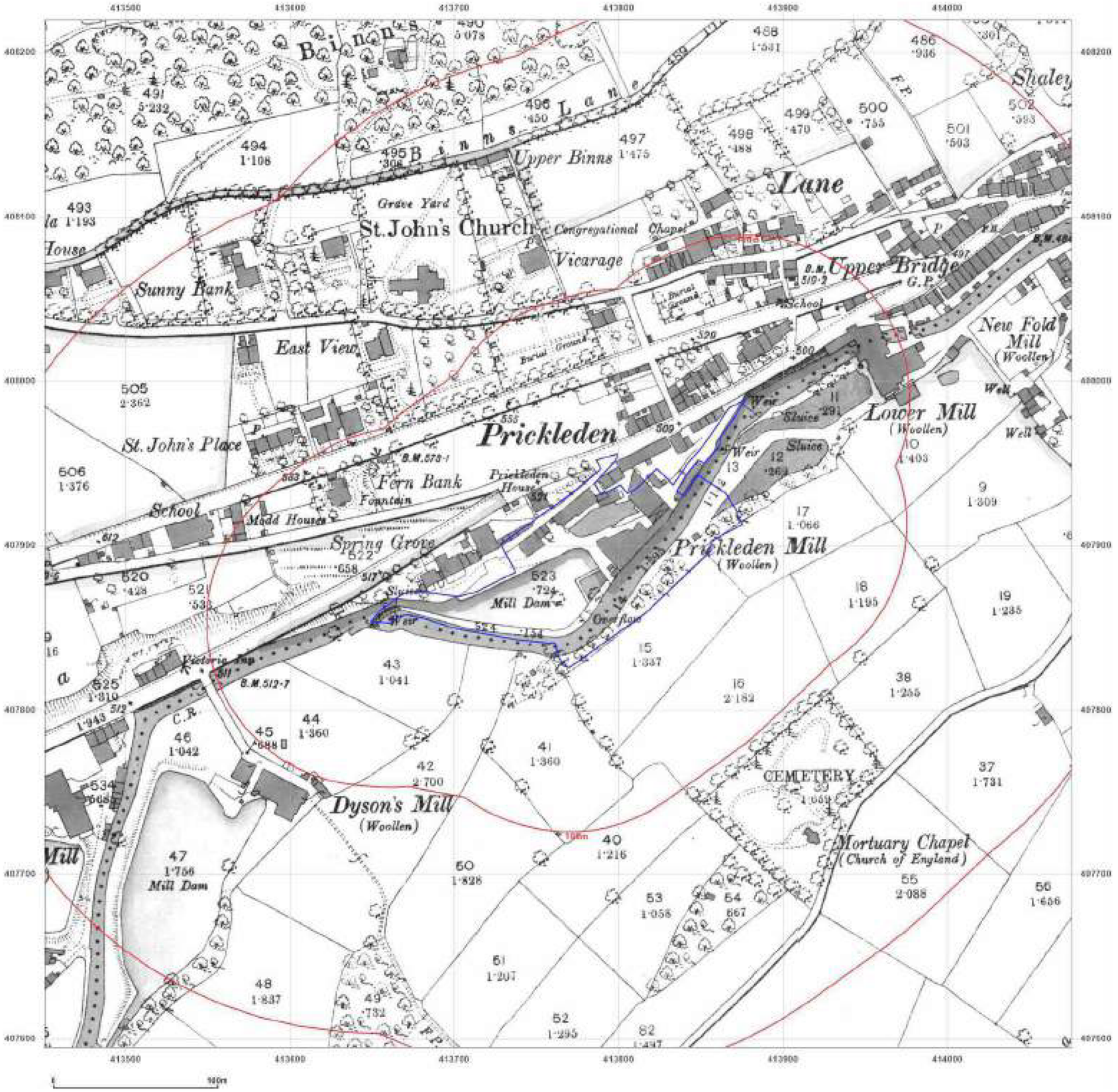

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

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

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Surveyed 1893
Revised 1893
Edition N/A
Copyright N/A
Levelled N/A

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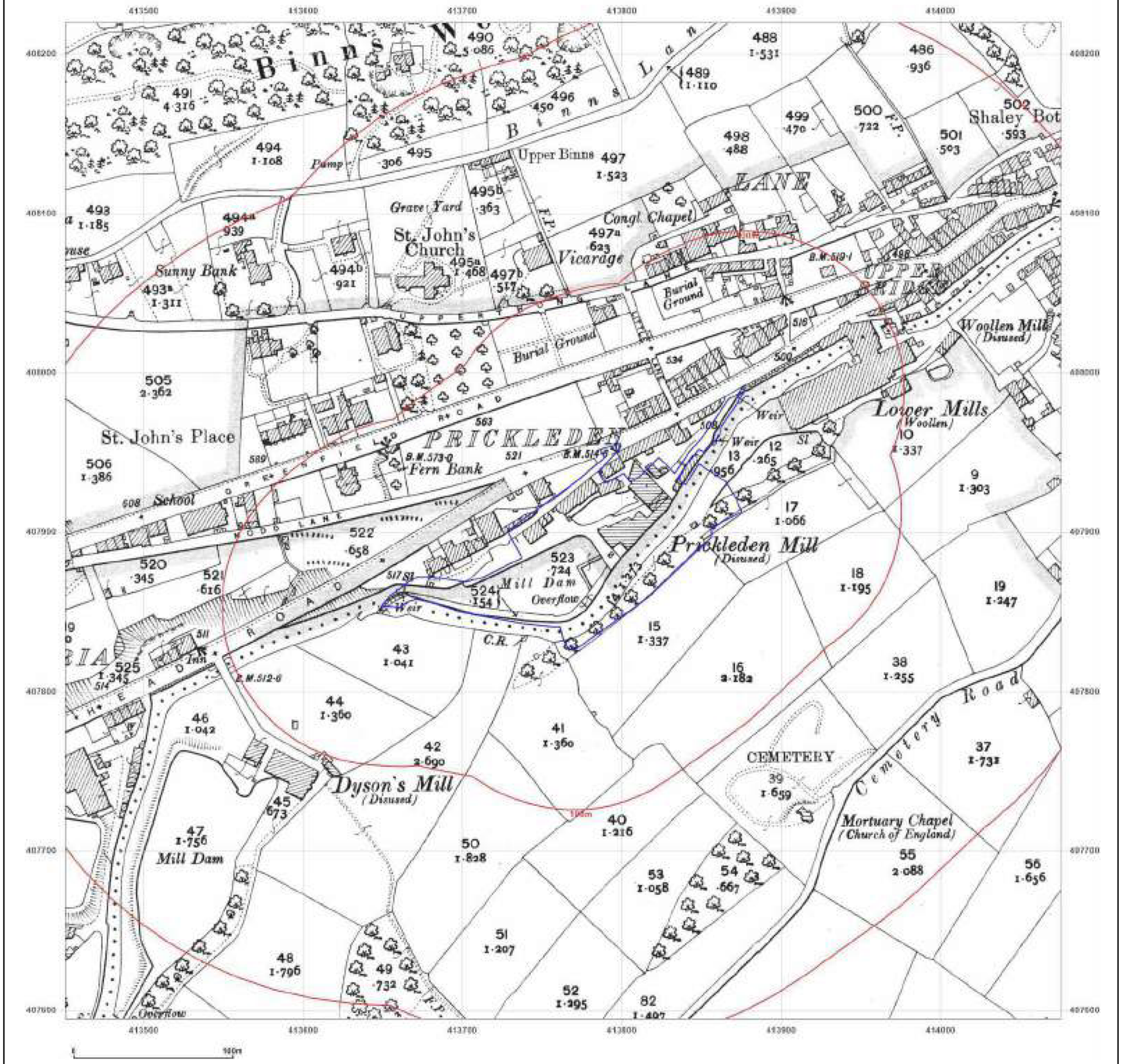

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: County Series

Map date: **1906**

Scale: 1:2,500

Printed at: 1:2,500

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Revised 1906
Edition N/A
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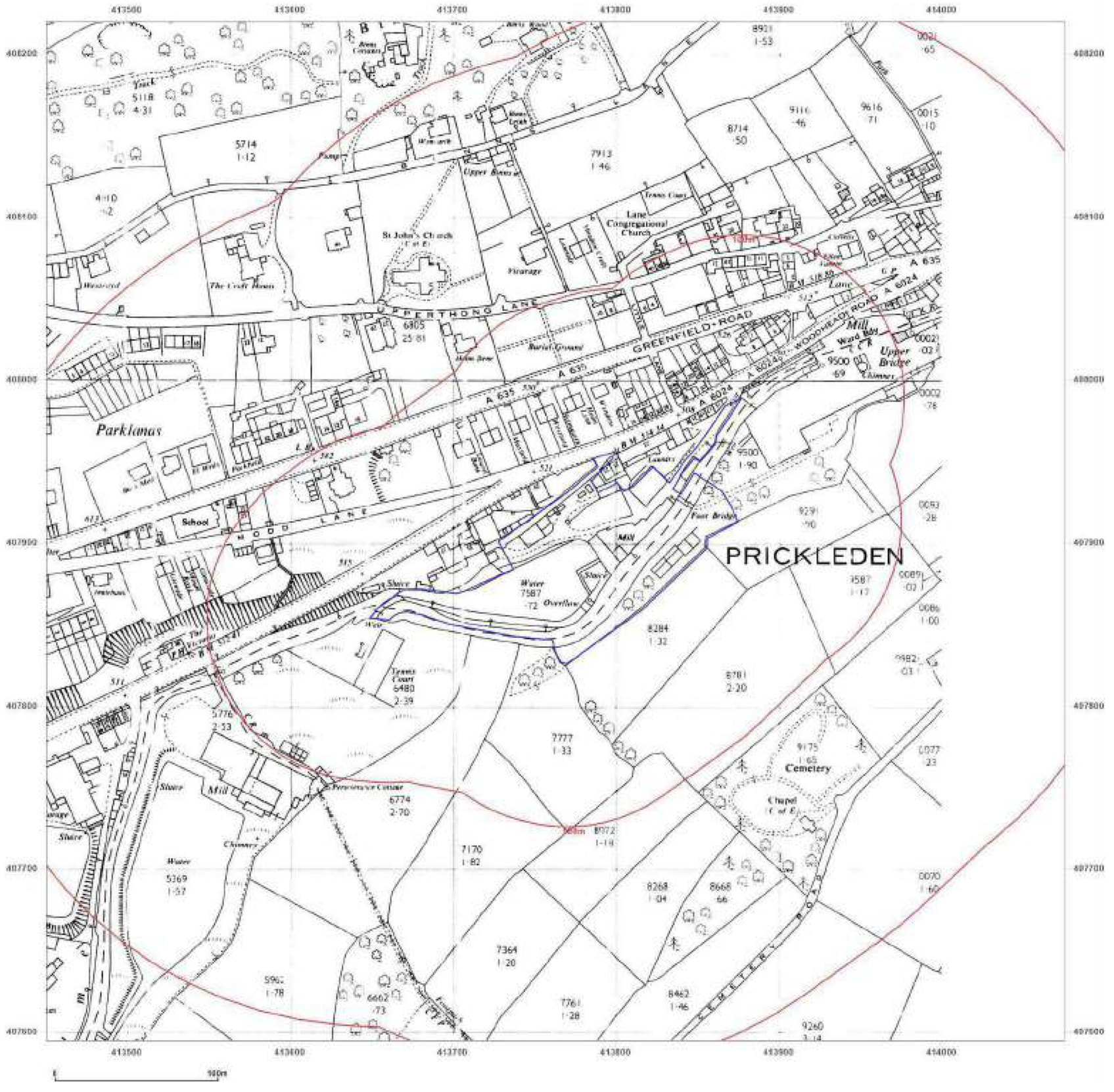

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid
Map date: **1964**
Scale: 1:2,500
Printed at: 1:2,500

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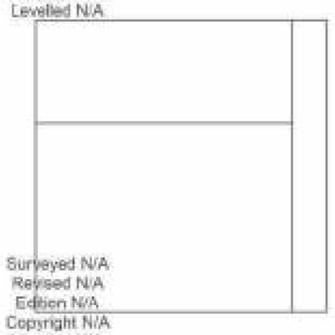
Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A



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

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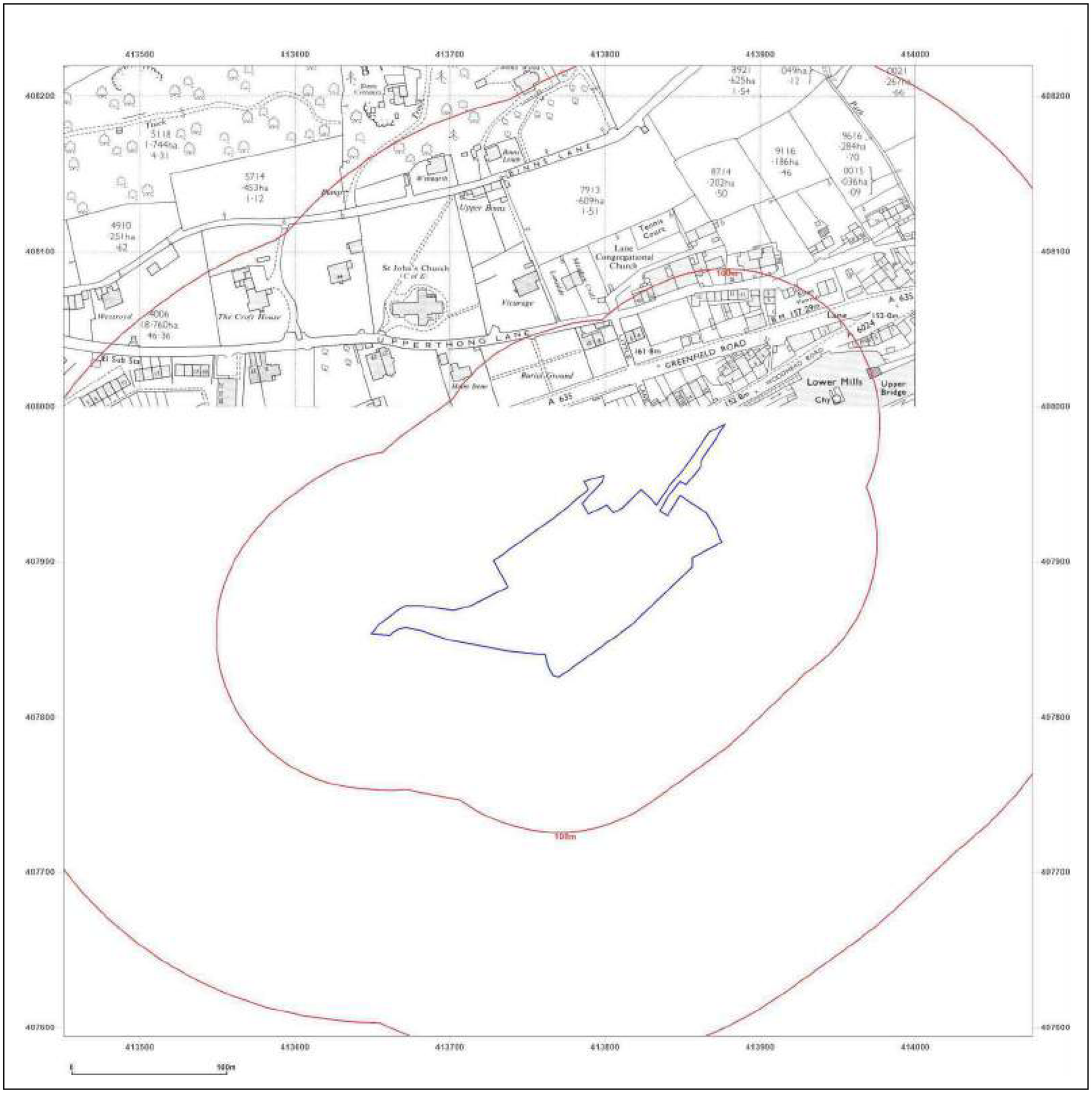

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid
Map date: **1966**
Scale: 1:2,500
Printed at: 1:2,500

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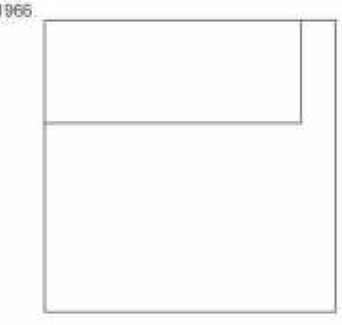
Surveyed N/A
Revised 1963
Edition N/A
Copyright 1964
Levelled 1966



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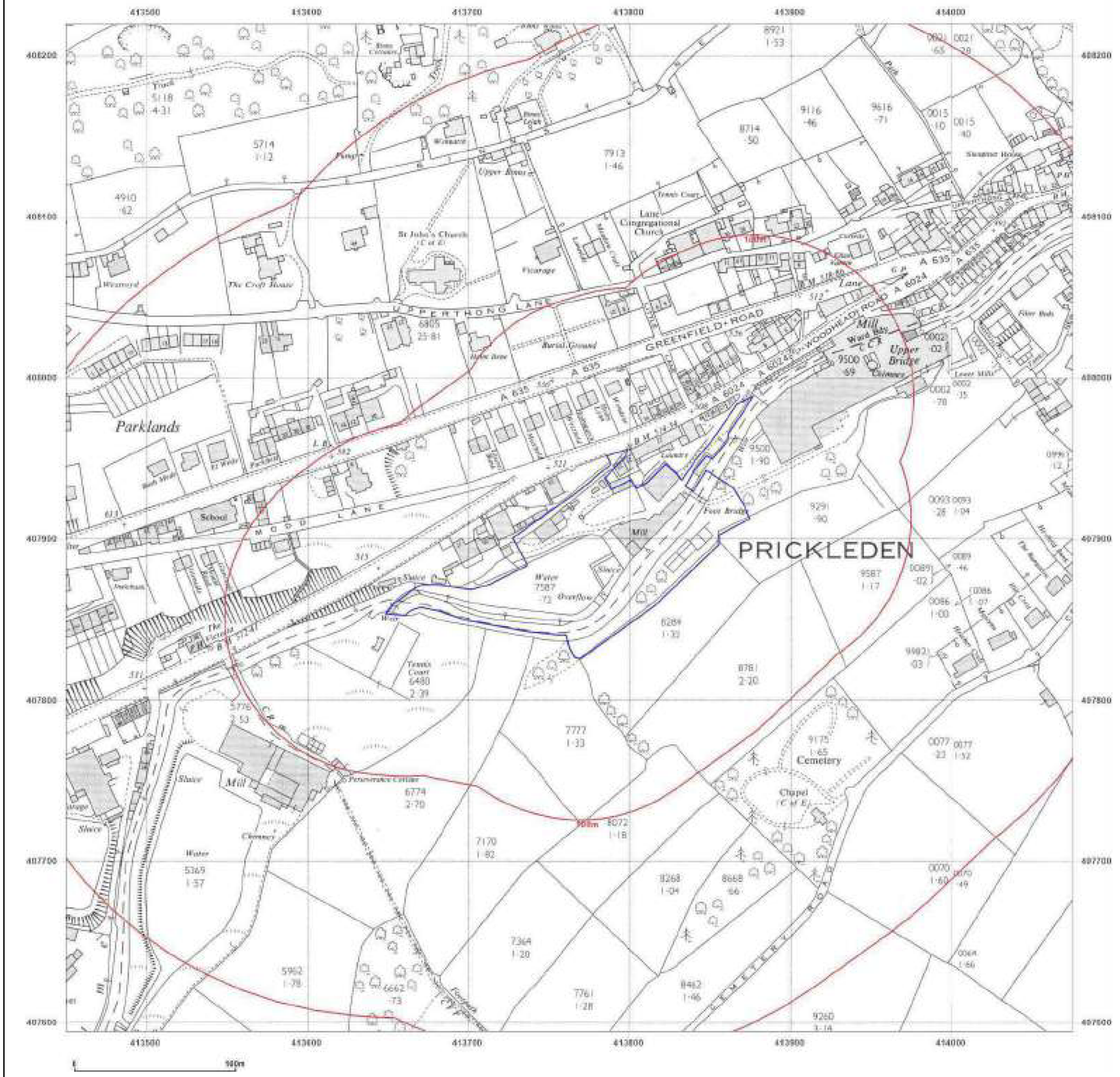

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid

Map date: **1964-1967**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1963 Revised 1963 Edition N/A Copyright 1964 Levelled 1930	Surveyed 1966 Revised 1966 Edition N/A Copyright 1967 Levelled 1959
Surveyed 1962 Revised 1962 Edition N/A Copyright 1964 Levelled 1930	Surveyed 1963 Revised 1963 Edition N/A Copyright 1964 Levelled 1959

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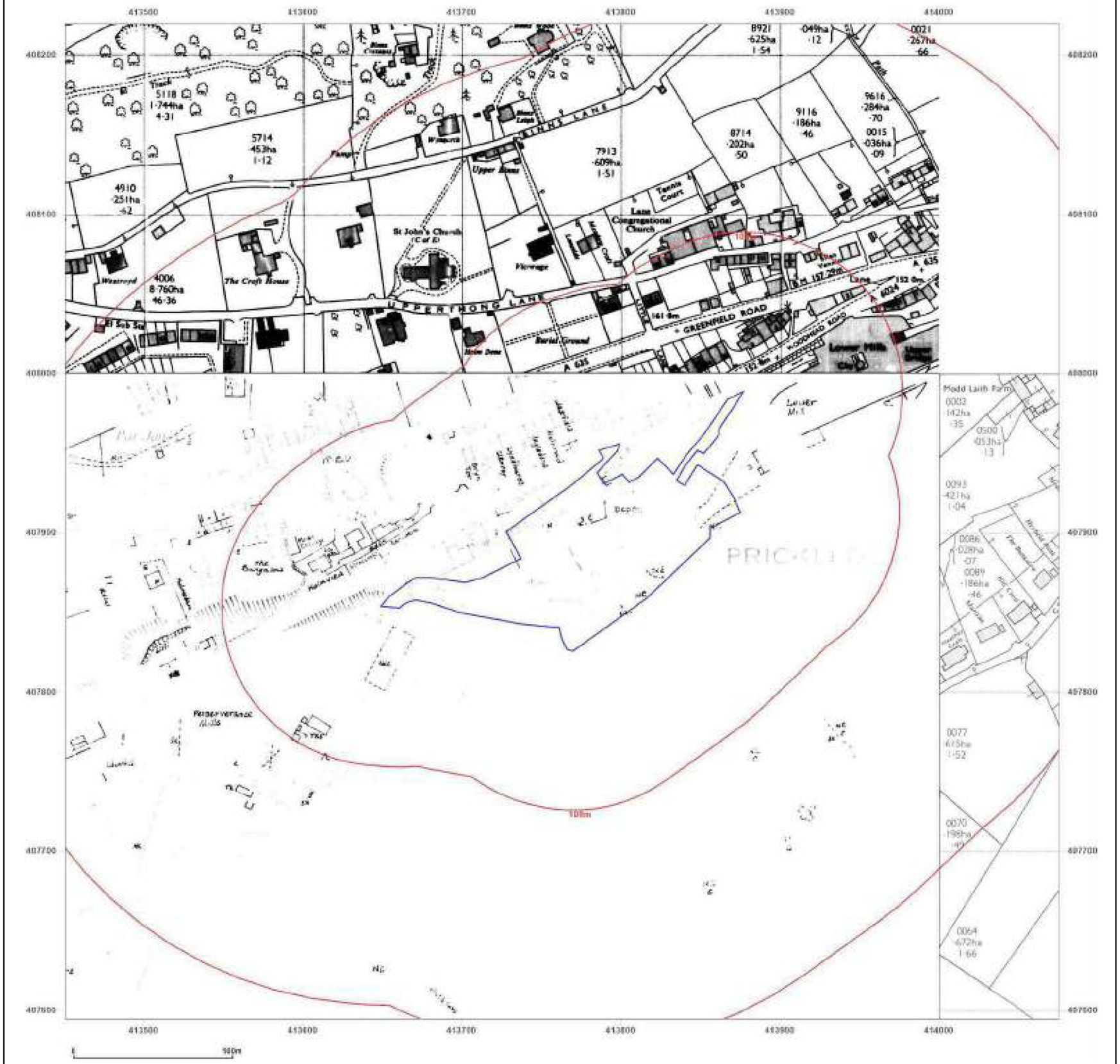

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid
Map date: **1975-1976**
Scale: 1:2,500
Printed at: 1:2,500

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

Surveyed N/A
Revised N/A
Edition N/A
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Levelled N/A

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Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid
Map date: **1977**
Scale: 1:2,500
Printed at: 1:2,500

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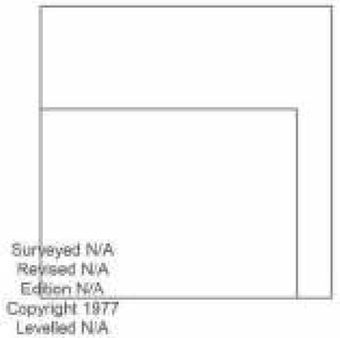

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Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid
Map date: **1977-1981**
Scale: 1:2,500
Printed at: 1:2,500

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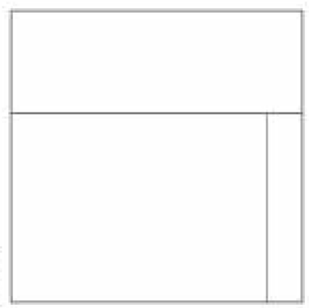

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Edition N/A
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Levelled 1968

Surveyed N/A
Revised N/A
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Site Details:

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Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid

Map date: **1985-1988**

Scale: 1:2,500

Printed at: 1:2,500

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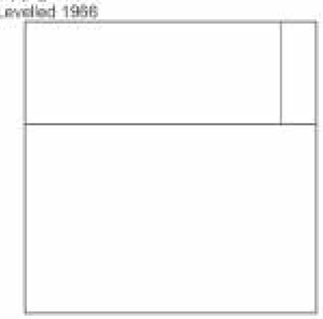
Surveyed 1966
Revised 1985
Edition N/A
Copyright 1985
Levelled 1956

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1988
Levelled 1959



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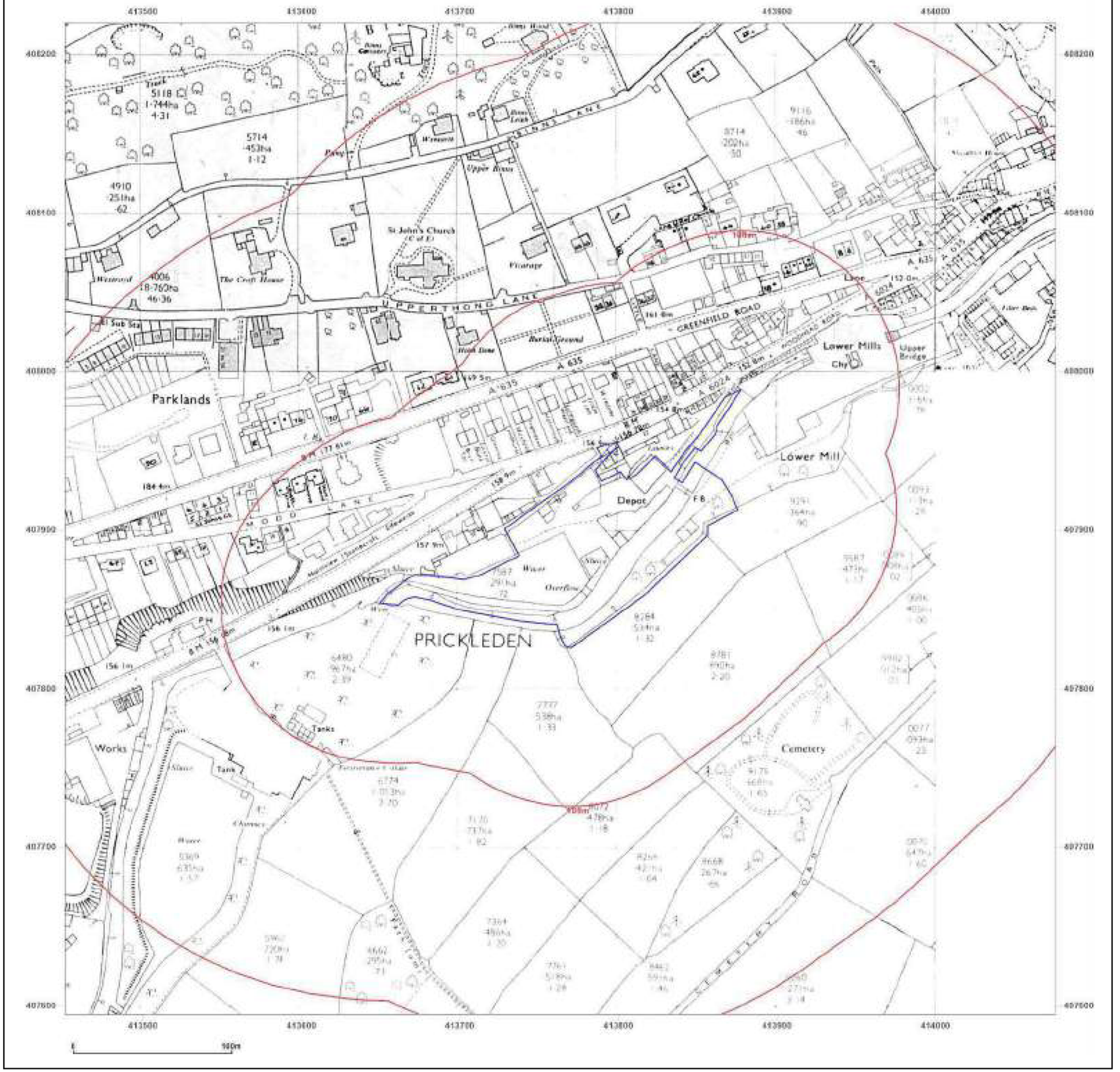

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name:	National Grid
Map date:	**1984-1988**
Scale:	1:2,500
Printed at:	1:2,500

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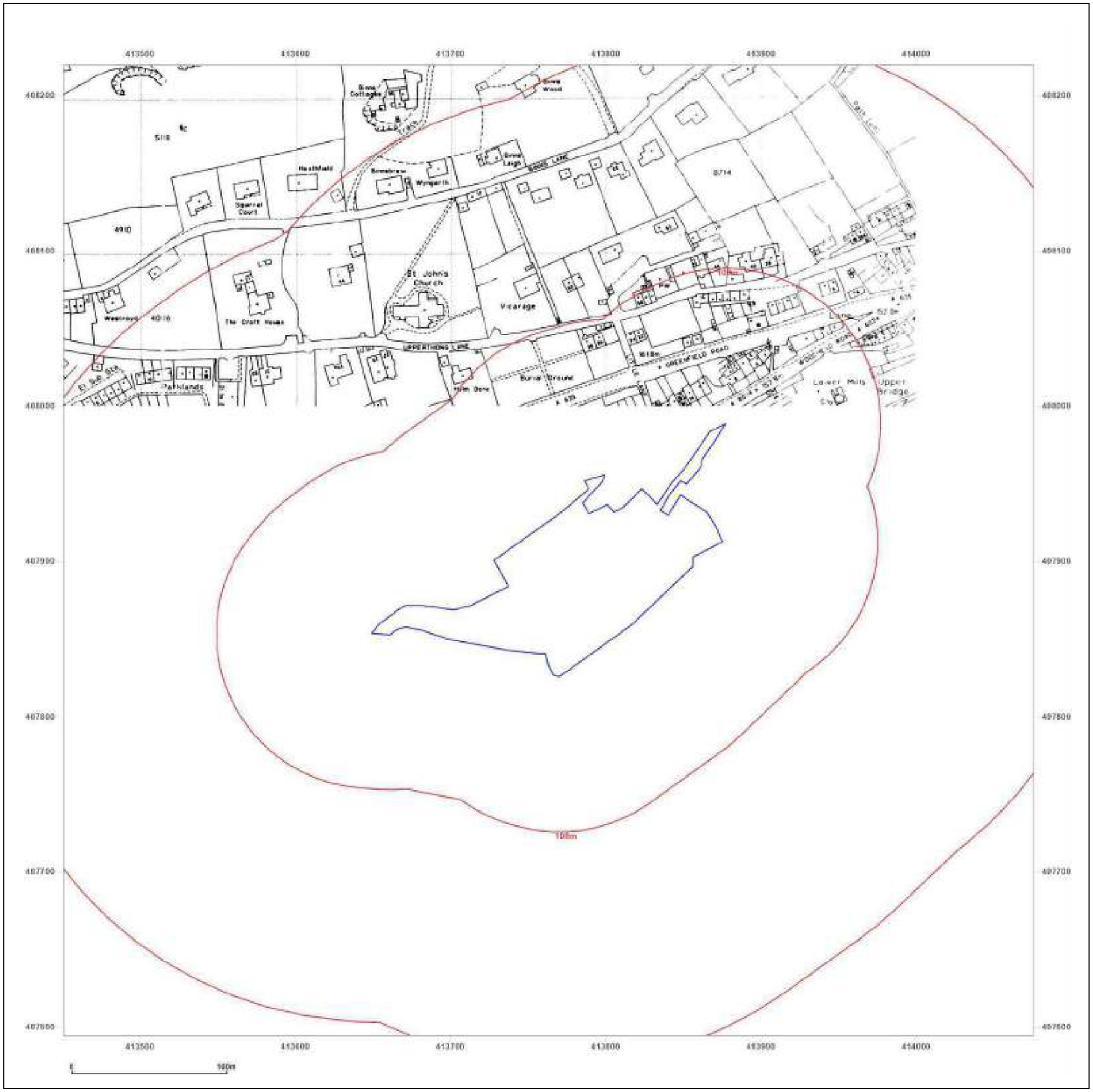

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

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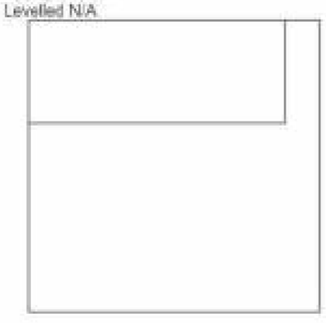
Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A



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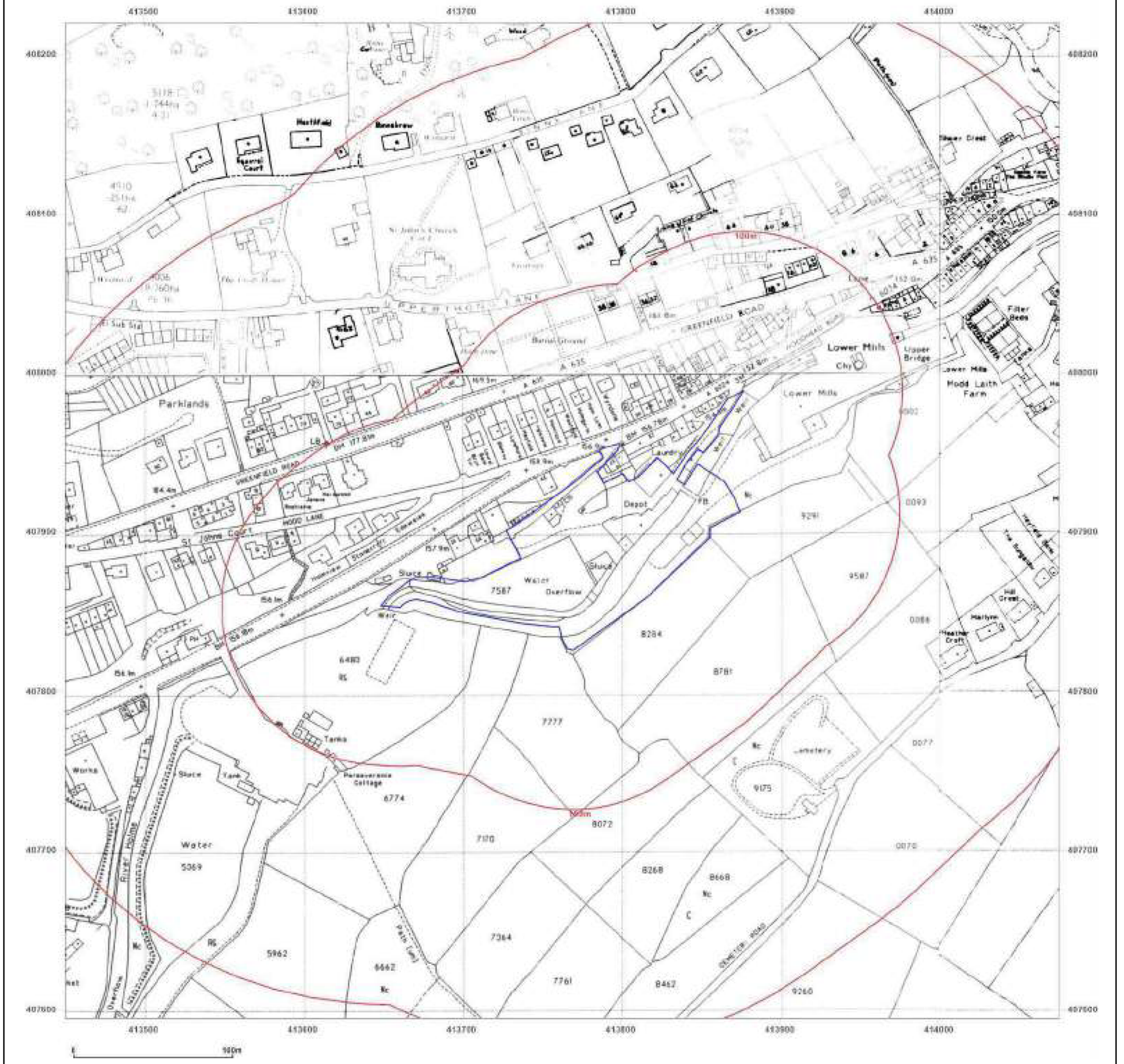

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid

Map date: **1990-1995**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1966 Revised 1990 Edition N/A Copyright 1990 Levelled 1966	Surveyed 1995 Revised N/A Edition N/A Copyright 1995 Levelled N/A
Surveyed 1993 Revised 1993 Edition N/A Copyright N/A Levelled N/A	Surveyed N/A Revised N/A Edition N/A Copyright 1995 Levelled N/A

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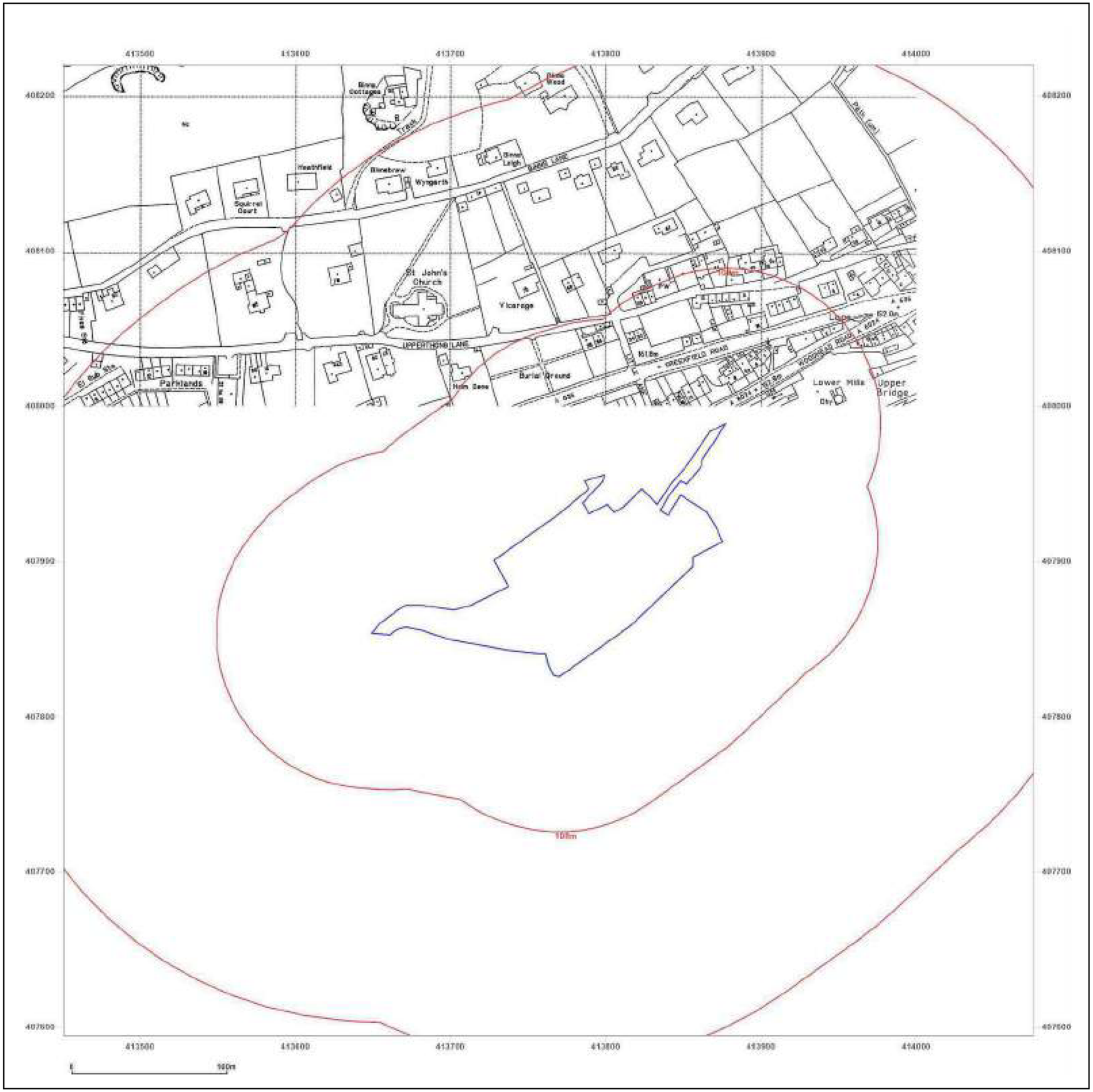

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid
Map date: 1995
Scale: 1:2,500
Printed at: 1:2,500

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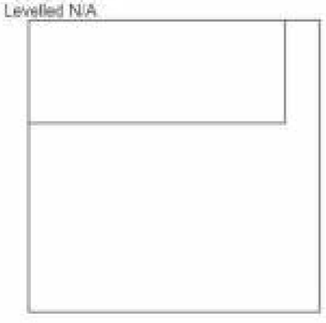
Revised 1995
Edition N/A
Copyright 1995
Levelled N/A



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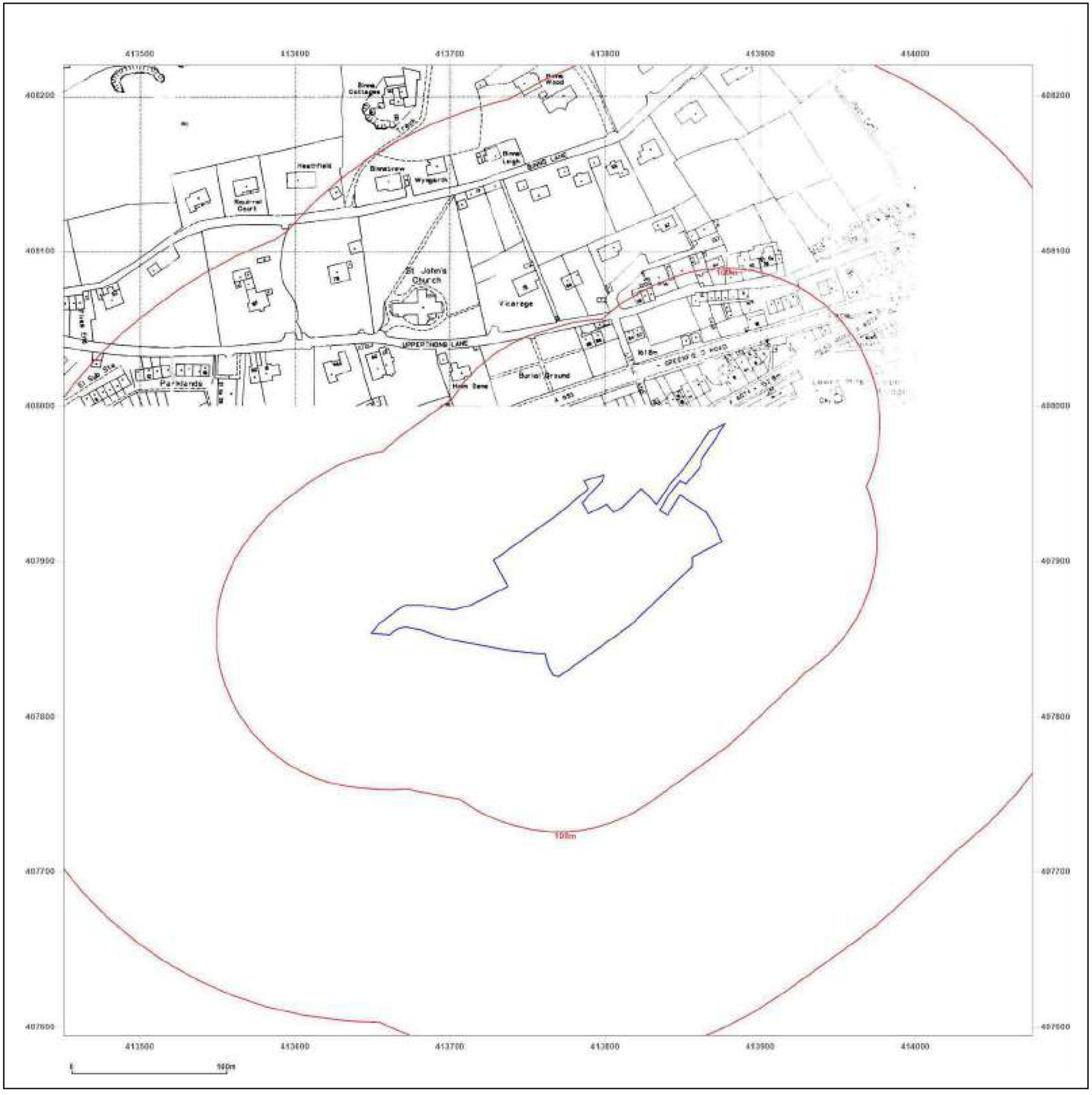

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid
Map date: **1995**
Scale: 1:2,500
Printed at: 1:2,500

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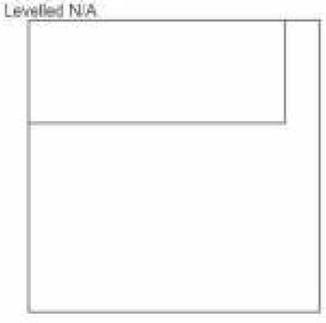
Surveyed 1995
Revised N/A
Edition N/A
Copyright 1995
Levelled N/A



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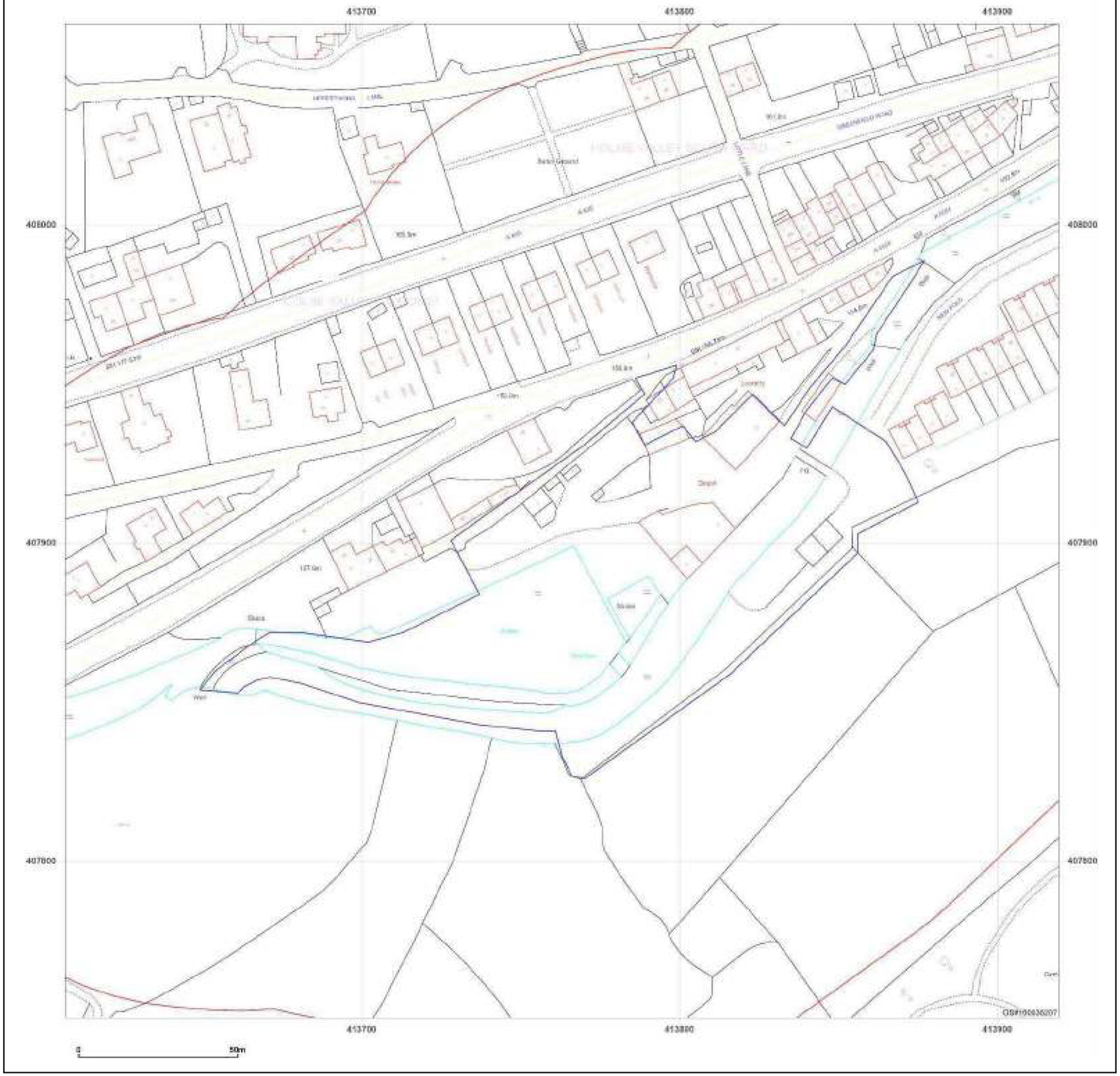

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

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

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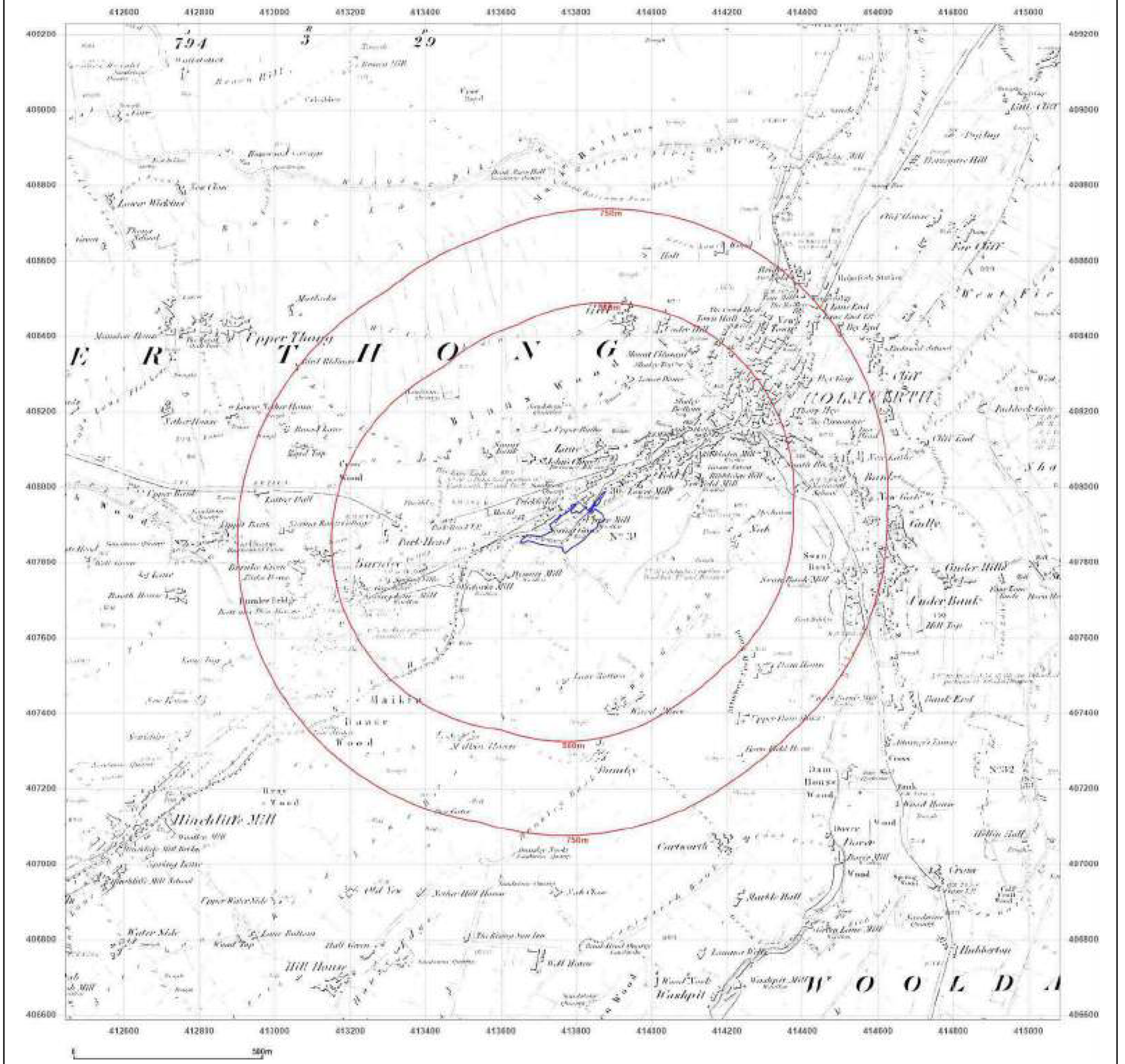

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

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

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Revised N/A
Edition 1854
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Surveyed 1854
Revised N/A
Edition 1854
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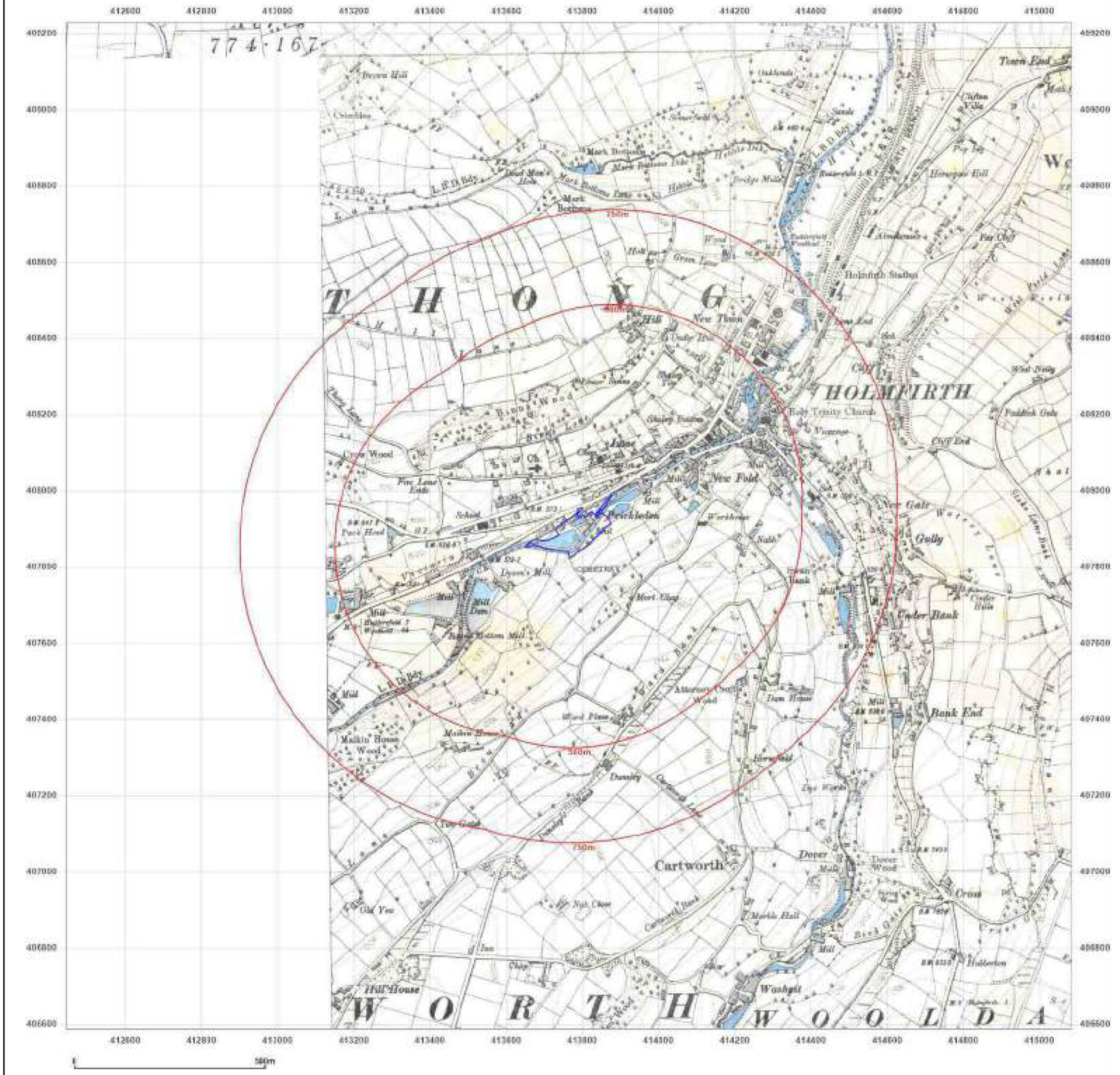

Groundsure
INSIGHTS

Site Details:

413784 407907

Client Ref:	G1342
Report Ref:	GS-8375524
Grid Ref:	413763, 407907

Map Name:	County Series
Map date:	**1888-1891**
Scale:	1:10,560
Printed at:	1:10,560

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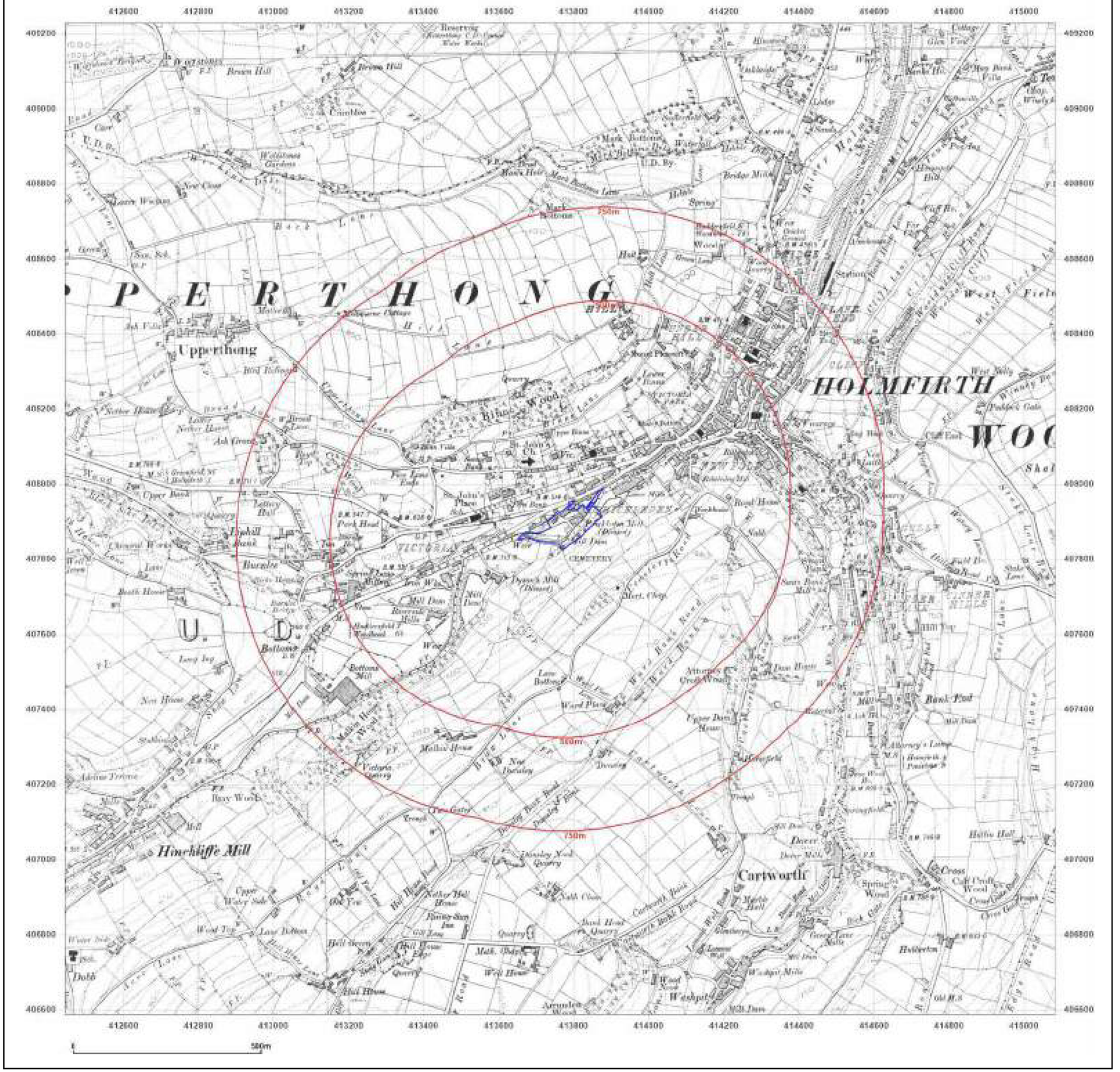

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: County Series

Map date: **1904**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1891
Revised 1904
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1888
Revised 1904
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1888
Revised 1904
Edition N/A
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Surveyed 1888
Revised 1904
Edition N/A
Copyright N/A
Levelled N/A

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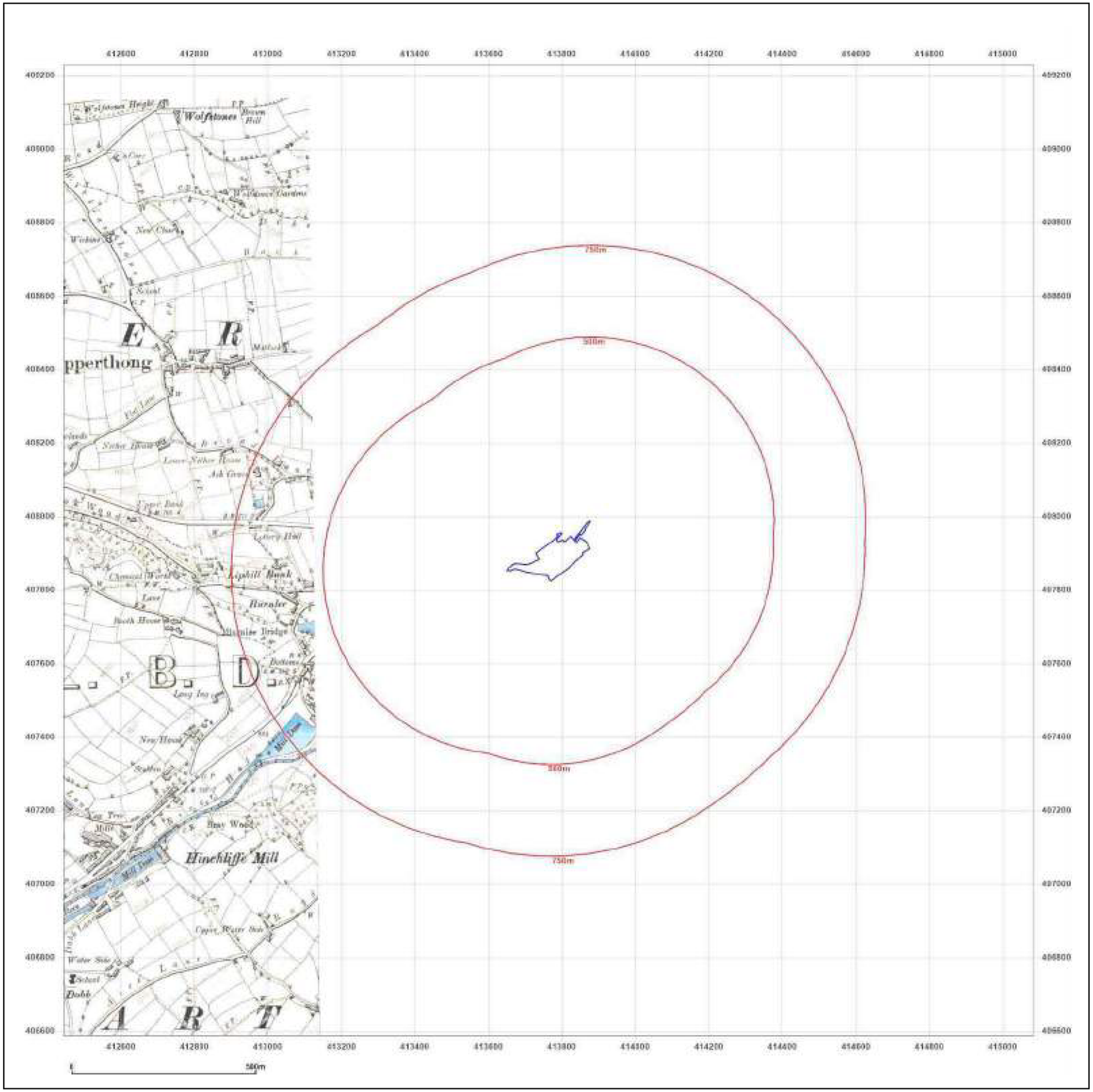

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: County Series
Map date: **1904**
Scale: 1:10,560
Printed at: 1:10,560

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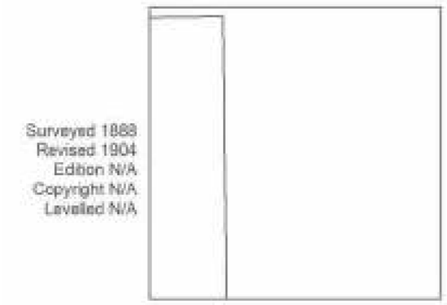

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Production date: 02 December 2021

Map legend available at:
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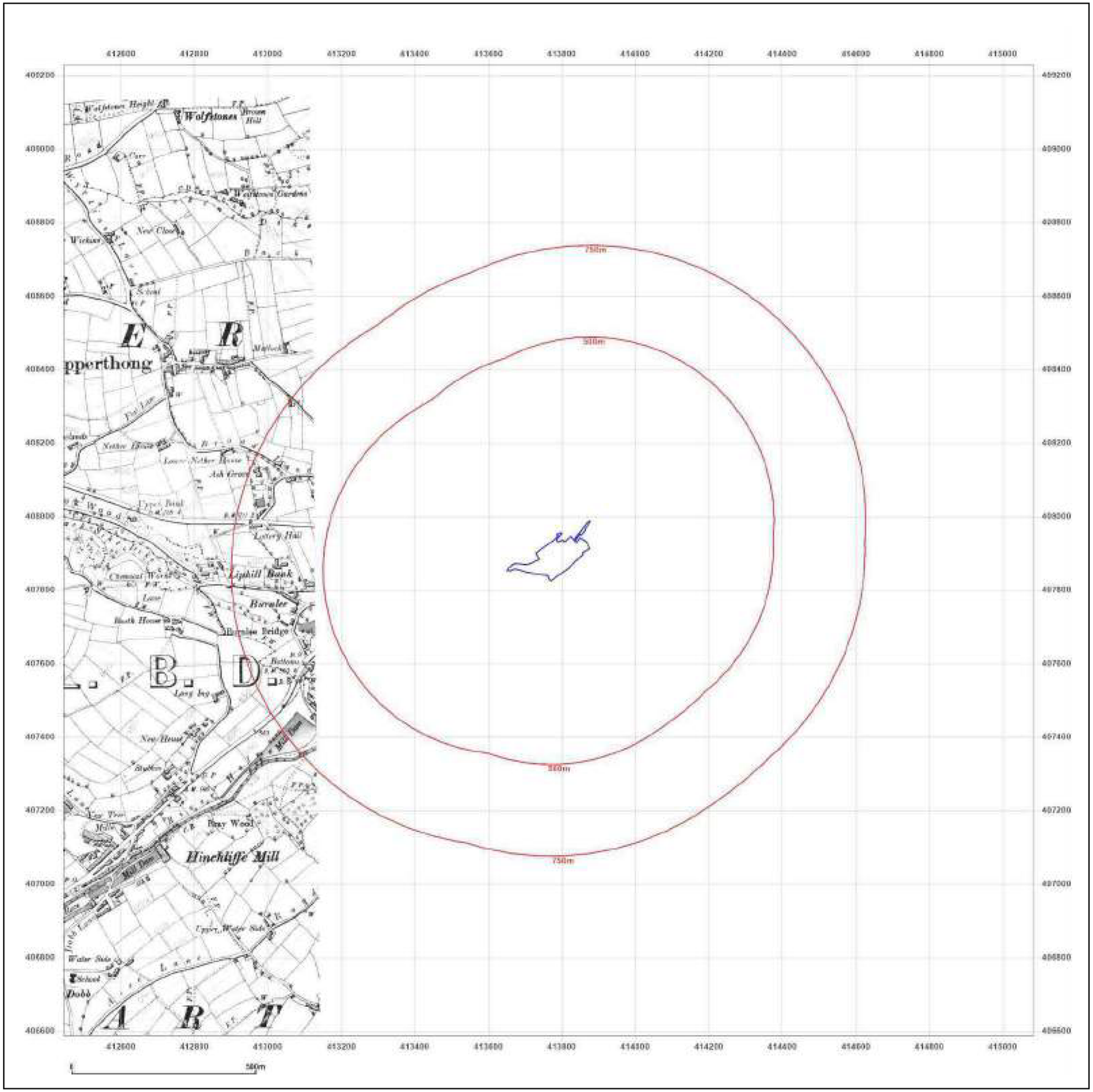

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: County Series
Map date: **1907**
Scale: 1:10,560
Printed at: 1:10,560

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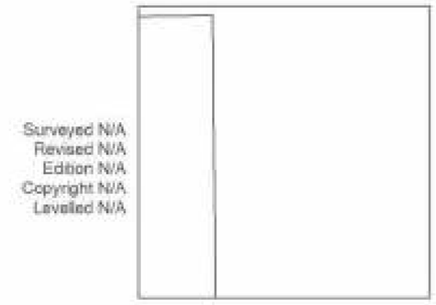

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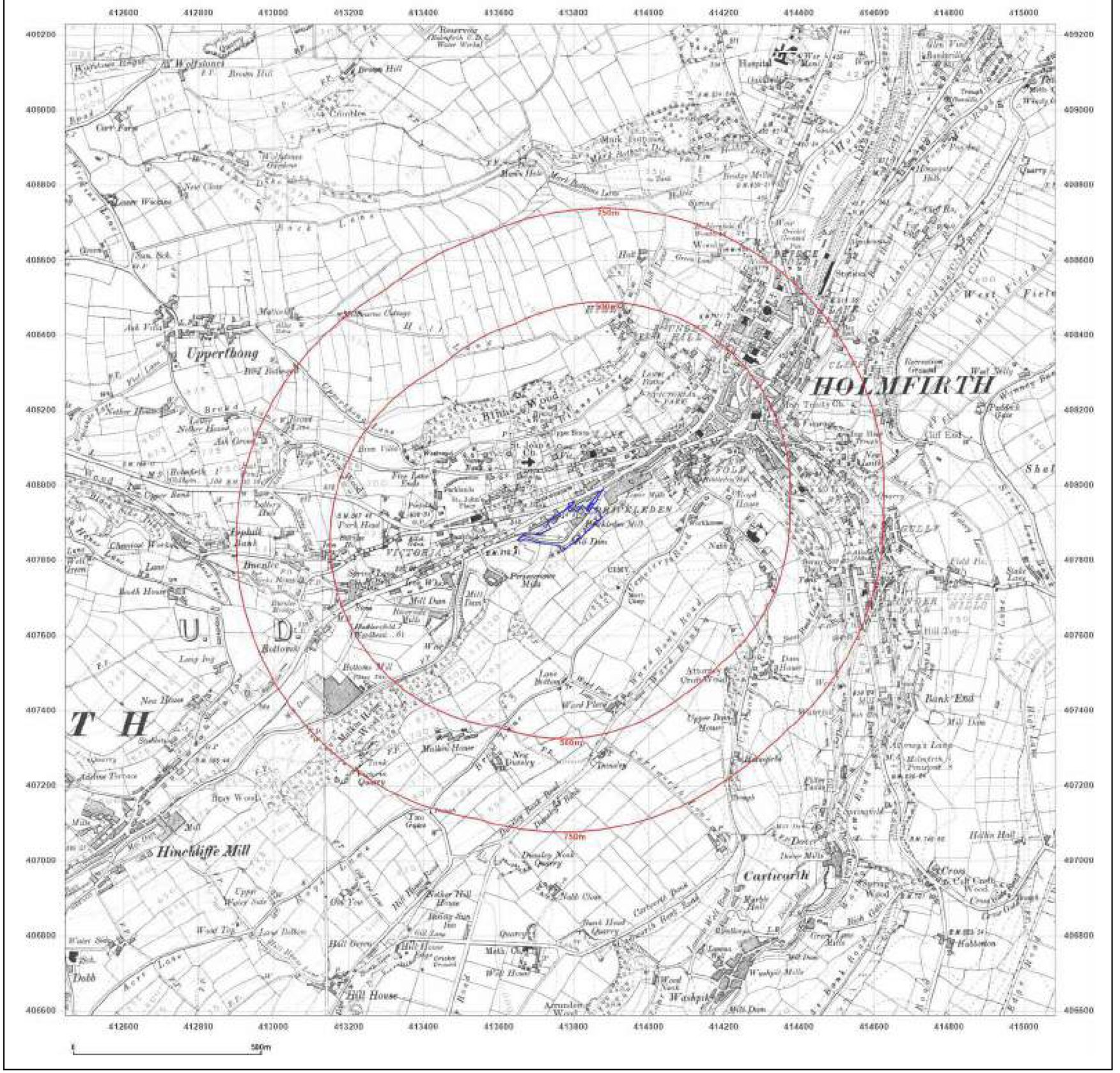
Production date: 02 December 2021

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



Groundsure
INSIGHTS

Site Details:

413784 407907

Client Ref:	G1342
Report Ref:	GS-8375524
Grid Ref:	413763, 407907
Map Name:	County Series
Map date:	**1929-1933**
Scale:	1:10,560
Printed at:	1:10,560

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Production date: 02 December 2021

Map legend available at:
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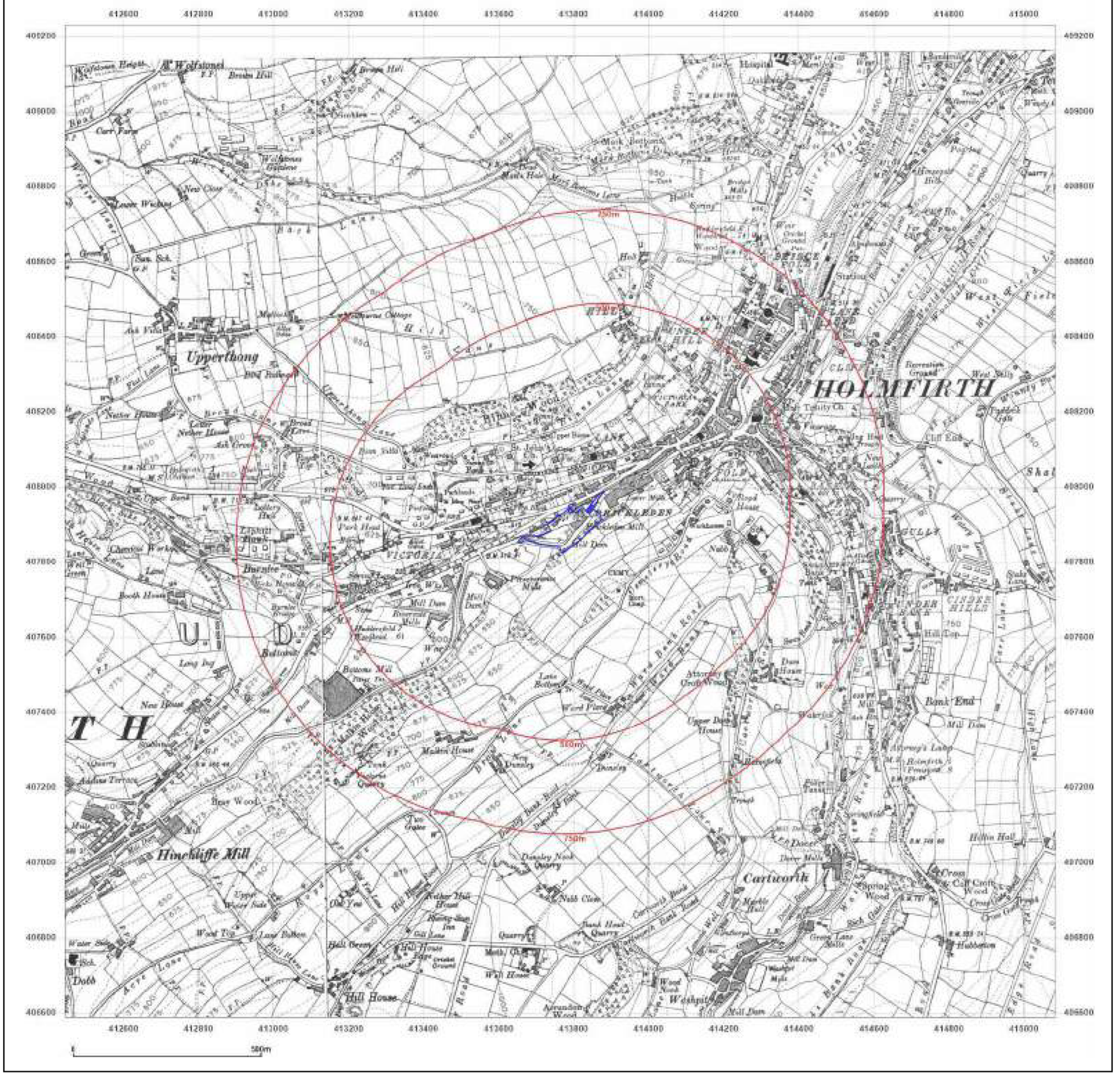

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

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Production date: 02 December 2021

Map legend available at:
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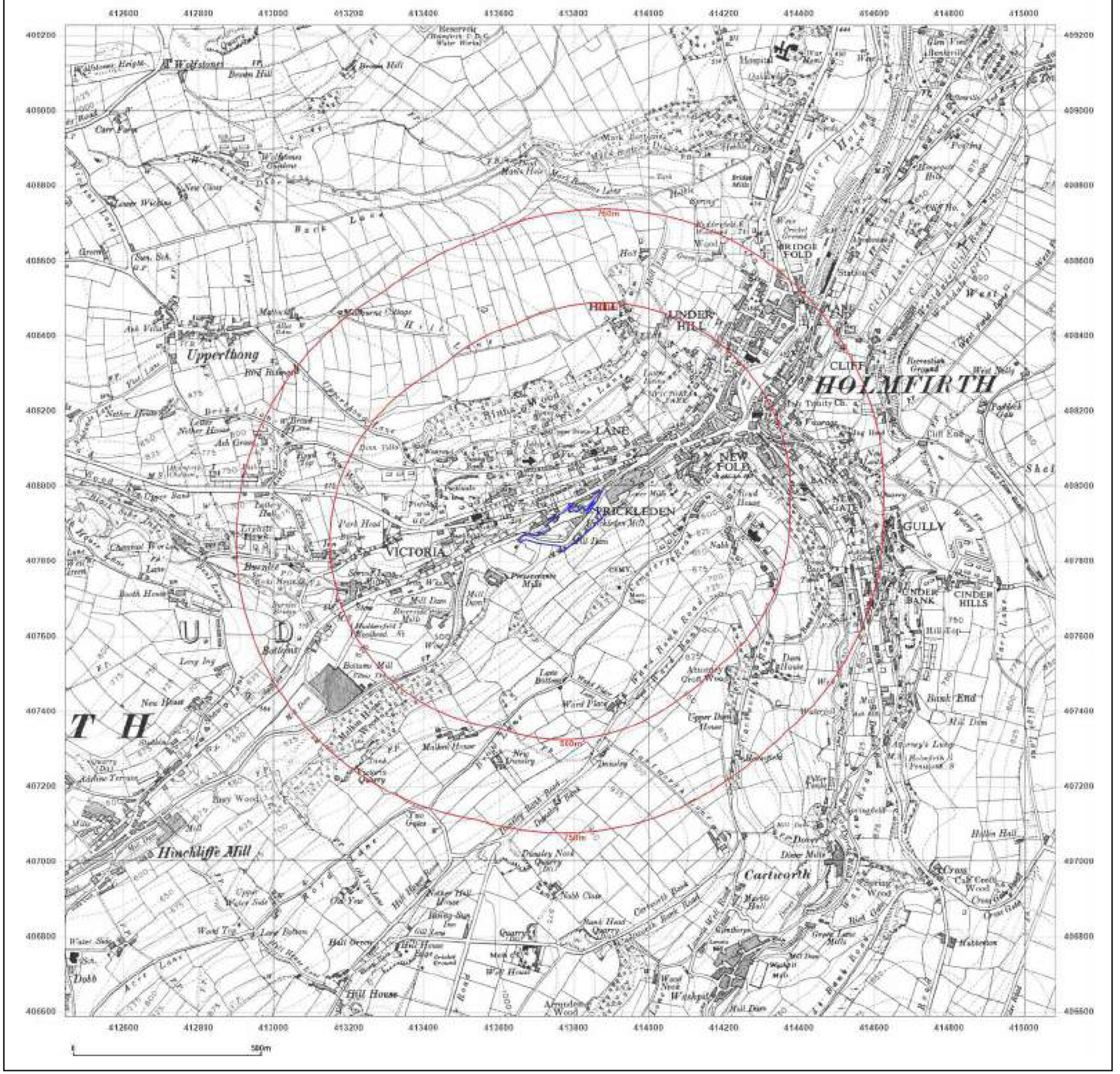

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: Provisional
Map date: **1955**
Scale: 1:10,560
Printed at: 1:10,560

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

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

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Production date: 02 December 2021

Map legend available at:
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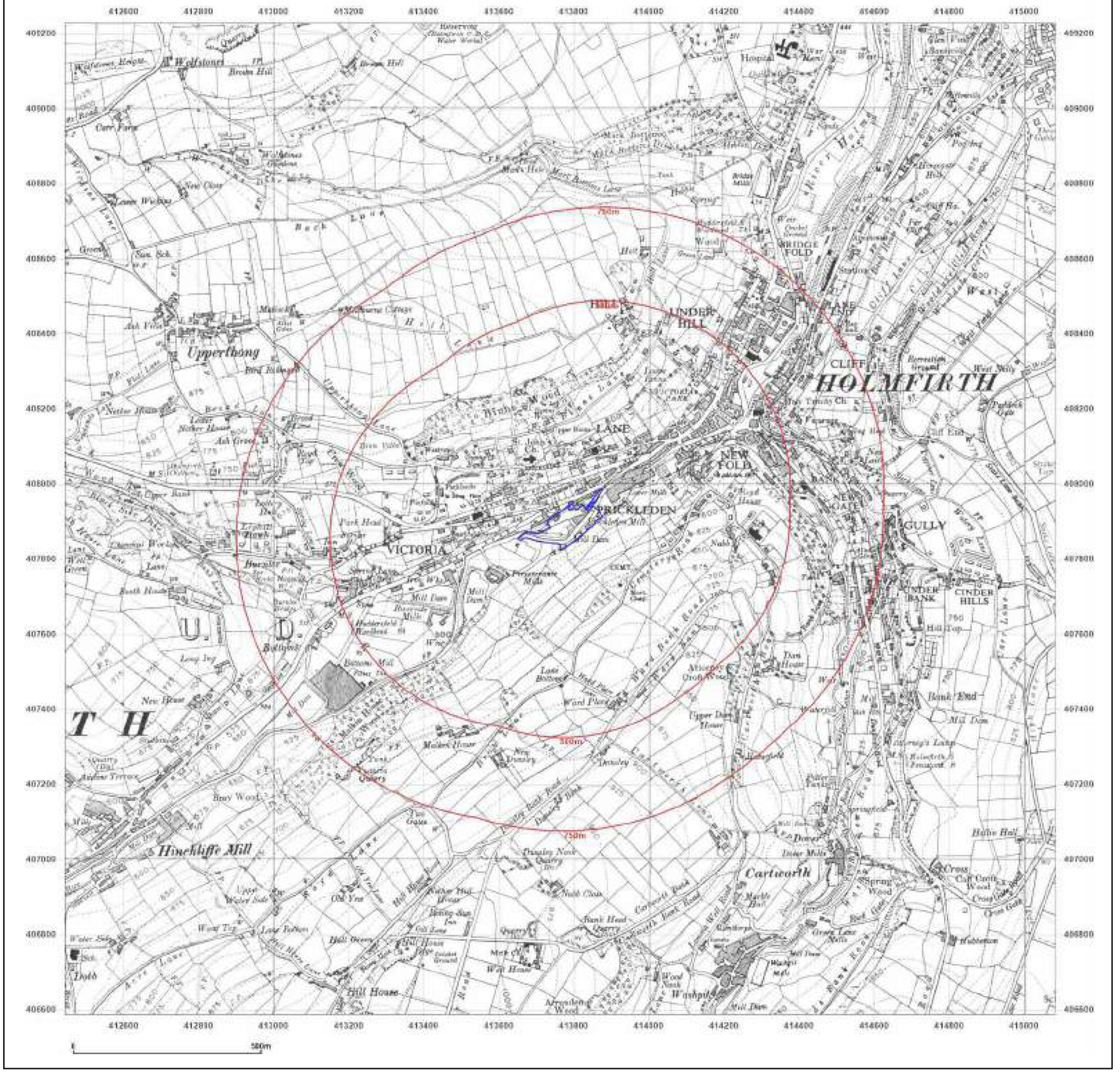

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: Provisional

Map date: **1965-1970**

Scale: 1:10,560

Printed at: 1:10,560

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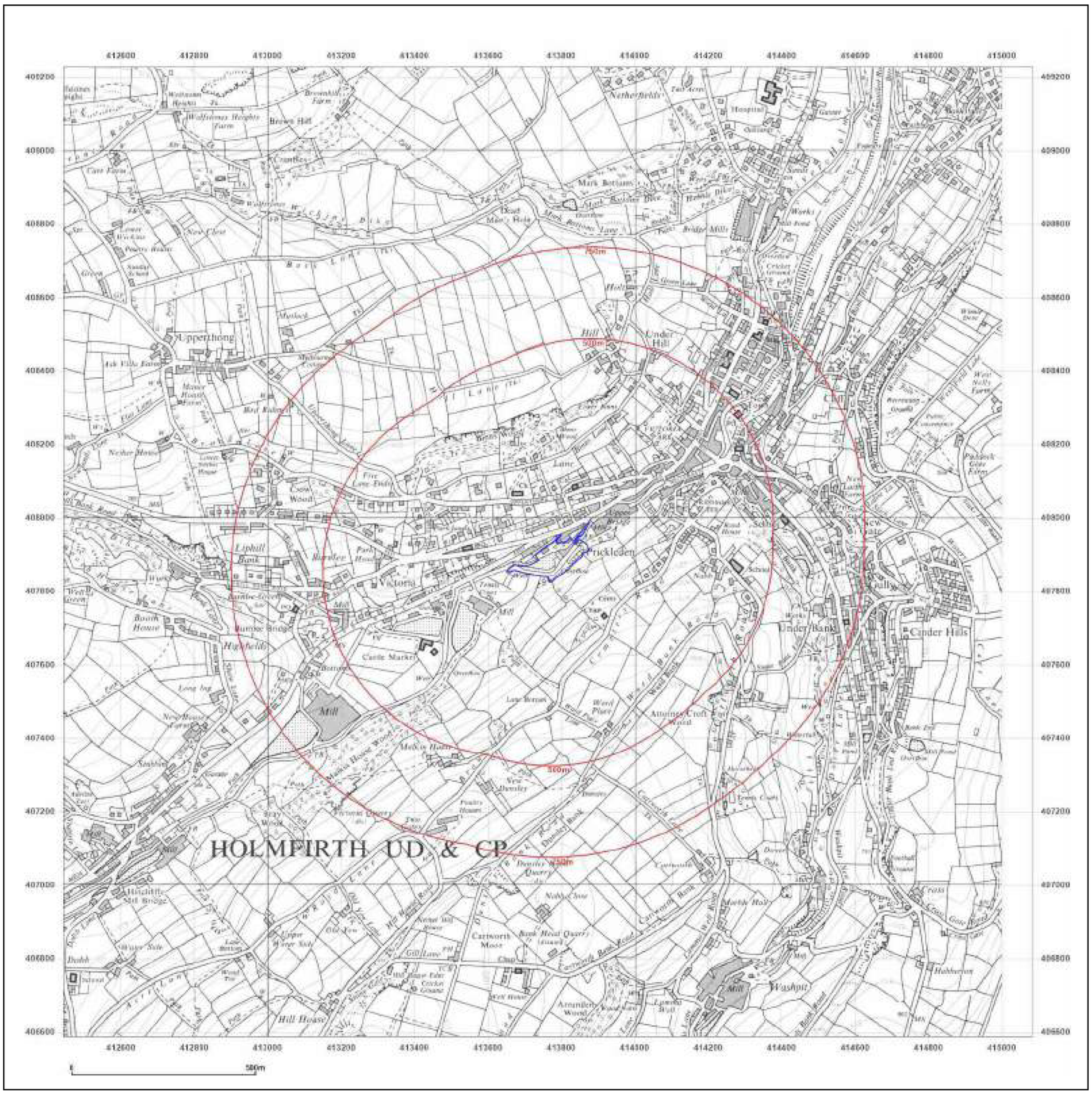

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: Provisional

Map date: **1970**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1970
Edition N/A
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Production date: 02 December 2021

Map legend available at:
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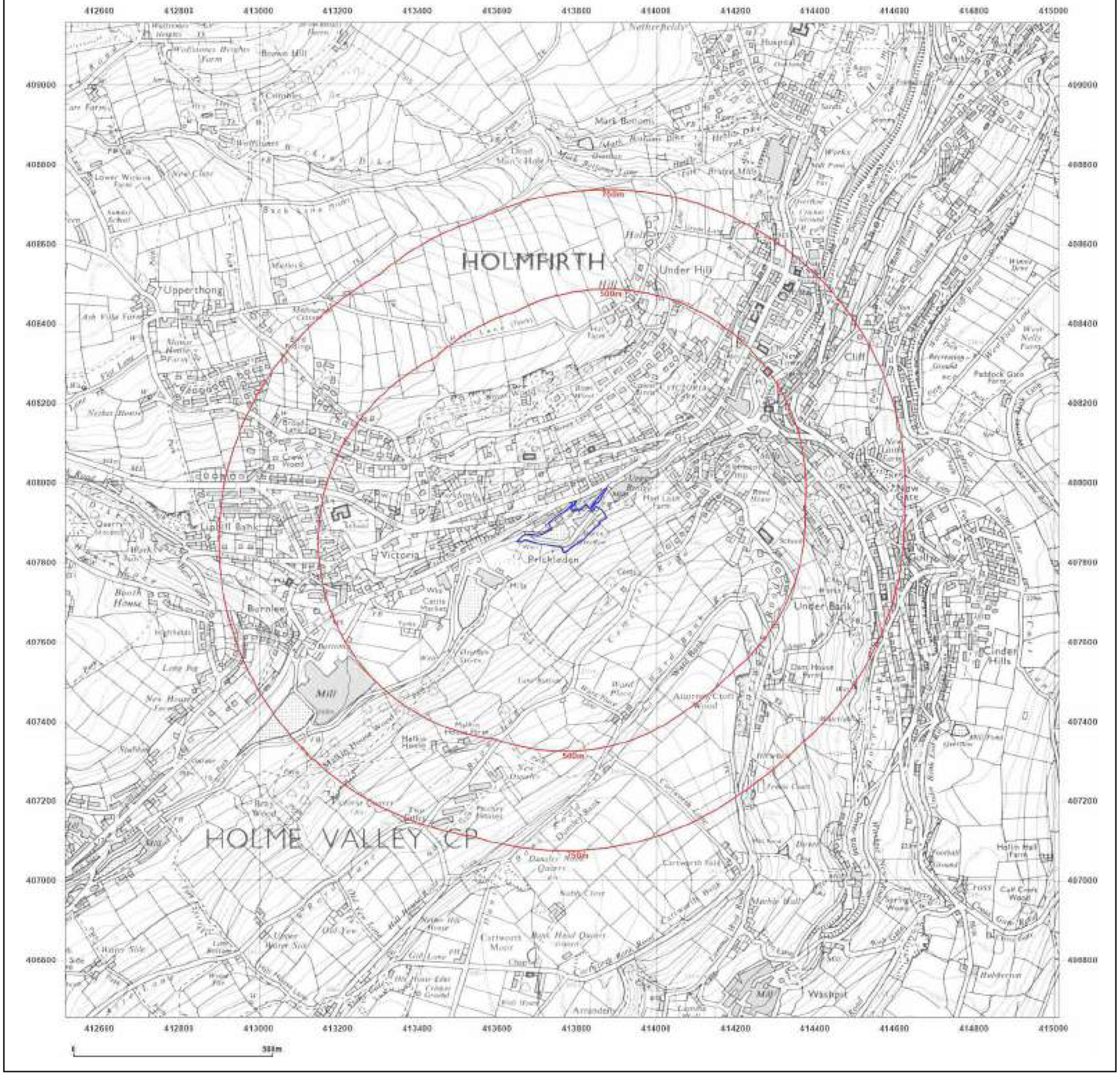

Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid

Map date: **1980**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1976
Revised 1980
Edition N/A
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Production date: 02 December 2021

Map legend available at:
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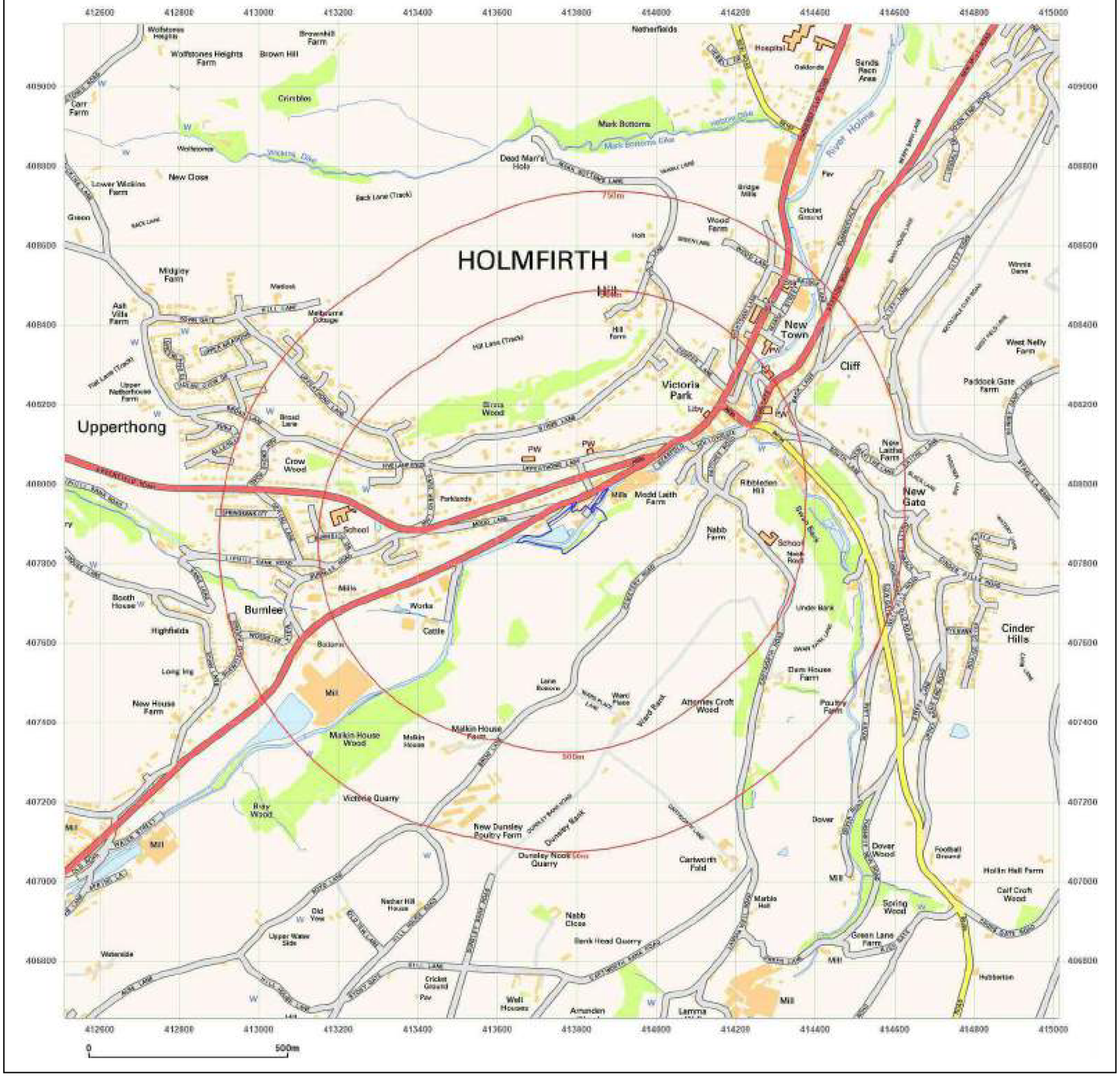

Groundsure
INSIGHTS

Site Details:

413784 407907

Client Ref:	G1342
Report Ref:	GS-8375524
Grid Ref:	413763, 407907

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

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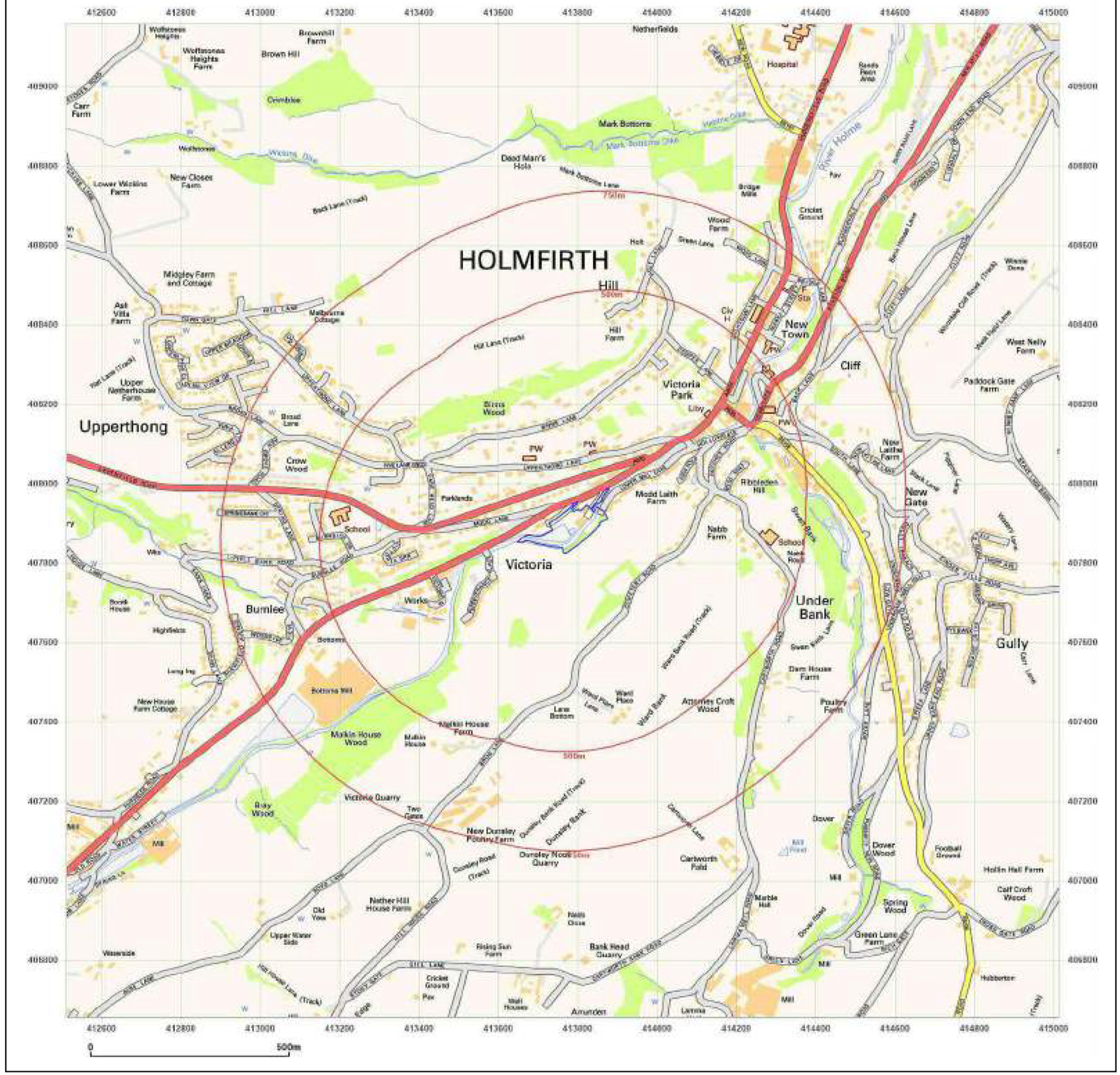
Production date: 02 December 2021

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



Groundsure
INSIGHTS

Site Details:

413784 407907

Client Ref:	G1342
Report Ref:	GS-8375524
Grid Ref:	413763, 407907

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

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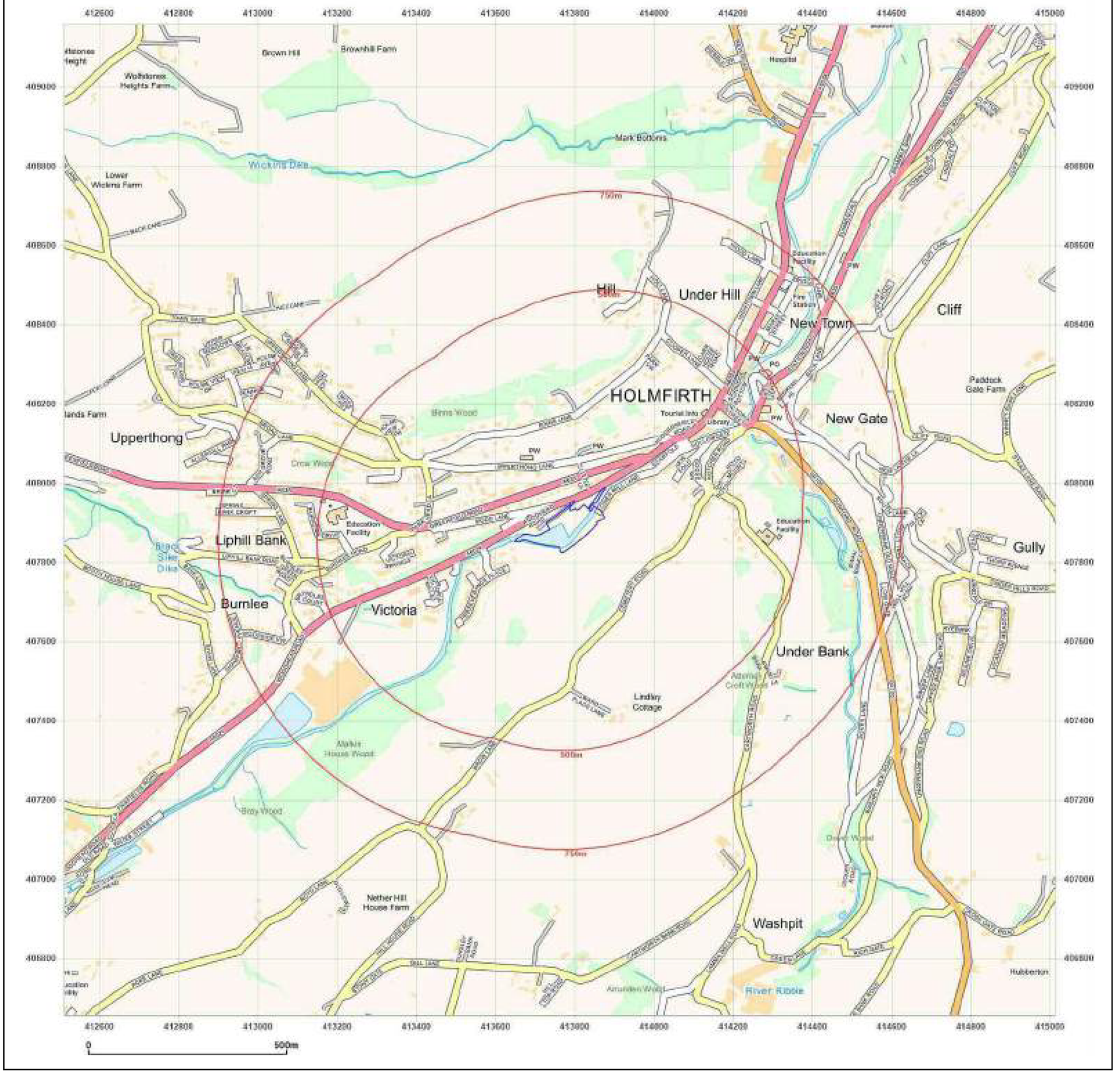
W: www.groundsure.com

Production date: 02 December 2021

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



Groundsure INSIGHTS

Site Details:

413784 407907

Client Ref: G1342
Report Ref: GS-8375524
Grid Ref: 413763, 407907

Map Name: National Grid
Map date: **2021**
Scale: 1:10,000
Printed at: 1:10,000

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Production date: 02 December 2021

Map legend available at:
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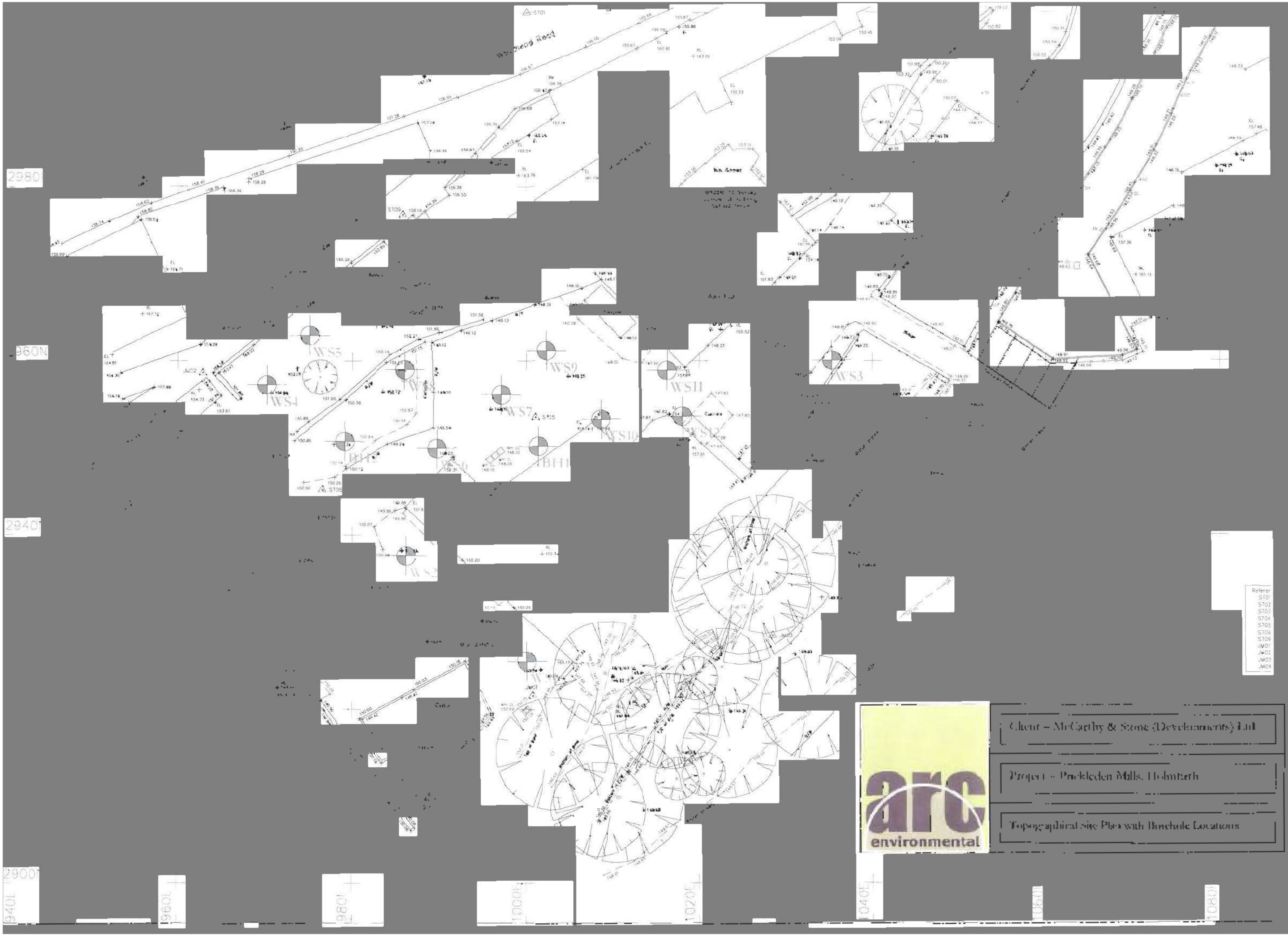
Appendix C ARC ENVIRONMENTAL EXPLORATORY HOLE LOGS


Woodhead Road
ST01
ST05
ST06
ST09
WS2
WS3
WS4
WS5
WS6
WS7
WS8
WS9
WS10
WS11
WS12
JMO2
JMO3
2980
2960N
2940
2900
9940E
9960E
9980
10000
10020
10040
10060
10080
Client – McCarthy & Stone (Developments) Ltd
Project – Prickleden Mills, Holmfirth
Topographical Site Plan with Borehole Locations
arc environmental

Arc Environmental Limited
The Rivergreen Centre
Aykley Heads
Durham
DH1 5TS

BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**BH1**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	16-10-07 16-10-07	148.00	E 1,001.3 N 2,950.2	
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-1.00	B					(1.50)	MADE GROUND - Sandstone rubble.		
1.00-1.45	SPT	N=31	1	146.50		1.50			
2.00-2.45	B					(2.00)	Medium dense to dense clayey very sandy GRAVEL, with cobbles. Gravel and cobbles consist of sandstone.		
2.00-2.45	SPT	N=25							
3.00-3.45	B								
3.00-3.45	SPT	N=32		144.50		3.50			
3.50-3.95	SPT	N=13				(2.30)	Very weak MUDSTONE.		
4.00-4.45	SPT	N=11							
4.50-5.00	B								
5.00	W								
5.80	SPT	N=75/0mm		142.20		5.80	Borehole complete at 5.80m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
16-10-07	00.00	5.80	5.00	150	1.50						WATER: Strike at 1.50m. Water standing at 1.50m after 20mins.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Cable Percussion	Logged By JS

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BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**BH2**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	15-10-07 16-10-07	150.31	E 979.2 N 2,950.8	
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-1.00	B						MADE GROUND - Very soft gravelly clay. Gravel contains sandstone, ash and brick.		
1.00-1.45	B					(2.10)			
1.00-1.45	SPT	N=1							
2.00-2.45	B			148.21		2.10			
2.00-2.45	SPT	N=1					Very soft black very sandy gravelly slightly organic CLAY.		
3.00-3.45	B		▼1			(1.10)			
3.00-3.45	SPT	N=14		147.11		3.20			
							Medium dense grey coarse grained SAND, with sandstone cobbles.		
4.00-4.45	SPT	N=44		146.21		(0.90) 4.10			
							Weathered SANDSTONE.		
5.00-5.24	SPT	118/240mm		145.07		(1.14) 5.24			
							Borehole complete at 5.24m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
15-10-07	00.00	4.50	4.50	150	3.00						WATER: Strike at 3.00m. Water dropped to 2.30m after 20mins.
16-10-07	00.00	5.24	4.50	150							

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Cable Percussion	Logged By JS

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BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS1**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	17-10-07	150.04	E 1,000.1 N 2,925.5	
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	B			149.84		0.20	MADE GROUND - Overgrown grass over dark black brown ash gravel.		
0.50-1.00	B			149.04		(0.80) 1.00	MADE GROUND - Loose dark brown clayey sandy gravel. Gravel contains sandstone and brick.		
1.00-2.00	B						MADE GROUND - Very soft dark brown sandy clay, with sandstone gravels and cobbles.		
1.00-1.45	SPT	N=1							
2.00-3.00	B			147.04		(2.00) 3.00			
2.00-2.45	SPT	N=1							
3.00-3.30	B			146.74		(0.30) 3.30	Very soft brown sandy CLAY.		
3.00-3.45	SPT	N=1	1						
3.30-4.00	B			145.94		(0.80) 4.10	Grey brown clayey sandy GRAVEL.		
4.00-4.45	SPT	N=62		145.59		(0.35) 4.45	Weak dark grey brown MUDSTONE.		
							Borehole complete at 4.45m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Strike at 3.30m. Water standing at 2.710m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

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Aykley Heads
Durham
DH1 5TS

BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS10**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	16-10-07	147.99	E 1,008.7 N 2,953.4	
Contractor				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	B			147.69		(0.30) 0.30	MADE GROUND - Overgrown grass over dark brown brick gravel.		
0.50-0.80	B			147.19		(0.50) 0.80	MADE GROUND - Brick and sandstone gravel.		
0.80-1.00	B								
1.00-1.40	B			146.69		(0.50) 1.30	Loose green grey brown silty SAND.		
1.00-1.45	CPT	N=9							
1.40-2.00	B		1						
2.00-2.75	B			145.24		(1.45) 2.75	Medium dense grey brown clayey sandy GRAVEL. Gravel consists of sandstone.		
2.00-2.45	SPT	N=15							
2.75-3.20	SPT	N=41		144.79		(0.45) 3.20	Very weak dark grey MUDSTONE, highly weathered.		
							Borehole complete at 3.20m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	WATER: Strike at 1.50m. Water standing at 1.58m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

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Aykley Heads
Durham
DH1 5TS

BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS11**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	16-10-07	147.95	E 1,016.2 N 2,958.9	
Contractor				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.40	B			147.55		(0.40) 0.40	MADE GROUND - Rough grass over dark brown sandy gravel, with sandstone cobbles.		
0.40-0.80	B			147.15		(0.40) 0.80	MADE GROUND - Sandstone cobbles.		
0.80-1.00	B						MADE GROUND - Soft dark grey sandy slightly gravelly SILT. Gravel consists of sandstone, ash and brick.		
1.00-1.60	B								
1.00-1.45	SPT	N=6	▼1	146.35		(0.80) 1.60			
1.60-2.00	B						Medium dense clayey sandy GRAVEL. Gravel consists of sandstone.		
2.00-2.50	B								
2.00-2.45	CPT	N=22				(1.40)			
2.50-3.00	B			144.95		3.00			
3.00-3.50	B						Medium dense grey brown clayey sandy GRAVEL. Gravel consists of sandstone.		
3.00-3.45	SPT	N=21							
3.50-4.00	B					(1.45)			
4.00-4.45	SPT	N=21		143.50		4.45			
							Borehole complete at 4.45m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	WATER: Strike at 1.50m. Water standing at 3.00m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

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Aykley Heads
Durham
DH1 5TS

BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS12**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	18-10-07	147.80	E 1,018.1 N 2,953.6	
Contractor				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.40	B			147.40		(0.40) 0.40	MADE GROUND - Rough grass over dark brown sandy brick, sandstone and ash gravel.		
0.40-1.00	B			147.30		0.50	Soft green brown sandy CLAY.		
				146.80		(0.50) 1.00	Soft orange brown sandy CLAY.		
1.00-1.50	B						Loose to medium dense orange brown clayey very sandy GRAVEL, with cobbles. Gravel consists of sandstone.		
1.00-1.45	SPT	N=7							
1.50-2.00	B								
2.00-2.45	SPT	N=14		144.80		(2.00) 3.00			
3.00-3.65	B						Dense dark grey brown clayey sandy GRAVEL. Gravel consists of sandstone.		
3.00-3.45	SPT	N=36		144.20		(0.60) 3.60			
3.65-3.92	SPT	N=75/265mm		144.15		3.65	Weak dark grey MUDSTONE, highly weathered.		
				143.89		3.92	Weak light brown SANDSTONE, highly weathered.		
							Borehole complete at 3.915m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	WATER: Strike at 1.00m. Water standing at 1.70m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

AGS3 UK BH 07-028 BH & WS LOGS.GPJ AGS3_ALL.GDT 20/12/11

Arc Environmental Limited
The Rivergreen Centre
Aykley Heads
Durham
DH1 5TS

BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS2**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	18-10-07	150.16	E 986.3 N 2,937.5	
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				150.11		0.05	MADE GROUND - Overgrown grass over loose yellow brown sandstone gravel.		
0.20-0.70	B			150.06		0.10	MADE GROUND - Tarmac.		
				149.96		(0.40) 0.20	MADE GROUND - Brown sandy gravelly cobbles. Cobbles consist of sandstone.		
				149.56		0.60	MADE GROUND - Black sandy gravel. Gravel consists of ash, sandstone and brick.		
0.70-1.00	B			149.46		0.70	MADE GROUND - Yellow brown sandy gravel. Gravel consists of sandstone.		
1.00-1.70	B								
1.00-1.45	SPT	N=2				(1.00)	Very soft orange brown sandy slightly gravelly CLAY. Gravel consists of sandstone.		
				148.46		1.70			
1.70-2.00	B						Very soft black sandy slightly gravelly organic CLAY, of intermediate plasticity.		
2.00-2.30	B					(0.60)			
2.00-2.45	SPT	N=1		147.86		2.30			
2.30-2.70	B					(0.40)	Very soft green grey sandy SILT.		
				147.46		2.70			
2.70-3.00	B						Medium dense grey brown clayey sandy GRAVEL.		
3.00-3.50	B								
3.00-3.45	SPT	N=12				(1.30)			
3.50-4.00	B								
				146.16		4.00			
4.00-4.60	B						Dark grey MUDSTONE, Highly weathered.		
4.00-4.45	SPT	N=22				(1.05)			
4.60-5.05	SPT	N=31							
				145.11		5.05			
							Borehole complete at 5.05m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	WATER: Strike at 2.60m. Water standing at 3.00m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

AGS3 UK BH 07-028 BH & WS LOGS.GPJ AGS3_ALL.GDT 20/12/11

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BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS3**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	18-10-07	148.40	E 1,035.3 N 2,960.0	
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	B						MADE GROUND - Rough grass over dark brown sandy gravel, with sandstone cobbles. Gravel consists of ash, sandstone and brick.		
						(0.80)			
0.50-1.00	B			147.60		0.80			
							MADE GROUND - Very soft dark brown sandy clay, with coal fragments.		
1.00-1.50	B								
1.00-1.45	CPT	N=1							
						(1.50)			
1.50-2.00	B		1						
2.00-2.30	B								
2.00-2.45	SPT	N=2		146.10		2.30			
2.30-2.75	B						Dark grey clayey sandy GRAVEL. Gravel consists of sandstone.		
						(0.45)			
2.75-3.00	SPT	N=75/245mm		145.65		2.75			
				145.41		3.00	Yellow brown fine to coarse grained SANDSTONE, highly weathered.		
							Borehole complete at 2.995m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Strike at 2.00m. Water standing at 2.00m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

AGS3 UK BH 07-028 BH & WS LOGS.GPJ AGS3_ALL.GDT 20/12/11

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BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS4**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	17-10-07	151.89	E 970.2 N 2,957.2	
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10-0.50	B			151.84		0.05	MADE GROUND - Overgrown grass over loose black sandy gravel.		
0.50-1.00	B					(0.95)	MADE GROUND - Dense light brown sandy gravel, with cobbles. Gravel consists of sandstone.		
				150.89		1.00			
1.00-1.45	CPT	N=4					Very soft brown sandy CLAY, with mudstone gravels (possible made ground).		
1.00-1.50	B					(0.80)			
1.50-2.00	B								
				150.09		1.80			
2.00-2.45	SPT	N=13					Loose to medium dense grey brown clayey sandy GRAVEL (possible made ground) Gravel consists of mudstone.		
2.00-2.50	B								
2.50-3.00	B								
3.00-3.45	SPT	N=8							
3.00-3.50	B					(2.90)			
3.50-4.00	B								
4.00-4.45	SPT	N=12							
4.00-4.70	B								
				147.19		4.70			
4.70-5.00	B						Grey brown silty slightly gravelly SAND.		
			1	147.09		4.80	Grey silty SAND, with occasional decomposed rootlets.		
				146.89		5.00			
5.00-5.45	SPT	N=15					Loose grey brown silty SAND.		
5.00-5.20	B			146.69		5.20			
5.20-5.50	B						Medium dense yellow brown gravelly SAND.		
5.50-5.86	SPT	N=96/360mm				(0.50)			
				146.19		5.70			
				146.03		5.86	Yellow brown fine to coarse grained SANDSTONE, highly weathered.		
							Borehole complete at 5.86m.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

WATER: Strike at 5.00m. Water standing at 3.80m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

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BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS5**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	17-10-07	152.05	E 975.1 N 2,962.9	
Contractor				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				151.90		0.15	MADE GROUND - Overgrown grass over brown sandstone gravel.		
0.15-0.50	B						MADE GROUND - Firm dark brown sandy gravelly clay. Gravel contains brick and tile.		
0.50-1.00	B					(0.85)			
				151.05		1.00			
1.00-1.45	SPT	N=4					Soft dark brown sandy CLAY. Gravel consists of sandstone and coal.		
1.00-1.70	B					(0.65)			
				150.40		1.65			
1.70-2.00	B					(0.35)	Soft brown sandy slightly gravelly CLAY.		
				150.05		2.00			
2.00-2.45	SPT	N=8					Loose grey mudstone GRAVEL.		
2.00-2.70	B					(0.75)			
				149.30		2.75			
2.70-3.00	B						Medium dense dark grey mudstone GRAVEL.		
3.00-3.45	SPT	N=29							
3.00-3.50	B								
3.50-4.00	B					(2.15)			
4.00-4.45	SPT	N=17	▼						
4.00-4.90	B								
				147.15		4.90			
4.90-5.10	B			146.95		5.10	Firm to stiff dark orange brown sandy CLAY.		
5.00-5.45	SPT	N=8					Loose grey silty SAND, with occasional decomposed rootlets.		
5.10-5.50	B					(0.70)			
5.50-6.00	B								
				146.25		5.80			
6.00-6.23	CPTN=75/230mm					(0.43)	Yellow brown fine to coarse grained SANDSTONE, highly weathered.		
				145.82		6.23			
							Borehole complete at 6.23m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	WATER: Strike at 4.00m. Water standing at 4.00m upon completion.

All dimensions in metres Scale 1:43.75	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

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BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS6**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	16-10-07	148.30	E 989.7 N 2,949.9	
Contractor				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10-0.50	B			148.20		0.10	MADE GROUND - Brown sandstone gravel.		
0.50-0.90	B					(0.80)	MADE GROUND - Grey black clayey sandy gravel, with sandstone cobbles and 'strong' hydrocarbon odour and black staining. Gravel consists of sandstone.		
0.90-1.10	B		▼	147.40		0.90			
1.00-1.45	CPT	N=26		147.20		1.10	MADE GROUND - Grey brown clayey sandy gravel, with concrete fragments.		
1.10-1.50	B					(0.90)	Medium dense dark grey clayey sandy GRAVEL, with decomposed rootlets at the base.		
1.50-2.00	B			146.30		2.00			
2.00-2.50	B					(0.80)	Very weak dark grey MUDSTONE, highly weathered.		
2.00-2.45	SPT	N=17							
2.50-3.00	B			145.50		2.80			
3.00-3.45	SPT	N=32				(0.65)	Weak dark grey MUDSTONE.		
				144.85		3.45			
							Borehole complete at 3.45m.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

WATER: Strike at 1.00m. Water standing at 1.95m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

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BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS7**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	16-10-07	148.09	E 997.1 N 2,956.1	
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.30	B			147.79		(0.30) 0.30	MADE GROUND - Sandstone and brick gravel.		
0.30-0.85	B			147.24		(0.55) 0.85	MADE GROUND - Compacted black brown slightly clayey gravel. Gravel consists of ash and brick.		
0.85-1.00	B		▼1	147.09		1.00	Dark grey clayey sandy GRAVEL. Gravel consists of sandstone (possible made ground).		
1.00-1.50	B								
1.00-1.45	SPT	N=23					Grey brown SANDSTONE, highly weathered.		
1.50-2.00	B			146.49		(0.60) 1.60			
2.00-2.33	SPT	N=75/325mm		145.77		(0.73) 2.33	Brown SANDSTONE, highly weathered.		
							Borehole complete at 2.325m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Strike at 1.00m. Water standing at 1.00m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

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BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS8**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	17-10-07	150.90	E 986.0 N 2,959.0	
Contractor				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				150.80		0.10	MADE GROUND - Overgrown grass over dark brown brick gravel.		
0.10-0.50	B						MADE GROUND - Loose brown clayey sandy gravel, with cobbles. Gravel consists of sandstone.		
0.50-1.00	B					(1.20)			
1.00-1.30	B								
1.00-1.45	SPT	N=5		149.60		1.30			
1.30-2.00	B						MADE GROUND - Very soft dark grey with orange mottling sandy gravelly SILT.		
						(1.20)			
2.00-2.50	B								
2.00-2.45	SPT	N=4	▼1	148.40		2.50			
2.50-2.80	B			148.10		(0.30) 2.80	MADE GROUND - Very soft grey silty sand, with occasional brick gravels and decomposed rootlets.		
2.80-3.00	B			147.90		3.00	MADE GROUND - Loose grey brown clayey sandy gravel, with decomposed rootlets.		
3.00-3.50	B								
3.00-3.45	SPT	N=1				(0.50)	Very soft grey brown sandy organic CLAY, with organic plant remains and a slight organic 'peaty' odour.		
				147.40		3.50			
3.50-4.00	B						Medium dense grey brown clayey sandy sandstone GRAVEL.		
						(0.70)			
4.00-4.45	SPT	N=66		146.70		4.20			
				146.45		4.45	Yellow brown fine to coarse grained SANDSTONE, highly weathered.		
							Borehole complete at 4.45m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Strike at 2.50m. Water standing at 2.945m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

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The Rivergreen Centre
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BOREHOLE LOG

Project				BOREHOLE No
Land off Woodhead Road, Holmfirth				**WS9**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	16-10-07	148.05	E 1,002.3 N 2,961.2	
Contractor				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	B			147.95		0.10	MADE GROUND - Dark brown sandy brick and sandstone gravel.		
							MADE GROUND - Dark brown sandy brick gravel, with sandstone cobbles.		
0.50-1.00	B								
						(1.70)			
1.00-2.00	B								
1.00-1.45	CPT	N=14	1						
				146.25		1.80			
							Grey brown SANDSTONE, highly weathered.		
2.00-2.19	SPT	N=75/190mm				(0.39)			
				145.86		2.19			
							Borehole complete at 2.19m.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Strike at 1.50m. Water standing at 1.68m upon completion.

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Windowless Sampling	Logged By SWWS

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DYNAMIC PROBE LOG

Project				PROBE No
Land off Woodhead Road, Holmfirth				DP2
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	18-10-07	150.16	E 986.3 N 2,937.5	
Contractor				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1				
2				
3				
4				
5	7 15 15 19 20			

Hammer Wt (kg)	
Hammer Drop (mm)	
Cone Dia (mm)	
Cone Type	DPSH
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Dynamic Probe	Logged By SWWS

AGS3 DYNAMIC PROBE 07-028 BH & WS LOGS.GPJ AGS3_ALL.GDT 20/12/11

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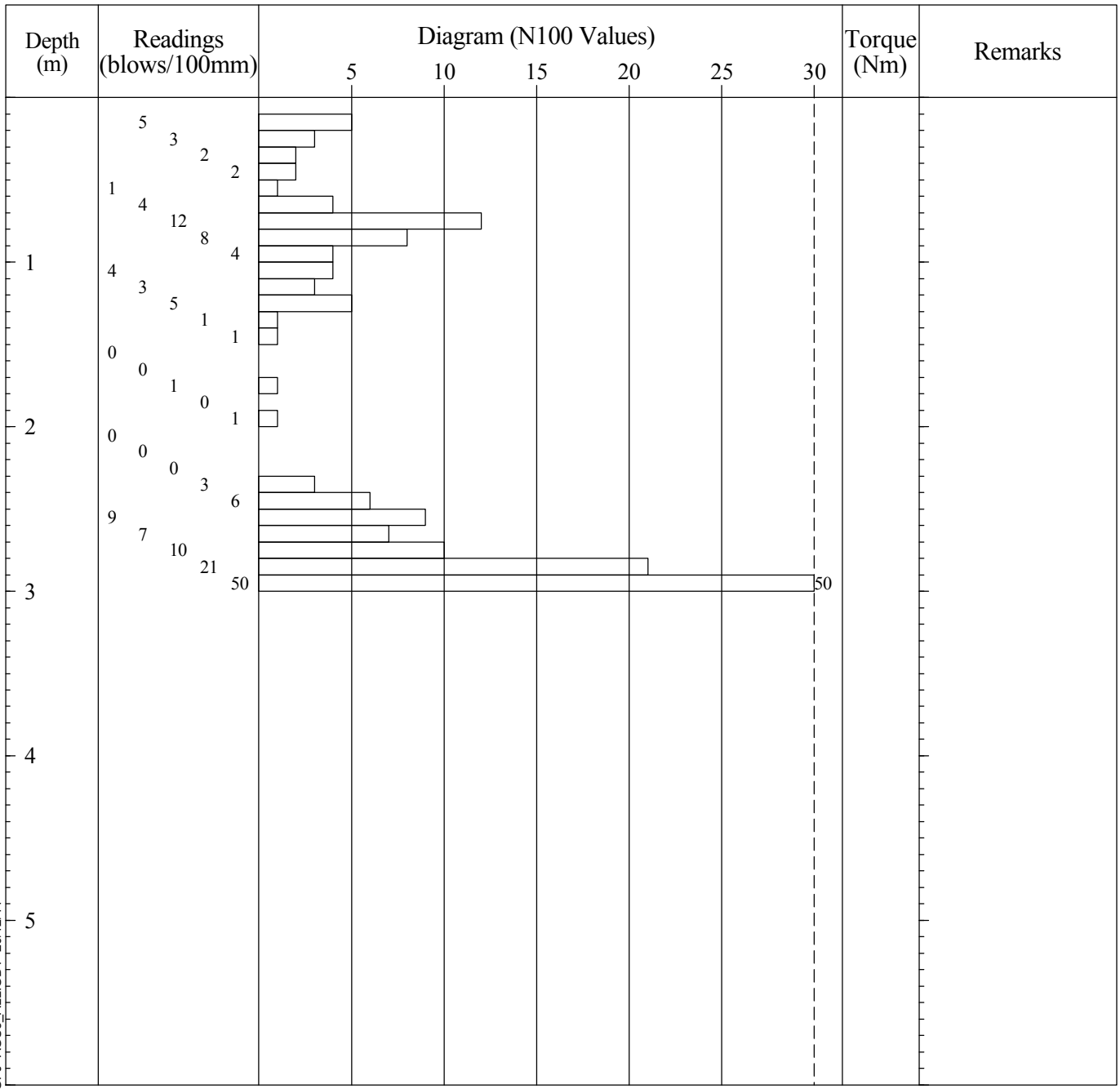
DYNAMIC PROBE LOG

Project				PROBE No
Land off Woodhead Road, Holmfirth				**DP3**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
07-028	18-10-07	148.40	E 1,035.3 N 2,960.0	
Contractor				Sheet 1 of 1

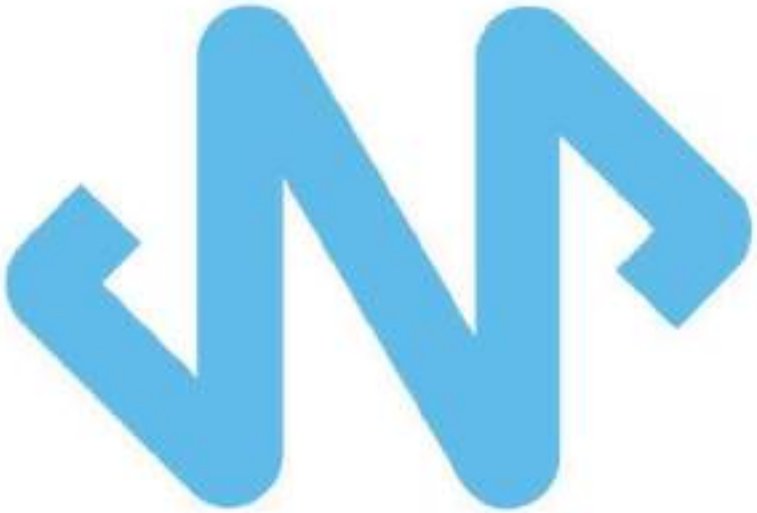


Hammer Wt (kg)	
Hammer Drop (mm)	
Cone Dia (mm)	
Cone Type	DPSH
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Client Conroy Brook (Developments) Ltd	Method/ Plant Used Dynamic Probe	Logged By SWWS

AGS3 DYNAMIC PROBE 07-028 BH & WS LOGS.GPJ AGS3_ALL.GDT 20/12/11



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