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**Geo-environmental
Ground Investigation Report
ON
PROPOSED RESIDENTIAL DEVELOPMENT
AT
STATION ROAD, SKELMANTHORPE
FOR
YORKSHIRE COUNTRY PROPERTIES LTD**

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Prepared by

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0.0 **EXECUTIVE SUMMARY**

SITE	The site is roughly rectangular, with a small extension to encompass the area of field behind the properties adjacent to the north east corner of the site. There are residential properties to the north, and to the west of the site beyond Station Road, and fields to the south and east. The overall site area is approximately 0.8ha. At the time of the site investigation, the northern half of the site was overgrown with brambles, with the remainder of the site covered by moderately long grass. The site slopes from south to north at an average grade of approximately 1 in 15. A high point of 148.84m AOD is located in the southern corner of the site and a low point of approximately 140.85m AOD located in the northern corner, close to Station Road.
HISTORY	Since 1854, the site itself has been shown as open field with a row of houses immediately to the north since 1854. Railway cuttings and coal workings have been present within 100m of the site since 1892. These workings have not been shown as active since 1993, indicating a likelihood of infilled ground in the vicinity of the site.
GEOLOGY	The majority of the site is underlain by the Pennine Lower Coal Measures Formation consisting of Sandstone, Mudstone and Siltstone. Encroaching on the southern boundary is the Pennine Lower Coal Measure Formation consisting only of Sandstone. An area of infilled ground is shown to encroach on the site from the north east. An area of voided worked ground is shown adjacent to the south of the site, as well as a large area of artificial ground close to the northern site boundary. The areas of voided and infilled ground are thought to be associated with the former railway cuttings, and historical coal extraction respectively. The fieldwork generally proved a shallow depth of topsoil overlying clays, with a mudstone bedrock. Generally, boreholes proved layers of clay, mudstone and coal within approximately 10m from the surface.
MINING/QUARRYING	The site is stated in a report by Rogers Geotechnical Services Ltd to be within a surface area which could be affected by past underground mining. A coal seam is shown outcropping in the north eastern part of the site. This report also states that there is likely two coal seams at less than 30m depth that may have been worked historically. An area of infilled ground is shown to

encroach on the site from the north east. This is thought to be associated with historical coal extraction respectively.

HYDROLOGY	The nearest recorded named water course is Baildon Dike located 137m north of the site. The site lies outside of current EA defined flood zones.
HYDROGEOLOGY	The bedrock underlying the site is classified as a Secondary (A) Aquifer. During the trial pit excavations, ground water seepage was noted in TP03 and TP06, at a depth of 1.3m within the coal seam and is thought to be perched water trapped in the seam. Ground water was also encountered immediately below the gas taps in BH01A and BH04A during the gas sampling on 06.03.19, however this is thought to be due to surface water percolation into the standpipes, rather than a high groundwater level.
HAZARDOUS GAS	The property is not in an area where any Radon Protection measures are required. A maximum carbon dioxide concentration of 3.8% and methane concentration of 0.5 was recorded in BH02. A maximum flow rate of 16 l/hr was detected in the monitoring stations, however this has been attributed to the high water level detected in the standpipe at the time of sampling and has thus been disregarded in gas regime calculations. No flow rate has been recorded in any of the other measurements taken. Based on the maximum concentrations and gas flow rates measured, the gas regime found on this site can be currently classified as Green, or CS1 by BS 8485:2105 Table 2 due to the low carbon dioxide and flow rate being recorded. These results are only preliminary, and testing is currently ongoing. A detailed analysis of the results and any gas protection measures required will be confirmed on completion of the on-site gas testing in a separate report.
CONTAMINATION	None of the samples taken from the topsoil or made ground on site displayed any elevated levels of contaminants. There were no elevated levels of PAH (Total) or PAH compounds. No asbestos was detected in the samples of made ground taken from site.
REMEDIATION	Since no areas of contamination were found, no remediation is expected to be necessary at this stage. If any contamination is discovered, a remediation strategy should be agreed upon.

FOUNDATIONS

We would therefore suggest that the proposed two storey residential constructions should be constructed on strip/trench fill footings founded entirely onto the clay strata. Where mudstone is encountered within the excavations, the foundations should be deepened to lie entirely onto the mudstone strata to avoid differential settlement. Any properties constructed in or adjacent to the area of made ground on site should be constructed using a piled foundation.

1.0 INTRODUCTION

- 1.1 As requested by Yorkshire Country Properties, this practice carried out ground and contamination investigation works to the proposed development at Station Road, Skelmanthorpe.
- 1.2 The purpose of the report was to:-
- 1.2.1 Identify the nature of the near surface strata, in order to enable recommendations to be made as to the most economic foundation solution for the proposed residential development.
 - 1.2.2 To identify any areas of contaminated ground.
 - 1.2.3 Propose a suitable outline remediation strategy, which will enable the site to be developed safely, to the satisfaction of the overseeing regulators and in compliance with the current environmental standards.
 - 1.2.4 Determine if shallow mine workings would adversely affect the site.
- 1.3 Soil sampling was undertaken via trial pits and boreholes to determine the near surface strata. Distributed samples were taken for testing to ascertain the nature of the soils and fills present.
- 1.4 The conclusions and recommendations made in this report are limited to the findings of the preliminary Geotechnical Survey. The report is made on condition that Haigh Huddleston Associates will not in any circumstances be liable for loss, arising directly or indirectly from ground conditions encountered between trial pits and boreholes, which have not been revealed by the investigation.
- 1.5 Any opinion given on the possible configuration of strata between trial pit and borehole locations and below maximum depth of the investigation is for guidance only. Any remarks on groundwater conditions made are based solely on observations made at the time of investigation. Kindly note that levels may differ from those reported due to seasonal variations or other influences.
- 1.6 Furthermore, there is the possibility that any trial pits or boreholes undertaken as part of the investigatory works may be within the influence of existing or proposed foundations or excavations. Haigh Huddleston Associates cannot be held responsible for any failure of any excavations, foundations or structures within the influence of the trial pits or boreholes.

2.0 THE SITE

- 2.1 The site is located to the south east of Station Road, Skelmanthorpe. It is situated around Ordnance Survey grid reference 423248,411115. A site location plan is included in Appendix A.
- 2.2 The site is roughly rectangular, with a small extension to encompass the area of field behind the properties adjacent to the north east corner of the site. There are residential properties to the north, and to the west of the site beyond Station Road, and fields to the south and east. The overall site area is approximately 0.8ha.
- 2.3 At the time of the site investigation, the northern half of the site was overgrown with brambles, with the remainder of the site covered by moderately long grass.
- 2.4 Tree growth and shrubs were noted to the site boundaries, in particular the southern corner of the site, where three mature oak trees were noted.
- 2.5 The north western site boundary along Station Road was formed by a dilapidated stone wall and wooden fence, overgrown by thick brambles. The remaining boundaries are formed by a wire fence with wooden posts, observed in places to have fallen down. A retaining wall separates the site from the existing properties to the north east, with the off-site properties at a lower level than the site.
- 2.6 The site slopes from south to north at an average grade of approximately 1 in 15. A high point of 148.84m AOD is located in the southern corner of the site and a low point of approximately 140.85m AOD located in the northern corner, close to Station Road.

3.0 SITE HISTORY

A number of historical Ordnance Survey plans from 1854-2014 have been consulted. These are contained for reference within Appendix C to the rear of the report. Below is a brief description outlining the significant developments that may affect future construction of the site.

Date	Historical uses on site	Historical findings within 100m perimeter of the site	Historical findings further than 100m perimeter of the site
1854	i) The site is shown as a single undeveloped field.	i) Further fields in all directions. ii) Road shown adjacent to north west boundary. iii) Row of houses adjacent to the northern boundary.	Village of Skelmanthorpe approximately 250m to the south.
1892-1893	i) The on-site features are similar to the previous sheet.	i) Railway cuttings running east to west, immediately south of the site. ii) Footpath to the eastern site boundary.	i) Gas Works with tanks approximately 200m south east of the site.
1904-1906	i) The on-site features are similar to the previous sheet.	i) Emley Moor Collieries labelled 50m to the north west of the site.	i) Housing developments at Park Gate approximately 150m north east of the site. ii) Railway sidings associated with collieries located approximately 110m north east of the site. iii) Reservoir shown approximately 200m south east of the site.
1913-1916	i) The on-site features are similar to the previous sheet.	i) No significant developments within 100m of the site.	i) No significant developments further than 100m from the site.
1929-1932	i) The on-site features are similar to the previous sheet.	i) No significant developments within 100m of the site.	i) Expansion of Skelmanthorpe village to south of site.
1938	i) The on-site features are similar to the previous sheet.	i) No significant developments within 100m of the site.	i) No significant developments further than 100m from the site.
1948	i) The on-site features are similar to the previous sheet.	i) No significant developments within 100m of the site.	i) No significant developments further than 100m from the site.
1951-1955	i) The on-site features are similar to the previous sheet.	i) No significant developments within 100m of the site.	i) No significant developments further than 100m from the site.
1959-1960	i) The on-site features are similar to the previous sheet.	i) Collieries to north west now labelled 'Mine'.	i) No significant developments further than 100m from the site.
1967-1969	i) The on-site features are similar to the previous sheet.	i) Mine Workings extend to within 10m of site.	i) No significant developments further than 100m from the site.
1979-1983	i) The on-site features are similar to the previous sheet.	i) Further Expansion of Skelmanthorpe Village. ii) Former colliery areas now labelled 'Active Workings'.	i) No significant developments further than 100m from the site.
1986-1993	i) The on-site features are similar to the previous sheet.	i) Railway Labelled as dismantled. ii) Mine workings no longer shown. iii) Active workings no longer labelled, area now labelled 'works'	i) No significant developments further than 100m from the site.

Date	Historical uses on site	Historical findings within 100m perimeter of the site	Historical findings further than 100m perimeter of the site
2002	i) The on-site features are similar to the previous sheet.	i) No significant developments within 100m of the site.	i) No significant developments further than 100m from the site.
2010	i) The on-site features are similar to the previous sheet.	i) Baildon way housing development approximately 100m west of the site.	i) No significant developments further than 100m from the site.
2014	i) The on-site features are similar to the previous sheet.	i) No significant developments within 100m of the site.	i) No significant developments further than 100m from the site.

4.0 SITE GEOLOGY & MINING

- 4.1 The geological information from the Groundsure GeoEnvironmental report has been consulted and we would report as follows:-
- 4.2 An area of infilled ground is shown to encroach on the site from the north east. An area of voided worked ground is shown adjacent to the south of the site, associated with the railway cuttings. A large area of artificial ground is shown close to the northern site boundary. Which is associated with historical coal extraction.
- 4.3 The majority of the site is underlain by the Pennine Lower Coal Measures Formation consisting of Sandstone, Mudstone and Siltstone. Encroaching on the southern boundary is the Pennine Lower Coal Measure Formation consisting only of Sandstone.
- 4.4 A coal seam is shown outcropping in the north eastern part of the site. A mining risk assessment has been undertaken by Rogers Geotechnical Services Ltd (Ref J3916/16/E), and states that there is likely two coal seams at less than 30m depth that may have been worked historically.
- 4.5 The Rogers Geotechnical Services Ltd report states the site is within a surface area which could be affected by past underground mining.
- 4.6 The property is not in area where the Coal Authority has granted, or plans to grant, a licence to remove or otherwise work coal using underground methods. However, reserves of coal exist in the local area which could be worked at some time in the future.
- 4.7 There are no known coal mine entries within, or within 20m of the site.
- 4.8 The south east of the site is identified as being at low risk of landslides. This means that there is a possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place.

5.0 ENVIRONMENTAL CONSIDERATIONS

5.1 Radon

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

No Radon Protective Measures are required.

5.2 Landfill Sites

There are no active or historic landfill sites within 250m of the site. The closest historic landfill is located 402m to the south west, and accepted inert and commercial waste. However, there are large areas of infilled ground recorded immediately northwest and east of the site, thought to be associated with the former areas of open cast mining.

5.3 Flood Risk

The site lies outside of current EA defined flood zones.

5.4 Groundwater

The bedrock underlying the site is classified as a Secondary (A) Aquifer. These are 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.

There are five recorded groundwater abstraction licences recorded within 250m of the site. These were all Category 3 (minor) incidents, and located 138, 157, 158 and 169m to the north, and 194m to the north east of the site.

There are no recorded licensed discharge consents significant to the site.

There are seven recorded pollution incidents in controlled waters in the vicinity of the site. These had only minor water impacts.

The nearest recorded named water course is Baildon Dike located 137m north of the site. This is identified as an inland stream.

The site is not within a Source Protection Zone.

No surface water abstraction licences are recorded within 250m of the site.

6.0 PRELIMINARY CONCEPTUAL SITE MODEL

- 6.1 The initial stage in assessing the risks posed from contaminated land during the redevelopment of a site is to prepare a conceptual model. A generalised conceptual model can be developed highlighting the main pollutant linkages through a contaminant ► pathway ► receptor model for the construction of a residential development. In order to prepare the conceptual model for a particular site the following parameters need to be reviewed as discussed below.
- 6.2 Contamination of existing land can be caused by a number of factors, including:-
- i) Possible historical/current industrial activities.
 - ii) Disposal of waste materials.
 - iii) Storage of materials.
 - iv) A number of natural processes can also lead to hazardous gases and elevated heavy metals.
- 6.3 Potential pathways can include ground and surface water, permeable strata, existing services providing a conduit and voided ground. Potential receptors can include human health, ecosystems, controlled waters and building structures. There are a number of ways that a receptor can be exposed to the contaminant these include, inhalation, direct contact, ingestion, dermal contact and uptake.
- 6.4 There has been little historical land use directly on the site likely to cause contamination. However, there is a low risk of contamination from the following:
- i. Possible ground gas migration from the areas of infilled ground in the vicinity of the site.
 - ii. Historical mine workings/railway cuttings adjacent to the site
- Therefore the potential for some contamination to exist on site is considered to be very low.
- 6.5 Considering the proposed residential end use of the site, there will be two possible human receptor groups exposed to the existing onsite contamination:-
- a) Site operatives during development.
 - b) End users, future site users (the critical receptor is a 6 year old female).
- 6.6 Human receptors may be exposed to site contamination by a number of possible pathways. These pathways are summarised in Table 1 below.

Table 1- Potential Human Exposure Pathways

<u>Human Exposure Pathway</u>	<u>Site Users</u>	<u>Construction Workers</u>
Soil Ingestion	YES	YES
Consumption of Home Grown Vegetables	YES	NO
Dermal Contact	YES	YES
Dust Inhalation	YES	YES
Gases/Vapours	YES	NO

- 6.7 The construction workers will come into contact with any contaminated soil to a far greater extent than future residents. The exposure pathways are generally through dermal contact and indirect ingestion. However their exposure will be for a limited time and the provision and correct use of personnel protective equipment and adequate welfare facilities during construction should restrict their risks to acceptable levels.
- 6.8 The risk of pollution to controlled waters by existing contamination is considered low. There has been no recorded historical usage of the site likely to cause heavy contamination to the ground.
- 6.9 No specific areas of ecological importance have been identified in the initial desk top study. Therefore the site is considered to be in a low risk environmental setting.
- 6.10 It is proposed to construct residential properties on the site with private garden areas. The presence of elevated sulphates and hydrocarbons could affect the long term integrity of buried concrete structures, including foundations and drainage pipes. Plastic water supply pipes can also be damaged by the presence of hydrocarbon contamination.

7.0 FIELDWORK

- 7.1 Site investigation works were undertaken on the 21st of February. A total of ten trial pits were undertaken using a JCB 3CX with back actor and 600mm wide bucket.
- 7.2 In addition to this, seven rotary boreholes were undertaken to determine the underlying strata. Four of these were repeated adjacent to the initial borehole to depths of 3m, and established as monitoring stations to establish the ground gas and groundwater conditions on site. The location of the trial pits and boreholes are indicated on the plan in Appendix A.
- 7.3 Materials encountered in the trial pits and boreholes were examined and categorised. Trial pit and borehole logs are contained within Appendix B of the report.
- 7.4 The site investigation works were designed to achieve comprehensive site coverage within the proposed development area, however the presence of thick brambles in the north of the site restricted investigations in this area. The location of boreholes was further restricted by the presence of overhead wires on site, as the borehole rig could not be used within 10m of these. Trial pit locations were pre-determined, and further testing may be required after site clearance works have been undertaken. A slight depression was noted adjacent the eastern boundary of the site, and TP02 and BH02 were undertaken in this area to determine if any anomalies existed.
- 7.5 Soil samples were removed from the natural and made ground deposits within the trial pits. The samples were removed by operatives wearing gloves and placed into airtight clean plastic containers and glass bottles for transportation to the laboratory.
- 7.6 A total of eight samples from the natural and ground deposits were recovered from the trial holes for chemical analysis during the site investigations in February 2019. The testing was carried out by a UKAS accredited laboratory to nationally or accredited in-house methods. The results of the contamination testing are contained within Appendix C of this report.
- 7.7 A suite of common potential contaminants consisting of heavy metals, phytotoxic metals, sulphates, sulphides and poly-aromatic hydrocarbons was analysed for, including a range of metals and inorganic substances and Asbestos.

7.8 All samples were stored in airtight containers within cool boxes at approximately 4°C until delivery to the laboratory within 48 hours.

8.0 RESULTS OF THE INVESTIGATION

8.1 GEOTECHNICAL INVESTIGATION

- 8.1.1 A copy of the trial hole and borehole logs providing a complete record of strata encountered beneath the proposed development is presented in Appendix B.
- 8.1.2 The fieldwork generally proved a shallow depth of topsoil overlying clays, with a mudstone bedrock.
- 8.1.3 The surface of all the trial pits consisted of rough grass/brambles over a dark brown loamy/clayey topsoil. The depth of topsoil varied between 0.2m and 0.4m in depth across the site.
- 8.1.4 In general, the trial pits proved a layer of light brown, firm to stiff clay 0.5-1.3m thick beneath the topsoil in every trial pit, with the exception of TP02 in the south eastern area of the site, which proved re-engineered clay, mudstone and coal fragments, to the base of the pit at 3.1m below ground level.
- 8.1.5 A number of the trial pits proved a thin seam of weathered immature coal beneath or within the clay, with thicknesses ranging from <0.1-0.4m, dipping 13° to the north east. This layer of coal was not evidenced in trial pits 7, 9 and 10, in the northern area of the site. It is thought that this coal seam may outcrop on site, explaining its absence in these trial pits
- 8.1.6 Except in TP02, a light grey moderately weak weathered mudstone was excavated at depths of 0.8-3.6m below ground level. All the trial pits ended in this strata at depths of 2.3-3.6m. The deepest trial pit (TP05), at the lowest point of the site, close to the south western boundary, proved a further layer of coal 0.6m thick, from 2.4-3.0m. This is presumed to dip below the remainder of the trial pits.
- 8.1.8 Generally, boreholes proved layers of clay, mudstone and coal within approximately 10m from the surface. A layer of coal 0.7-0.8m thick was proved between 5.2 and 11.4m depth, in all the boreholes, with the exception BH02. BH02 was carried out in the area of made ground in the east of the site, where the coal is assumed to have been extracted by opencast methods. This made ground was found to extend to a depth of 8.1m below existing ground levels. A 0.5m thick layer of black mudstone

with coal traces was proved in every trial pit, at depths between 8.5 and 14.2m. BH05 also proved a 0.5m thick layer of weathered coal from 2.1-2.6m depth.

- 8.1.9 None of the coal seams encountered within the boreholes appeared to have been worked by underground methods, however further investigation of this may be required, as several of the boreholes have proven a <1:10 seam thickness to rockheads ratio, meaning that workings may present a danger of ground subsidence or collapse.
- 8.1.10 Geotechnical analysis is currently being undertaken on the collected samples of clayey, soil, and will be reported on in due course.

8.2 GROUNDWATER

- 8.2.1 During the trial pit excavations, ground water seepage was noted in TP03 and TP06, at a depth of 1.3m within the coal seam and is thought to be perched water trapped in the seam. Ground water was also encountered immediately below the gas taps in BH01A and BH04A during the gas sampling on 06.03.19, which was undertaken during a period of heavy rainfall, however this is thought to be due to surface water percolation into the standpipes, rather than a high groundwater table. No ground water was observed during the second round of gas testing on 29.03.19, indicating that water was perched in the standpipes during the first round of monitoring.
- 8.2.2 It should be recognised that ground water levels may vary throughout the year. During periods of heavy rainfall the groundwater levels may be substantially higher than the results revealed in these investigations.

8.3 GAS MONITORING

- 8.3.1 As discussed previously BH01A, BH02A, BH04A and BH07A were installed with gas standpipes and lockable covers. Gas testing is currently being undertaken on site and to-date the wells have been monitored on one occasion.
- 8.3.2 A standard gas monitoring procedure has been followed in accordance with CIRIA guidance, including measurement of the following:-
- i) Methane, Oxygen and Carbon Dioxide concentrations.
 - ii) Atmospheric Pressure.
 - iii) Gas Flow Rate.

- iv) Standing water level.

8.3.3 The result of the monitoring undertaken to-date is summarised in Table 2 below. A complete set of results will be reported on completion of the intended testing programme.

Table 2 - Summary of Recorded Gas Levels.

Borehole No.	Date	Oxygen %	Carbon Dioxide %	Methane %	Flow Rate (l/hr)	Depth to Water (m)	Atmospheric Pressure (mb)
BH01A	06.03.19	16.0	1.7	NR	-16	0	962
	29.3.19	18.2	1.3	0.5	ND	2.6	1014
BH02A	06.03.19	10.8	3.8	NR	ND	DRY	962
	29.3.19	19.7	1.2	NR	ND	DRY	1014
BH04A	06.03.19	16.2	0.9	NR	ND	0	962
	29.3.19	16.2	1.2	NR	ND	2.0	1014
BH07A	06.03.19	12.2	2.3	NR	ND	1.6	962
	29.3.19	18.6	1.8	0.5	ND	1.8	1014

8.3.4 A maximum carbon dioxide concentration of 3.8% and methane concentration of 0.5 was recorded in BH02. A maximum flow rate of 16 l/hr was detected in the monitoring stations, however this has been attributed to the high water level detected in the standpipe at the time of sampling and has thus been disregarded in gas regime calculations.

8.3.5 Based on the maximum concentrations and gas flow rates measured, the gas regime found on this site can be currently classified as **Green**, or CS1 by BS 8485:2105 Table 2 due to the low carbon dioxide recorded.

8.3.6 The gas monitoring is ongoing and a final report confirming any gas protection measures required will be prepared when the monitoring is completed.

9.0 CONTAMINATION

9.1 HUMAN HEALTH RISK ASSESSMENT

9.1.1 The appraisal of contaminated land within the UK is based on a risk assessment approach. The method involves the principle of defining a source ► pathway ► receptor, linkage to establish a human health risk. For any risk to exist to a potential receptor from an identified contaminant there must be an unbroken source ► pathway ► target relationship.

9.1.2 In the first instance site data for the contaminant levels are compared against guidance such as the CLEA values published by DEFRA. Should the site values exceed the guidance criteria, the contamination levels are recognised to have the potential to pose a risk to human health. Two scenarios are then available:-

- a) To break or remove one of the source ► pathway ► receptor linkages, by specifying an appropriate level of remedial work. Examples of remedial action may include the removal of the contaminated material or alternatively specifying a sufficient capping layer.
- b) The alternative approach is to provide a more detailed human health site specific risk assessment. This will involve examining factors such as soil properties, exposure assumptions, groundwater flows and contamination composition.

9.2 CONTAMINATION RESULTS

9.2.1 As stated above, in order to put the analytical results into context, the data has in the first instance been assessed in relation to several sets of guidelines: -

9.2.2 The analytical results have been assessed via an initial screening assessment with regard to the current Contaminated Land Exposure Assessment model (CLEA UK) for human health, which has been produced for the Environment Agency and the Department of Environment, Food and Rural Affairs (DEFRA). The CLEA model provides Soil Guideline Values (SGVs) for a limited range of contaminants only, and these are based on risk to human health. As such they do not take into account potential risks to other receptors eg groundwater and third party land.

- 9.2.3 It is proposed to redevelop the site for residential properties with private garden areas. Soil results have therefore been assessed against the CLEA SGV's for residential use with plant uptake, as these are considered to be the most suitable guidelines to protect the most critical targets from contaminants via all possible exposure routes.
- 9.2.4 Where no CLEA SGV has been published, Generic Assessment Criteria (GAC) based on guidelines from the Chartered Institute of Environmental Health (CIEH) and Land Quality Management Ltd (LQM) S4UL document residential land use with plant uptake has been used. Where there is no GAC, guidance limits have been adopted from sources referenced in the table below.
- 9.2.5 A new approach has now been adopted for the calculation of SGV based on an acceptably low level of risk. These Category 4 Screening Levels (C4SL) have been calculated for six substances to date by modifying the toxicological/exposure parameters within CLEA. C4SLs have been used as tier 1 trigger levels within this assessment, superseding the previous CIEH and LQM SGVs.
- 9.2.6 Assessment of risk is considered as a tiered approach. Assessment based on non intrusive means is considered Tier 1 assessment, comparison against SGVs and GACs is a Tier 2 assessment, and the generation of and comparison with Site Specific Assessment Criteria (SSAC) is a Tier 3 assessment and is conducted where deemed appropriate following the Tier 2 assessment.
- 9.2.7 The sulphate and acid concentrations have been compared against the BRE digest "Concrete in Aggressive Ground" parts 1-4. This will enable the concrete class to be specified in relation to possible contact with aggressive soils.
- 9.2.8 The results of the chemical analysis are presented on the laboratory analysis sheets with Appendix C. A summary of the significance of the results is presented in Table 3.

Table 3

Comparison of contaminant against accepted guidance values for residential use with plant uptake

<u>CONTAMINANT</u>	<u>SGV</u> <u>MG/KG</u>	<u>CONCENTRATION IN</u> <u>ALL SOILS.</u> <u>MG/KG</u>	<u>No. OF</u> <u>SAMPLES</u> <u>EXCEEDING</u> <u>GUIDANCE</u> <u>VALUES</u>	<u>PERCENTAGE</u> <u>OF SAMPLES</u> <u>EXCEEDING</u> <u>GUIDELINE</u> <u>VALUE</u>
Arsenic	37 (4)	7.4-27	0/8	
Cadmium	22 (4)	<0.1-0.7	0/8	
Chromium (Total)	130 (2)	20-29	0/8	
Lead	200 (4)	16-120	0/8	
Mercury (Total)	1.2 (1)	<0.05-0.43	0/8	
Selenium	250 (1)	<0.5-0.8	0/8	
Copper	2400 (1)	24-51	0/8	
Nickel	180 (1)	15-32	0/8	
Zinc	3700 (1)	48-500	0/8	
Sulphate	0.24 (3)	0.03-0.11	0/8	
Thiocyanate	50	<0.6-5.3	0/8	
Sulphide	250	<10-28	0/8	
Naphthalene	2.3 (1)	<0.1	0/8	
Benzo(a)pyrene	5 (4)	<0.1-1.1	0/8	
PAH (Total)	40	<1.6-16	0/8	
Phenols	760 (1)	<0.3-0.9	0/8	
Asbestos	No fibres	None detected	0/8	
pH	6-8	5.9-7.0	2/8	25

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(2) DEFRA CLR SGV's withdrawn used for initial comparison

(3) BS 8110 1985 Table 6.1

(4) Category 4 Screening Levels

9.2.9 No Elevated levels of any metal or inorganic contaminants were detected in the samples sent for analysis, including the samples of re-engineered material taken from TP02.

9.2.10 There were no elevated levels of PAH (Total) or PAH compounds.

9.2.11 No asbestos was detected in the samples taken from site.

9.2.12 No elevated levels of sulphate were recorded in the samples taken from site.
Therefore a design sulphate class DS-1, ACEC class AC-1, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".

9.3 **QUALITATIVE RISK ASSESSMENT**

9.3.1 The Qualitative Risk Assessment is based upon the previously discussed source ► pathway ► receptor principle. In relation to the proposed site these may be described as follows:-

9.3.2 **SOURCE**

- i) Potential ground gas migration from the filled ground in the vicinity of the site.

9.3.3 **PATHWAYS**

- i) Ingestion of contamination material.
- ii) Inhalation of contaminated particles.
- iii) Dermal contact with the known contamination.
- iv) Leaching to controlled waters.

9.3.4 **RECEPTORS**

- i) Residential site users.
- ii) Construction and maintenance workers.
- iii) Controlled waters.
- iv) The building structure.

9.3.5 Each of the receptors will now be appraised and attribute the likely risks involved.

i) Residential site users.

Based on the chemical results obtained it is considered that there is currently a **low/negligible** risk to end users from contamination on-site.

No Elevated levels of any metal or inorganic contaminants were detected in the samples sent for analysis. Nor were elevated levels of PAH (Total) or individual PAH compounds.

No asbestos was recorded in the samples taken from site.

A maximum carbon dioxide concentration of 3.8% and no methane was recorded in BH02. A maximum flow rate of 16 l/hr was detected in the monitoring stations, however this was attributed to a high water level in the standpipe causing increased pressure, and resulting in an anomalously high flow rate. This measurement is therefore disregarded in gas regime calculations. No flow rate has been detected in any of the other samples taken.

Based on the maximum concentrations and gas flow rates measured, the gas regime found on this site can be currently classified as **Green**, or CS1 by BS 8485:2105 Table 2 due to the low carbon dioxide recorded. A final classification will be determined upon completion of gas monitoring.

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. No Radon Protective Measures are required.

ii) Construction and Maintenance Workers.

It is considered that there is a **negligible** risk to construction and maintenance workers from the redevelopment of the site.

Construction workers should always wear PPE including overalls, boots and gloves when handling the contaminated materials onsite. In addition eating, drinking and smoking should be restricted to designated areas where the above hygiene facilities are available.

iii) Controlled Waters

The chemical analysis undertaken on samples of the natural strata from site have proved the site to be free of contaminated material. The excavation work undertaken has proven the site to be underlain by relatively impermeable clays. It is therefore considered that there is a **negligible** risk to groundwater and controlled waters from existing contamination on site.

iv) Building Structures.

No elevated levels of sulphate were recorded in the samples taken from site. Therefore a design sulphate class DS-1, ACEC class AC-1, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".

Service providers should be forwarded the final validated chemical levels in order for them to provide an accurate specification for the apparatus to be provided. New services should be surrounded and backfilled with clean material to afford some protection to the apparatus and allow any future maintenance work to be undertaken in clean material.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 GEOTECHNICAL ASSESSMENT

10.1.1 The fieldwork generally proved clays and sands overlying a mudstone bedrock. No made ground was encountered, except for an area close to the eastern site boundary, in which TP02 and BH02 were undertaken.

For initial design purposes we would envisage a safe bearing capacity of 100kN/m² where foundations are cited onto the clay strata, or 150kN/m² where foundations are extended onto the mudstone strata.

10.1.2 We would therefore suggest that the proposed two storey residential constructions for the majority of the site should be constructed on strip/trench fill footings founded entirely onto the clay strata. Where mudstone is encountered within the excavations, the foundations should be deepened to lie entirely onto the mudstone strata to avoid differential settlement. The foundation widths will vary dependent upon the line loadings calculated.

10.1.3 Any properties constructed in the area of made ground on site should be constructed using a piled foundation. The following general comments relating to piling are provided for guidance, and further advice should be sought from a specialist-piling contractor.

10.1.4 Piled foundations should extend beneath the made ground and be socketed into the underlying bedrock. It may be necessary to pre-drill the pile positions into the hard strata to ensure the loads are transferred to below the made ground. The deepest area of made ground found within the boreholes was 8.1m, therefore a preliminary estimate of 9.1m for the pile lengths should be allowed for using a minimum 1.0m socket beyond the base of workings.

10.1.5 The safe working load that may be supported on a pile is dependent on the pile diameter, its founding depth and the method of installation. As piles would be founded in bedrock, they will be essentially end bearing, although there may also be some shaft adhesion within the made ground. It is essential that pile design allows for negative skin friction.

- 10.1.6 It is recommended however, that flexible service connections are used on this site, especially where they enter the buildings, in order to avoid any possible damage due to self-settlement of the weak strata once the site is developed.
- 10.1.7 On completion of the piling works, pile testing should be undertaken to confirm the adequacy and load carrying capacity of the installed piles.
- 10.1.8 Should any shallow obstructions occur, e.g. large boulders, they should either be grubbed-up, or alternatively replacement piles installed. The pile logs should be checked prior to the piling rig departing site, to ensure consistent pile lengths are installed throughout the site. At present we would propose that steel piles are utilised for the house foundations.
- 10.1.9 The new houses can be built off ring beams designed to span the piles. In order to bond them to the piles, the tops of the piles must be tied to the reinforcement within the ground beams. This can be achieved by a variety of methods dependent upon the type of piles adopted.
- 10.1.10 For piled foundations, suspended floor slabs should be utilised. A pre-cast 'Beam and Block' concrete ground floor construction could be utilised, and suspended across the ring beams.
- 10.1.11 All foundations should be placed below a line of 45° drawn up from the base of any services or other structures.
- 10.1.12 Due to the perched groundwater recorded in TP03 and TP06, as well as the water levels encountered during the gas monitoring, extra caution should be taken in deep excavations across site, as they could experience instability. Support should be considered for excavations which are to be left open for longer periods. Please note that ground water flows can vary throughout the year and a further assessment should be undertaken if construction work is proposed following a prolonged rainfall event.
- 10.1.13 No elevated levels of sulphate were recorded in the samples taken from site. Therefore a design sulphate class DS-1, ACEC class AC-1, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".

- 10.1.14 Wherever any foundations are located near existing or proposed new trees, their foundations must be sited below the root growth zone. Reference should be made to the NHBC standards Chapter 4.2 “Building Near Trees” which provides guidance on foundation criteria, depths and construction. All services should be similarly protected. Plasticity testing of the clays on site is currently underway and will be reported on once the results are known.
- 10.1.15 Due to the potential for coal to be encountered during excavations, foundations should not be unnecessarily overly deepened, in order to minimise the chances of coal seams being encountered, as these pose a risk of combustion.
- 10.1.16 Where coal is encountered during foundation excavations, foundations should be taken through the coal seam into the underlying natural strata. The coal should then be sealed with concrete to create a trench fill foundation.

10.2 MINING

- 10.2.1 The Rogers Geotechnical Services Ltd report states the site is within a surface area which could be affected by past underground mining.
- 10.2.2 The property is not in area where the Coal Authority has granted, or plans to grant, a licence to remove or otherwise work coal using underground methods. However, reserves of coal exist in the local area which could be worked at some time in the future.
- 10.2.3 There was no evidence in the boreholes that the coal had been extracted by underground methods. However, there is an area of re-engineered clays in the east where the coal may have been extracted by opencast methods.
- 10.2.4 It will be necessary to undertake further boreholes to expand the coverage of the ground investigation works. In particular, boreholes should be undertaken in a diamond 5 formation in the footprints of planned properties in the vicinity of the re-engineered clay in the east of the site.

10.3 GROUND FLOOR SLAB – GAS MEASURES

- 10.3.1 As discussed previously, gas monitoring stations were installed in four of the rotary boreholes undertaken on site.
- 10.3.2 Initial gas testing has proven a maximum carbon dioxide concentration of 3.8% and no methane in BH02A. A very high maximum flow rate of 16 l/hr was detected in the monitoring stations, however this has been attributed to a high water level in the standpipe, and has thus been disregarded in gas regime calculations. No flow has been recorded in any of the other samples taken.
- 10.3.3 No Radon Protection measures are required for the site.
- 10.3.4 The proposed development consists of low rise residential housing and therefore the gas regime has been characterised in accordance with the traffic light methodology as outlined in *CIRIA Report C665*. Based on the maximum concentrations and gas flow rates measured, the gas regime found on this site can be currently classified as **Green**, or CS2 by BS 8485:2105 Table 2.
- GSV = max carbon dioxide concentration x max flow rate 0.038 x 0 = 0.0 l/h
- 10.3.5 A detailed analysis of the results and any gas protection measures will be confirmed on completion of the on-site gas testing in a separate report.

10.4 CONTAMINATION ASSESSMENT

- 10.4.1 Chemical analysis of the topsoils found on site has proved the existing material to be clean, and suitable for re-use on site.
- 10.4.2 No elevated levels of metal or inorganic contaminants were detected in the samples taken from the site.
- 10.4.3 There were no elevated levels of PAH (Total) or PAH compounds.
- 10.4.4 No asbestos was detected in the samples of made ground taken from site.

- 10.4.5 Prior to construction work commencing on site, the existing topsoil should be scraped and stockpiled behind protective fencing to prevent cross contamination during demolition/development works.
- 10.4.6 Should any suspected areas of contamination be exposed during site strip/construction, an engineer should be contacted to determine if additional chemical testing should be undertaken. The on-site staff should maintain a photographic record and dates of any exposed contaminated material.
- 10.4.7 It is not currently anticipated that any topsoil will be required to be imported to site based on the currently available information. However, should any material need to be imported, all imported material should be tested for the range of contaminants listed previously in Table 4. Only material found to be below published trigger levels should be deemed uncontaminated and accepted for use on site.
- 10.4.8 If the imported material is from a Greenfield site, a minimum of 3 samples or 1 per 250m³ of imported material should be taken for testing, whichever is greater. If it is from a brownfield site, a minimum of 6 samples, or 1 per 100m³ of imported material should be taken for testing, whichever is greater. Material provided by a commercial supplier should be certified to the same level of testing, with the certificate less than two months old.
- 10.4.9 All imported certified material should be placed immediately. If this is not possible, or the material is not certified and sampling is to be carried out prior to being laid, it should be securely stored on site prior to use to prevent possible contamination from any materials on site.
- 10.4.10 If any areas of made ground are removed off site, they should be taken to a licensed waste site and full documentation should be obtained. Any material to be taken off-site should be suitably quarantined prior to removal to prevent cross contamination. Any relevant chemical test results should be given to the landfill operator, so that they can determine if this material is suitable to be disposed of in their licensed landfill.
- 10.4.11 Due to the potential for coal to outcrop on site, it should be ensured that in areas of soft landscaping there is at least a metre of inert cover above any coal seams encountered.

11.0 SUGGESTED FURTHER WORK

- 11.1 Gas monitoring to be completed on site and final recommendations for ground gas protection measures to be made.
- 11.2 Further site investigation to be undertaken, in particular the area of made ground in the east of the site. This should include a site strip, in order to determine the area, as well as further boreholes around this area to depths of at least 10m, in order to confirm that no workings extend further into the site. Additionally, boreholes should be undertaken in diamond 5 formations in the footprints of the proposed properties in the vicinity of the made ground, once a site layout has been agreed.
- 11.3 Further testing to be undertaken on topsoil following stockpiling to confirm it's suitability for use.

12.0 APPROVALS

12.1 Proposals for the remediation of contaminated land may require the approval of numerous bodies.

These include:

- a) Kirklees Health Department as required by the building and planning regulations.
- b) The NHBC or similar as they will provide the insurance costs to cover the property.
- c) The Environment Agency if there are risks of contamination to ground or surface water systems. They will also require notification if material is removed from site and taken to an appropriate tip.
- d) Relevant highways and drainage authorities and other service companies may also wish to know about the level of contaminants.

Prepared by



M. Huddleston. MEng

Checked by



T. Haigh. BSc.,C.Eng.M.I.C.E.

April 2019

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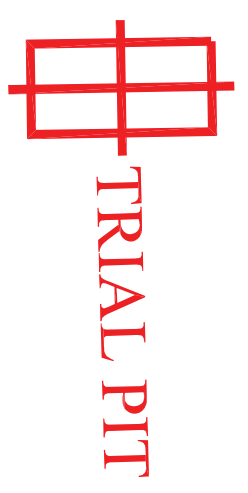
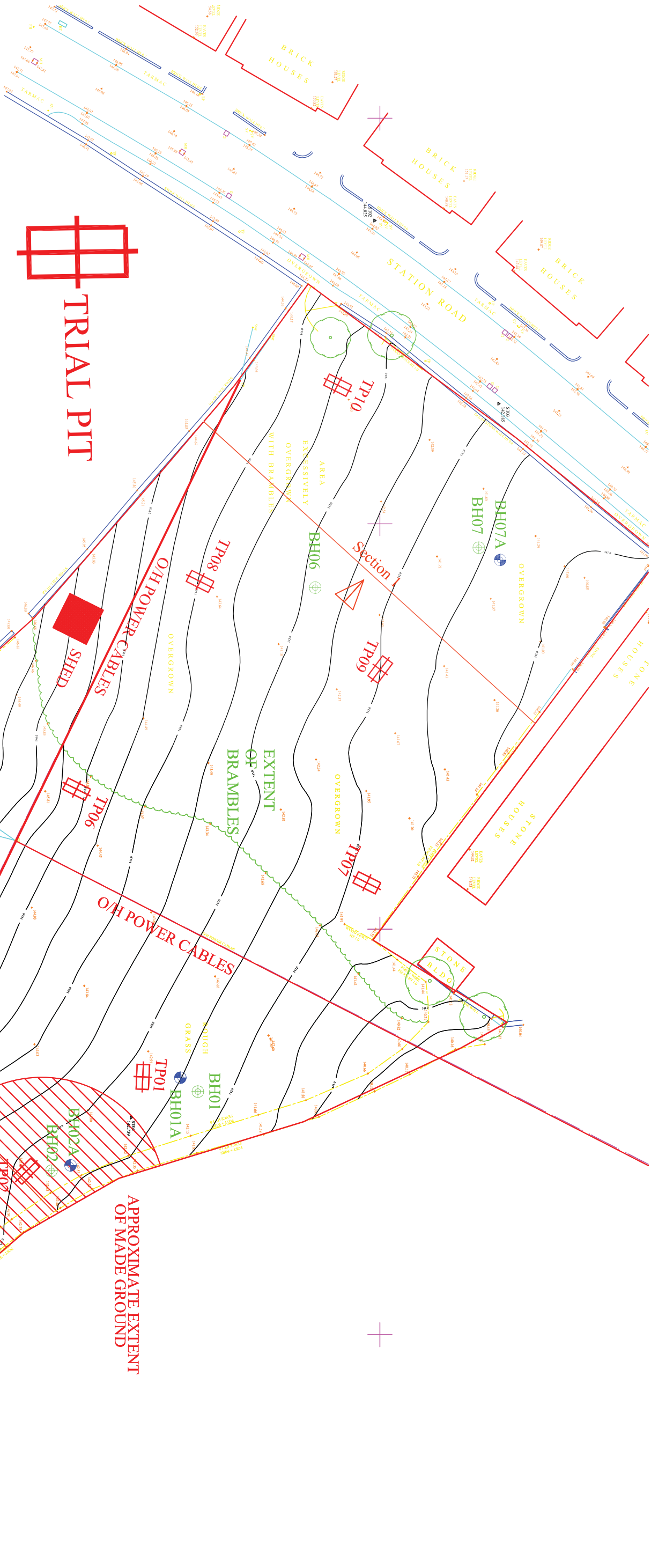
APPENDIX A

Site Location Plan

Site Investigation Plan

Site Cross Sections

Typical Site Conceptual Model



TRIAL PIT

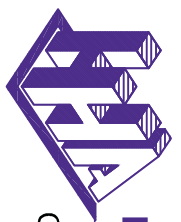


BOREHOLE



BOREHOLE WITH GAS
MONITORING STATION

REV A - GROUND INVESTIGATION WORKS SHOWN 22/02/19 DP

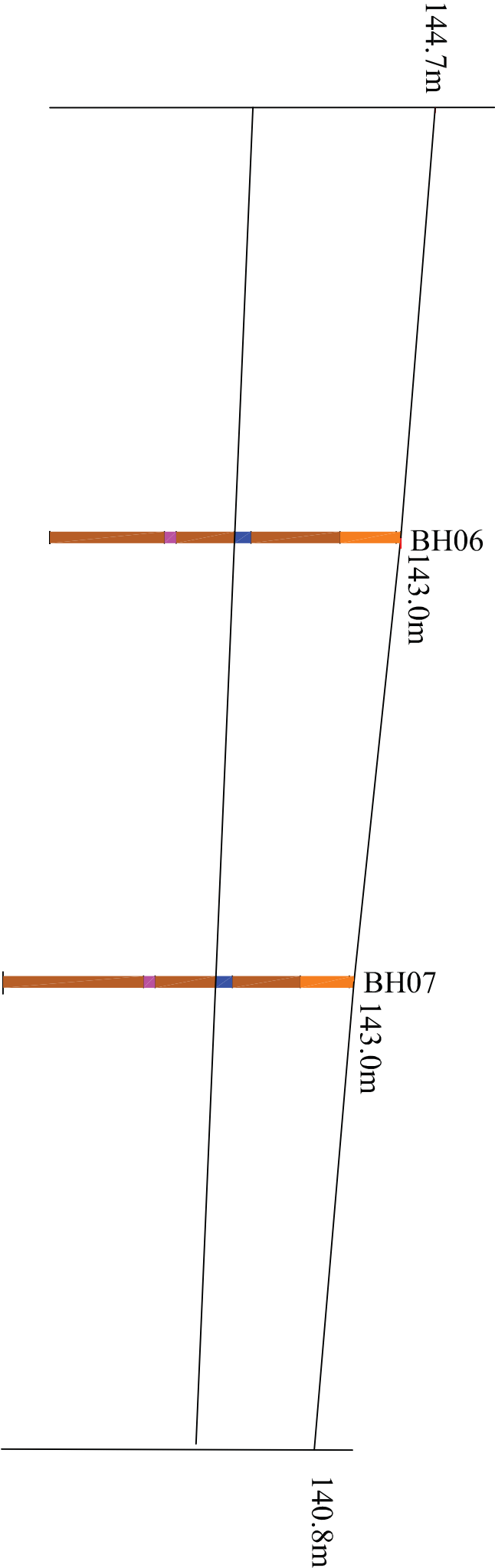


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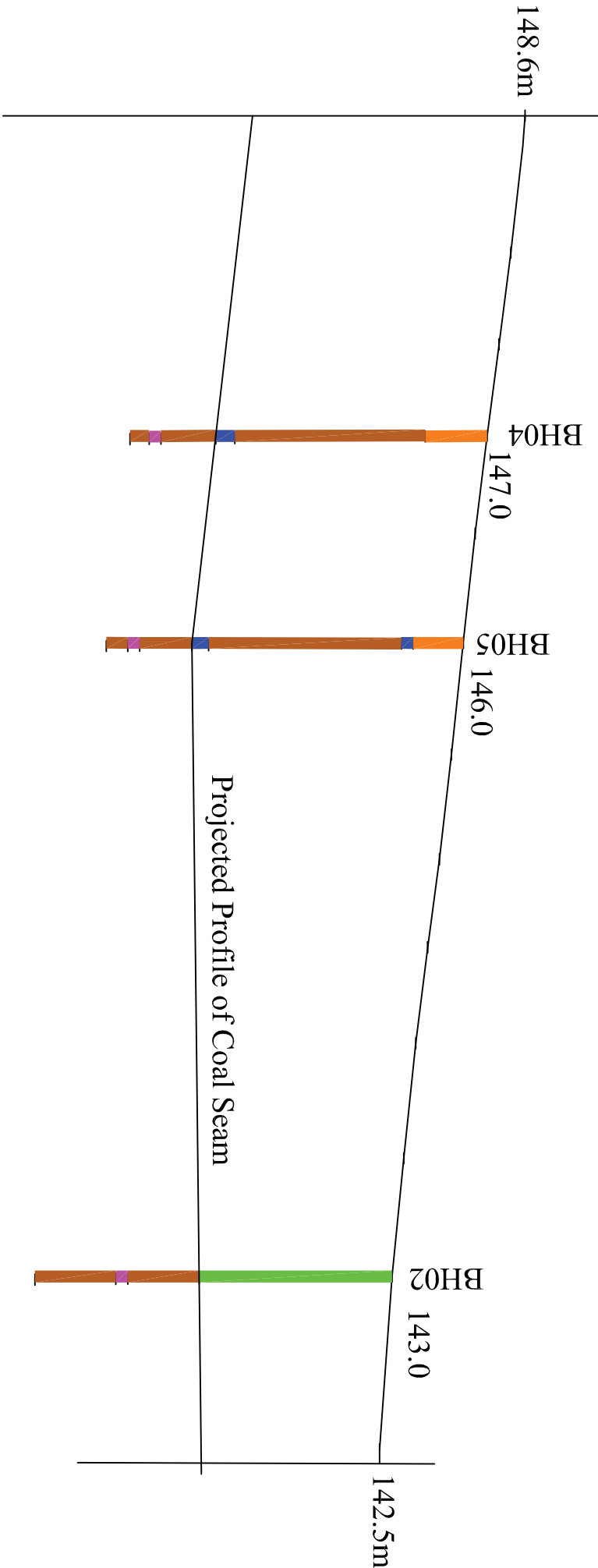
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e trevor.haigh@haighhuddleston.co.uk

Client	YORKSHIRE COUNTRY PROPERTIES		
Project	Station Road, Skelmanthorpe		
Detail	Site Investigation Plan		
Scale	Dwn	Chkd	Date
1/500@A3 DP	JM	14-01-19	E18/7366/03A

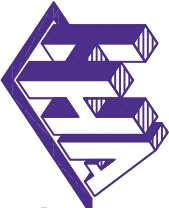
Section 1



Section 2



- KEY
- = CLAY
 - = MUDSTONE
 - = COAL
 - = MADE GROUND
 - = MUDSTONE WITH COAL TRACES

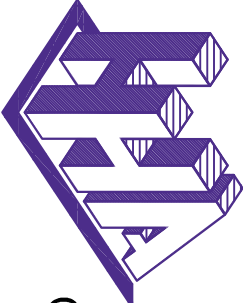
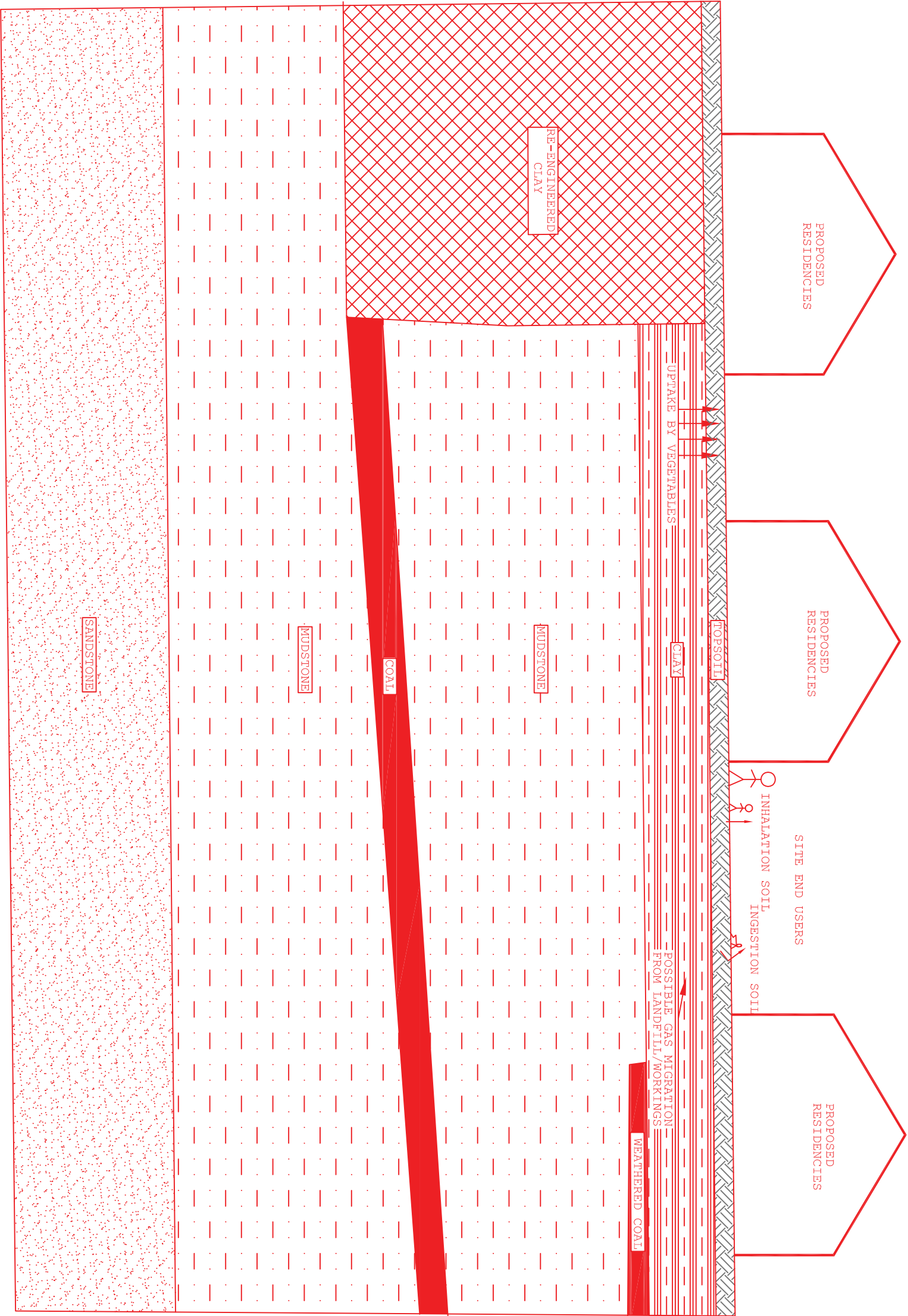


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Client	YORKSHIRE COUNTRY PROPERTIES			
Project	Station Road, Skelmanthorpe			
Detail	Site Cross Sections			
Scale	Dwn	Chkd	Date	Dwg No.
1/500	A3	DP	MD 01-04-19	E18/7366/04



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Client
Yorkshire Country Properties

Project
Station Road Skelmanthorpe

Detail
Typical Site Conceptual Model

Scale	Dwn	Chkd	Date	Dwg No.
NTS	DP	MD	Apr '19	E18/7366/32

APPENDIX B

Trial Hole Logs

Borehole Logs



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FORM HHA 5

TRIAL HOLE NO. 1

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0		
	0.25	Rough grass over dark brown loamy topsoil.
0.5		Stiff light brown clay.
1.0		
	1.4	Thin (<100mm) band of weathered coal at 1.4m.
1.5		Light grey firm/stiff mottled clay.
	1.9	
2.0		Light grey completely weathered mudstone containing coal fragments, excavated as angular gravels.
	2.4	Light grey weak weathered mudstone. End of trial pit.
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES @0.2 and 0.6m

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



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FORM HHA 5

TRIAL HOLE NO. 2

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0

	0.3	Rough grass over dark brown loamy topsoil.
0.5		
1.0		
1.5		
2.0		
2.5		
3.0		
	3.1	
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES @0.2 and 1.0m

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



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FORM HHA 5

TRIAL HOLE NO. 3

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0

	0.25	Rough grass over dark brown loamy topsoil.
0.5		Firm light brown/grey mottled clay.
1.0		
1.2		
1.5	1.5	Weak/immature completely weathered coal.
2.0		Moderately weak light grey completely weathered mudstone containing occasional coal fragments. Water ingress at 1.3m from sides.
2.3		
2.5		Moderately weak light grey highly weathered mudstone.
2.9		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

YES

Sample taken

NO

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



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FORM HHA 5

TRIAL HOLE NO. 4

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0

	0.4	Rough grass over dark brown clayey topsoil containing coal fragments possible made ground .
0.5		
1.0		
1.5		
	1.7	
2.0		Light grey weak highly weathered mudstone.
	2.3	
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES . m

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....

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FORM HHA 5

TRIAL HOLE NO. 5

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0

	0.3	Rough grass over dark brown clayey topsoil.
0.5		Light brown/grey firm/stiff clay.
1.0		
	1.3	Thin band of weathered coal at 1.3m.
		Light grey completely weathered mudstone containing coal fragments.
1.5	1.5	
		Moderately weak light grey weathered mudstone.
2.0		
	2.4	
2.5		Weathered coal.
3.0	3.0	
		Light grey moderately weak weathered mudstone.
3.5		
	3.6	
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

NO

Sides of excavation remained stable

YES

Level

.....

NOTES:.....
.....



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FORM HHA 5

TRIAL HOLE NO. 6

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0

	0.3	Rough grass and brambles over dark brown loamy topsoil.
0.5		
1.0		
	1.1	Firm light brown/grey clay. lay land drain at . m. dry
	1.4	ompletely weathered coal. Water ingress from sides at 1.3m.
1.5		
	1.	Soft light grey mottled clay.
2.0		
2.5		
	2.9	ompletely weathered light grey mudstone.
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

YES

Sample taken

YES . m

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



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FORM HHA 5

TRIAL HOLE NO. 7

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0

	0.2	Overgrown brambles over dark brown loamy topsoil.
0.5		Firm light brown/grey clay.
1.0		
1.2		
1.5		Weak light grey/brown very weathered mudstone.
1.		
2.0		Moderately strong light grey weathered mudstone containing coal fragments.
2.3		
2.5		Strong light grey/brown mudstone.
2.6		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES . m

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



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FORM HHA 5

TRIAL HOLE NO.

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0

	0.3	Overgrown brambles over dark brown clayey topsoil.
0.5		Firm light brown clay.
	0.	thin band of weathered coal at . m.
1.0		Light grey completely weathered mudstone.
1.5		
2.0		
	2.3	
2.5		Moderately weak light grey weathered mudstone.
	2.	
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

NO

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



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FORM HHA 5

TRIAL HOLE NO. 9

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0

	0.3	Rough grass and brambles over dark brown clayey topsoil.
0.5		
1.0		
	1.3	
1.5		Light grey completed weathered mudstone.
	1.	
2.0		
	2.4	
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

NO

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



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FORM HHA 5

TRIAL HOLE NO. 10

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7366
Site :	SKELMANTHORPE	Date :	21/02/2019

0.0

	0.25	Overgrown brambles over dark brown loamy topsoil.
0.5		Firm/stiff light brown/grey clay.
	0.	
1.0		Light grey completely weathered mudstone.
1.5	1.5	
2.0		Moderately weak light grey weathered mudstone.
	2.3	
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES . m

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



GROUND SUPPORT SERVICES (UK) LTD

GEOTECHNICAL AND GROUND SUPPORT FOUNDATION SPECIALISTS

Unit D2B Bryans Close, Harworth Industrial Estate, Harworth, South Yorkshire, DN11 8RY

Phone: 01302 744 322 Email: thomas@groundsupportservices.net

Site Investigation Drillers log		Site: <u>Station road</u>		Sheet: <u>1 of 3</u>						
Rig: <u>C6</u>		Crew: <u>G Pilkington J Fragget</u>		Date: <u>21-2-19</u>						
Hours on site:			Travelling Time:							
Equipment used:										
BH	Depth	Strata Description	BH	Depth	Strata Description					
move rig to		Station road	2	0.00 - 0.20	Soil					
				0.20 - 8.10	made ground					
1	0.00 - 0.30	Soil		8.10 - 11.10	mudstone grey					
	0.30 - 2.60	Clay		11.10 - 11.60	mudstone black					
	2.60 - 6.80	mudstone grey			with coal traces					
	6.80 - 7.50	Coal		11.60 - 15.00	mudstone grey					
	7.50 - 10.40	mudstone grey								
	10.40 - 10.90	mudstone black	2A	0.00 - 0.20	Soil					
		with coal traces		0.20 - 3.00	made ground					
	10.90 - 17.20	mudstone grey								
	17.20 - 22.10	Sandstone grey			Install 2.00 mt slotted pipe					
	22.10 - 30.00	mudstone grey			1.00 mt plain pipe					
		silty			Gravel 3.00 mt to 1.00 mt					
					Bentonite 1.00 mt to 0.00 mt					
1A	0.00 - 0.30	Soil			1 end cap 1 gas tap					
	0.30 - 2.60	Clay			Concrete in 1 cover					
	2.60 - 3.00	mudstone grey								
			3	0.00 - 0.30	Soil					
Install 2.00 mt slotted pipe				0.30 - 3.10	Clay					
1.00 mt plain pipe				3.10 - 8.80	mudstone grey					
Gravel 3.00 mt to 1.00 mt				8.80 - 9.60	Coal					
Bentonite 1.00 mt to 0.00 mt				9.60 - 12.00	mudstone grey					
1 end cap 1 gas tap				12.00 - 12.50	mudstone black					
Concrete in 1 cover					with coal traces					
				12.50 - 15.00	mudstone grey					
Casing / Water level details										
BH	Casing Die	Casing Depth	Strike	Water Rise	Sealed	Totals	BH's	Drill	Case	Core
						Today				
						Previous				
						To date				

Signed  Driller



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Phone: 01302 744 322 Email: thomas@groundsupportservices.net

<u>Site Investigation Drillers log</u>			Site: <u>Station road</u>			Sheet: <u>2 of 3</u>				
Rig: <u>C6</u>			Crew: <u>G Pilkington J Fragget</u>			Date: <u>21-2-19</u>				
Hours on site:			Travelling Time:							
Equipment used:										
BH	Depth	Strata Description	BH	Depth	Strata Description					
4	0.00-0.20	Soil		10.70-11.40	Coal					
	0.20-2.60	Clay		11.40-13.60	mudstone grey					
	2.60-10.60	mudstone grey		13.60-14.10	mudstone black					
	10.60-11.40	Coal			with coal traces					
	11.40-13.70	mudstone grey		14.10-15.00	mudstone grey					
	13.70-14.20	mudstone black								
		with coal traces	6	0.00-0.20	Soil					
	14.20-15.00	mudstone grey		0.20-2.60	Clay					
				2.60-6.40	mudstone grey					
4A	0.00-0.20	Soil		6.40-7.10	Coal					
	0.20-2.60	Clay		7.10-9.60	mudstone grey					
	2.60-3.00	mudstone grey		9.60-10.10	mudstone black					
					with coal traces					
	Install 2.00 mt	slotted pipe		10.10-15.00	mudstone grey					
	1.00 mt	plain pipe								
	Gravel 3.00 mt	to 1.00 mt	7	0.00-0.20	Soil					
	Bentonite 1.00 mt	to 0.00 mt		0.20-2.30	Clay					
	1 end cap	1 gas tap		2.30-5.20	mudstone grey					
	Concrete in	1 cover		5.20-5.90	Coal					
				5.90-8.50	mudstone grey					
5	0.00-0.20	Soil		8.50-9.00	mudstone black					
	0.20-2.10	Clay			with coal traces					
	2.10-2.60	Coal weathered		9.00-15.00	mudstone grey					
	2.60-10.70	mudstone grey								
<u>Casing / Water level details</u>										
BH	Casing Die	Depth	Strike	Water Rise	Sealed	Totals	BH's	Drill	Case	Core
						Today				
						Previous				
						To date				

Signed

Driller

[illegible]

Signed _____ Driller

APPENDIX C

Chemical Analysis of Samples



Certificate of Analysis

Certificate Number 19-03718

05-Mar-19

Client Haigh Huddleston & Associates Ltd
Firth Buildings
99-101 Leeds Road
Dewsbury
WF12 7BU

Our Reference 19-03718

Client Reference 7366

Order No (not supplied)

Contract Title Skelmanthorpe

Description 8 Soil samples.

Date Received 27-Feb-19

Date Started 27-Feb-19

Date Completed 05-Mar-19

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "A Fenwick", is placed over a faint, larger signature.

Adam Fenwick
Contracts Manager





Summary of Chemical Analysis

Matrix Descriptions

Our Ref 19-03718

Client Ref 7366

Contract Title Skelmanthorpe

Sample ID	Depth	Lab No	Completed	Matrix Description
TP01	0.2	1466536	05/03/2019	Dark brown sandy CLAY including odd rootlets
TP01	0.6	1466537	05/03/2019	Brown sandy CLAY
TP02	0.2	1466538	05/03/2019	Dark brown sandy CLAY including odd rootlets
TP02	1	1466539	05/03/2019	Dark brown slightly gravelly, sandy CLAY
TP04	0.2	1466540	05/03/2019	Dark brown slightly gravelly, sandy CLAY including odd rootlets and some COAL
TP06	0.2	1466541	05/03/2019	Dark brown gravelly, sandy CLAY including odd rootlets
TP07	0.2	1466542	05/03/2019	Dark brown sandy CLAY including odd rootlets
TP10	0.2	1466543	05/03/2019	Dark brown sandy CLAY including odd rootlets

Summary of Chemical Analysis

Soil Samples

Our Ref 19-03718

Client Ref 7366

Contract Title Skelmanthorpe

Lab No	1466536	1466537	1466538	1466539	1466540	1466541
Sample ID	TP01	TP01	TP02	TP02	TP04	TP06
Depth	0.20	0.60	0.20	1.00	0.20	0.20
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	25/02/19	25/02/19	25/02/19	25/02/19	25/02/19	25/02/19
Sampling Time	00AM	00AM	00AM	00AM	00AM	00AM

Test	Method	LOD	Units						
Metals									
Arsenic mg/kg	DETSC 2301#	0.2	mg/kg	20	7.8	17	7.4	12	20
Cadmium mg/kg	DETSC 2301#	0.1	mg/kg	0.2	< 0.1	0.2	0.1	0.1	0.2
Chromium mg/kg	DETSC 2301#	0.15	mg/kg	21	21	21	21	21	21
Copper mg/kg	DETSC 2301#	0.2	mg/kg	30	24	29	30	34	32
Lead mg/kg	DETSC 2301#	0.3	mg/kg	57	16	49	24	33	57
Mercury mg/kg	DETSC 2325#	0.05	mg/kg	0.11	< 0.05	0.09	< 0.05	< 0.05	0.09
Nickel mg/kg	DETSC 2301#	1	mg/kg	17	15	19	32	27	18
Selenium mg/kg	DETSC 2301#	0.5	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc mg/kg	DETSC 2301#	1	mg/kg	98	48	91	92	78	89
Inorganics									
pH	DETSC 2008#			6.3	7.0	5.9	6.7	6.2	6.3
Thiocyanate mg/kg	DETSC 2130#	0.6	mg/kg	0.8	< 0.6	1.1	< 0.6	0.7	1.0
Sulphide mg/kg	DETSC 2024*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	28
Sulphate as SO4, Total %	DETSC 2321#	0.01	%	0.09	0.03	0.09	0.04	0.05	0.08
PAHs									
Naphthalene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene mg/kg	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene mg/kg	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	0.2	0.3
Pyrene mg/kg	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	0.3	0.3
Benzo(a)anthracene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total mg/kg	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric mg/kg	DETSC 2130#	0.3	mg/kg	0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 19-03718

Client Ref 7366

Contract Title Skelmanthorpe

Lab No	1466542	1466543
Sample ID	TP07	TP10
Depth	0.20	0.20
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	25/02/19	25/02/19
Sampling Time	00PM	00PM

Test	Method	LOD	Units		
Metals					
Arsenic mg/kg	DETSC 2301#	0.2	mg/kg	26	27
Cadmium mg/kg	DETSC 2301#	0.1	mg/kg	0.4	0.7
Chromium mg/kg	DETSC 2301#	0.15	mg/kg	20	29
Copper mg/kg	DETSC 2301#	0.2	mg/kg	51	35
Lead mg/kg	DETSC 2301#	0.3	mg/kg	93	120
Mercury mg/kg	DETSC 2325#	0.05	mg/kg	0.43	0.17
Nickel mg/kg	DETSC 2301#	1	mg/kg	19	17
Selenium mg/kg	DETSC 2301#	0.5	mg/kg	0.6	0.8
Zinc mg/kg	DETSC 2301#	1	mg/kg	260	500
Inorganics					
pH	DETSC 2008#			5.9	6.5
Thiocyanate mg/kg	DETSC 2130#	0.6	mg/kg	2.4	5.3
Sulphide mg/kg	DETSC 2024*	10	mg/kg	< 10	< 10
Sulphate as SO ₄ , Total %	DETSC 2321#	0.01	%	0.09	0.11
PAHs					
Naphthalene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	0.1
Acenaphthene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	0.2
Phenanthrene mg/kg	DETSC 3301	0.1	mg/kg	0.3	1.6
Anthracene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	0.4
Fluoranthene mg/kg	DETSC 3301	0.1	mg/kg	0.4	3.3
Pyrene mg/kg	DETSC 3301	0.1	mg/kg	0.4	3.4
Benzo(a)anthracene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	1.1
Chrysene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	1.4
Benzo(b)fluoranthene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	0.9
Benzo(k)fluoranthene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	0.6
Benzo(a)pyrene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	1.1
Indeno(1,2,3-c,d)pyrene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	0.6
Dibenzo(a,h)anthracene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	0.3
Benzo(g,h,i)perylene mg/kg	DETSC 3301	0.1	mg/kg	< 0.1	0.8
PAH Total mg/kg	DETSC 3301	1.6	mg/kg	< 1.6	16
Phenols					
Phenol - Monohydric mg/kg	DETSC 2130#	0.3	mg/kg	< 0.3	0.9

Summary of Asbestos Analysis Soil Samples

Our Ref 19-03718

Client Ref 7366

Contract Title Skelmanthorpe

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1466536	TP01 0.20	SOIL	NAD	none	A Christodoulou
1466537	TP01 0.60	SOIL	NAD	none	A Christodoulou
1466538	TP02 0.20	SOIL	NAD	none	A Christodoulou
1466539	TP02 1.00	SOIL	NAD	none	A Christodoulou
1466540	TP04 0.20	SOIL	NAD	none	A Christodoulou
1466541	TP06 0.20	SOIL	NAD	none	A Christodoulou
1466542	TP07 0.20	SOIL	NAD	none	A Christodoulou
1466543	TP10 0.20	SOIL	NAD	none	A Christodoulou

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 19-03718
 Client Ref 7366
 Contract Skelmanthorpe

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1466536	TP01 0.20 SOIL	25/02/19	GJ 250ml, PT 1L		
1466537	TP01 0.60 SOIL	25/02/19	GJ 250ml, PT 1L		
1466538	TP02 0.20 SOIL	25/02/19	GJ 250ml, PT 1L		
1466539	TP02 1.00 SOIL	25/02/19	GJ 250ml, PT 1L		
1466540	TP04 0.20 SOIL	25/02/19	GJ 250ml, PT 1L		
1466541	TP06 0.20 SOIL	25/02/19	GJ 250ml, PT 1L		
1466542	TP07 0.20 SOIL	25/02/19	GJ 250ml, PT 1L		
1466543	TP10 0.20 SOIL	25/02/19	GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETS 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETS 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETS 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETS 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETS 2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETS 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETS 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETS 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETS 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETS 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETS 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

APPENDIX D

Groundsure Geo Insight Report

Rogers Geotechnical Services Ltd Mining Risk

Assessment (Ref J3916/16/E)

**Environmental
Geotechnical
Specialists**



REPORT

job number J3916/16/E	site address Station Road
date June 2017	Skelmanthorpe
written by C. E. Mason	Huddersfield
checked by S. P. Rogers	issued by C. E. Mason

Rogers Geotechnical Services Ltd

Telephone 0843 50 666 87 **Fax** 0843 51 599 30

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Huddersfield, West Yorkshire HD8 8LU.



GEO TECHNICAL
ENVIRONMENTAL



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Appendices

1.	Site Plan
2.	Coal Authority Report

Report on a Coal Mining Risk Assessment

Location: Land at Station Road
Skelmanthorpe, Huddersfield

For: Yorkshire Country Properties

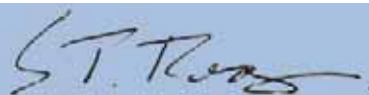
Report No. J3916/17/E

Report date: May 2017

For and on behalf of **Rogers Geotechnical Services Ltd**



C. E. Mason BSc FGS
Graduate Geotechnical Engineer



Steve Rogers CEng, CGeol, MICE, MCIHT, FGS
Technical Director

1. Introduction

It is understood that as part of the planning application at the site, a Coal Mining Risk Assessment has been requested by the planning authority. Consequently, a desktop study was commissioned in order to assess the risk to the development from coal mining. This report presents the findings of the study.

2. Geological Desk Study

The geological desk study has been undertaken using the following sources of information.

- British Geological Survey map sheet¹.
- British Geological Survey *Geology of Britain Viewer*².
- Coal Authority Report³.
- British Geological Survey *Borehole Records*⁴.

¹ Sources: British Geological Survey (NERC) Map Sheet 86 ; Glossop Solid and Drift Editions

² Sources: British Geological Survey (NERC) Geology of Britain Viewer [online resource from www.bgs.ac.uk]

³ Coal Authority Reference: 810016730560011 dated 16th May 2017

⁴ Sources: British Geological Survey (NERC) Borehole Records [online resource from <http://www.bgs.ac.uk/>]

2.1 British Geological Survey Maps and Viewer

The appropriate map sheet for the site and the geology viewer has been examined and the following table presents the indicated geology:

Table 1: Geological Data for the Site

Strata Type	Strata Name ⁵	Previous Name ⁶	Description ⁶
Superficial Geology			None recorded.
Solid Geology	Pennine Lower Coal Measures Formation	Lower Coal Measures	Interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part.

The site is situated on a north sloping embankment. Dip indicators on the map suggest that the strata dips 13° to the north east, and has a generalised regional dip of 2° north east. In addition, the site is situated within a heavily faulted area, with a general regional fault trend pattern of northwest-southeast.

Furthermore, the site is situated in close proximity to an area of worked ground located some 200m to the west of the site. This feature is anticipated to be associated with Emley Moor Collieries which was established in the early 1900's. Another area of 'infilled ground' is shown to be present immediately adjacent to the northern site boundary. Taking into account the outcrop patterns of the coal seams surrounding this feature, it is anticipated that this deposit also represents opencast workings associated with the removal of the Whinmoor Coal Seam. This feature is not shown on the available historic maps.

There are three seams of coal that are shown to outcrop within the local area. These seams are summarised as follows:

Table 2: Summary of coal seams within the vicinity of the site.

Seam Name	Seam thickness ^{5*}	Outcrop distance from site ⁵	Anticipated depth below site
Whinmoor (Cumberworth Thick) Coal	1.30	Immediately North	Anticipated within 10m bgl.
Black Band (Shertcliffe Coal)	0.3 – 0.8	275m NE	Not anticipated to be present below the site
Cumberworth Thin Coal	0.0 – 0.40	N/A	Between 15m to 20m bgl.

*All distances are given as approximations only. It should be noted that coal seam thicknesses vary over relatively short distances

⁵ Sources: British Geological Survey (NERC) Map Sheets 86; Glossop; Solid and Drift Edition, and Geology of Britain Viewer [online resource from www.bgs.ac.uk]

⁶ Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [online resource from www.bgs.ac.uk]

The Whinmoor Coal is known to have been worked locally and is generally about 1m thick. This seam and the overlying Black Band and Lousey coals are often evenly separated by measures, commonly with sandstone. The Whinmoor Coal Seam is noted to have a roof of sandstone in many localities within the region. As stated above, the outcrop of the seam is distorted by the presence of opencast mining within the local area. Based on the outcrop pattern and the topography of the local area, it is assumed that this seam may be present at very shallow depths below the surface of the site (i.e. within 10m bgl). The seam does not naturally outcrop to the south of the site due to the presence of a fault within the local area.

The Black Band Coal (Top Beeston Coal), although persistent, is known to be relatively thin within the local area. Taking into account the outcrop patterns of coal within the local area, and the younging direction of the stratum, this seam is not anticipated to be present below the site surface.

Due to high levels of faulting in close proximity to the site the Cumberworth Thin Coal is not shown to outcrop within the local area. This seam is known to be discontinuous in nature and may be separated from the Whinmoor Coal by a leaf of sandstone. If this seam is present, it is likely to be located 15m below the Whinmoor Coal. Therefore, it is likely that this seam could present between 15m and 20m below the site surface.

2.2 Coal Authority Mines Report

As part of this study a Non-residential Coal Authority Mining Report has been obtained. The report is presented as Appendix 2 and for the purposes of discussion has been summarised below:

Table 3: Summary of the Non-residential Coal Authority Mining Report

Has the search report highlighted evidence or potential of:			
Ref	Mining Feature	Yes/No	Comments
1	Underground Coal Mining: Past	Yes	The property is not within a surface area that could be affected by past underground mining. However the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered prior to any site works or future development activity. Your attention is drawn to the Comments on the Coal Authority information section of the report.
2	Underground Coal Mining: Present	No	The property is not within a surface area that could be affected by present underground mining.
3	Underground Coal Mining: Future	Yes	The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods. The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods. The property is not in an area likely to be affected from any planned future underground coal mining. However, reserves of coal exist in the local area which could be worked at some time in the future. No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.
4	Mine Entries	Yes	There are no known coal mine entries within, or within 20 metres of, the boundary of the property. There may however be mine entries/additional mine entries in the local area which the Coal Authority has no knowledge of.

5	Coal Mining Geology	No	Please see CON29M (ref: 810016730560011) for further information.
6	Opencast Coal Mining: Past	Yes	The property is within the boundary of an opencast site from which coal has been removed by opencast methods.
7	Opencast Coal Mining: Present	No	The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.
8	Opencast Coal Mining: Future	No	There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary. The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.
9	Coal Mining Subsidence	No	Please see CON29M (ref: 810016730560011) for further information.
10	Mine Gas	No	
11	Hazards Related to Coal Mining	No	
12	Withdrawal of Support	No	

2.3 Geological Survey Borehole Records

The British Geological Survey (NERC) keeps borehole records from across Britain which are available for public viewing through their website⁷. As part of this study, the records in the area around the site have been reviewed in order to assist in establishing the geological conditions.

Unfortunately in this instance, there are no borehole scans available within the vicinity of the site that are available for public viewing. Other borehole scans are available at a greater distance to the site, however are not anticipated to represent comparable ground conditions to those anticipated to be present below the site.

3. Risk Assessment

The risk to the stability of the proposed residential development has been evaluated from the data obtained and with reference to the following ratings and definitions:

- Low - The possibility of instability is unlikely therefore no further action is necessary.
- Moderate - The possibility of instability is likely and further investigation or remedial action may be required.
- High - The possibility of instability is highly likely and further investigation or remedial action will be necessary.

Table 4: Development specific risk assessment			
Item	Risk of Instability	Coal Seam(s) Considered	Risk Rating
1	Shallow coal seams	Whinmoor Coal Seam	Moderate
		Cumberworth Thin Coal	Low

2	Coal workings at depth	The property is not within a surface area that could be affected by past underground mining.	Low
3	Opencast workings	The property is within the boundary of an opencast site from which coal has been removed by opencast methods.	Low/moderate

On the basis of all of the information provided above, two coal seams are anticipated to be present within 30m of the surface at the site. Whilst these seams may be of limited thickness, the possibility the seams being worked below the site cannot be ruled out. Historic coal mining activity is evident in the nearby area, and therefore it is considered that if coal was known to be close to ground level it could have been removed illicitly via shallow mining methods with relative ease.

It may be noted that guidance available from both the NHBC and the CIRIA publication, SP32 - *construction over abandoned mine workings*, suggests that competent overburden thickness above a coal seam should be greater than 10 times the thickness of a seam plus seam thickness in order that the collapse of workings would pose a low risk to surface structures.

On this basis, assuming a maximum thickness of the Whinmoor Coal Seam to be 1.3m, 14.3m of competent overburden is required above this seam to prevent instability to any surface structures. The outcrop of the Whinmoor seam is distorted due to historic open cast mining towards the north of the site. However, taking into account the dip of the stratum and the topography of the local area, it is assumed that this seam may be present at relatively shallow depths below the site surface (i.e within 5m to 10m bgl), suggesting that there will not be a sufficient thickness of overburden above this seam should it have been worked illicitly. Therefore, a moderate risk rating has been assigned, and further investigation is recommended.

The Cumberworth Thin Coal Seam is known to be discontinuous and often subordinate in nature. If present within the sequence, it is likely to be observed at depths in excess of 15.0m bgl. Taking into consideration the above information it is suggested that a significant thickness of competent overburden will be present. Therefore, a low risk rating has been placed on this seams, and no further investigation is required.

In regards to deeper mining which could affect the site, the property is not within a surface area that could be affected by underground mining. Therefore, there is considered to be a low risk of instability at the site due workings at depth.

However, it should be further noted that the CON29M report states that the property is within the boundary of an opencast site from which coal has been removed by opencast methods. Taking into consideration the extent of the made ground present towards the north of the site, it is anticipated that the above statement corresponds to this made ground feature. It is suggested that the open casting is in fact present to the north of the proposed development, and therefore will not affect any future development on the site. However, it is recommended that careful inspections take place during the development. Should any evidence for day-holes, bell pits or open-cast workings become apparent, works should be halted and the advice of geotechnical specialists sought. Due to the close proximity of the site to the opencasting, it is possible that coal spoil may be present at the site surface.

4. Conclusions

In light of the potential risks of instability at the site from the working of shallow coal at the site, it cannot be recommended that development takes place without further investigation to conclusively determine the presence of such workings. This work should include physical drilling methods to explore the ground conditions.

General practice is to undertake rotary openhole boreholes at three locations across the site to mitigate against the potential for drilling through intact columns associated with pillar and stall workings. Furthermore, it is normal to investigate the ground to 30m below ground level; any workings below this depth are unlikely to result in significant instability. However, in this case, the risk of instability is due to shallow workings, therefore, drilling to these depths may not be necessary and the objective should be to ensure that the shallow seams are un-worked or have sufficient competent cover. It may therefore be possible, in the first instance, to undertake one borehole to 30m below the top of the rockhead, with the remaining boreholes proving the depth and continuity of the coal seam. In any event, it is considered that approval should be sought with the Local Authority as to the efficacy of this approach.

In addition, it is recommended that careful inspections take place during the development. Should any evidence for day-holes, bell pits or open-cast workings become apparent, works should be halted and the advice of geotechnical specialists sought. Due to the close proximity of the site to the opencasting, it is possible that coal spoil may be present at the site surface.

It is of note that Rogers Geotechnical Services would be happy to assist in any further intrusive investigation that may be required.

Appendix 1

Site Plan

Land Registry Current title plan

Title number **WYK878555**
Ordnance Survey map reference **SE2311SW**
Scale **1:1250 enlarged from 1:2500**
Administrative area **West Yorkshire : Kirklees**



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Appendix 2

Coal Authority Report

CON29M Non-Residential Mining Report

LAND AT STATION ROAD
SKELMANTHORPE
HUDDERSFIELD

Date of enquiry: 16 May 2017
Date enquiry received: 16 May 2017
Issue date: 16 May 2017

Our reference: 81001673056001
Your reference: 16643970



CON29M Non-Residential Mining Report

This report is based on, and limited to, the records held by the Coal Authority and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Client name

TM PROPERTY SEARCHES LIMITED

Enquiry address

LAND AT STATION ROAD, SKELMANTHORPE,
HUDDERSFIELD

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

 /company/the-coal-authority

 /thecoalauthority

 /coalauthority



Approximate position of property



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Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	Yes
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	Yes
5	Coal mining geology	No
6	Past opencast coal mining	Yes
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	No
13	Working facilities order	No
14	Payments to owners of former copyhold land	No
15	Information from the Cheshire Brine Subsidence Compensation Board	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

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

However the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered prior to any site works or future development activity. Your attention is drawn to the Comments on the Coal Authority information section of the report.

2. Present underground coal mining

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

3. Future underground coal mining

The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

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

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

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

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

4. Mine entries

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

There may however be mine entries/additional mine entries in the local area which the Coal Authority has no knowledge of.

5. Coal mining geology

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

6. Past opencast coal mining

The property is within the boundary of an opencast site from which coal has been removed by opencast methods.

7. Present opencast coal mining

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

8. Future opencast coal mining

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

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

9. Coal mining subsidence

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

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

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

10. Mine gas

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

11. Hazards related to coal mining

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

12. Withdrawal of support

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13. Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14. Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

15. Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Comments on the Coal Authority information

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In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

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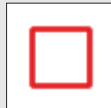
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Enquiry boundary

Key

Approximate position of enquiry boundary shown



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Haigh Huddleston & Associates

99-101, LEEDS ROAD,
DEWSBURY, WF12 7BU

Groundsure
Reference:

GS-5864926

Your Reference:

YORKSHIRE_COUNTRY_PROPERTIES_
7366

Report Date

7 Mar 2019

Report Delivery
Method:

Email - pdf

Geo Insight

Address: STATION ROAD, SKELMANTHORPE, HUDDERSFIELD, HD8 9TT

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,

A handwritten signature in black ink, appearing to be "J. O.", followed by a period.

Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

Address: STATION ROAD, SKELMANTHORPE, HUDDERSFIELD, HD8 9TT
Date: 7 Mar 2019
Reference: GS-5864926
Client: Haigh Huddleston & Associates



Aerial Photograph Capture date: 26-Mar-2012
Grid Reference: 423248,411115
Site Size: 0.8054ha

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9.4 Active Railways.....	49
9.5 Railway Projects.....	50

Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	Yes
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	No
	1.2.2 Are there any records of landslide within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	Yes

Section 2: Geology 1:50,000 Scale

2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	Yes
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	Yes
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	No
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	No
	2.2.3 Are there any records of landslide within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features

2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?

Yes

2.3.3 Are there any records of linear features within 500m of the study site boundary?

Yes

Section 3: Radon

3. Radon

3.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

3.2 Radon Protection

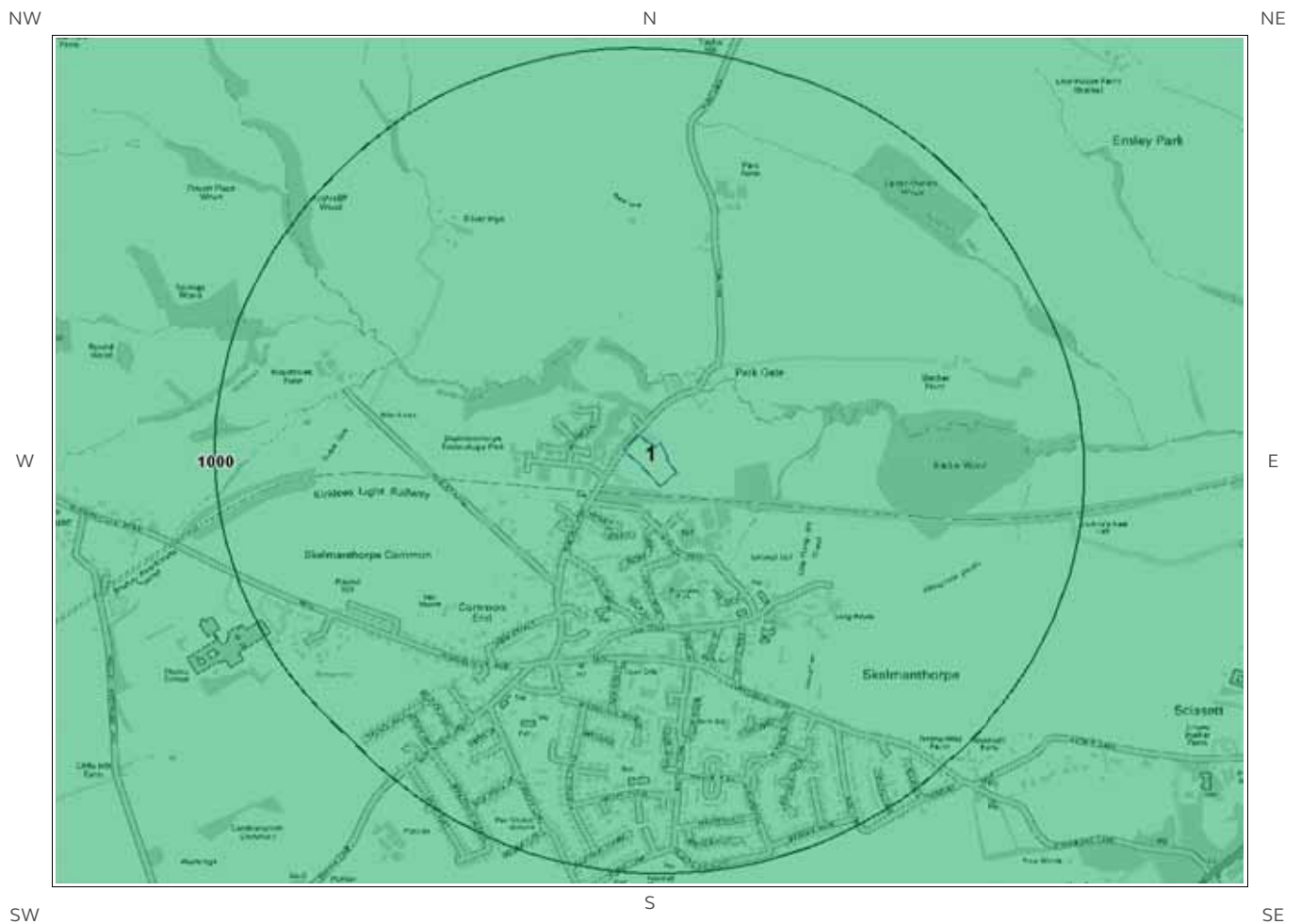
No radon protective measures are necessary.

Section 4: Ground Workings	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	0	11	30	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	3	4	0	11
4.3 Current Ground Workings	0	0	2	3	9

Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	3	4	0	11
5.2 Coal Mining	1	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	0	0	0	0	0
5.5 Non-Coal Mining Cavities	0	0	0	0	0
5.5 Natural Cavities	0	0	0	0	0

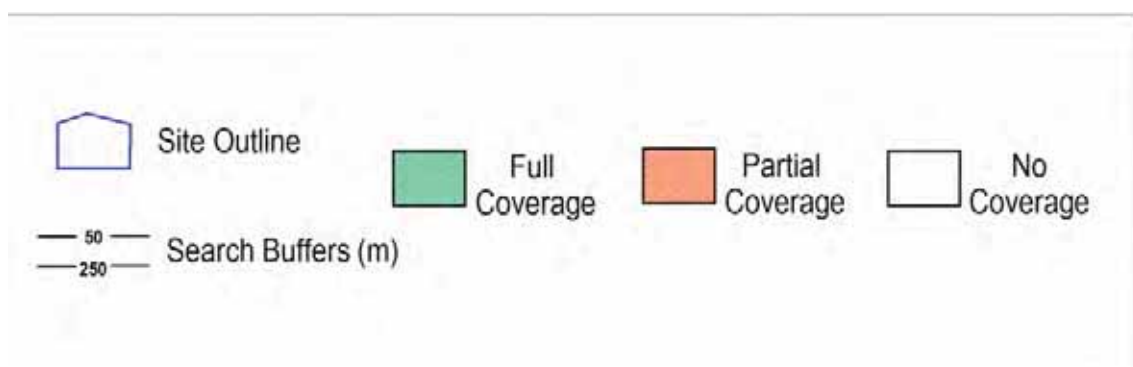
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Very Low				
6.2 Landslides	Low				
6.3 Ground Dissolution of Soluble Rocks	Negligible				
6.4 Compressible Deposits	Moderate				
6.5 Collapsible Deposits	Very Low				
6.5 Running Sand	Very Low				
Section 7: Borehole Records	On-site	0-50m	51-250		
7 BGS Recorded Boreholes	0	0	2		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	2	1	0		
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	
9.2 Historical Railway and Tunnel Features	0	1	18	Not Searched	
9.3 Historical Railways	0	0	0	Not Searched	
9.4 Active Railways	0	4	6	Not Searched	
9.5 Railway Projects	0	0	0	0	

1:10,000 Scale Availability



1_10,000 Availability Legend

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Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	Some deposits are mapped	Full	Full	Some deposits are mapped
N2	1050.0	Some deposits are mapped	Full	Full	Some deposits are mapped
N3	1699.0	Some deposits are mapped	Full	Full	No coverage

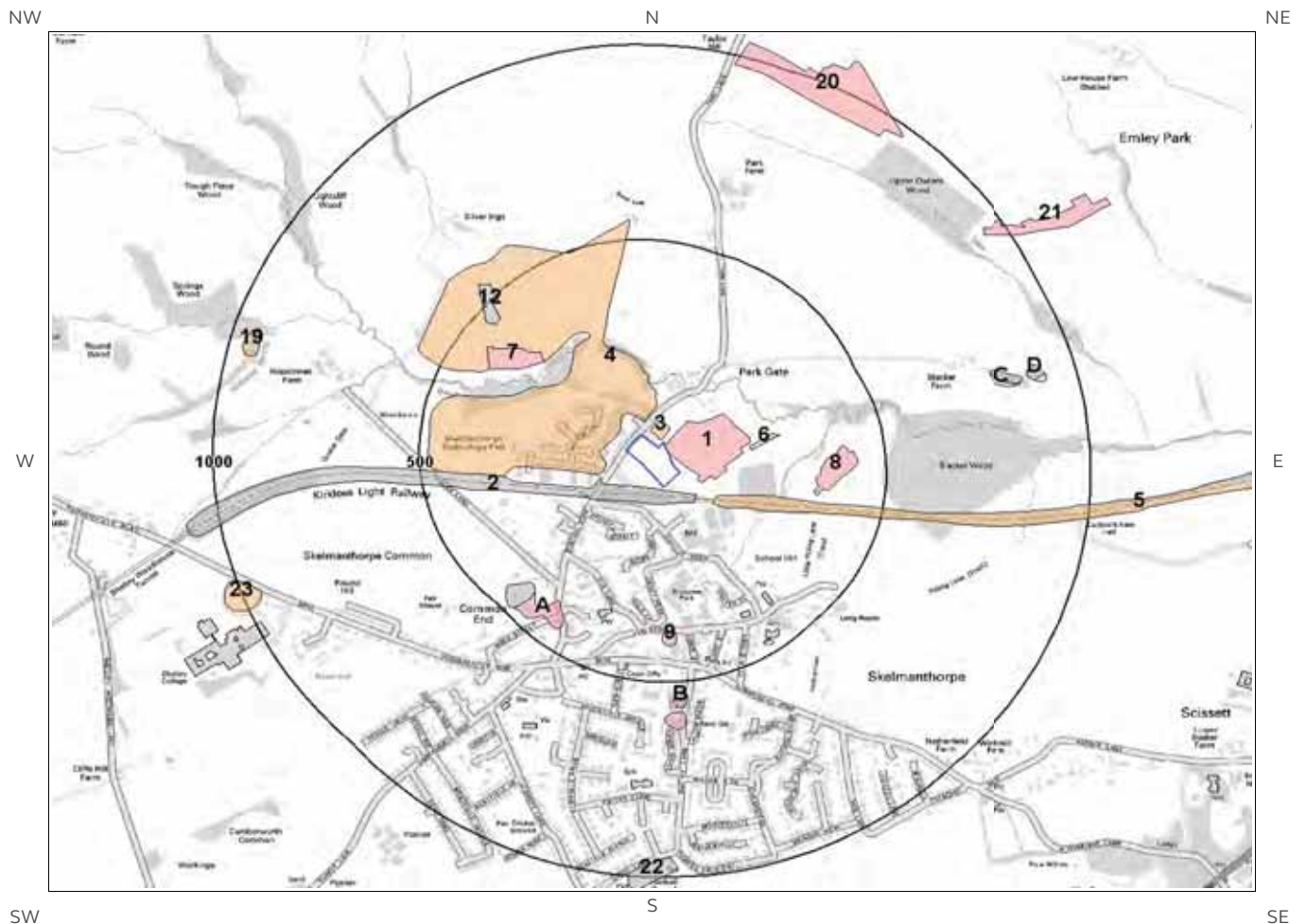
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

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1. Geology 1:10,000 scale

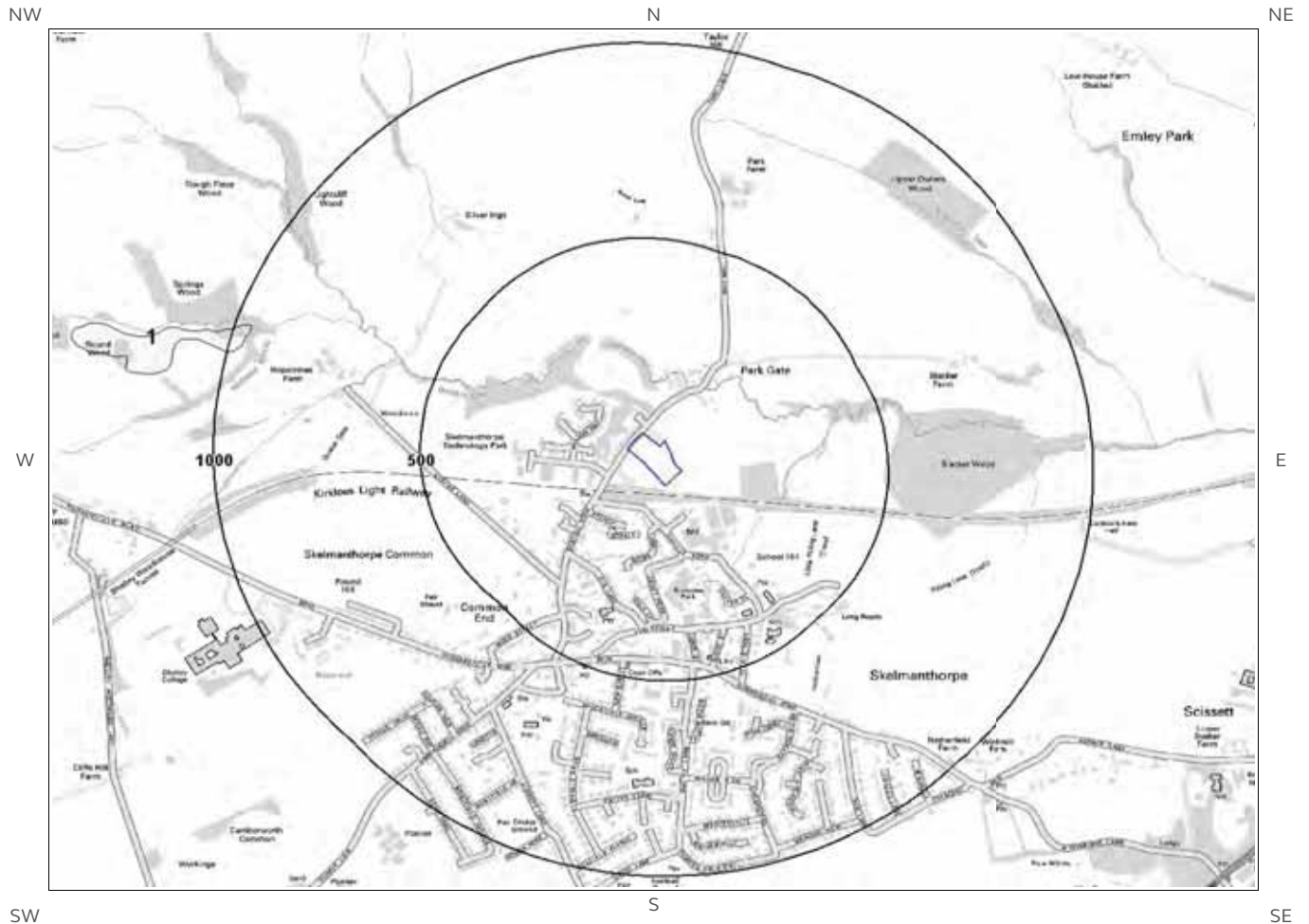
1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? Yes

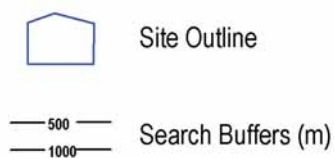
ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	WMGR-ARTDP	Infilled Ground	Artificial Deposit
2	8.0	S	WGR-VOID	Worked Ground (Undivided)	Void
3	9.0	N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	37.0	N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
5	106.0	SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
6	182.0	E	WGR-VOID	Worked Ground (Undivided)	Void
7	298.0	NW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
8	326.0	E	WMGR-ARTDP	Infilled Ground	Artificial Deposit
9	373.0	S	WMGR-ARTDP	Infilled Ground	Artificial Deposit
10A	387.0	SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
11A	401.0	SW	WGR-VOID	Worked Ground (Undivided)	Void
12	450.0	NW	WGR-VOID	Worked Ground (Undivided)	Void

1.2 Superficial Deposits and Landslips map (1:10,000 scale)



Artificial Ground Legend

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1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

1.2.2 Landslip

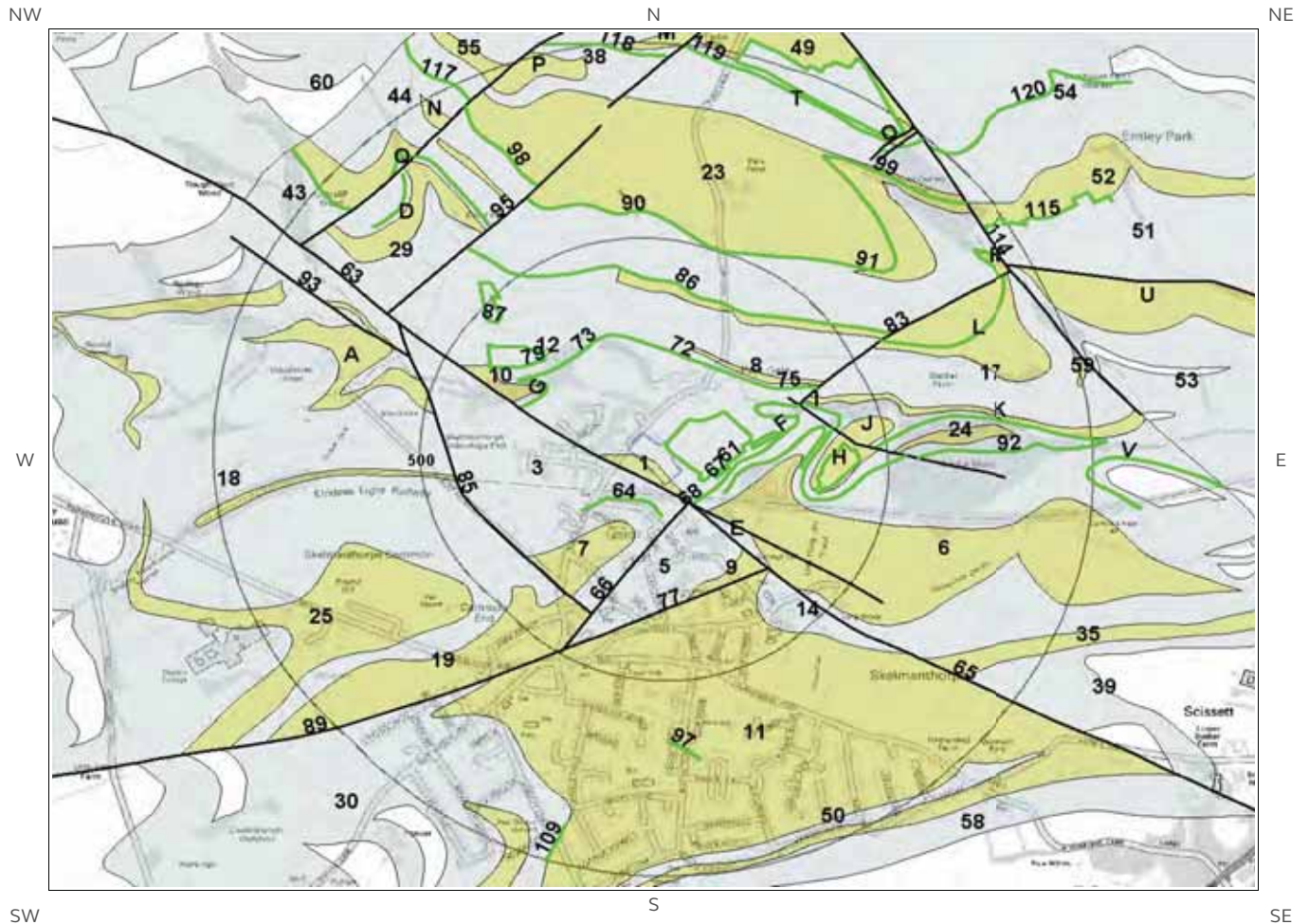
Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)



Bedrock and linear features Legend

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1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
2I	0.0	On Site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
3	9.0	SW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
4E	59.0	SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
5	70.0	SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
6	116.0	SE	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
7	133.0	SW	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
8	237.0	NE	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
9	245.0	SE	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
10	258.0	NW	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
11	292.0	SE	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
12	302.0	NW	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
13H	312.0	E	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
14	330.0	SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
15K	348.0	NE	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
16	354.0	NE	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
17	363.0	NE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
18	365.0	SW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
19	365.0	SW	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
20J	393.0	E	PLCM-SDST	Pennine Lower Coal Measures Formation - Sandstone	Langsettian Sub-age
21	420.0	W	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
22A	473.0	W	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? Yes

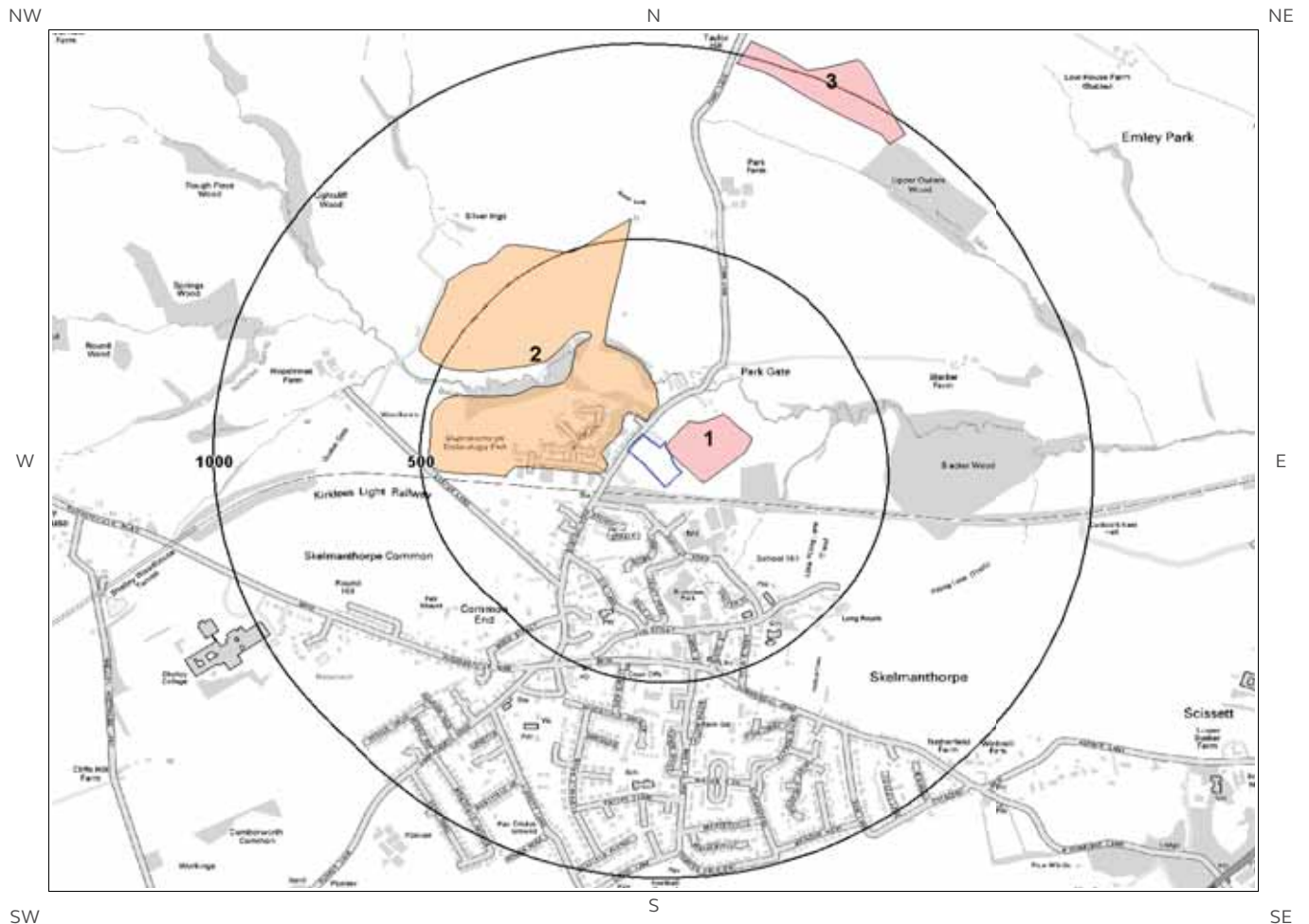
ID	Distance (m)	Direction	Category Description	Feature Description
61	0.0	On Site	ROCK	Coal seam, observed
62E	9.0	SW	FAULT	Normal fault, inferred; crossmarks on downthrow side
63	46.0	SW	FAULT	Normal fault, inferred; crossmarks on downthrow side
64	58.0	SW	ROCK	Coal seam, inferred
65	59.0	SE	FAULT	Normal fault, inferred; crossmarks on downthrow side
66	70.0	SE	FAULT	Normal fault, inferred; crossmarks on downthrow side
67	75.0	E	ROCK	Coal seam, observed
68	79.0	SE	ROCK	Coal seam, inferred
69F	86.0	SE	ROCK	Coal seam, observed
70F	116.0	SE	ROCK	Coal seam, inferred
71F	182.0	E	ROCK	Coal seam, observed
72	216.0	N	ROCK	Coal seam, observed
73	244.0	N	ROCK	Coal seam, inferred
74G	246.0	NW	ROCK	Coal seam, inferred
75	255.0	NE	ROCK	Coal seam, inferred
76G	260.0	NW	ROCK	Coal seam, observed
77	292.0	SE	FAULT	Normal fault, inferred; crossmarks on downthrow side
78H	292.0	E	ROCK	Coal seam, inferred
79	298.0	NW	ROCK	Coal seam, observed
80I	305.0	NE	ROCK	Coal seam, inferred
81J	318.0	NE	FAULT	Normal fault, inferred; downthrow not specified
82H	326.0	E	ROCK	Coal seam, observed
83	330.0	NE	FAULT	Normal fault, inferred; downthrow not specified
84I	340.0	NE	ROCK	Coal seam, inferred
85	365.0	SW	FAULT	Normal fault, inferred; downthrow not specified
86	374.0	N	ROCK	Coal seam, inferred
87	450.0	NW	ROCK	Coal seam, observed
88K	472.0	E	ROCK	Coal seam, inferred
89	486.0	SW	FAULT	Normal fault, inferred; crossmarks on downthrow side

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

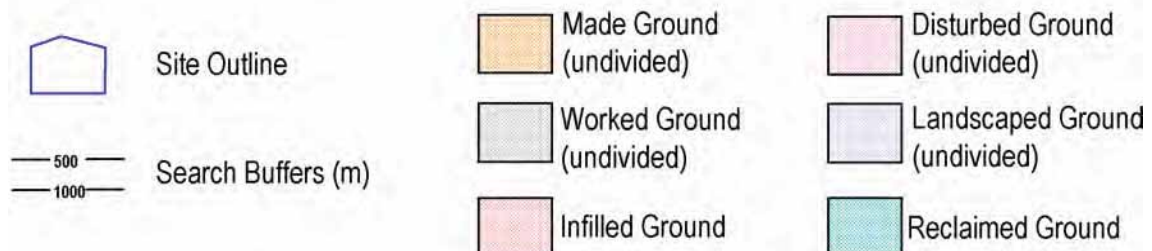
This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



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2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 086

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? Yes

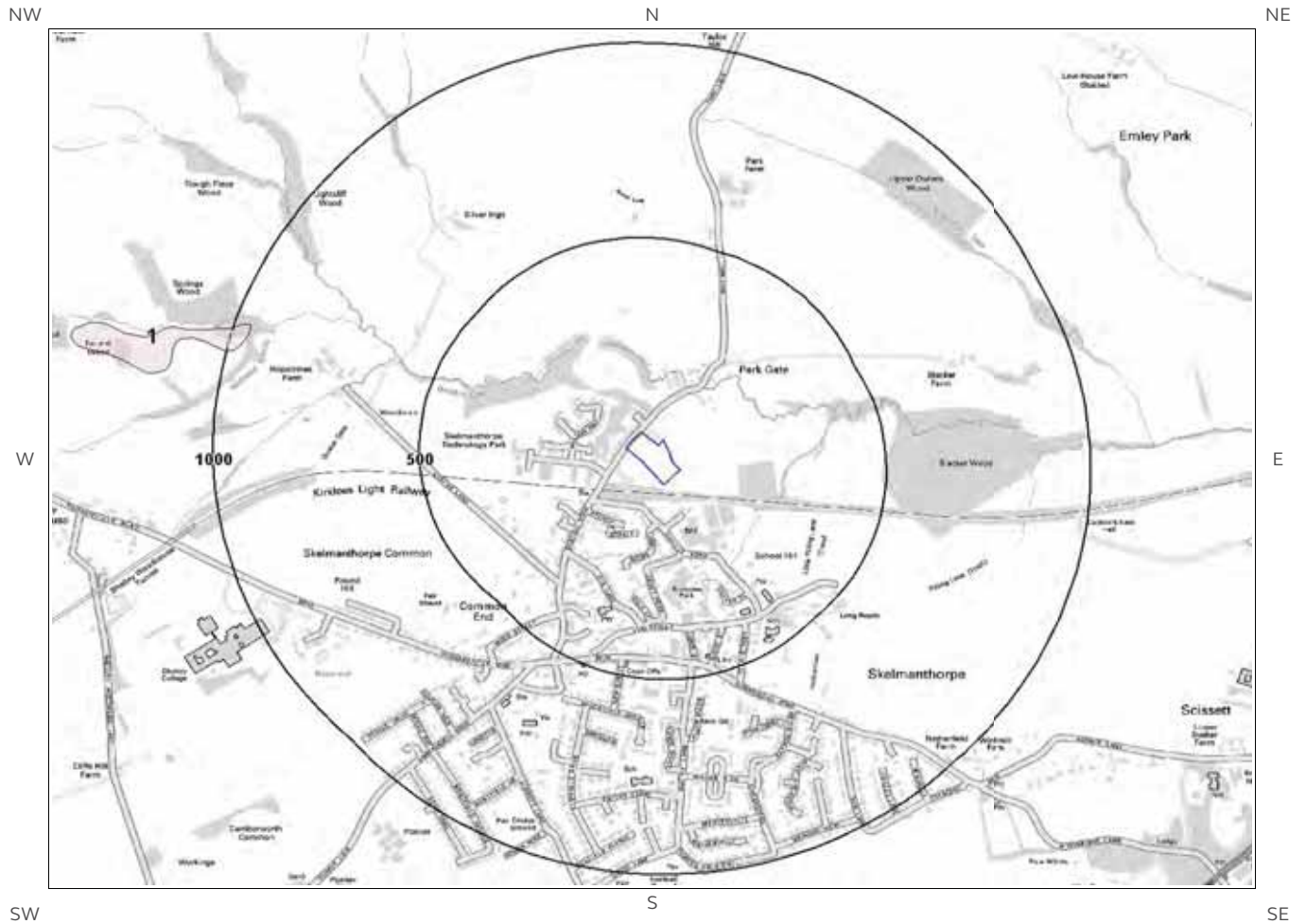
ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT
2	36.0	N	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	Very High	Low
36.0	N	Mixed	Very High	Low

2.2 Superficial Deposits and Landslips map (1:50,000 scale)



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2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? No

Database searched and no data found.

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? No

Database searched and no data found.

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

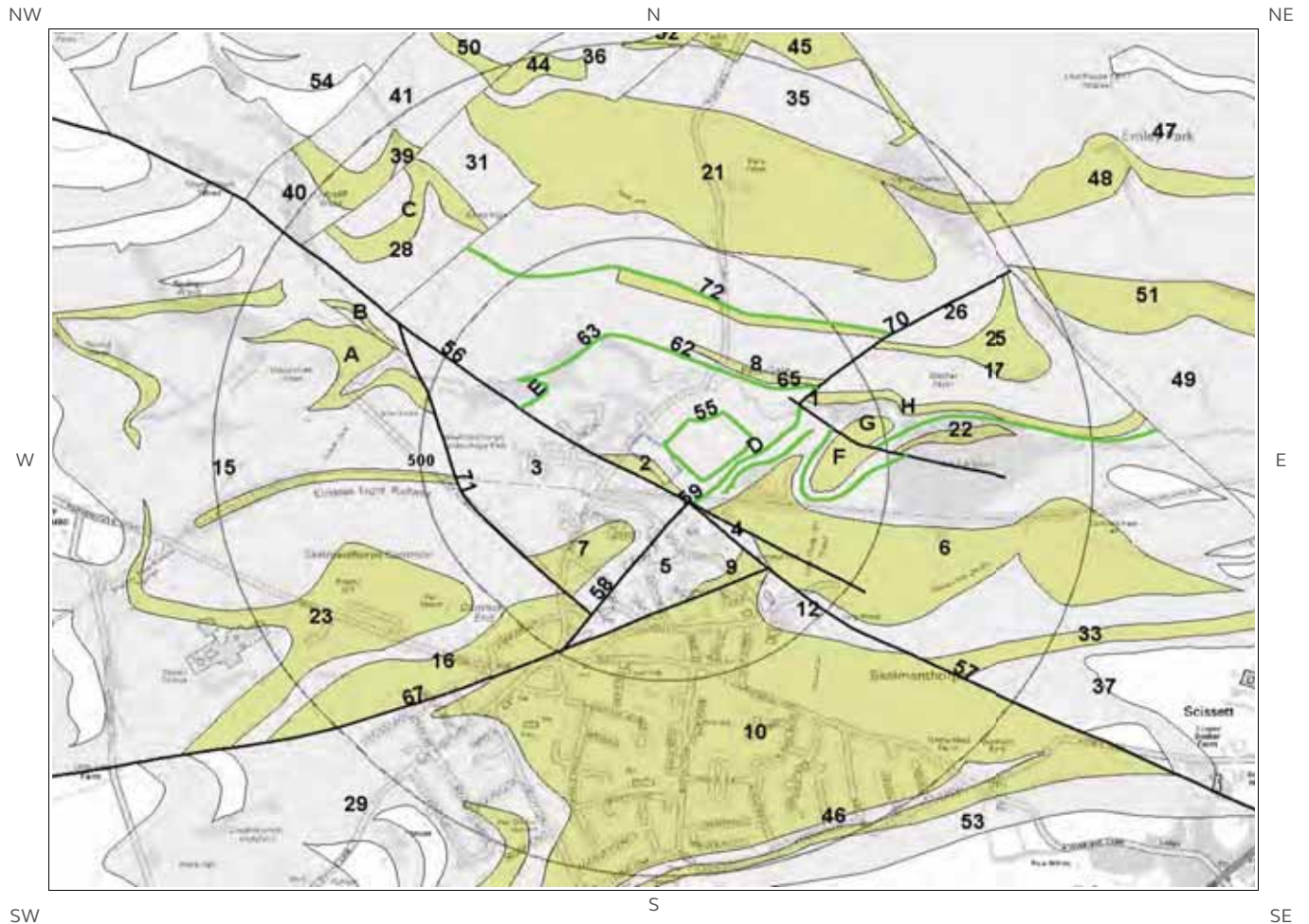
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary? No

Database searched and no data found.

2.3 Bedrock and linear features map (1:50,000 scale)



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2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 086

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
2	0.0	On Site	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
3	9.0	SW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
4	59.0	SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
5	70.0	SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
6	116.0	SE	PF-SDST	PENISTONE FLAGS - SANDSTONE	WESTPHALIAN
7	133.0	SW	PF-SDST	PENISTONE FLAGS - SANDSTONE	WESTPHALIAN
8	237.0	NE	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
9	244.0	SE	PF-SDST	PENISTONE FLAGS - SANDSTONE	WESTPHALIAN
10	292.0	SE	PF-SDST	PENISTONE FLAGS - SANDSTONE	WESTPHALIAN
11F	311.0	E	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
12	329.0	SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
13H	348.0	NE	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
14	352.0	NE	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
15	365.0	SW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
16	365.0	SW	PF-SDST	PENISTONE FLAGS - SANDSTONE	WESTPHALIAN
17	377.0	NE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
18G	393.0	E	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
19	419.0	W	PF-SDST	PENISTONE FLAGS - SANDSTONE	WESTPHALIAN
20A	473.0	W	PF-SDST	PENISTONE FLAGS - SANDSTONE	WESTPHALIAN

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	High	Low
0.0	On Site	Fracture	High	Low

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? Yes

ID	Distance	Direction	Category Description	Feature Description
55	0.0	On Site	ROCK	Coal seam, observed
56	9.0	SW	FAULT	Fault, inferred
57	59.0	SE	FAULT	Fault, inferred
58	70.0	SE	FAULT	Fault, inferred
59	79.0	SE	ROCK	Coal seam, inferred
60D	86.0	SE	ROCK	Coal seam, observed
61D	116.0	SE	ROCK	Coal seam, inferred
62	217.0	N	ROCK	Coal seam, observed
63	244.0	N	ROCK	Coal seam, inferred
64E	246.0	NW	ROCK	Coal seam, inferred
65	255.0	NE	ROCK	Coal seam, inferred
66E	260.0	NW	ROCK	Coal seam, observed
67	292.0	SE	FAULT	Fault, inferred
68F	293.0	E	ROCK	Coal seam, inferred
69G	318.0	NE	FAULT	Fault, inferred, displacement unknown
70	330.0	NE	FAULT	Fault, inferred
71	365.0	SW	FAULT	Fault, inferred
72	376.0	NE	ROCK	Coal seam, inferred
73H	472.0	E	ROCK	Coal seam, inferred

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

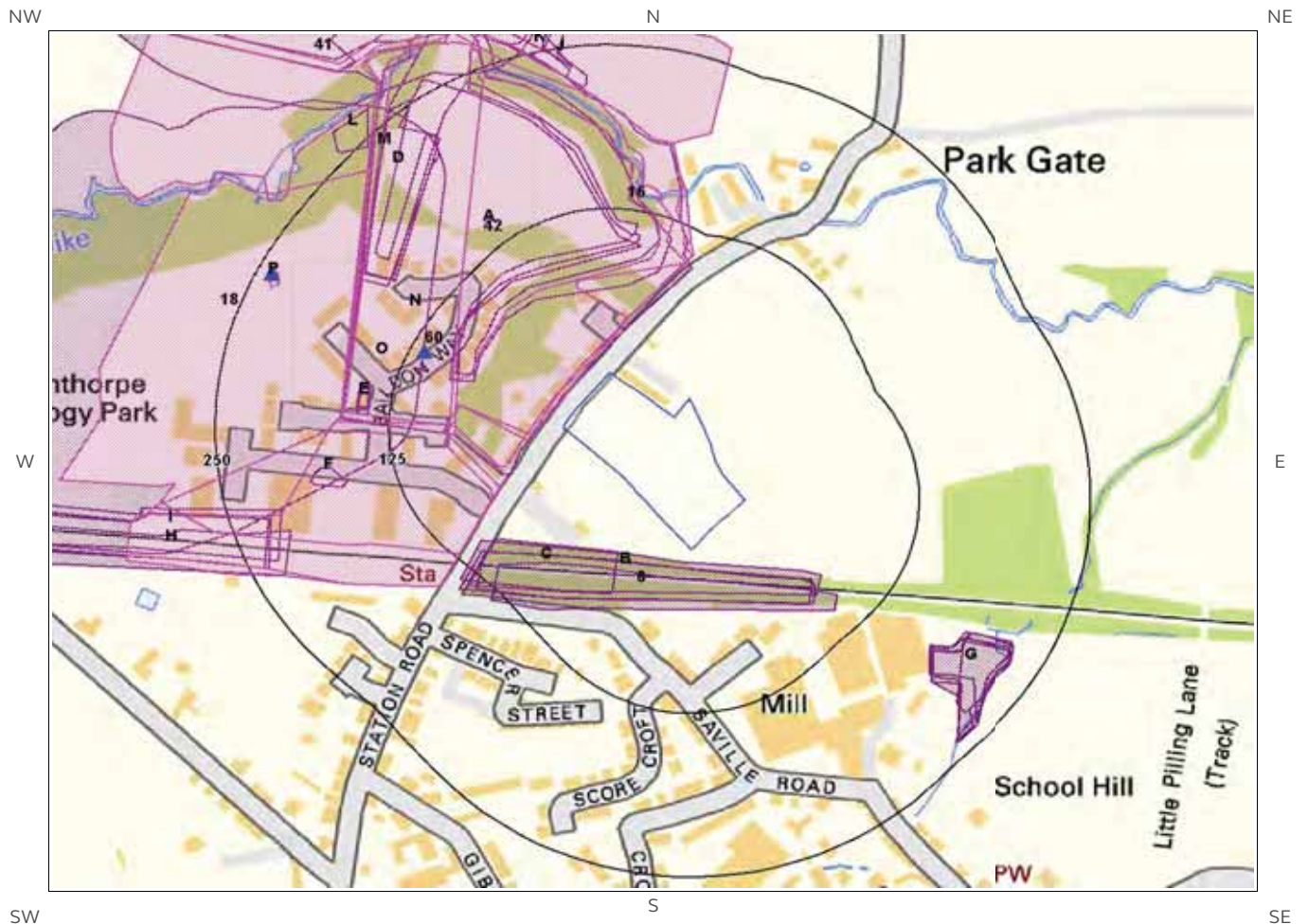
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

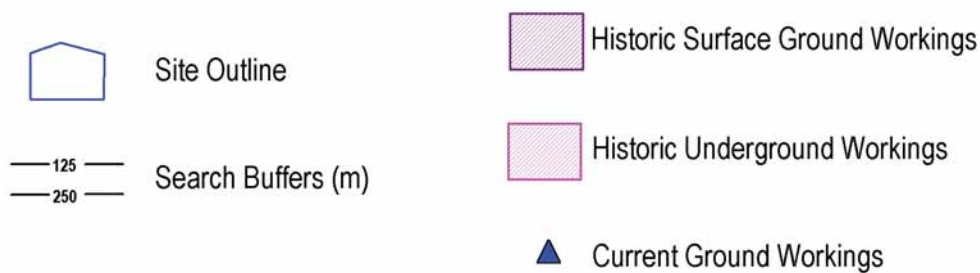
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

4 Ground Workings map



Ground Workings Legend

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4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1B	10.0	S	423226 411035	Cuttings	1951
2A	13.0	NW	423065 411432	Collieries	1938
3A	13.0	NW	423065 411432	Collieries	1938
4B	15.0	S	423228 411027	Cuttings	1938
5B	15.0	S	423223 411028	Cuttings	1904
6B	15.0	S	423223 411028	Cuttings	1948
7A	17.0	NW	423068 411436	Collieries	1951
8	23.0	S	423243 411021	Cuttings	1892
9C	41.0	SW	423155 411036	Cuttings	1993
10C	41.0	SW	423155 411036	Cuttings	1979
11C	41.0	SW	423155 411036	Cuttings	1967
12N	55.0	SW	423048 411390	Collieries	1948
13D	64.0	N	423066 411347	Refuse Heap	1938
14D	64.0	N	423066 411347	Refuse Heap	1938
15O	70.0	SW	423057 411228	Collieries	1904
16	75.0	N	423219 411305	Refuse Heap	1948
17M	76.0	NW	423065 411354	Refuse Heaps	1951
18	107.0	W	422859 411219	Unspecified Workings	1979
19E	140.0	W	423027 411161	Reservoir	1948
20E	141.0	W	423026 411160	Reservoir	1938
21E	141.0	W	423026 411166	Reservoir	1951

ID	Distance (m)	Direction	NGR	Use	Date
22F	161.0	W	423002 411104	Unspecified Pit	1948
23F	161.0	W	423002 411104	Unspecified Pit	1904
24	162.0	NW	423041 411323	Refuse Heap	1948
25G	174.0	SE	423464 410947	Reservoirs	1951
26G	174.0	SE	423464 410952	Ponds	1967
27G	174.0	SE	423464 410952	Ponds	1979
28G	177.0	SE	423464 410943	Reservoirs	1948
29G	178.0	SE	423473 410942	Reservoirs	1938
30G	190.0	SE	423473 410952	Reservoir	1904
31H	211.0	W	422865 411050	Cuttings	1892
32I	212.0	W	422833 411065	Cuttings	1951
33J	218.0	N	423167 411426	Unspecified Pit	1892
34H	221.0	W	422849 411059	Cuttings	1904
35I	221.0	W	422849 411059	Cuttings	1948
36H	223.0	W	422851 411058	Cuttings	1938
37J	227.0	N	423152 411434	Unspecified Pit	1948
38K	227.0	N	423152 411434	Unspecified Pit	1904
39K	234.0	N	423153 411442	Cuttings	1951
40L	245.0	NW	423017 411368	Slurry Ponds	1979
41	246.0	N	422994 411554	Unspecified Workings	1979

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? Yes

The following Historical Underground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
42	12.0	NW	423134 411291	Unspecified Mine	1979
43L	16.0	NW	423107 411407	Unspecified Mine	1967
44M	17.0	NW	423068 411436	Collieries	1951
45N	55.0	SW	423048 411390	Collieries	1948
46O	70.0	SW	423057 411228	Collieries	1904
47P	232.0	NW	422962 411253	Unspecified Old Shaft	1948
48P	234.0	NW	422962 411258	Unspecified Old Shaft	1951
Not shown	823.0	N	423280 412040	Colliery	1892
Not shown	832.0	N	423272 412051	Colliery	1951
Not shown	839.0	N	423255 412064	Colliery	1948
Not shown	839.0	N	423255 412064	Colliery	1904
Not shown	842.0	N	423269 412060	Unspecified Mine	1979
Not shown	851.0	N	423242 412052	Unspecified Mine	1967
Not shown	875.0	N	423264 412060	Unspecified Shaft	1904
Not shown	887.0	N	423226 412075	Air Shaft	1904
Not shown	921.0	N	423209 412108	Unspecified Level	1948
Not shown	921.0	N	423209 412108	Unspecified Level	1904
Not shown	922.0	N	423212 412110	Unspecified Level	1951

4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
60	115.0	NW	423070 411200	Coal, Deep	Emley Moor Collieries	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
61P	240.0	NW	422960 411260	Coal, Deep	Boggart Lane Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	403.0	NW	423014 411540	Coal, Deep	Emley Lane Collieries	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	412.0	SW	422990 410740	Sandstone	Saw Mills	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	438.0	SW	422908 410788	Sandstone	Saw Mills	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	535.0	S	423289 410515	Sandstone	Smithy Lane	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	572.0	N	423176 411755	Coal, Deep	Booth Lane Level	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	598.0	S	423283 410452	Sandstone	Smithy Lane	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	666.0	S	423412 410401	Sandstone	Skelmanthorpe	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	869.0	SW	422843 410288	Clay & Shale	Lidgett Lane	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	878.0	N	423253 412061	Coal, Deep	Nineclogs Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	897.0	E	424160 411346	Sandstone	Blacker Wood	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	931.0	N	423214 412115	Coal, Deep	Nineclogs Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

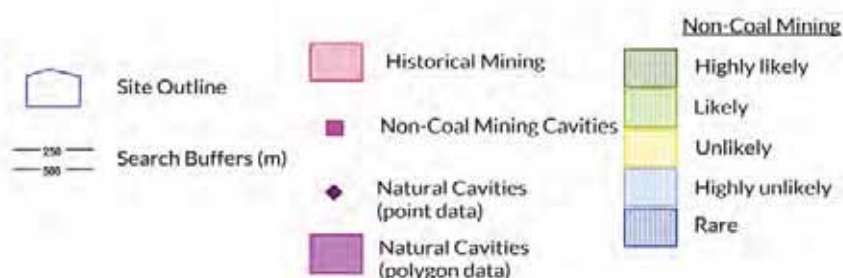
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	987.0	NE	423780 412004	Sandstone	Emley Park	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

5 Mining, Extraction & Natural Cavities map



Mining, Extraction and Natural Cavities Legend

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5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? Yes

The following Historical Mining information is provided by Groundsure:

ID	Distance (m)	Direction	NGR	Details	Date
1	12.0	NW	423134 411291	Unspecified Mine	1979
2A	16.0	NW	423107 411407	Unspecified Mine	1967
3	17.0	NW	423068 411436	Collieries	1951
4A	55.0	SW	423048 411390	Collieries	1948
5	70.0	SW	423057 411228	Collieries	1904
6B	232.0	NW	422962 411253	Unspecified Old Shaft	1948
7B	234.0	NW	422962 411258	Unspecified Old Shaft	1951
Not shown	823.0	N	423280 412040	Colliery	1892
Not shown	832.0	N	423272 412051	Colliery	1951
Not shown	839.0	N	423255 412064	Colliery	1904
Not shown	839.0	N	423255 412064	Colliery	1948
Not shown	842.0	N	423269 412060	Unspecified Mine	1979
Not shown	851.0	N	423242 412052	Unspecified Mine	1967
Not shown	875.0	N	423264 412060	Unspecified Shaft	1904
Not shown	887.0	N	423226 412075	Air Shaft	1904
Not shown	921.0	N	423209 412108	Unspecified Level	1904
Not shown	921.0	N	423209 412108	Unspecified Level	1948
Not shown	922.0	N	423212 412110	Unspecified Level	1951

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? Yes

The following Coal Mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

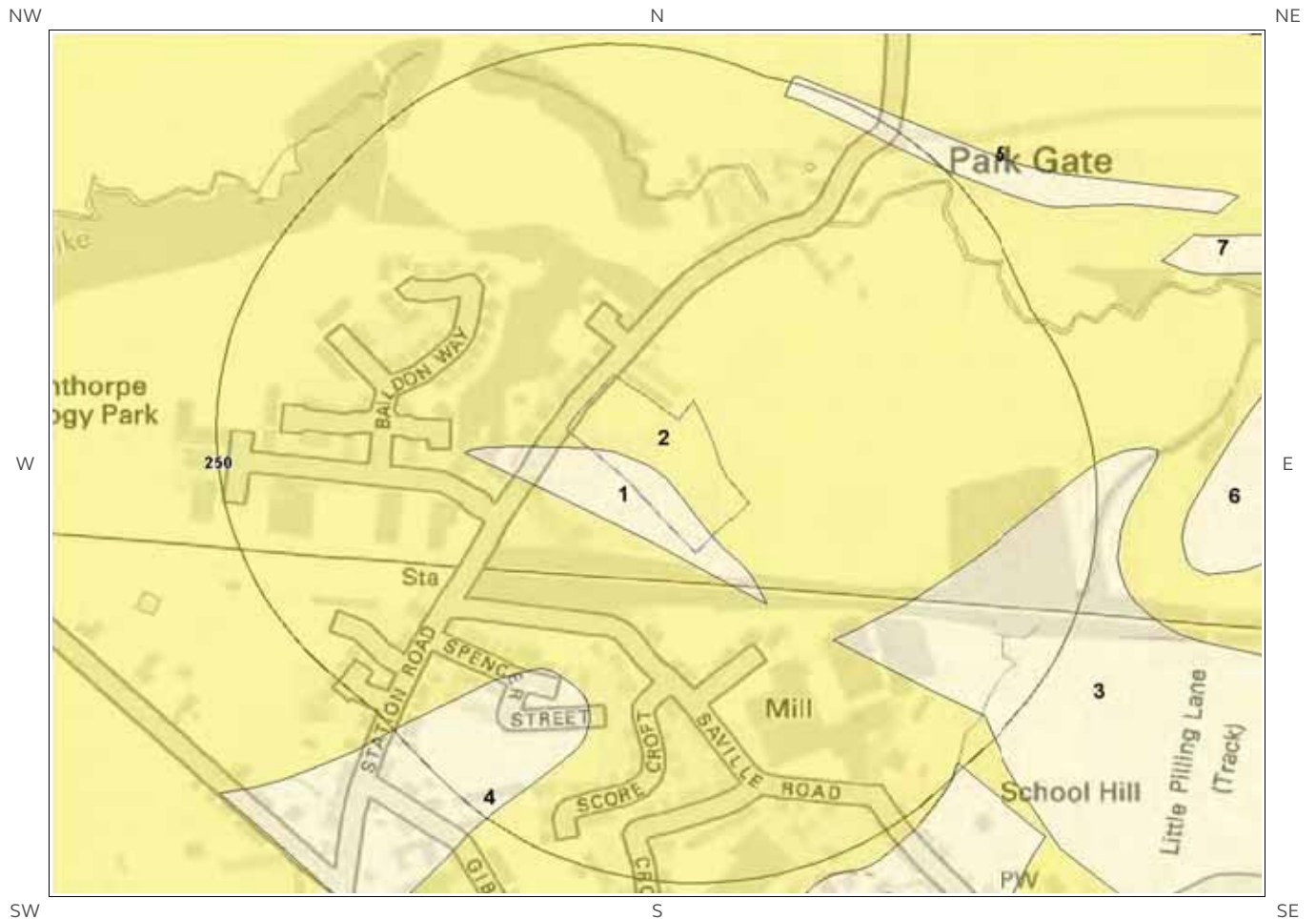
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

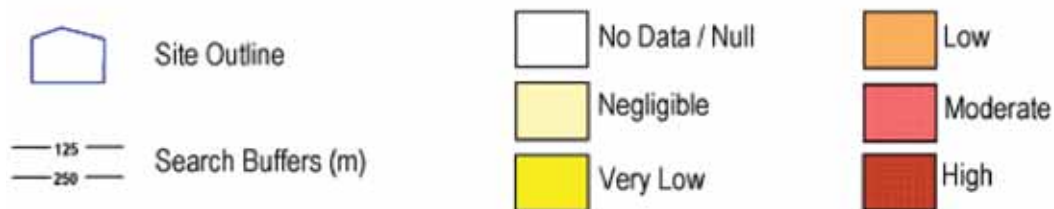
6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map

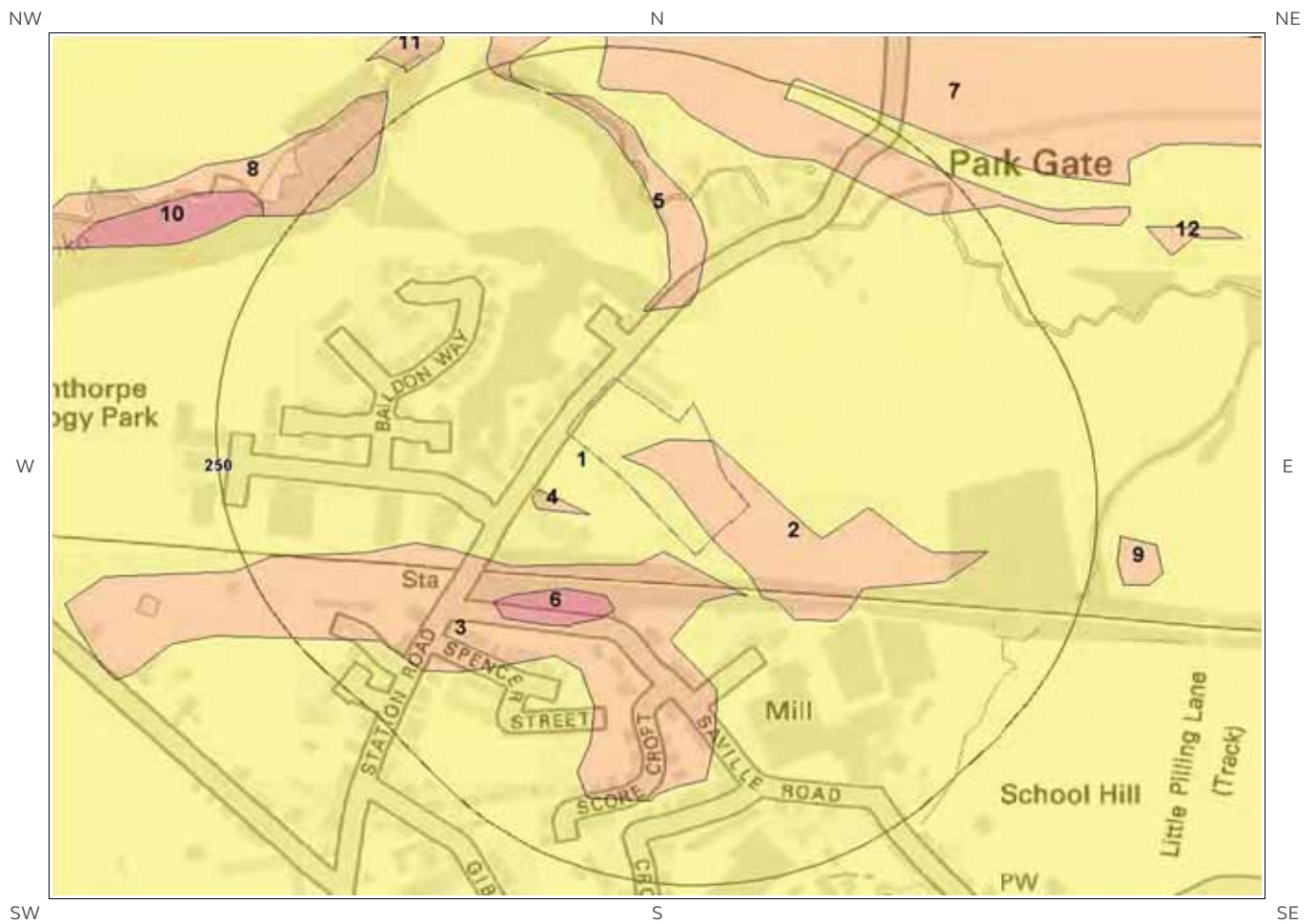


Shrink Swell Clay Legend

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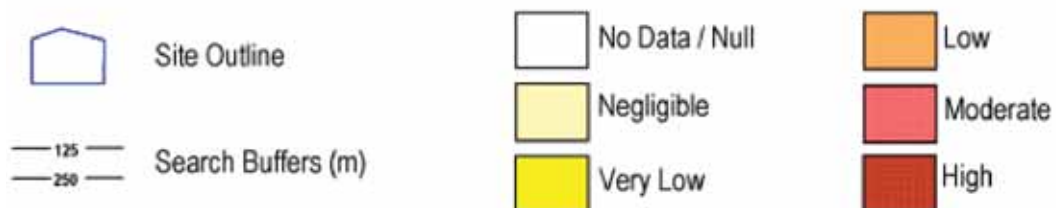


6.2 Landslides map

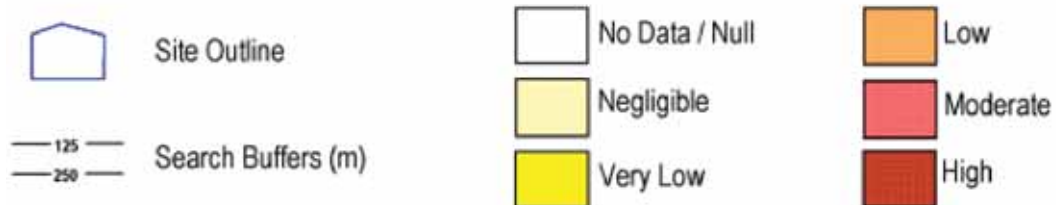
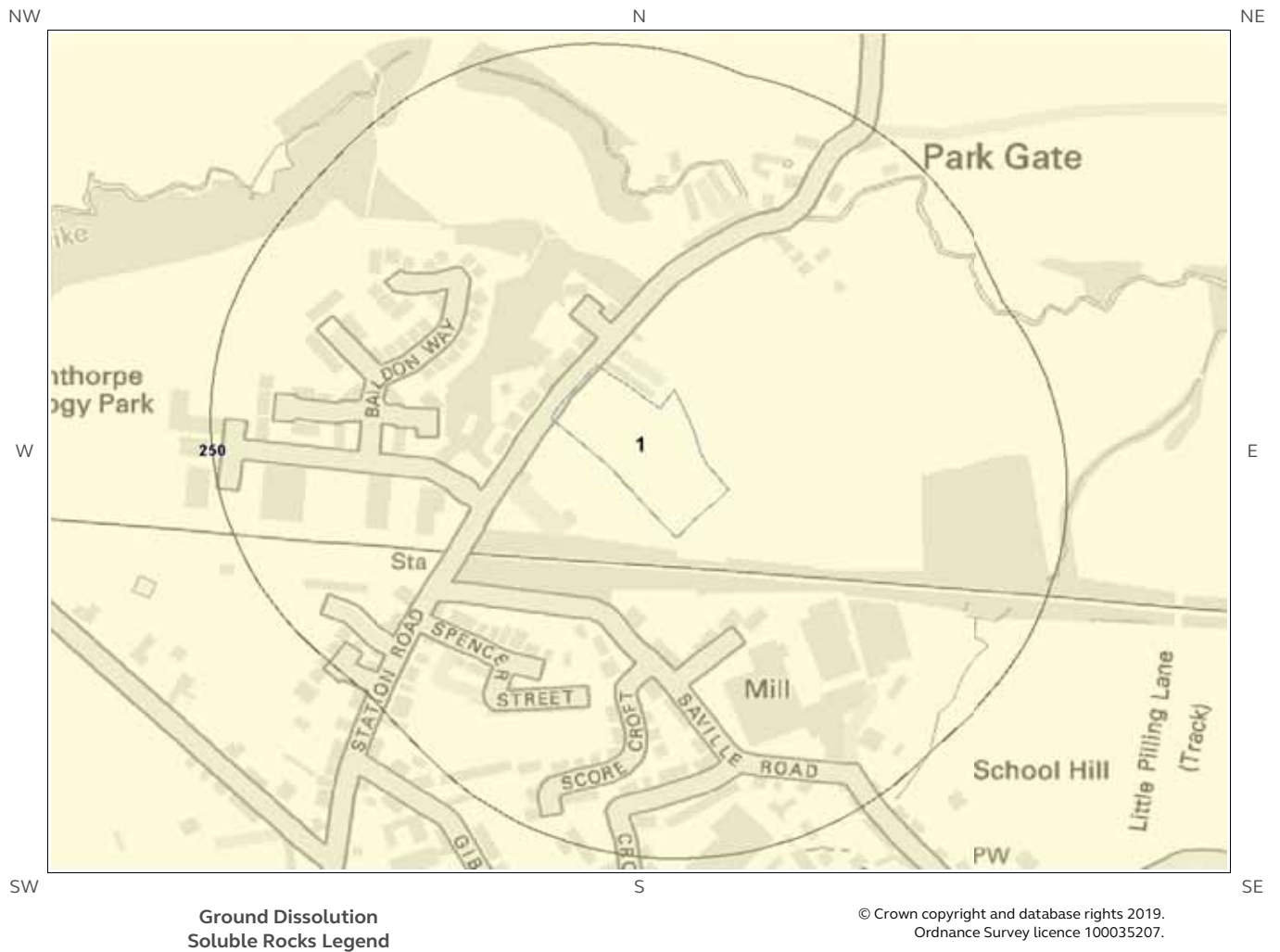


Landslides Legend

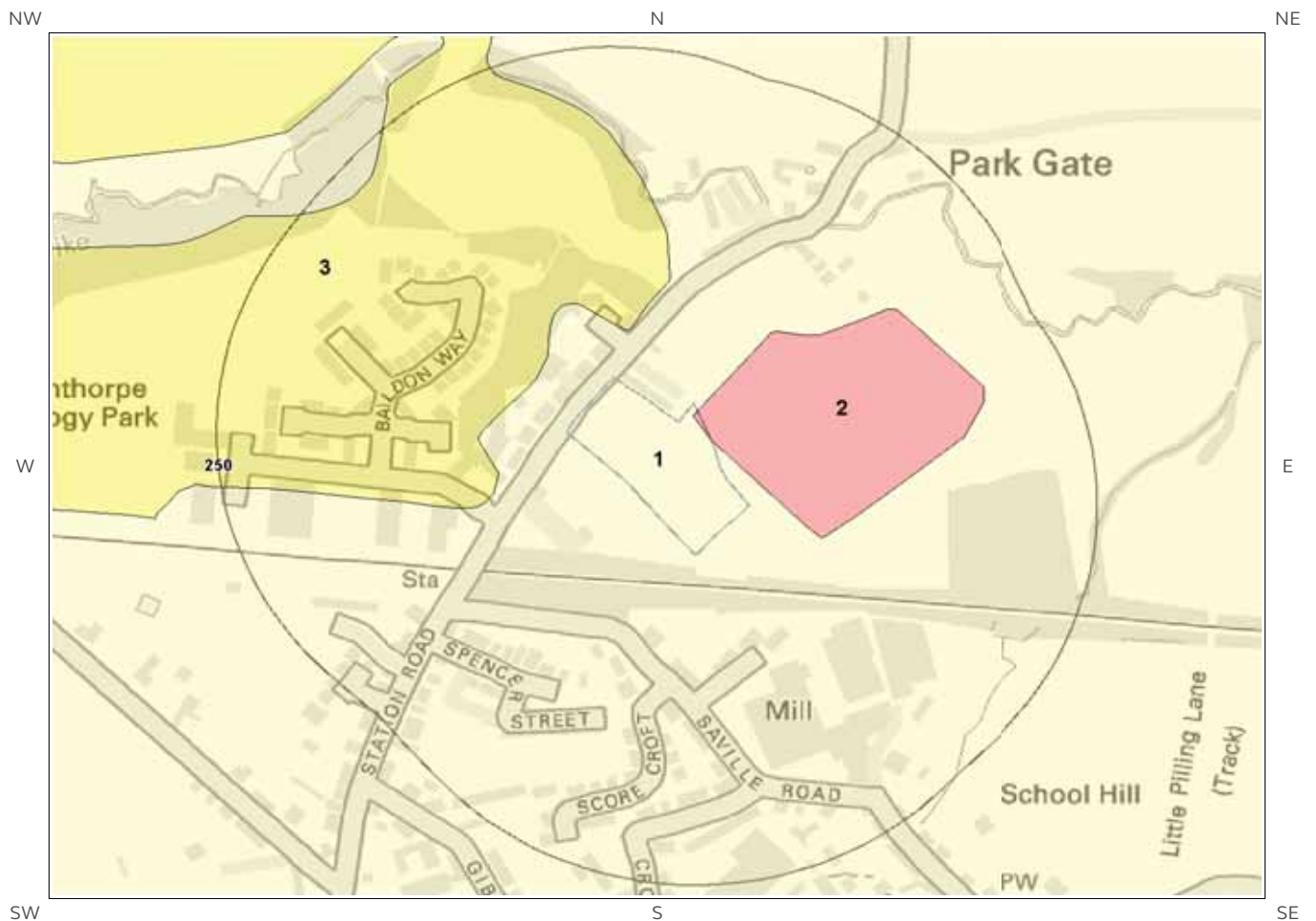
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6.3 Ground Dissolution of Soluble Rocks map

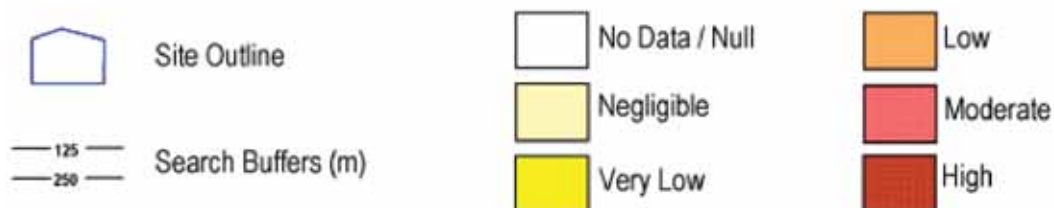


6.4 Compressible Deposits map

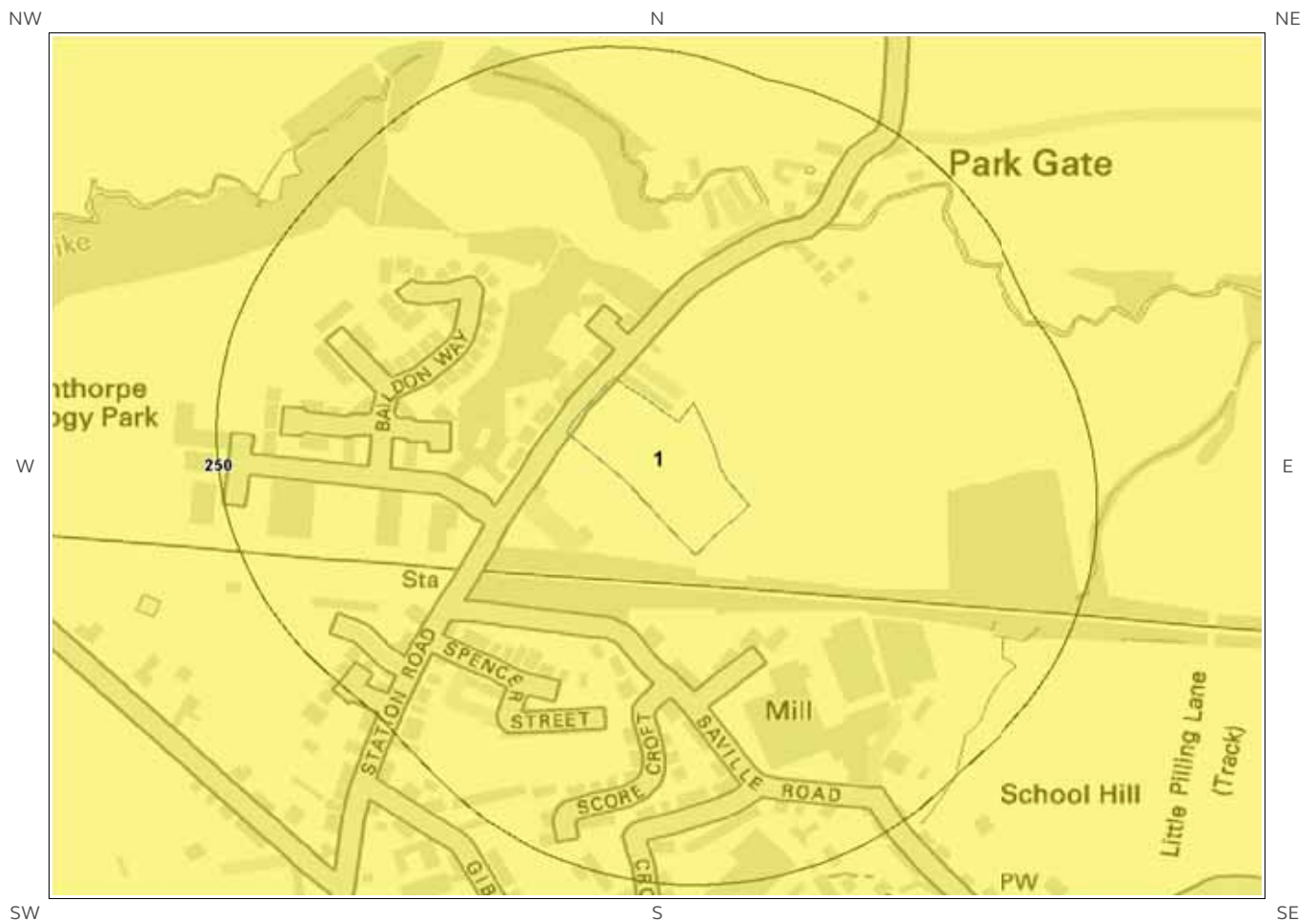


Compressible Deposits Legend

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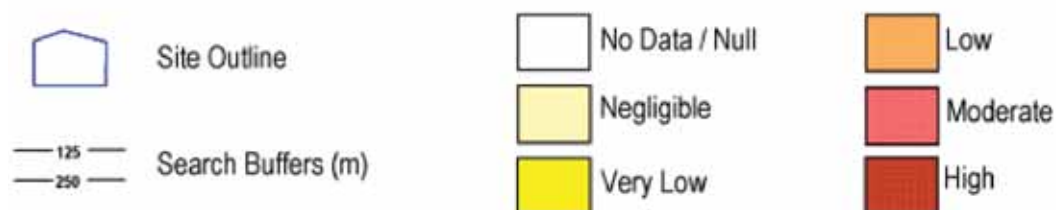


6.5 Collapsible Deposits map



Collapsible Deposits Legend

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6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site** boundary? Moderate

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
2	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.
2	0.0	On Site	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.

* This includes an automatically generated 50m buffer zone around the site

ID	Distance (m)	Direction	Hazard Rating	Details
3	9.0	SW	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.
4	36.0	SW	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
2	0.0	On Site	Moderate	Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property - possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.
3	36.0	N	Very Low	Very low potential for compressible deposits to be present. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

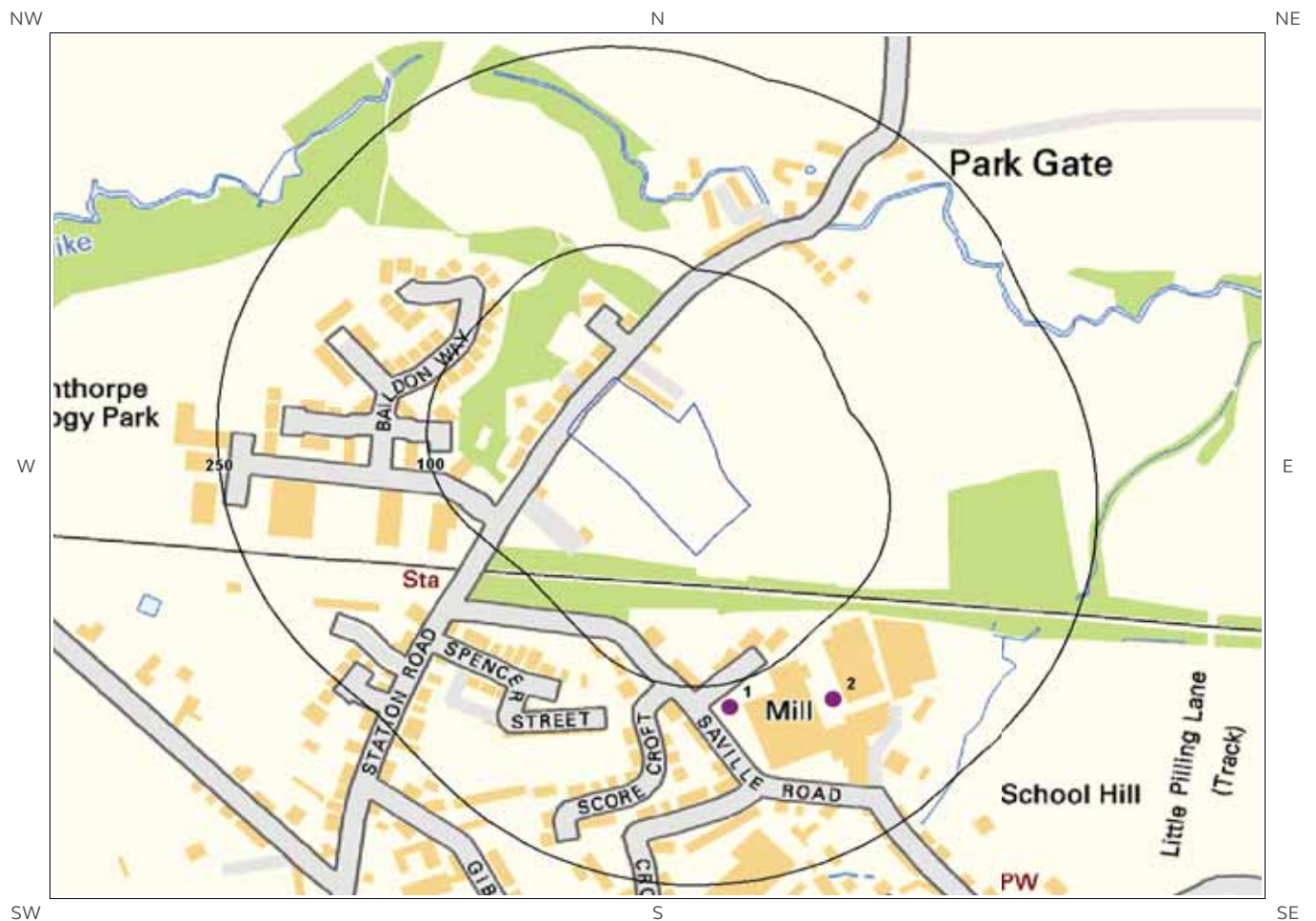
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
3	36.0	N	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

7 Borehole Records map



Borehole Records Legend

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7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

2

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	118.0	S	423286 410934	SE21SW28	75.0	FUR FABRICS LTD WAKEFIELD RD SKELMANTHORPE
2	147.0	SE	423360 410940	SE21SW1	114.3	GREENSIDE MILLS SKELMANTHORPE

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: scans.bgs.ac.uk/sobi_scans/boreholes/57114

#2: scans.bgs.ac.uk/sobi_scans/boreholes/57082

8 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

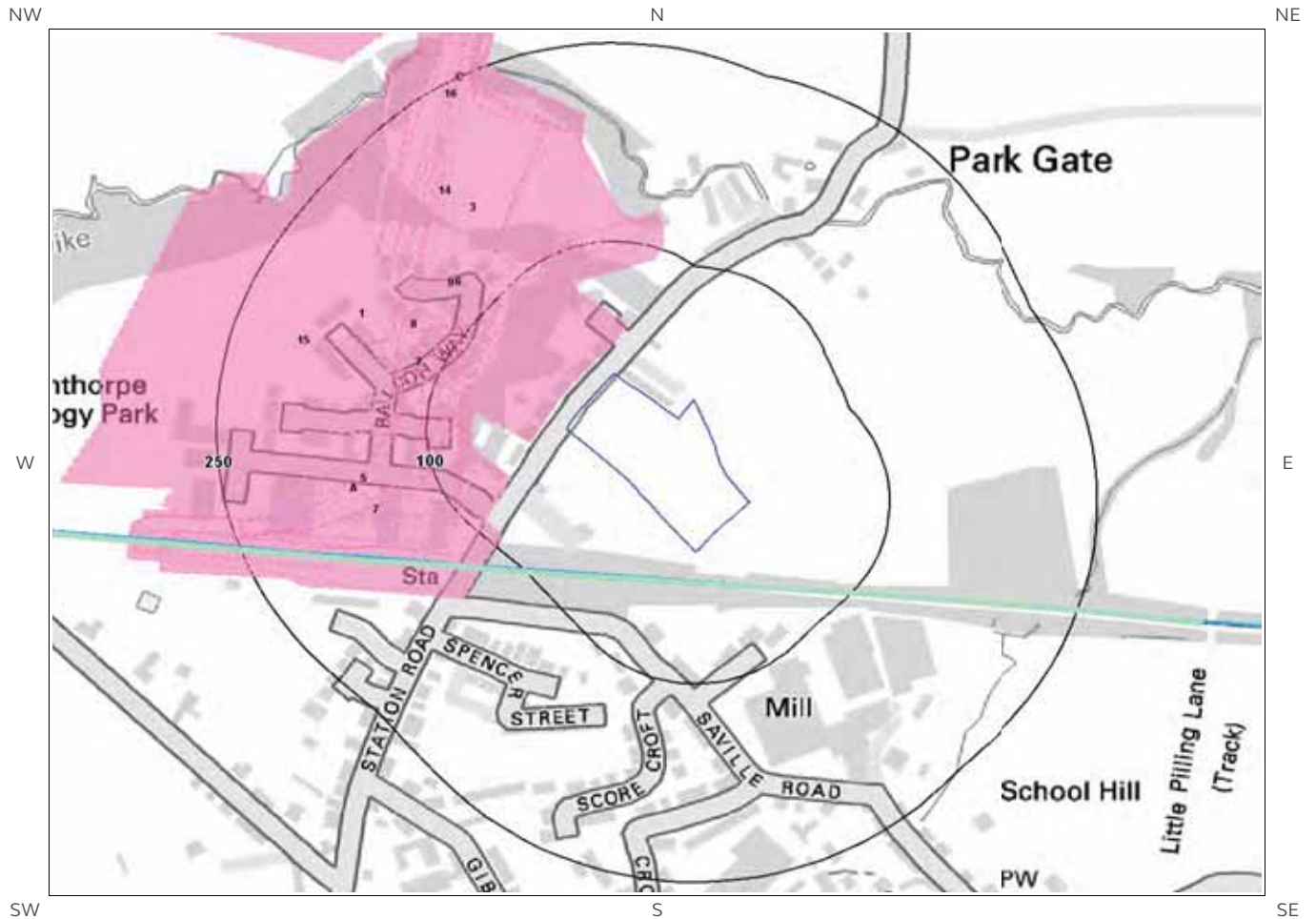
3

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
50.0	S	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg

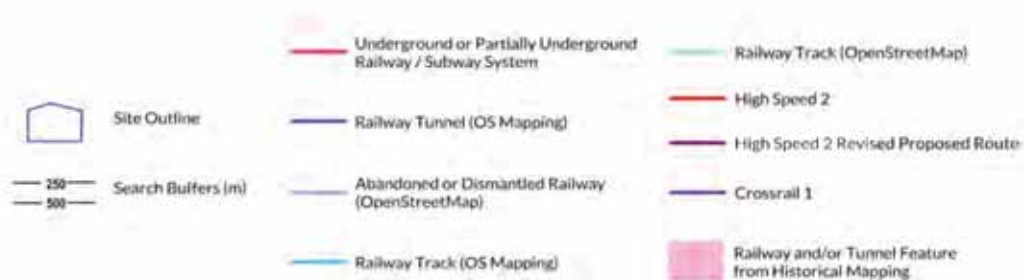
*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend

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9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	16	NW	423074 411407	Railway Sidings	1967
2	55	SW	423010 411139	Railway Sidings	1948
3	61	NW	423091 411467	Tramway Sidings	1955
4A	67	W	423052 411111	Railway Sidings	1955
5	70	SW	423010 411139	Railway Sidings	1904
6	73	NW	423097 411411	Railway Sidings	1979

ID	Distance (m)	Direction	NGR	Details	Date
7	74	W	423072 411117	Railway Sidings	1892
9	74	NW	423098 411401	Railway Sidings	1959
8	86	W	423086 411397	Railway Sidings	1938
10A	92	W	423072 411146	Railway Sidings	1893
11B	95	W	423088 411395	Railway Sidings	1913
12B	95	W	423088 411395	Railway Sidings	1913
13	97	W	423062 411153	Railway Sidings	1906
14	118	NW	423145 411611	Tramway Sidings	1893
15	147	NW	422983 411206	Railway Sidings	1959
16	204	NW	423125 411545	Tramway Sidings	1906
17C	209	NW	423129 411550	Tramway Sidings	1913
18C	209	NW	423129 411550	Tramway Sidings	1913
19	211	NW	423011 411337	Railway Sidings	1959

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Name	Type
22	S	Not given	Multi Track
22	S	Not given	Multi Track

Distance (m)	Direction	Name	Type
24	S	Kirklees Light Railway	narrow_gauge
24	S	Kirklees Light Railway	narrow_gauge
118	SW	Kirklees Light Railway	narrow_gauge
118	SW	Kirklees Light Railway	narrow_gauge
129	SW	Not given	Multi Track
129	SW	Not given	Multi Track
130	SW	Kirklees Light Railway	narrow_gauge
130	SW	Kirklees Light Railway	narrow_gauge

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

Contact Details

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BGS Geological Hazards Reports and general geological enquiries

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Standard Terms and Conditions

Groundsure's Terms and Conditions can be viewed online at this link:
<https://www.groundsure.com/terms-and-conditions-feb11-2019>

APPENDIX E

Groundsure Enviro Insight Report

Historical Plans



Haigh Huddleston & Associates
99-101, LEEDS ROAD,
DEWSBURY, WF12 7BU

Groundsure Reference:	GS-5864925
Your Reference:	YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Date	7 Mar 2019
Report Delivery Method:	Email - pdf

Enviro Insight

Address: STATION ROAD, SKELMANTHORPE, HUDDERSFIELD, HD8 9TT

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,

A handwritten signature in black ink, appearing to be "A. J. O.", followed by a comma.

Managing Director
Groundsure Limited

Enc.
Groundsure Enviroinsight

Enviro Insight

Address: STATION ROAD, SKELMANTHORPE, HUDDERSFIELD, HD8 9TT

Date: 7 Mar 2019

Reference: GS-5864925

Client: Haigh Huddleston & Associates

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 26-Mar-2012

Grid Reference: 423248,411115

Site Size: 0.8054ha

Report Reference: GS-5864925

Client Reference: YORKSHIRE_COUNTRY_PROPERTIES_7366

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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	0	15	81	61
1.2 Additional Information – Historical Tank Database	0	0	18	15
1.3 Additional Information – Historical Energy Features Database	0	0	31	15
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	3	5
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	0	13	34	36
Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	1	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	0	7
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	7	1
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	1	1	2
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	0	2

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	0	12	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Records of Artificial Ground and Made Ground present beneath the study site	Identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	None identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m					
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	None identified					
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified					
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	5	2	0	15
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	1	0	2
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	3	0	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

0-500m

	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	No	No
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	0	14	26	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	Yes	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Environment Agency Zone 2 floodplains within 250m of the study site	Identified					
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	Identified					
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Very Low					
7.4 Flood Defences within 250m of the study site	None identified					
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified					
7.6 Areas used for Flood Storage within 250m of the study site	None identified					
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Potential at Surface					
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	Low					

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	1	4	1
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	1	0	0	0	0	1
8.14 Records of Green Belt land	1	0	0	0	0	2

Section 9: Natural Hazards

9.1 Maximum risk of natural ground subsidence

Moderate

9.1.1 Maximum Shrink-Swell hazard rating identified on the study site

Very Low

9.1.2 Maximum Landslides hazard rating identified on the study site

Low

9.1.3 Maximum Soluble Rocks hazard rating identified on the study site

Negligible

9.1.4 Maximum Compressible Ground hazard rating identified on the study site

Moderate

9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site

Very Low

9.1.6 Maximum Running Sand hazard rating identified on the study site

Very Low

9.2 Radon

9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?

No radon protective measures are necessary.

Section 10: Mining

10.1 Coal mining areas within 75m of the study site

Identified

10.2 Non-Coal Mining areas within 50m of the study site boundary

None identified

10.3 Brine affected areas within 75m of the study site

None identified

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licences, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

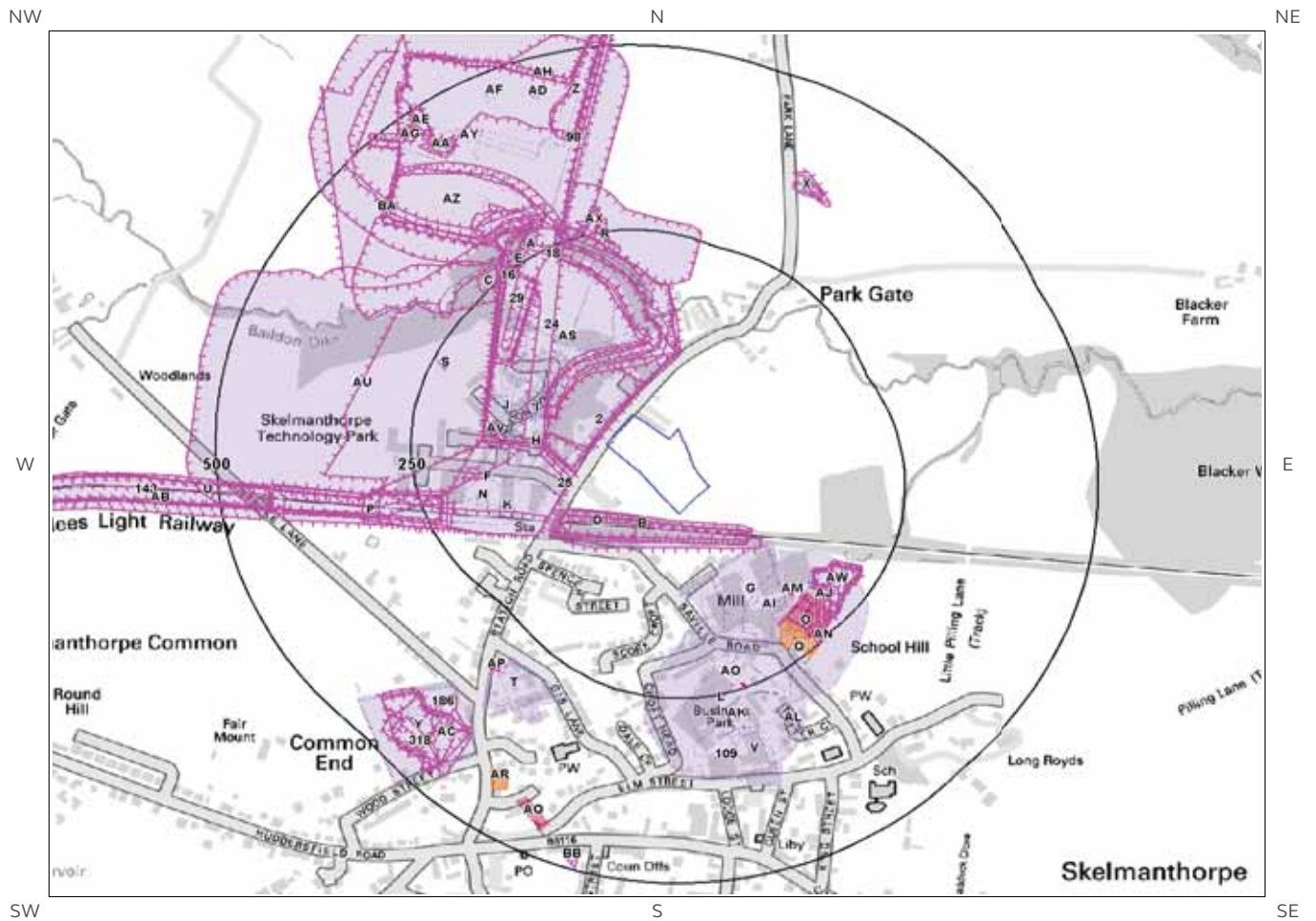
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

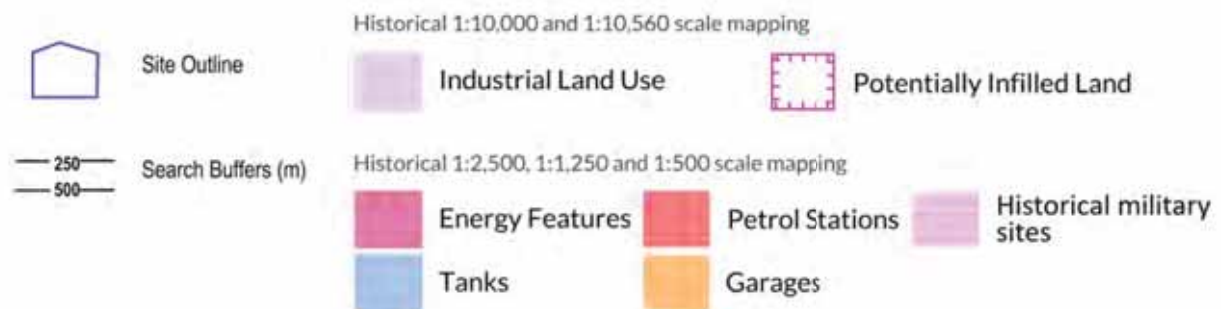
Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 157

ID	Distance [m]	Direction	Use	Date
1B	10	S	Cuttings	1951
2	12	NW	Unspecified Works	1993
3AS	12	NW	Unspecified Mine	1979
4A	13	NW	Collieries	1938
5A	13	NW	Collieries	1938
6B	15	S	Cuttings	1938
7B	15	S	Cuttings	1948
8B	15	S	Cuttings	1904
9C	16	NW	Railway Sidings	1967
10C	16	NW	Unspecified Mine	1967
11A	17	NW	Collieries	1951
12B	23	S	Cuttings	1892
13D	41	SW	Cuttings	1979
14D	41	SW	Cuttings	1993
15D	41	SW	Cuttings	1967
16	55	SW	Collieries	1948
17M	55	SW	Railway Sidings	1948
18	61	NW	Tramway Sidings	1951
19E	64	N	Refuse Heap	1938
20E	64	N	Refuse Heap	1938
21F	67	W	Railway Sidings	1951
22F	70	SW	Railway Sidings	1904
23J	70	SW	Collieries	1904
24	73	NW	Railway Sidings	1979
25	74	SW	Railway Building	1892
26F	74	W	Railway Sidings	1892
27AT	75	N	Refuse Heap	1948
28E	76	NW	Refuse Heaps	1951
29	86	W	Railway Sidings	1938
30G	87	SE	Unspecified Mills	1951
31G	87	SE	Unspecified Mill	1967
32G	87	SE	Unspecified Mill	1979
33G	87	SE	Unspecified Mill	1993
34H	88	W	Railway Building	1892

35I	89	NW	Railway Building	1892
36G	91	SE	Unspecified Mills	1938
37G	93	SE	Unspecified Mills	1948
38H	103	W	Railway Buildings	1892
39AU	107	W	Unspecified Workings	1979
40G	108	SE	Unspecified Mills	1892
41AI	109	SE	Unspecified Mills	1904
42I	113	NW	Railway Buildings	1892
43J	122	NW	Railway Buildings	1892
44O	138	SE	Unspecified Works	1967
45L	142	S	Unspecified Mill	1967
46K	143	SW	Railway Station	1967
47K	143	SW	Railway Station	1979
48K	145	SW	Railway Station	1951
49K	146	SW	Railway Station	1892
50L	146	S	Unspecified Mills	1948
51K	149	SW	Railway Station	1938
52K	150	SW	Railway Station	1948
53K	150	SW	Railway Station	1904
54F	161	W	Unspecified Pit	1904
55F	161	W	Unspecified Pit	1948
56M	162	NW	Refuse Heap	1948
57N	165	SW	Railway Building	1951
58N	168	SW	Railway Building	1938
59N	170	SW	Railway Building	1904
60N	170	SW	Railway Building	1948
61AJ	171	SE	Laundry	1951
62O	189	SE	Unspecified Commercial/Industrial	1948
63O	189	SE	Gas Works	1904
64O	190	SE	Unspecified Commercial/Industrial	1938
65L	194	S	Unspecified Mills	1951
66O	200	SE	Unspecified Tanks	1967
67O	200	SE	Unspecified Tanks	1979
68L	204	S	Unspecified Mill	1979
69L	204	S	Unspecified Commercial/Industrial	1993
70O	204	SE	Gas Works	1892
71P	211	W	Cuttings	1892
72P	212	W	Cuttings	1951
73O	212	SE	Unspecified Tank	1904
74O	212	SE	Unspecified Tank	1948
75R	218	N	Unspecified Pit	1892
76P	221	W	Cuttings	1948
77P	221	W	Cuttings	1904
78P	223	W	Cuttings	1938

79O	223	SE	Unspecified Tank	1892
80Q	224	SE	Laundry	1948
81O	224	SE	Unspecified Tank	1951
82O	226	SE	Unspecified Tank	1938
83Q	226	SE	Laundry	1938
84R	227	N	Unspecified Pit	1904
85R	227	N	Unspecified Pit	1948
86O	228	SE	Gasometer	1904
87O	228	SE	Unspecified Tank	1948
88L	228	S	Unspecified Mills	1938
89S	228	NW	Unspecified Old Shaft	1938
90S	228	NW	Unspecified Old Shaft	1938
91S	232	NW	Unspecified Old Shaft	1948
92S	234	NW	Unspecified Old Shaft	1951
93AX	234	N	Cuttings	1951
94AN	242	SE	Gasometer	1892
95C	245	NW	Slurry Ponds	1979
96AY	246	N	Unspecified Workings	1979
97A	261	NW	Refuse Heap	1948
98	271	N	Tramway Sidings	1904
99V	272	S	Unspecified Mills	1892
100T	281	SW	Unspecified Mills	1951
101T	282	SW	Unspecified Mills	1892
102T	284	SW	Unspecified Mills	1938
103T	286	SW	Unspecified Mills	1948
104AZ	294	NW	Refuse Heap	1948
105BA	294	NW	Refuse Heap	1979
106U	297	W	Cuttings	1979
107U	297	W	Cuttings	1993
108U	297	W	Cuttings	1967
109	300	S	Unspecified Mills	1948
110V	304	S	Unspecified Mills	1951
111W	307	NW	Unspecified Tanks	1938
112V	310	S	Unspecified Mills	1938
113W	318	NW	Unspecified Tanks	1951
114X	355	NE	Unspecified Ground Workings	1904
115X	356	NE	Unspecified Ground Workings	1892
116X	361	NE	Unspecified Pit	1951
117Y	366	SW	Stone Sawing and Planing Mills	1951
118Y	368	SW	Stone Sawing and Planing Mills	1948
119Y	369	SW	Stone Sawing and Planing Mills	1938
120AC	376	SW	Unspecified Quarry	1892

121Z	382	N	Refuse Heap	1938
122Z	382	N	Refuse Heap	1938
123Z	382	N	Refuse Heap	1948
124AF	388	N	Refuse Heaps	1951
125Y	393	SW	Unspecified Pit	1951
126Y	397	SW	Railway Sidings	1948
127Y	398	SW	Unspecified Ground Workings	1938
128Y	398	SW	Unspecified Ground Workings	1938
129Y	399	SW	Unspecified Ground Workings	1967
130Y	402	SW	Railway Sidings	1951
131Y	408	SW	Unspecified Quarry	1948
132Y	413	SW	Railway Sidings	1938
133AA	422	NW	Refuse Heap	1938
134AA	422	NW	Refuse Heap	1938
135AA	425	NW	Refuse Heap	1948
136AB	433	W	Cuttings	1892
137AB	435	W	Cuttings	1904
138AB	435	W	Cuttings	1948
139AB	436	W	Cuttings	1932
140AC	441	SW	Unspecified Quarry	1904
141AD	444	N	Unspecified Tanks	1948
142AD	444	N	Unspecified Tanks	1938
143	453	W	Railway Sidings	1993
144AB	454	W	Cuttings	1951
145AE	454	NW	Unspecified Heap	1948
146AE	457	NW	Unspecified Heap	1938
147AE	457	NW	Unspecified Heap	1938
148AF	461	NW	Unspecified Tanks	1948
149AG	464	NW	Settling Tanks	1948
150AG	464	NW	Settling Tanks	1938
151AG	464	NW	Settling Tanks	1938
152AH	468	N	Unspecified Tanks	1938
153AF	469	NW	Unspecified Tank	1951
154AH	469	N	Unspecified Tanks	1948
155AG	471	NW	Settling Tanks	1951
156AH	475	N	Unspecified Tank	1951
157BB	475	S	Unspecified Pit	1892

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary:

33

ID	Distance (m)	Direction	Use	Date
158AI	172	SE	Unspecified Tank	1893
159AJ	181	SE	Unspecified Tank	1980
160AJ	181	SE	Unspecified Tank	1989
161AJ	183	SE	Unspecified Tank	1986
162AJ	184	SE	Unspecified Tank	1993
163AJ	184	SE	Unspecified Tank	1995
164AJ	184	SE	Unspecified Tank	1995
165O	187	SE	Gas Works	1906
166O	187	SE	Gas Works	1893
167O	206	SE	Gasholders	1969
168O	207	SE	Gas Holders	1959
169O	207	SE	Tanks	1893
170O	207	SE	Gasometer	1906
171O	207	SE	Gasometer	1969
172O	225	SE	Gasholders	1893
173O	225	SE	Gasometer	1906
174O	225	SE	Gasometer	1893
175AO	225	S	Unspecified Tank	1986
176AK	280	S	Tanks	1980
177AK	284	S	Unspecified Tank	1913
178AK	299	S	Unspecified Tank	1893
179AK	299	S	Unspecified Tank	1906
180AK	299	S	Unspecified Tank	1980
181AK	301	S	Unspecified Tank	1959
182AK	301	S	Unspecified Tank	1913
183AL	314	SE	Unspecified Tank	1893
184AL	314	SE	Unspecified Tank	1906
185AL	314	SE	Unspecified Tank	1906
186	395	SW	Unspecified Tank	1913
187Y	435	SW	Unspecified Tank	1893
188AC	440	SW	Unspecified Tank	1913
189AC	440	SW	Unspecified Tank	1906
190AC	440	SW	Unspecified Tank	

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary:

46

ID	Distance (m)	Direction	Use	Date
191AI	174	SE	Electricity Substation	1995
192AI	174	SE	Electricity Substation	1995
193AI	174	SE	Electricity Substation	1993
194AI	174	SE	Electricity Substation	1969
195AM	174	SE	Electricity Substation	1989
196AM	175	SE	Electricity Substation	1980
197AM	175	SE	Electricity Substation	1986
198AM	176	SE	Electricity Substation	1906
199O	187	SE	Gas Works	1893
200O	187	SE	Gas Works	1989
201O	193	SE	Gas Distribution Station	1980
202O	193	SE	Gas Distribution Station	1986
203O	193	SE	Gas Distribution Station	1993
204AJ	195	SE	Gas Distribution Station	1995
205AJ	195	SE	Gas Distribution Station	1995
206AJ	195	SE	Gas Distribution Station	1969
207AJ	206	SE	Gasholders	1906
208O	207	SE	Gas Holders	1893
209O	207	SE	Gasometer	1969
210O	207	SE	Gasometer	1893
211AN	225	SE	Gasholders	1906
212AN	225	SE	Gasometer	1969
213AN	225	SE	Gasometer	1989
214AO	242	S	Electricity Substation	1980
215AO	243	S	Electricity Substation	1986
216AO	243	S	Electricity Substation	1993
217AO	243	S	Electricity Substation	1995
218AO	245	S	Electricity Substation	1995
219AO	246	S	Electricity Substation	1986
220AO	246	S	Electricity Substation	1989
221AO	246	S	Electricity Substation	1980
222AP	307	SW	Electricity Substation	1993
223AP	308	SW	Electricity Substation	1995
224AP	308	SW	Electricity Substation	1995
225AP	309	SW	Electricity Substation	1969
226AP	309	SW	Electricity Substation	1989
227AP	309	SW	Electricity Substation	1980
228AP	309	SW	Electricity Substation	1986
229AQ	429	SW	Electricity Substation	1993
230AQ	453	SW	Electricity Substation	1995
231AQ	453	SW	Electricity Substation	1995
232AQ	453	SW	Electricity Substation	
233AQ	454	SW	Electricity Substation	
234AQ	454	SW	Electricity Substation	

235AQ	454	SW	Electricity Substation
236AQ	454	SW	Electricity Substation

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 8

ID	Distance (m)	Direction	Use	Date
237AN	198	SE	Garage	1993
238AN	198	SE	Garage	1995
239AN	198	SE	Garage	1995
240AR	408	SW	Garage	1969
241AR	410	SW	Garage	1995
242AR	410	SW	Garage	1993
243AR	410	SW	Garage	1989
244AR	410	SW	Garage	

1.6 Historical military sites

Certain military installations were not noted on historic mapping for security reasons. Whilst not all military land is necessarily of concern, Groundsure has researched and digitised a number of Ordnance Factories and other military industrial features (e.g. Ordnance Depots, Munitions Testing Grounds) which may be of contaminative concern. This research was drawn from a number of different sources, and should not be regarded as a definitive or exhaustive database of potentially contaminative military installations. The boundaries of sites within this database have been estimated from the best evidence available to Groundsure at the time of compilation.

Records of historical military sites within 500m of the search boundary:

0

Database searched and no data found.

1.7 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site:

83

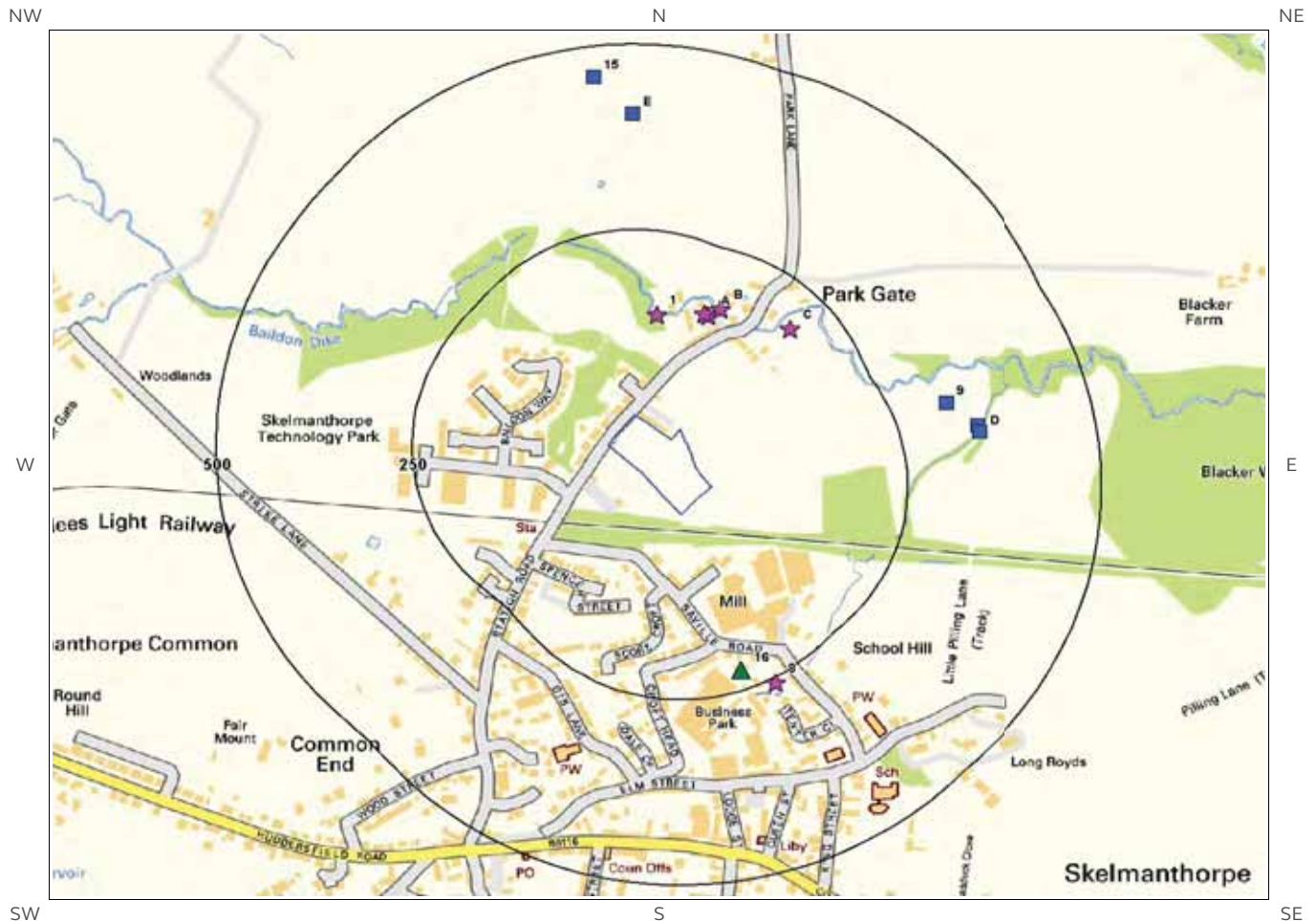
The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
245B	10	S	Cuttings	1951
246AS	12	NW	Unspecified Mine	1979
247A	13	NW	Collieries	1938
248A	13	NW	Collieries	1938
249B	15	S	Cuttings	1938
250B	15	S	Cuttings	1904
251B	15	S	Cuttings	1948
252C	16	NW	Unspecified Mine	1967
253A	17	NW	Collieries	1951
254B	23	S	Cuttings	1892
255D	41	SW	Cuttings	1967
256D	41	SW	Cuttings	1979
257D	41	SW	Cuttings	1993
258C	55	SW	Collieries	1948
259E	64	N	Refuse Heap	1938
260E	64	N	Refuse Heap	1938
261J	70	SW	Collieries	1904
262AT	75	N	Refuse Heap	1948
263A	76	NW	Refuse Heaps	1951
264AU	107	W	Unspecified Workings	1979
265AV	140	W	Reservoir	1948
266AV	141	W	Reservoir	1938
267AV	141	W	Reservoir	1951
268F	161	W	Unspecified Pit	1904
269F	161	W	Unspecified Pit	1948
270M	162	NW	Refuse Heap	1948
271AW	174	SE	Reservoirs	1951
272AW	174	SE	Ponds	1967
273AW	174	SE	Ponds	1979
274AJ	177	SE	Reservoirs	1948
275AJ	178	SE	Reservoirs	1938
276AJ	190	SE	Reservoir	1904
277P	211	W	Cuttings	1892
278P	212	W	Cuttings	1951
279R	218	N	Unspecified Pit	1892

280P	221	W	Cuttings	1904
281P	221	W	Cuttings	1948
282P	223	W	Cuttings	1938
283AX	227	N	Unspecified Pit	1948
284AX	227	N	Unspecified Pit	1904
285S	228	NW	Unspecified Old Shaft	1938
286S	228	NW	Unspecified Old Shaft	1938
287S	232	NW	Unspecified Old Shaft	1948
288S	234	NW	Unspecified Old Shaft	1951
289AX	234	N	Cuttings	1951
290C	245	NW	Slurry Ponds	1979
291AY	246	N	Unspecified Workings	1979
292A	261	NW	Refuse Heap	1948
293AZ	294	NW	Refuse Heap	1948
294BA	294	NW	Refuse Heap	1979
295U	297	W	Cuttings	1979
296U	297	W	Cuttings	1993
297U	297	W	Cuttings	1967
298X	355	NE	Unspecified Ground Workings	1904
299X	356	NE	Unspecified Ground Workings	1892
300X	361	NE	Unspecified Pit	1951
301AC	376	SW	Unspecified Quarry	1892
302Z	382	N	Refuse Heap	1938
303Z	382	N	Refuse Heap	1938
304Z	382	N	Refuse Heap	1948
305AF	388	N	Refuse Heaps	1951
306AC	393	SW	Unspecified Pit	1951
307AC	398	SW	Unspecified Ground Workings	1938
308AC	398	SW	Unspecified Ground Workings	1938
309Y	399	SW	Unspecified Ground Workings	1967
310Y	408	SW	Unspecified Quarry	1948
311AA	422	NW	Refuse Heap	1938
312AA	422	NW	Refuse Heap	1938
313AA	425	NW	Refuse Heap	1948
314AB	433	W	Cuttings	1892
315AB	435	W	Cuttings	1904
316AB	435	W	Cuttings	1948
317AB	436	W	Cuttings	1932
318	441	SW	Unspecified Quarry	1904
319AB	454	W	Cuttings	1951
320AE	454	NW	Unspecified Heap	1948
321AE	457	NW	Unspecified Heap	1938

322AE	457	NW	Unspecified Heap	1938
323AG	464	NW	Settling Tanks	1948
324AG	464	NW	Settling Tanks	1938
325AG	464	NW	Settling Tanks	1938
326AE	471	NW	Settling Tanks	1951
327BB	475	S	Unspecified Pit	1892

2. Environmental Permits, Incidents and Registers Map



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2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

1

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
16	226	S	423337 410836	Address: Nick Ryden (Motor Engineers), Skelmanthorpe Business Park, Skelmanthorpe, Huddersfield, HD8 9ED Process: Waste Oil Burner <0.4 MW Status: New Legislation Applies Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

7

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
9	320	E	423600 411200	Address: SKELMANTHORPE CSO, PATH OFF STATION ROAD, SKELMANTHORPE, HUDDERSFIELD, WEST YORKSHIRE, HD8 9EF Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 3494 Permit Version: 1 Receiving Water: SKELMANTHORPE BECK Status: TRANSFERRED FROM R(PP)A 1951- 1961 Issue date: 20/10/1980 Effective Date: 20-Oct-1980 Revocation Date: 30/03/2004
10D	349	E	423642 411161	Address: SKELMANTHORPE CSO, PATH OFF STATION ROAD, SKELMANTHORPE, HUDDERSFIELD, WEST YORKSHIRE, HD8 9EF Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 3494 Permit Version: 3 Receiving Water: TRIB OF PARK GATE DIKE Status: VARIED UNDER EPR 2010 Issue date: 21/02/2018 Effective Date: 31-Mar-2018 Revocation Date: -
11D	349	E	423640 411170	Address: SKELMANTHORPE CSO, PATH OFF STATION ROAD, SKELMANTHORPE, HUDDERSFIELD, WEST YORKSHIRE, HD8 9EF Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 3494 Permit Version: 2 Receiving Water: TRIB OF PARK GATE DIKE Status: MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 10/02/2004 Effective Date: 31-Mar-2004 Revocation Date: 30/03/2018

ID	Distance (m)	Direction	NGR	Details	
12E	406	N	423200 411590	Address: PROPERTIES AT PARK FARM, PARK LANE, SKELMANTHORPE, WEST YORKSHIRE Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: WRA7644 Permit Version: 2	Receiving Water: TRIBUTARY OF BAILDON DIKE Status: MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 18/12/2000 Effective Date: 18-Dec-2000 Revocation Date: -
13E	406	N	423200 411590	Address: PROPERTIES AT PARK FARM, PARK LANE, SKELMANTHORPE, WEST YORKSHIRE Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: WRA7644 Permit Version: 2	Receiving Water: TRIBUTARY OF BAILDON DIKE Status: MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 18/12/2000 Effective Date: 18-Dec-2000 Revocation Date: -
14E	406	N	423200 411590	Address: PROPERTIES AT PARK FARM, PARK LANE, SKELMANTHORPE, WEST YORKSHIRE Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: WRA7644 Permit Version: 2	Receiving Water: TRIBUTARY OF BAILDON DIKE Status: MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 18/12/2000 Effective Date: 18-Dec-2000 Revocation Date: -
15	459	N	423150 411640	Address: PROPERTIES AT PARK FARM, PARK LANE, SKELMANTHORPE, WEST YORKSHIRE Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: WRA7644 Permit Version: 1	Receiving Water: TRIBUTARY OF BAILDON DIKE Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 14/11/2000 Effective Date: 14-Nov-2000 Revocation Date: 17/12/2000

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site:

0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

8

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
1	138	N	423231.0 411319.0	Incident Date: 18-Mar-2002 Incident Identification: 64615.0 Pollutant: Contaminated Water Pollutant Description: Other Contaminated Water Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2A	157	N	423296.0 411318.0	Incident Date: 04-Mar-2002 Incident Identification: 61683.0 Pollutant: Agricultural Materials and Wastes Pollutant Description: Other Agricultural Material or Waste Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
3A	158	N	423291.0 411320.0	Incident Date: 06-Sep-2002 Incident Identification: 105998.0 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
4B	169	N	423312.0 411326.0	Incident Date: 17-Aug-2001 Incident Identification: 24869.0 Pollutant: Contaminated Water Pollutant Description: Minewater Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
5B	169	N	423312.0 411326.0	Incident Date: 17-Aug-2001 Incident Identification: 24869.0 Pollutant: Contaminated Water Pollutant Description: Minewater Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
6C	194	NE	423400.0 411300.0	Incident Date: 21-Jul-2001 Incident Identification: 17969.0 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
7C	194	NE	423400.0 411300.0	Incident Date: 21-Jul-2001 Incident Identification: 17969.0 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
8	257	SE	423382.0 410822.0	Incident Date: 15-Jun-2001 Incident Identification: 9497.0 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

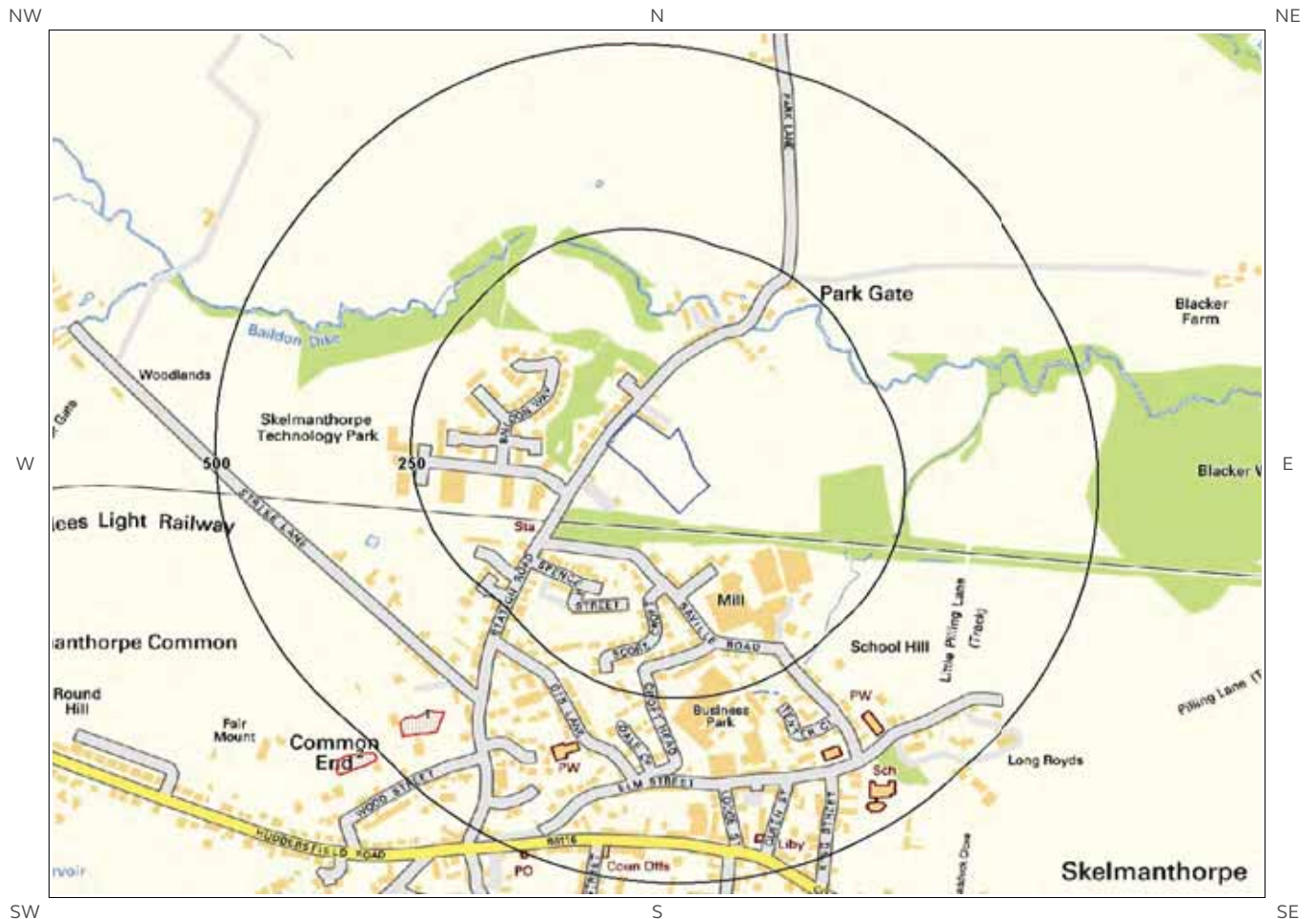
Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

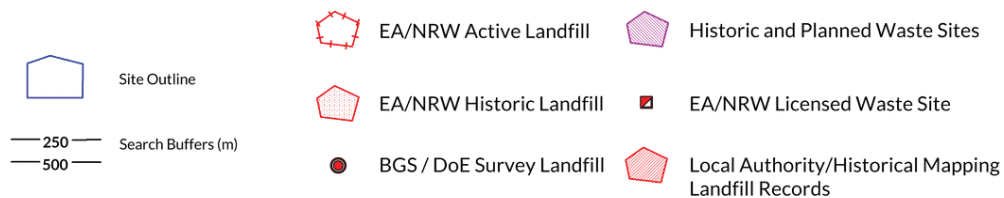
Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

4

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
1	402	SW		Site Address: Station Road, Skelmanthorpe Waste Licence: Yes Site Reference: 4400/(231) Waste Type: Inert, Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 11-Jun-1980 Licence Surrendered: 15-Feb-1988 Licence Holder Address: - Operator: - Licence Holder: Kirklees Metropolitan Borough Council First Recorded: 01-Jan-1980 Last Recorded: 31-Dec-1981
2	507	SW		Site Address: Derelict Quarry at rear of Environmental Health Depot, Station Road, Skelmanthorpe Waste Licence: Yes Site Reference: 4400/(231) Waste Type: Inert, Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 11-Jun-1980 Licence Surrendered: 03-Jun-1988 Licence Holder Address: Directorate of Technical Services, Civic Centre Phase III, Huddersfield Operator: - Licence Holder: Kirklees Metropolitan Borough Council First Recorded: 11-Jun-1980 Last Recorded: 03-Jun-1988
Not shown	1074	SW		Site Address: Land to the Rear of Ponker Farm and adjacent to Ponker Lane, Ponker Lane, Skelmanthorpe, Huddersfield Waste Licence: Yes Site Reference: 4700/0763, 4700/0273 Waste Type: Inert, Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 06-Aug-1990 Licence Surrendered: 22-Apr-1994 Licence Holder Address: Ponker Farm, Skelmanthorpe, Huddersfield Operator: - Licence Holder: Wilson Armitage and Sons Limited First Recorded: 31-Aug-1990 Last Recorded: 31-Dec-1993
Not shown	1425	SW		Site Address: Ponker Quarry, Shelley, Woodhouse Lane, Lower Cumberworth Waste Licence: Yes Site Reference: 4400/(786) Licence Issue: 17-Sep-1990 Licence Surrendered: Licence Holder Address: Hazlehead, Stocksbridge, Sheffield

ID	Distance (m)	Direction	NGR	Details
				Waste Type: Inert, Industrial, Commercial Environmental Permitting Regulations (Waste) Reference: - Operator: - Licence Holder: Hepworth Building Products First Recorded: 01-Jun-1991 Last Recorded: -

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

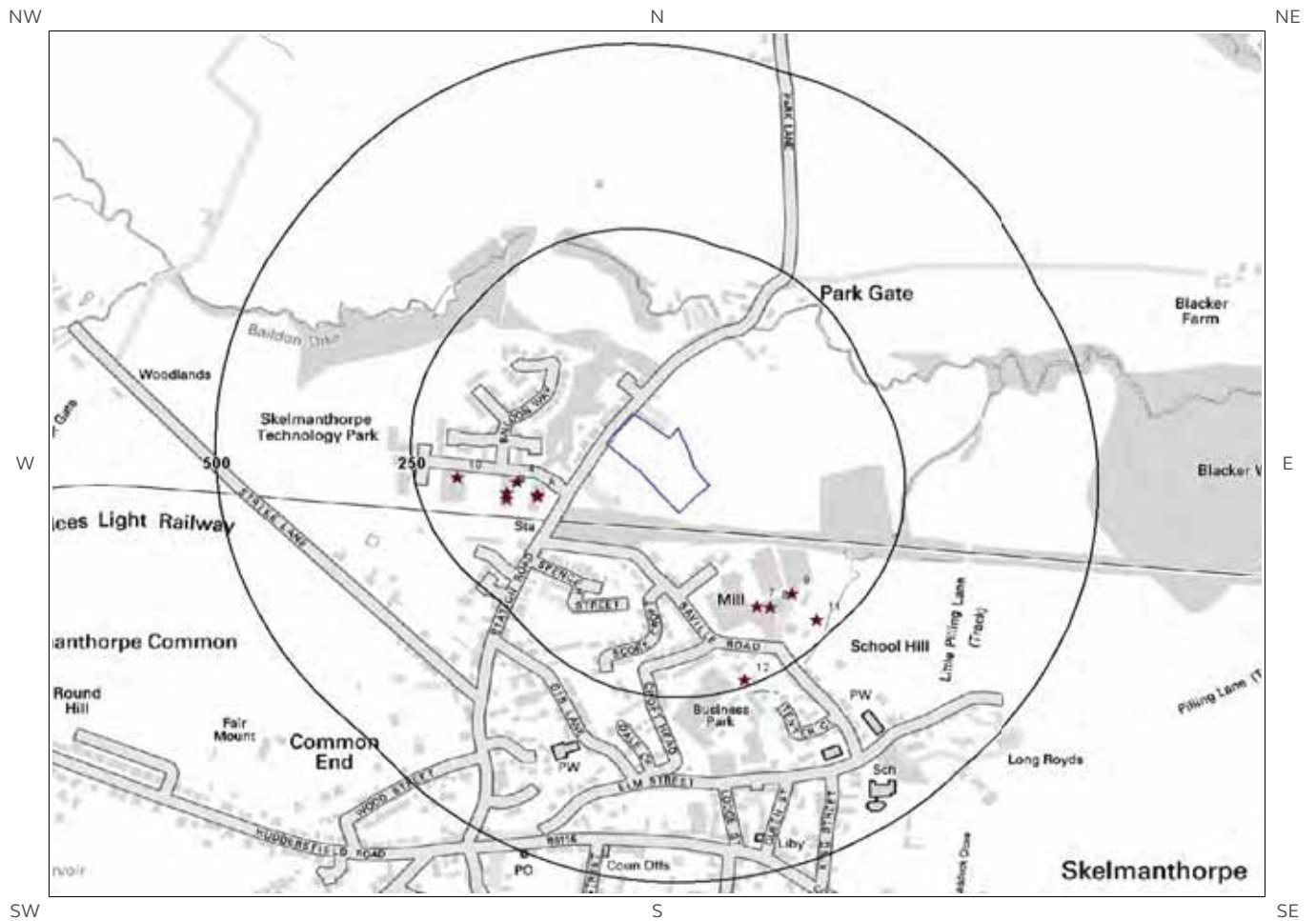
2

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
Not shown	1416	W	421800 411500	Site Address: Huddersfield Road, Shelley, Huddersfield, West Yorkshire Type: Landfill taking Non-Biodegradable Wastes Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: NAY002 EPR reference: - Operator: Naylor Clayware Ltd Waste Management licence No: 61050 Annual Tonnage: 0.0 Issue Date: 11/04/1995 Effective Date: - Modified: 04/11/2000 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Peace Wood Correspondence Address: Clough Green, Cawthorne, Barnsley, S75 4AD
Not shown	1416	W	421800 411500	Site Address: Land/premises At, Huddersfield Road, Shelley, Huddersfield, Issue Date: 11/04/1995 Effective Date: -

ID	Distance (m)	Direction	NGR	Details
				West Yorkshire, HD8 8LH Type: Landfill taking Non-Biodegradable Wastes Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: NAY002 EPR reference: EA/EPR/HP3795ZJ/V002 Operator: Naylor Drainage Ltd Waste Management licence No: 61050 Annual Tonnage: 24999.0 Modified: 04/11/2000 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Peace Wood Correspondence Address: -

4. Current Land Use Map



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4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

12

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1A	112	SW	Bobby Dazzler Signs Ltd	423080 411075	Unit 1 Skelmanthorpe Technology Park, Standback Way, Skelmanthorpe, Huddersfield, West Yorkshire, HD8 9GA	Signs	Industrial Products
2A	113	SW	Zybax	423081 411072	Skelmanthorpe Technology Park, Standback Way, Skelmanthorpe, Huddersfield, West Yorkshire, HD8 9GA	Cleaning Equipment and Supplies	Industrial Products
3A	113	SW	Wellhouse Leisure	423081 411072	Unit 1 Skelmanthorpe Technology Park, Standback Way, Skelmanthorpe, Huddersfield, West Yorkshire, HD8 9GA	Vehicle Hire and Rental	Hire Services
4	125	SW	Electricity Sub Station	423055 411092	West Yorkshire, HD8	Electrical Features	Infrastructure and Facilities
5B	144	SW	Firesolve Ltd	423041 411078	Unit 2/A Skelmanthorpe Technology Park, Standback Way, Skelmanthorpe, Huddersfield, West Yorkshire, HD8 9GA	Special Purpose Machinery and Equipment	Industrial Products
6B	147	SW	Pingtek Power Tools Ltd	423042 411069	Unit 2b Skelmanthorpe Technology Park, Standback Way, Skelmanthorpe, Huddersfield, West Yorkshire, HD8 9GA	Tools Including Machine Shops	Industrial Products
7	160	SE	Silo	423361 410924	West Yorkshire, HD8	Hoppers and Silos	Farming
8	172	SE	A V Motors	423378 410922	Marsden Street, Skelmanthorpe, Huddersfield, West Yorkshire, HD8 9EF	Vehicle Repair, Testing and Servicing	Repair and Servicing
9	179	SE	Electricity Sub Station	423406 410941	West Yorkshire, HD8	Electrical Features	Infrastructure and Facilities
10	197	W	Branta Group	422978 411098	Unit 3/A Skelmanthorpe Technology Park, Standback Way, Skelmanthorpe, Huddersfield, West	Cleaning Equipment and Supplies	Industrial Products

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
Yorkshire, HD8 9GA							
11	225	SE	Gas Distribution Station	423437 410906	West Yorkshire, HD8	Gas Features	Infrastructure and Facilities
12	240	S	Electricity Sub Station	423345 410824	West Yorkshire, HD8	Electrical Features	Infrastructure and Facilities

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

0

Database searched and no data found.

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site:

0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site:

0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT
MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

5.2 Superficial Ground and Drift Geology

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.3 Bedrock and Solid Geology

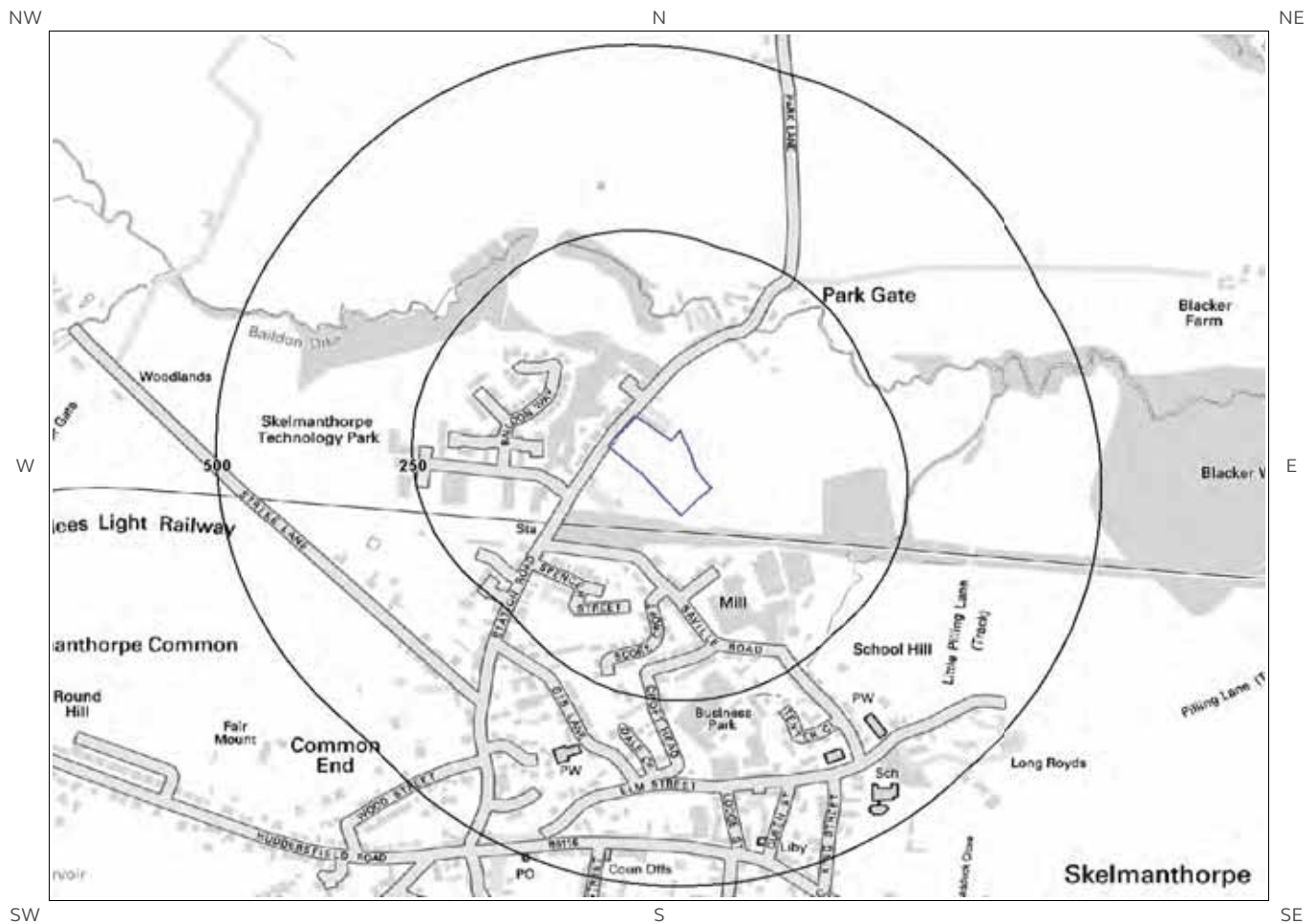
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION	SANDSTONE
PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE

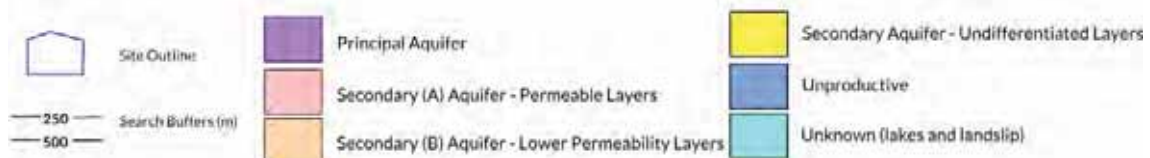
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

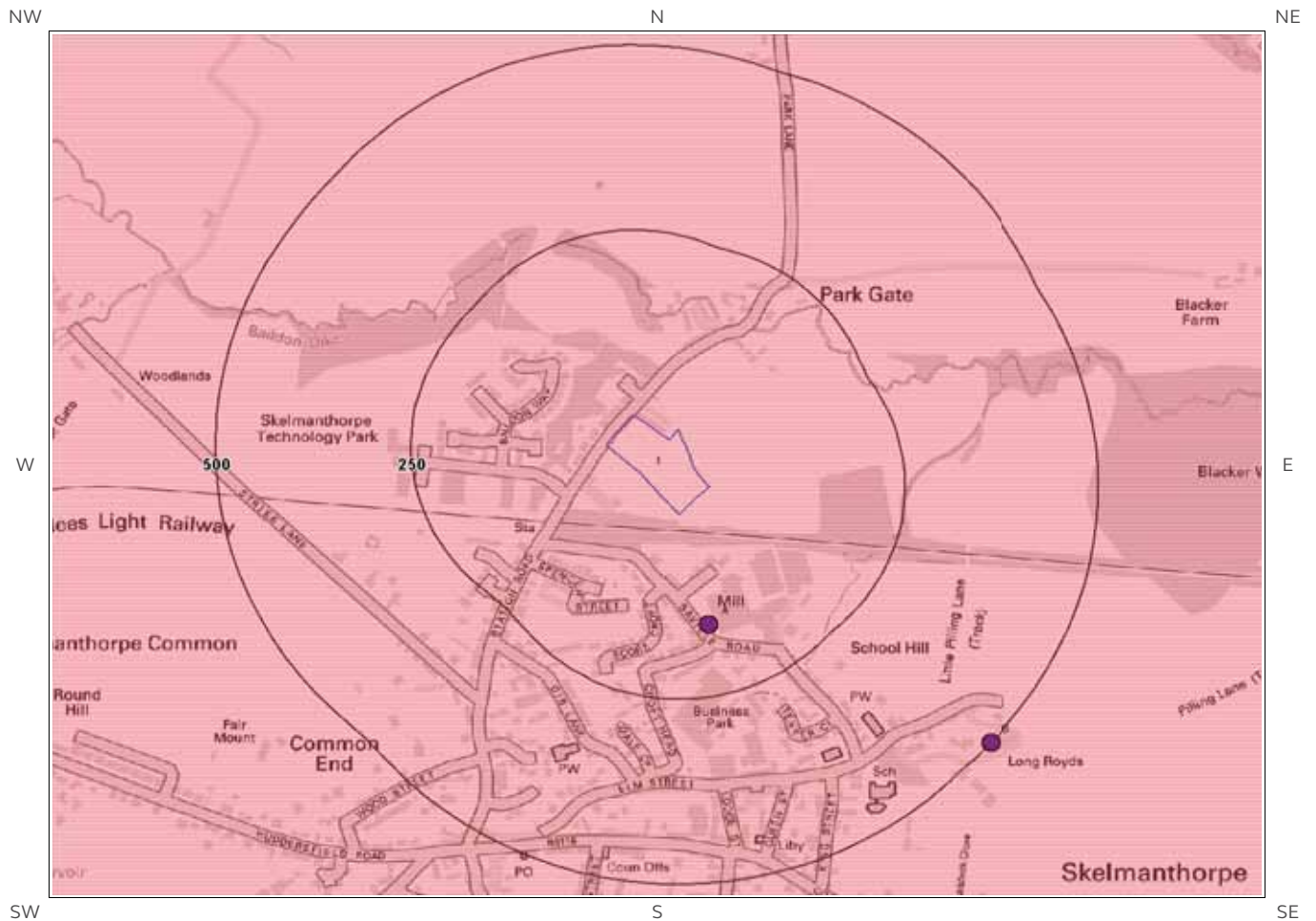
6a. Aquifer Within Superficial Geology



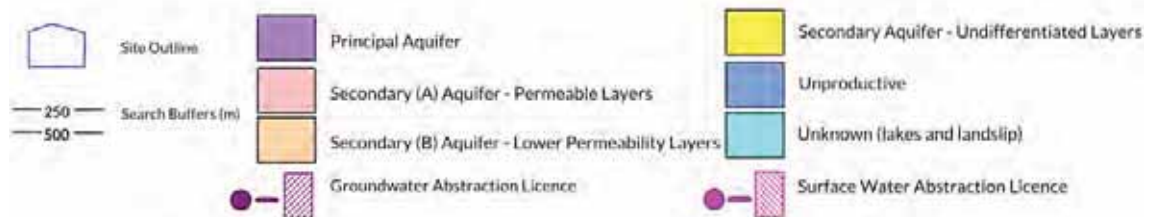
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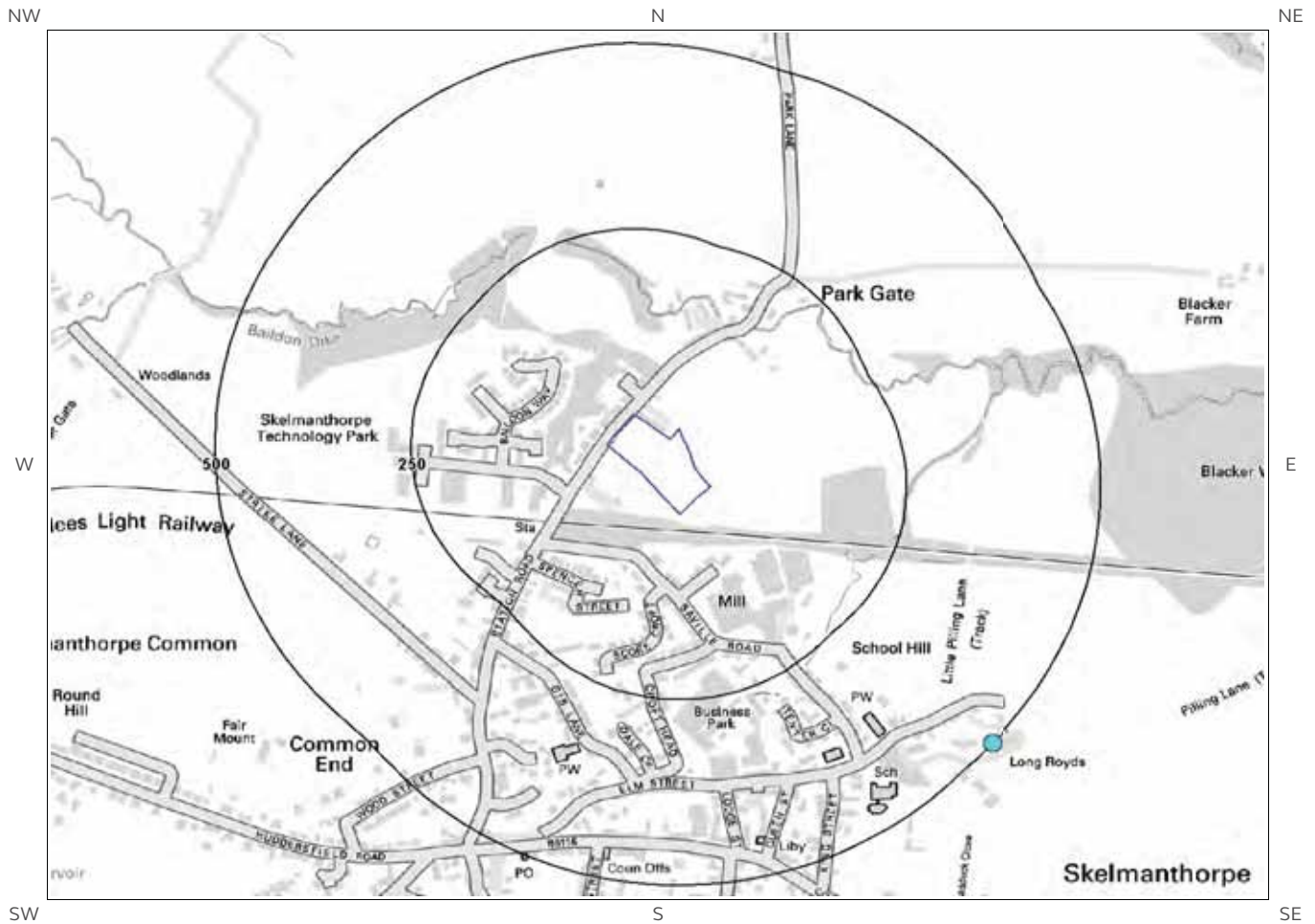
6b. Aquifer Within Bedrock Geology and Abstraction Licences



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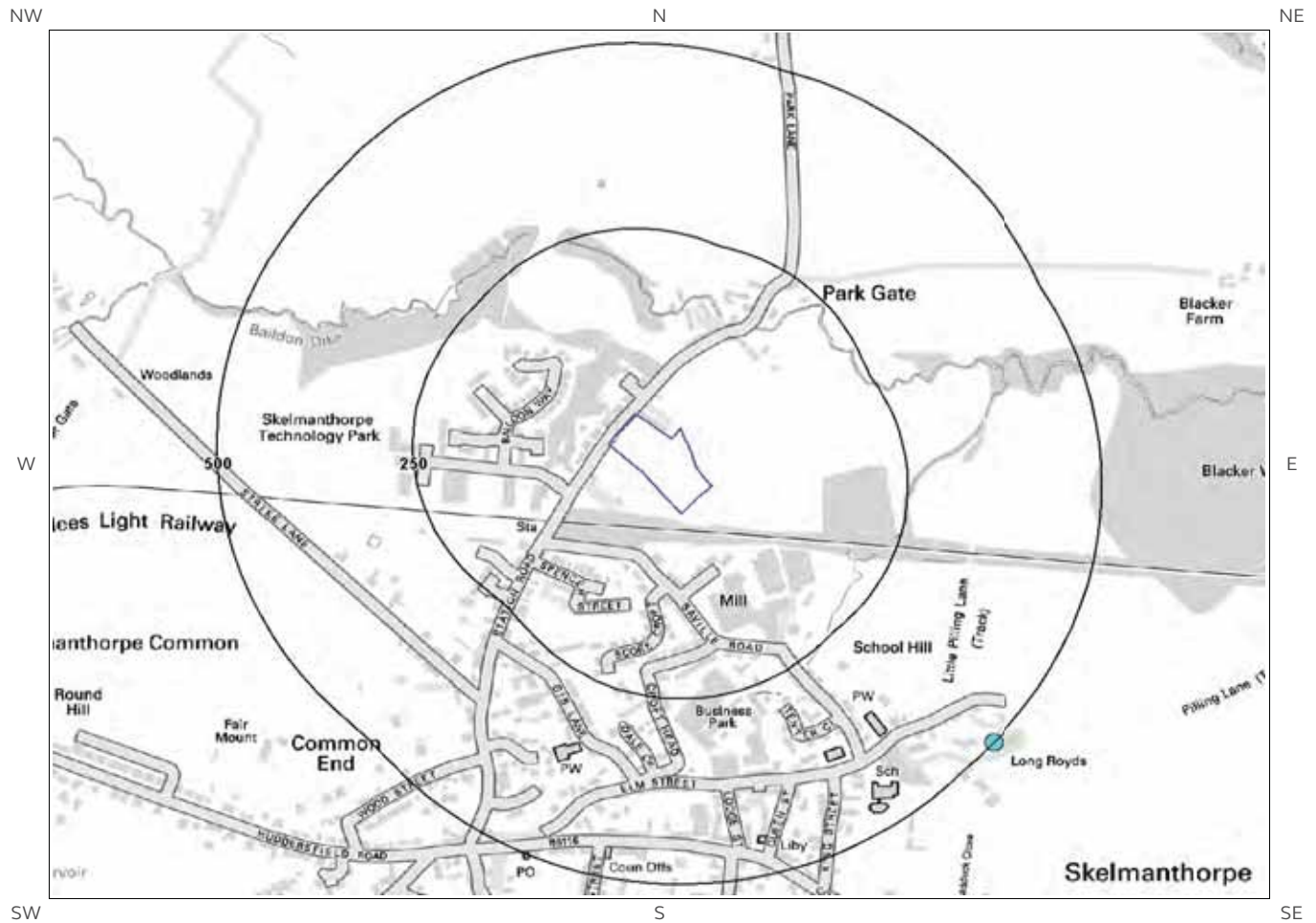
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences



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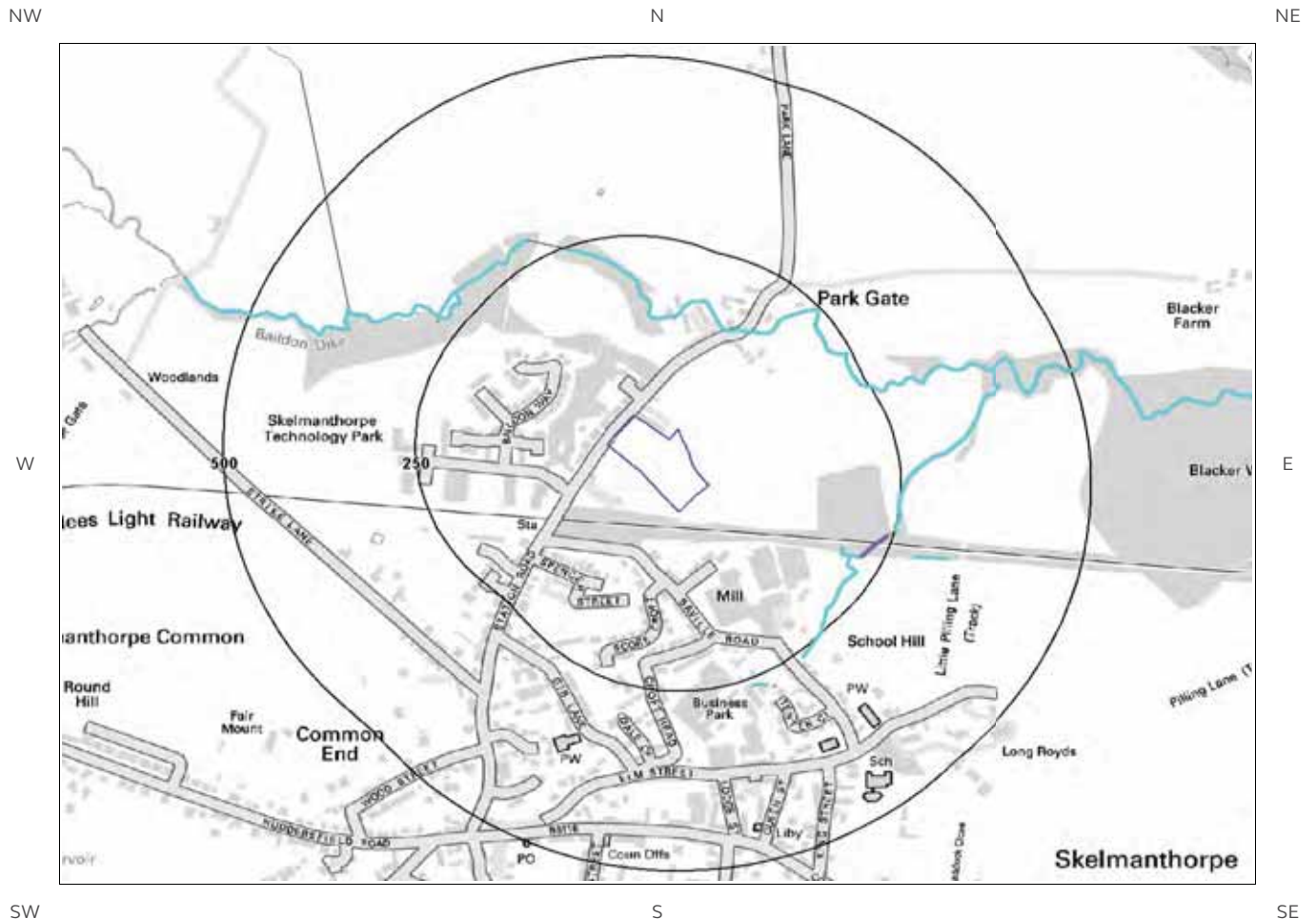
6d. Hydrogeology – Source Protection Zones within confined aquifer



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6e. Hydrology – Watercourse Network and River Quality



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6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property No

Database searched and no data found.

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	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

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site Identified

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
2A	154	S	423300 410900	Status: Historical Licence No: 2/27/08/091 Details: Process Water Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - SKELMATHORPE Data Type: Point Name: TECHNIFLEECE LTD Annual Volume (m³): 131000 Max Daily Volume (m³): 545 Original Application No: - Original Start Date: 27/09/1977 Expiry Date: - Issue No: 103 Version Start Date: 13/03/2006 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
3A	154	S	423300 410900	Status: Historical Licence No: 2/27/08/091 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - SKELMATHORPE Data Type: Point Name: FLEECE LTD INC DAWSON FABRICS	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 27/09/1977 Expiry Date: - Issue No: 102 Version Start Date: 01/10/2002 Version End Date:
4A	154	S	423300 410900	Status: Historical Licence No: 2/27/08/091 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - SKELMATHORPE Data Type: Point Name: FLEECE LTD INC DAWSON FABRICS	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 27/09/1977 Expiry Date: - Issue No: 102 Version Start Date: 01/10/2002 Version End Date:
5A	154	S	423300 410900	Status: Historical Licence No: 2/27/08/091 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: DAWSON FUR FABRICS LIMITED	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 27/09/1977 Expiry Date: - Issue No: 100 Version Start Date: 27/09/1977 Version End Date:
6A	154	S	423300 410900	Status: Historical Licence No: 2/27/08/091 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: DAWSON FUR FABRICS LIMITED	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 27/09/1977 Expiry Date: - Issue No: 100 Version Start Date: 27/09/1977 Version End Date:
7B	499	SE	423660 410740	Status: Historical Licence No: 2/27/13/174 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: SIMMONDS	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 23/12/1994 Expiry Date: - Issue No: 100 Version Start Date: 23/12/1994 Version End Date:
8B	499	SE	423660 410740	Status: Historical Licence No: 2/27/13/174 Details: Raw Water Supply Direct Source: GROUNDWATERS Point: BOREHOLE-COAL MEASURES-SKELMANTHORPE Data Type: Point Name: SIMMONDS	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 23/12/1994 Expiry Date: - Issue No: 101 Version Start Date: 03/06/2001 Version End Date:
Not shown	1589	NE	424530 412120	Status: Historical Licence No: 2/27/08/104 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - EMLEY Data Type: Point Name: SAVILE TRUST (1965)	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 17/06/1988 Expiry Date: - Issue No: 100 Version Start Date: 17/06/1988 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1589	NE	424530 412120	Status: Historical Licence No: 2/27/08/104 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: SAVILE ESTATE	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 17/06/1988 Expiry Date: - Issue No: 100 Version Start Date: 17/06/1988 Version End Date:
Not shown	1713	NW	421820 412200	Status: Historical Licence No: 2/27/08/126 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - HUDDERSFIELD Data Type: Point Name: T/A T R & C HALL	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 11/10/2000 Expiry Date: - Issue No: 1 Version Start Date: 11/10/2000 Version End Date:
Not shown	1713	NW	421820 412200	Status: Historical Licence No: 2/27/08/126 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - HUDDERSFIELD Data Type: Point Name: T/A T R & C HALL	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 11/10/2000 Expiry Date: - Issue No: 1 Version Start Date: 11/10/2000 Version End Date:
Not shown	1713	NW	421820 412200	Status: Active Licence No: 2/27/08/126 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - SHELLEY Data Type: Point Name: C & M HALL	Annual Volume (m³): 32225 Max Daily Volume (m³): 89 Original Application No: - Original Start Date: 11/10/2000 Expiry Date: - Issue No: 4 Version Start Date: 31/10/2016 Version End Date:
Not shown	1742	SE	424800 410200	Status: Historical Licence No: 2/27/08/028 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - SCISSETT Data Type: Point Name: PHOENOX TEXTILES LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 20/01/1966 Version End Date:
Not shown	1742	SE	424800 410200	Status: Historical Licence No: 2/27/08/028 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: PHOENOX TEXTILES LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 20/01/1966 Version End Date:
Not shown	1751	S	423200 409300	Status: Historical Licence No: 2/27/08/005 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL X2 Data Type: Point Name: SHAW	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 25/01/1985 Version End Date:

ID	Distance (m)	Direction	NGR	Details
Not shown	1751	S	423200 409300	Status: Historical Licence No: 2/27/08/005 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: WELL X2 - COAL MEASURES - DENBY DALE Data Type: Point Name: D M & J SHAW Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 25/01/1985 Version End Date:
Not shown	1758	NW	421750 412180	Status: Historical Licence No: 2/27/08/126 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: GROUNDWATERS Point: BOREHOLE- COAL MEASURES - HUDDERSFIELD Data Type: Point Name: T/A T R & C HALL Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 11/10/2000 Expiry Date: - Issue No: 1 Version Start Date: 11/10/2000 Version End Date:
Not shown	1758	NW	421750 412180	Status: Historical Licence No: 2/27/08/126 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE- COAL MEASURES - HUDDERSFIELD Data Type: Point Name: T/A T R & C HALL Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 11/10/2000 Expiry Date: - Issue No: 1 Version Start Date: 11/10/2000 Version End Date:
Not shown	1792	NW	421550 411910	Status: Historical Licence No: 2/27/08/126 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: UNDERGROUND STRATA - COAL MEASURES Data Type: Point Name: T R & C HALL Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 11/10/2000 Expiry Date: - Issue No: 2 Version Start Date: 18/09/2002 Version End Date:
Not shown	1792	NW	421550 411910	Status: Active Licence No: 2/27/08/126 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE- COAL MEASURES - SHELLEY Data Type: Point Name: C & M HALL Annual Volume (m³): 32225 Max Daily Volume (m³): 89 Original Application No: - Original Start Date: 11/10/2000 Expiry Date: - Issue No: 4 Version Start Date: 31/10/2016 Version End Date:
Not shown	1921	E	425200 410800	Status: Historical Licence No: 2/27/08/112 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: AUCKLAND Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 20/06/1996 Expiry Date: - Issue No: 100 Version Start Date: 20/06/1996 Version End Date:
Not shown	1921	E	425200 410800	Status: Historical Licence No: 2/27/08/112 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - SCISSETT Data Type: Point Name: AUCKLAND Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 20/06/1996 Expiry Date: - Issue No: 100 Version Start Date: 20/06/1996 Version End Date:

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site

None identified

Database searched and no data found.

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site

Identified

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distance (m)	Direction	NGR	Details
1	499	SE	423660 410740	Status: Historical Licence No: 2/27/13/174 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: SIMMONDS Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 23/12/1994 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:
Not shown	1713	NW	421820 412200	Status: Historical Licence No: 2/27/08/126 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - HUDDERSFIELD Data Type: Point Name: T/A T R & C HALL Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 11/10/2000 Expiry Date: - Issue No: 1 Version Start Date: Version End Date:
Not shown	1758	NW	421750 412180	Status: Historical Licence No: 2/27/08/126 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: GROUNDWATERS Point: BOREHOLE- COAL MEASURES - HUDDERSFIELD Data Type: Point Name: T/A T R & C HALL Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 11/10/2000 Expiry Date: - Issue No: 1 Version Start Date: Version End Date:

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site

None identified

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site None identified

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
181	W	Minor Aquifer/High Leaching Potential	H3	Coarse textured or moderately shallow soils which readily transmit non-adsorbed pollutants and liquid discharges but have some ability to attenuate adsorbed pollutants because of their clay or organic matter content.
199	E	Minor Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
210	E	Minor Aquifer/High Leaching Potential	H3	Coarse textured or moderately shallow soils which readily transmit non-adsorbed pollutants and liquid discharges but have some ability to attenuate adsorbed pollutants because of their clay or organic matter content.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site None identified

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

This watercourse information is provided by Ordnance Survey MasterMap Water Network. The data provides a detailed centre line following the curve of the waterway precisely, so all distances provided in the report should be understood as measurements to the centreline rather than a measurement to the nearest point of the watercourse. Underground watercourses are inferred from entry and exit points so caution is advised in using these to indicate precise locations of underground watercourses when planning site investigation and development.

The following Ordnance Survey MasterMap Water Network records are represented on the Hydrology Map (6e):

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
1	137 N	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
13	137 N	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
2	196 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
14	196 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
3	208 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
4	208 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
15	208 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
16	208 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
5	221 SE	Not Specified	Lake, loch or reservoir.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.3
17	221 SE	Not Specified	Lake, loch or reservoir.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.3
6	247 N	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
18	247 N	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
7	249 E	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
19	249 E	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
8	260 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.2
20	260 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.2
9	269 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
21	269 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
10	272	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	NW			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
22	272 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
11	280 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
12	280 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.3
23	280 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
24	280 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.3
13	282 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
14	282 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.4
25	282 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
26	282 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.4
15	285 E	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
27	285 E	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
16	369 NE	Park Gate Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions)

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				Average Width in Watercourse Section (m): 2.9
28	369 NE	Park Gate Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.9
17	375 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
29	375 NW	Baildon Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
18	383 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
30	383 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
19	388 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
31	388 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
20	403 NE	Park Gate Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.3
Not shown	403 NE	Park Gate Dike	Inland river not influenced by normal tidal action.	Catchment Area: Don and Rother Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.3

6.11 Surface Water Features

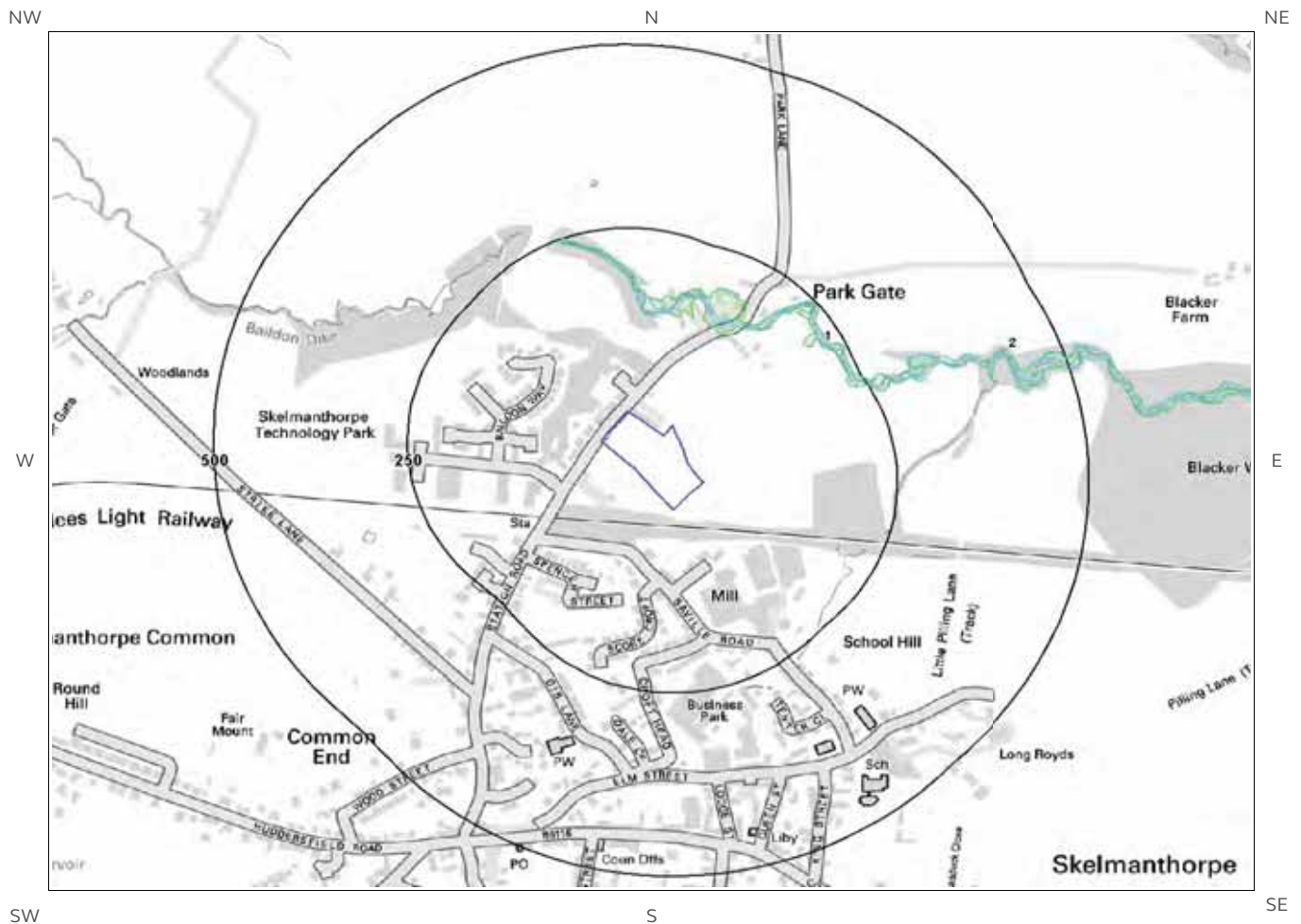
Surface water features within 250m of the study site

Identified

The following surface water records are not represented on mapping:

Distance (m)	Direction
137	N
161	NE
208	SE
208	SE
221	NE
250	E

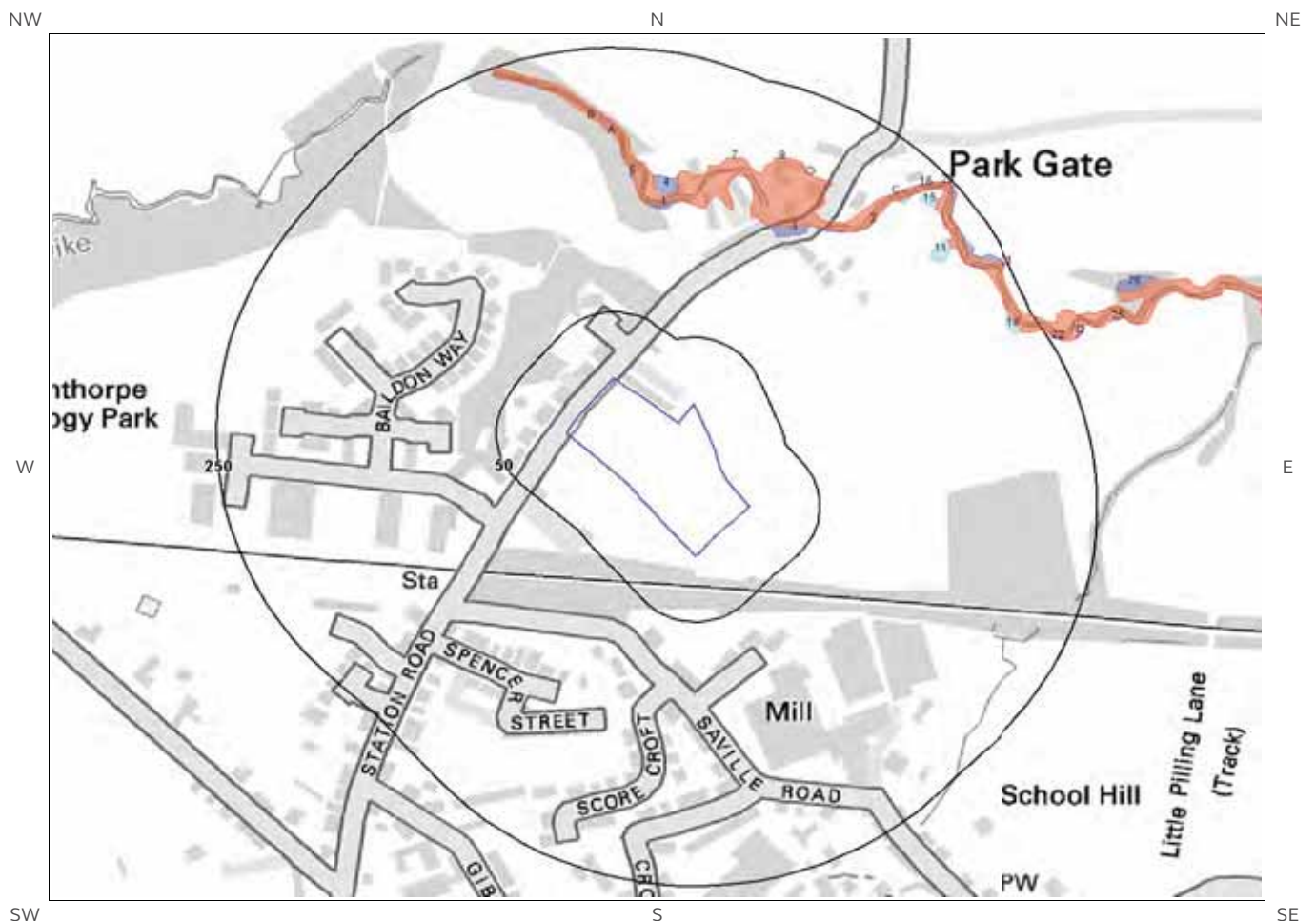
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



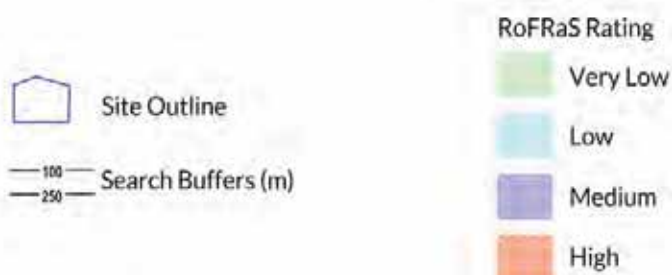
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7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m Identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

ID	Distance (m)	Direction	Update	Type
1	132	N	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m Identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

ID	Distance (m)	Direction	Update	Type
1	132	N	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite Very Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Flood Defences within 250m of the study site	None identified
Database searched and no data found.	

7.5 Areas benefiting from Flood Defences

Areas benefiting from Flood Defences within 250m of the study site	None identified
--	-----------------

7.6 Areas benefiting from Flood Storage

Areas used for Flood Storage within 250m of the study site	None identified
--	-----------------

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site	Identified
--	------------

Clearwater Flooding or Superficial Deposits Flooding	Clearwater Flooding
--	---------------------

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions	Potential at Surface
---	----------------------

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

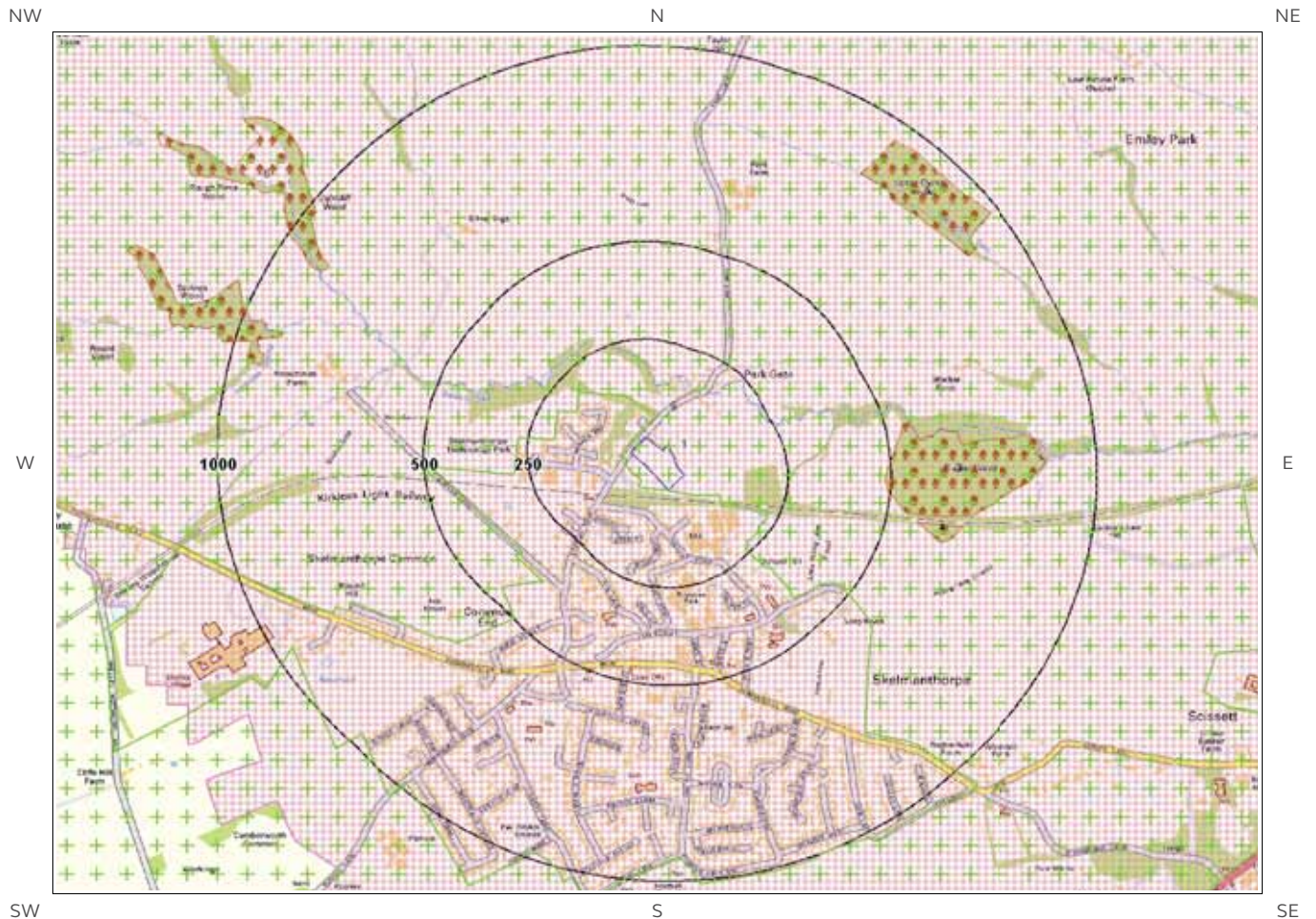
7.8 Groundwater Flooding Confidence Areas

British Geological Survey confidence rating in this result	Low
--	-----

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site

Identified

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

6

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
3	485	E	BLACKER WOOD	Ancient and Semi-Natural Woodland
4	575	E	BLACKER WOOD	Ancient and Semi-Natural Woodland
5	828	NE	UPPER OWLERS WOOD	Ancient Replanted Woodland
6	872	NW	LIGHTCLIFF WOOD/ROUGH PIECE	Ancient Replanted Woodland
7	897	W	SPRINGS WOOD	Ancient and Semi-Natural Woodland
Not shown	1802	S	WITHER WOOD	Ancient Replanted Woodland

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

2

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
1	0	On Site	Existing	DEFRA
Not shown	1050	S	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

3

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ID	Distance	Direction	Green Belt Name	Local Authority Name
9	0	On Site	Liverpool, Manchester and West Yorks Greenbelt	Kirklees District (B)
Not shown	1050	S	Liverpool, Manchester and West Yorks Greenbelt	Kirklees District (B)
Not shown	1825	SE	Liverpool, Manchester and West Yorks Greenbelt	Kirklees District (B)

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a **Groundsure Geo Insight**, available from our **website**. The following information has been found:

9.1.1 Shrink Swell

Maximum Shrink-Swell** hazard rating identified on the study site Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property no significant increase in insurance risk due to natural slope instability problems.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site

Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

Maximum Running Sand** hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

* This indicates an automatically generated 50m buffer and site.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site

Identified

The following coal mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary

None identified

Database searched and no data found.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site

None identified

Guidance: No Guidance Required.

Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com

British Geological Survey Enquiries
Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:
Web: www.bgs.ac.uk

BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

Environment Agency
National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 03708 506 506
Web: www.environment-agency.gov.uk
Email: enquiries@environment-agency.gov.uk

Public Health England
Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe
Email: enquiries@phe.gov.uk
Main switchboard: 020 7654 8000

The Coal Authority
200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey
Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505

Local Authority
Authority: Kirklees Council
Phone: 01484 221 000
Web: <http://www.kirklees.gov.uk/>
Address: Civic Centre 3, Market Street, Huddersfield, HD1 1WG

Gemapping PLC
Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444



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Map Name: County Series

Map date: 1893

Scale: 1:2,500

Printed at: 1:2,500



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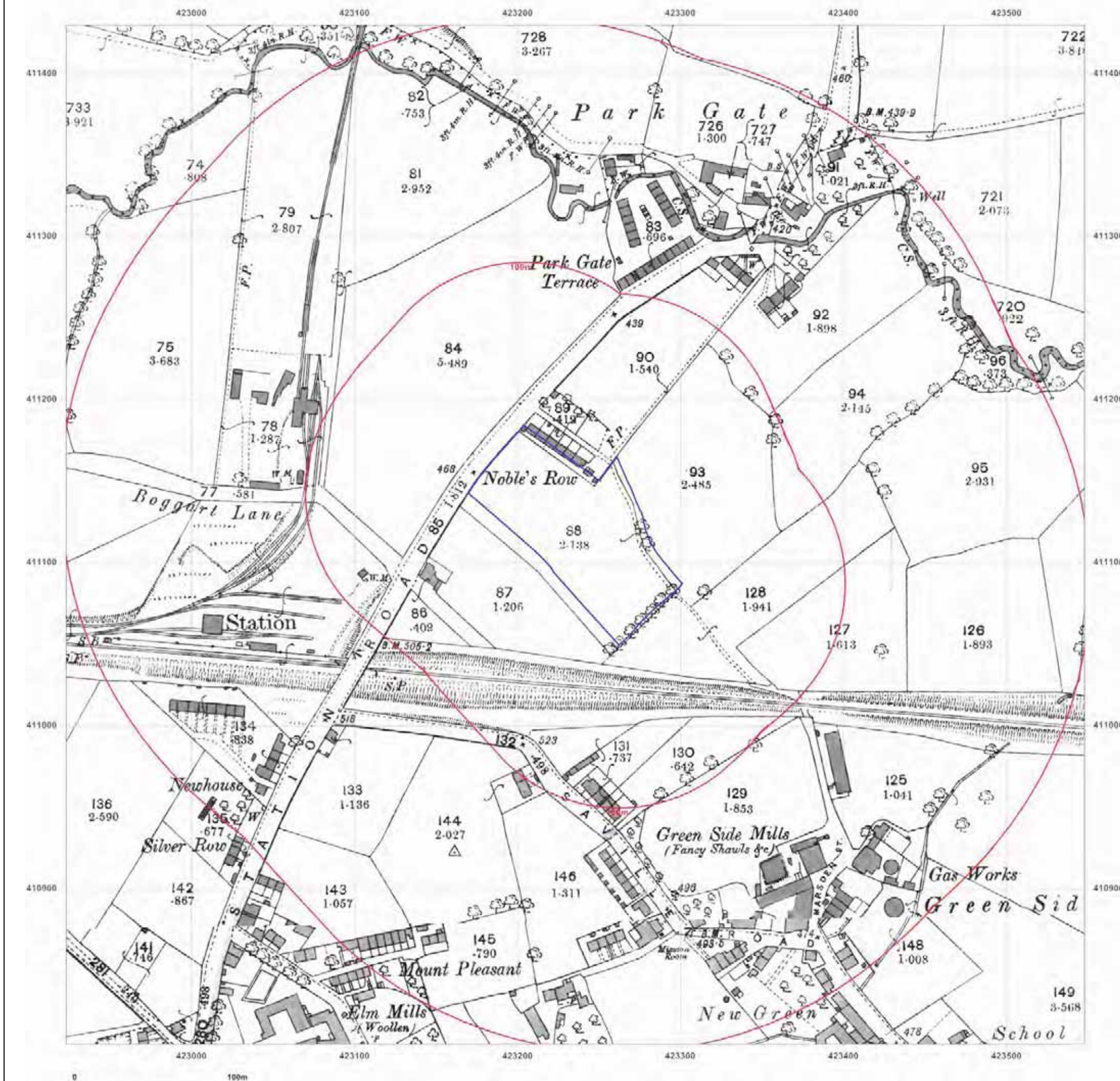


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Map Name: County Series

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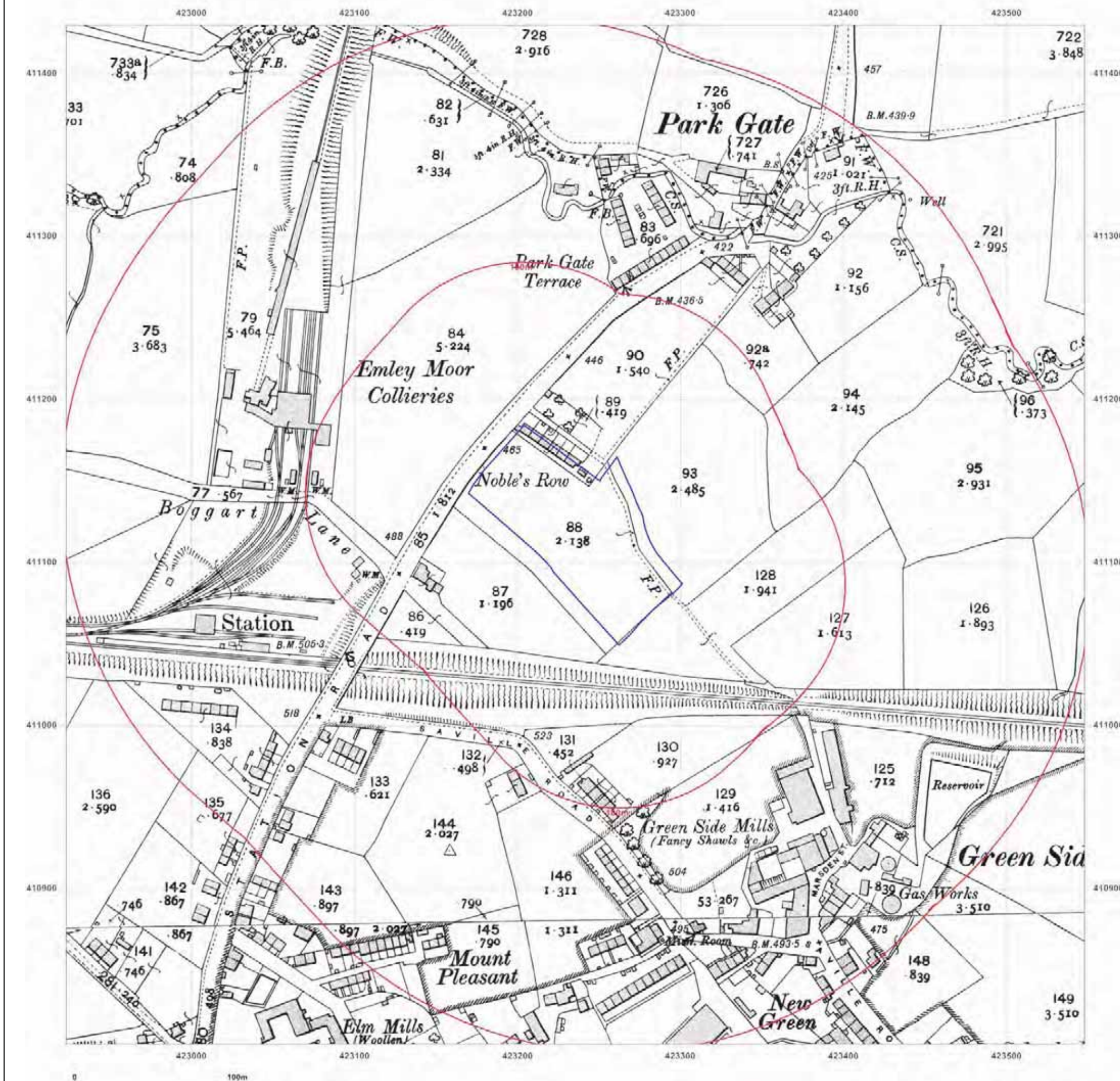


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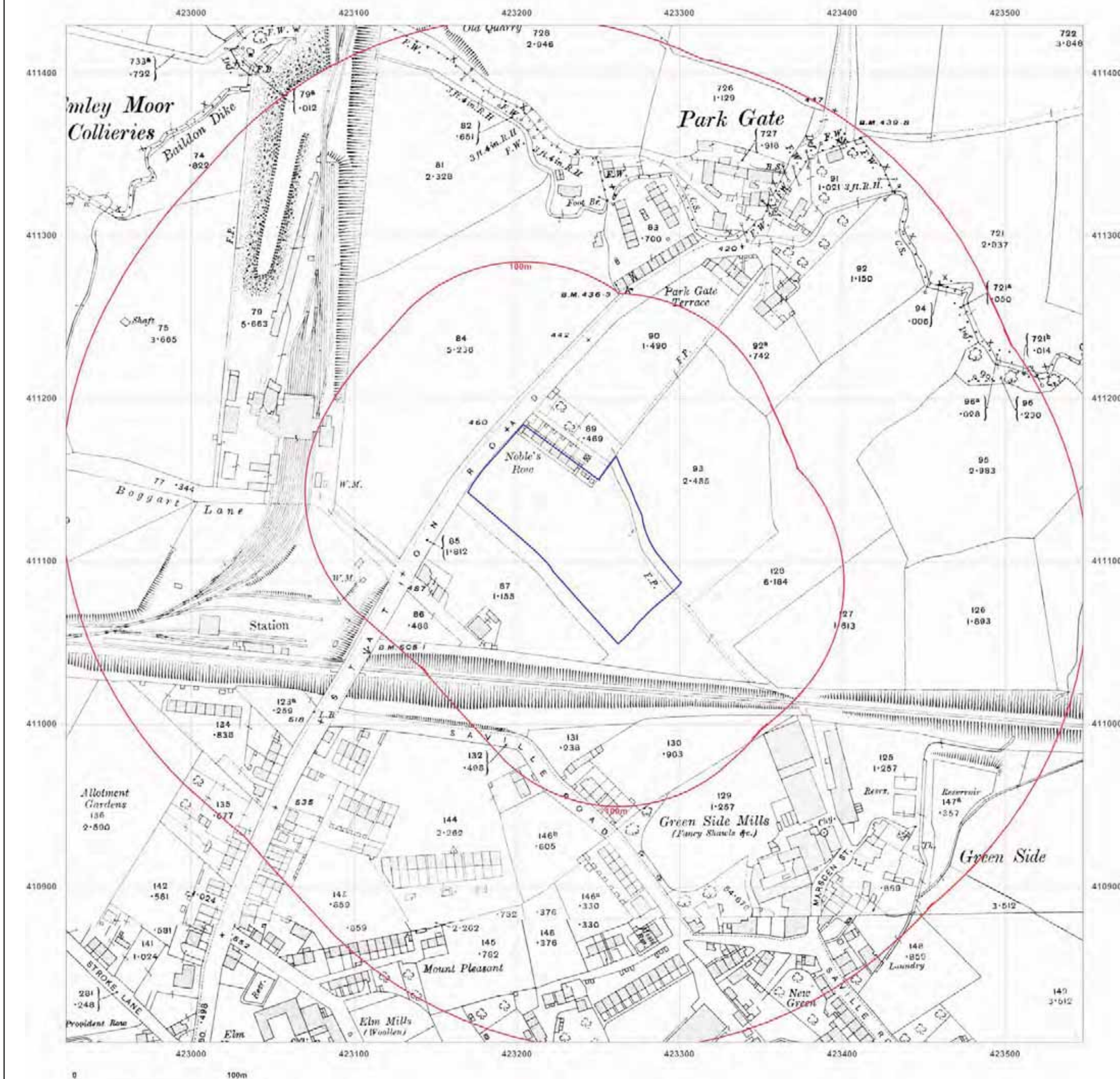


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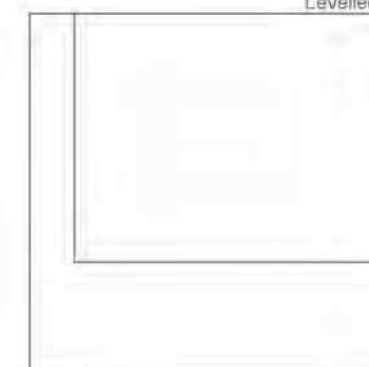
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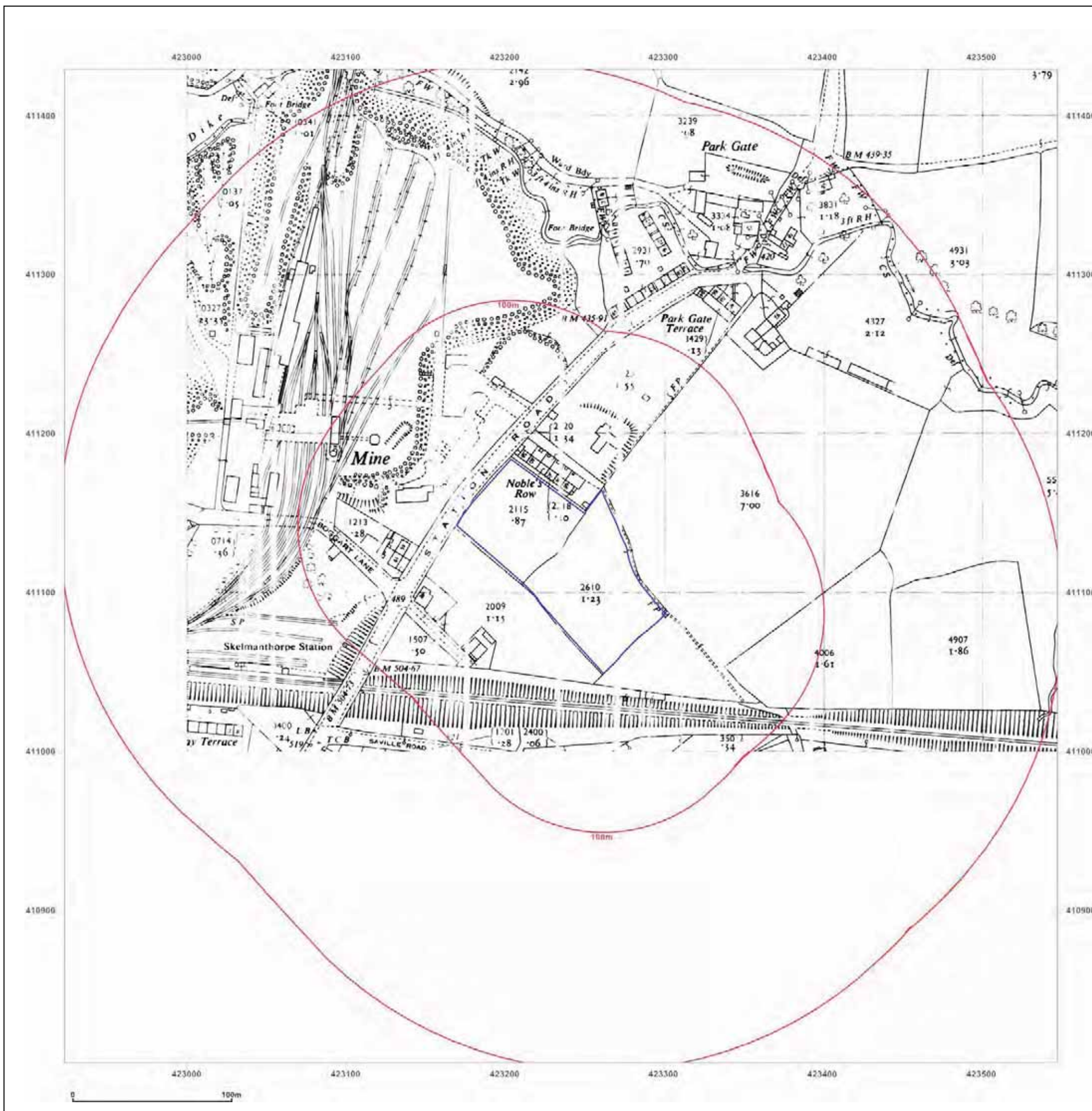


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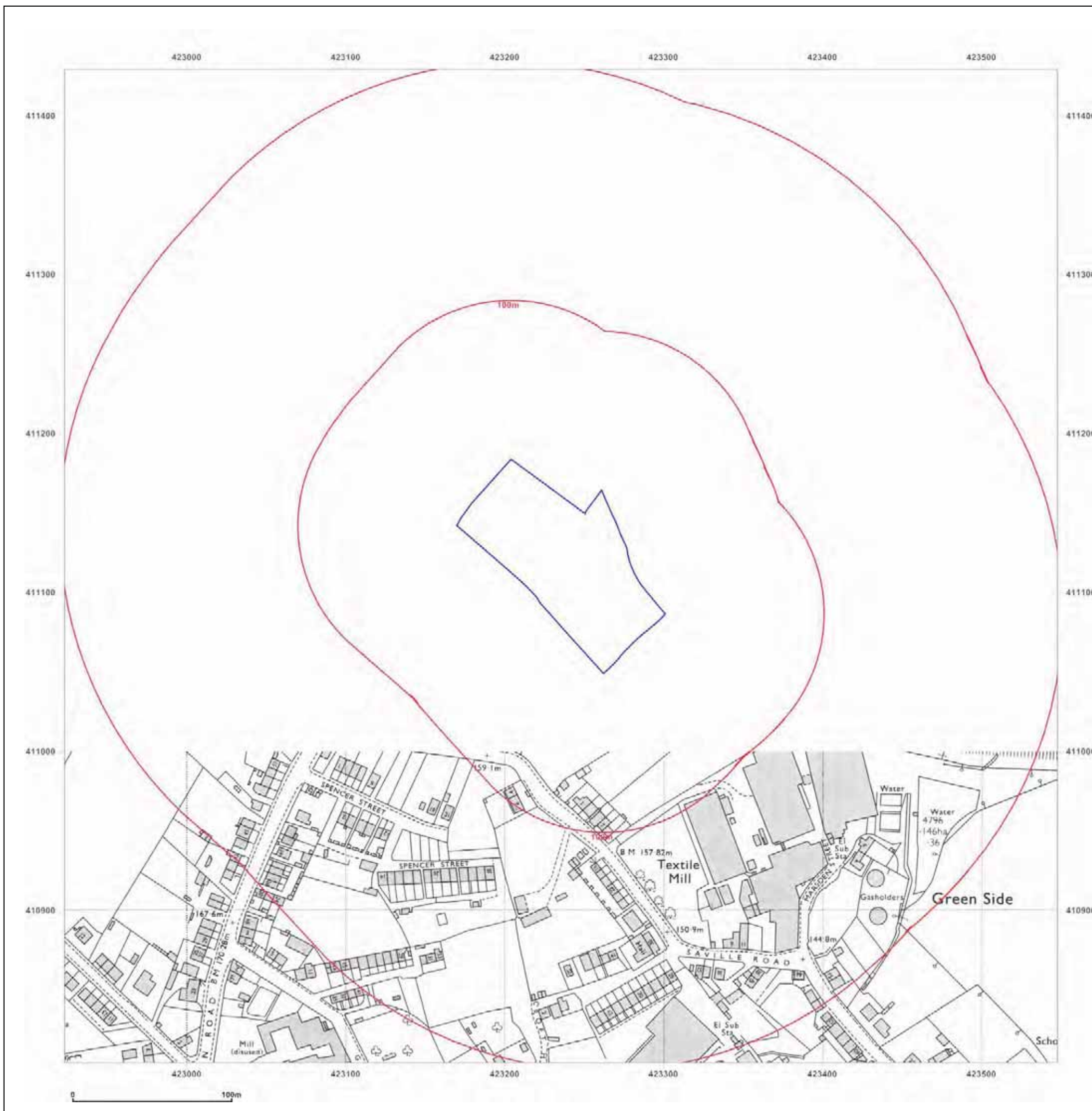


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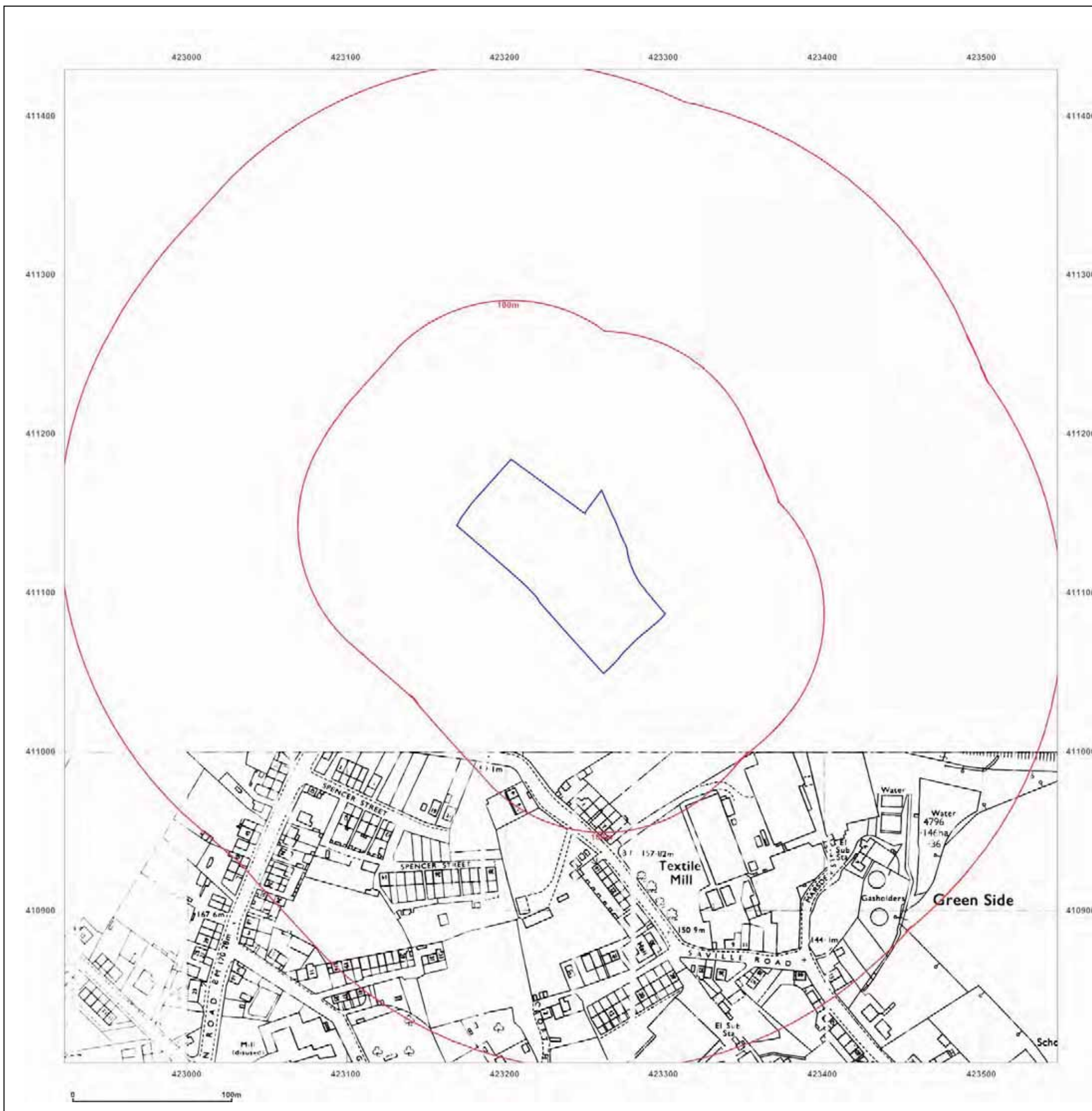


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Site Details:

STATION ROAD,
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HUDDERSFIELD, HD8 9TT

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1974-1978

Scale: 1:2,500

Printed at: 1:2,500



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 1974
Levelled N/A

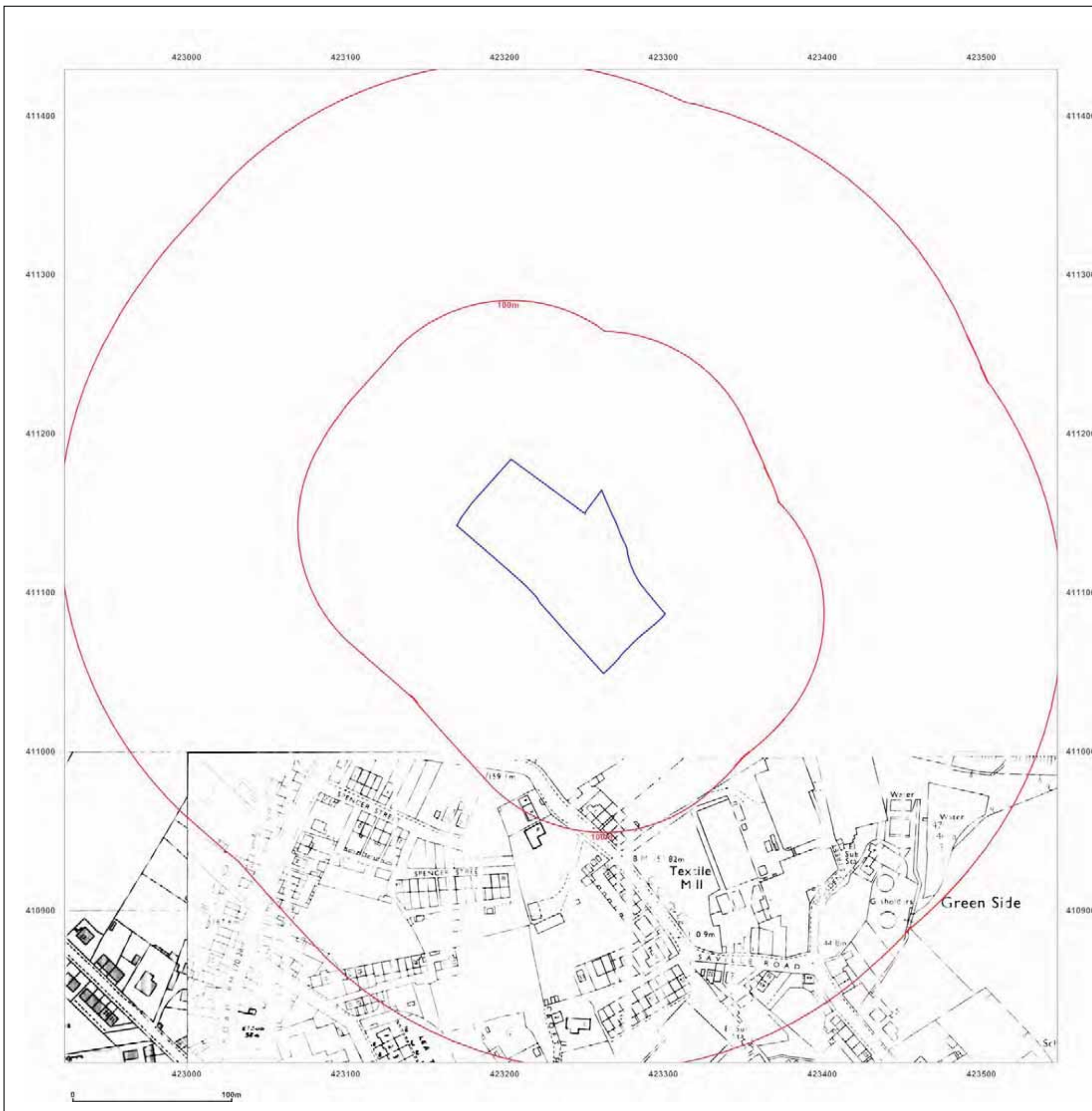


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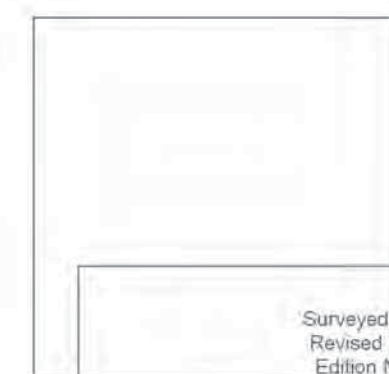
Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1978

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1978
Levelled N/A

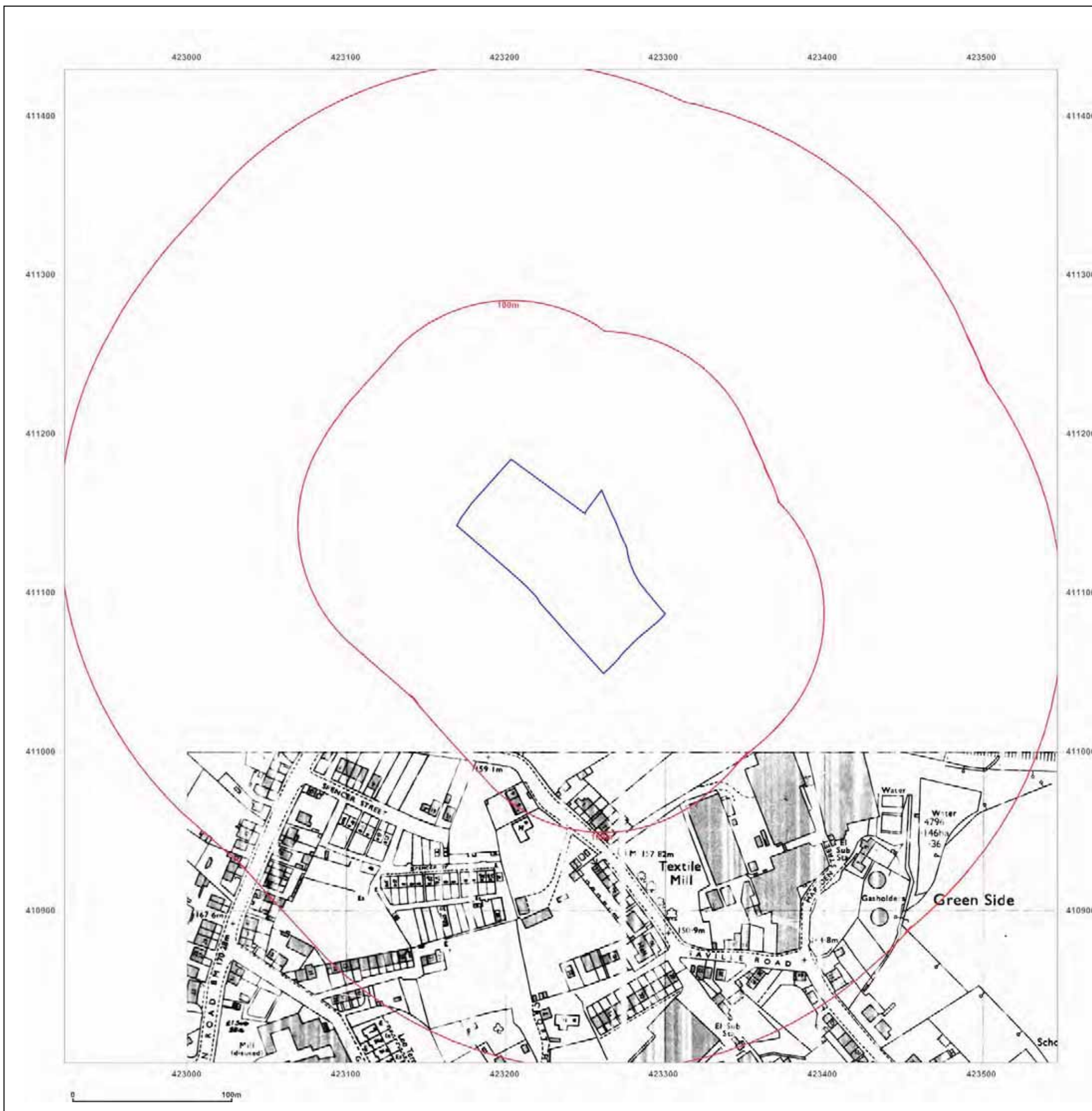


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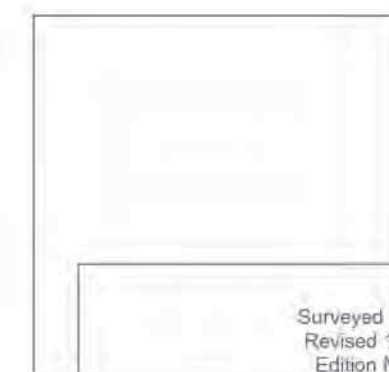
Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1980

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1980
Revised 1980
Edition N/A
Copyright 1982
Levelled 1958

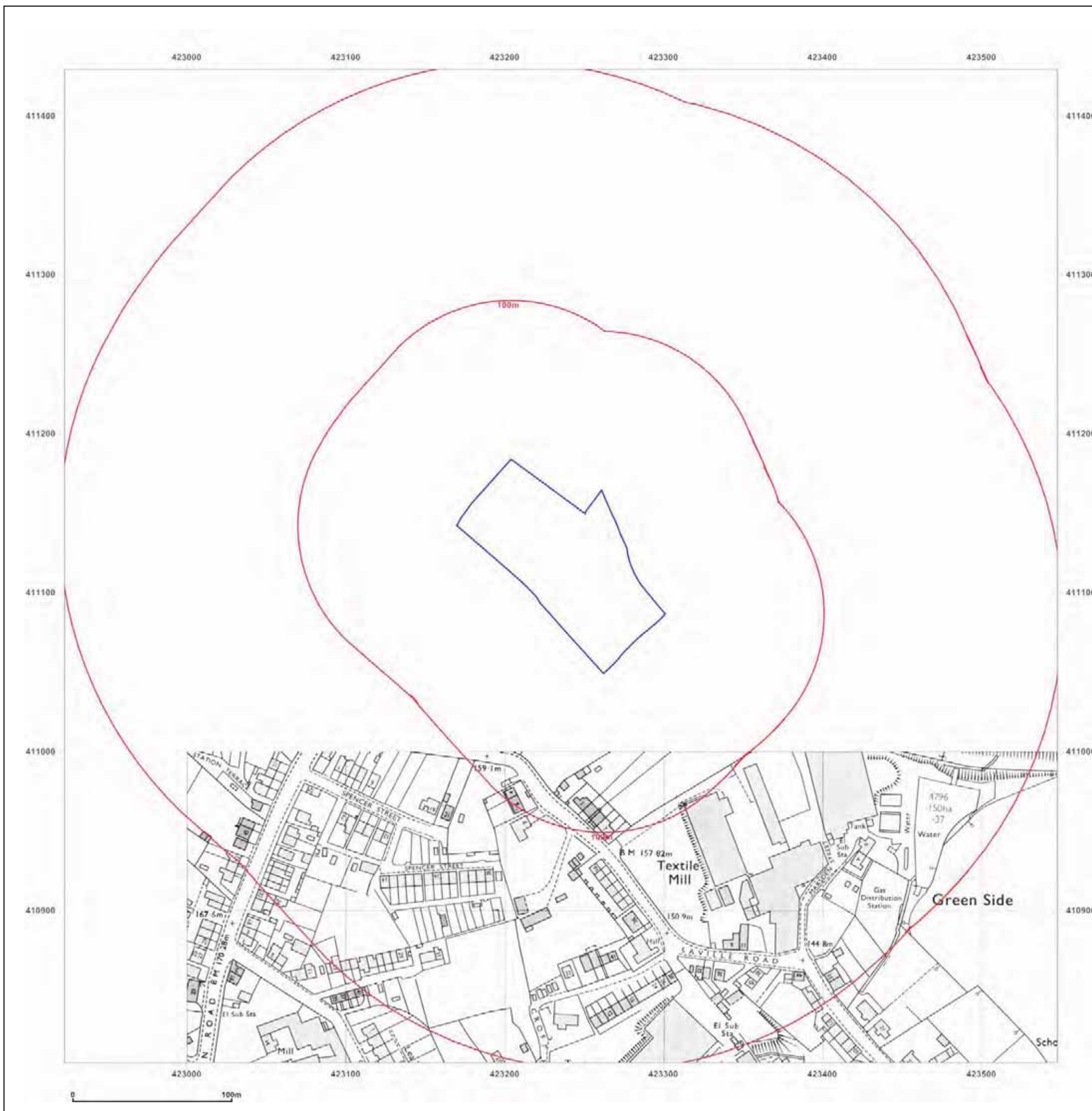


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1986-1990

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1958
Revised 1990
Edition N/A
Copyright 1990
Levelled 1958

Surveyed 1958
Revised 1987
Edition N/A
Copyright 1987
Levelled 1958

Surveyed 1958
Revised 1987
Edition N/A
Copyright 1987
Levelled 1958

Surveyed 1968
Revised 1986
Edition N/A
Copyright 1986
Levelled 1968



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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1988-1992

Scale: 1:2,500

Printed at: 1:2,500



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

Surveyed 1958
Revised 1990
Edition N/A
Copyright 1990
Levelled 1958

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

Surveyed N/A
Revised 1989
Edition N/A
Copyright 1991
Levelled N/A

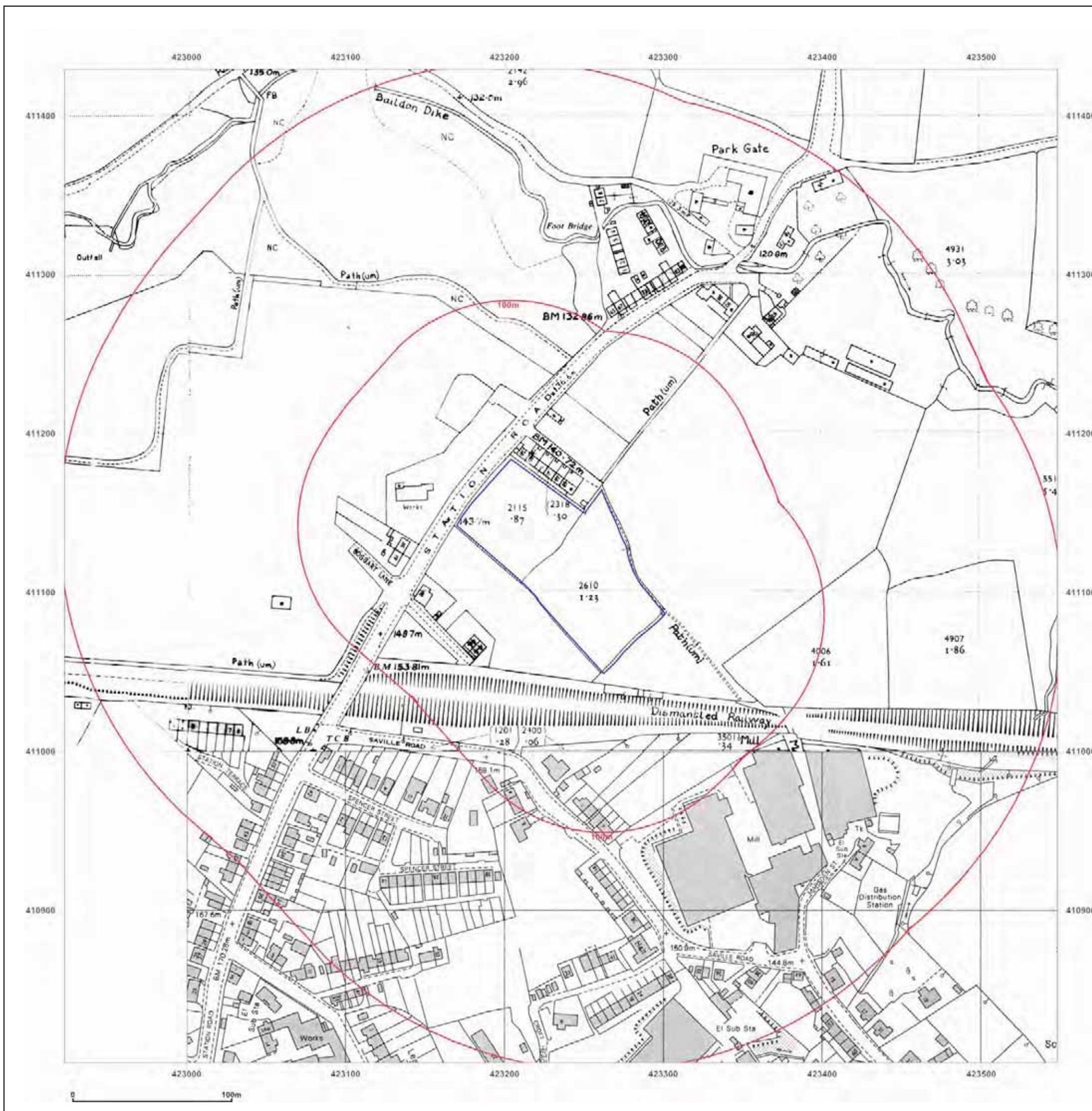


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1989-1992

Scale: 1:2,500

Printed at: 1:2,500



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

Surveyed N/A
Revised 1989
Edition N/A
Copyright 1991
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1992
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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1992-1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A	Surveyed N/A
Revised N/A	Revised N/A
Edition N/A	Edition N/A
Copyright 1992	Copyright 1993
Levelled N/A	Levelled N/A

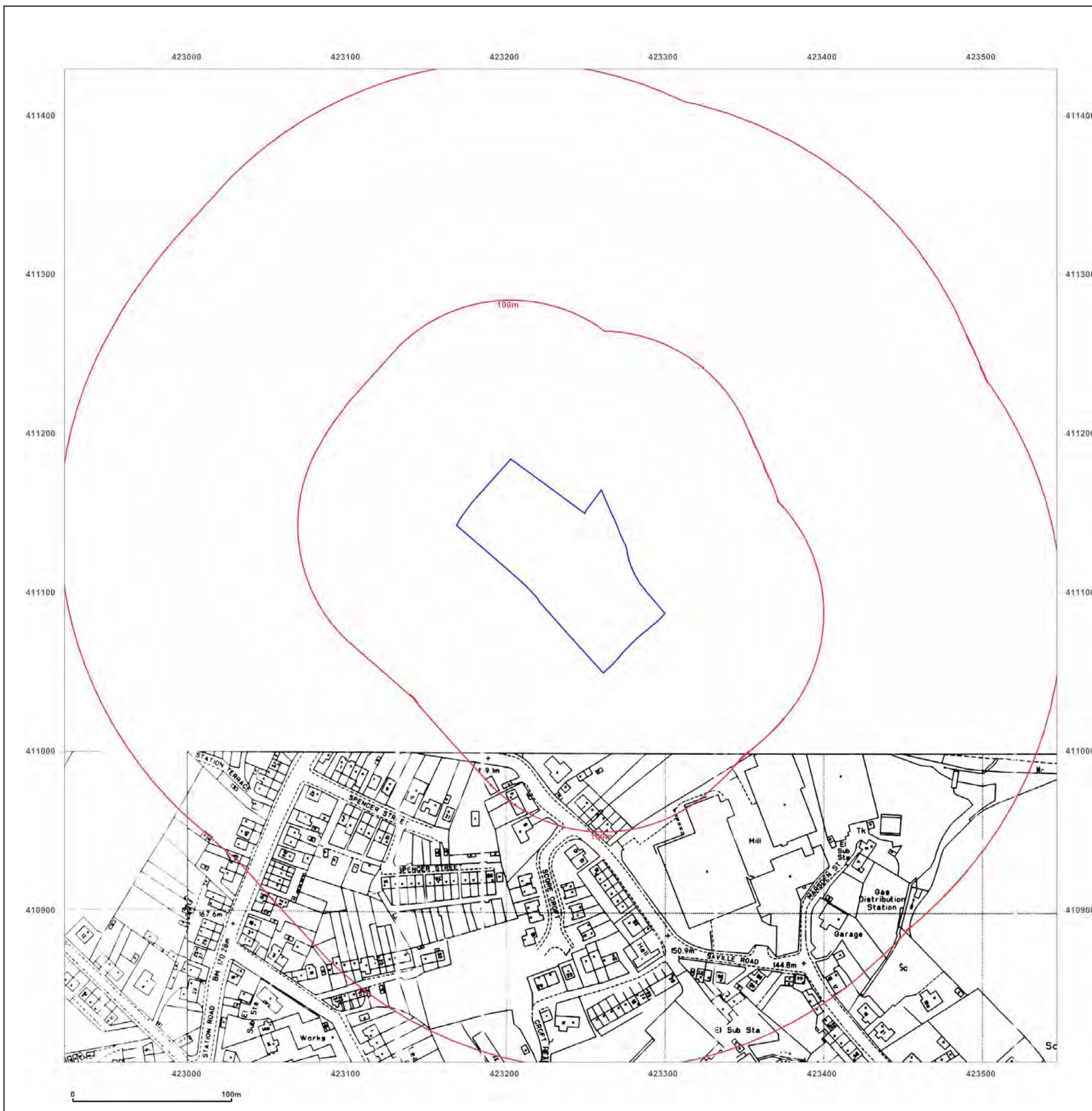


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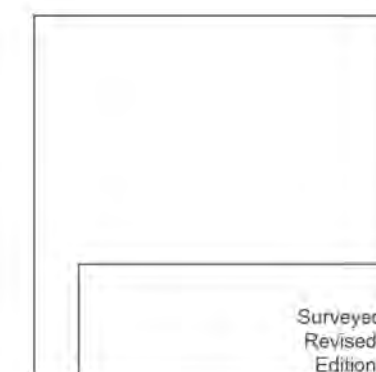
Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



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

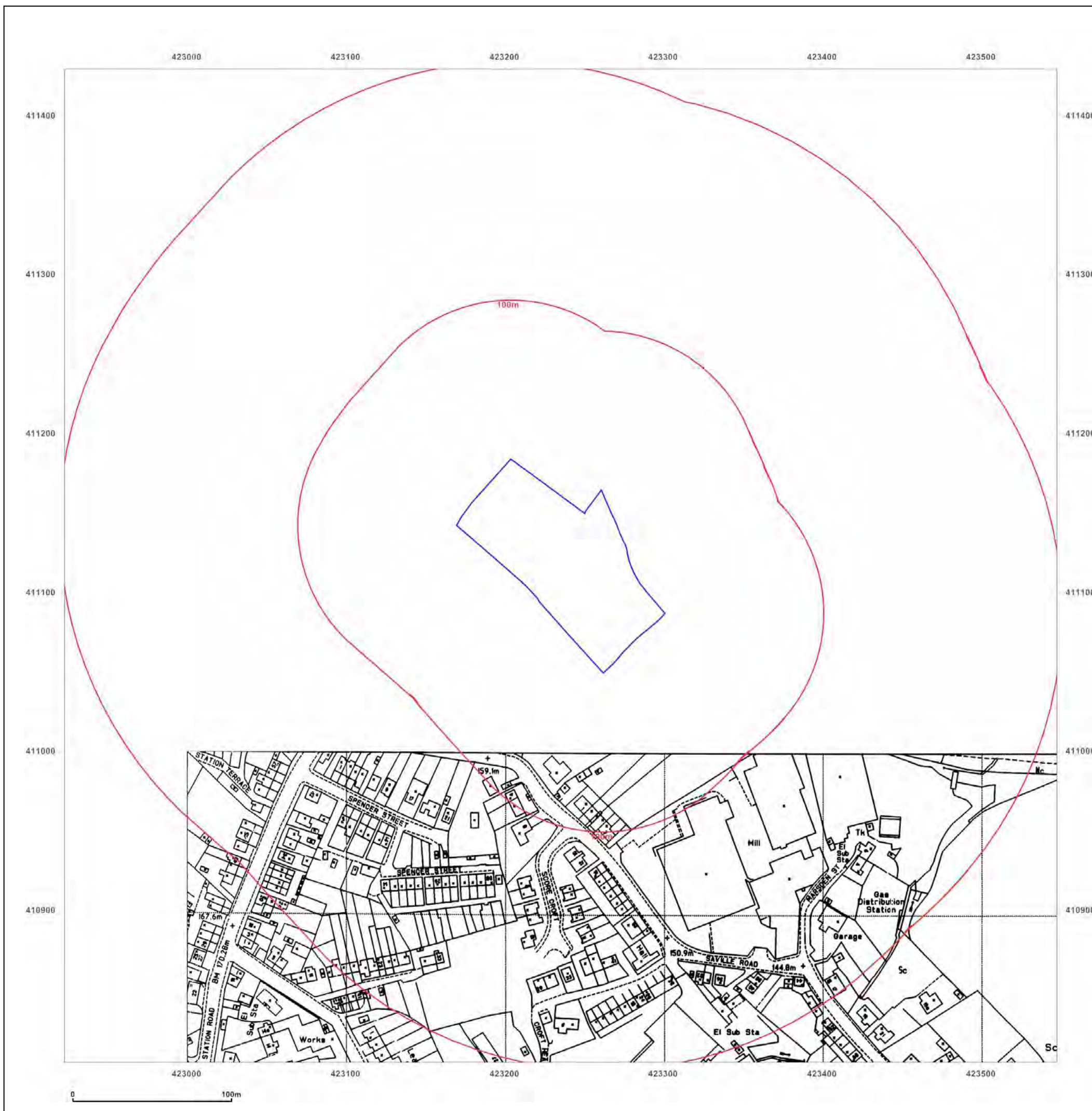


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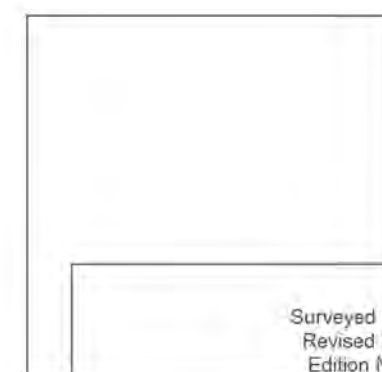
Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



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

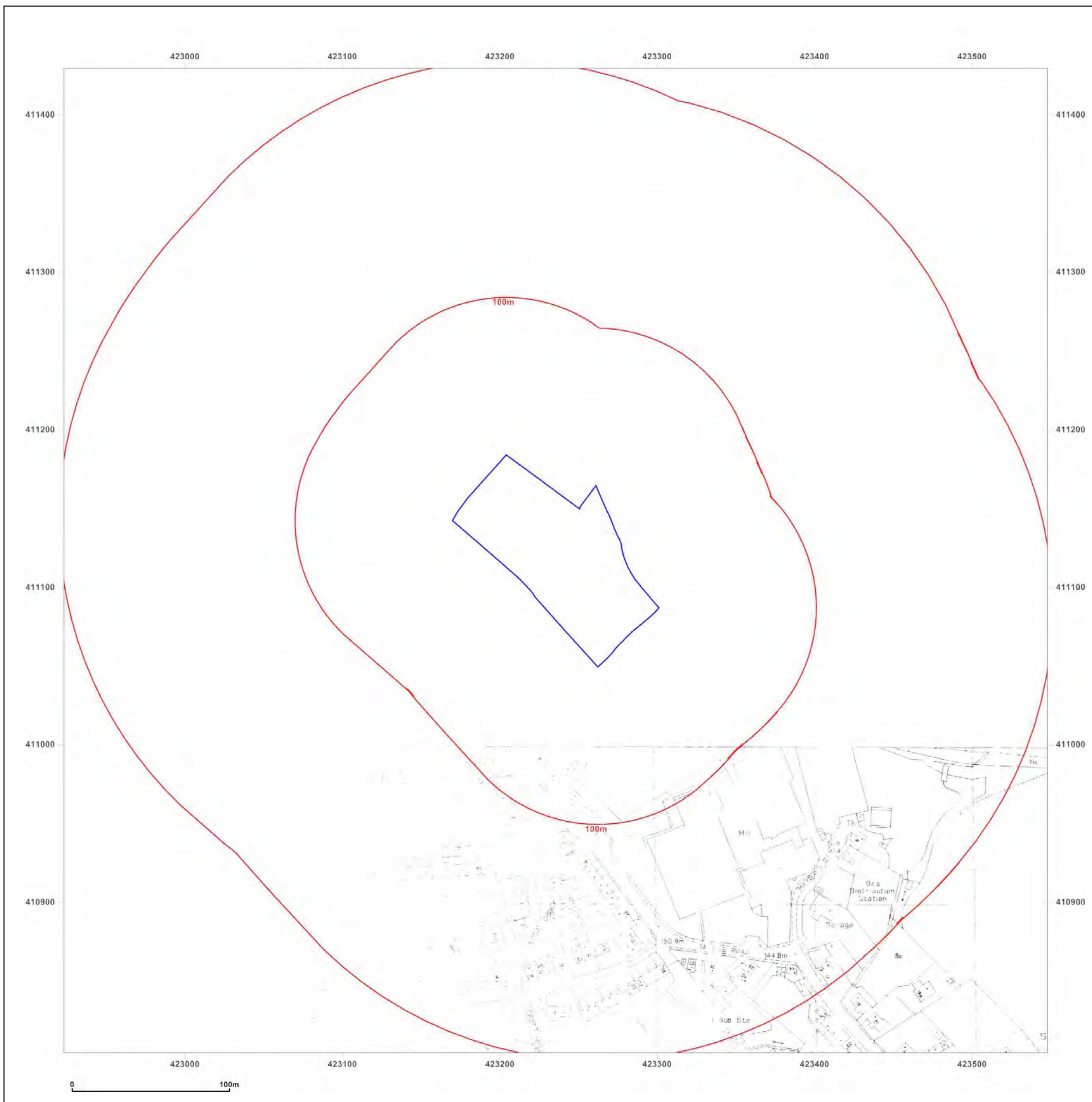


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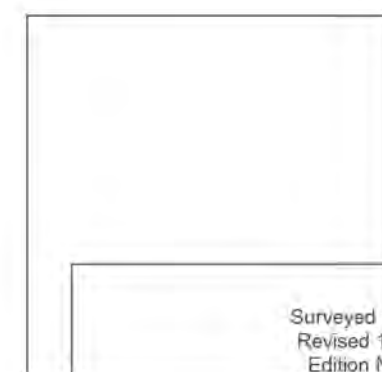
Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



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

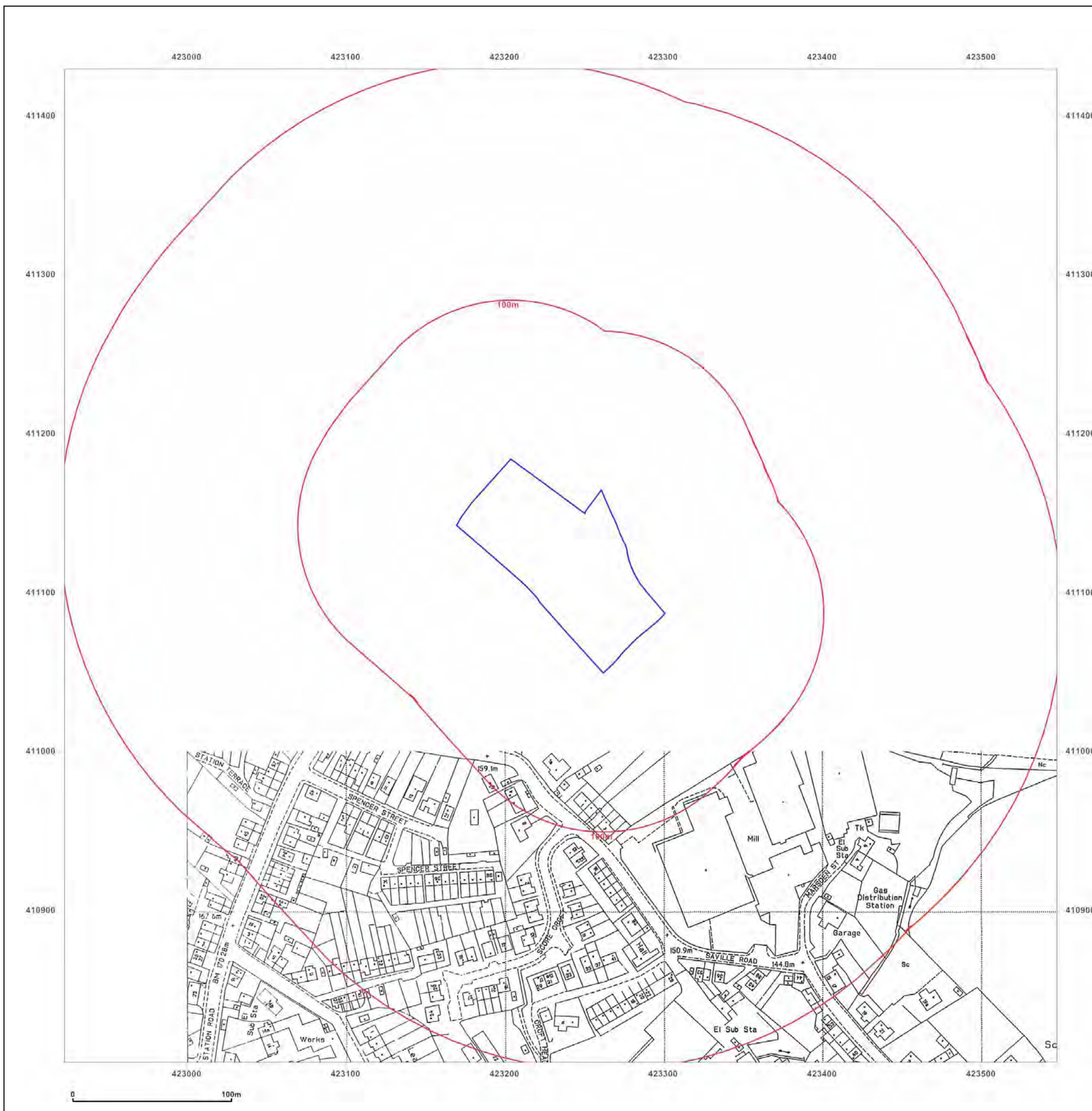


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: County Series

Map date: 1892

Scale: 1:10,560

Printed at: 1:10,560



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

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

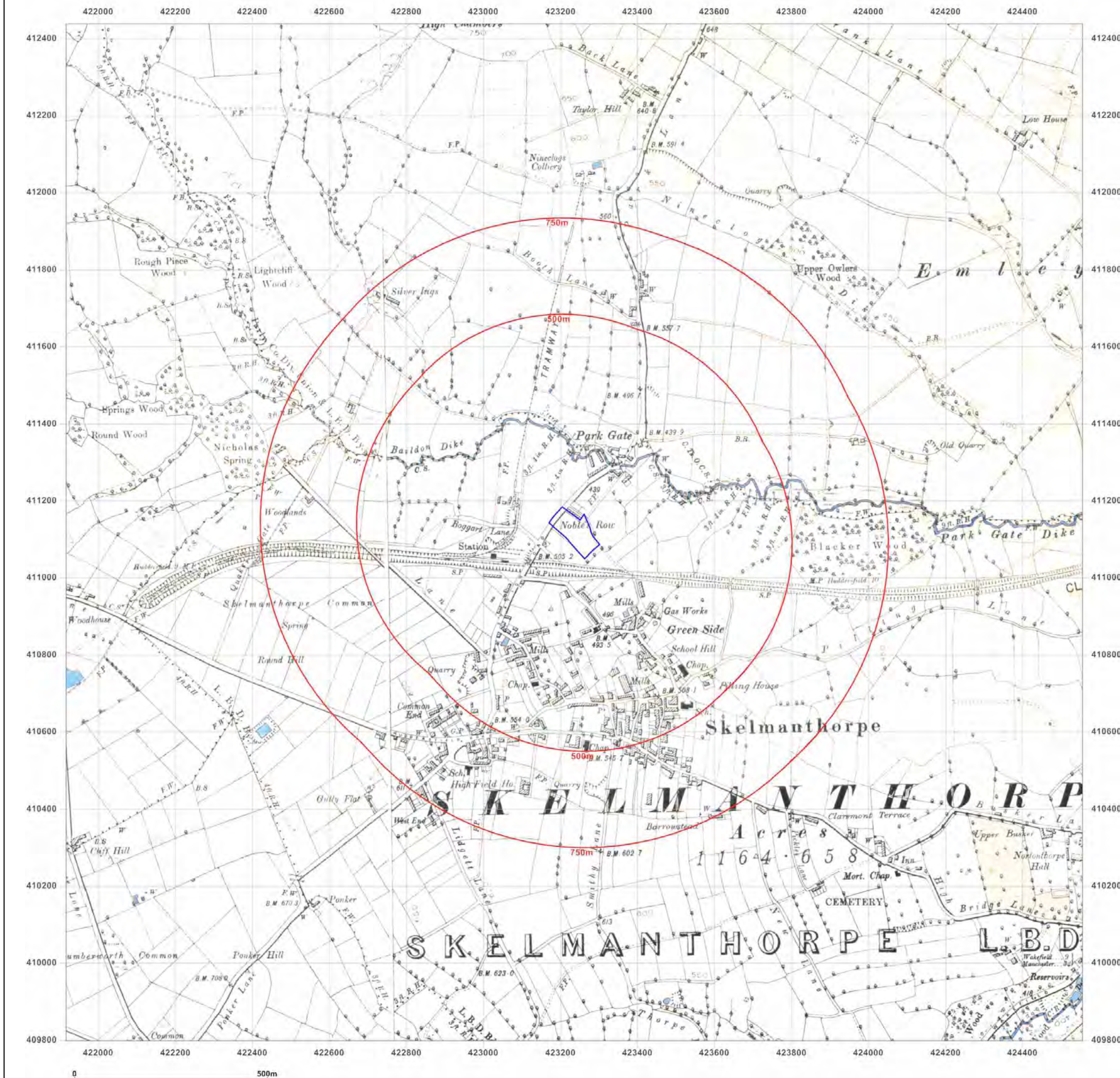


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: County Series

Map date: 1904

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1892
Revised 1904
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1892
Revised 1904
Edition N/A
Copyright N/A
Levelled N/A

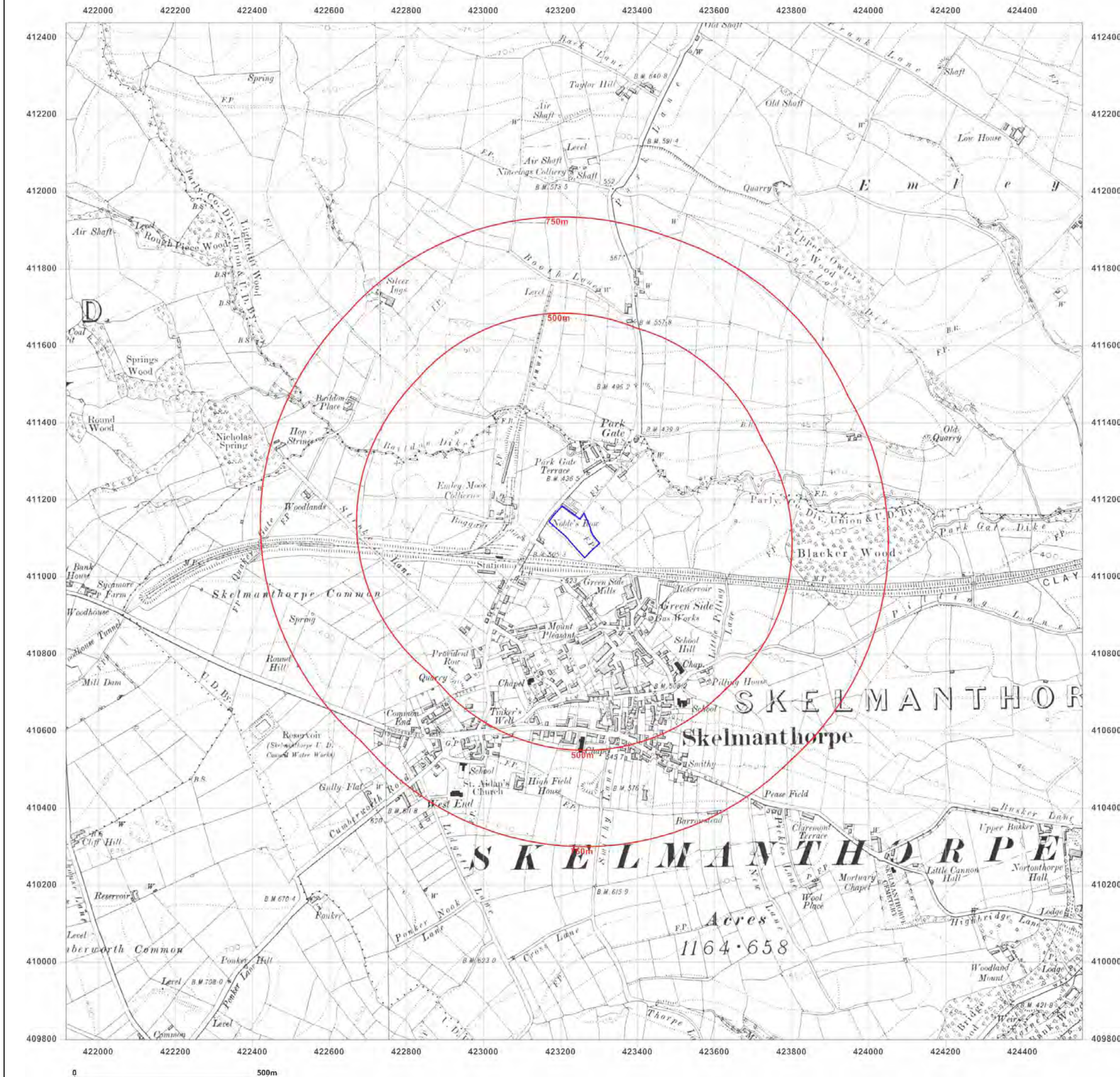


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: County Series

Map date: 1929-1932

Scale: 1:10,560

Printed at: 1:10,560



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

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

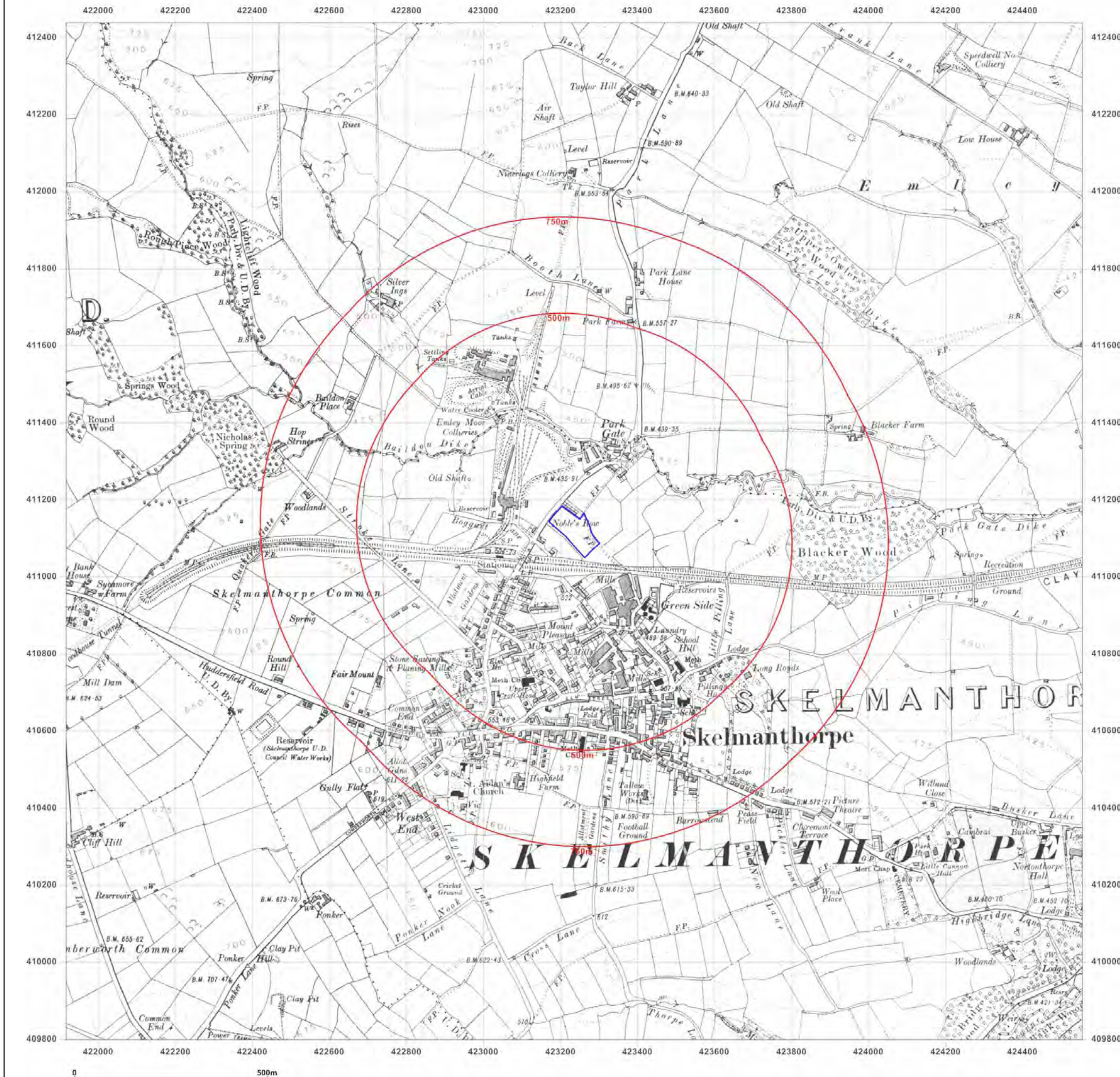


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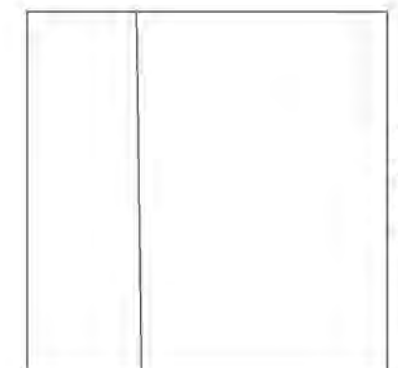
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Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1851
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

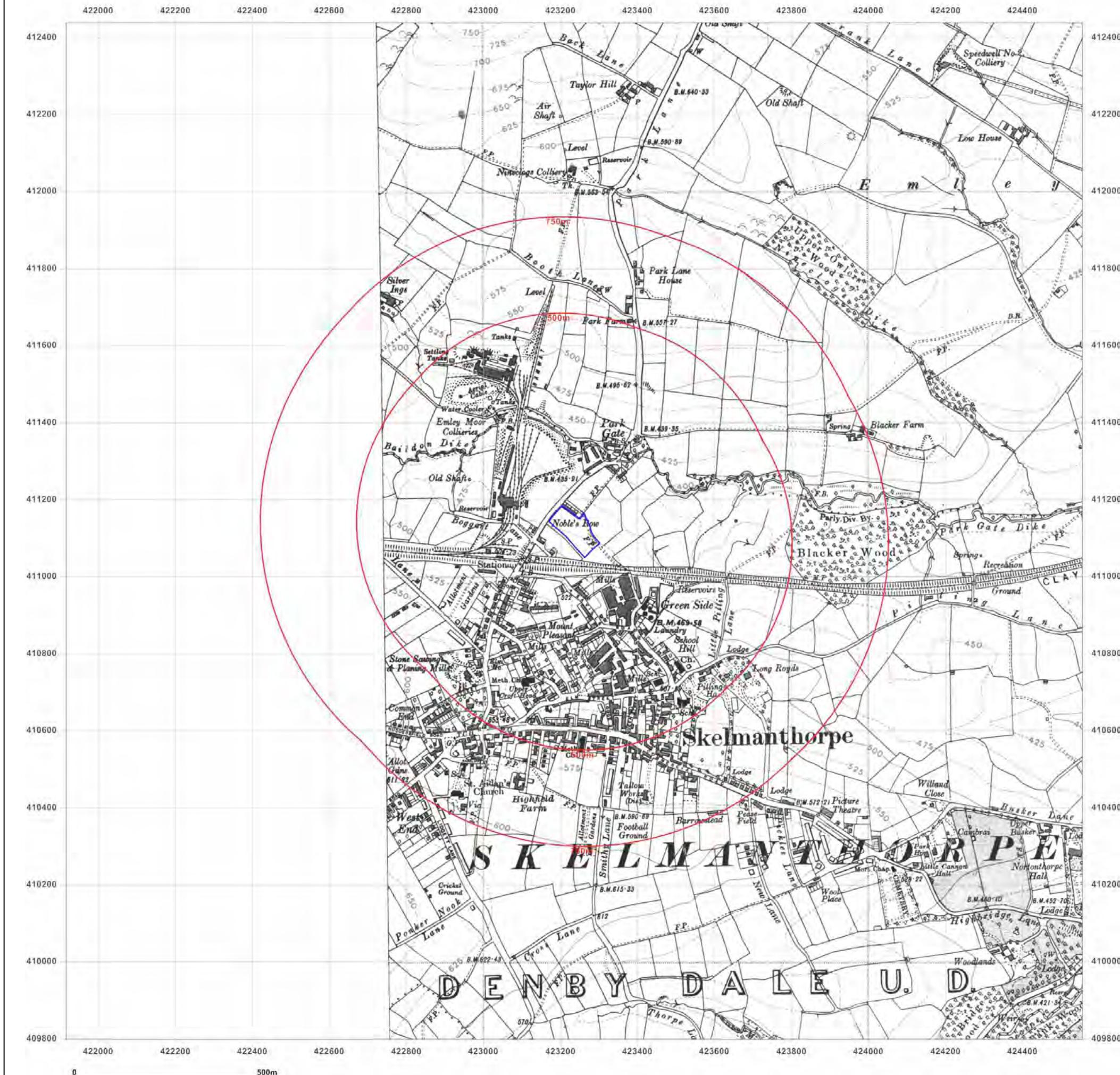


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: County Series

Map date: 1948

Scale: 1:10,560

Printed at: 1:10,560



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

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

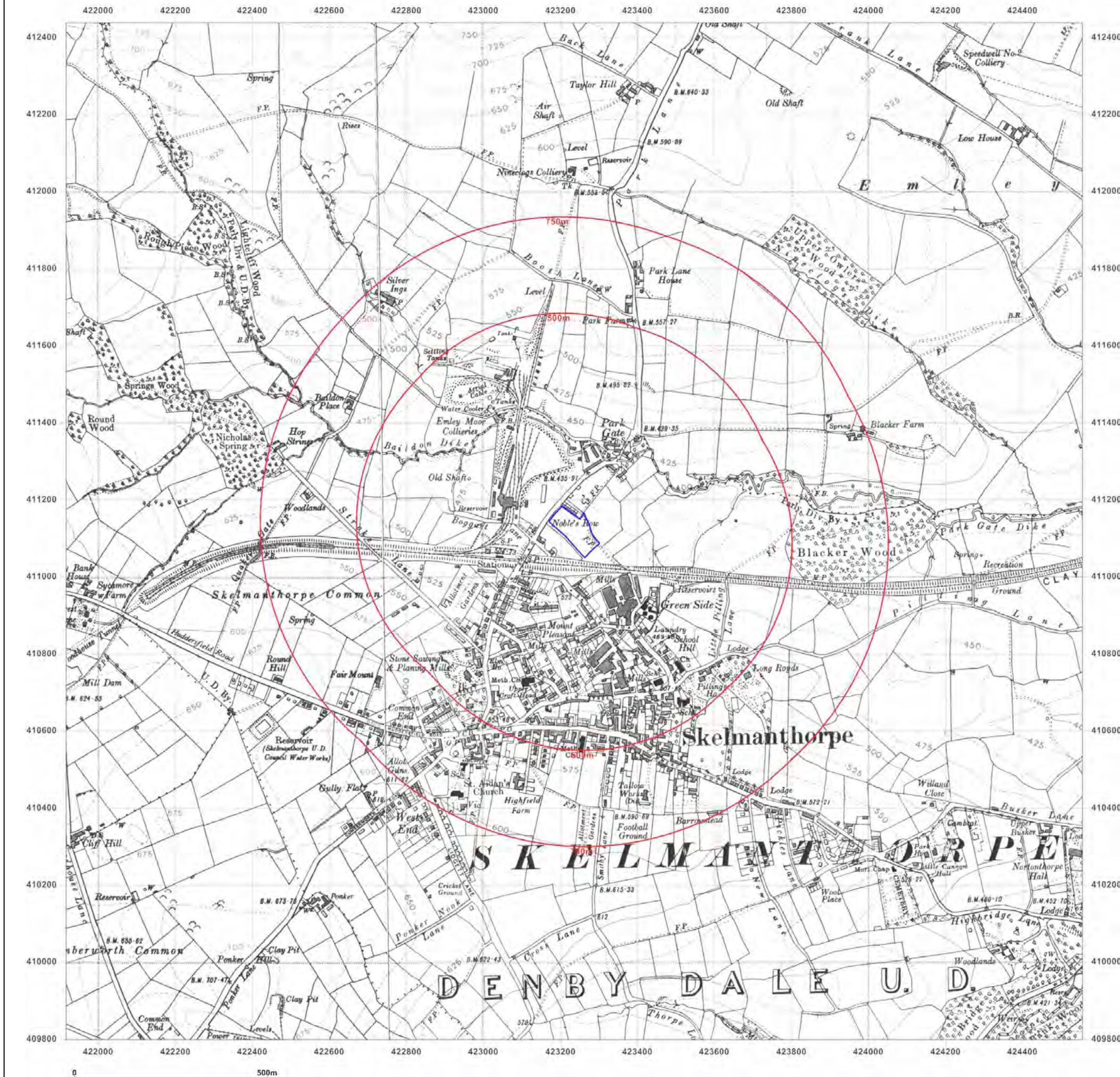


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: Provisional

Map date: 1951-1955

Scale: 1:10,560

Printed at: 1:10,560



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

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

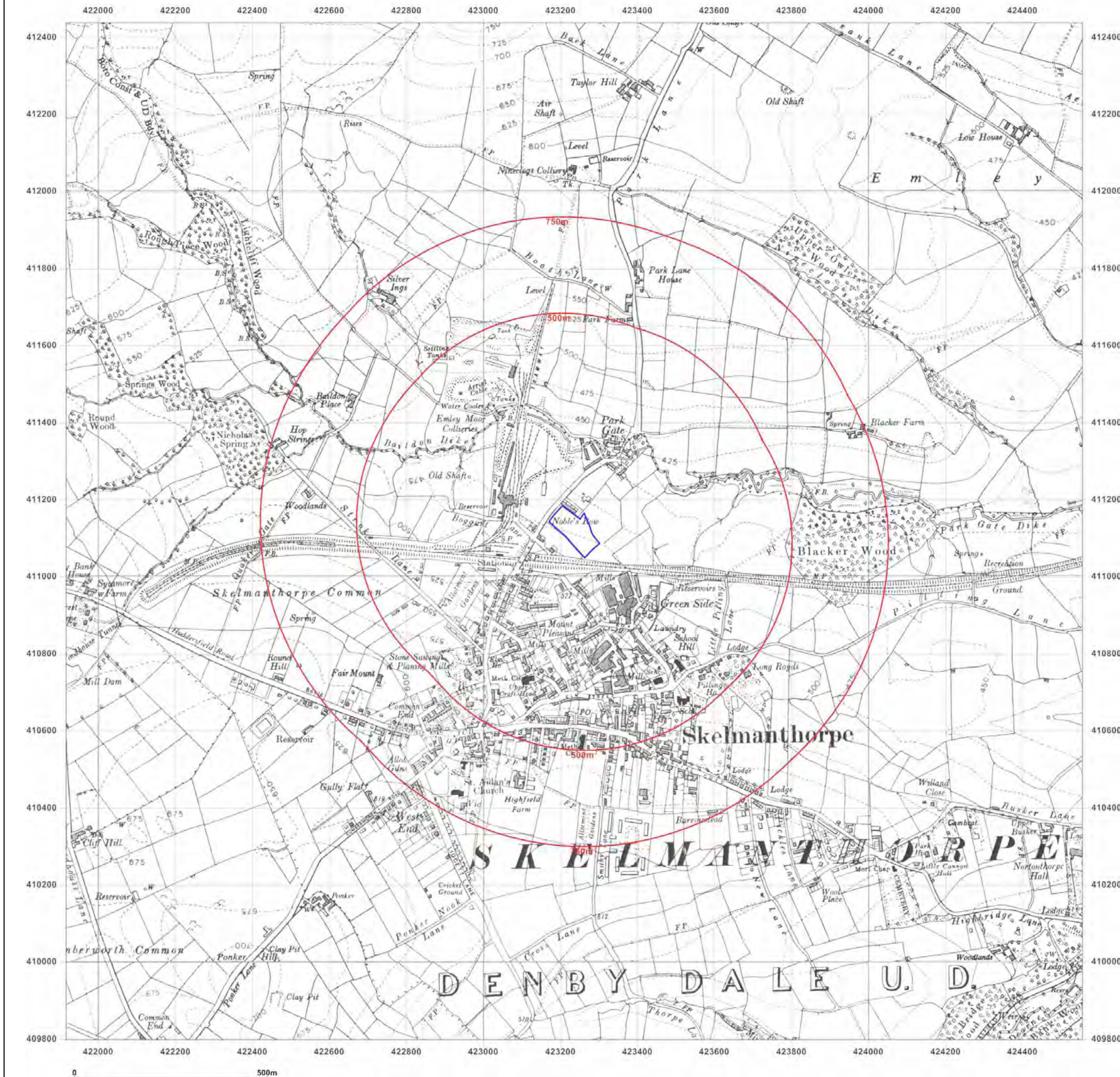


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: Provisional

Map date: 1967

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

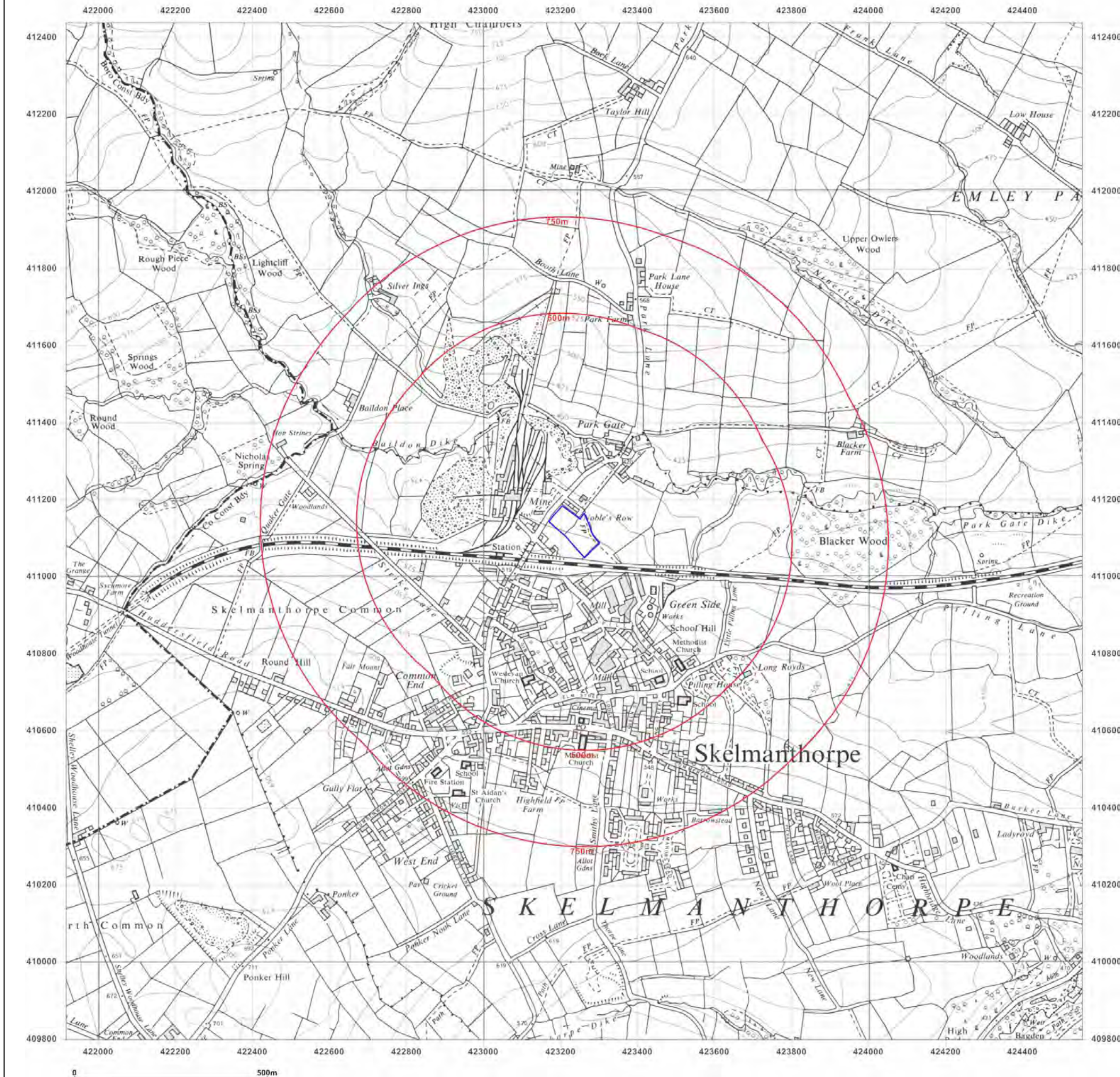


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 1979-1983

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1977
Revised 1979
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1980
Revised 1983
Edition N/A
Copyright N/A
Levelled N/A

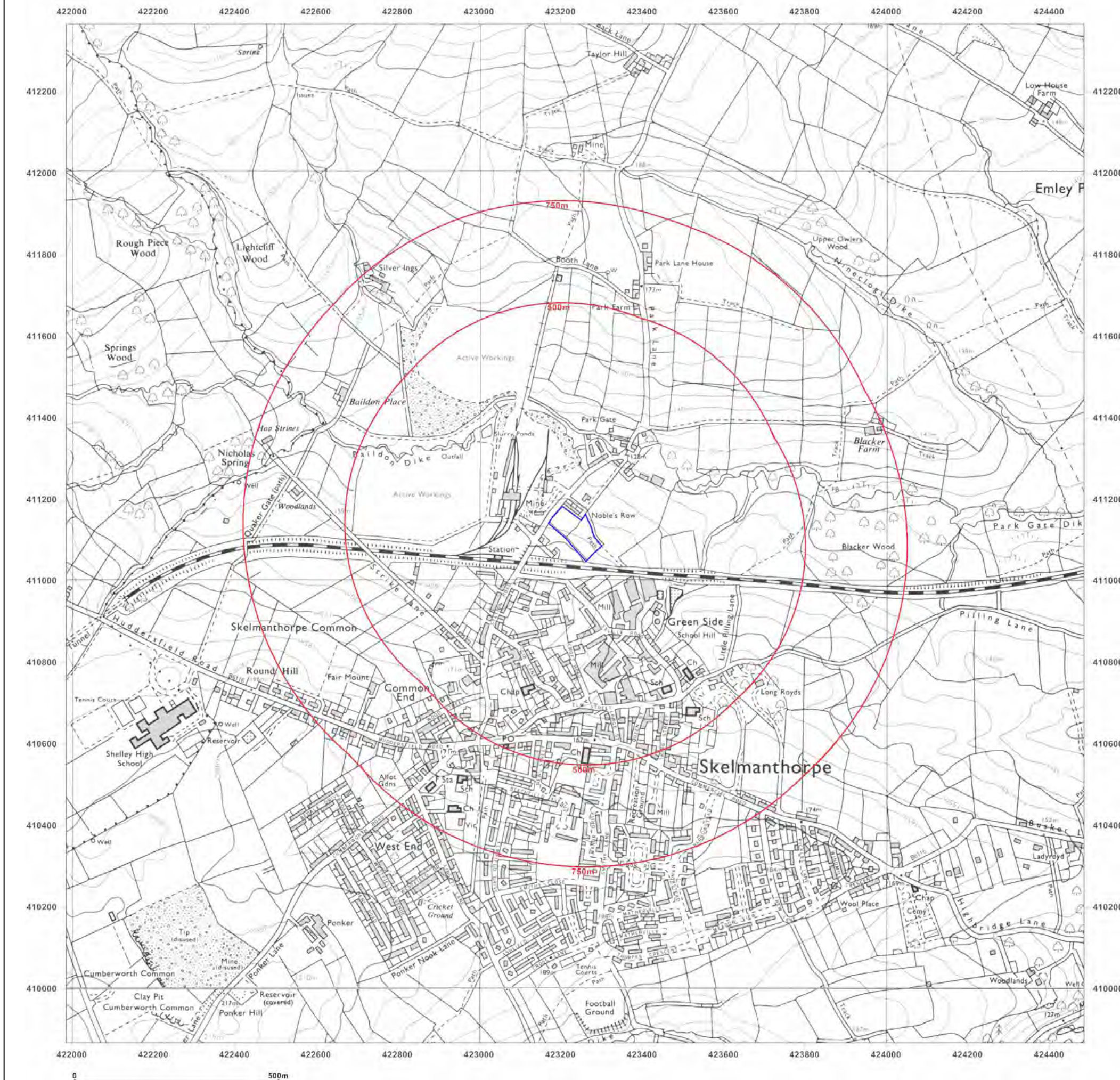


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

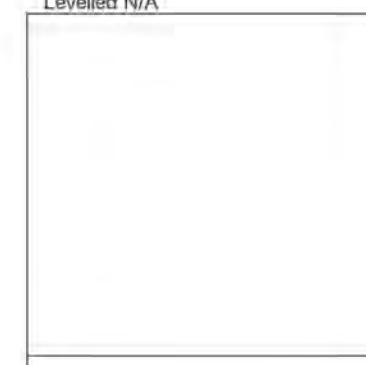
Map date: 1993

Scale: 1:10,000

Printed at: 1:10,000



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

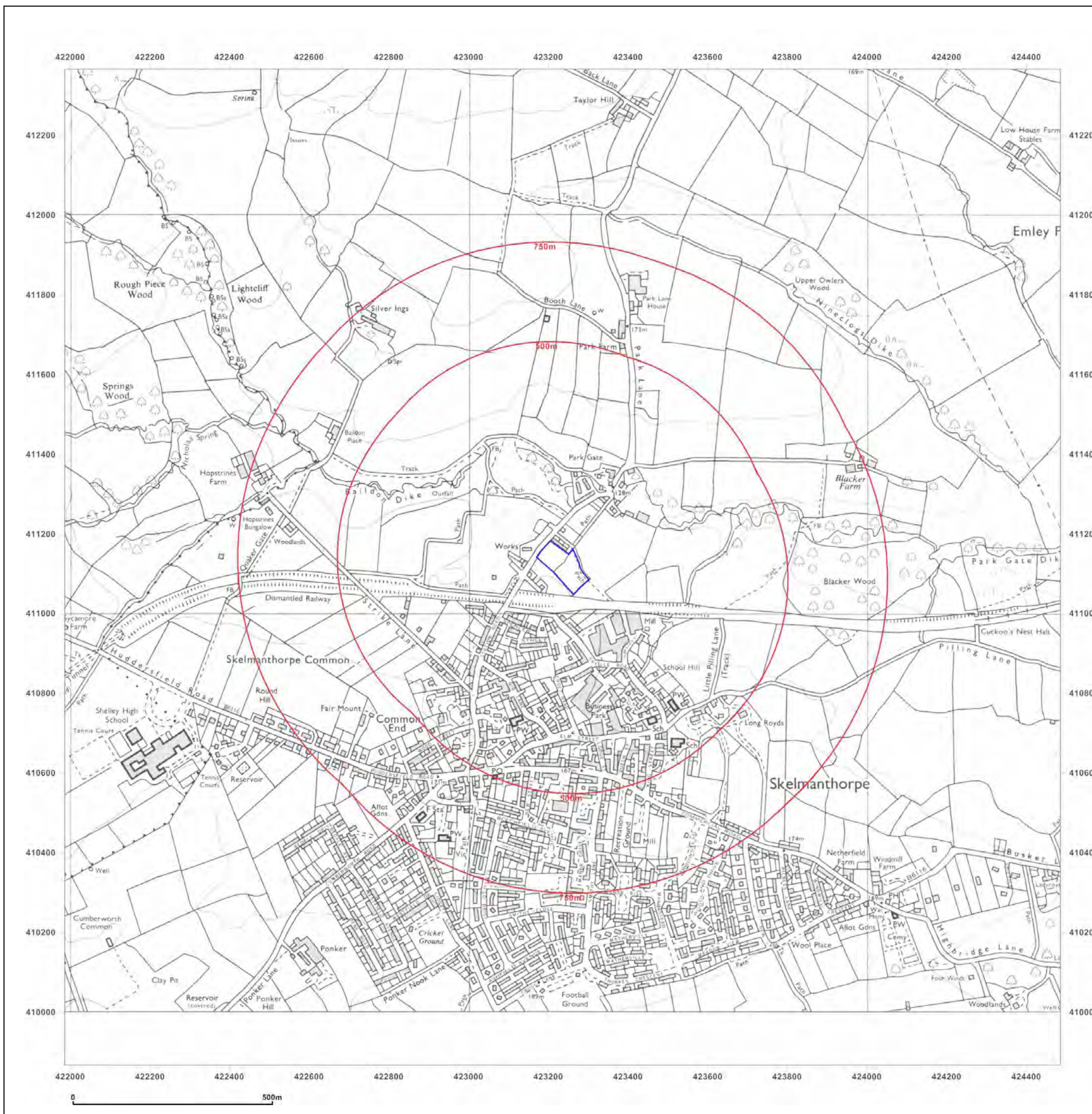


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000

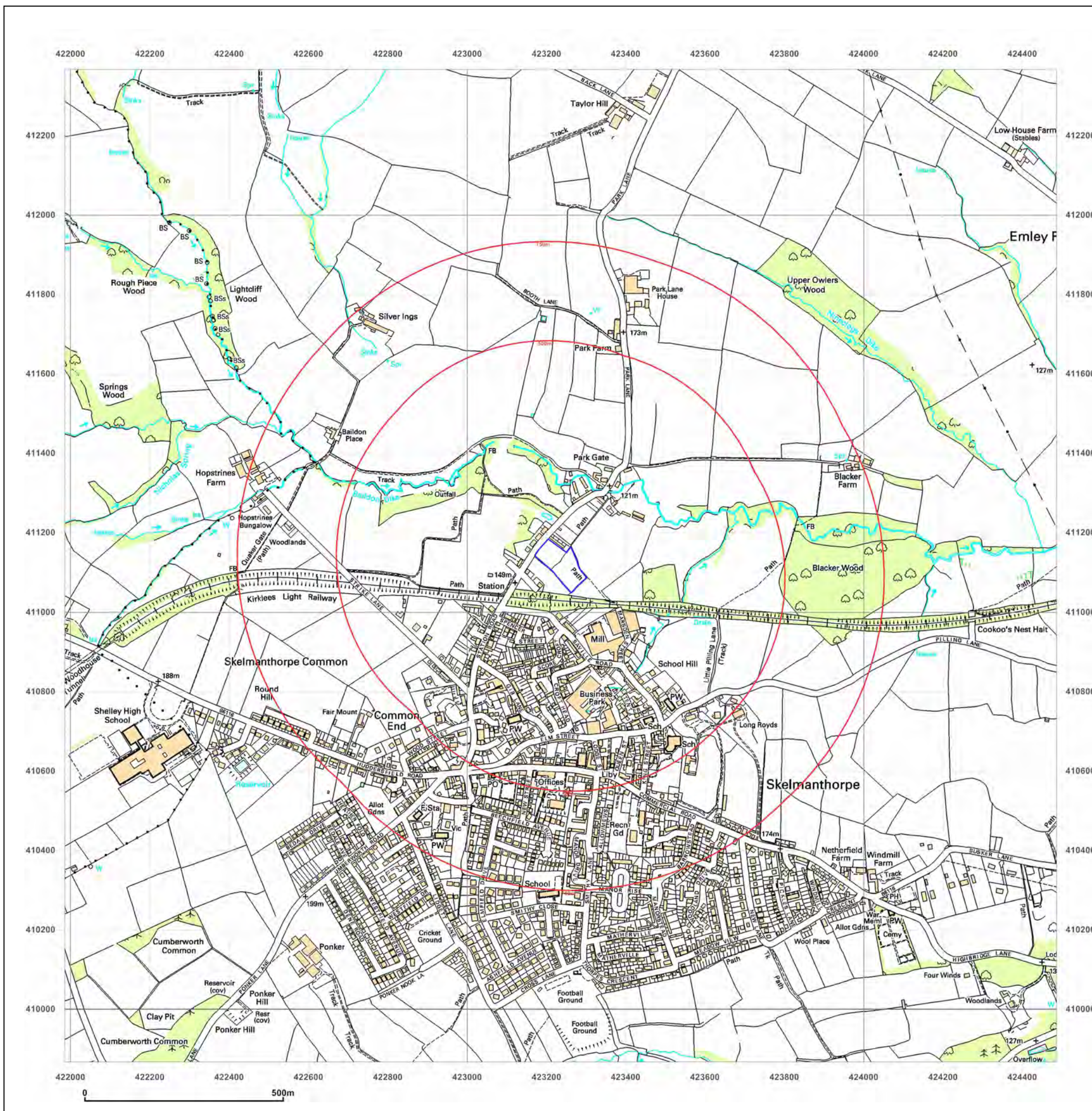


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

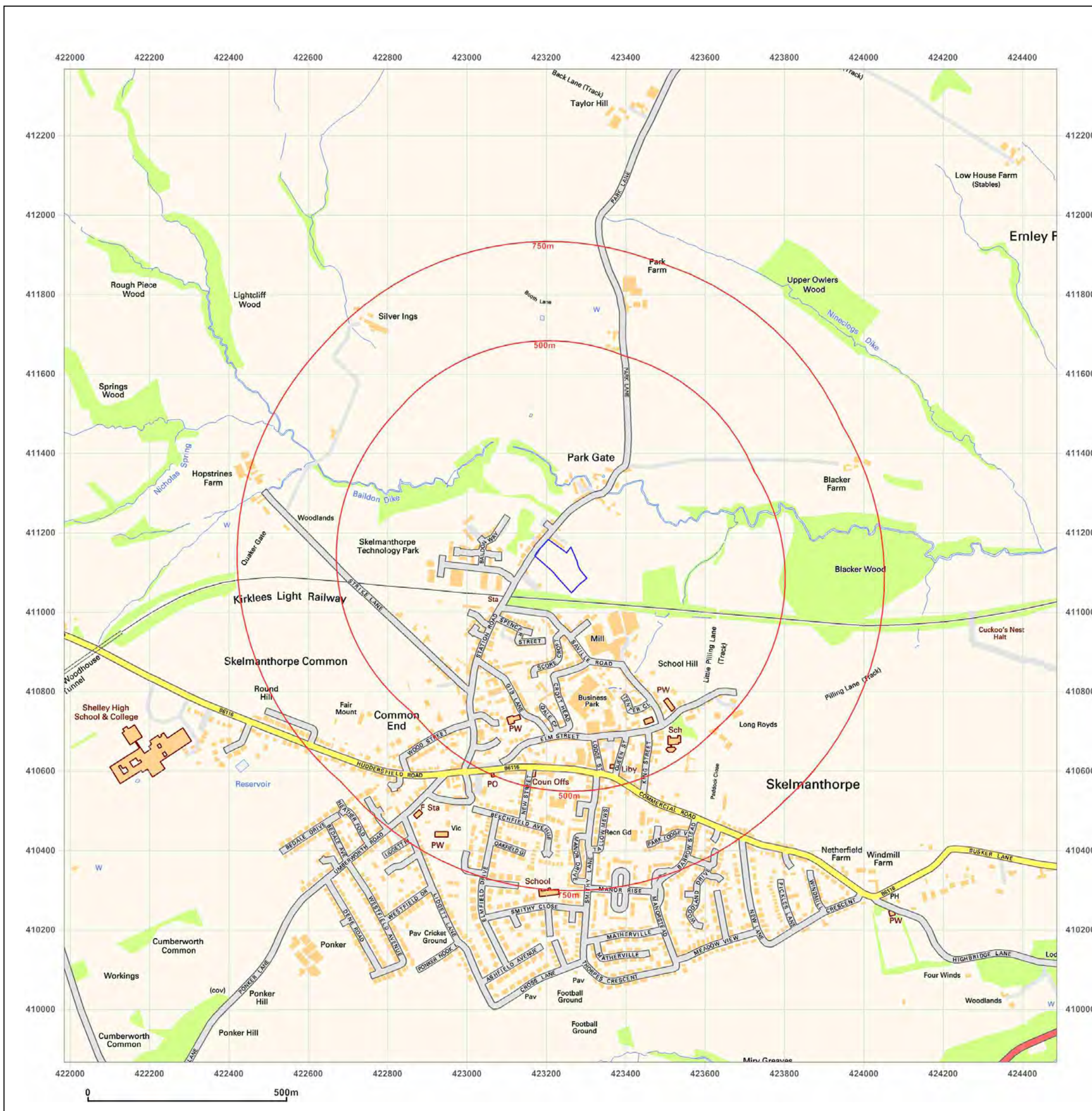


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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7366
Report Ref: GS-5864927
Grid Ref: 423235, 411117

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



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