



GEOENVIRONMENTAL DESK STUDY REPORT

Circa 100 Dwellings on Land off Hawshaw Lane, Hoyland

Reference

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2

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CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

Hoyland Developments Ltd

This report has been prepared for the sole use and reliance of the above named party. This report shall not be relied upon or transferred to any other parties without the express written authorisation of JPG (Leeds) Limited. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

DOCUMENT HISTORY

VERSION	PURPOSE/DESCRIPTION	DATE
1	Final – For issue to Client	December 2016
2	Final – For issue to Client	December 2016



EXECUTIVE SUMMARY

Site Address	Land off Hawshaw Lane, Hoyland
NGR	Approximate NGR 435973, 400624.
Current Site Use & Proposed Development	The site is currently undeveloped. It is proposed to redevelop the site with a residential development, access roads and landscape areas. The proposed tunnelled HS2 route, oriented approximately north to south is shown to pass through the eastern part of the site.
Site History	Historical maps show that the site has never been developed since at least 1855.
Site Setting	<p>Geology – No superficial deposits are shown to be present on the site. The underlying bedrock is shown to comprise Pennine Middle Coal Measures Formation. The site is also underlain by two bands of sandstone (the Barnsley Rock and the Kent's Rock) and two coal seams (the Barnsley and the Kent's Thin seams). The site is crossed by two faults, orientated north west to south east.</p> <p>Infilled ground, comprising backfilled opencast workings, is shown to the south west of the outcrop of the Barnsley Coal Seam. This infilled ground extends to the north west, beyond the site boundary. An area of made ground is shown immediately beyond the north east boundary of the site.</p> <p>Mining – The Coal Authority report shows that there is coal at shallow depths, which may have been worked at some time in the past. Part of the site has been mined by opencast methods. A damage notice or claim for alleged subsidence damage was made for two properties along the south east boundary of the site, but both claims were rejected.</p> <p>A plan by RSK shows the opencast mining area to terminate at the boundary of the Proposed Residential Development Area. However, a BGS map shows it extends into the Proposed Residential Development Area. The thickness of the backfill along the north western boundary of the site is shown to range between 20m and 65m.</p> <p>Hydrogeology – The underlying bedrock is classified as a Secondary A Aquifer. The site does not lie within an Environment Agency (EA) Groundwater Source Protection Zone.</p> <p>Hydrology – The nearest surface water feature is a tertiary river, which is connected to a small lake to the north. Two drains are also present in the vicinity of the site.</p> <p>Flooding – The site is not within a Zone 2 or Zone 3 floodplain.</p> <p>Landfill – There are records of no historical landfill sites, and no waste treatment, waste transfer or waste disposal sites within 500m of the site.</p> <p>Radon Risks – The site is within a radon affected area, as between 1 and 3% of the properties are above the action level for radon gas. No radon protective measures are required.</p>
Environmental Risk Assessment	<p>The following potential sources of contamination may be present on the site:</p> <ul style="list-style-type: none"> • Made ground associated with historical opencast mining, backfilling and restoration. • Hazardous gases associated with the made ground and underlying shallow coal seams. <p>On the basis of the proposed end use and known history, the following potential pollutant linkages may be present:</p> <ul style="list-style-type: none"> • Development and maintenance workers and site end users, i.e. residents, could come into contact with soils containing elevated concentrations of potential contaminants and hazardous gases. • Site end users could come into contact with made ground and home grown produce containing elevated concentrations of potential contaminants, e.g. eating home grown produce from gardens. • The underlying Secondary Aquifers, the nearby tertiary river and drains could become contaminated due to the leaching and migration of contaminants from soil into surface water and groundwater via surface water and groundwater flow. • Buildings and services could be affected by potentially aggressive contaminants in the soils; and • Planting in landscape areas and gardens could be affected by phytotoxic elements within the soils. <p>These are based on current site conditions and do not consider exposure pathways following any remediation of the site. If the site can be shown to pose no "significant harm" or pollution to controlled waters, then the site can be considered to be uncontaminated.</p> <p>Based on the potential pollutant linkages present on the site, the site should be considered to be low to moderate risk with respect to contamination.</p>
Preliminary Engineering Assessment	<p>Mining – Part of the site has been mined by opencast methods. The RSK plans show the opencast mining area to terminate at the boundary of the proposed residential development area. However, the BGS plan shows it extends into this area. The extent of the opencast workings and depths to underlying coal seams within influencing distance of the surface should be assessed as part of an intrusive ground investigation.</p> <p>Foundations</p> <p>Outside the Backfilled Opencast Area - The selection of foundation type for the proposed development will be governed by the thickness of any made ground and the strength and settlement characteristics of the underlying natural strata, which will need to be assessed.</p> <p>Within the Backfilled Opencast Area - It is considered unlikely that traditional ground improvement options, e.g. vibro-stone columns or piles would be viable for the proposed development. An assessment should be made of the long term settlement characteristics of the full thickness of the opencast backfill and of the constraints imposed by features such as buried highwalls.</p>



	<p>The proposed route of the HS2 railway line passes through the eastern part of the site. The RSK plans indicate that it will be tunnelled beneath the site. Consideration should be given to the potential impact that this may have on the proposed development.</p> <p>Ground Floor Construction - In accordance with NHBC guidance, where the made ground is in excess of 600mm thick, it is recommended that a suspended beam and block floor slab be utilised.</p> <p>Groundwater - It may be expected that shallow perched groundwater will be encountered within the infilled ground and natural strata. The presence of groundwater will need to be assessed as part of any ground investigation.</p> <p>Obstructions - Based on the history of the site, the presence of significant obstructions within the infilled ground should be expected, i.e. within the footprint of the backfilled opencast mining area.</p> <p>Excavations - Excavations through any made ground and natural ground may be unstable and temporary side support is likely to be required. The stability of the made ground and natural strata will need to be assessed as part of any ground investigation.</p> <p>Roads, Pavements and Hardstanding Surfaces - It is recommended that at this stage, a conservative bearing value for the sub-grade is used, until the nature of the sub-grade can be physically assessed.</p> <p>Chemical Attack on Buried Concrete - Samples of made and natural ground should be obtained and submitted to the laboratory for testing in order to assess the sulphate content and acidity and hence the concrete class required for buried concrete to the latest standard.</p>
Further Required	<p>Work</p> <p>In order to assess the potential environmental and geotechnical constraints, it is recommended that the following investigative works should be carried out:</p> <ul style="list-style-type: none"> • Trial pits to examine the shallow ground conditions and to obtain soil samples. Soakaway testing may also be required in selected trial pits. • Cable percussive boreholes with in situ tests to provide geotechnical information in order to assess the nature of the subsurface and confirm the depth and distribution of any made ground. These boreholes will facilitate the installation of gas and groundwater monitoring wells and allow soil samples to be obtained from greater depths. • Rotary boreholes will be required to assess the depth of made ground in opencast areas and potential for mining instability beneath the site. • Chemical analysis of soil and water samples in order to determine the concentrations of potential contamination on the site. • Geotechnical testing to classify materials and inform foundation design and chemical testing to assess the nature and extent of any contamination on the site and determine the Aggressive Chemical Environment for Concrete classification. • Monitoring of gas and groundwater wells for hazardous gases, methane, carbon dioxide, and oxygen and flow rate to the requirements of the Local Authority.
<p>This sheet is intended as a summary only of the assessment of the site in relation to ground condition. It does not provide a definitive engineering analysis.</p>	



1.0 INTRODUCTION

1.1 Instruction

JPG (Leeds) Limited (JPG) has been instructed by Hoyland Developments Ltd to carry out a geoenvironmental desk study for a residential development on land off Hawshaw Lane, Hoyland.

1.2 Objectives

The main objective of the geoenvironmental desk study is to identify potential geotechnical and environmental issues that may represent constraints to the proposed redevelopment of the site.

1.3 Scope of Works

The scope of works for the desk study included, but was not limited to, the following:

- Site inspection and description.
- Review of any previous reports.
- Review of contemporary and historical Ordnance Survey publications.
- Consultations with regulatory authorities where appropriate.
- Review of geological publications (including hydrology, hydrogeology and soil survey publications where appropriate).
- Review of the risk from past mining.
- Review of the radon status of the site.
- An environmental database search.
- Outline environmental risk assessment.
- Preliminary recommendations with respect to foundations, ground floor and pavement design.
- Recommendations for further work where appropriate.
- Presentation of the findings in a tabular non-technical summary.

1.4 Location

The site is located to the north east of Junction 36 of the M1 motorway, on the north side of Hoyland Road, approximately 1.5km north west of Hoyland town centre. The approximate centre of the site is located at NGR 435973, 400624. A site location plan is given as Figure 1 in Appendix A.



1.5 Site Description and Topography

The site has an irregular shape and covers an area of approximately 3.90ha.

Access to the site is from the east, via a double field gate along Hawshaw Lane. Another potential access to the site lies along Hoyland Road and is currently blocked off by two tall hedges and a private garden.

The site is open along its north western and south western boundaries and bounded beyond by wood fences. A footpath, oriented east to west, lies behind the northern fence. The north western boundary follows the line of overhead electrical cables. The site is bounded to the north east by metal fencing, beyond which, football pitches are located. The site is bounded to the south east by gardens attached to detached and semi-detached houses.

Site levels rise from south to north and fall from west to east and east to west toward a depression line within the west part of the site.

All of the site has a cover of grass. A rectangular concrete water trough lies in the middle of the site. A sewage manhole is also present around the south west corner of the site.

An aerial photograph of the site is presented as Figure 2 and selected photographs of the site are contained in Appendix B.

1.6 Development Proposals

It is proposed to redevelop the site with a residential development, access roads and landscape areas.

A sketch has been provided which is referenced below and a copy is contained in Appendix A.

- Phase 1 Masterplan Coloured Revised.

1.7 Previous Reports

No previous reports were made available for review.

1.8 Limitations

The general limitations to the nature of the investigation are outlined in Appendix F.



2.0 SITE HISTORY

Historical plans for the site were obtained from GroundSure (GS). These have been reviewed in order to establish any former uses of the site and identify any potentially contaminative historical uses, or potential geotechnical constraints to the proposed development.

A summary of the relevant map information is presented in Table 2 and copies of relevant plans are presented in Appendix C.

Table 2 – Summary of Relevant Historical Map Information

Date(s) & Scale	Feature
1855 1:10,560	The site is occupied by agricultural fields which are divided by several field boundaries. Hoyland Lane and Hawshaw Lane run along the south western boundary of the site. A pond and a pump are marked immediately south across Hoyland Lane.
1891-1894 1:10,560 & 1893 1:2,500	No significant changes are shown on the site. Short Wood Dike is marked approximately 220m west of the site. A graveyard is marked approximately 220m north east of the site. A powder magazine is marked approximately 235m west of the site. Hoyland Common is shown to be developing to the south west of the site.
1903 1:10,560 & 1906 1:2,500	No significant changes are shown on or beyond the site.
1929 1:10,560	No significant changes are shown on the site. Sewage tanks are marked approximately 460m west of the site. A cemetery is marked approximately 410m east of the site. Fearnley Road has been built to the south east of the site. The pond, immediately south of the site, has been drained.
1931 1:2,500 & 1938 1:10,560	No significant changes are shown on or beyond the site.
1948 1:10,560	No significant changes are shown on the site. A large stockpile of colliery spoil is marked approximately 350m north west of the site. It is attached to Rockingham Colliery, further to the north west.
1951-1956 1:10,560	No significant changes are shown on the site. The area, immediately to the north west of the site is shown to be an opencast mining area.
1955 1:1,250 & 1955 1:2,500	No significant changes are shown on the site. A clothing factory is marked approximately 45m south west of the site.
1965-1966 1:10,560 & 1967 1:2,500	No significant changes are shown on the site. The colliery spoil area has extended further to the east and south. The sewage tanks, to the north west of the site, have been removed. A pond is marked approximately 260m north west of the site. It is fed by Short Wood Dike.
1968-1972 1:1,250	No significant changes are shown on the site. The clothing factory has extended to the north west. An electrical substation is marked approximately 13m south west of the site.
1970-1975 1:1,250 1976-1978 1:1,250	No significant changes are shown on or beyond the site. No significant changes are shown on the site. The clothing factory to the west of the site is relabelled "factory". It has extended up to the south west boundary of the site. A tank is marked approximately 40m south west of the site.
1977-1980 1:10,000	No significant changes are shown on the site. The colliery spoil area has extended further to the east and south. It is located approximately 130m north west of the site. Slurry ponds are marked approximately 430m west of the site. The pond to the north west of the site has been drained.
1986 1:1,250	No significant changes are shown on or beyond the site. (Partial coverage)
1987 1:10,000 & 1987-1992 1:10,000	No significant changes are shown on the site. A pump house is marked approximately 200m west of the site. The colliery spoil area is now marked as a disused tip. This area is located approximately 130m north west of the site. The disused tip boundary has receded to the north. The area which has been uncovered is used to store disused workings. The slurry ponds, to the north west of the site, have been removed.
1993 1:1,250	No significant changes are shown on or beyond the site. (Partial coverage)
2002 1:10,000	No significant changes are shown on the site. The disused tip is no longer marked on the map. Four tertiary rivers/drain are marked trending north and then veering to the north east. The closest one from the site is marked approximately 17m north west of the site.



2010 1:10,000	No significant changes are shown on or beyond the site.
2014 1:10,000	No significant changes are shown on or beyond the site.



3.0 SITE SETTING

3.1 Geology

The GS report and the following geological publications have been consulted:

- British Geological Survey. Sheet 87. Barnsley. 1:50,000 Scale. Bedrock and Superficial Geology. Dated 2008.
- British Geological Survey. Sheet SE30SE. Wombwell. 1:10,000 Scale. Bedrock and Superficial Deposits. Dated 2005.

No superficial deposits are shown to be present on the site.

The underlying bedrock is shown to comprise Pennine Middle Coal Measures Formation, which comprises mudstone, siltstone, coal and sandstone, with bands of distinct sandstone.

The strata are generally orientated north west to south east and is recorded to dip at approximately 6-7 degrees to the east.

Two named sandstone units and coal seams are shown to outcrop on the site.

- The Barnsley Rock is shown to cross the west part of the site in a north west to south east direction. The Barnsley Coal seam (2.39m to 2.64m thick) is shown to outcrop around the western quadrant of the site and along the Barnsley Rock seam.
- The Kent's Rock is shown to cross the northern corner of the site. The Kent's Thin Coal seam (0.56m to 0.66m thick) is shown to outcrop adjacent to the north eastern boundary of the site (this is terminated against the unnamed fault).

The Wentworth Fault and an unnamed fault (opencast plans indicate this to be the Elsecar Fault), are orientated north west to south east and downthrowing towards the north east. The Wentworth Fault is shown to cross the centre of the site; the unnamed fault is shown to run along the north eastern boundary of the site. Both are faults at rockhead. An underground fault is also shown to be present in the Barnsley Coal seam.

Infilled ground, comprising backfilled opencast workings, is shown to the south west of the outcrop of the Barnsley Coal Seam. This infilled ground extends to the north west, beyond the site boundary.

An area of made ground is shown immediately beyond the north east boundary of the site.

Historical borehole information has been obtained from the BGS. There are records of two boreholes located approximately 130m south west of the site. These boreholes record the strata between the Silkstone Coal seam and the Whinmoor Coal seam, which occur at depth beneath the site.



A third borehole, located approximately 520m to the south west of the site in Hoyland Common, records made ground to 1.06m, underlain by mottled clay to 1.27m and slightly weathered mudstone to 3.06m.

Copies of the borehole logs are contained in Appendix D.

3.2 Coal Mining

A Coal Mining Report has been obtained from the Coal Authority, which states the following:

- The property is in a surface area that could be affected by underground mining in 14 seams of coal at 60m to 440m depth, and last worked in 1977. Any movement in the ground due to coal mining activity should have stopped.
- In addition, 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 property is not within a surface area that could be affected by present underground mining.
- 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.
- 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.
- The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.
- The property is within the boundary of an opencast site from which coal has been removed by opencast methods.
- The property does not lie within 200m of the boundary of an opencast site from which coal is being removed by opencast methods.
- The property is not within 800m of the boundary of an opencast site for which the Coal Authority is determining whether to grant or has granted a licence to remove coal by opencast methods.
- A damage notice or claim for alleged subsidence damage was made in October 1995 for 114 & 124 Hoyland Road, Hoyland Common, Barnsley, S74 0AS. However, both claims were rejected. There is no current Stop Notice delaying the start of remedial works or repairs to the properties.
- There are a further 1 claim(s) within 50 metres of the property boundary that do not match the property address. These are shown on the enquiry boundary plot.
- 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.



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

Copies of plans, produced by RSK for the adjacent Rockingham Site, have been obtained. These are referenced below:

- RSK. Rockingham. Site Boundary Plan. Job No. 321393. Drawing No. 321393-R1(01)D002A. Dated 11.06.13. Figure 2, Revision A for Harworth Estates.
- RSK. Rockingham. Worked Areas for Coal Seams. Job No. 321393. Drawing No. 321393-R01(01)D003A. Dated 12.07.13. Figure 3, Revision A for Harworth Estates.
- RSK. Rockingham. Unnamed (1AQ) Basal Seam. Job No. 321393. Drawing No. 321393-R1(01)D004A. Dated 12.07.13. Figure 4, Revision A for Harworth Estates.
- RSK. Rockingham. Contours of Approximate Backfill Thickness. Job No. 321393. Drawing No. 321393-R02(00)D003A. Dated 01.10.13. Figure 3, Revision A for Harworth Estates.

The Site Boundary Plan shows the proposed tunnelled HS2 route. This is oriented approximately north to south and passes through the eastern part of the site.

The RSK plans show the opencast mining areas including a buried highwall, to lie to the north of the site. The thickness of the backfill along the north western boundary of the site is shown to range between 20m and 65m.

The extent of the opencast workings is shown to terminate at the boundary of the proposed residential development area as shown on Drawing No. 1009 (referenced in Section 1.6 of this report). However, the BGS Geology plan, SE30SE, shows the workings extend into the proposed residential development area.

The extent and depth of the opencast workings are controlled by the faults which cross the site, a summary of the worked seams is provided below:

- To the east of the Elsecar Fault, the Beamshaw BB and Kent's Thin BA are recorded to have been worked. The Unnamed 1AY seam is shown to have been worked very close to the fault.
- To the west of the Elsecar Fault (and lying immediately beneath the Unnamed 1AY seam) the following seams in stratigraphic order are recorded to have been worked; Barnsley Rider Upper AY2, Barnsley Rider Lower AY1, Barnsley AVX (outcrops on site), Dunsil Rider Upper 2AU, Dunsil Rider Lower 1AU, Dunsil AU, Swallow Wood Rider 1AR, Swallow Wood AR and Unnamed 1AQ.
- Underground workings have also been recorded in the following seams, which underlie the base of the opencast; Lidgett, Flockton Thick, Flockton Thin, Top Fenton, Low Fenton, Parkgate, Thorncliffe and Silkstone.

A plan showing the extent of the recorded opencast mining areas is presented as Figure 4 in Appendix A.

The GS report states that localised small scale underground mining for iron ore may have occurred, but that the potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered.



A copy of the Coal Mining Report is presented in Appendix E.

3.3 Hydrogeology

The underlying bedrock is classified as a Secondary A Aquifer. These are described as containing '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 no active groundwater abstraction licences within 500m of the site.

The site does not lie within an Environment Agency Groundwater Source Protection Zone.

3.4 Hydrology

Short Wood Dike is located approximately 190m west of the site. The river is shown to flow towards the north west and feed a small lake further to the north. The 2002 map also shows two drains to the west and north west of the site within 250m of the site.

There is one active licenced discharge consent to Short Wood Dike. It is granted to Tinker Lane Sewage Pumping Station, located approximately 220m west of the site, for sewage discharges and sewer storm overflow.

There are no active surface water abstraction licences within 500m of the site.

The site is not within a Zone 2 or Zone 3 floodplain. These represent the annual probabilities of flooding and are 0.1% to 1% and >1% respectively.

It is likely that a flood risk assessment will be required by the Local Authority as part of any planning application for the site.

3.5 Pollution Incidents

There are no records of any Environment Agency List 1 recorded pollution incidents within 500m of the site.

There are records of two Environment Agency List 2 recorded pollution incidents within 500m of the site. In all cases, minor impact was recorded to land. These are summarised in Table 3.5.1 below.

Table 3.5.1 – Environment Agency List 2 Recorded Pollution Incidents

Distance & Direction	Incident Date	Incident Identification	Pollutant	Impact
467m, South West	09/09/2003	188758	Asbestos	Land: Minor
472m, South West	20/01/2003	132102	Household Waste	Land: Minor



3.6 Landfill and Waste

The GS report includes information on active and former landfill sites supplied by the Environment Agency, Local Authority, BGS/Department of Environment (DoE) and Historical Mapping Records.

There are no records of any historical landfill sites within 500m of the site.

Historical mapping shows ground workings or a refuse heap, approximately 359m north of the site.

There are no records of any waste treatment, waste transfer or waste disposal sites within 500m of the site.

3.7 Environmental Permits, Incidents and Registers

There are no records of any historic Integrated Pollution Control (IPC) authorisations within 500m of the site.

There are no records of Part A(1) and Integrated Pollution Prevention Control (IPPC) authorised activities within 500m of the site.

There are no active Part A(2) permitted activities or enforcements within 500m of the site.

There are records of one Part B permitted activity within 500m of the site. It refers to Metaliform Holdings, located approximately 422m north west of the site. The authorised process is powder coating.

There are no records of any Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the site.

There are no records of any Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the site.

There are no records of any List 1 or List 2 Dangerous Substances Inventory Site within 500m of the site.

There are no records of any Category 3 or 4 Radioactive Substances Authorisations within 500m of the site.

There are no active recorded Control of Major Accidents Hazard (COMAH) or Notification of Installations Handling Hazardous Substances (NIHHS) sites within 500m of the site.

There are no sites determined as contaminated Land under Section 78R of the Environmental Protection Act 1990 within 500m of the site.



3.8 Radon Risks

The site is in a radon affected area, as between 1 and 3% of properties are above the action level for radon. No radon protective measures will be necessary in the construction of new buildings or extensions in these areas.

3.9 Additional Information

There are no records of any petrol stations and fuel sites within 500m of the site boundary.

There are records of four potentially contaminating activities or features within 250m of the site. They include one electricity substation, an above ground tank, an airlines company and a pumping house.



4.0 ENVIRONMENTAL RISK ASSESSMENT

4.1 Introduction

The presence of contaminated materials on a site is generally only of concern if an actual or potentially unacceptable risk exists.

The statutory definition of contaminated land is given in the Environmental Protection Act, Part IIA, Section 78, 1990, which was introduced by the Environment Act, Section 57, Department of Environment, 1995 and is defined as:

Land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that:

- Significant harm is being caused or there is a significant possibility of such harm being caused (where harm is defined as harm to health of living organisms or other interference with the ecological systems of which they form a part and, in the case of man, includes harm to his property); and/or
- Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused (by the land).

The potential for harm to occur requires three conditions to be satisfied:

- Sources – The presence of substances (potential contaminants/pollutants), in or under the ground, that may cause harm or pollution.
- Receptors - The presence of a receptor which may be harmed, e.g. the water environment or humans, buildings, fauna and flora; and
- Pathway - The existence of a linkage between the Source and the Receptor.

In order to assess the contamination risk at the site, the above rationale has been applied and is discussed in the context of Contamination Sources and Potential Pollutant Linkages.

4.2 Potential Sources

Historical maps show that the site has never been developed since at least 1855.

The 1:10,000 BGS map shows the Barnsley and the Kent's Thin seams to lie around the western quadrant and along the north eastern boundary of the site. It also shows that the opencast area may overlap the site.

The potentially contaminating current offsite activities include a pumping station, an above ground tank and an electrical substation.



Based on the above and the findings of the desk study, the following potentially contaminative sources may be present on the site:

- Made ground associated with historical opencasting, backfilling and restoration.
- Hazardous gases associated with the made ground and underlying shallow coal seams.

Reference has been made to relevant Department of the Environment Industry Profiles and CLR 8 'Potential Contaminants for the Assessment of Land', March 2002, published by the EA (withdrawn in 2008).

Potential contaminants which could be present on and beneath the site are listed below:

- Metals, semi-metals and non-metals.
- Inorganic compounds.
- Organic compounds, e.g. Polycyclic Aromatic Hydrocarbons (PAHs), Petroleum Hydrocarbons.
- Hazardous Gases.

4.3 Potential Pathways

The site has been assessed in accordance with the proposed redevelopment of the site for a residential end use with plant uptake. The following potential exposure pathways will require consideration, both during the redevelopment works and on completion of the construction:

- Ingestion and dermal contact with contaminated soil and groundwater.
- Inhalation of hazardous gases.
- Leaching/migration of contaminants from soil into groundwater by percolation.
- Leaching/migration of contaminants into surface water via groundwater and surface flow.
- Permeation of water supply pipes and other services by organic and aggressive contaminants.
- Uptake of contaminants by planting in gardens and landscape areas.



4.4 Potential Receptors

The potential receptors considered are:

- Development workers and future maintenance workers involved in excavations, e.g. foundations or where services are being installed or repaired following development.
- Future end users of the site (i.e. residents).
- The underlying Secondary A Aquifer (Bedrock).
- The nearby tertiary river and drains.
- Buildings and services.
- Planting in landscape areas and gardens.

4.5 Pollutant Linkage Assessment

A potential pollutant linkage assessment has been completed and is summarised in the Conceptual Site Model which is presented as Figure 3 in Appendix A. This is based on the proposed redevelopment of the site for a residential end use.

On the basis of the proposed end use and known history of the site, the following potential pollutant linkages may be present:

- Development and maintenance workers and site end users, i.e. residents, could come into contact with soils containing elevated concentrations of potential contaminants and hazardous gases.
- Site end users could come into contact with made ground and home grown produce containing elevated concentrations of potential contaminants, e.g. eating home grown produce from gardens.
- The underlying Secondary A Aquifer, the nearby tertiary river and drains could become contaminated due to the leaching and migration of contaminants from soil into surface water and groundwater via surface water and groundwater flow.
- Buildings and services could be affected by potentially aggressive contaminants in the soils; and
- Planting in landscape areas and gardens could be affected by phytotoxic elements within the soils.

These are based on current site conditions and do not consider exposure pathways following any remediation of the site.

If the site can be shown to pose no "significant harm" or pollution to controlled waters, then the site can be considered to be uncontaminated.



4.6 Risk Classification

Based on the potential pollutant linkages present on the site, the site should be considered to be **low to moderate risk with respect to potential contamination**. This designation will be largely dependent on the nature of any made ground.

In order to fully assess and classify the risks to human health, underlying aquifer and buildings/services, a Phase 2 Intrusive Investigation, including chemical testing of soils and groundwater and gas monitoring will be required.



5.0 PRELIMINARY ENGINEERING ASSESSMENT

5.1 Development Proposals

It is proposed to redevelop the site with a residential development, access roads and landscape areas.

A sketch has been provided. This is referenced below and a copy is presented in Appendix A.

- Phase 1 Masterplan Coloured Revised

5.2 Mining

The Coal Authority report states that the property is within the boundary of an opencast mining site from which coal has been removed by opencast methods.

The RSK plans show the opencast mining area to terminate at the boundary of the proposed residential development area as shown on Drawing No. 1002. However, the BGS Geology plan SE30SE, shows it extends into the area.

The extent of the opencast workings, particularly those within the footprint of the proposed residential area, as shown on the BGS Geology Plan and depths to underlying coal seams within influencing distance of the surface should be assessed as part of an intrusive ground investigation.

5.3 Foundations

Outside the Backfilled Opencast Area

Ground conditions are likely to comprise weathered Coal Measures strata comprising mainly mudstone and siltstone with bands of sandstone.

The selection of foundation type for the proposed development will be governed by the thickness of any made ground and the strength and settlement characteristics of the underlying natural strata, which will need to be assessed.

If suitable founding strata is present at shallow depth then a shallow foundation solution, e.g. strip foundations, will be suitable for the proposed development.

However, if the underlying natural strata is unsuitable, i.e. too weak or compressible, then consideration could be given to the adoption of deeper trench fill foundations.

If further poor ground is encountered, then consideration could be given to ground treatment options, e.g. vibro-stone columns or piles.

Within the Backfilled Opencast Area

Ground conditions are likely to comprise uncompacted colliery spoil to depths of between 20m and 65m.



It should be assumed that the made ground within the backfilled opencast will be unsuitable for the support of structural loads due to variations in material properties and low strength. If shallow spread foundations were to be used, the ground would become overstressed, leading to significant settlements.

Due to the nature and documented thickness of the uncompacted backfill, i.e. 20m to 65m, it is considered unlikely that traditional ground improvement options, e.g. vibro-stone columns or piles would be viable for the proposed development.

In order to assess the viability of the proposed development, an assessment should be made of the long term settlement characteristics of the full thickness of the opencast backfill and constraints imposed by features such as buried highwalls.

The proposed route of the HS2 railway line passes through the eastern part of the site. The RSK plans indicate that it will be tunnelled beneath the site. Consideration should be given to the potential impact that this may have on the proposed development.

5.4 Ground Floor Construction

In accordance with NHBC guidance, where the made ground is in excess of 600mm thick, it is recommended that a suspended beam and block floor slab be utilised. For the former opencast areas, ground floor construction should be reviewed in relation to any ground treatment for foundations.

5.5 Groundwater

It may be expected that shallow perched groundwater will be encountered within the infilled ground and natural strata. The presence of groundwater will need to be assessed as part of any ground investigation.

5.6 Obstructions

Based on the history of the site, the presence of significant obstructions within the infilled ground should be expected, i.e. particularly within the footprint of the backfilled opencast mining area.

5.7 Excavations

Excavations through any made ground and natural ground may be unstable and temporary side support is likely to be required. The stability of the made ground and natural strata will need to be assessed as part of any ground investigation.

5.8 Roads, Pavements and Hardstanding Surfaces

It is recommended that at this stage, a conservative bearing value for the sub-grade is used, until the nature of the sub-grade can be physically assessed.



5.9 Chemical Attack on Buried Concrete

Samples of made and natural ground should be obtained and submitted to the laboratory for testing in order to assess the sulphate content and acidity and hence the concrete class required for buried concrete to the latest standard.



6.0 FURTHER INVESTIGATIONS

In order to assess the potential environmental and geotechnical constraints to the proposed development. It is recommended that the following investigative works should be carried out:

- Trial pits to examine the shallow ground conditions and to obtain soil samples. Soakaway testing may also be required in selected trial pits.
- Cable percussive boreholes with in situ tests to provide geotechnical information in order to assess the nature of the subsurface and confirm the depth and distribution of any made ground. These boreholes will facilitate the installation of gas and groundwater monitoring wells and allow soil samples to be obtained from greater depths.
- Rotary boreholes will be required to assess the depth of made ground in opencast areas and potential for mining instability beneath the site.
- Chemical analysis of soil and water samples in order to determine the concentrations of potential contamination on the site.
- Geotechnical testing to classify materials and inform foundation design and chemical testing to assess the nature and extent of any contamination on the site and determine the Aggressive Chemical Environment for Concrete classification.
- Monitoring of gas and groundwater wells for hazardous gases, methane, carbon dioxide, and oxygen and flow rate to the requirements of the Local Authority.

A Nivlet
BSc MSc

For and on behalf of JPG (Leeds) Limited

December 2016



Appendix A Figures/Drawings

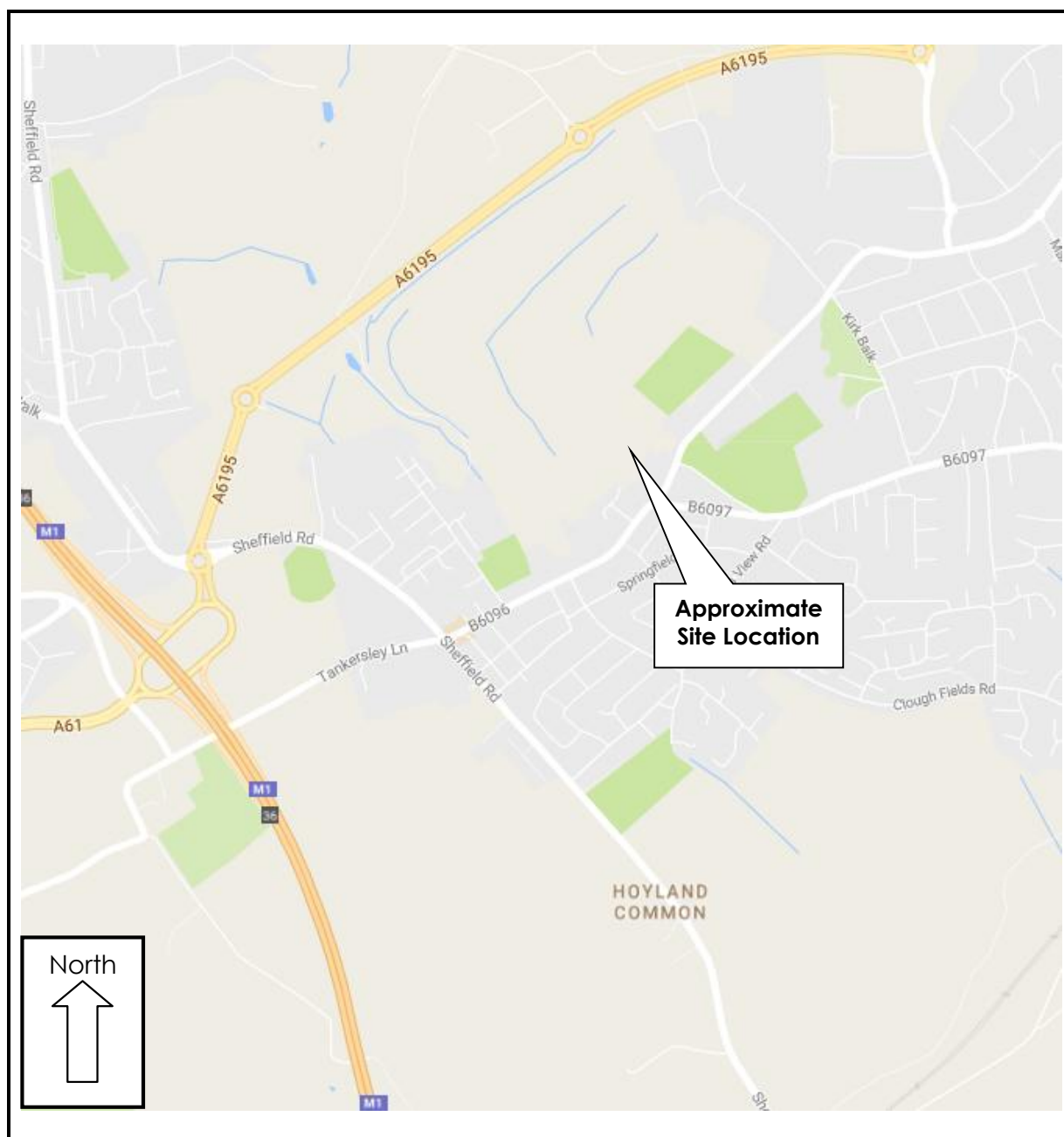


Figure 1 – Site Location Plan

Site	Circa 100 Dwellings on Land off Hawshaw Lane, Hoyland
Client	Hoyland Developments Ltd
Job Number	5003-d
Scale	NTS



Figure 2 – Aerial Photograph	
Site	Circa 100 Dwellings on Land off Hawshaw Lane, Hoyland
Client	Hoyland Developments Ltd
Job Number	5003-d
Scale	NTS

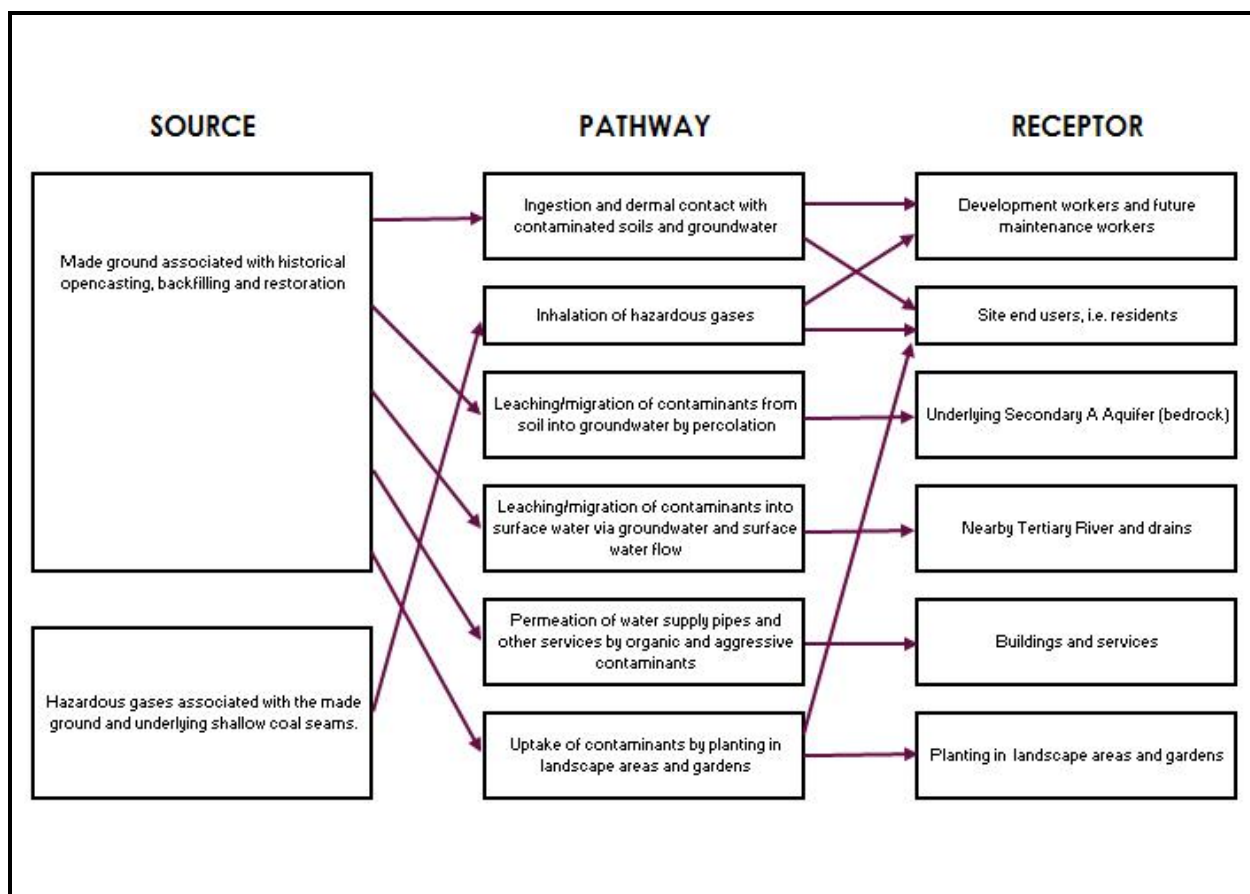


Figure 3 – Conceptual Site Model

Site	Circa 100 Dwellings on Land off Hawshaw Lane, Hoyland
Client	Hoyland Developments Ltd
Job Number	5003-d





Appendix B Site Photographs



Photograph 1: View looking west from the north eastern boundary of the site



Photograph 2: View looking south west from the north eastern boundary of the site



Photograph 3: View looking south east from the northern corner of the site



Photograph 4: View looking south west from the northern corner of the site



Photograph 5: View looking north east from the western corner of the site



Photograph 6: View looking south east from the western corner of the site



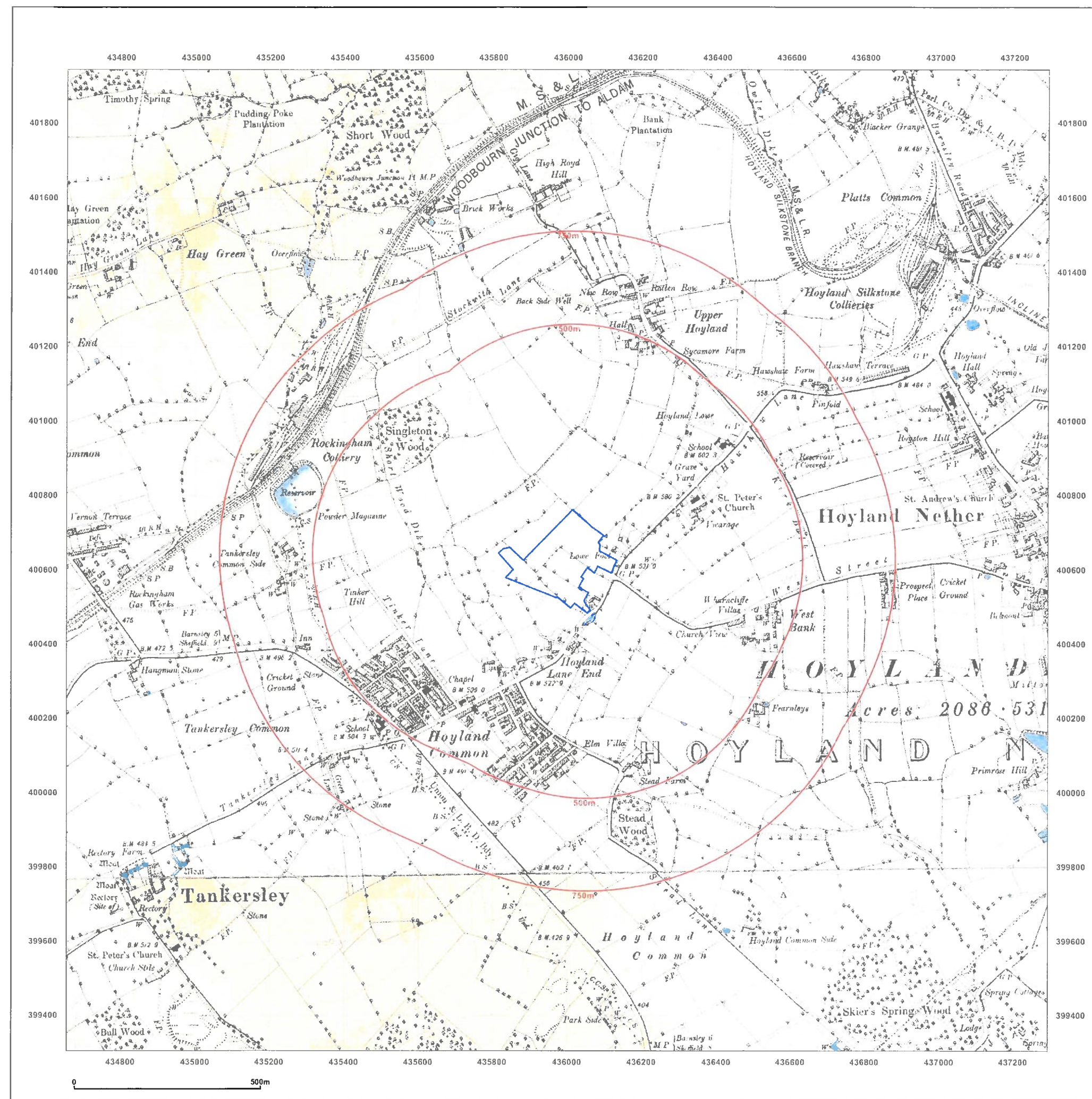
Photograph 7: View looking north west from the south western boundary of the site



Photograph 8: View looking south east from the south western boundary of the site



Appendix C Historical Plans



Site Details:

Hoyland Road, S74 0AS

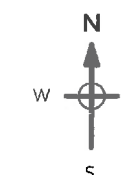
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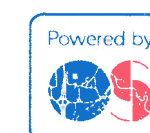


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Map Name: County Series

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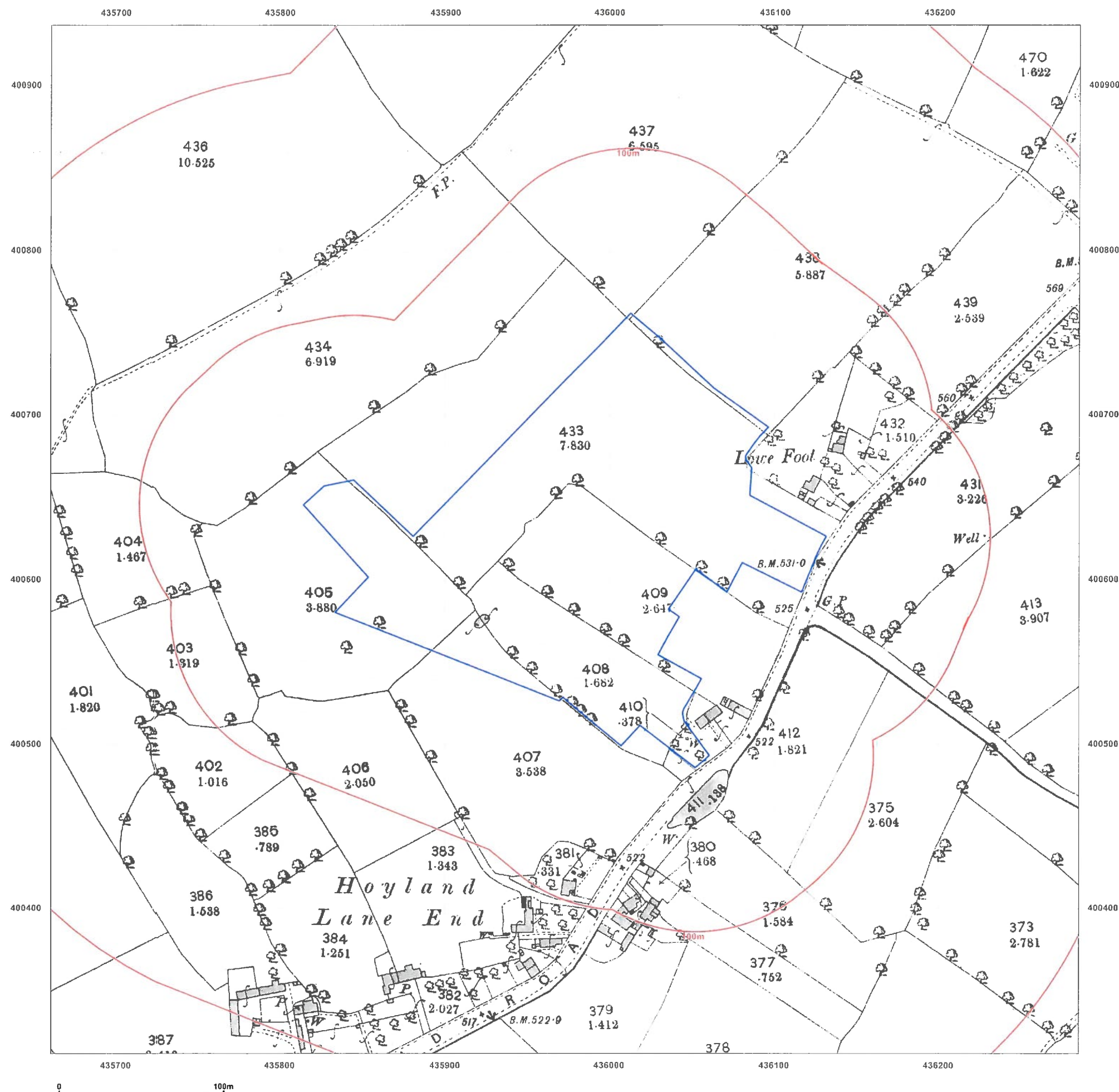


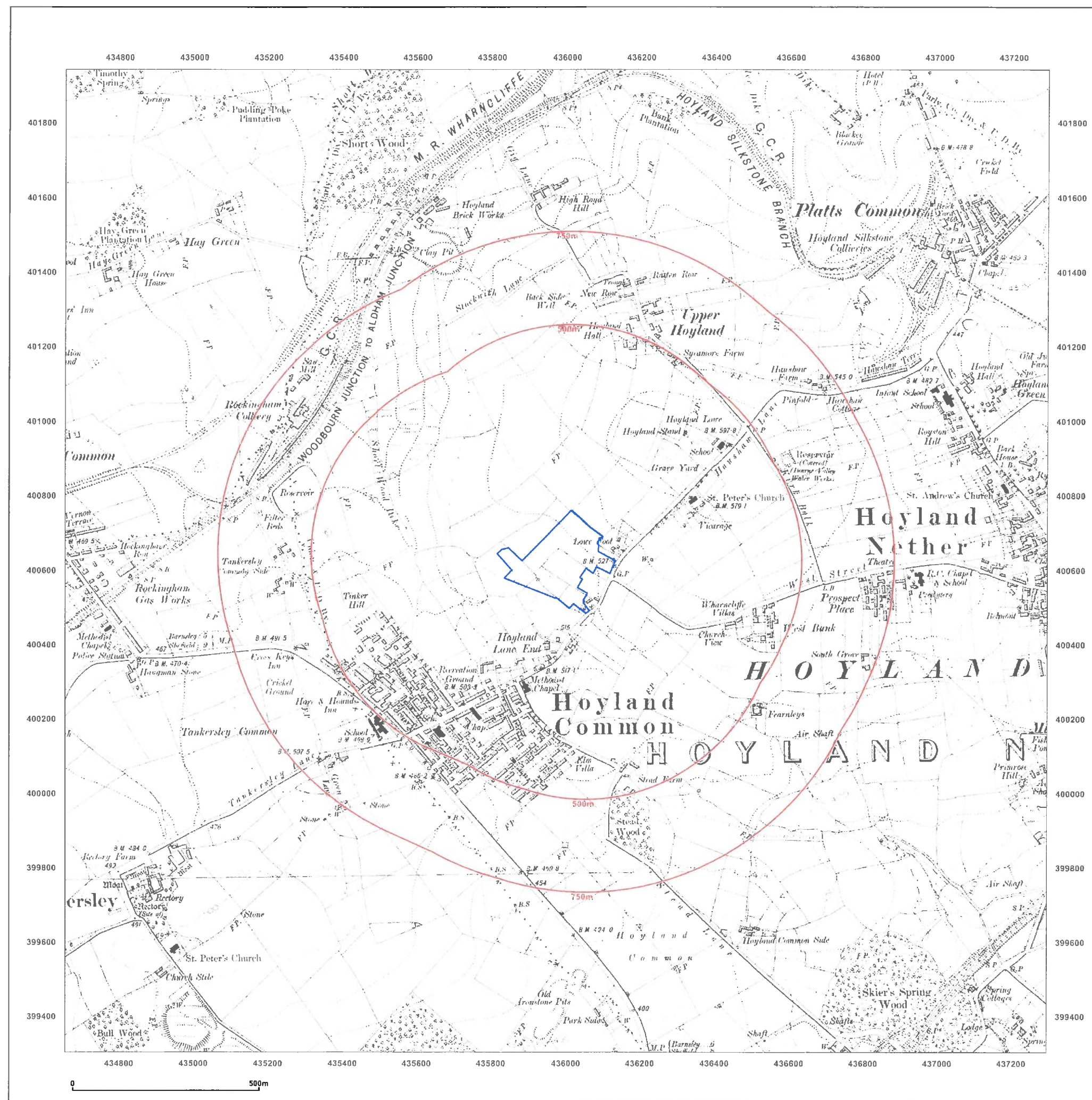
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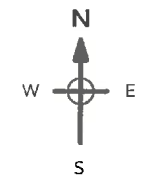
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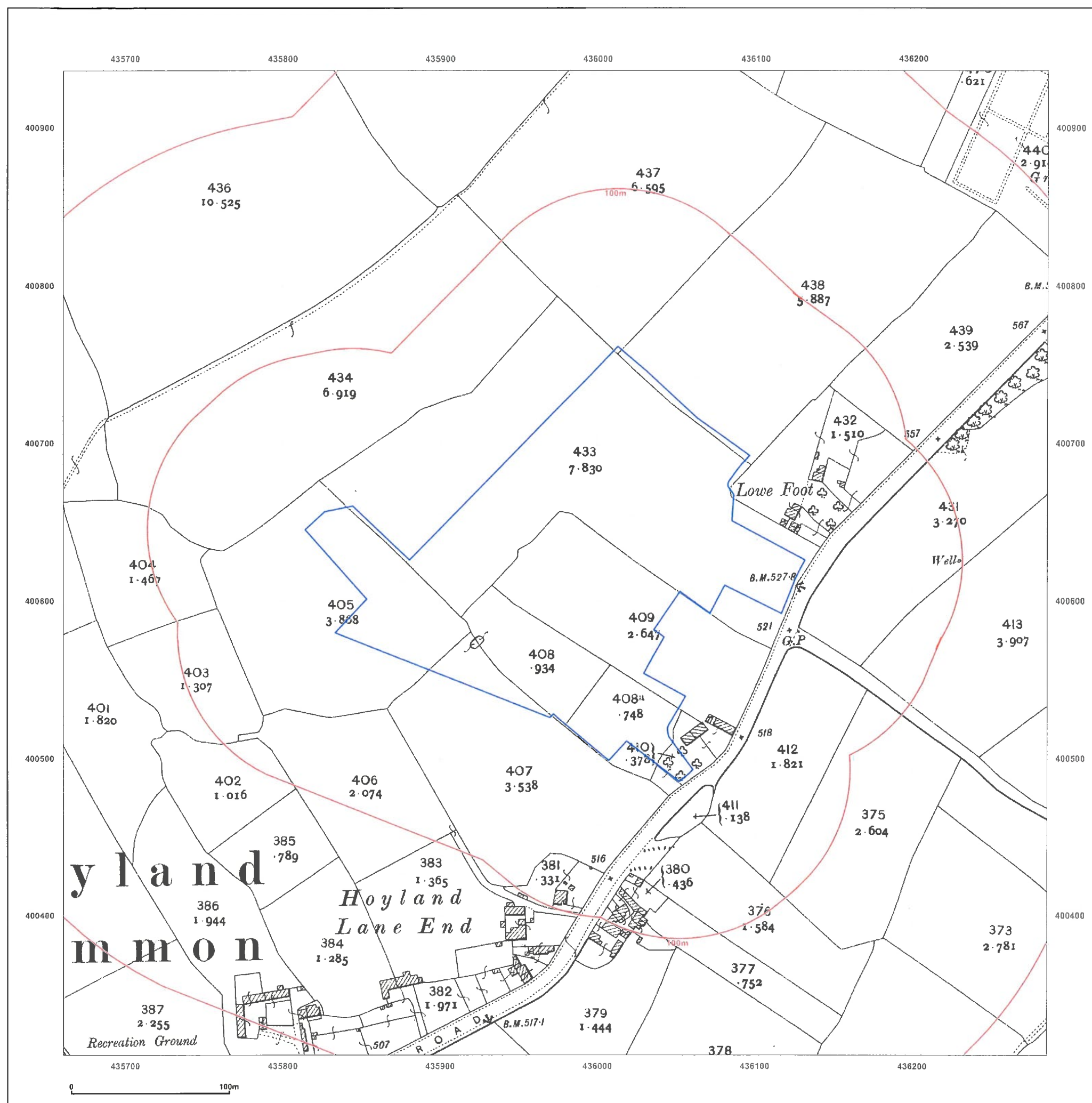


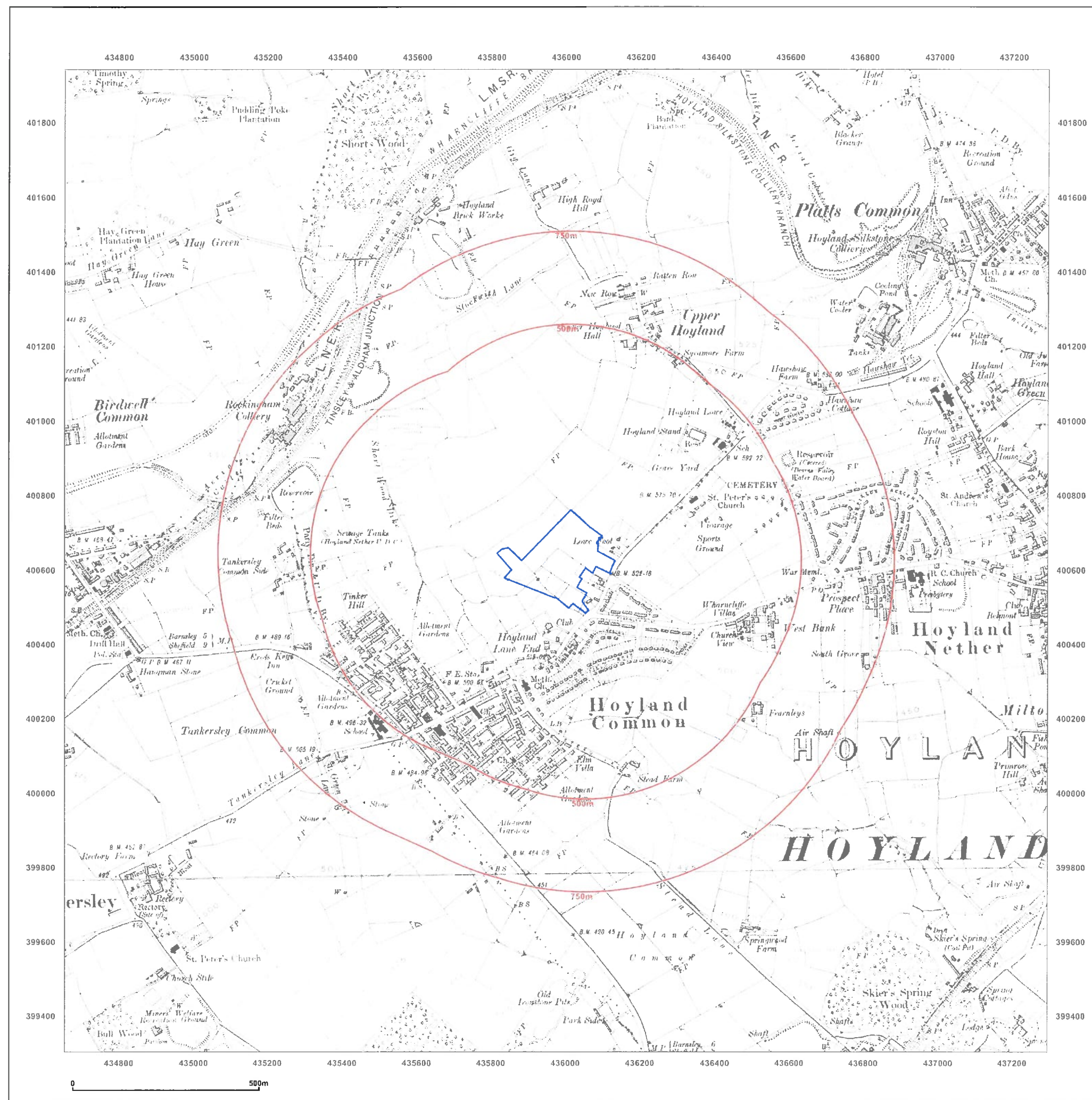
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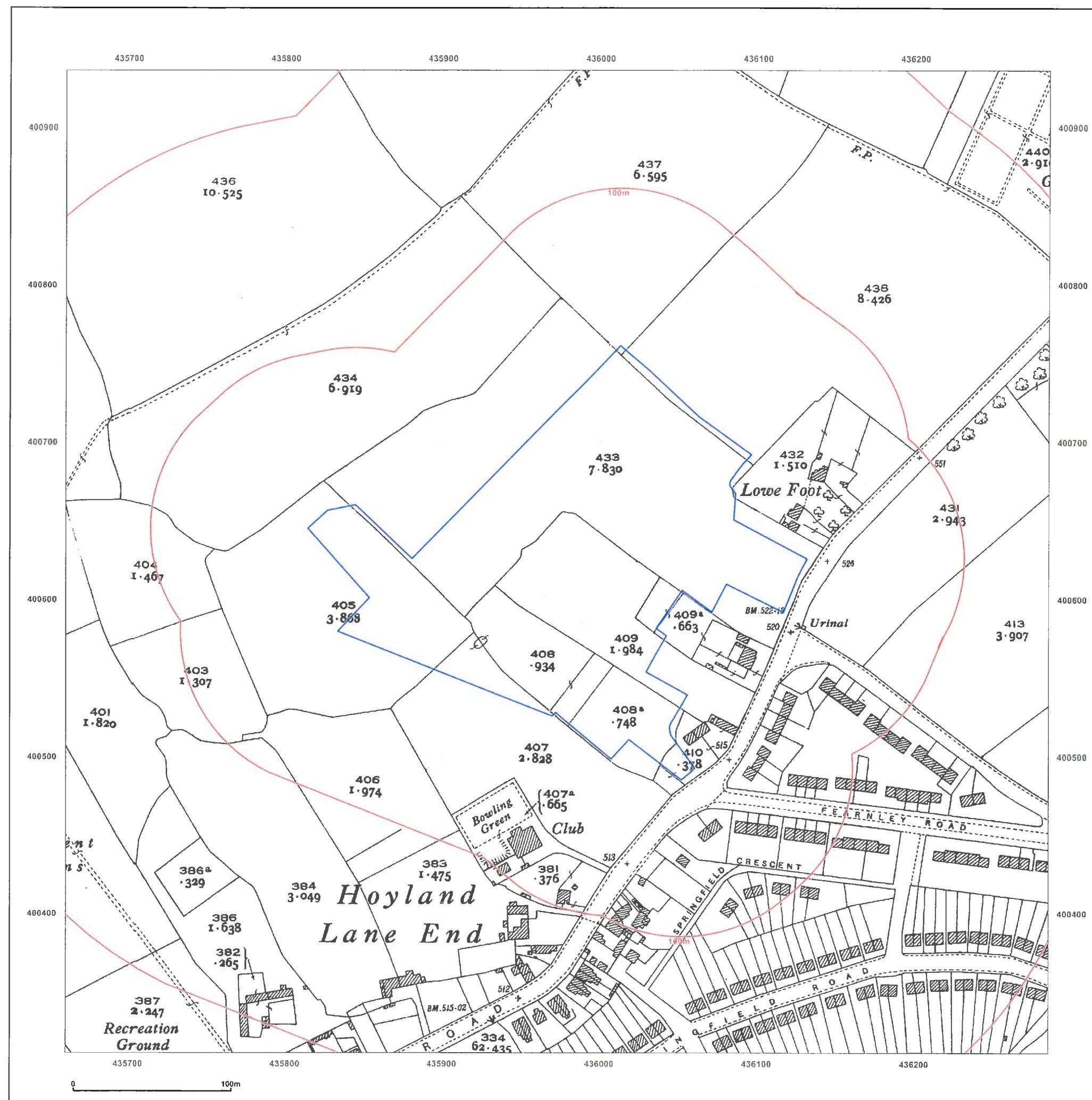


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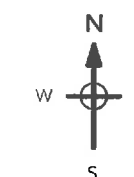
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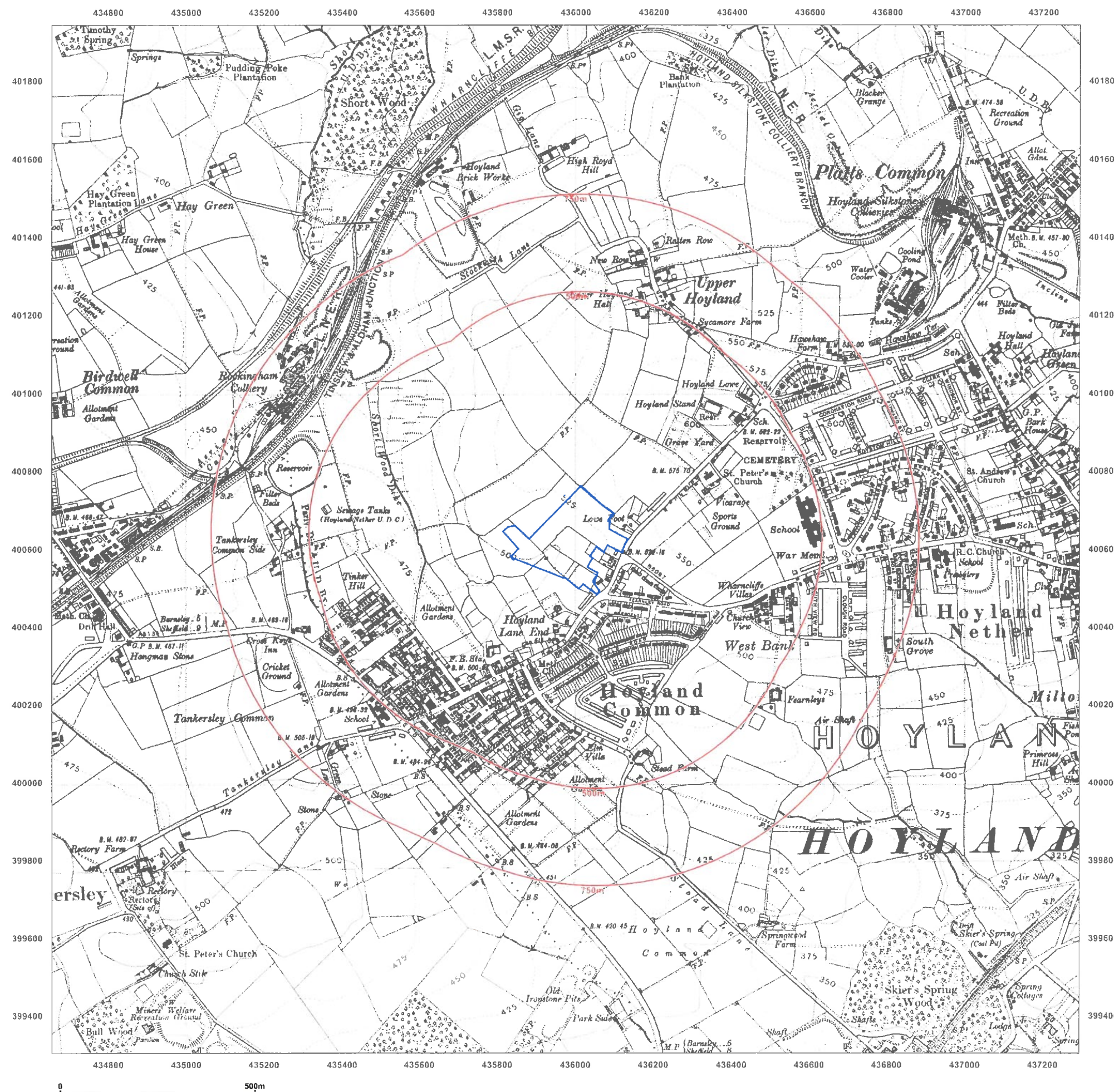


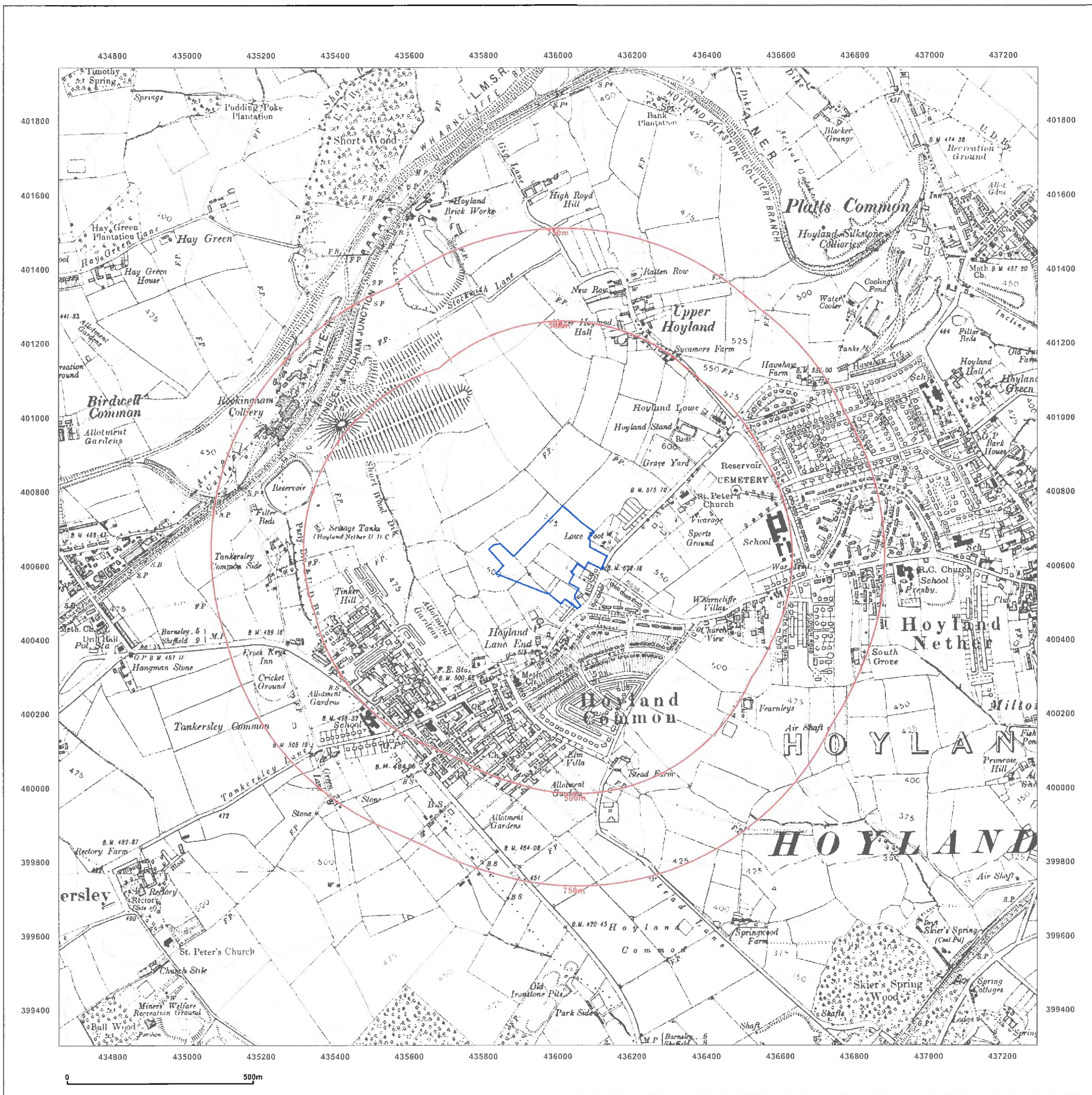
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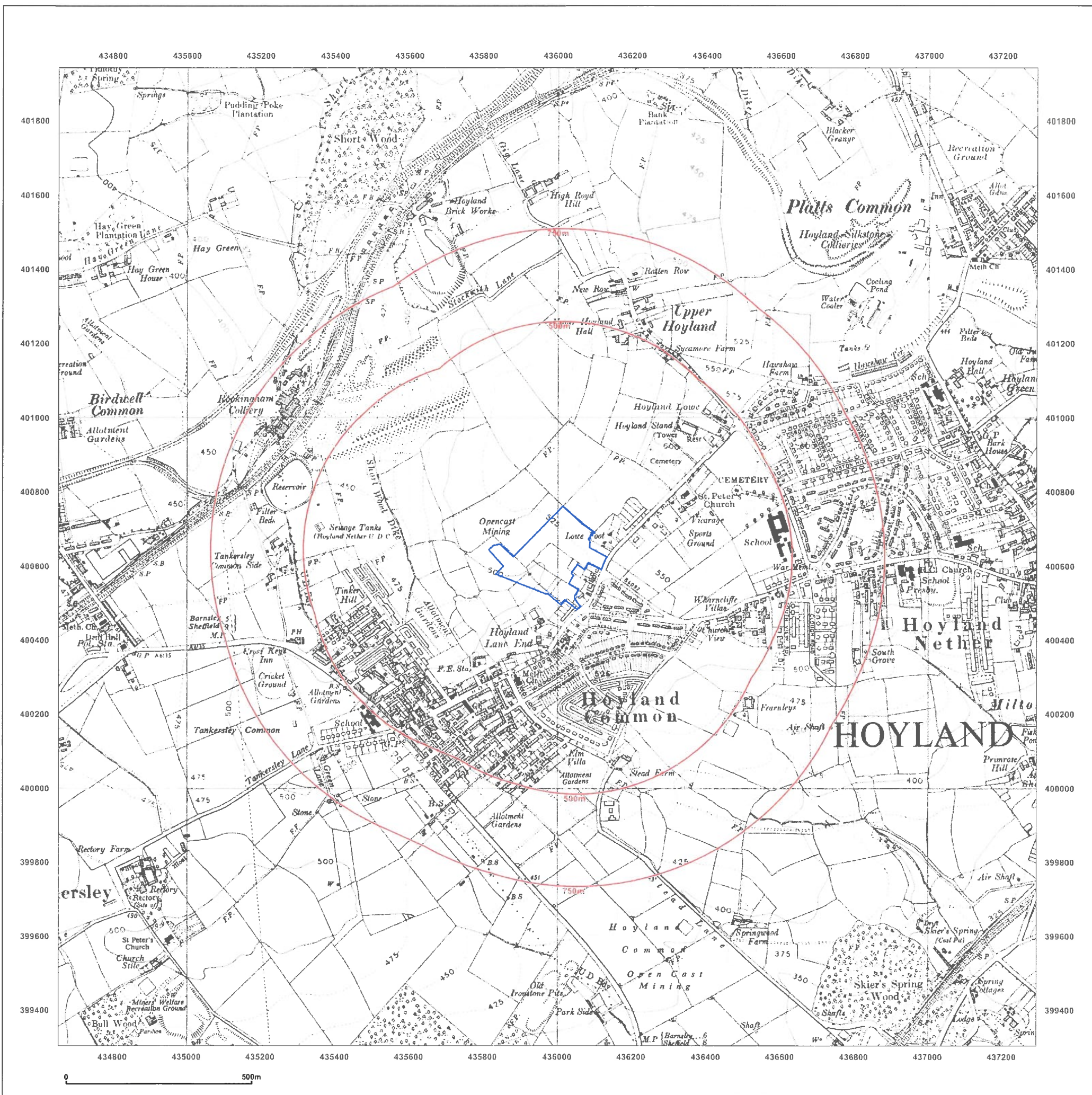


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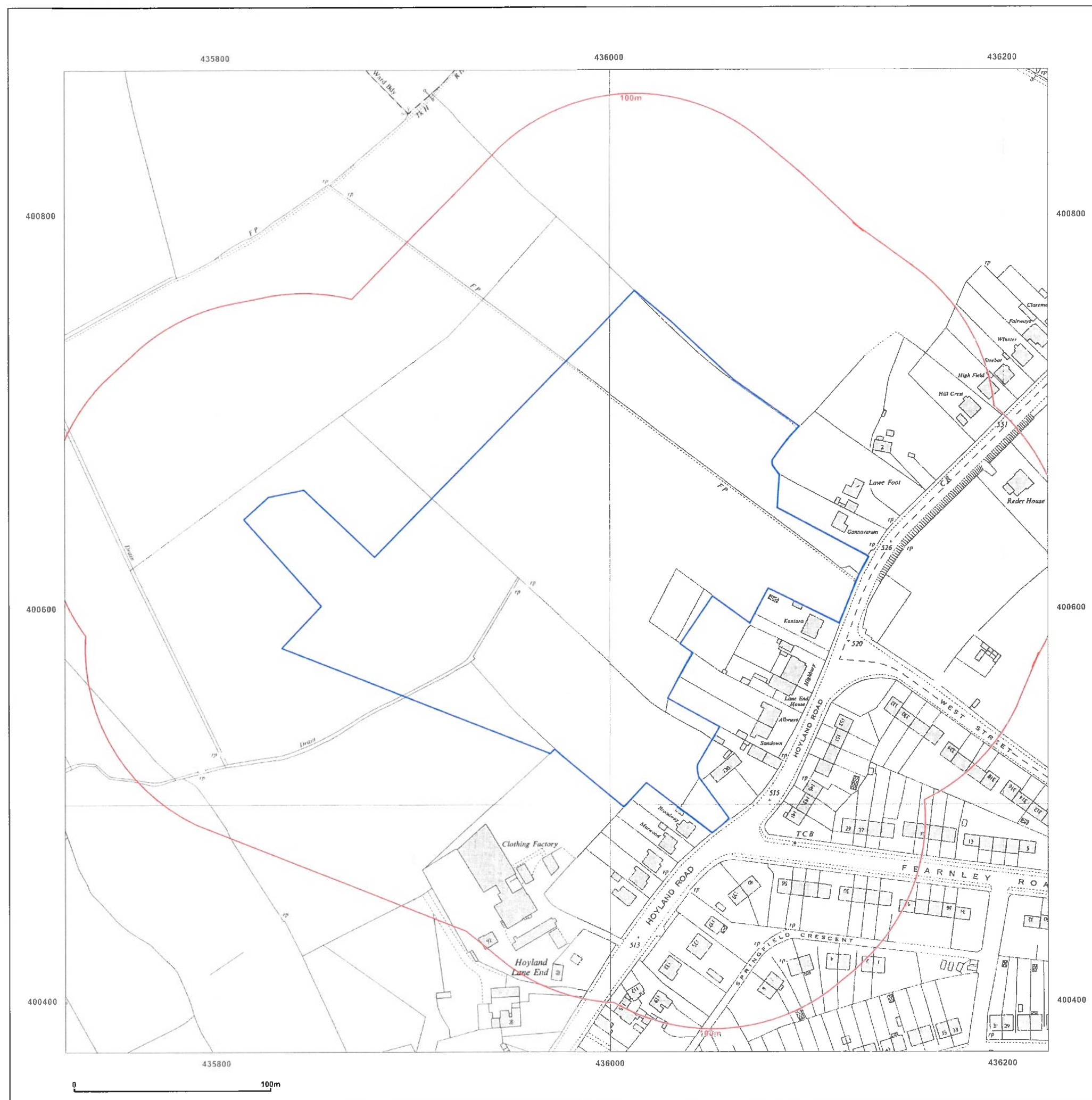


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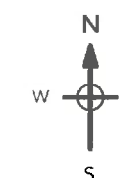
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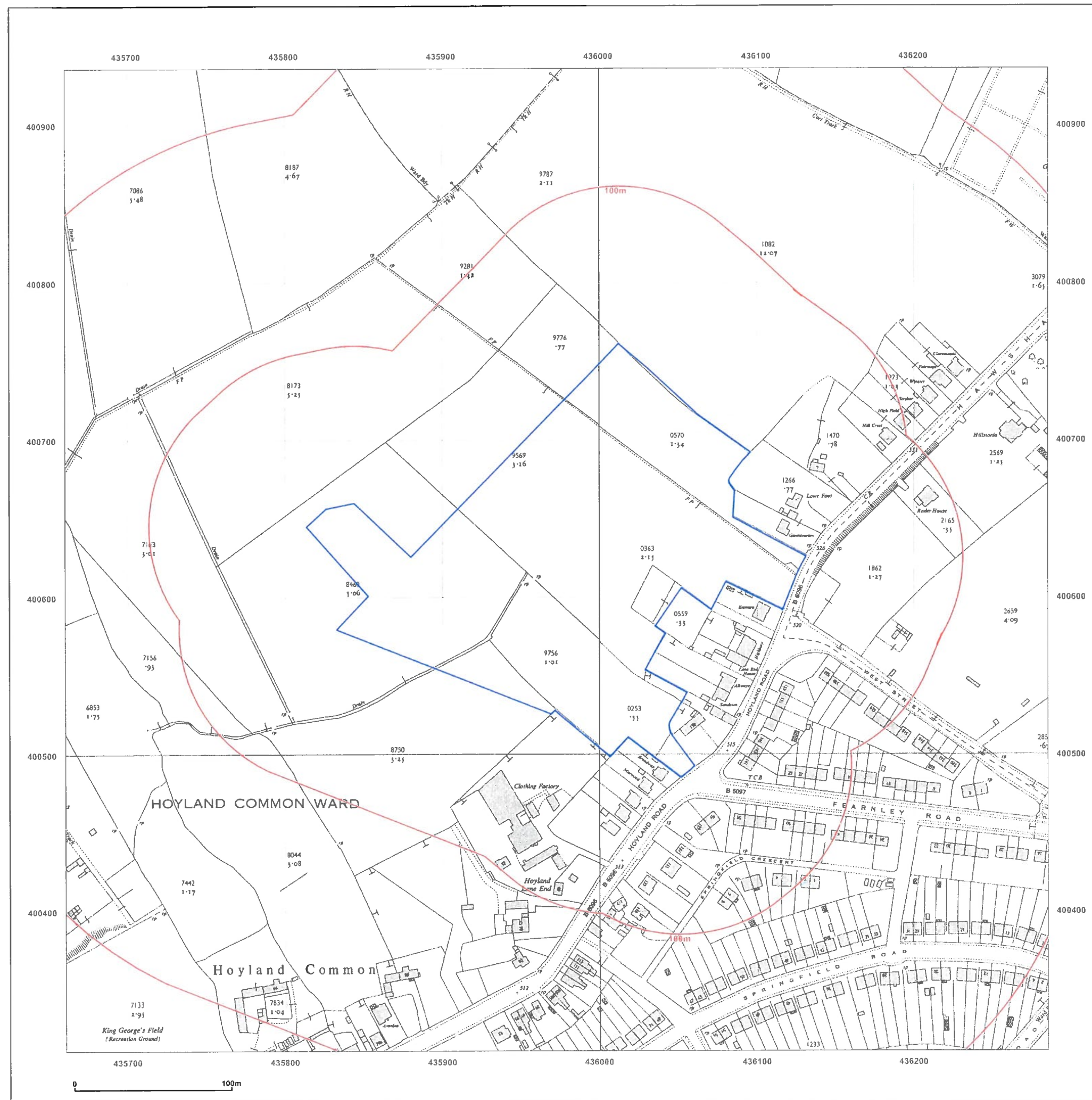


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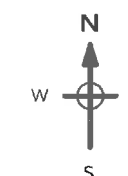
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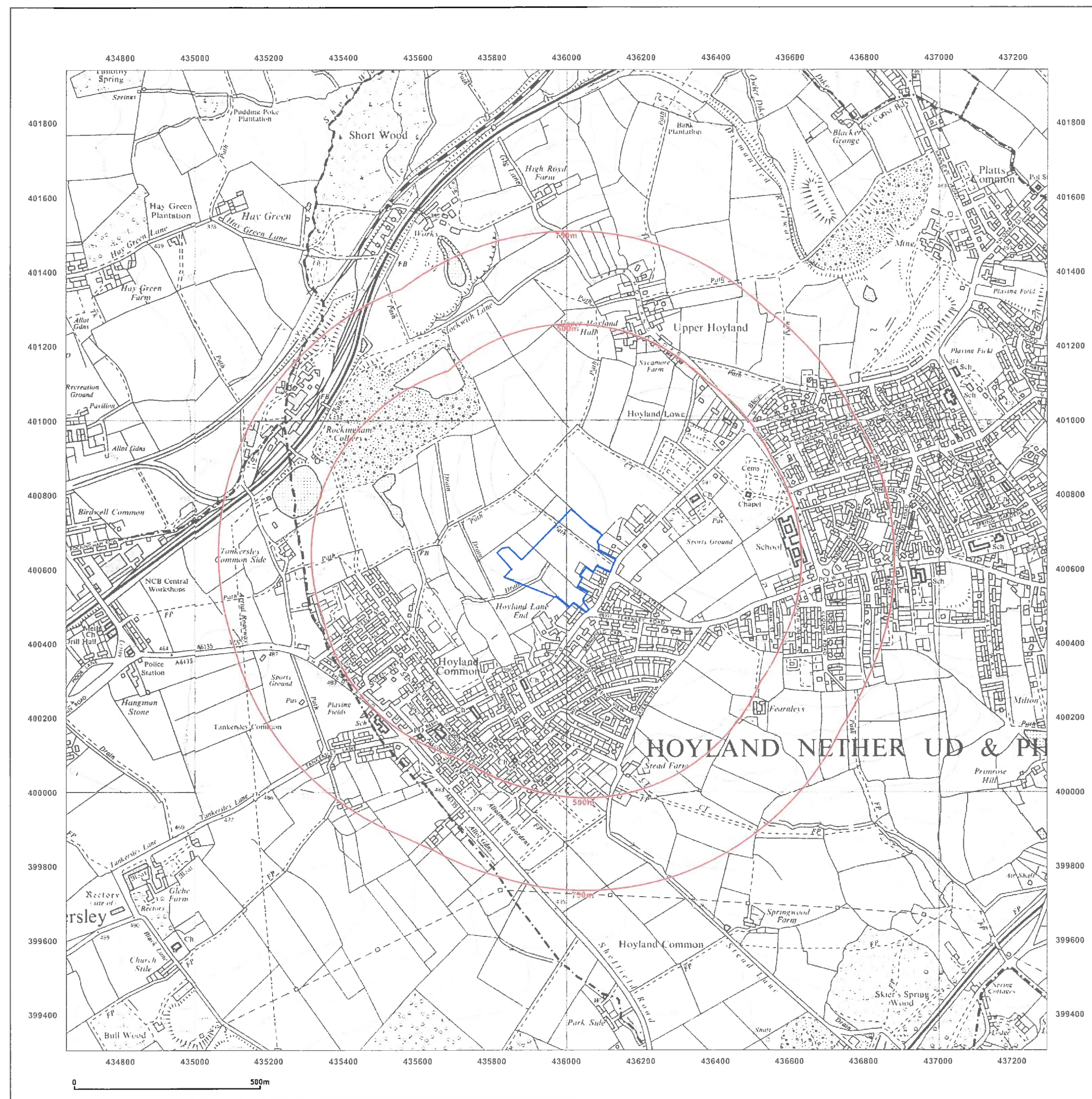


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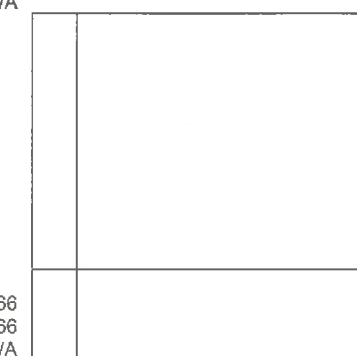
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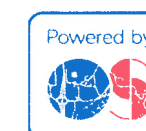
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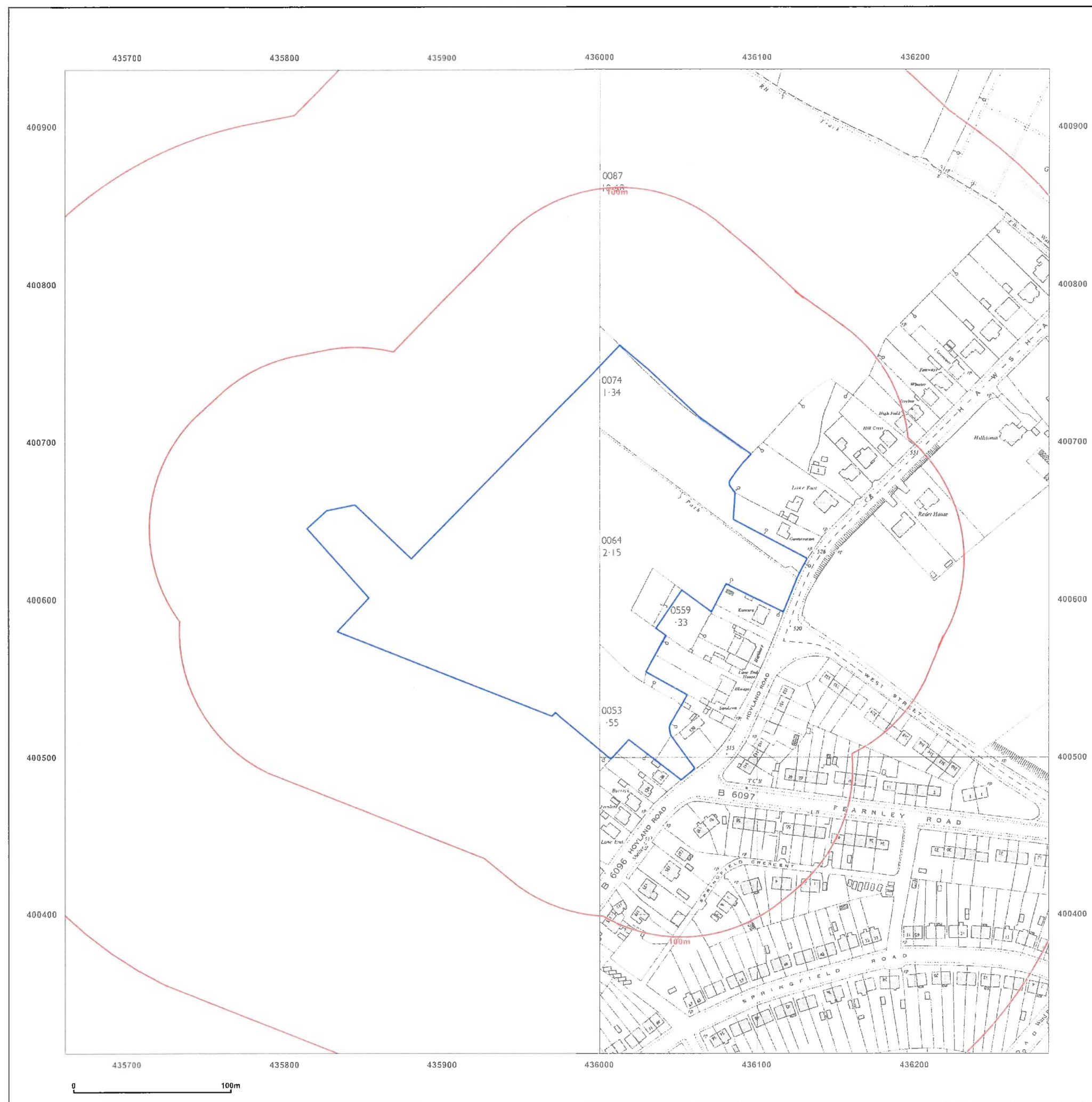


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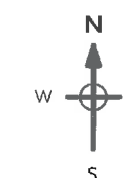
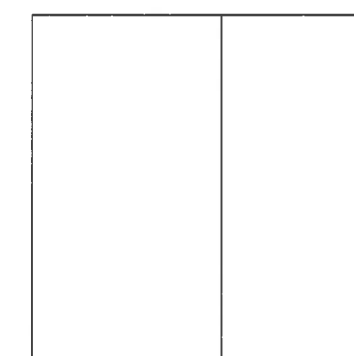
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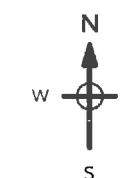
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Map date: 1968-1972

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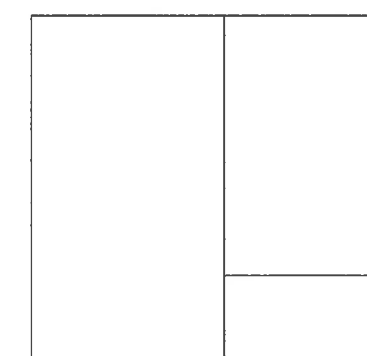
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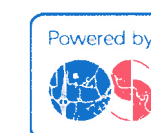
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Levelled N/A



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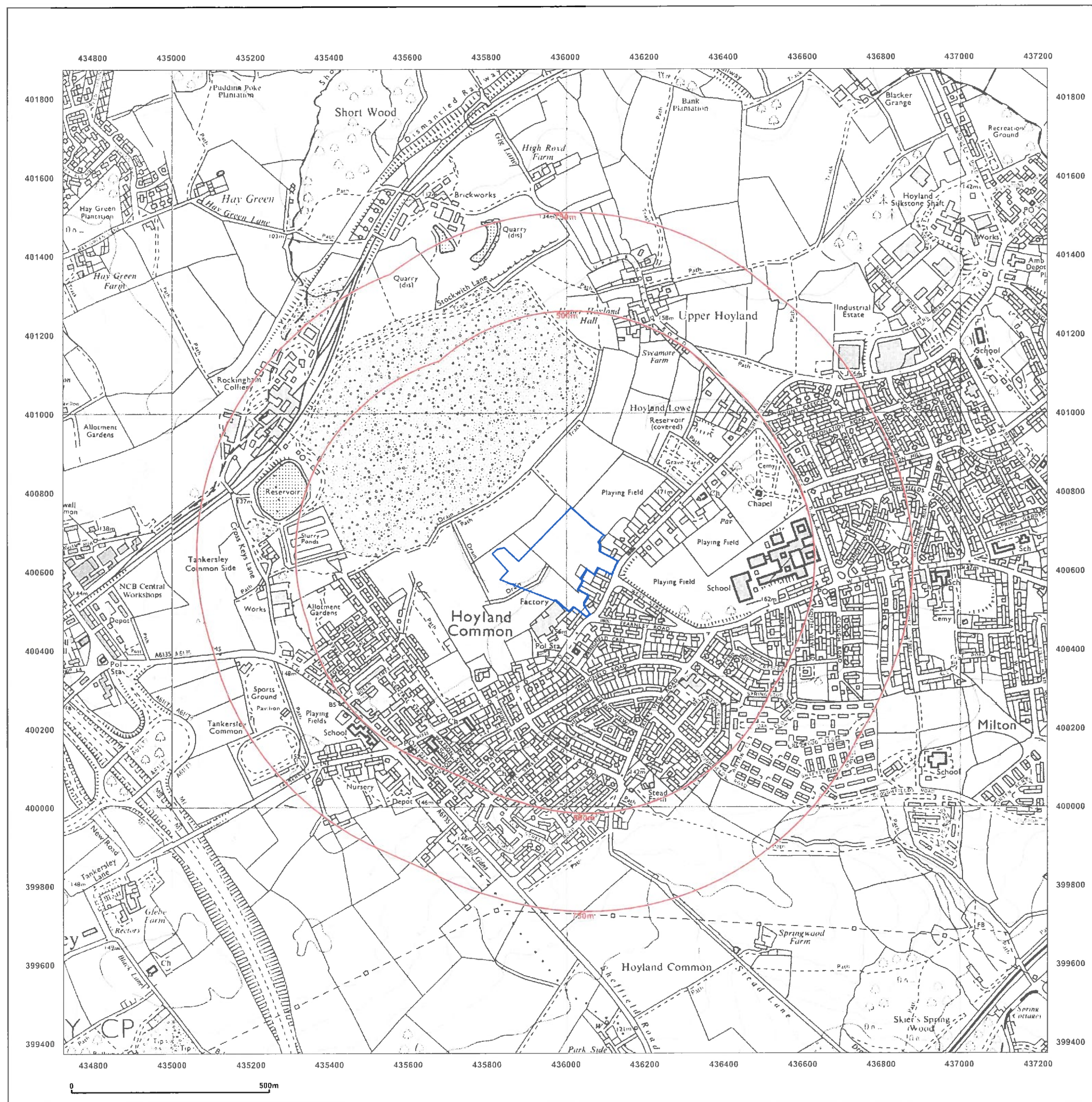


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Production date: 15 November 2016

To view map legend click here [Legend](#)



Site Details:

Hoyland Road, S74 0AS

Client Ref: 37477
Report Ref: CMAPS-CM-576277-37477-151116HIS
Grid Ref: 435973, 400624

Map Name: National Grid

Map date: 1977-1980

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
 Revised 1977
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1976
 Revised 1977
 Edition N/A
 Copyright N/A
 Levelled N/A

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

Surveyed 1979
 Revised 1980
 Edition N/A
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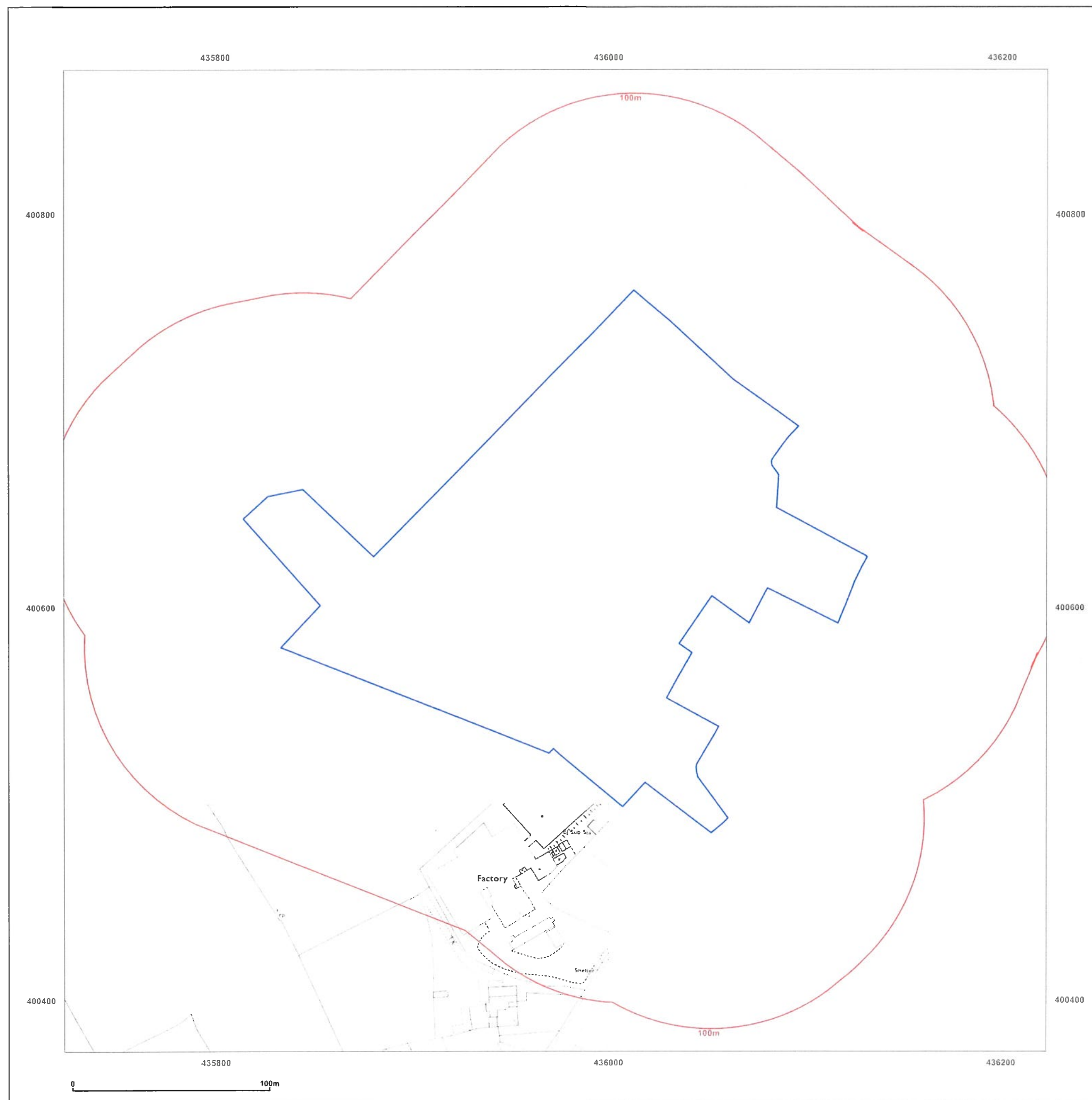


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Production date: 15 November 2016

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Site Details:

Hoyland Road, S74 0AS

Client Ref: 37477
Report Ref: CMAPS-CM-576277-37477-151116HIS
Grid Ref: 435973, 400624

Map Name: National Grid

Map date: 1986

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1963
Revised 1986
Edition N/A
Copyright 1986
Levelled 1963



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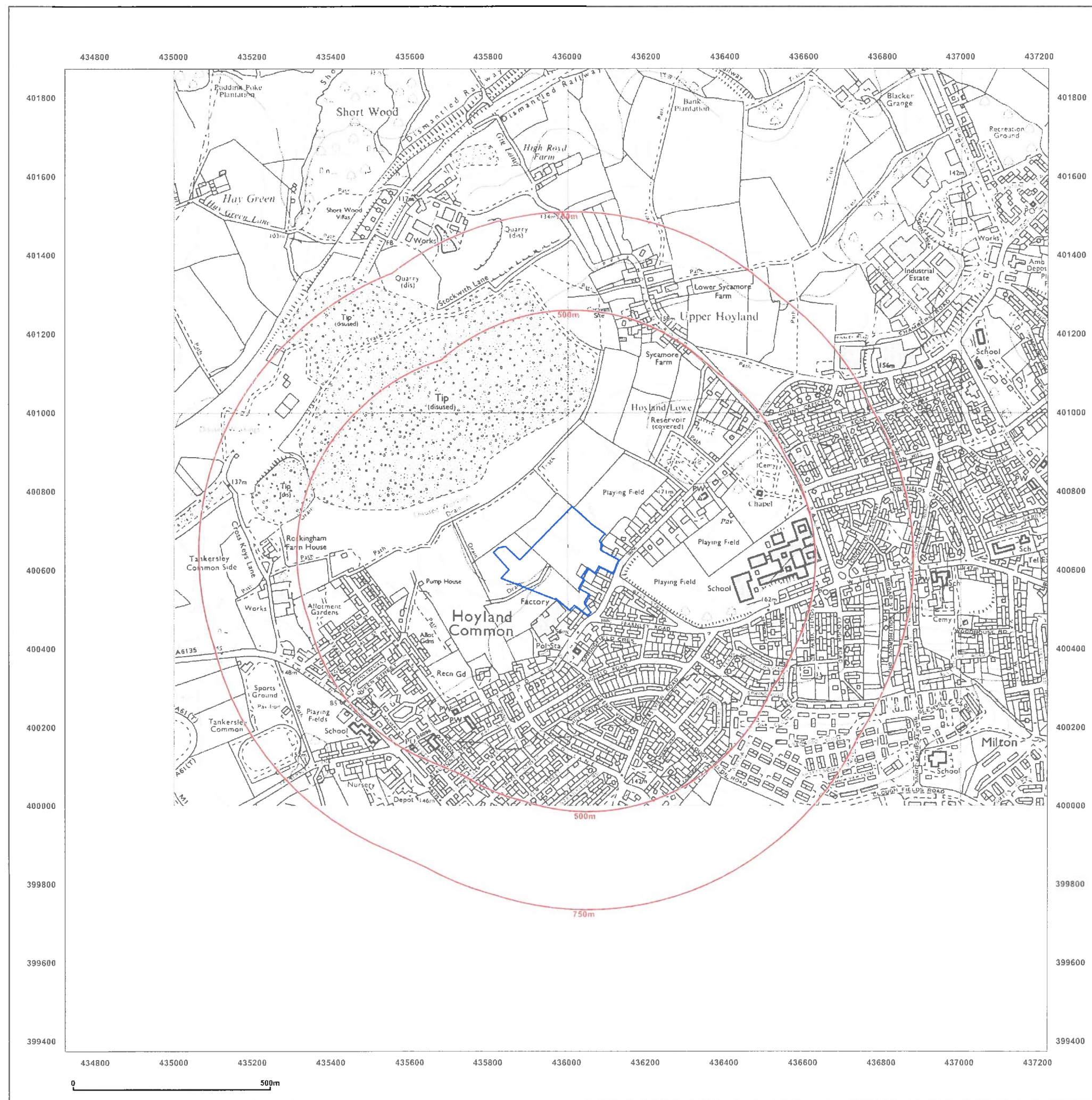


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Site Details:

Hoyland Road, S74 0AS

Client Ref: 37477
Report Ref: CMAPS-CM-576277-37477-151116HIS
Grid Ref: 435973, 400624

Map Name: National Grid

Map date: 1987

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1986
Revised 1987
Edition N/A
Copyright N/A
Levelled N/A



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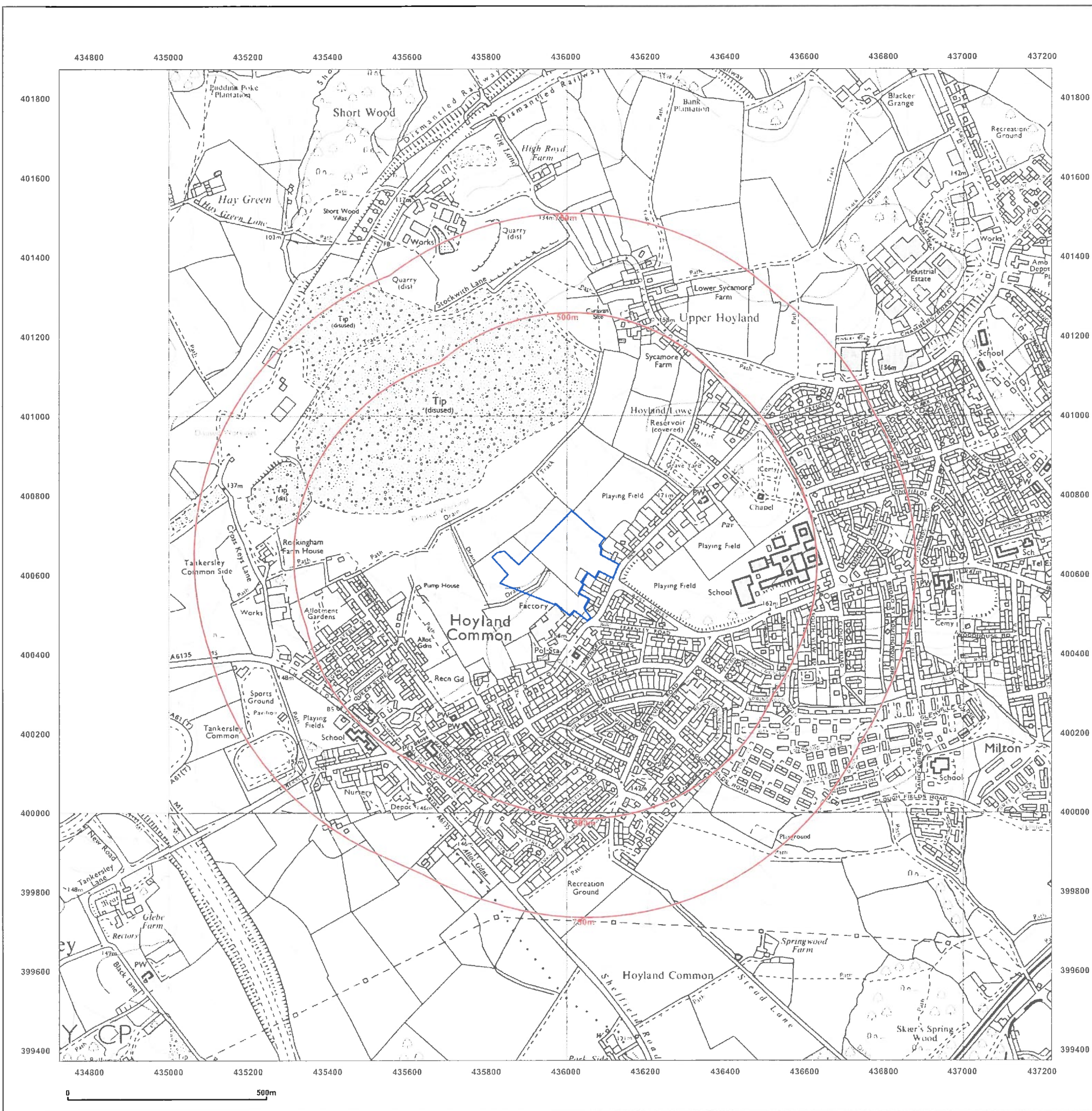


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Site Details:

Hoyland Road, S74 0AS

Client Ref: 37477
Report Ref: CMAPS-CM-576277-37477-151116HIS
Grid Ref: 435973, 400624

Map Name: National Grid

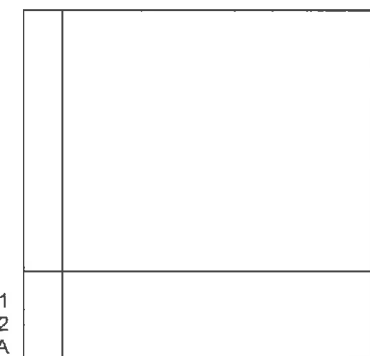
Map date: 1987-1992

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1991
Revised 1992
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1986
Revised 1987
Edition N/A
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Levelled N/A

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



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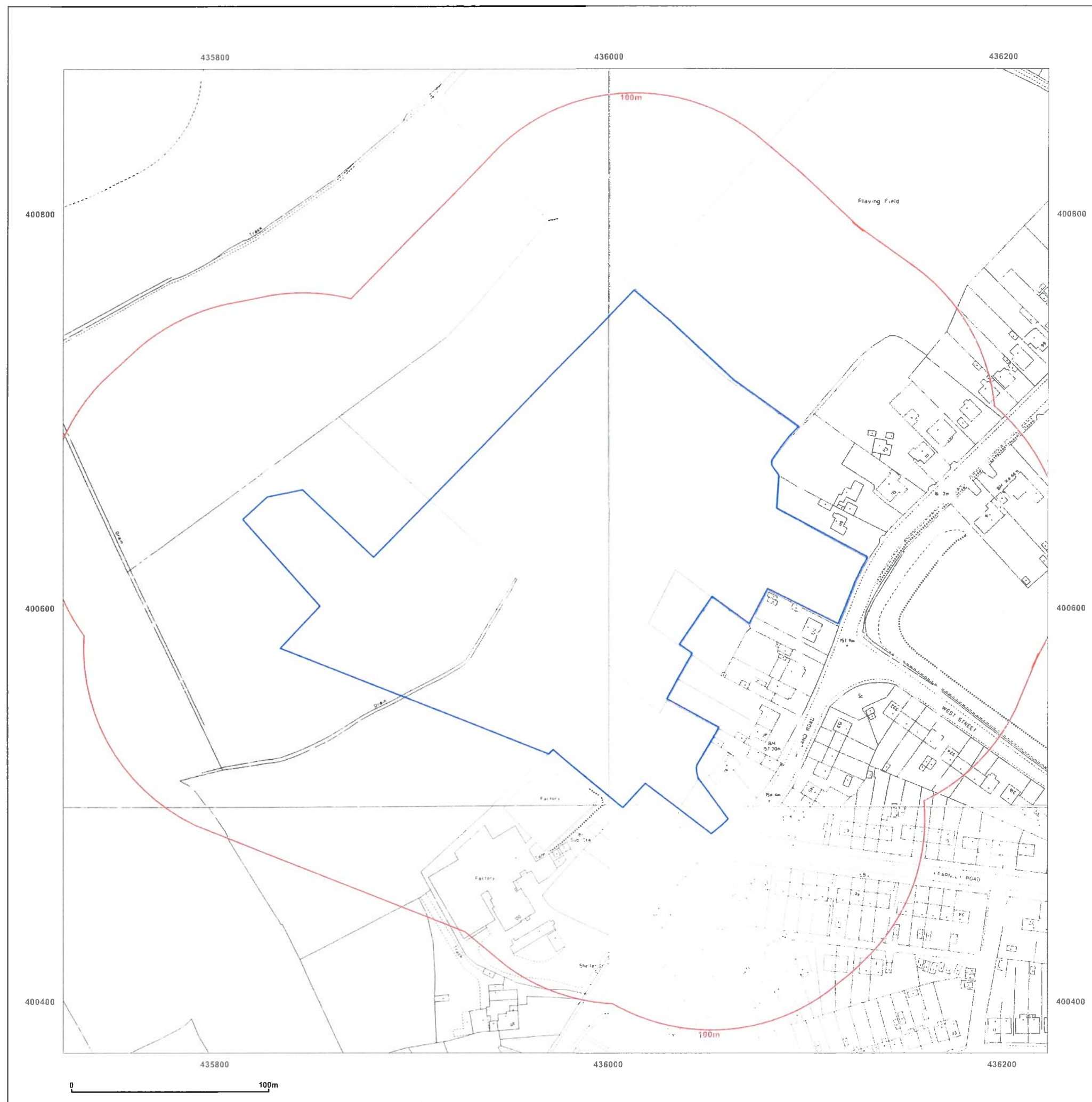


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Production date: 15 November 2016

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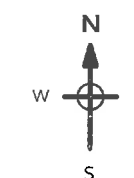
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Grid Ref: 435973, 400624

Map Name: National Grid

Map date: 1993

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1993
Revised N/A
Edition N/A
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Revised 1993
Edition N/A
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Revised 1993
Edition N/A
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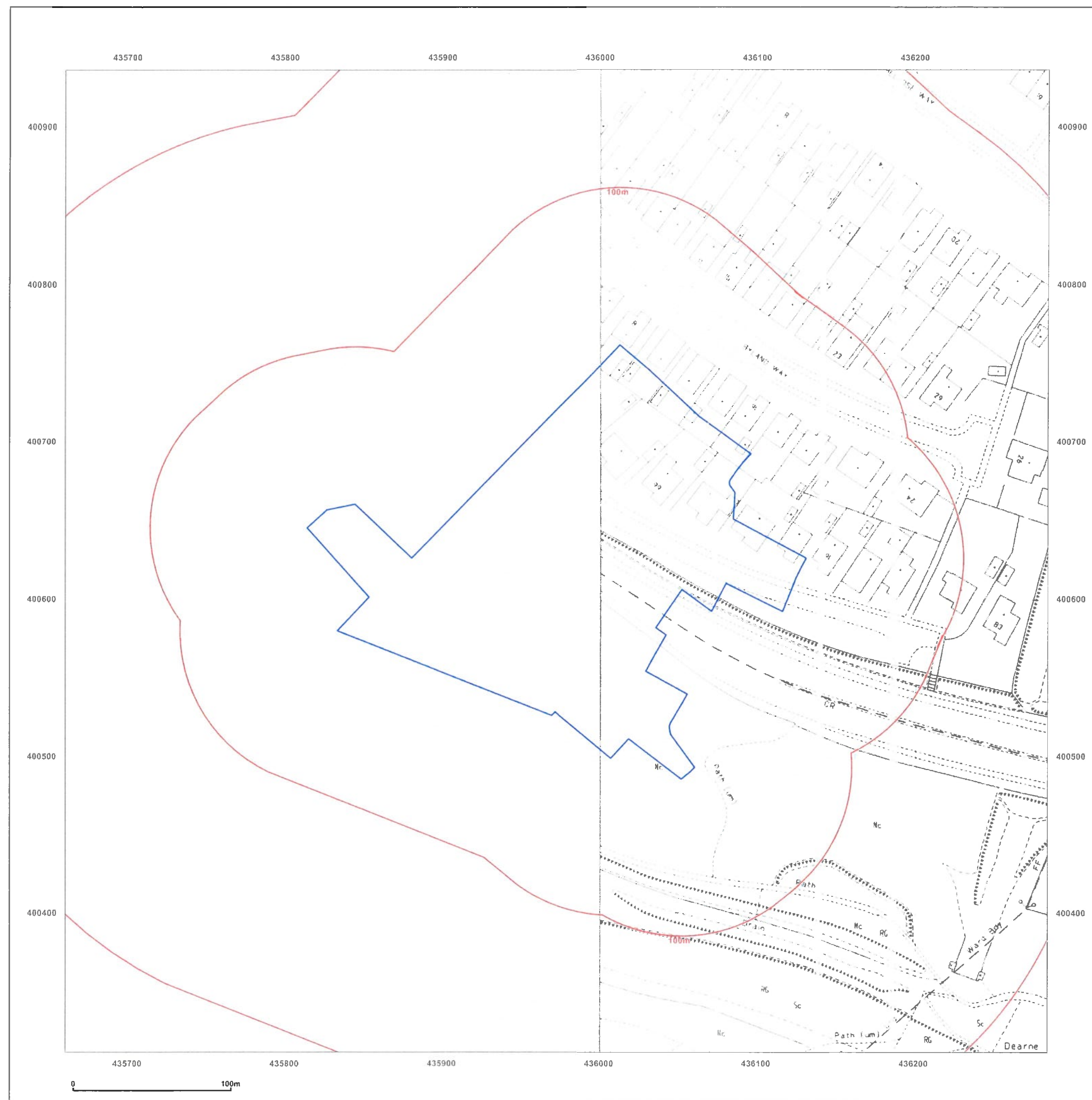


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Site Details:

Hoyland Road, S74 0AS

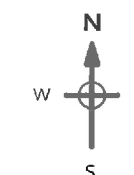
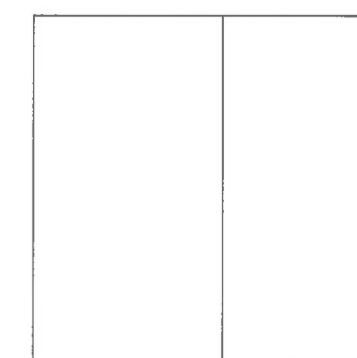
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Grid Ref: 435973, 400624

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



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



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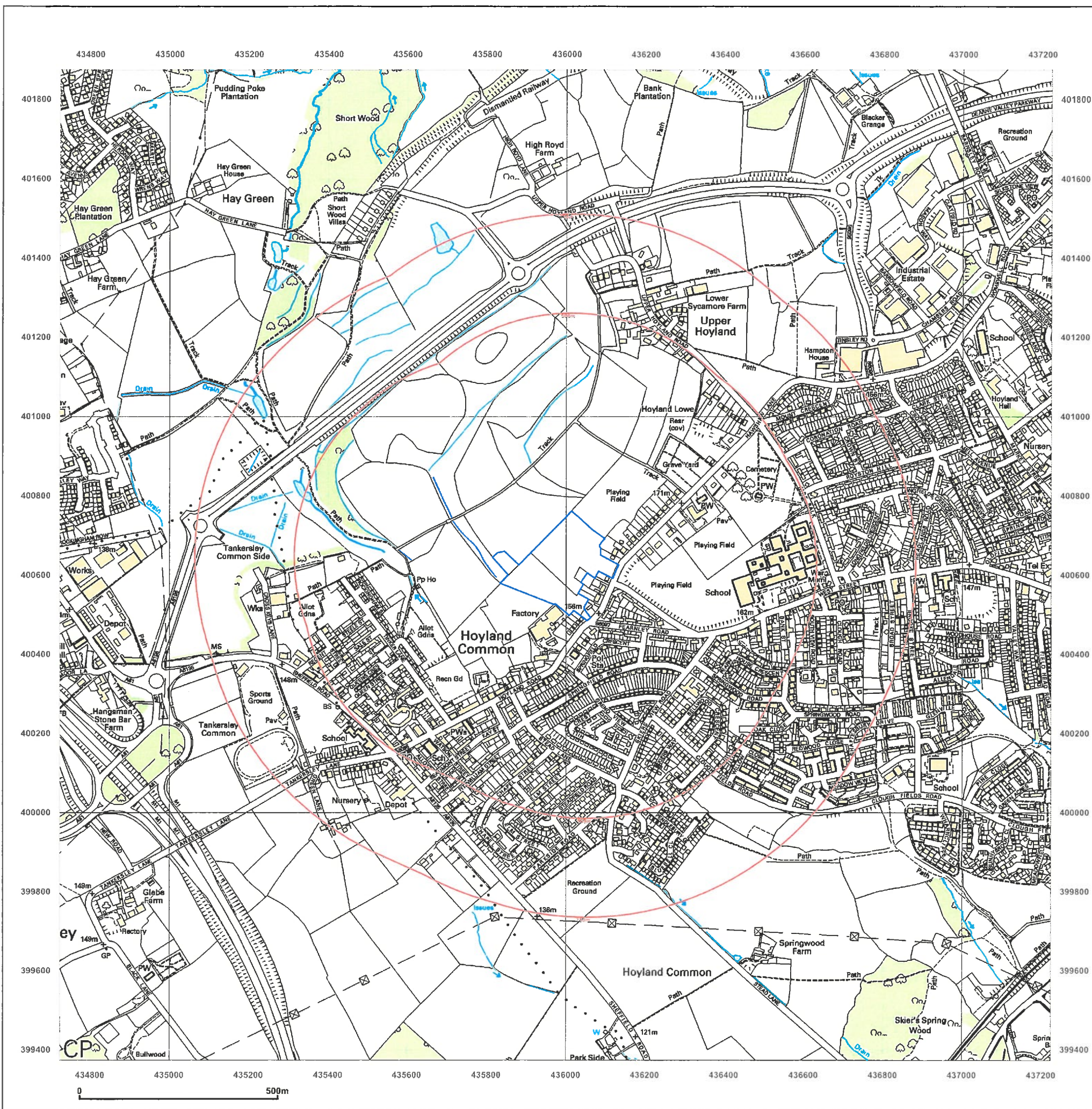


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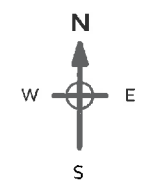
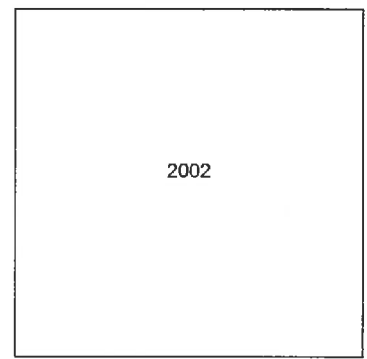
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Production date: 15 November 2016

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Site Details:	
Hoyland Road, S74 0AS	
Client Ref:	37477
Report Ref:	CMAPS-CM-576277-37477-151116HIS
Grid Ref:	435973, 400624
Map Name:	1:10,000 Raster
Map date:	2002
Scale:	1:10,000
Printed at:	1:10,000



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Production date: 15 November 2016

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Site Details:

Hoyland Road, S74 0AS

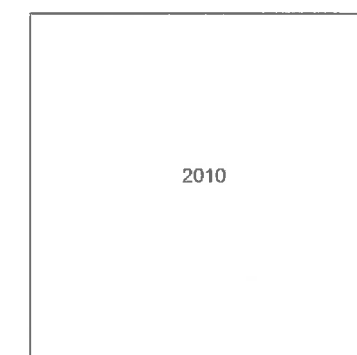
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Report Ref: CMAPS-CM-576277-37477-151116HIS
Grid Ref: 435973, 400624

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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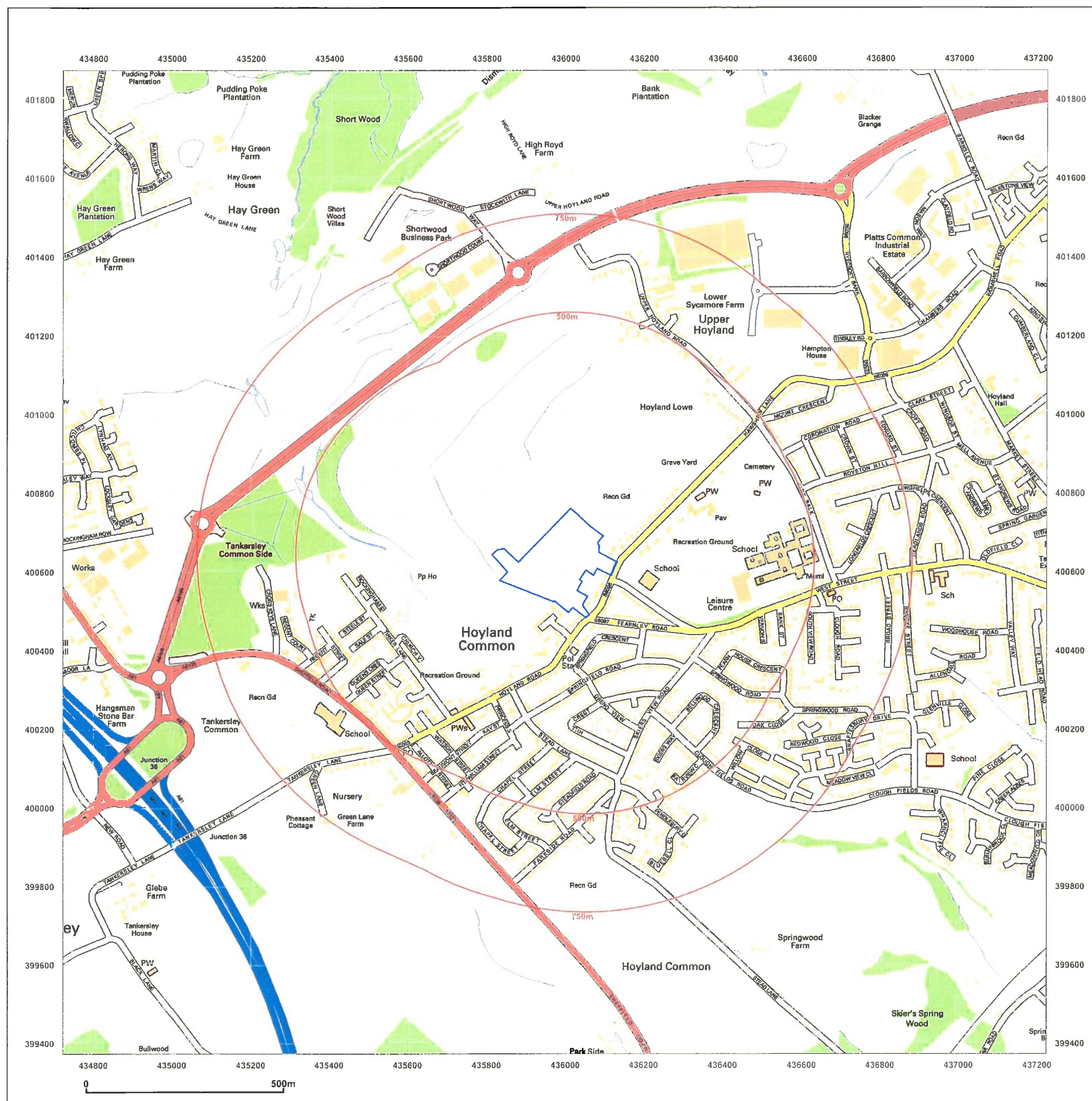


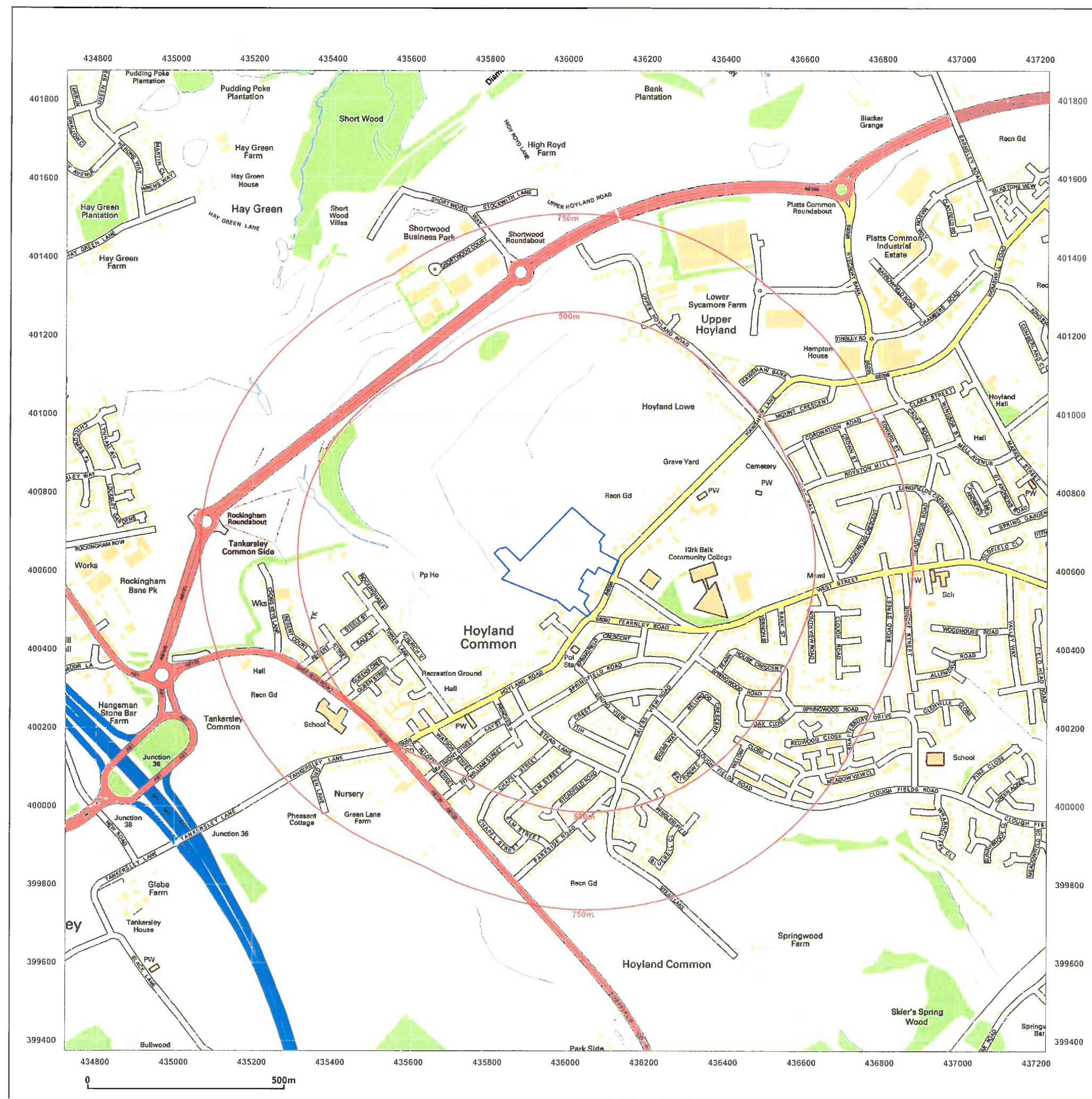
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Production date: 15 November 2016

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Site Details:

Hoyland Road, S74 0AS

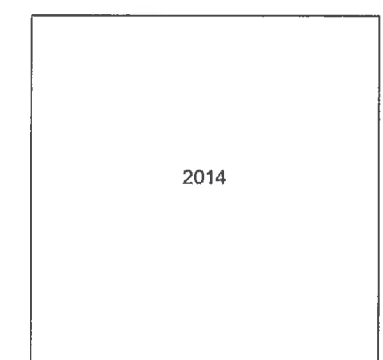
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Report Ref: CMAPS-CM-576277-37477-151116HIS
Grid Ref: 435973, 400624

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



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Production date: 15 November 2016

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Appendix D BGS Borehole Logs



**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 84507 : BGS Reference: SE30SE71
British National Grid (27700) : 435490,400210

[Report an issue with this borehole](#)

<<

< Prev

Page 1 of 1 ▾

Next >

>>

STRATA		Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb./sq. ft.	Ø deg.	m.c. %	y lb./cu. ft.	N
Made Ground Bricks and Ashes				3'-6"						
Mottled Clay			3'-6" 4'-2"	8" 4'-0"	□	no test.				
Mudstone Slightly Weathered at upper levels				5'-10" 8'-6" 10'-0"	I					113
Water struck No Water. Final Standing Level										
Undisturbed Sample □ Disturbed Sample ○ Water Sample △ Penetration Test I						c = Cohesion Ø = Angle of Internal Friction m.c. = Moisture Content y = Bulk Density N = Standard Penetration Value				
Water levels may be subject to seasonal or tidal variation and should not be taken as constant.										

SE 30 SE 14 UNDERGROUND BORE
RECORD OF ~~SHAFT~~ BORE FOR MINERALS

Name and Number of Shaft or Bore given by Geological Survey:

Rockingham Colliery, 87/72

Name and Number given by owner (if different from above):

Town or Village: Hoyland

Date of sinking: 1910-11

Exact site

(3577 0053) approximate site given on 6" map.
725 yds W 25° S of Hoyland Nether Church

County: Yorkshire

6" Quarter Sheet: 22 NE

1" N.S. Geol. Map: 87

1" O.S. Geol. Map:

Whether Confidential

No

A sketch-map or tracing from a large-scale map is desirable.

Purpose for which made: to prove the Whinnor Seam

Level at which bore commenced relative to O.D.: -574

If not down bore, state if horizontal or up

Made by

surface is about 480 ft.

for Messrs. Newton Chambers Ltd.

Information from

Messrs. Newton Chambers Ltd.

Date received: 21/1/1941

Specimens

Dip of strata

GEOLOGICAL CLASSIFICATION	DESCRIPTION	THICKNESS			DEPTH		
		ft	in		ft	in	
	Foot of Silestone Seam at - 574 ft. Below O.D.						
	Guide tube	1.22	4				
	Grey rock	8.13	26	8	9.35	30	8
	Soft bind with ironstone	2.18	7	2	11.53	37	10
	Blue bind with ironstone	5.33	17	6	16.87	55	4
	Grey rock	2.16	7	1	19.02	62	5
	Black shale	1.19	3	11	20.22	66	4
	Crack	0.25	-	10	20.47	67	2
	White chunch	1.32	4	4	21.79	71	6
	Dark bind	0.89	2	11	22.68	74	5
	Rock	0.61	2	-	23.29	76	5
	Stone bind	0.94	3	1	24.23	79	6
	Hard grey rock	1.60	5	3	25.83	84	9
	Rock	1.35	4	5	27.18	89	2
	Blue bind	0.41	1	4	27.58	90	6
	Rock	0.48	1	7	28.07	92	1
	Dark bind + ironstone	3.15	10	4	31.22	102	5
	Coal	0.10	-	4	31.32	102	9
	Dark blue bind	0.84	2	9	32.16	105	6
	Light bind	3.25	10	8	35.41	116	2
	Hard grey rock	4.04	13	3	39.45	129	5
	Blue bind	1.27	4	2	40.72	133	7
	Dark shale	0.84	2	9	41.55	136	4
	Grey bind	2.54	8	4	44.09	144	8
	Ironstone band	0.30	1	-	44.40	145	8
	Grey bind		1	-	44.70	146	8
	Hard rock	0.26	1	2	45.06	147	10
	Strong blue bind	3.17	10	5	48.23	158	3
	Gal	0.41	1	4	48.64	159	7
	Sparin	1.75	5	9	50.39	165	4
	Strong bind	2.64	8	8	53.04	174	-
	Hard band	0.18	-	7	53.21	174	7
	Strong bind with ironstone bands	3.86	12	8	57.07	187	3
	Hard band	0.30	1	-	57.38	188	3
	Strong bind with ironstone bands	3.86	12	8	61.24	200	11

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.
* WESTPHALIAN & AT FURNACE

G.S.M. Office File No. Site marked on 6" Map by Site marked on 1" Map by

British Geological Survey

RECORD OF ~~SHALLOW~~ BORE FOR MINERALS

SE 30/29

County Yorkshire6" Quarter Sheet 202 N 451" N.S. Geol. Map 871" O.S. Geol. Map 2

Whether Confidential

No

A sketch-map or tracing from a large-scale map is desirable.

Name and Number of ~~Sheet~~ or Bore given by Geological Survey:Rockingham Colliery, 87/72 SE 30 SE 1/4

Name and Number given by owner (if different from above):

Town or Village HoylandDate of sinking 1910-11Exact site SE 30 SE 1/4 (725 yds W 25° S of Hoyland Nether ChurchPurpose for which made to prove the Whinmoor SeamLevel at which bore commenced relative to O.D. - 574If not down bore, state if horizontal or up —Made by surface is about 450 ft.for Messrs. Newton Chambers Ltd.Information from Messrs. Newton Chambers Ltd.Date received Sept 28 1914

Specimens

Dip of strata

GEOLOGICAL CLASSIFICATION

DESCRIPTION

THICKNESS

DEPTH

Ft. In

Ft. In

Foot of Silurian Seams at - 574 ft. Below O.D.

Guide tube

4 -

4 -

Grey rock

26 8

30 8

Soft bind with ironstone

7 2

37 10

Blue bind with ironstone

17 6

55 4

Grey rock

7 1

62 5

Black shale

3 11

66 4

Congl.

- 10

67 2

White chert

4 4

71 6

Dark bind

2 11

74 5

Rock

2 -

76 5

Stone bind

3 1

79 6

Hard grey rock

5 3

84 9

Rock

4 5

89 2

Blue bind

1 4

90 6

Rock

1 7

92 1

Dark bind + ironstone

10 4

102 5

Coal

- 4

102 9

Dark blue bind

2 9

105 6

Light bind

10 8

116 2

Hard grey rock

13 3

129 5

Blue bind

4 2

133 7

Dark shale

2 9

136 4

Grey bind

8 4

144 8

Ironstone band

1 -

145 8

Grey bind

1 -

146 8

Hard rock

1 2

147 10

Strong blue bind

10 5

158 3

Gal.

1 4

159 7

Spavin

5 9

165 4

Strong bind

8 8

174 -

Hard band

- 7

174 7

Strong bind with ironstone bands

12 8

187 3

Hard band

1 -

188 2

Strong bind with ironstone bands

12 8

200 11

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.G.S.M. Office
File No.Site marked
on 6" Map bySite marked
on 1" Map by

2

RECORD of WELL or BORING (Continued)

303

Rockingham Colliery

County

Survey No.

1" N.S. geol. map.

87/72

87

GEOLOGICAL CLASSIFICATION.

SE 30 SE 1/4
NATURE OF STRATA.

THICKNESS.

DEPTH.

Feet. Inches.

Feet. Inches.

Hard band
Strong bind with ironstone bands
Clod
Hard grey cank
Blue bind
Hard band
Stone bind
Cank
Bind
Cank
Clod
Cank
Bind
Hard grey rock
Clod with coal joints
Stone bind
Hard band
Stone bind to bottom of hole

Feet.	Inches.	Feet.	Inches.
201	37	61	37
208	4	62	4
212	9	64	9
214	5	65	5
216	10	65	10
216	4	65	14
217	5	66	19
219	6	66	25
219	3	66	31
224	4	68	28
226	5	69	01
230	6	70	38
231	4	70	49
240	3	73	30
243	7	74	09
256	11	78	03
256	3	78	11
275	6	81	05

British Geological Survey

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per M. Johnson
12.7.77.

UNDERGROUND BORE

YORKSHIRE 282 NE

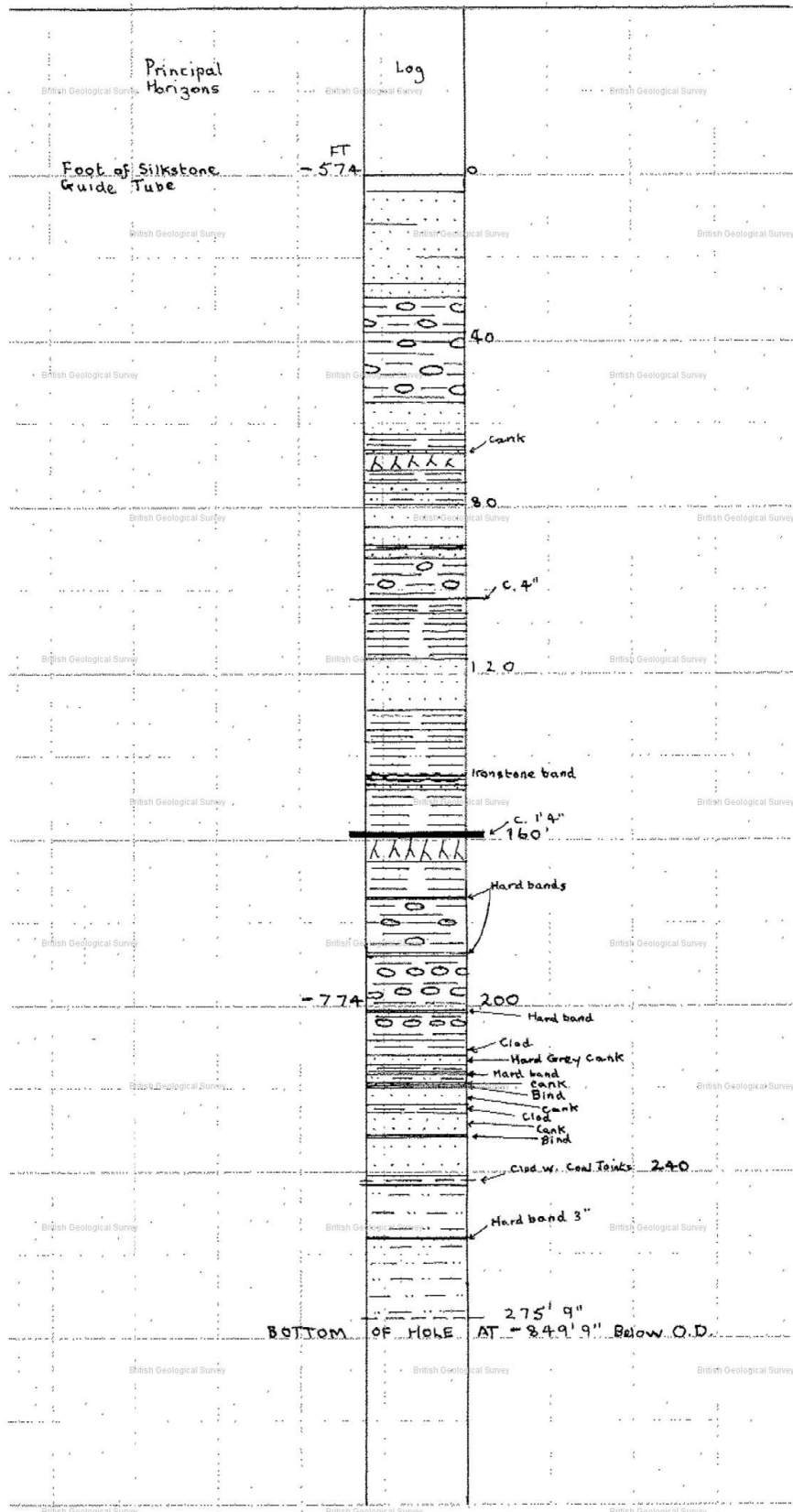
SE 30 SE / 14

ROCKINGHAM COLLIERY 87/72

1910-1911

725 yds. W. 25° S. of Hayland Nether Church.

574 BELOW O.D.



YORKSHIRE WATER AUTHORITY - Survey of Existing Boreholes

I.G.S. Ref. No SE 20. SE/114. N.G.R. SE.357.005.....

Licence No.

OWNERS NAME British Geological Survey

App No British Geological Survey

ADDRESS .. Rotherham Colliery,

Authorised Abstraction

..... Hayland

surface at 480'

started at 01 574'

g.p.h.
g.p.d.
m.g.a.

STRAATA DETAILS	Thick	Depth
Commenced at 574' below OD		
Guide tube	4"	4'
Gray rock	36' 8"	30' 8"
Bind + cement	15'	15'
Rock	7' 1"	62' 5"
Black shale	3' 11"	66' 4"
Sand	10"	67' 2"
Clunch	4' 4"	71' 6"
layers of rock + bind		102' 5"
Coal	4"	102' 9"
Rock + bind		108' 3"
Coal	1' 4"	109' 7"
Bind + hard bands		208' 2"
Clod	4' 9"	212' 11"
Sand	1' 5"	214' 4"
Bind + sand		224'
Clod	2' 5"	226' 5"
Sand	4' 6"	230' 11"
Bind + rock		235' 9"
Bind	19' 6"	255' 9"

Dia.

Depth 275' 9"

Lining British Geological Survey

Well sinker

Date 1941

R.W.L.

P.W.L.

British Geological Survey

British Geological Survey

British Geological Survey

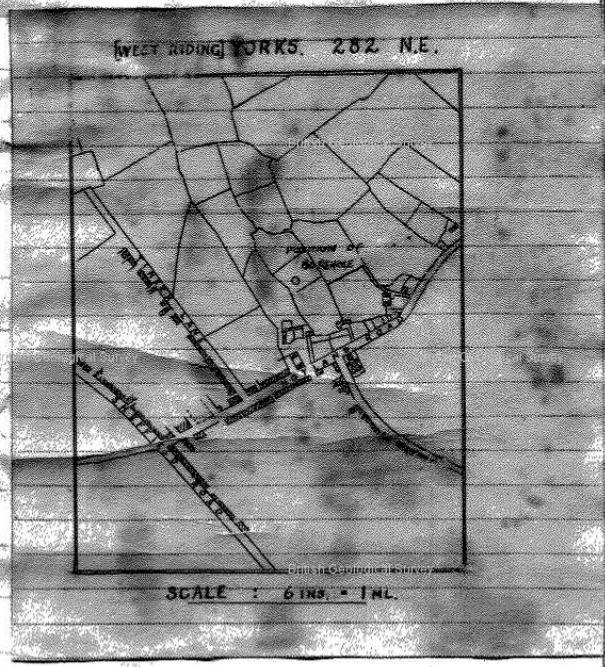
British Geological Survey

British Geological Survey

British Geological Survey

MINERAL SE 30 SE 15 Underground Boring
 304 8773
 (101904) No. 17352-8154-5,000 12/28 Gp. 180. O.A. British Geological Survey
 SECTION OF Mineral Bone at Rockingham Colliery, Hoyland.
from Silkstone Seam to prove
Whinmoor Seam
 Maps: One-inch 87 Six-inch 282 NE County Yorks W.R.
 Height above O.D. 414500 Latitude _____ Longitude [30810042]
 Communicated by Newton Chambers & Co., Thornecliffe Date of Sinking 1938-1939
 Made by Foraky Ltd. Dip of Strata 1433

716 yds. W 29° S. of St. Peter's Church, Hoyland Nether.
 Record from company attached.



Borehole from Silkstone to Whinmoor Seam, Rockingham

		Core %	Thickness.		Depth.
			M	Ft. Ins.	Ft. Ins.
Dec 3rd.	Fireclay		4.	6. M	4. 6.
4th.	Very strong shale.	1.37	4.	6.2749.	0.
6th.	Gray Rock	100.	2.13	7. 0.48816.	0.
12th.	Crystalline. grey sandstone.	100.	1.12	3. 8.57919.	8.
13th.	Very siliceous grey bind.	100.	1.45	4. 9.74424.	5.
	Fine grey sandstone.	100.	1.73	5. 8.91730.	1.
	Very siliceous grey bind.	100.	0.81	2. 8.99832.	9.
	Coarse grey sandstone.	100.	0.15	6.101333.	3.
14th.	Strong grey bind.	100.	1.30	4. 3.114837.	6.
	Ironstone band.	100.	0.33	1.114637.	7.
	Dark Grey shale.	100.	0.03	1.114837.	8.
	Soft grey bind.	100.	0.30	1. 0.117938.	8.
	Grey shale.	100.	0.20	8.117939.	4.
	Soft grey bind	100.	0.43	1. 5.24240.	9.
	Ironstone.	100.	0.03	1.124540.	10.
	Soft grey bind.	100.	0.28	11.127341.	9.
15th.	-do- with occasional Ironstone bands.	100.	2.72	8. 11.154750.	9.
	Grey bind with <u>carbonicola</u> shells.	100.	0.36	1. 2.158051.	10.
	-do- with plants & fireclay nature.	100.	0.28	11.160852.	9.
	Grey bind.	100.	0.46	1. 6.165454.	3.
	Fireclay (many plants)	100.	0.94	3. 1.174857.	4.
	Grey bind.	100.	0.15	6.176357.	10.
	Fireclay (many plants)	100.	1.04	3. 5.186761.	3.
	Siliceous grey bind with plants.	100.	1.09	3. 7.197664.	10.
	Shale with coal partings.	100.	0.08	3.197665.	6.
16th.	Fireclay.	100.	0.91	3. 0.208868.	6.
	Fireclay (many plants)	100.	2.39	7. 10.232776.	4.
	Siliceous bind.	100.	0.97	3. 2.242379.	6.
17th.	Micaceous Sandstone.	100.	1.42	4. 8.266584.	2.
	-do- -do-	100.	1.88	6. 2.275390.	4.
	Dark shale with very small shells.	100.	0.69	2. 3.282292.	7.
18th.	Dark shale with shells and plants.	100.	2.49	8. 2.307100.	9.
	Black shale with shells.	100.	0.76	2. 6.3147103.	3.
19th.	COAL 2"	100.	0.05	23.22103.	5.
	Fireclay with coal streaks, at top	100.	0.08	3.36103.	8.
	Fireclay (many plants).	100.	1.47	4. 10.337108.	6.
	Grey shale.	100.	0.15	6.3322109.	0.
20th.	Grey shale.	100.	0.61	2. 0.338111.	0.
	Sandstone.	100.	1.40	4. 7.3523115.	7.
	Dark shale with shells.	100.	0.51	1. 8.354117.	3.
	-do-	100.	0.69	2. 3.3642119.	6.
21st.	Sandstone.	100.	3.02	9. 11.3745129.	5.
	Grey shale with plant remains.	100.	1.19	3. 11.4064133.	4.
	Grey bind with large plants (Calamites & Sigillaria) replaced by Coal & small shells replaced by & preserved as pyrites. Little Ironstone also.	100.	1.75	5. 9.4384143.	10.
22nd.	Strong grey bind with plants.	100.	1.52	5. 0.45261148.	10.
	Fairly strong grey bind.	100.	1.07	3. 6.4642152.	4.
	Grey shale.	100.	1.93	6. 4. 15848.36	8.
	Carbonaceous shale (many plants)	100.	0.23	9. 15948.59	5.
	Soft grey bind.		0.18	7. 16048.70.	
	COAL 1'0"	50.	0.30	1. 0. 16149.07	0.
	Soft Fireclay.	100.	0.76	2. 6. 16349.83	6.
23rd.	Strong Fireclay.	100.	2.08	6. 10. 17051.72	4.
	Sandy bind.	100.	2.62	8. 7. 17824.31	1.
	Sandy bind with coal streaks.	100.	0.05	2. 17954.58	1.
	Sandy bind.	100.	0.74	2. 5 18155.32	6.
24th.	Sandy bind with much calamites and an unusual type of small fern.	100.	1.68	5. 6. 18757.00	0.
28th.	Sandy bind.	100.	1.30	4. 3. 19158.27	3.
	Sandy bind with large calamites and ferns.	100.	0.18	7. 19158.47	10.
29th.	Sandy bind with Calamites.	100.	1.63	5. 4. 19760.10	2.

UNDERGROUND BORE (Cored)

YORKSHIRE 282 NE

SE 30 SE / 15

ROCKINGHAM COLLIERY 87/73

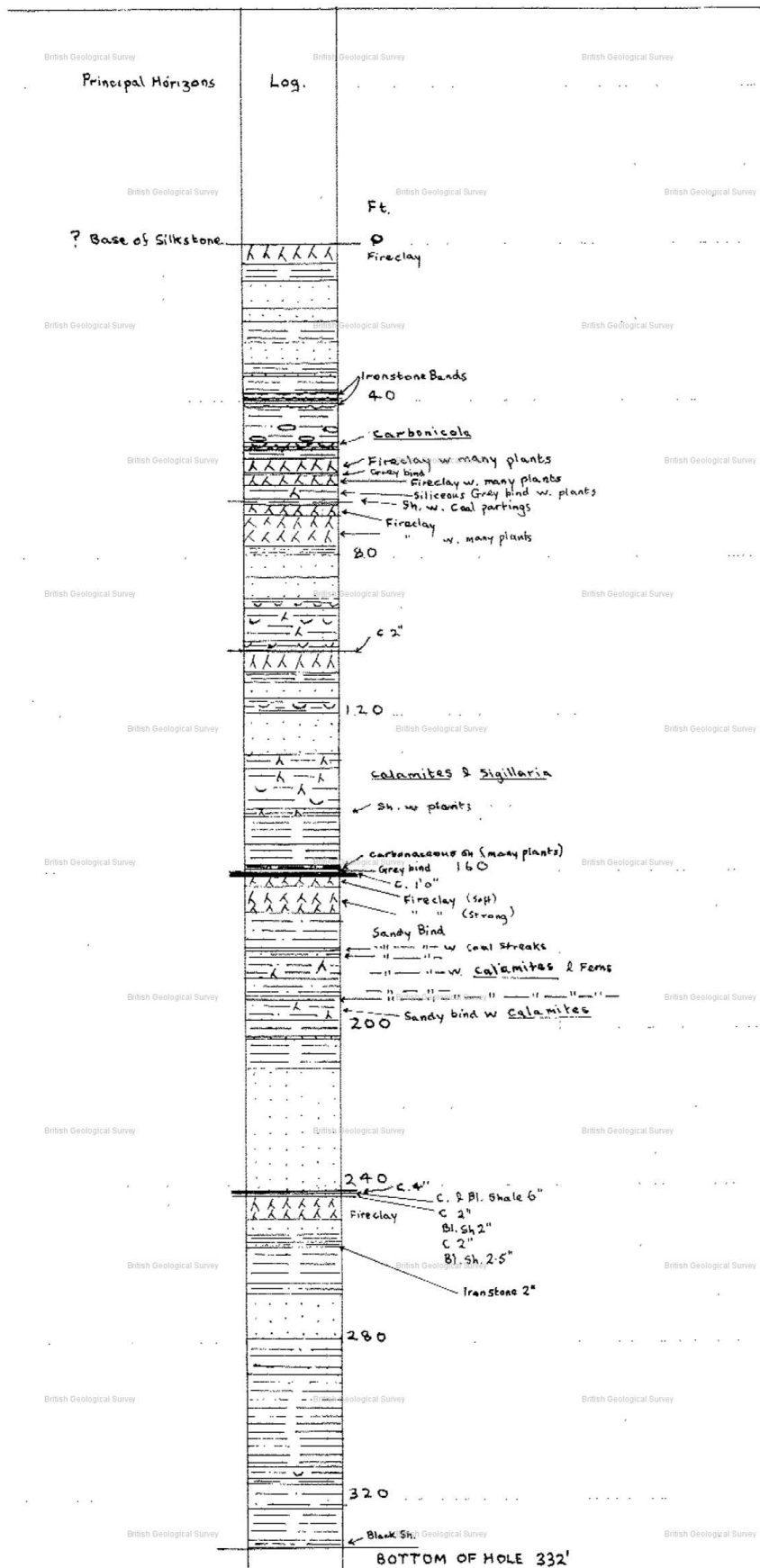
1938-1939

From Silkestone Seam
To prove Whinmoor seam

Foraky Ltd.

716 yards W 29° S of St. Peter's Church
Hoyland Nether

Depth Not Recorded



Dec.	30th.	Soft bind (extremely few plants) showing current bedding very plainly	100.	5.152 0.	202.61622.
		Grey sandstone.	100.	42.44 8.	202.61810.
	31st.	Siliceous Grey bind.	100.	7.221 3.	210.443 1.
		Grey bind with few plants.	100.	0.13 5.	210.6416 6.
		Grey Sandstone.	100.	30.937 9.	211.7353 3.
Jan.	4-5th.	COAL (4")	1'6 1/2" 50.	0.10 4.	241.73637.
		COAL and Black shale (6")		0.15 6.	242.73791.
		COAL (2")		0.05 2.	242.73843.
		Black shale (2")		0.05 2.	242.73895.
		COAL (2")		2.	242.73947.
		Black shale (2 1/2")		0.072 1/2.	242.74009 1/2.
	6th.	Fireclay	100.	5.1613 1/2.	218.75421.
		Sandstone.	100.	4.122 0.	252.76831.
	7th.	Grey shale (sandy)	100.	2.081 8.	254.77659.
	8th.	Grey shale (dark)	100.	0.23 9.	255.7788 6.
	9th.	Ironstone.	100.	0.05 2.	255.77938.
	10th, 11th.	Grey shale (dark)	90.	82.62 7.	264.80543.
	12th.	Grey (Sandy) bind.	100.	20.811.	267.81432.
	13th.	Grey sandstone.	100.	113.6110.	279.85040.
	14th.	Sandy grey bind.			
		Core badly broken from 281'8" to 288'6" owing to diameter reduction from 6" to 5 1/2"	50.	10.41 4.	283.86260.
	15th.	Sandy grey bind.			
	22nd.	Grey shale.	35.	5.168 6.	288.87436.
	25th.	Grey shale.	100.	23.7041.	311.94977.
	26th.	Dark grey shale with few poor.			
Feb.	1st.	shell casts.	100.	3.0972.	311.95949.
		Grey shale.	100.	0.2811.	315.96228.
		Very dark grey shale.	100.	1.036 2.	316.965710.
	2nd.	Sandy dark grey bind.	100.	5.157 2.	322.98520.
	3rd.	Grey shale.	100.	3.259 6.	330.60746.
		Black shale.	100.	10.46 6.	332.61190.
		Bottom of hole.			



Appendix E Coal Authority Report



The Coal
Authority

Resolving the **impacts** of mining

CON29M Non-Residential Mining Report

HOYLAND SITE D
HOYLAND ROAD
HOYLAND
HOYLAND
SOUTH YORKSHIRE
S74 0AS

Date of enquiry: 15 November 2016
Date enquiry received: 15 November 2016
Issue date: 15 November 2016

Our reference: 51001298179001
Your reference:



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

JPG (LEEDS) LIMITED

Enquiry address

HOYLAND SITE D, HOYLAND ROAD, HOYLAND,
HOYLAND, SOUTH YORKSHIRE, S74 0AS

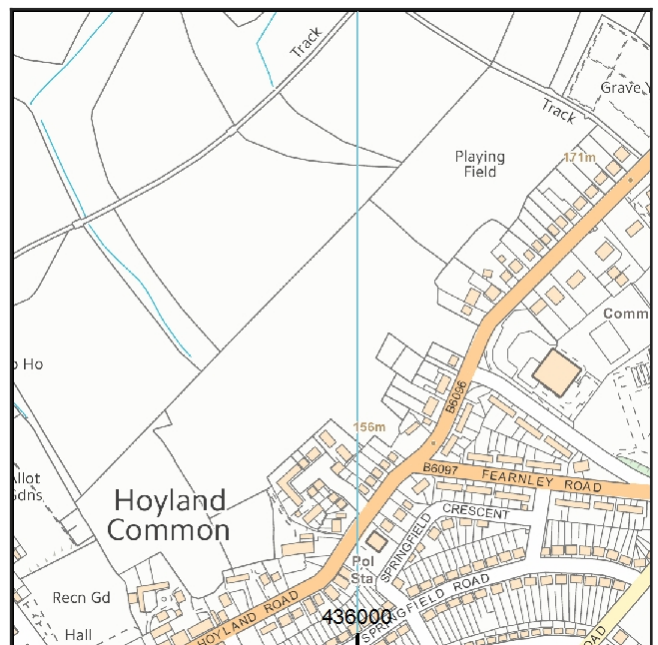
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Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

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 /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	Yes
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

Further recommended reports
Coal mining subsidence claims 50m buffer report
Coal mining subsidence claims history

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is in a surface area that could be affected by underground mining in 14 seams of coal at 60m to 440m depth, and last worked in 1977.

Any movement in the ground due to coal mining activity should have stopped.

In addition 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

A damage notice or claim for alleged subsidence damage was made in October 1995 for 114 HOYLAND ROAD, HOYLAND COMMON, BARNSELEY, SOUTH YORKSHIRE, S74 0AS. However, the claim was rejected.

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

A damage notice or claim for alleged subsidence damage was made in December 1994 for 124 HOYLAND ROAD, HOYLAND COMMON HOYLAND, BARNSELEY, SOUTH YORKSHIRE, S74 0AS. However, the claim was rejected.

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

There are a further 1 claim(s) within 50 metres of the property boundary that do not match the property address. These are shown on the enquiry boundary plot.

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.

If further subsidence damage claims information is required, please visit www.groundstability.com.

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.

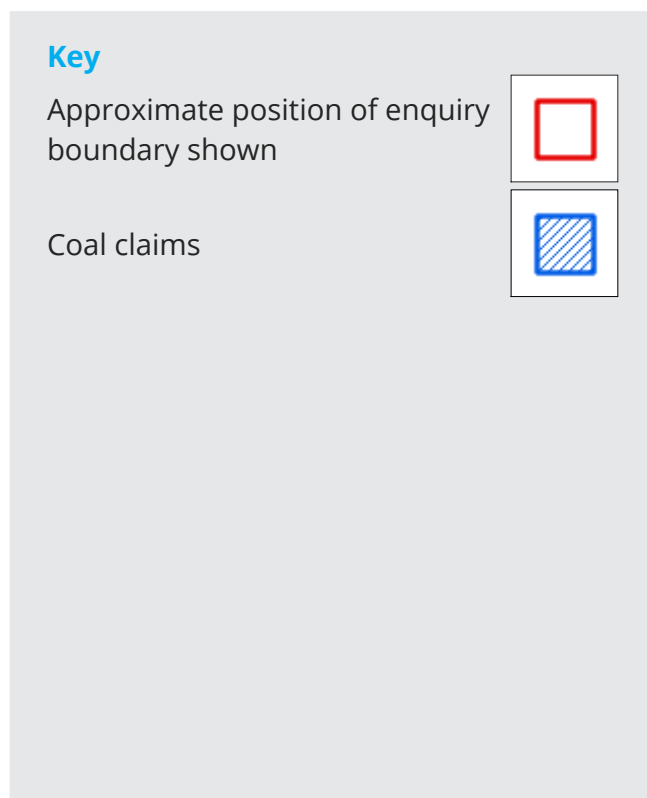
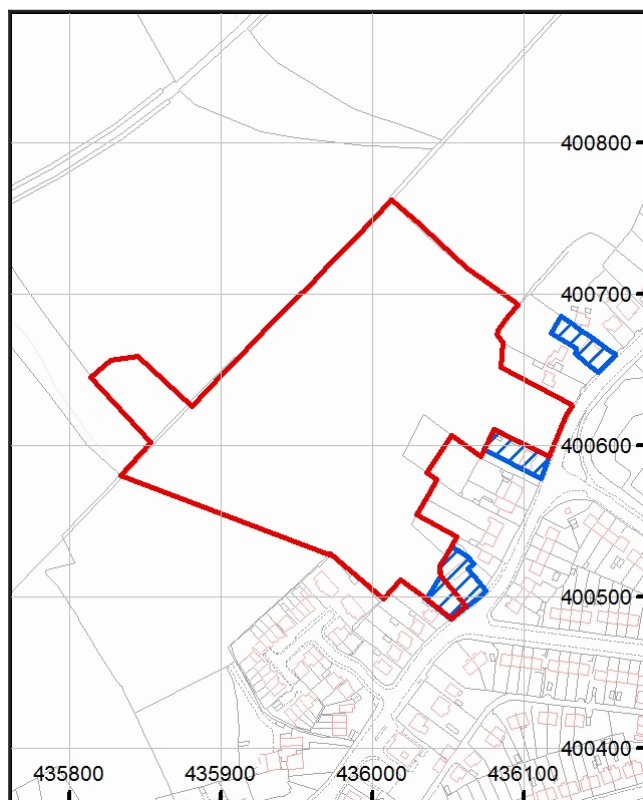
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Alternative formats

If you would like this report in an alternative format, please contact our communications team.

Enquiry boundary



How to contact us

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Appendix F Notes on Limitations



General

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- b) this document to any third party with whom an agreement has not been executed.

Phase I Desk Study Reports

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

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

Phase II Geo-Environmental Investigations

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics and ground and groundwater conditions to allow a reasonable assessment of the environmental risks together with engineering and development implications. The objectives of the investigation have been Ltd to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects.

The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

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