PRELIMINARY RISK ASSESSMENT
BLACKTHORN FARM
CULVERSTON, KENT
ESQUIRE DEVELOPMENTS
DS-25054-25-101
JUNE 2025

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EXECUTIVE SUMMARY

A Tier 1 Preliminary Risk Assessment was requested by Esquire Developments. The purpose of the assessment was to identify any contaminative or geotechnical issues associated with former land use at *Blackthorn Farm, Culverston, Kent* which might impact on the site redevelopment.

SITE DETAILS				
Approximate Area (ha)	**Centred on OSGB Eastings, Northings**	**Previous Use(s)**	**Current Use**	**Proposed Use**
5.43	563758, 163417	undeveloped	Stables and paddocks	Residential development of 100 dwellings and public open space

TIER 1 NON-INTRUSIVE INVESTIGATION							
Geology			**Groundwater Aquifer**		**Surface Water**	**Radon**	**Flood Risk**
Made Ground	**Superficial**	**Solid**	**Superficial**	**Solid**			
Likely around structures, quarry and where evidence of waste burning.	Clay-with-flints Formation	Lewes Nodular Chalk Formation, Seaford Chalk Formation	Unproductive Aquifer	Principal Aquifer	None within 2 km of site	The site lies within an area designated RnC2 and no protection measures are required	Rivers and sea: very low Surface water: negligible Groundwater: low

Contamination	
Source ► Pathway ► Receptor	**Risk Rating**
Heavy metals and hydrocarbons ► inhalation / ingestion / dermal exposure / ingestion of fruit and vegetables ► future residents	MODERATE / LOW
Heavy metals and hydrocarbons ► inhalation / ingestion / dermal exposure ► construction workers	MODERATE
Phytotoxic heavy metals ► direct update ► future planting	MODERATE / LOW
Heavy metals and hydrocarbons ► direct contact ► standard potable water pipes	MODERATE / LOW
Heavy metals and hydrocarbons ► inhalation / ingestion / dermal exposure / direct contact / groundwater flow ► protected habitat	MODERATE / LOW
Asbestos► inhalation ► future residents	MODERATE / LOW
Asbestos► inhalation ► construction workers	MODERATE
Hazardous Gas ► inhalation ► future residents	MODERATE
Hazardous Gas ► inhalation ► construction workers	MODERATE / LOW

RECOMMENDATIONS		
Intrusive Investigation	**Geotechnical**	**Other**
• The drilling of boreholes and excavation of machine dug trial pits to investigate the presence or absence of potentially contaminated soils and groundwater at the site. • Environmental sampling of the soil and water quality on site. • Installation of hazardous gas / vapour and groundwater monitoring standpipes with a programme of monitoring.	• Geotechnical assessments for foundation, road and drainage design.	• Pre-demolition assessment for asbestos-containing materials in existing structures. • A UXO desk study is recommended to establish the site-specific risk from UXO.

SECTION 1 INTRODUCTION

1.1 Esquire Developments proposes to develop an area of land located at Blackthorne Farm, Gravesend, Kent, DA13, for residential development purposes. The proposed development comprises:

i. Residential development of 100 dwellings;

ii. Public open space; and

iii. Sustainable urban drainage systems (SUDS).

1.2 A site location plan and proposed development plan are presented in Appendix 1.

1.3 IDOM Merebrook Limited (IDOM) has been commissioned by Esquire Developments to undertake a Tier 1 Preliminary Risk Assessment and to advise on the geo-environmental implications of the redevelopment of the site for the proposed end use.

1.4 The objectives of the investigation are to:

i. Assess the presence and significance of any potential sources of contamination at the site;

ii. Identify potential receptors at the site;

iii. Identify and assess plausible pathways between potential contaminant sources and receptors;

iv. Make a qualitative assessment of any identified risks and develop an initial site conceptual model; and

v. Determine if further assessment of any identified potential contaminant linkages is required.

1.5 A Tier 1 Preliminary Risk Assessment (Non-intrusive Investigation) has been undertaken for the subject site.

1.6 This report presents the findings of the Tier 1 Preliminary Risk Assessment and provides an interpretation of the geo-environmental conditions that exist at the site. The contaminative status of the site and the implications with respect to development have been interpreted in accordance with the current government guidance on source-pathway-receptor risk assessment. This report follows LCRM (Land Contamination Risk Management) guidance to ascribe a conservative qualitative appraisal of the hazards associated with the site.

1.7 This report has been prepared for Esquire Developments for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Esquire Developments and IDOM as to the extent to which the findings may be appropriate for their use.

SECTION 2 TIER 1 (NON-INTRUSIVE INVESTIGATION)

2.1 INTRODUCTION

2.1.1 The non-intrusive investigation has been conducted with reference to the documents and sources detailed in Table 1 below:

Table 1: Published data and information sources

Source Data - Other			
Radon: guidance on protection measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects) 2023 edition		BGS Geology of Britain 1:50,000 online maps	
Environment Agency online surface water flood maps		UK National Air Quality Archive, online	
Source data - Groundsure Data			
Ordnance Survey (OS) historical maps scaled at 1:10,560, 1:10,000, 1:2,500 and 1:1,250 dated 1864 - 2025			
Past land use	Agricultural designations	River and coastal flooding	Mining and ground workings
Waste and landfill	Habitat designations	Surface water flooding	Ground cavities and sinkholes
Current industrial land use	Geology	Groundwater flooding	Radon
Hydrogeology	Boreholes	Environmental designations	Soil chemistry
Hydrology	Natural ground subsidence	Visual and cultural designations	Railway infrastructure and projects

2.1.2 The above sources are all authoritative and it is believed that they are reasonably reliable. However, independent verification of the information supplied has not necessarily been carried out and IDOM cannot be held liable for inaccuracies or deficiencies in the information.

2.2 SITE LOCATION AND SETTING

2.2.1 The site is located at Blackthorne Farm, Gravesend, Kent, DA13.

2.2.2 The site occupies an area of approximately 5.43 hectares located at National Grid Reference 563758, 163417 and presented in Appendix 1 of this report.

2.2.3 The site is bounded by Heron Hill Lane to the north of the site and A227 road to the west of the site. There are a few residential dwellings north, east and south adjacent

to site. The site is generally level with a notable drop in elevation between Field 1 and the deciduous woodland band. Slopes are present towards the east of Field 2.

2.2.4 An IDOM engineer undertook a site walkover on March 13th, 2025.

2.2.5 The site comprised farm buildings and fields as illustrated in Figure 1.

2.2.5.1 Field 1 is in the northernmost area with a car repair garage adjacent to site.

2.2.5.2 Fields 1 and 2 are divided by a band of deciduous woodland having a dilapidated structure

2.2.5.3 Field 3 is located south of the main farm buildings.

2.2.6 The following potential sources of contamination were recorded:

i. Shed with suspected asbestos-containing materials (felt);

ii. Suspected asbestos roofing on stable 3 (cement);

iii. Manure heap with evidence of waste burning; and

iv. Storage units containing chemical drums.

2.2.7 Photographs are presented in Appendix 5 and a selection is presented below (Plates 1 to 7).

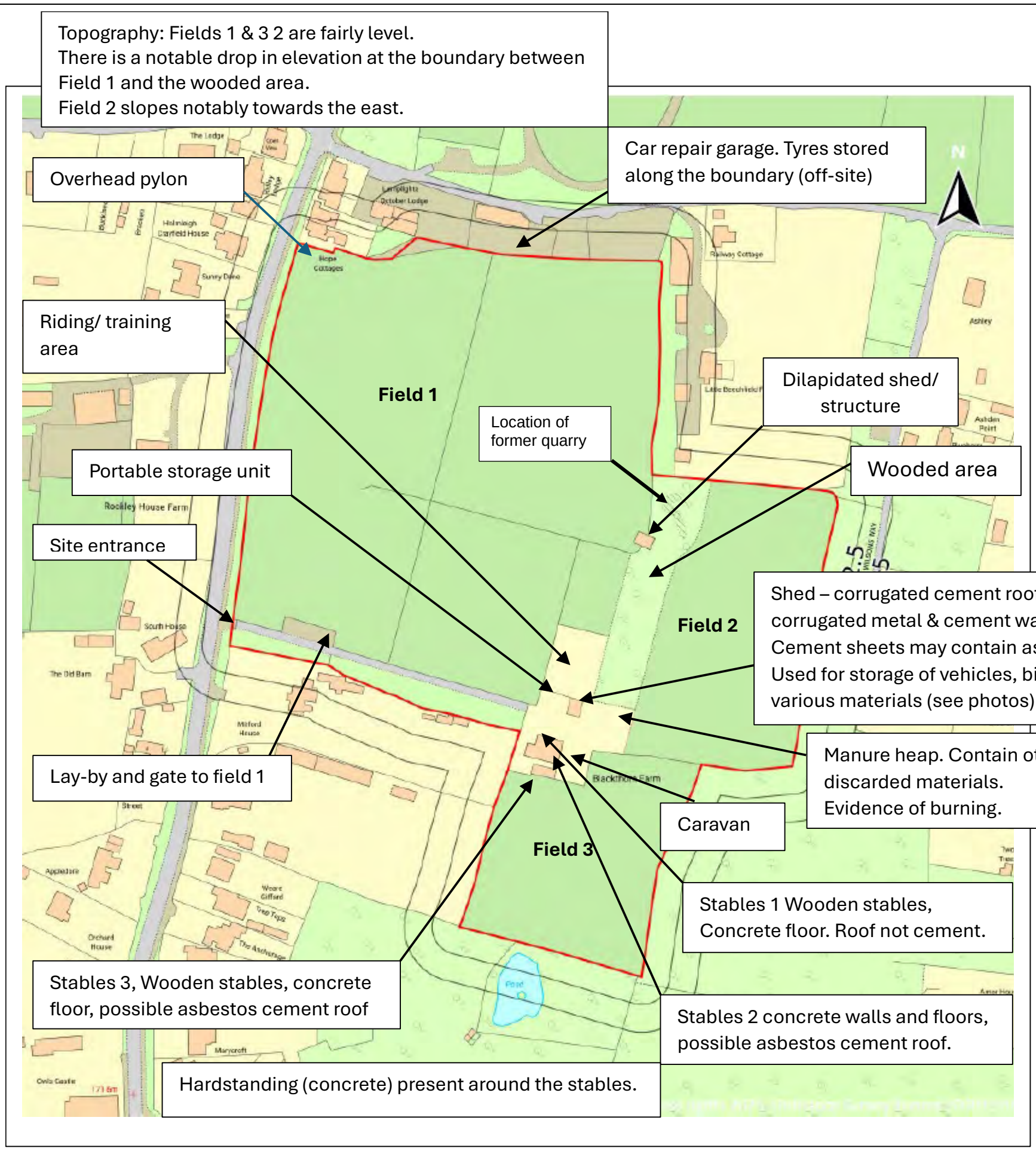


Figure 1: Map of the site highlighting the main potential sources of contamination observed on site walkover. The location of the former quarry is also indicated.

Plate 1: Shed with potential asbestos containing material (corrugated cement)

Plate 2: Stable roof with potential asbestos containing material (bitumen roof felt)

Plate 3: Manure heap with evidence of waste burning

Plate 4: Manure heap – evidence of burning

Plate 5: Dilapidated shed

Plate 6: chemical containers near shed

Plate 7: Waste disposed on site near shed

2.3 SITE HISTORY

2.3.1 The site history, based on a review of the historic and current maps, dating from 1864 to 2025 is summarised in Table 2 below. Potentially contaminative land uses are shown in **bold**. Copies of key maps used in this review are provided in Appendix 2.

Table 2: Summary of the key features shown on historic maps

Data Source	Site / Surroundings
1865 – 1895 (1:2,500 scale and 1:10,560 scale).	Site The site is largely undeveloped except for a track indicated to bisect Field 1 from west to east from South Street to the corridor of woodland separating Field 1 and Field 2.
	Surroundings Predominantly rural with undeveloped fields woods and scattered properties. **Orchards** are located to the western and southern boundaries. A Beer House is located to the southwest corner of Field 1 on South Street. There are several **chalk pits** indicated approximately 400 to 500 m from site. A **Smithy** is located approximately 300 m to the west of site, off Chapman's Hill. Woods (Willow Wood, Scrubs Wood and Beechen Wood) are located within 500 m to the southeast of site.

Data Source	Site / Surroundings
1896 – 1955 (1:10,560 and 1:2,500 scale).	Site A **quarry** is illustrated in the northern section of the wooded corridor between Field 1 and Field 2.
	Surroundings Increased amounts of properties within 500 m of site including a **school**, GP and **allotments** associated with the settlement of Culverstone Green to the south of the site. Former **chalk pits** no longer illustrated. The former Beer House is now indicated to be a **pond**.
1964 - 1985 (1:10,560 scale and 1:2,500 scale).	Site A small rectangular **structure** appears on site on the 1977 1:2,500 map in the current location of the main farm buildings.
	Surroundings Increased residential development especially in the southeast where much of the woods have made way for houses. A **Poultry Farm** is indicated 100 m to the south of site. A **Builders Yard** is located to the northern boundary of Field 1. **Orchards** no longer illustrated. **Ridley Turning Garage** approximately 50 m northwest of site.
2001 to 2025 (1:10,000 scale).	Site Building on site is now labelled as **Blackthorn Farm** and additional **buildings** are illustrated in 2010 mapping.
	Surroundings **Pond** is illustrated south of the site where the former **poultry farm** was located but is not mapped in 2025. Inspection of satellite imagery appears to show this feature undergoing terrestrialization from 1990. **Ridley Turning Garage** replaced by residential properties before 2001.

2.3.2 In summary historic plans show that, with the exception the quarry, the site was undeveloped until the 1970s when a small rectangular structure (likely a stable) appeared on the present location of the main farm stable buildings.

2.3.3 The quarry was noted to be overgrown during the site walkover but historic use of the area to deposit wastes cannot be discounted, and it may be a potential contamination source.

2.3.4 Asbestiform material may have been used in the construction of the sheds and stables on site given their age and are therefore also considers as a potential contamination source.

2.3.5 The recorded off-site potentially contaminative features which may have affected the subject site are considered to be:

i. the terrestrialized pond to the southern boundary which may contain putrescible organic matter and be a source of hazardous ground gas, although

unlikely to be significant given the period of time elapsed since it became infilled; and

ii. the vehicle service and tyre shredding centre to the northern boundary where they may have been spills and leaks of fuels, oils, paints and solvents.

2.3.6 Extracts of key maps are presented below.

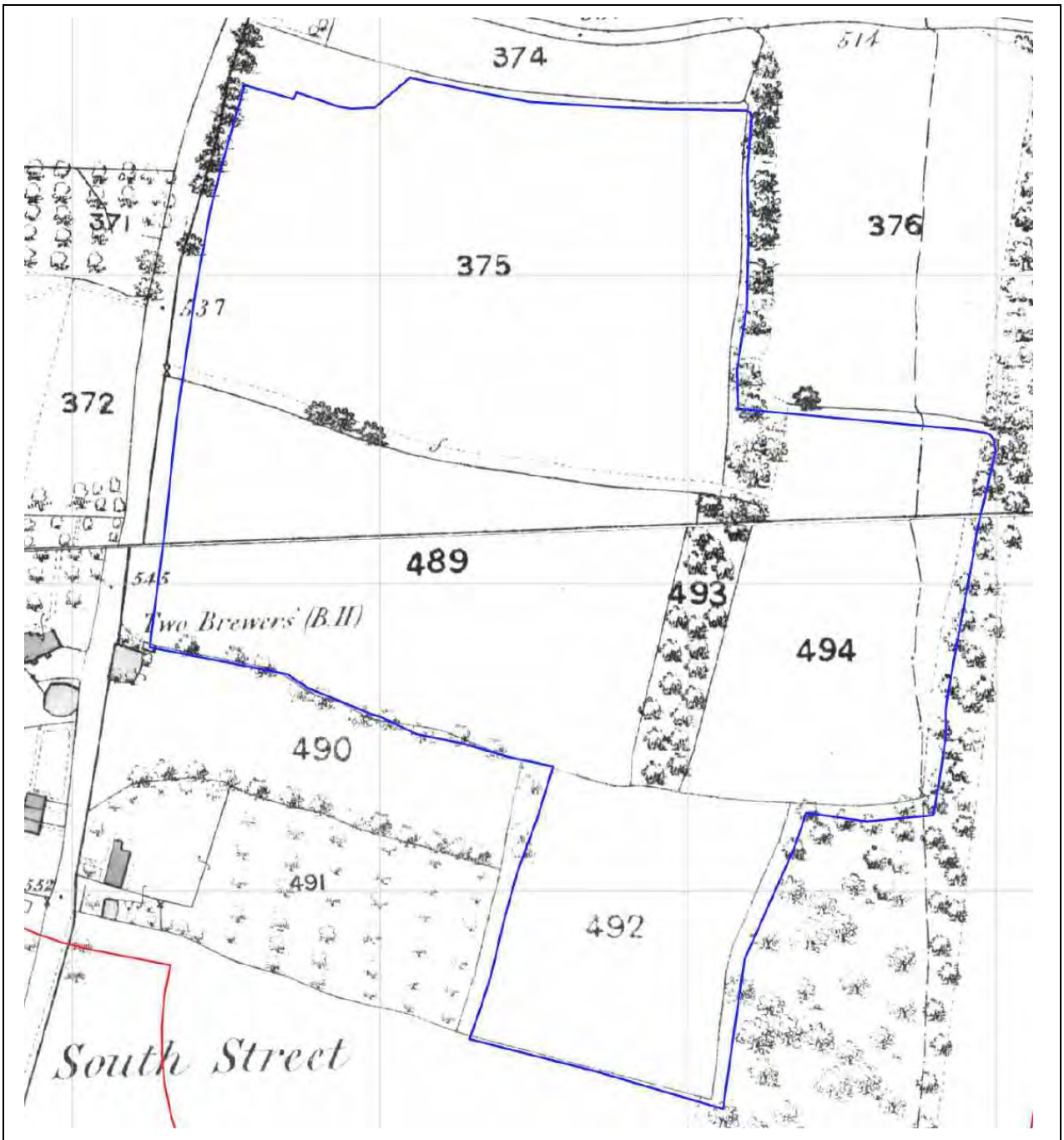


Figure 2: 1865 1:2,500 map showing Two Brewers Beer House and track bisecting Field 1. Surrounding orchards to the west and south.

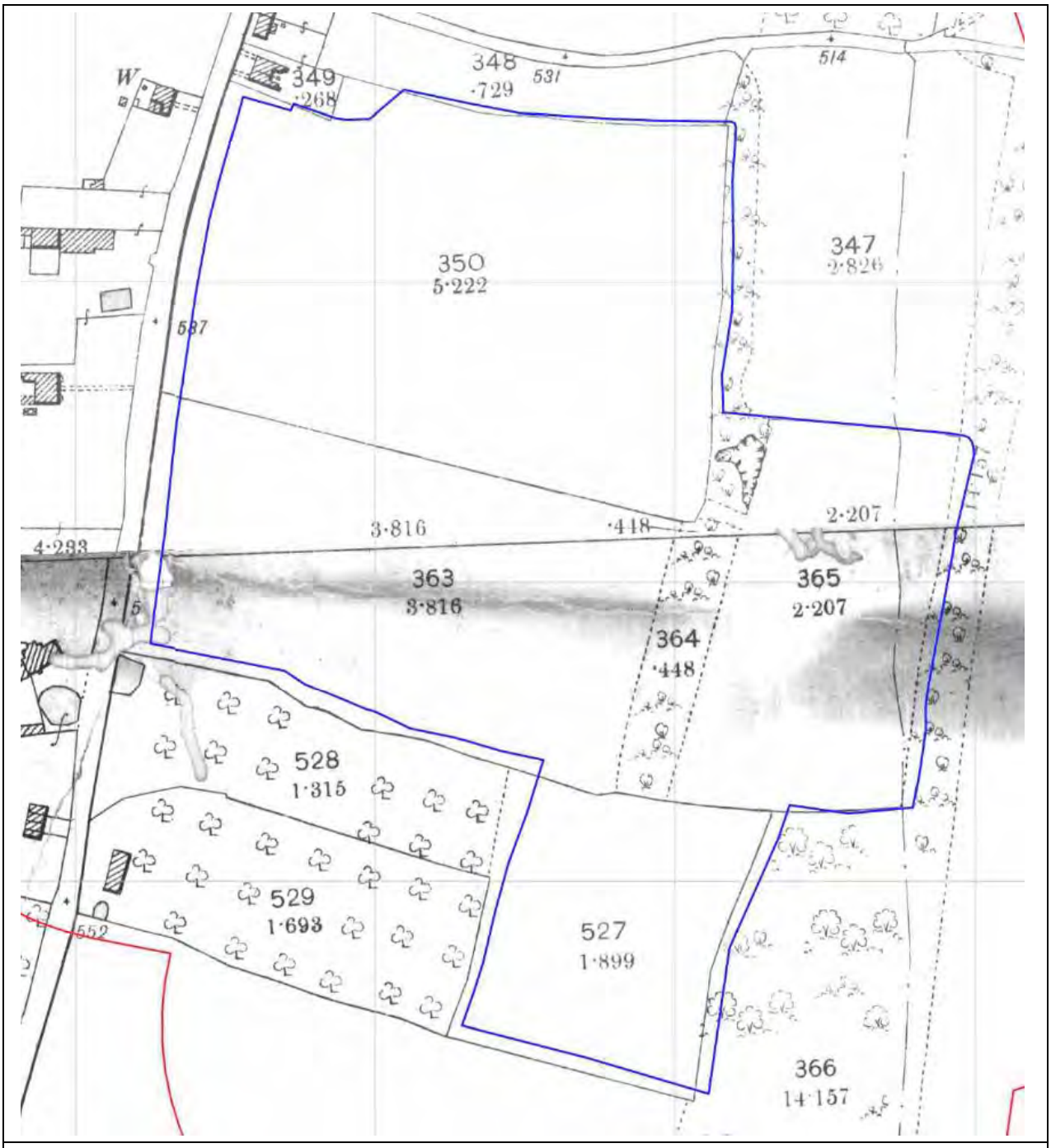


Figure 3: 1896 1:2,500 map with quarry first illustrated

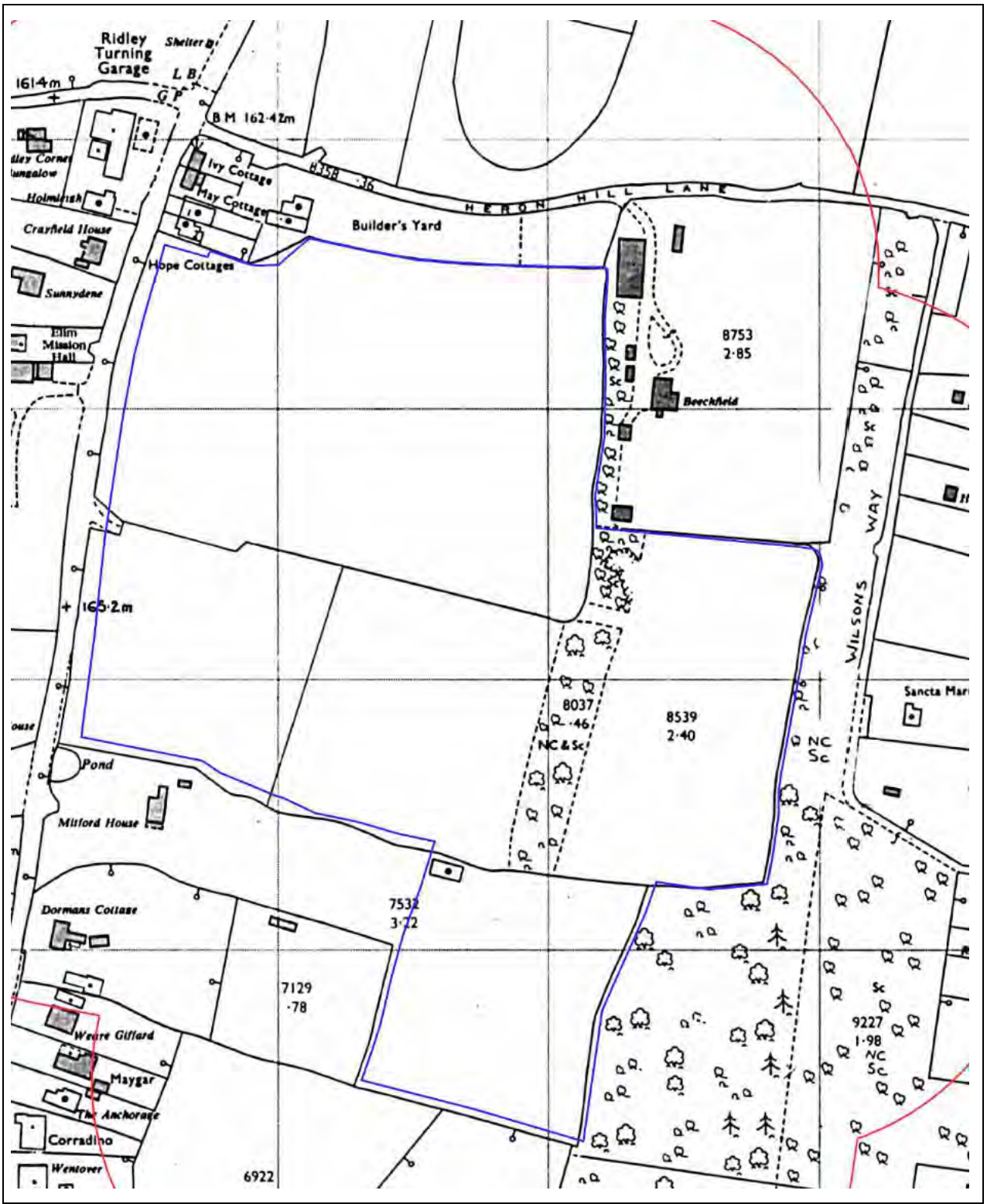


Figure 4: 1985 1:2,500 map shows immediately surrounding development and the first structure to appear on site (first illustrated on a 1977 map). Ridley Turning Garage last mapped northeast of site before being replaced with residential properties. The Builders Yard to the north of the site later becomes a tyre shredders and vehicle service, repair and testing centre.

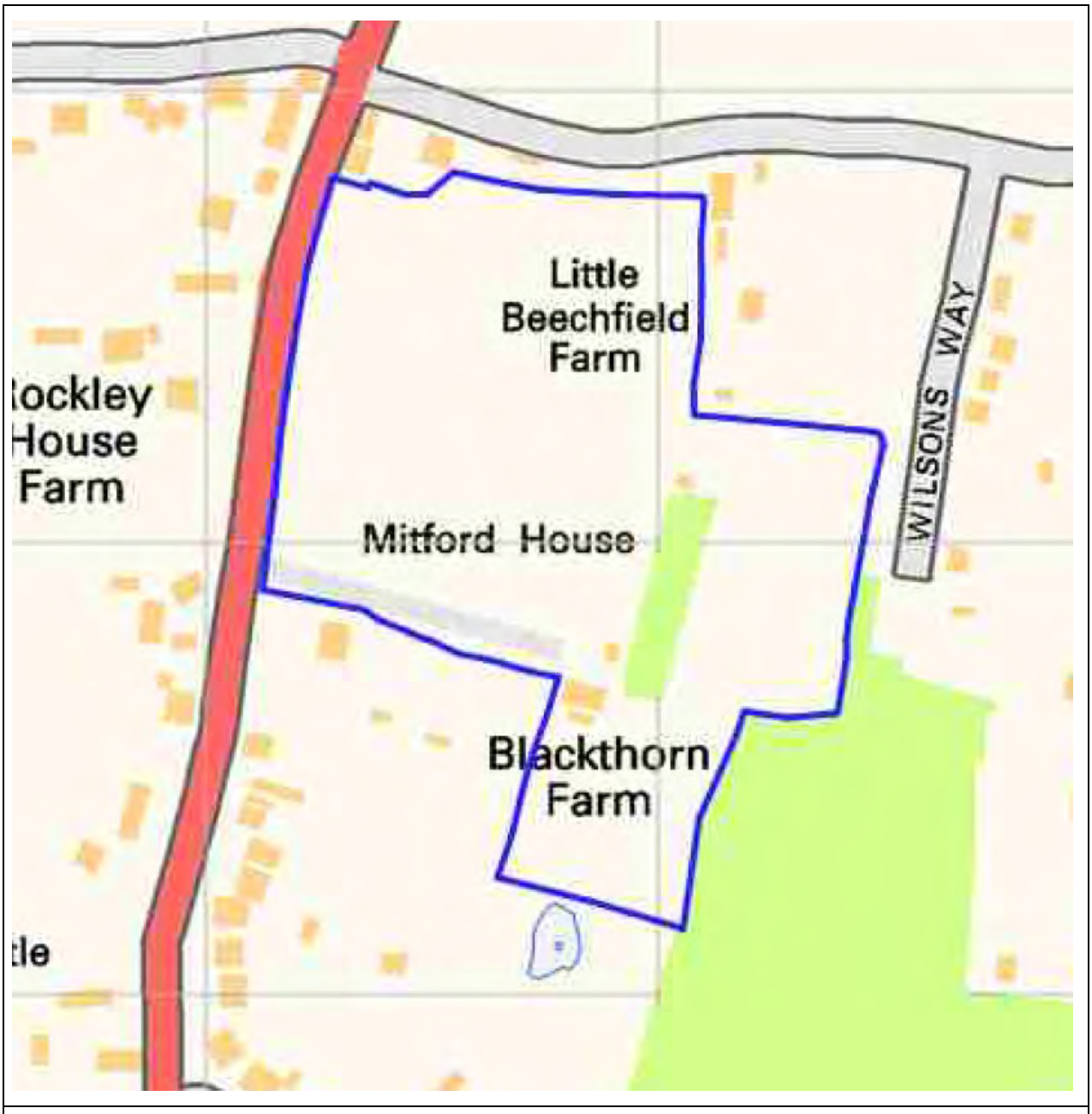


Figure 5: 2010 1:10,000 map showing further structures onsite and off-site former pond to the south

2.3.7 Given the nature of the historical mapping process (scale, representation of conditions at discrete time intervals frequency *etc*.), any such maps and plans may not provide a comprehensive account of a site's history. Identification of pertinent land uses and associated potentially contaminative activities, may therefore be absent from mapping records.

2.4 GEOLOGY

2.4.1 There are no records of artificial or made ground on site.

2.4.2 The majority of the site is underlain by superficial deposits of the Clay-with-flints Formation, characteristically orangish brown and reddish brown sandy clay with abundant nodules and rounded pebbles of flint. No superficial deposits are recorded in the east of site (Field 2).

Figure 6: Superficial Clay-with-flints formation

2.4.3 The site is underlain by bedrock of the Lewes Nodular Chalk Formation in the east and Seaford Chalk Formation.

Figure 7: Bedrock geology

2.4.4 A borehole log from 1985 located approximately 600 m southwest of the site indicates the presence of Clay-with-flints Formation to an approximately depth of 6.0 m bgl. Underneath, chalk with gravel and cobbles of flint was recorded to a depth of 14.10 m bgl, where the borehole was terminated. A copy of the log is presented in Appendix 3.

2.5 BACKGROUND SOIL CHEMISTRY

2.5.1 Data published by the BGS indicates the following background chemistry concentrations can be expected at the site:

i. Arsenic – 15 - 25 mg/kg;

ii. Lead – 100 mg/kg;

iii. Bioaccessible Lead – 60 mg/kg;

iv. Cadmium – 1.8 mg/kg;

v. Chromium – 60 - 90 mg/kg;

vi. Nickel – 15 – 30 mg/kg.

2.5.2 These heavy metal concentrations are not considered to be a potential risk to human health.

2.6 HYDROGEOLOGY

2.6.1 The superficial geology (where present) is designated as Unproductive aquifer. Records from Groundsure indicate the superficial aquifer has low permeability and has negligible significance for water supply or river base flow.

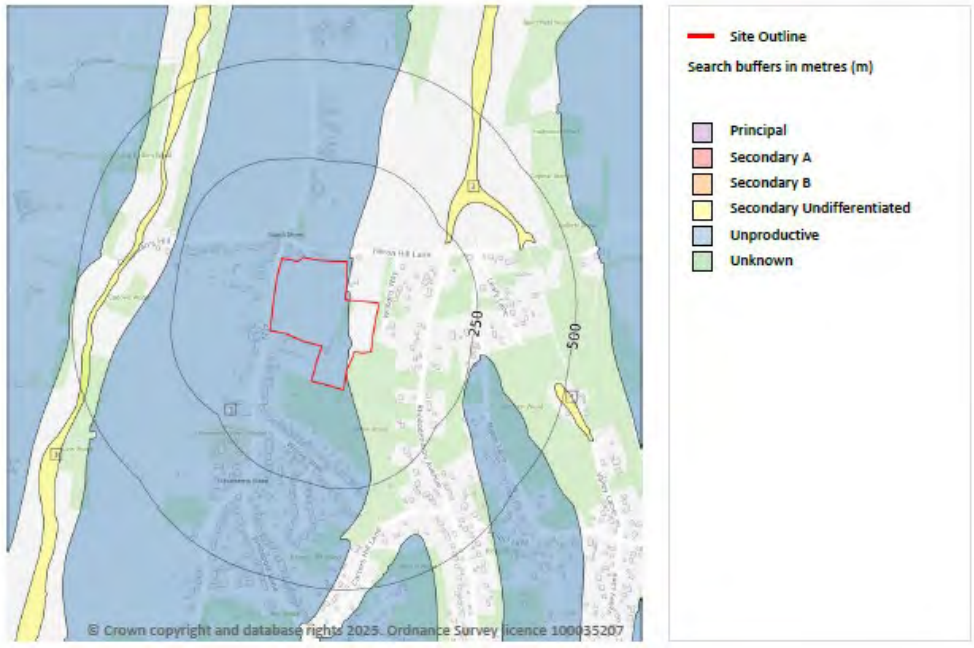


Figure 8: Unproductive superficial aquifer on site

2.6.2 The bedrock Chalk Formations are all designated as Principal Aquifer. Records from Groundsure indicate that the bedrock aquifer has medium vulnerability.

2.6.3 The site is located within the groundwater Source Protection Zone 3: Total Catchment. The site is located within the: North Kent Medway Chalk WFD Groundwater Body. The water body has poor overall rating and poor chemical rating.

2.6.4 There are no groundwater abstractions for potable or non-potable use located within 2 km of the site.

2.7 HYDROLOGY

2.7.1 There are no surface water features within 500 m of the site.

2.7.2 The site forms part of the Lower Medway Coastal Catchment and is expected to drain to the sea, rather than a freshwater body.

2.7.3 There are no licensed surface water abstractions located within 2 km of the site.

2.8 FLOODING

2.8.1 The site is not indicated to be in an area benefitting from flood defences. Historical flood events are not indicated to have occurred on the site. The risk of flooding, based on Risk of Flooding from Rivers and Sea (RoFRaS) models is indicated to be very low.

2.8.2 Environment Agency Flood Zone information is used within the planning system to help determine whether flood risk assessments are required for development. Flood Zones do not take into account any flood defences. Flood risk assessments are not required for a development that's less than 1 ha in Flood Zone 1 unless it could be affected by sources of flooding other than rivers and the sea, in all other cases a flood risk assessment will be required. The site is designated as Flood Zone 1.

2.8.3 Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events. The mapping indicates the site is at negligible risk from surface water flooding.

2.8.4 Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Modelling shows the majority of the site lies in an area that is at low risk and the easternmost area of the site is at negligible risk of groundwater flooding.

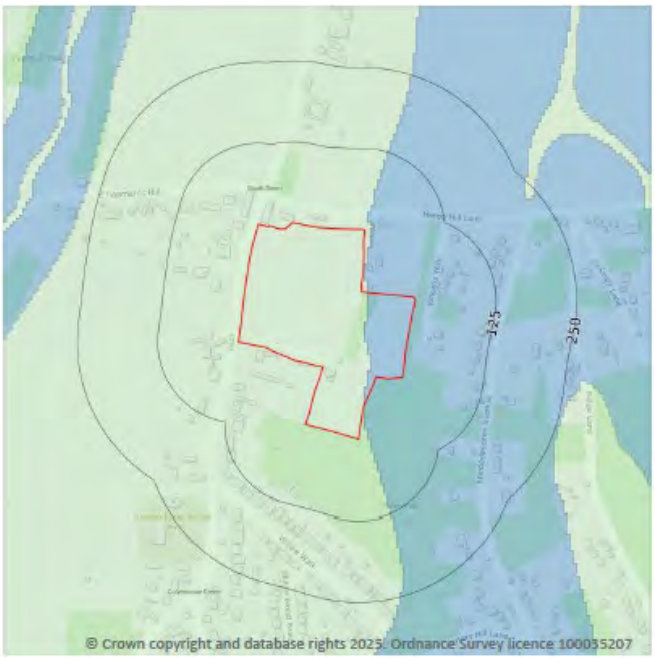


Figure 9: Groundwater flooding risk

2.8.5 The maximum identified flood risks in each category are summarised in Table 3 below:

Table 3: Summary of flood risk

Risk of Flooding from Rivers and Sea (RoFRaS)	Environment Agency Flood Zone	Surface Water Flooding	Groundwater Flooding
Very Low The chance of flooding from rivers or the sea is considered to be less than 1 in 1000 (0.1%) in any given year or equal to 1 in 30 (3.3%) in any given year.	Zone 1 – little or no risk with an annual probability of flooding from rivers and the sea of less than 0.1%	negligible	Negligible (easternmost area of the site)

2.9 CURRENT SITE ISSUES

2.9.1 Potentially significant environmental issues have been investigated within relevant distances of the site, based on the database of records supplied by Groundsure. These relate to the following searches:

i. Water discharge or pollution incidents within 250 m of the site;

ii. Waste management sites within 250 m of the site;

iii. Statutory authorisations within 50 m of the site;

iv. Trades of possible contaminative use within 50 m of the site;

v. Special protection or conservation areas within 50 m of the site; and

vi. Any other relevant issues.

2.9.2 Potentially significant environmental issues identified by the above searches are summarised in Table 4. It is noted that Groundsure has interpreted a circular feature to the east of the site as a tank, however this has been confirmed to be a decorative water feature.

Table 4: Potentially significant environmental issues

Environmental Category	Description
Water discharge or pollution incidents within 250 m	none
Waste management sites within 250 m	none
Statutory authorisations within 50 m	There are 14 waste exemptions all registered at the same site to the north of the site boundary (Heron Hill Lane, Meopham, DA13 0QL) related to treating (mechanical treatment of end of life tyres) and storing waste.
Trades of possible contaminative use within 50 m	There are two trades of possible contaminative use: *i.* Paynes Cars (vehicle repair, testing and service) located 13 m north of the site (the same location where waste exemptions have been registered) *ii.* A historical garage (Ridley Turning Garage) located northwest of the site and last mapped in 1985.
Special protection or conservation areas within 50 m	The site is located within designated Green Belt. The woodland to the eastern boundary is designated as Ancient Woodland.
Other	There are two licensed sewage effluent discharges onto land listed 140 and 186 m east of the site.

2.10 INDICATIVE GROUND STABILITY HAZARDS

2.10.1 Table 5 summarises the identified natural ground subsidence hazard ratings.

Table 5: Summary of natural ground subsidence hazards

Type	Maximum Hazard rating
Shrink swell clays	Mostly low coincident where superficial deposits present
Running sands	Negligible
Compressible deposits	Negligible
Collapsible deposits	Very low
Landslides	Low but only to northeastern boundary of Field 1 with majority of site Very Low and Field 2 Negligible.
Ground dissolution of soluble rocks	Moderate except Field 2 (Very Low)

2.10.2 The presence of potential solution features in the underlying chalk bedrock may be a constraint to development of the site and is likely to require intrusive investigation to identify any occurrences.

2.11 MINING, GROUND WORKINGS AND NATURAL CAVITIES

2.11.1 There are no records of significant mining or ground working activities in the vicinity that may potentially influence the site. It is, however, noted that the historical maps do illustrate a quarry on site which has not been identified by the Groundsure report as a surface ground working. This feature was positively identified in the site walkover as an overgrown depression in the ground with steep sides.

2.11.2 There are no records of ground cavities or sinkholes within a 500 m radius of the site.

2.12 RADON GAS

2.12.1 The licensed Radon Potential Dataset for the site has been consulted. The Radon Potential is shown in six discrete Radon Classes (RnC1 to RnC6) as set out in Table 6. The Radon Class is defined as a percentage probability range of dwellings exceeding the Radon Action Level.

Table 6: Radon classes, risk and mitigation

Radon Class (probability range)	General Risk	Affected Area ?	Building Control Regulations (England and Wales)
1 (0 to <1%)	low	No	No *
2 (1 to <3%)	medium	Yes	No *
3 (3 to <5%)		Yes	Yes - Basic
4 (5 to <10%)		Yes	Yes - Basic
5 (10 to <30%)	high	Yes	Yes - Full
6 (30 to 100%)		Yes	Yes - Full

* Fitting radon protection in new buildings might be considered if there is a high risk location such as a routinely occupied basement

2.12.2 The licensed Radon Potential Dataset has been obtained from Groundsure which illustrates the 25 m tiled mapping and is provided in Appendix 3. This data is the highest resolution radon dataset available for the UK, produced to a 50 m accuracy. This data has been pre-buffered to account for the relative accuracy and other uncertainties, so no additional buffering on site is required.

2.12.3 The site-specific Radon Potential Dataset and Guidance issued by the Buildings Research Establishment (BRE-211) indicates that the site lies within an area designated RnC2 and no radon protection measures are required under the Building Control Regulations.

2.12.4 Temporary site buildings can also be affected by radon. The Ionising Radiations Regulations 2017 apply where "*any work (other than a practice) is carried out in an atmosphere containing radon 222 gas at an annual average activity concentration in air exceeding 300 Bq.m^{-3}*." In accordance with HSE guidance, a site specific radon risk assessment for the workplace should be carried out where buildings are located in an area affected by radon (RnC2 and above).

2.13 UXO

2.13.1 Regional Unexploded Bomb Risk Maps published by Zetica have been consulted which show a moderate risk. The site is mostly undeveloped, therefore a UXO Desk Study and Risk Assessment is recommended to confirm the risk rating.

2.14 AIR QUALITY

2.14.1 The site does not lie within a designated Air Quality Management Area (AQMA) for Local Authority.

2.15 PROTECTED HABITAT

2.15.1 Information from environmental designations dataset was obtained from the Groundsure Report to identify any ecological receptors that might be relevant to the contamination risk assessment for the site. The following three records of deciduous woodland to the southern and eastern site boundaries are considered to be potentially relevant receptors as illustrated below:

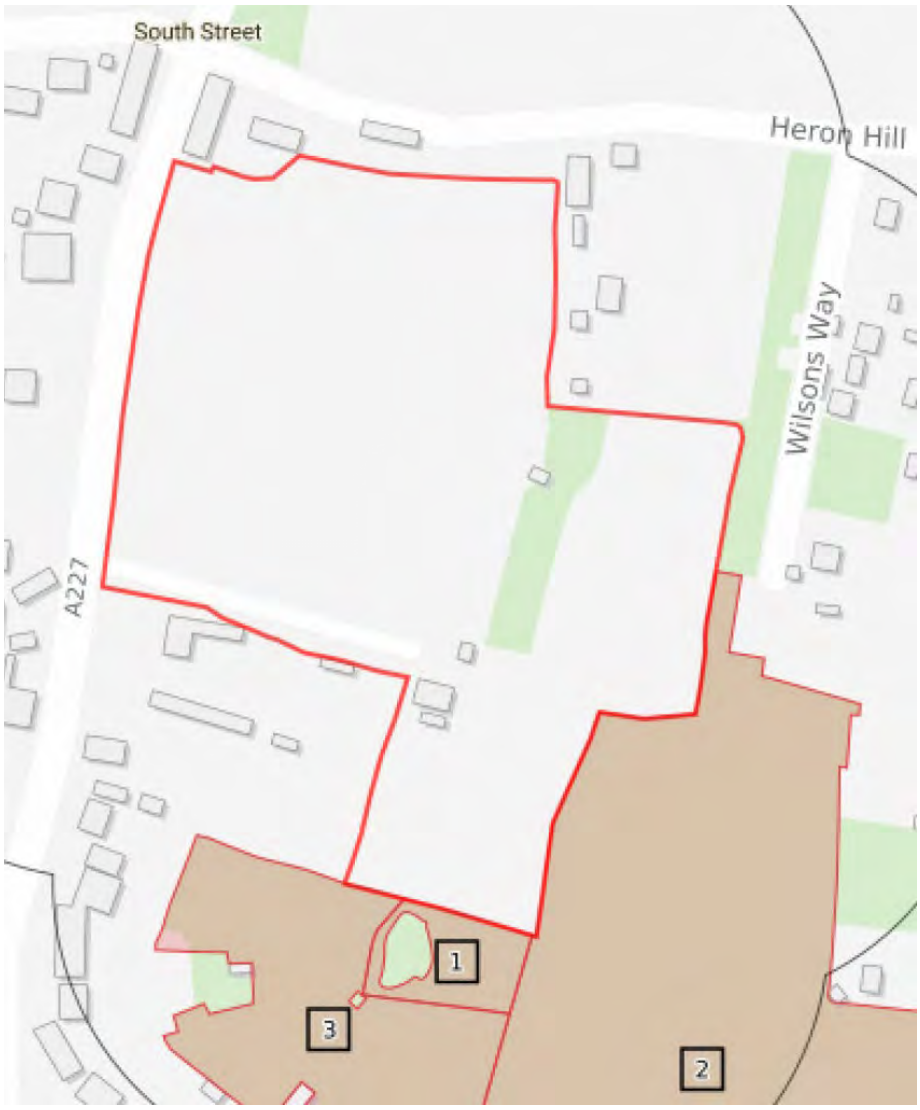


Figure 10: Three records of deciduous woodland (Priority Habitat) to southern and eastern boundaries

2.16 ARCHAEOLOGICAL SITES AND ANCIENT MONUMENTS

2.16.1 Information from the visual and cultural designations dataset was obtained from a review of the Groundsure online data viewer to identify any archaeological, historic building or historic site receptors that might be relevant to the contamination risk assessment for the site. There are considered to be no potentially relevant receptors within 2050 m of the site.

2.17 PREVIOUS INVESTIGATIONS

2.17.1 No known previous investigation data exists for the site.

2.18 PLANNING HISTORY

2.18.1 Publicly available online planning records were searched on Gravesham Borough Council website show the following previous applications on site:

i. Reference 19480002; “Erection of a bungalow”. Refused September 1948.

ii. Reference 19520351; “Development of land for residential purposes”. Refused 11 March 1953; and

iii. Reference 20000449; “Erection of a replacement barn”. Withdrawn November 2000.

SECTION 3 PRELIMINARY CONCEPTUAL SITE MODEL

3.1 A preliminary conceptual site model (CSM) has been developed from the findings of the desk study and site reconnaissance. The CSM has been developed using the framework established in Part IIA of the *Environmental Protection Act 1990* and detailed in:

i. Environment Agency guidance *Land Contamination Risk Management* published on gov.uk; and

ii. BS EN ISO 21365:2020 - Soil quality – Conceptual site models for potentially contaminated sites.

3.2 The desk study and site reconnaissance has identified the following potentially significant sources of contamination:

i. asbestiform materials associated with onsite structures;

ii. spills and leaks from chemical/fuel storage on site;

iii. potential for PAH and heavy metal contamination from waste burning;

iv. potential for deposits of made ground in former quarry;

v. potential for fugitive ground gas emissions from adjacent terrestrialized pond; and

vi. potential for migration of mobile contaminants / vapours from spills or leaks at adjacent car servicing and tyre shredding centre to the north of site.

3.3 Given the fields have been used for grazing it is considered unlikely that there has been significant pesticide or herbicide use.

3.4 The following receptors have been considered:

i. Present site users;

ii. Future residents/users;

iii. Construction workers;

iv. Plants used in landscaping;

v. Potable water supply pipework;

vi. The general public and adjacent site users;

vii. Controlled waters (groundwater only as there are no relevant surface water receptors); and

viii. Protected habitats.

3.5 The following migration pathways are considered to be potentially viable:

i. inhalation of dust generated from contaminated soils;

ii. inhalation of organic vapours;

iii. inhalation of airborne asbestos fibres through disturbance of asbestos contaminated soils and / or asbestos containing materials;

iv. inhalation of radon generated through radioactive decay of uranium;

v. inhalation of hazardous ground gas generated from potentially putrescible soils;

vi. inhalation of other hazardous materials;

vii. direct ingestion of contaminated soils;

viii. ingestion of produce grown on site;

ix. dermal exposure to contaminated soils;

x. direct contact of plants with soils containing phytotoxic concentrations of heavy metals;

xi. direct contact of contaminated made ground soils with permeable plastic potable water supply pipes;

xii. vertical and horizontal migration of mobile soil contaminants to controlled waters; and

xiii. horizontal migration of mobile soil contaminants to protected habitats.

3.6 The preliminary CSM is presented in Table 7 below.

Table 7: Preliminary Conceptual Site Model

POTENTIAL CONTAMINANT SOURCE	RELEASE MECHANISM	PATHWAY	EXPOSURE ROUTE	RECEPTOR								
				Present Site Users / General Public	Future Residents / Site Users	Construction Workers	Future Planting	Water Supply Pipes	Adjacent Site Users	Controlled Waters: Surface Water	Controlled Waters: Aquifer	Protected Habitat
SOIL (HEAVY METALS AND HYDROCARBONS)	DUST	AIR	INHALATION	✓	✓	✓			✓			✓
	DIRECT	DIRECT	INGESTION	✓	✓	✓						✓
	DIRECT	DIRECT	DERMAL EXPOSURE	✓	✓	✓						✓
	DIRECT	DIRECT SOIL / SEDIMENT	DIRECT CONTACT / UPTAKE				✓	✓				✓
	PLANT UPTAKE	GARDEN FRUIT AND VEGETABLES	INGESTION	✗	✓							
	INFILTRATION / LEACHING	GROUNDWATER FLOW	DIRECT								✓	✓
	RUNOFF	SURFACE WATER FLOW	DIRECT							✗		✗
MADE GROUND (ASBESTOS)	FIBRE RELEASE	AIR	INHALATION	✓	✓	✓			✓			
SOIL (CHALK / PUTRESCIBLE)	GAS FROM DECOMPOSITION	AIR	INHALATION	✓	✓	✓			✓			
SOIL (VOC)	VAPOUR FROM VOLATILISATION	AIR	INHALATION	✓	✓	✓			✓			
GROUNDWATER (VOC)	VAPOUR FROM VOLATILISATION	AIR	INHALATION	✓	✓	✓			✓			
GROUNDWATER (DISSOLVED CONTAMINANTS)	DIRECT	BASEFLOW TO SURFACE WATER	DIRECT							✗		✗
URANIUM IN UNDERLYING STRATA	RADON FROM RADIOACTIVE DECAY	AIR	INHALATION	✓	✓	✓						

✗ SOURCE►PATHWAY►RECEPTOR NOT COMPLETE AND NO FURTHER ACTION REQUIRED
✓ SOURCE►PATHWAY►RECEPTOR COMPLETE AND FURTHER ACTION REQUIRED

SECTION 4 TIER 1 PRELIMINARY RISK ASSESSMENT

4.1 INTRODUCTION

4.1.1 Risk from contamination has been assessed using the source-pathway-receptor and pollutant linkage methodology, whereby a risk can only exist if all elements of: source, pathway and receptor, are present.

4.1.2 The level of risk considers the likelihood of the risk occurring and the severity of the potential consequence of that risk using the approach outlined in Appendix 5. As illustrated in Table 8, this Tier 1 preliminary risk assessment combines the likelihood and severity of the risk using a Risk Assessment Matrix approach as recommended by CIRIA C552, 2001 and updated in *Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66* published by NHBC, EA and CIEH (2008).

Table 8: Risk assessment matrix (after CIRIA C552 and R&D66)

		MAGNITUDE OF POTENTIAL CONSEQUENCE (SEVERITY) OF RISK			
		SEVERE	**MEDIUM**	**MILD**	**MINOR**
LIKELIHOOD OF RISK	**HIGH LIKELIHOOD**	Very High Risk	High Risk	Moderate Risk	Low Risk
	LIKELY	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	LOW LIKELIHOOD	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	UNLIKELY	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

4.1.3 For each full pollutant linkage identified in the conceptual model, a risk rating has been assigned and presented in the proceeding sections.

4.2 SOIL CONTAMINATION (HEAVY METALS AND HYDROCARBONS)

4.2.1 The site may be impacted by localised spillages of fuel or chemicals. Burning of wastes has occurred on site and soils may also be locally impacted. There is also the potentially for potentially contaminated made ground within the former quarry.

4.2.2 There is a limited potential for migration of mobile contaminants from the car servicing and tyre recycling centre to the north.

4.2.3 There is no public access to site and no full time site users, therefore the overall risk to these receptors is considered to be low.

4.2.4 Residents of any future development are more likely to be exposed to any potentially contaminated site soils, therefore the overall risk is considered to be moderate / low.

4.2.5 Construction workers are considered to be at the greatest risk of exposure to soil contamination during works that require direct handling, processing and excavation of soils and therefore the resultant overall risk is considered to be moderate.

4.2.6 It is unlikely any made ground will be suitable for standard polymeric potable water supply and therefore the overall risk rating is considered to be moderate / low.

4.2.7 The presence of heavy metals in made ground at phytotoxic concentrations cannot be ruled out and therefore the risk to future planting is considered to be moderate / low.

4.2.8 The overall risk to adjacent site users is considered to be low as the generation of significant quantities of potentially contaminated fugitive dust from site that may affect human health is considered to be low.

4.2.9 The majority of the site is indicated to be underlain by cohesive superficial deposits which may act as an aquitard to vertical migration of any mobile contaminants. However, the eastern field is indicated to have no cohesive superficial deposits and therefore the risk to groundwater through infiltration and leaching of mobile contaminants is considered to be moderate / low.

4.2.10 Priority habitat woodland and Ancient Woodland is located to the southern and eastern site boundary. Fugitive dusts may be generated during the construction phase, therefore the potential overall risk to protected habitats is considered to be moderate / low.

4.2.11 Table 9 below summarises the level of risk assigned to each receptor from soil contamination:

Table 9: Risks from soil contamination (heavy metals and hydrocarbons)

Receptor		Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users		dust inhalation	unlikely	medium	LOW
		direct ingestion	unlikely	medium	LOW
		dermal exposure	unlikely	medium	LOW
Residents of future development		dust inhalation	likely	mild	MODERATE / LOW
		direct ingestion	likely	mild	MODERATE / LOW
		dermal exposure	likely	mild	MODERATE / LOW
		ingestion of fruit / vegetables	likely	mild	MODERATE / LOW
Construction workers		dust inhalation	likely	medium	MODERATE
		direct ingestion	likely	medium	MODERATE
		dermal exposure	likely	medium	MODERATE
Future planting		direct uptake of phytotoxic metals	low likelihood	medium	MODERATE / LOW
Water supply pipes		direct contact leading to corrosion / permeation	low likelihood	medium	MODERATE / LOW
Adjacent site users		fugitive dust inhalation	low likelihood	mild	LOW
Controlled waters	Aquifer	infiltration / leaching	low likelihood	medium	MODERATE / LOW
Protected habitat		dust deposition (demolition / construction phase)	likely	mild	MODERATE / LOW
		direct ingestion (fauna feeding / drinking)	likely	mild	MODERATE / LOW
		dermal exposure (fauna)	likely	mild	MODERATE / LOW
		direct contact (flora)	likely	mild	MODERATE / LOW
		groundwater flow to hydrologically connected habitat	low likelihood	medium	MODERATE / LOW

4.1 SOIL CONTAMINATION (ASBESTOS)

4.1.1 The presence of asbestiform materials in structures is strongly suspected and it cannot be discounted that made ground soils may also be affected with debris. The risks of airborne fibre release from low risk products such as cement and soils is, however, considered to be relatively low.

4.1.2 The public or present users are unlikely to be significantly exposed and therefore the overall risk is considered to be low.

4.1.3 Residents of the future development may have an increased of exposure to contaminated soils through gardening activities and therefore the overall risk is considered to increase to moderate / low.

4.1.4 Construction workers are at greatest risk of exposure through handling of soils and materials that may contain asbestos.

4.1.5 It is unlikely that significant fugitive airborne asbestos fibres would be released that may affect adjacent site users.

4.1.6 Table 10 below summarises the level of risk assigned to each receptor from asbestos contamination of soils:

Table 10: Risks from soil contamination (asbestos)

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	inhalation of airborne fibres generated from dry soils	unlikely	medium	LOW
Residents of future development		low likelihood	medium	MODERATE / LOW
Construction workers		likely	medium	MODERATE
Adjacent site users		unlikely	medium	LOW

4.2 HAZARDOUS GAS

4.2.1 The underlying chalk could be a source of carbon dioxide ground gas due to natural weathering processes, however, recent NHBC guidance[1] suggests that due to the extremely slow rate of degradation in all normal circumstances, chalk is not a credible source of hazardous gas emissions.

[1] NHBC 2023 Hazardous Ground Gas Essential Guide for Housebuilders

4.2.2 Any significant made ground deposits on site, especially those rich in organic matter (horse manure for example) could be a potential source of hazardous ground gas. The quarry, which may have been partially infilled, may also be a potential source.

4.2.3 Potential off-site sources have been identified although the risks from fugitive ground gas from the adjacent terrestrialized pond and the vehicle works to the north are considered to be relatively low.

4.2.4 The overall risks to the public and present site users are considered to be very low given that there are no enclosed buildings in direct ground contact on site.

4.2.5 There is considered to be an increased risk of exposure to future residents with a potentially severe consequence (explosion / asphyxiation) and the overall risk is considered to be moderate.

4.2.6 An overall moderate / low risk applies to construction workers who may need to enter confined spaces such as excavation voids.

4.2.7 The risk to adjacent site users is considered to be very low as a significant ground gas source generating fugitive emissions is unlikely to be present on site.

4.2.8 Table 11 below summarises the level of risk assigned to each receptor from hazardous gas generation:

Table 11: Risks from hazardous gas

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	decomposition of coal / peat / chalk / putrescible made ground generating hazardous gas that can migrate by diffusion or advection via cracks in foundations / utility trenches / service penetrations. Outdoor inhalation in confined excavations.	unlikely	minor	VERY LOW
Residents of future development		low likelihood	severe	MODERATE
Construction workers		low likelihood	mild	MODERATE / LOW
Adjacent site users		unlikely	mild	VERY LOW

4.3 VAPOUR

4.3.1 There is a localised and relatively small possibility of fugitive vapours from the adjacent car garage and spills / leaks onsite. There is an increased likelihood of risk in enclosed buildings or confined spaces such as excavations and therefore the risks to future residents and construction workers are considered to be higher. It is

unlikely that any significant vapours would be generated from small leaks and spills, and therefore the severity of risk is considered to be reduced.

4.3.2 Table 12 below summarise the level of risk assigned to each receptor from vapour generation:

Table 12: Risks from soil and groundwater vapour

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	Volatilisation of VOCs from contaminated soil and groundwater generating vapours that can migrate by diffusion or advection via cracks in foundations / utility trenches / service penetrations. Outdoor inhalation in confined excavations / localised spills.	unlikely	minor	VERY LOW
Residents of future development		low likelihood	mild	LOW
Construction workers		low likelihood	mild	LOW
Adjacent site users / general public		unlikely	minor	VERY LOW

4.4 RADON

4.4.1 The site lies within an area designated RnC2 and therefore the overall risk to future residents is moderate in accordance with the risk rating defined by the Buildings Research Establishment. No radon protection measures are required in new dwellings.

4.4.2 The severity of risk is considered to be reduced for the general public and present site users as there are no habitable buildings in contact with the ground on site. Similarly, the severity of risk to construction works is considered to be reduced.

4.4.3 Table 13 below summarises the level of risk assigned to each receptor from radon:

Table 13: Risks from radon

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	Radon generated through decay of uranium in underlying rocks then migration by diffusion through overlying permeable strata and	likely	minor	LOW
Residents of future development		likely	medium	MODERATE

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
Construction workers	advection into properties via cracks in foundations / utility trenches / service penetrations.	likely	minor	LOW

SECTION 5 COMBINED CSM AND RISK ASSESSMENT

5.1 The preliminary Conceptual Site Model and Tier 1 Preliminary Risk Assessment have been combined to present the overall risk ratings assigned to each identified source ► pathway ► receptor and is presented in Table 14.

Table 14: Combined Preliminary Conceptual Site Model and Tier 1 Risk Assessment

POTENTIAL CONTAMINANT SOURCE	RELEASE MECHANISM	PATHWAY	EXPOSURE ROUTE	RECEPTOR: Present Site Users / General Public	Future Residents / Site Users	Construction Workers	On-Site Planting	Water Supply Pipes	Adjacent Site Users / General Public	Controlled Waters: Surface Water	Controlled Waters: Aquifer	Protected Habitat
SOIL (HEAVY METALS AND HYDROCARBONS)	DUST	AIR	INHALATION	LOW	MODERATE / LOW	MODERATE			LOW			MODERATE / LOW
	DIRECT	DIRECT	INGESTION	LOW	MODERATE / LOW	MODERATE						MODERATE / LOW
	DIRECT	DIRECT	DERMAL EXPOSURE	LOW	MODERATE / LOW	MODERATE						MODERATE / LOW
	DIRECT	DIRECT	DIRECT CONTACT / UPTAKE				MODERATE / LOW	MODERATE / LOW				MODERATE / LOW
	PLANT UPTAKE	GARDEN FRUIT AND VEGETABLES	INGESTION	X	MODERATE / LOW							
	INFILTRATION / LEACHING	GROUNDWATER FLOW	DIRECT								MODERATE / LOW	MODERATE / LOW
	RUNOFF	SURFACE WATER FLOW	DIRECT							X		X
MADE GROUND (ASBESTOS)	FIBRE RELEASE	AIR	INHALATION	LOW	MODERATE / LOW	MODERATE			LOW			
SOIL (CHALK / PUTRESCIBLE)	GAS FROM DECOMPOSITION	AIR	INHALATION	VERY LOW	MODERATE	MODERATE / LOW			VERY LOW			
SOIL (VOC)	VAPOUR FROM VOLATILISATION /	AIR	INHALATION	VERY LOW	LOW	LOW			VERY LOW			
GROUNDWATER (VOC)	VAPOUR FROM VOLATILISATION	AIR	INHALATION	VERY LOW	LOW	LOW			VERY LOW			
GROUNDWATER (DISSOLVED CONTAMINANTS)	DIRECT	BASEFLOW TO SURFACE WATER	DIRECT							X		X
URANIUM IN UNDERLYING STRATA	RADON FROM RADIOACTIVE DECAY	AIR	INHALATION	LOW	MODERATE	LOW						

X SOURCE►PATHWAY►RECEPTOR NOT COMPLETE AND NO FURTHER ACTION REQUIRED

SECTION 6 CONCLUSIONS AND RECOMMENDATIONS

6.1 A Tier 1 Preliminary Risk Assessment has been undertaken for a proposed residential end use on an area of land located at Blackthorne Farm, Gravesend, Kent, DA13.

6.2 The site was first developed in the 1970s with stables and addition stables and storage units have been added.

6.3 The following potential sources of contamination were identified:

i. asbestiform materials associated with onsite structures;

ii. spills and leaks from chemical/fuel storage on site;

iii. potential for PAH and heavy metal contamination from waste burning;

iv. potential for deposits of made ground in former quarry;

v. potential for fugitive ground gas emissions from adjacent terrestrialized pond; and

vi. potential for migration of mobile contaminants / vapours from spills or leaks at adjacent car servicing and tyre shredding centre to the north of site.

6.4 The identified potential contaminant linkages will require intrusive site investigation to obtain more information and to undertake a Tier 2 generic quantitative risk assessment.

6.5 The investigation should include:

i. Installation of shallow ground gas and groundwater monitoring boreholes targeting areas of made ground including the former quarry as well as potential off site sources of ground gas at the site boundary;

ii. Machine dug trial pitting of made ground to determine the depth and contaminative status;

iii. Testing of any suspected ACMs;

iv. Assessment of site topsoil to determine suitability for re-use.

6.6 It is considered unlikely that any significant quantities of mobile contamination (such as hydrocarbons) would be encountered. However, if any mobile contamination is discovered by the site investigation, then risks to the sensitive chalk aquifer should be assessed further.

SECTION 7 OTHER RECOMMENDATIONS

7.1 The intrusive site investigation should include geotechnical assessment of the natural strata for foundation, road and drainage design.

7.2 A pre-demolition asbestos survey should be undertaken on the remaining building(s) present on site.

7.3 A UXO desk study is recommended to establish the site-specific risk from UXO.

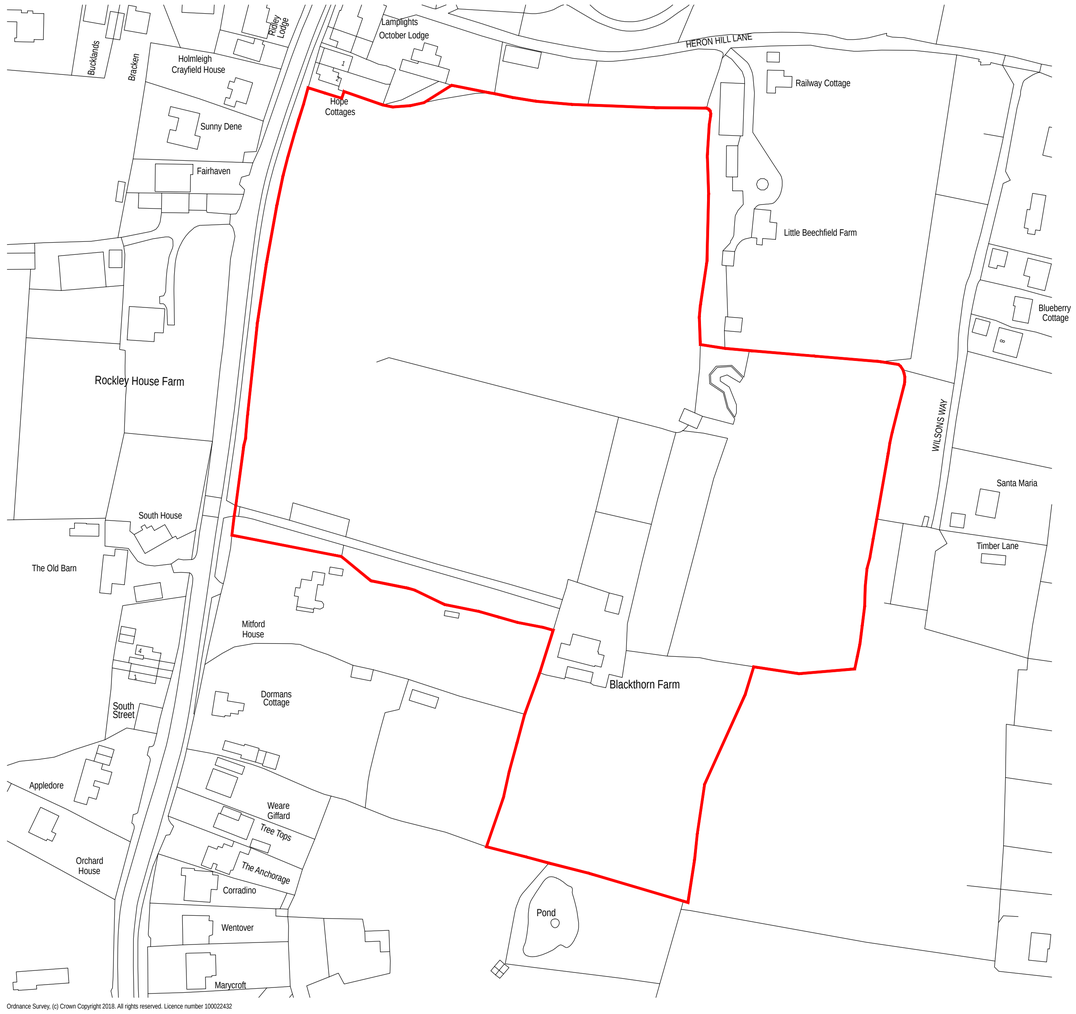
7.4 The site is in Environment Agency Flood Zone 1. The site is over 1 ha and therefore a flood risk assessment may be required.

7.5 Materials, including waste soils which are not to be retained on site, should be removed and disposed of in accordance with all relevant statues.

7.6 It is recommended that this report is submitted to the regulators (Local Authority EHO and Planners, Environment Agency Planning Liaison) for approval prior to commencement of the works.

APPENDIX 1

- Site Location Plan
- Proposed Development Plan



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Scale 1:1250

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Notes:

Do Not Scale.

Report all discrepancies, errors and omissions.

Verify all dimensions on site before commencing any work on site or preparing shop drawings.

All materials, components and workmanship are to comply with the relevant British Standards, Codes of Practice, and appropriate manufacturers recommendations that from time to time shall apply.

For all specialist work, see relevant engineers drawings.

REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

ESQUIRE
DEVELOPMENTS

Esquire Developments Ltd.
Studio 3, The Old Laundry
Green Street Green Road
Longfield
Kent
DA2 8EB

www.esquiredevelopments.com
01474 706 184

PROJECT:
Blackthorn Farm
Culverstone
Kent

DESCRIPTION:
Site Red Line Plan

SCALE AT A1:	DATE:	DRAWN:	CHECKED:
1:1250	Jan 2018	BK	
PROJECT NO:	**DRAWING NO:**		**REVISION:**
ESQ-000	000-1000		A

Esquire Developments

NOTE. Subject to Survey

CHAPMAN'S HILL

HERON HILL LANE

A227 SOUTH STREET

Ridley Lodge

Lamplights

Crayfield House

Sunny Dene

Fairhaven

Railway Cottage

Little Beechfield Farm

Rockley House Farm

Existing Site Access
To Be Retained & Improved

Green

Green

Green

Green

Public
Open Space

SUDS
Green

Santa Maria

Timber Lane

The Old Barn

Mitford House

Dormans Cottage

Site Layout Plan
1:1000 @ A1

N

0m 50m 100m

CLAGUE ARCHITECTS

62 Burgate, Canterbury
Kent CT1 2BH 01227 762 060

1 Kinsbourne Court, Luton Road
Harpenden, Hertfordshire AL5 1BL 01582 765 102

4th Floor, 99 Charterhouse Street
London EC1M 6HR 0203 597 6112

CANTERBURY LONDON HARPENDEN

Client / Project
Esquire Developments

Proposed Residential Development
Land at Blackthorn Farm,
South Street,
Culverstone

Drawing
Sketch Scheme Site Layout Plan

Scale 1:1000 @ A1

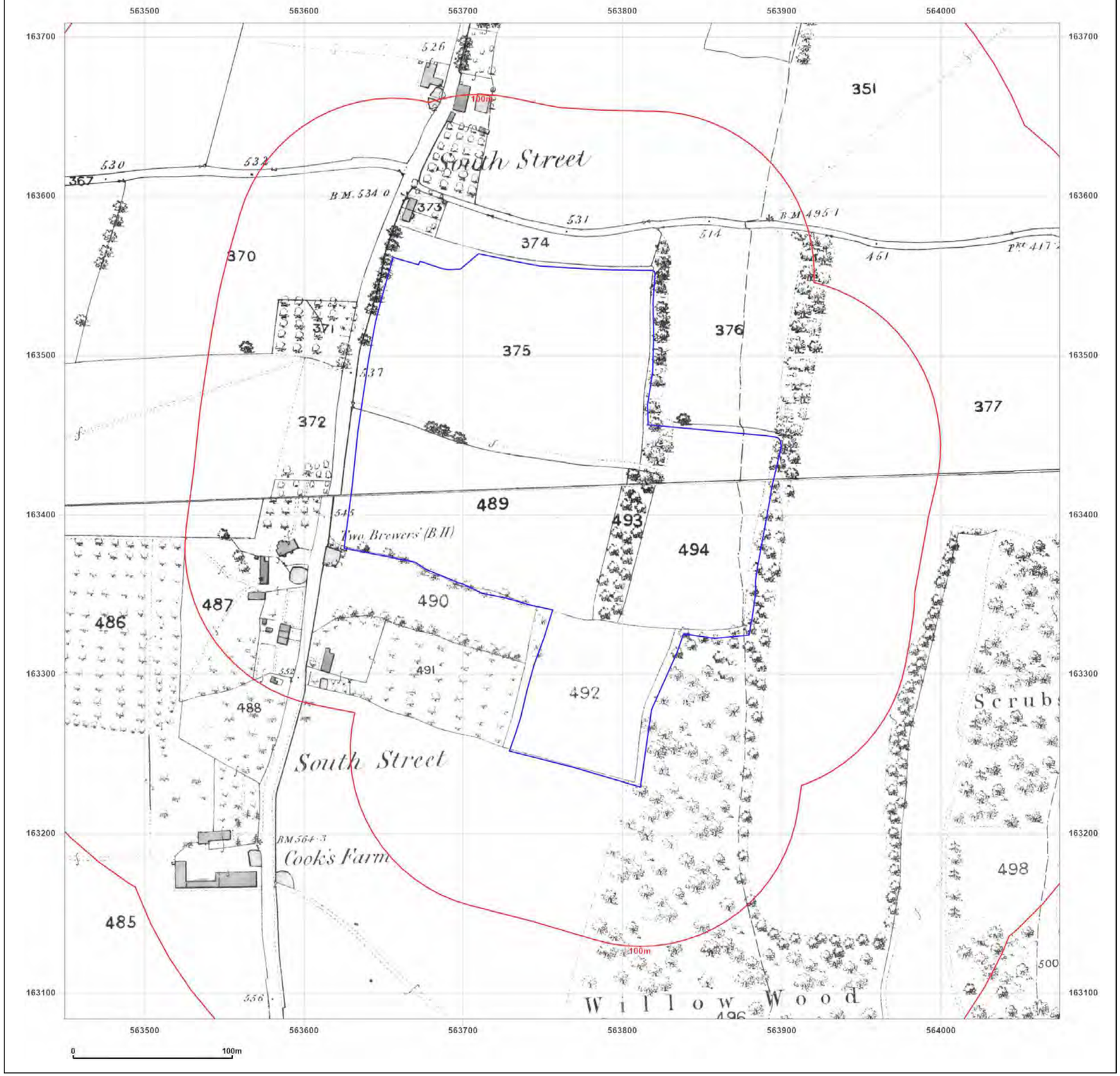
Date XX

Drawing No. **23557A/01**

Drawn SW

Proposed Residential Development Land at Blackthorn Farm, South Street, Culverstone

APPENDIX 2 ▪ Historical Plans



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Grid Ref: 563762, 163396

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Surveyed 1864
Revised 1864
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1865
Edition N/A
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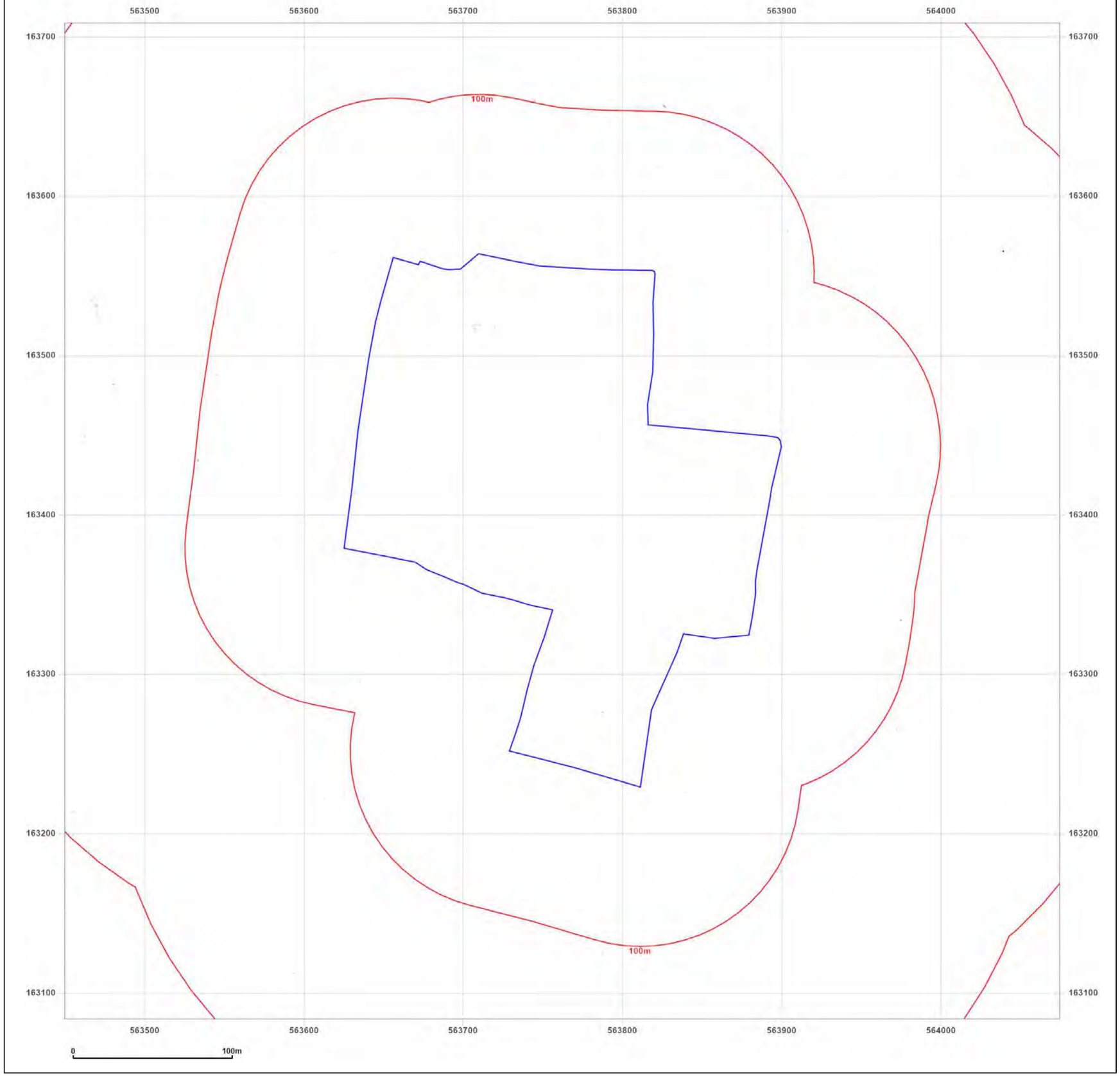

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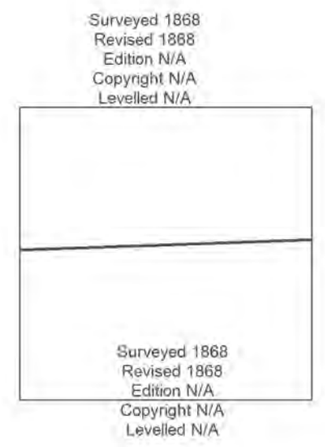

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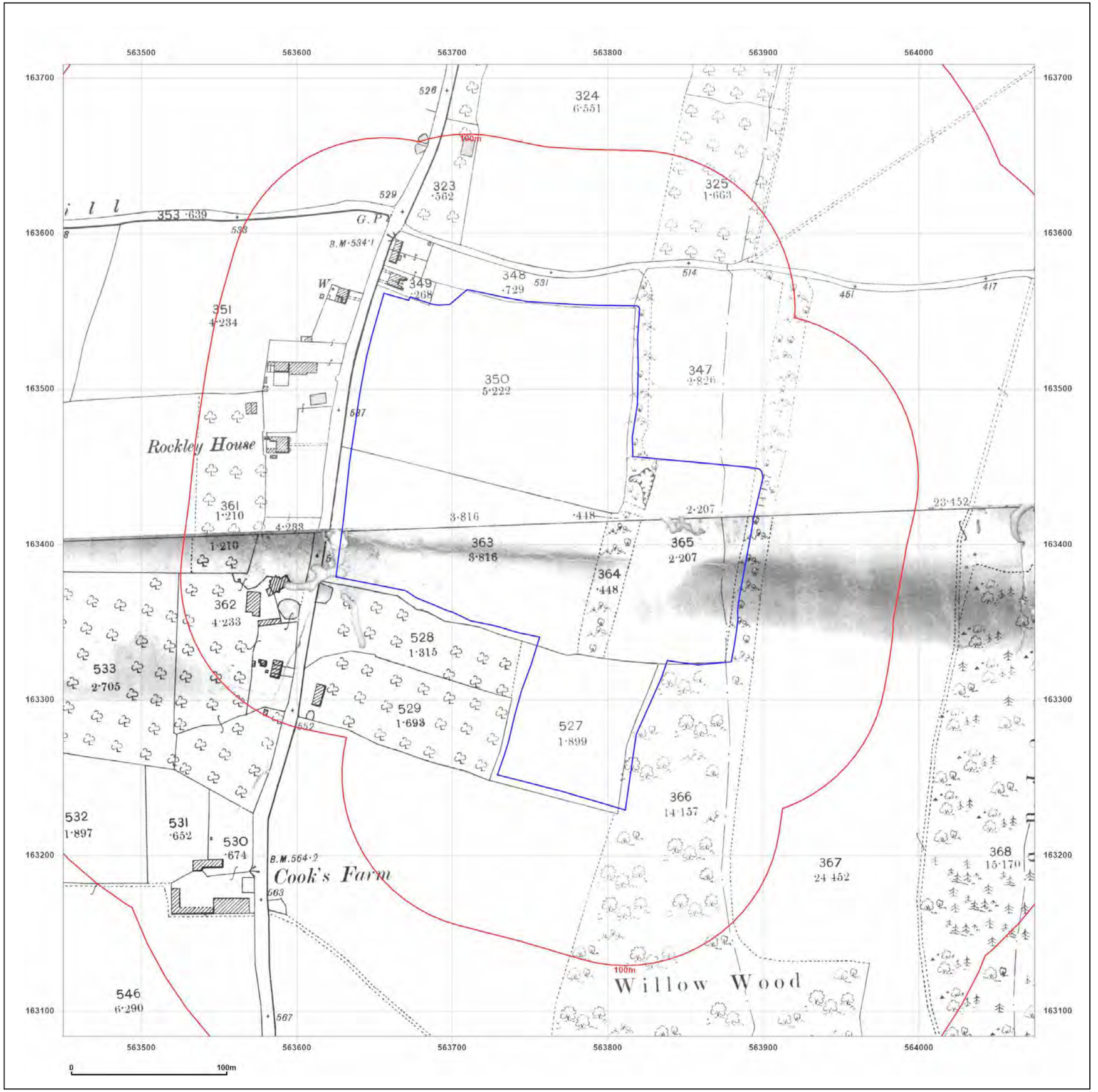

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Revised 1896
Edition N/A
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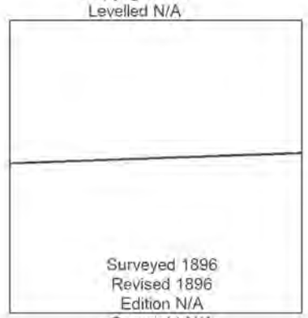
Levelled N/A



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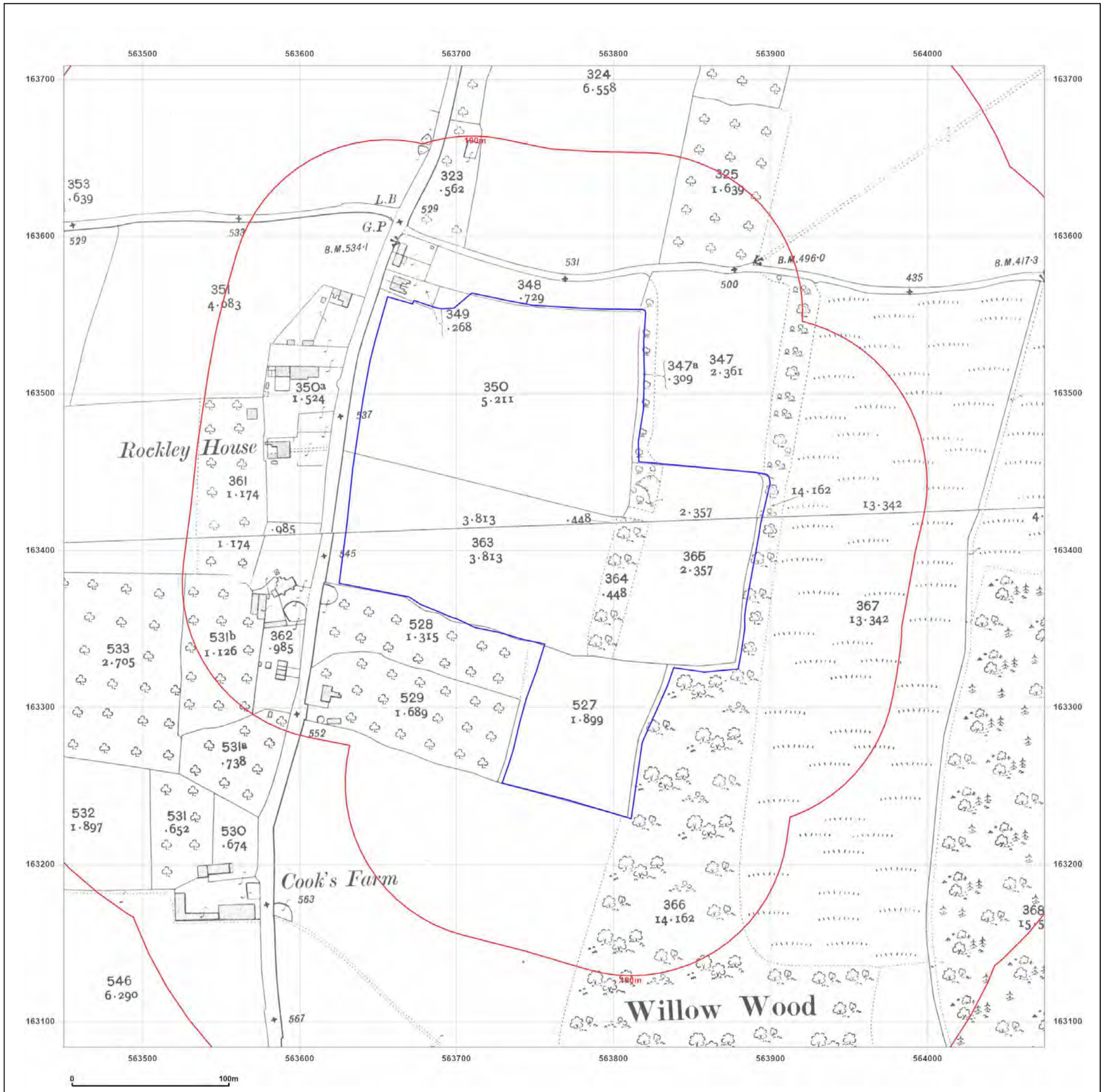

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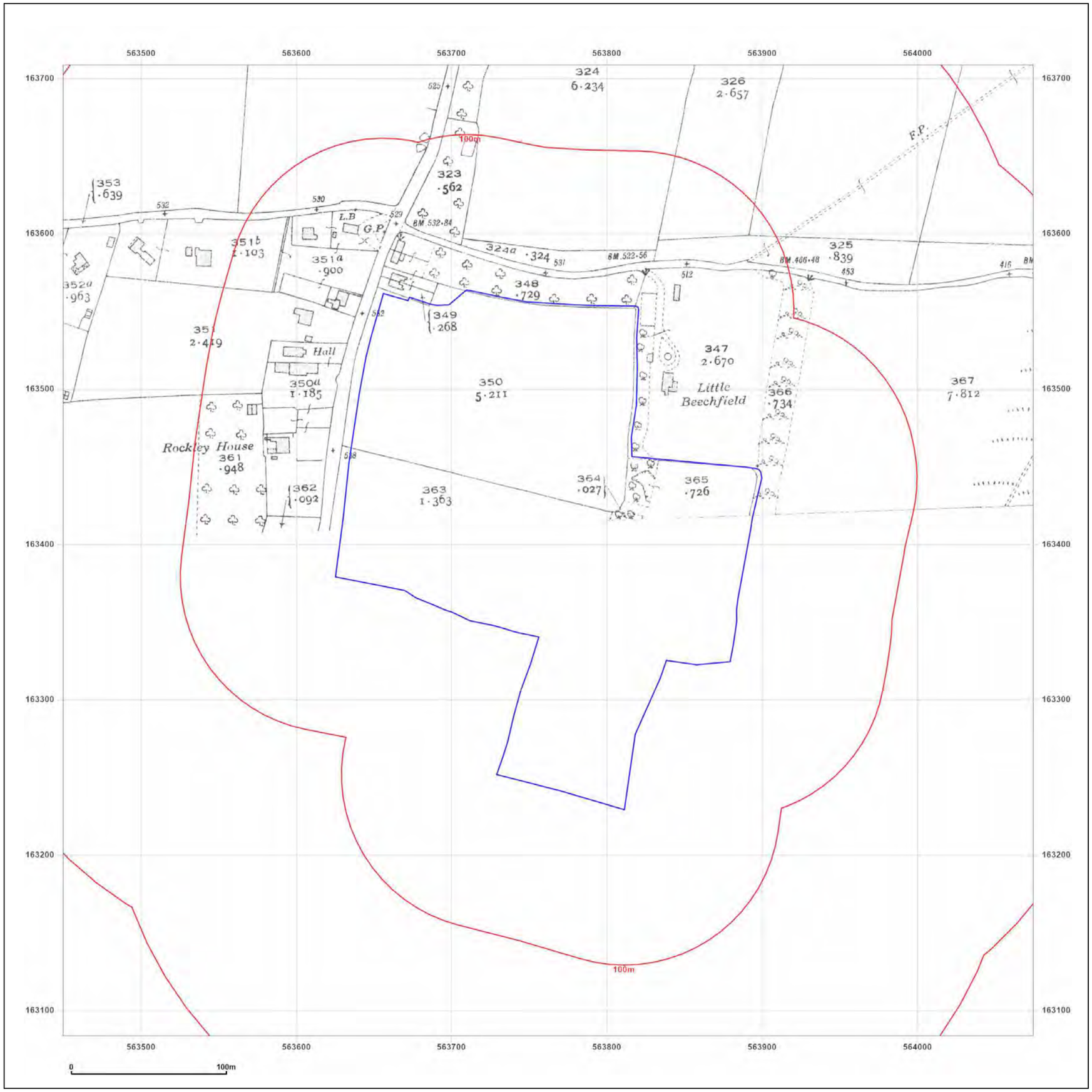

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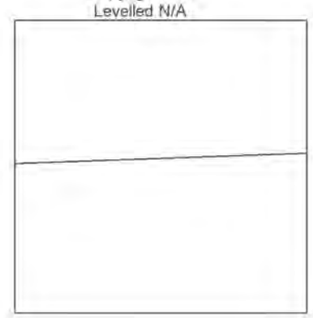

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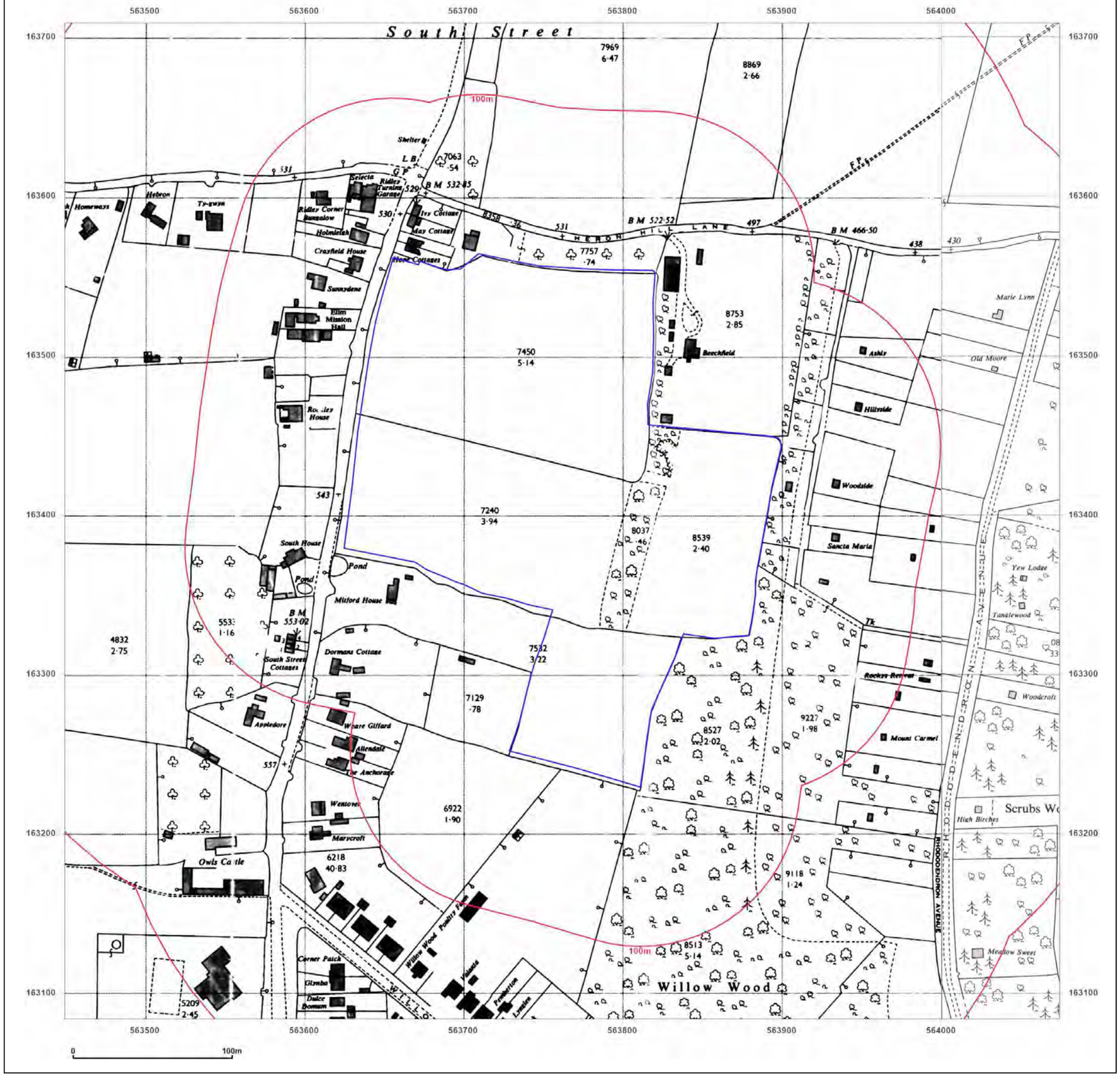

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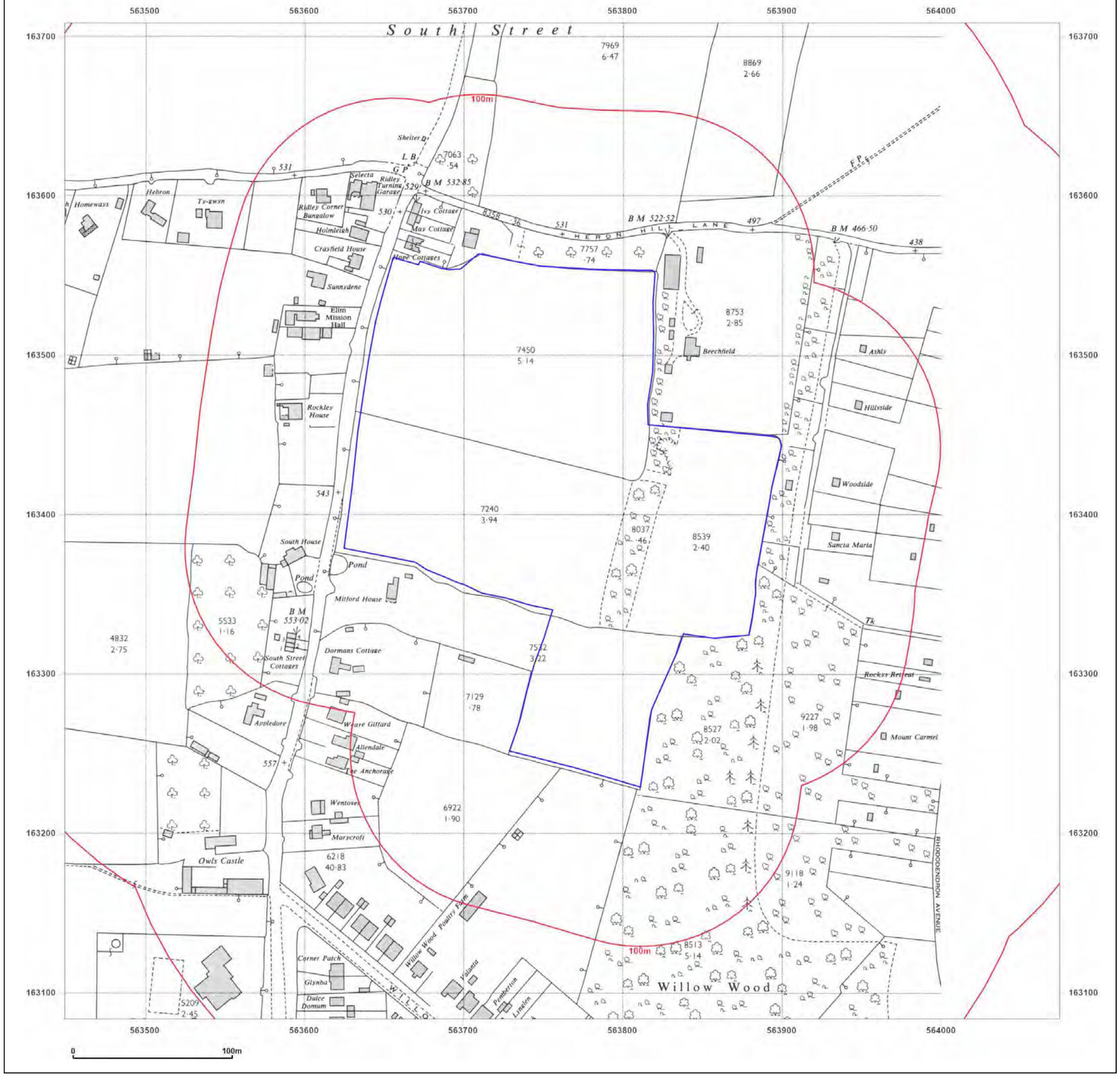

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Grid Ref: 563762, 163396

Map Name: National Grid

Map date: **1964**

Scale: 1:2,500

Printed at: 1:2,500

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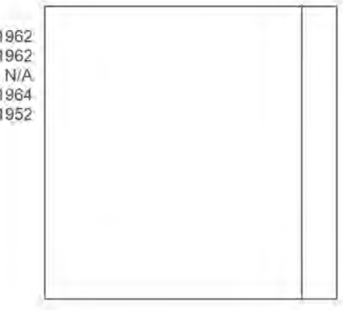
Surveyed 1962
Revised 1962
Edition N/A
Copyright 1964
Levelled 1952



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W: www.groundsure.com

Production date: 11 March 2025

Map legend available at:
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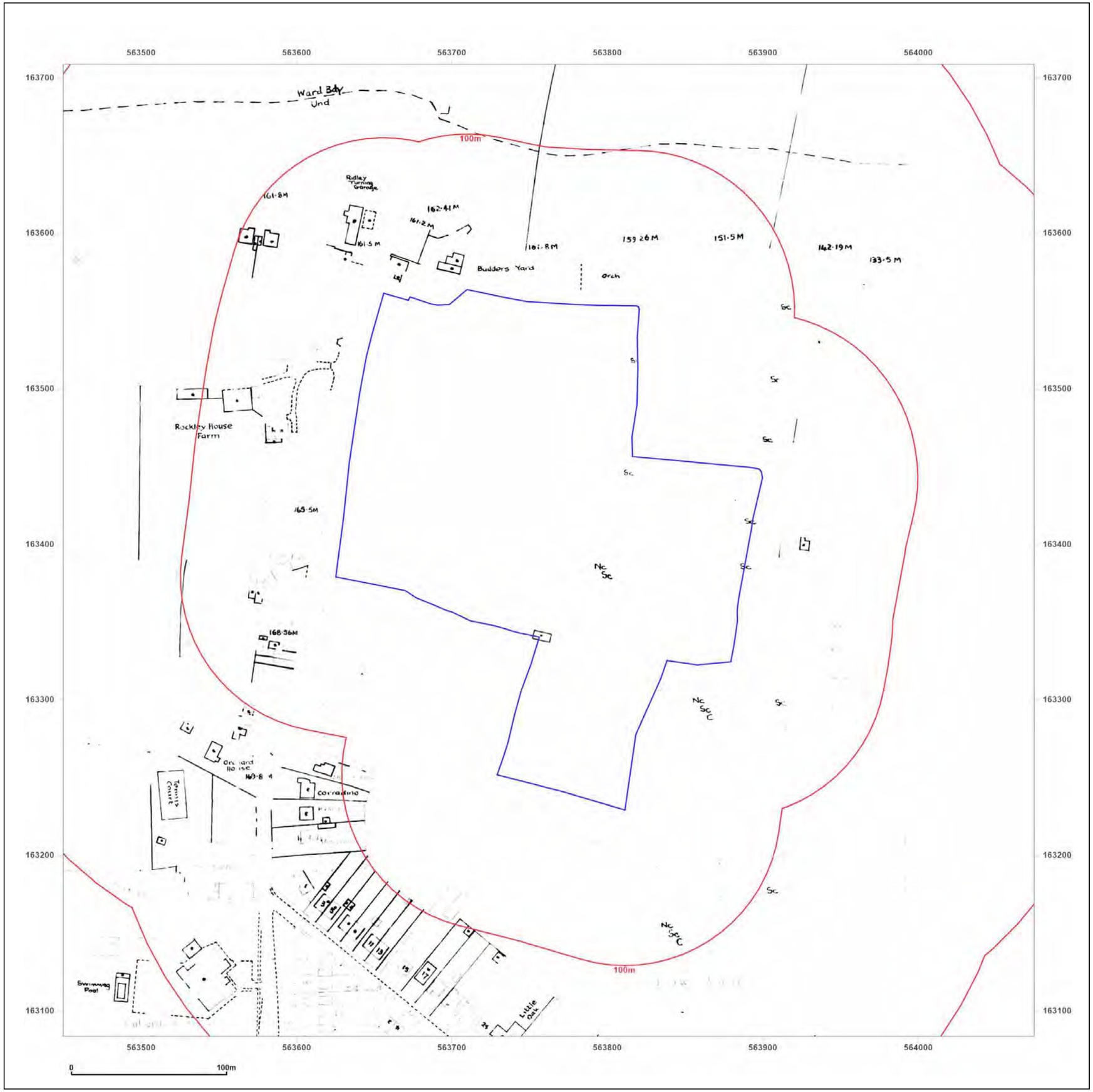

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1_2500
Grid Ref: 563762, 163396

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

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

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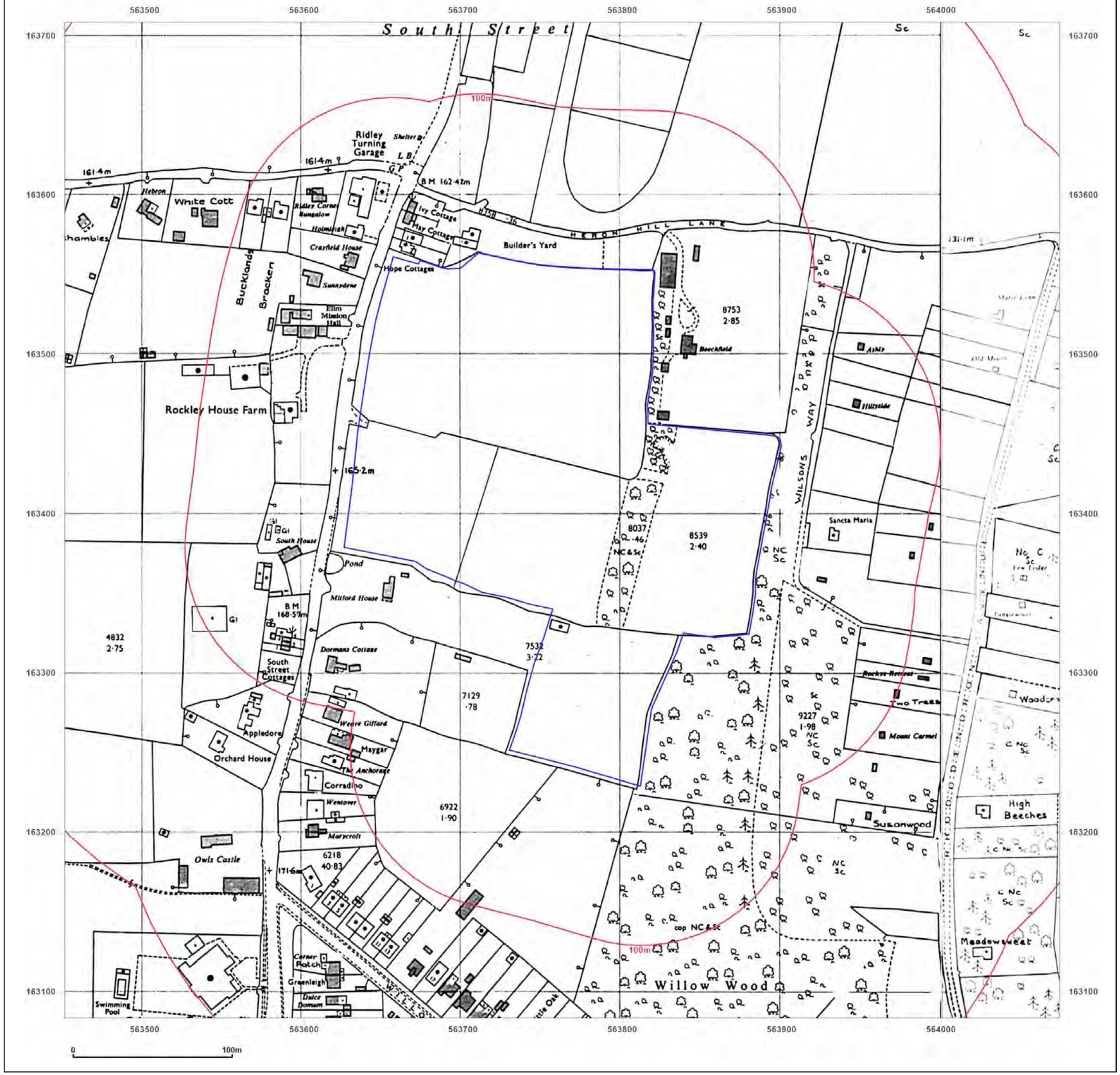

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1_2500
Grid Ref: 563762, 163396

Map Name: National Grid

Map date: **1985**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1983
Revised 1985
Edition N/A
Copyright 1985
Levelled 1983

Surveyed 1983
Revised 1985
Edition N/A
Copyright 1985
Levelled 1983

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Production date: 11 March 2025

Map legend available at:
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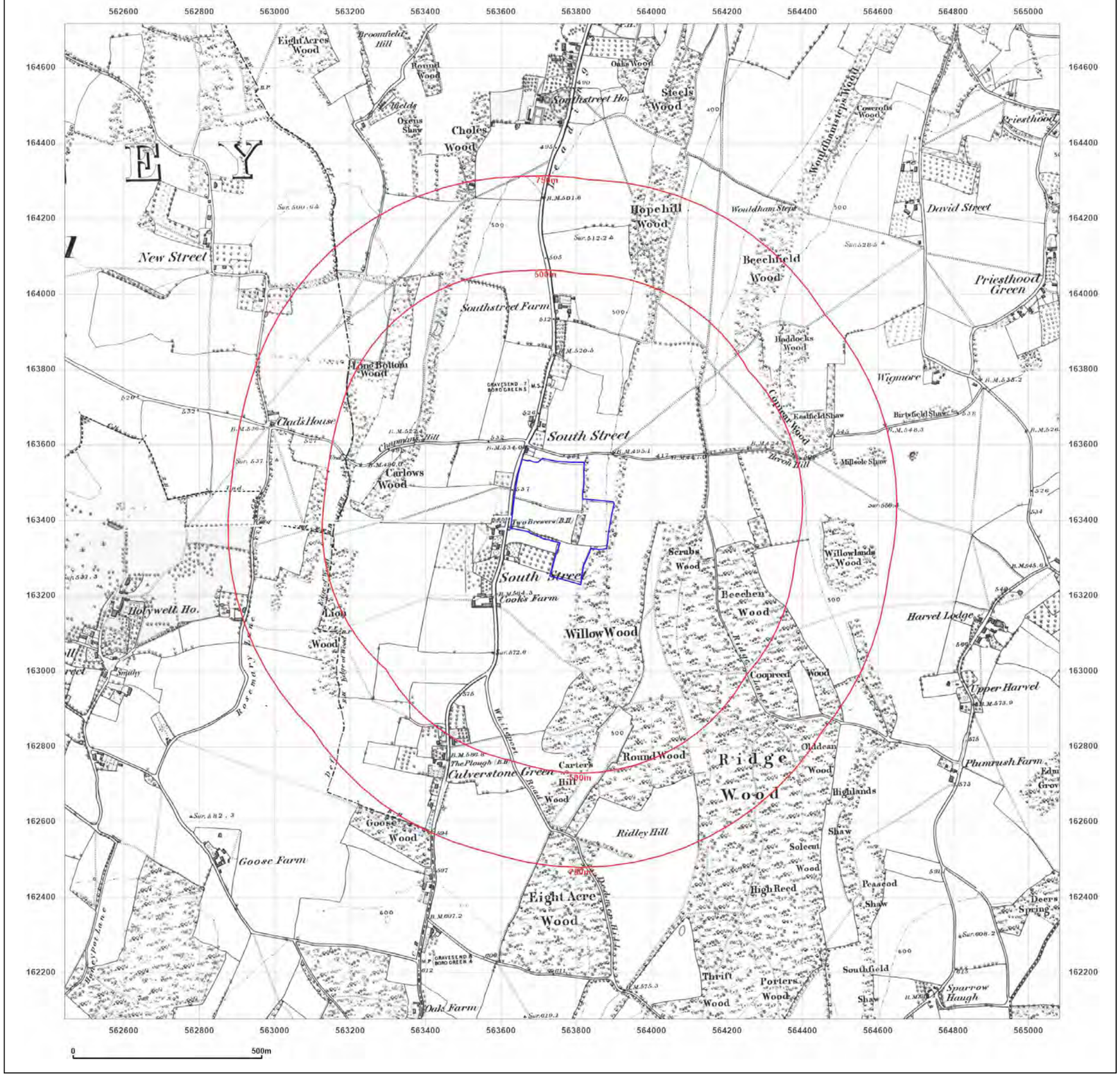

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: County Series

Map date: **1867**

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Printed at: 1:10,560

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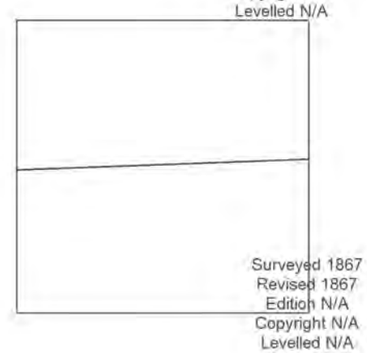

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Production date: 11 March 2025

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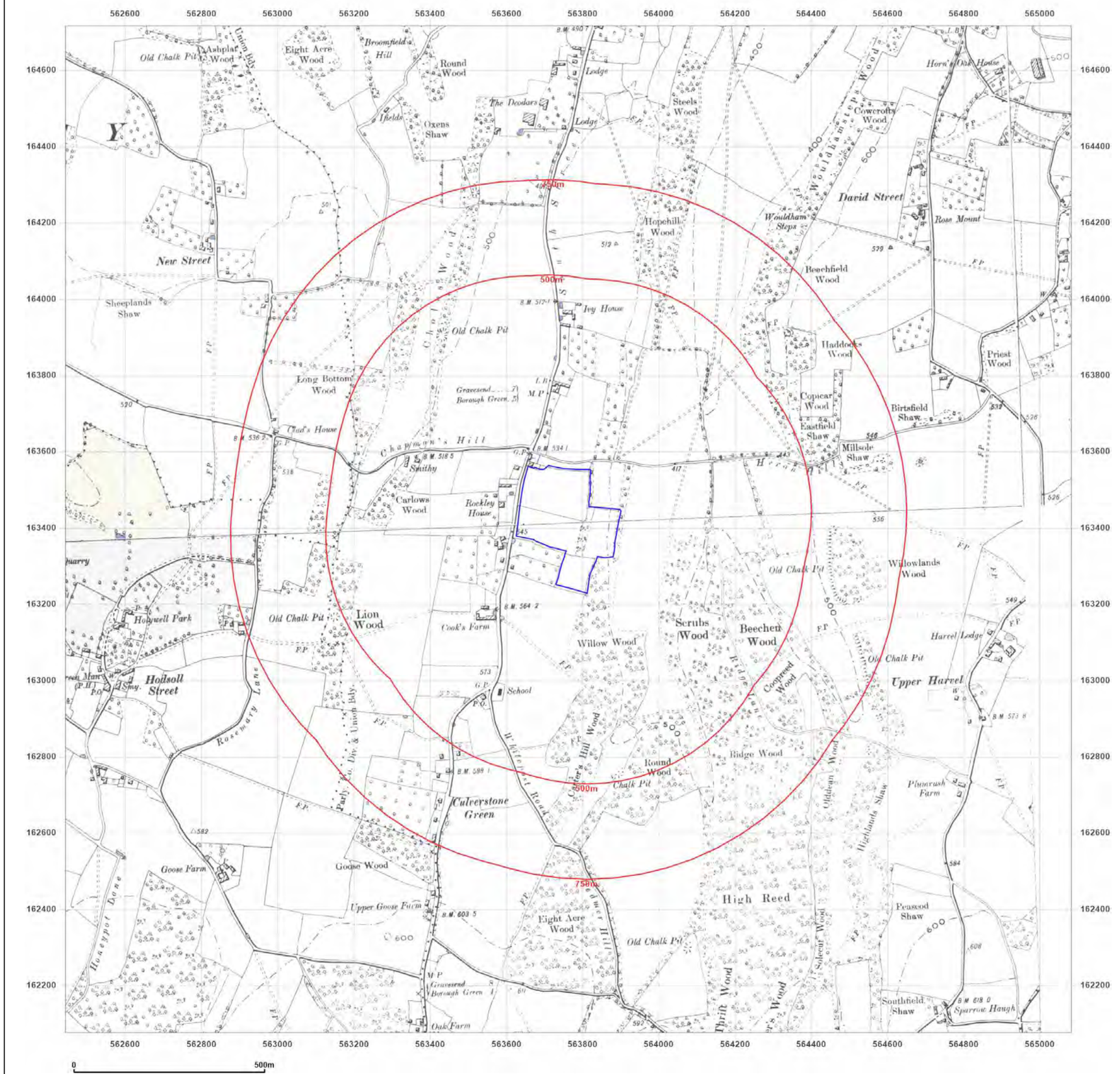

Groundsure INSIGHTS

Site Details:

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Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: County Series

Map date: **1895**

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Printed at: 1:10,560

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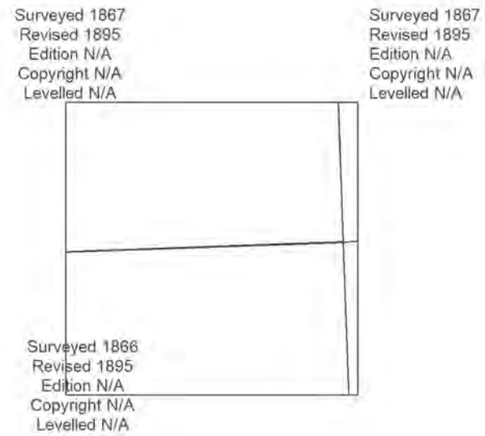

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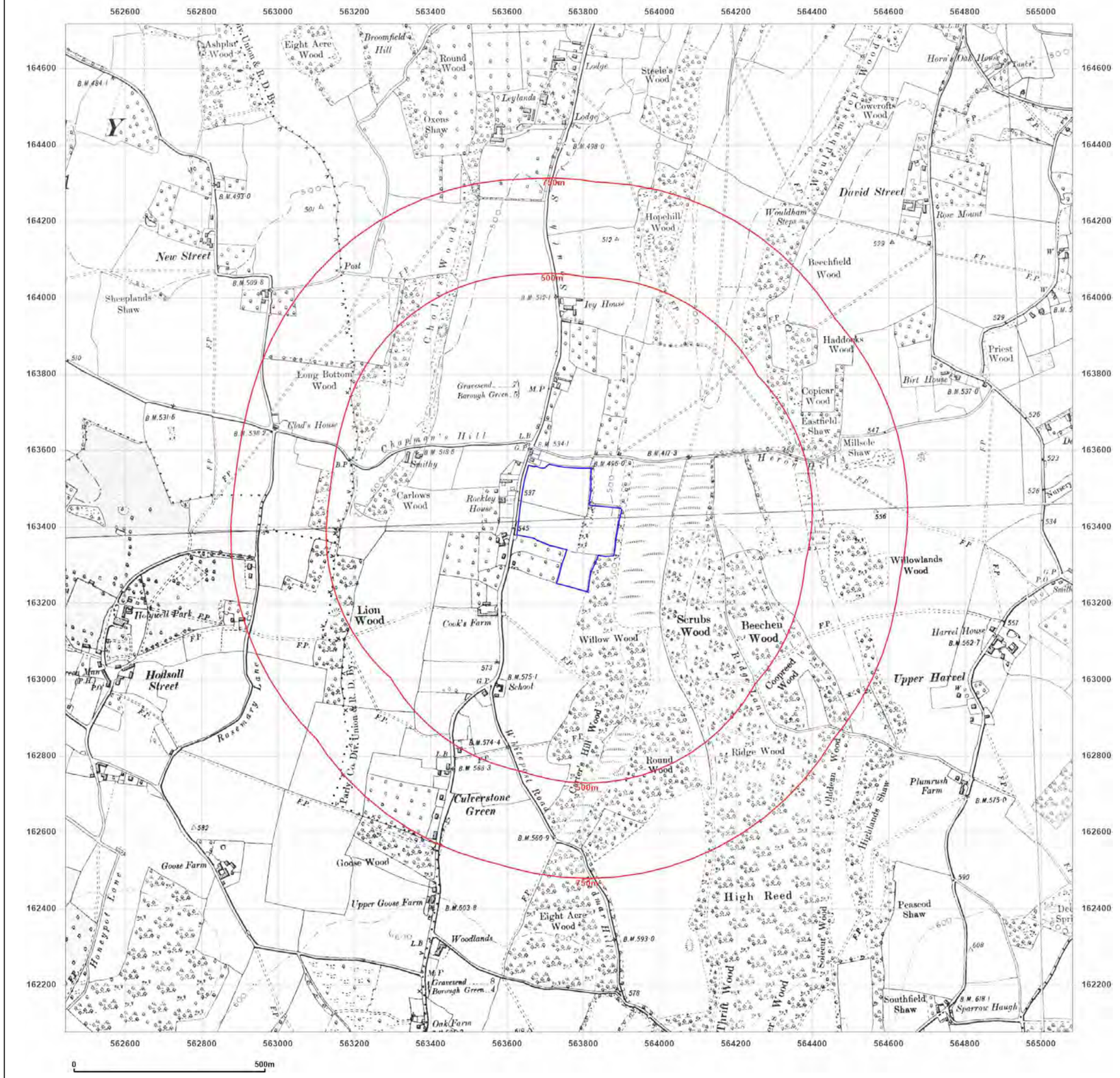

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: County Series

Map date: **1907**

Scale: 1:10,560

Printed at: 1:10,560

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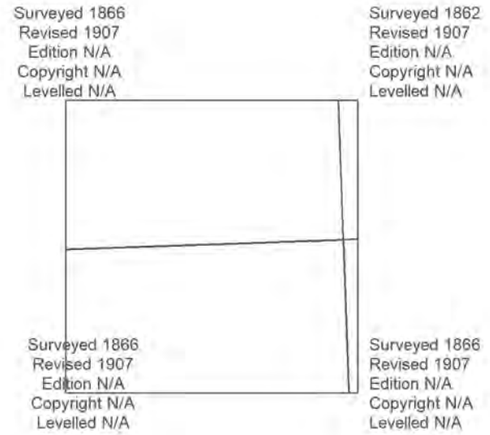

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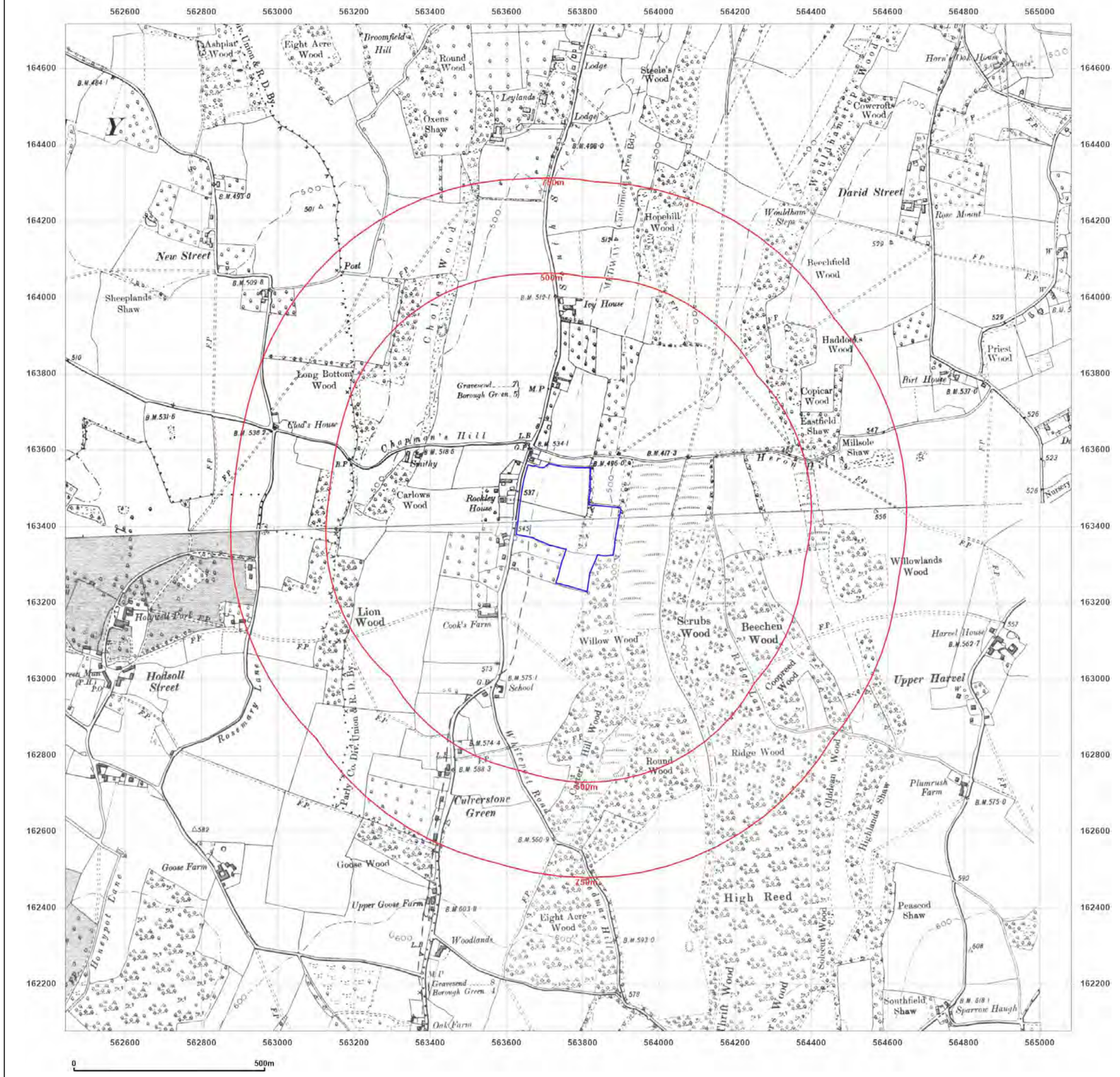
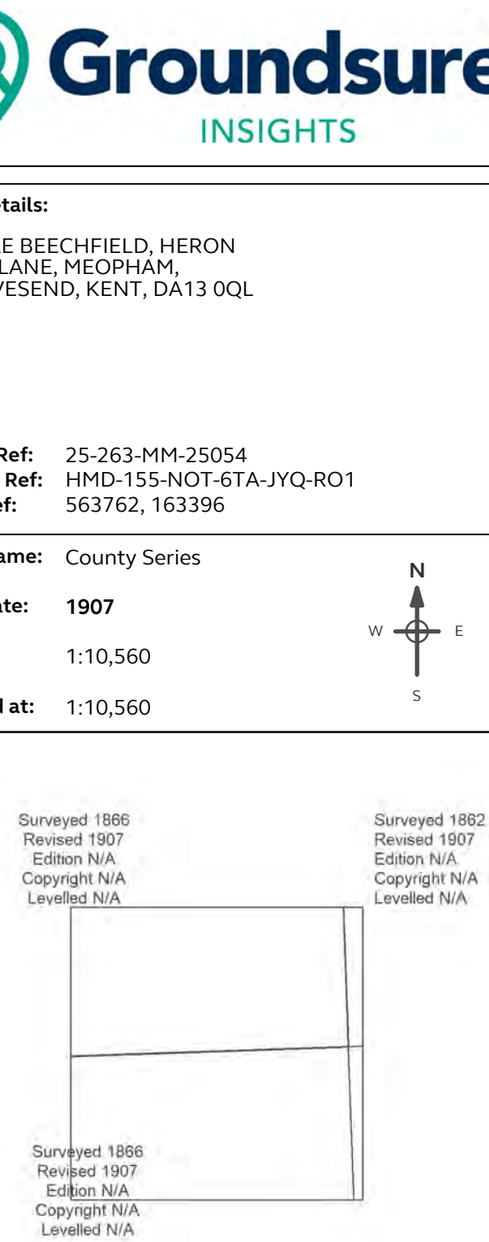
W: www.groundsure.com

Production date: 11 March 2025

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





Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON
HILL LANE, MEOPHAM,
GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: County Series

Map date: **1907**

Scale: 1:10,560

Printed at: 1:10,560

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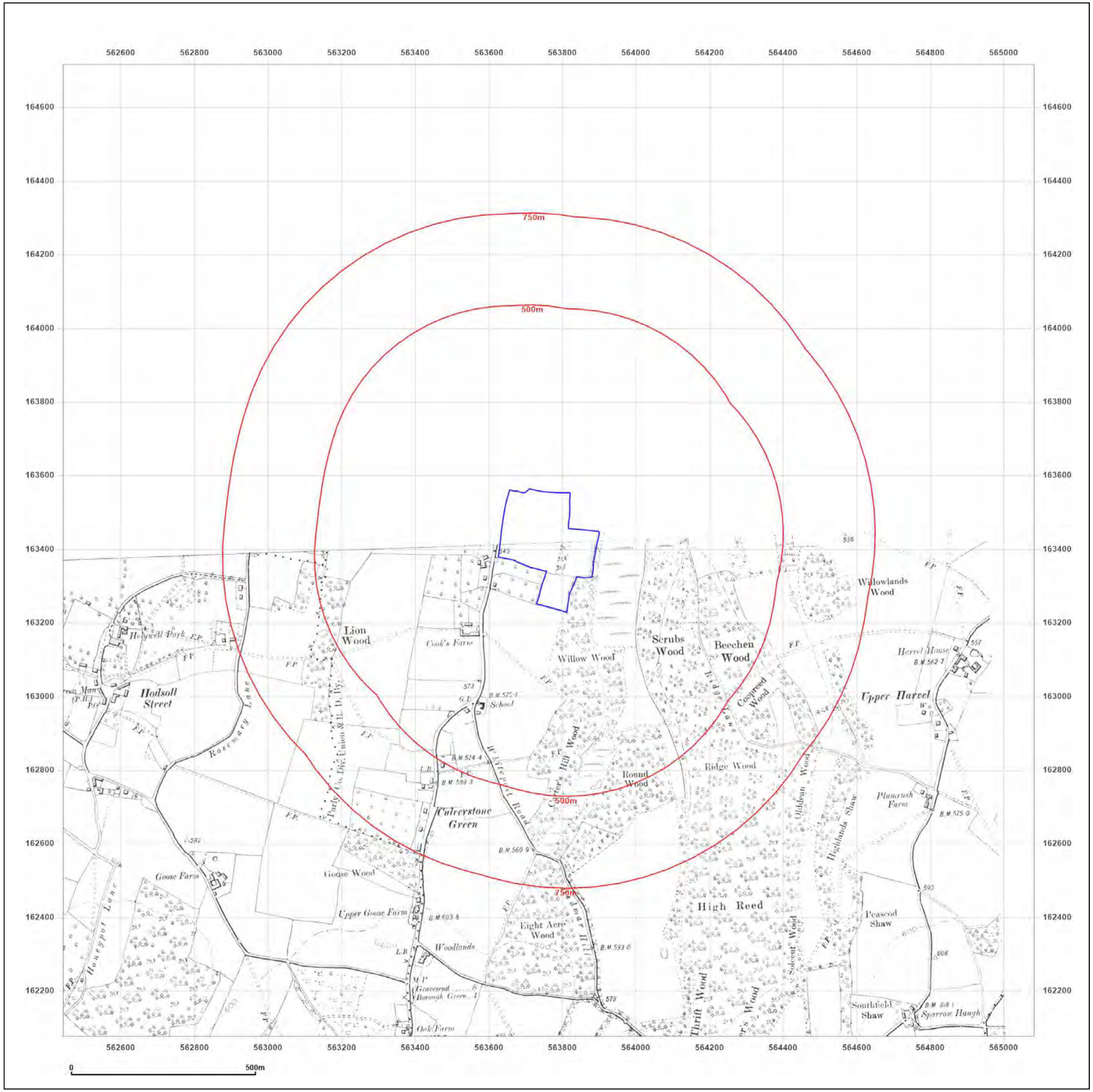

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

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

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Powered by OS

Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 11 March 2025

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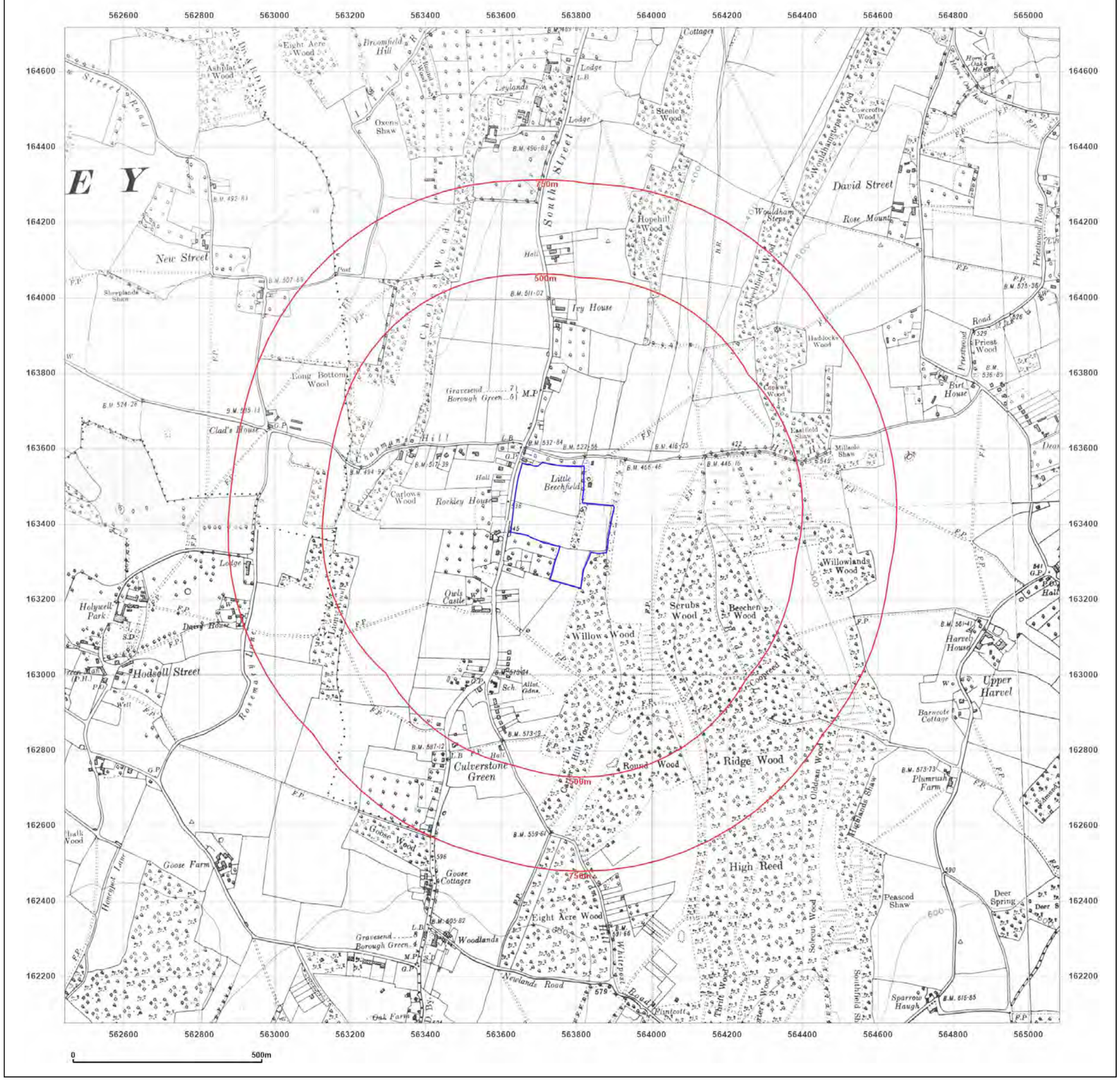

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: County Series

Map date: **1936**

Scale: 1:10,560

Printed at: 1:10,560

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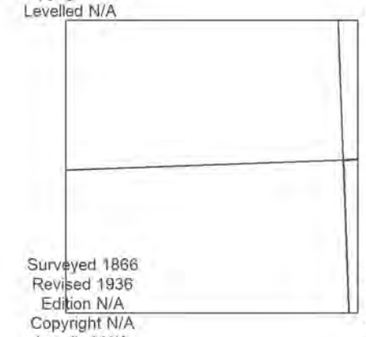

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Map legend available at:
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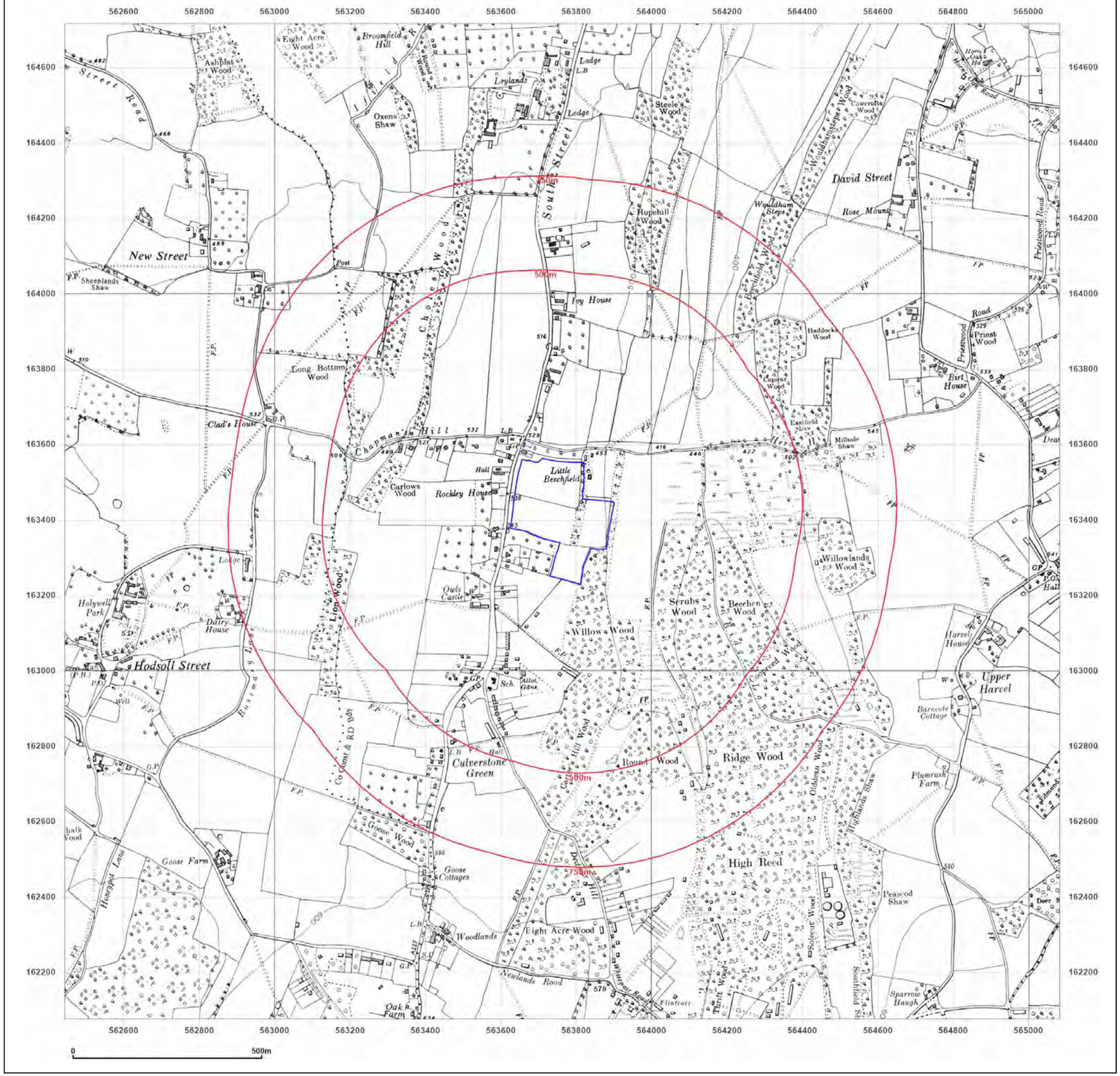

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: Provisional

Map date: **1955**

Scale: 1:10,560

Printed at: 1:10,560

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

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

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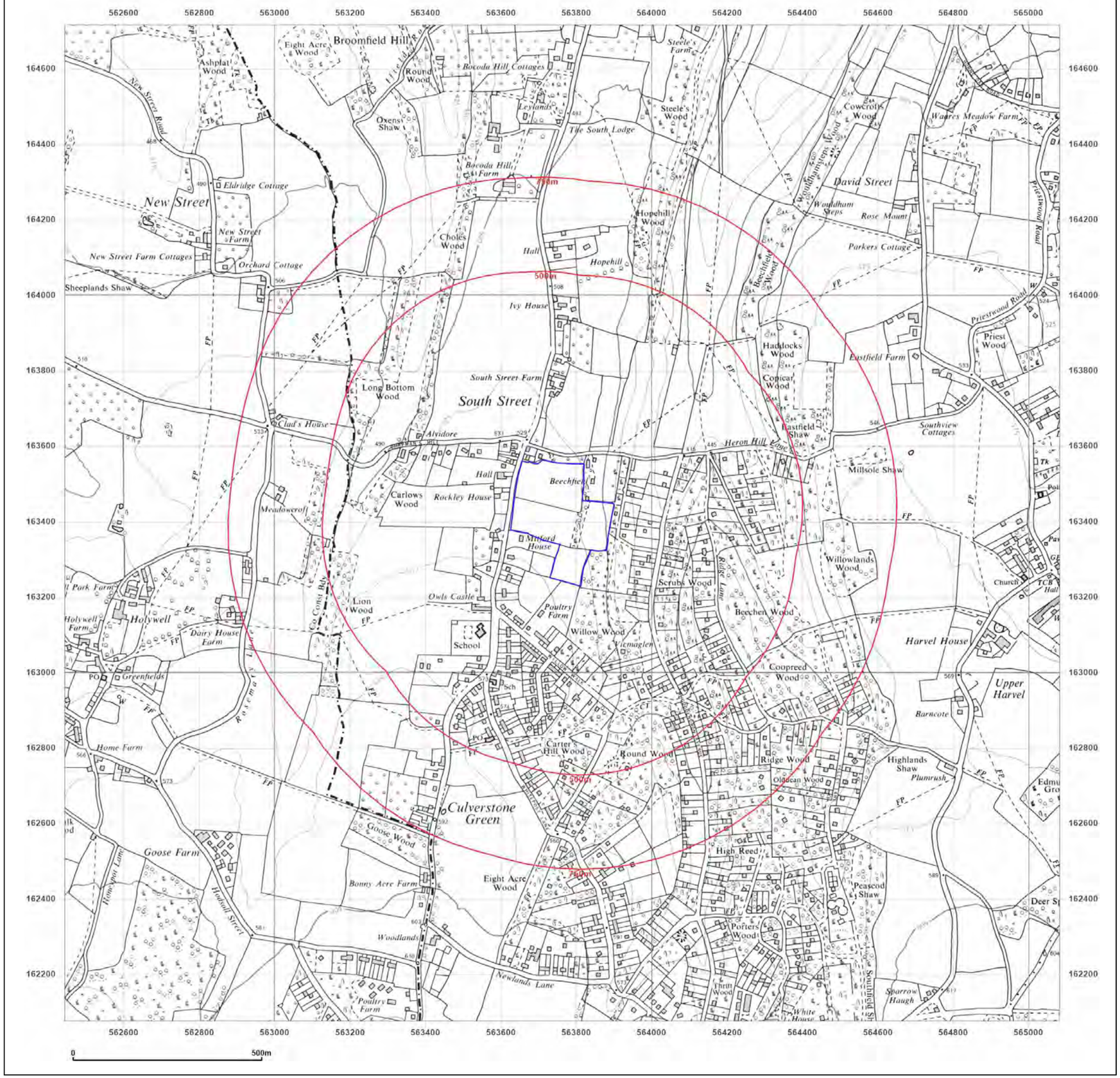
Production date: 11 March 2025

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



Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: Provisional

Map date: **1966-1967**

Scale: 1:10,560

Printed at: 1:10,560

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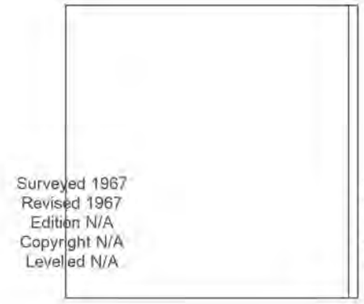

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Production date: 11 March 2025

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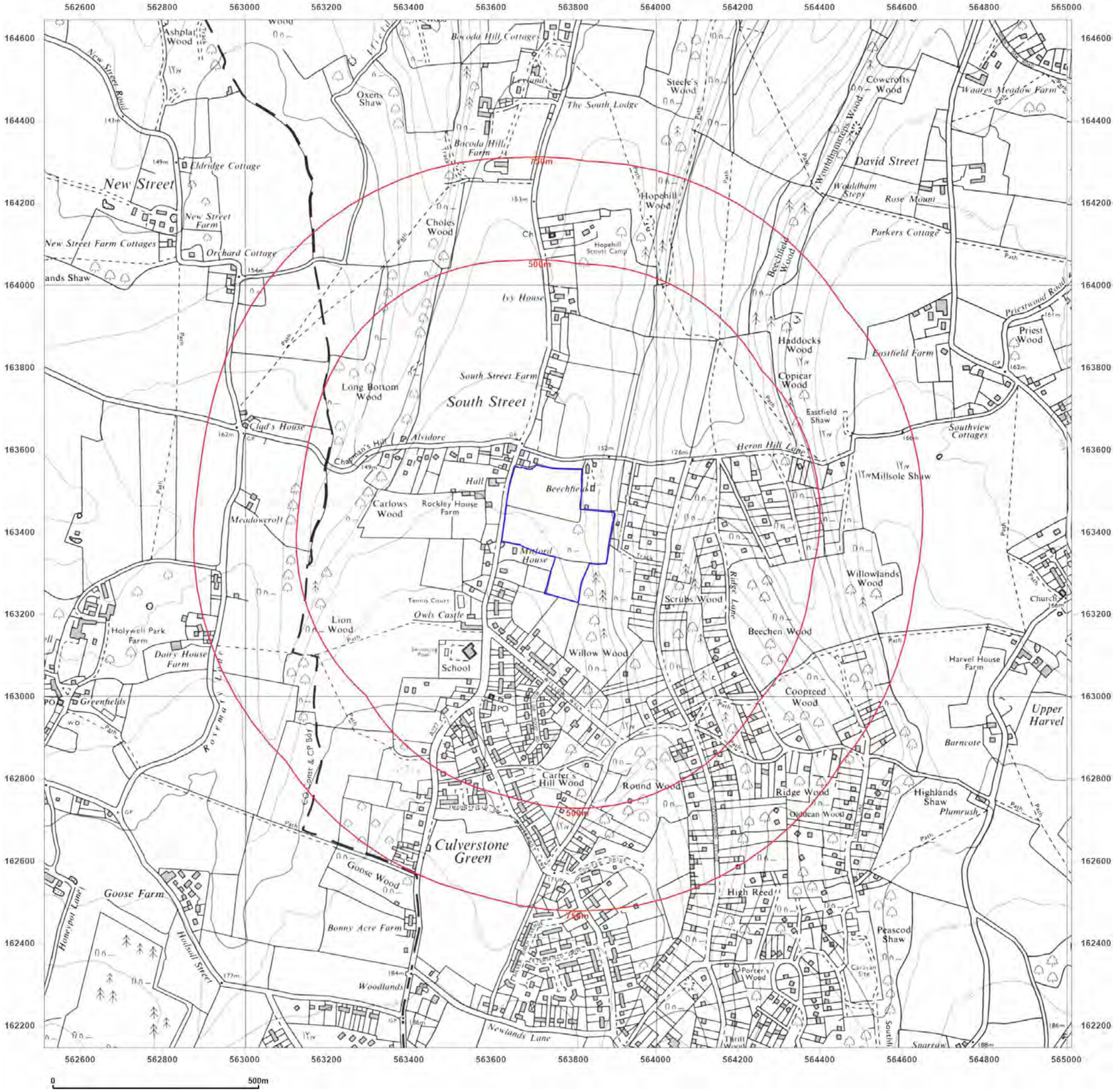

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON
HILL LANE, MEOPHAM,
GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: National Grid

Map date: **1976-1977**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1975
Revised 1977
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1985
Revised 1976
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 11 March 2025

Map legend available at:
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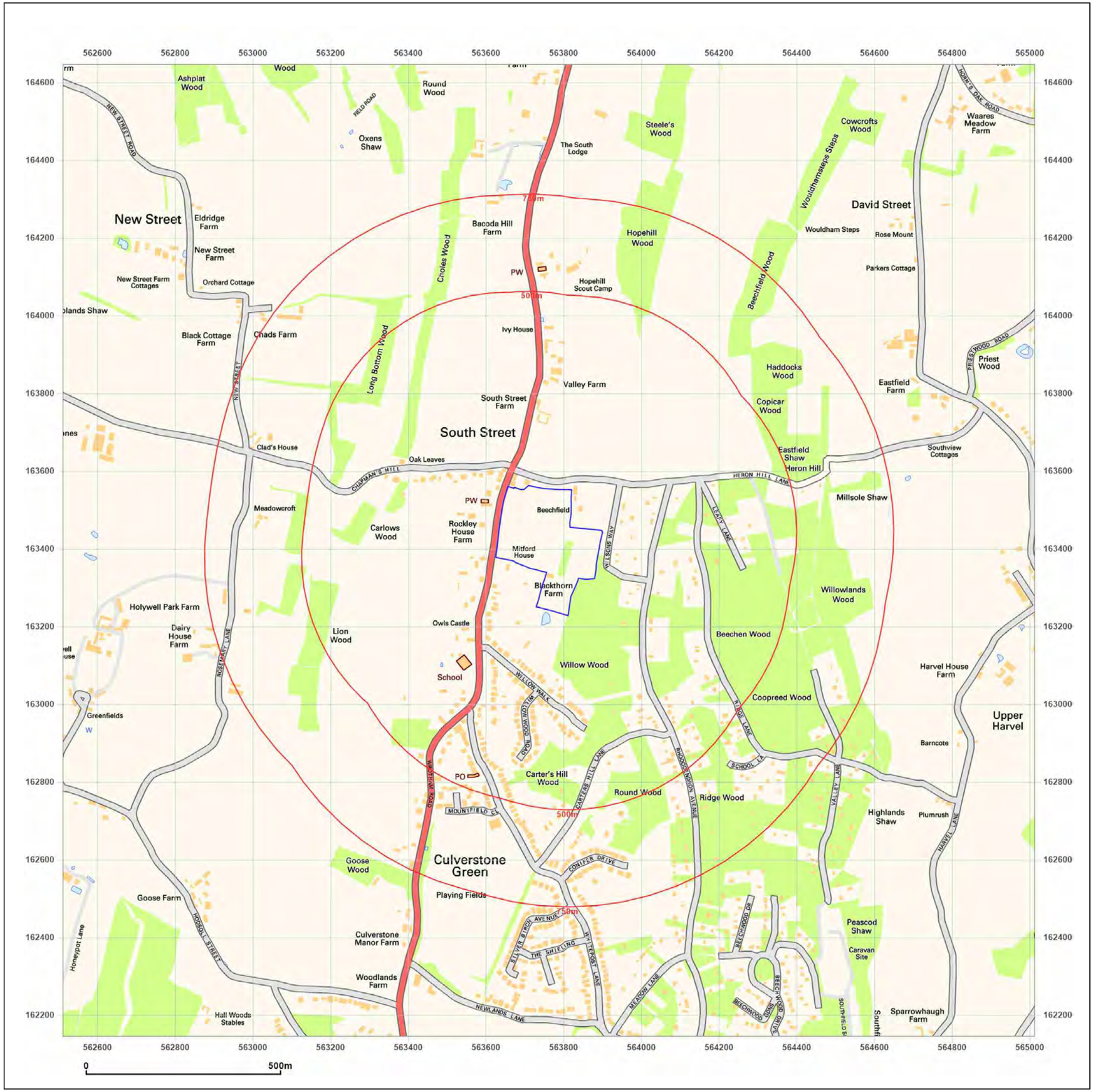

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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W: www.groundsure.com

Production date: 11 March 2025

Map legend available at:
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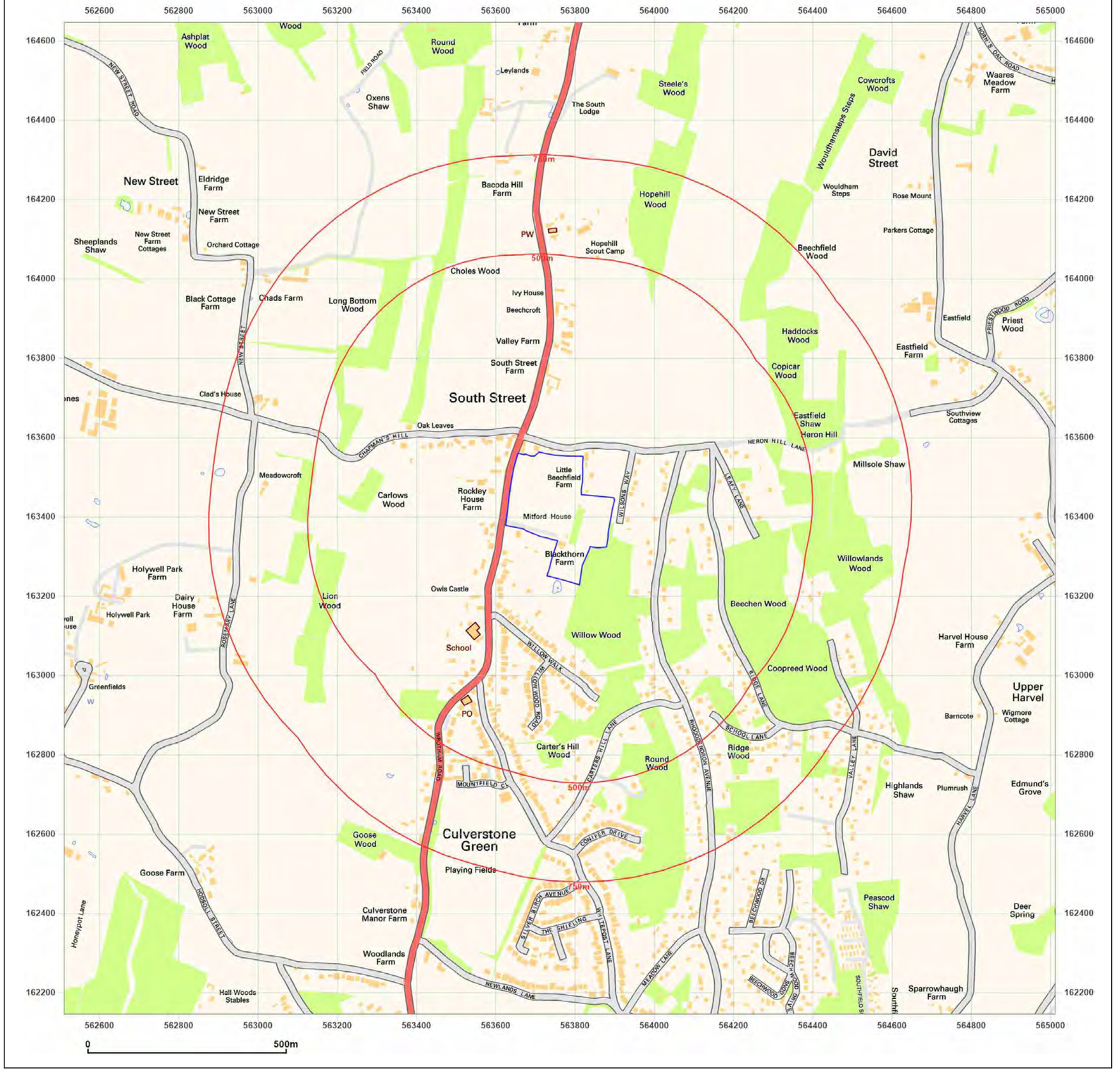

Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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Produced by
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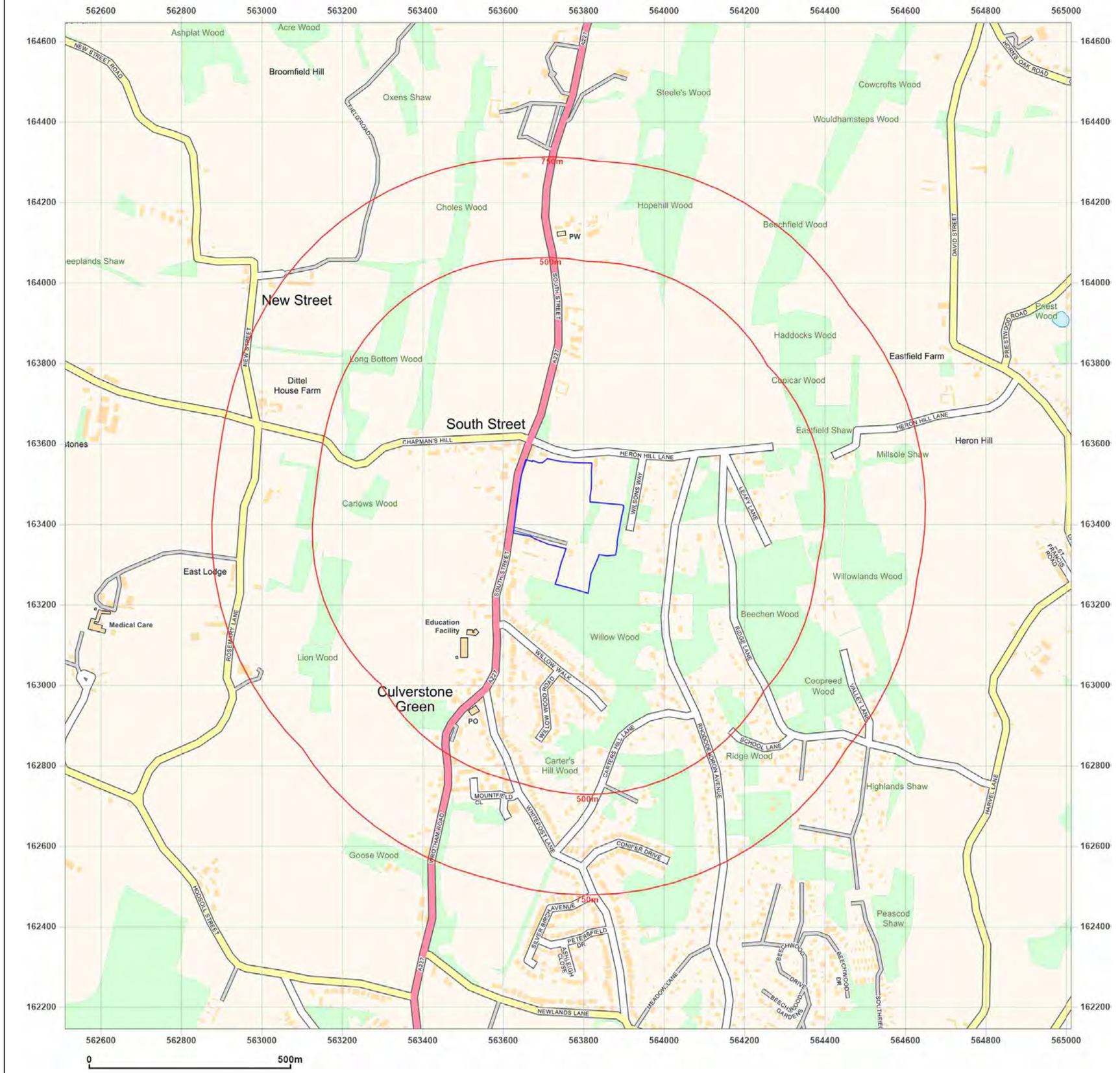
W: www.groundsure.com

Production date: 11 March 2025

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



Groundsure INSIGHTS

Site Details:

LITTLE BEECHFIELD, HERON HILL LANE, MEOPHAM, GRAVESEND, KENT, DA13 0QL

Client Ref: 25-263-MM-25054
Report Ref: HMD-155-NOT-6TA-JYQ-RO1
Grid Ref: 563762, 163396

Map Name: National Grid
Map date: **2025**
Scale: 1:10,000
Printed at: 1:10,000

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Production date: 11 March 2025

Map legend available at:
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APPENDIX 3

- BGS Borehole Logs

117

Kent County Council
Highways Laboratory
Geotechnical Group

TQ 66 SW/20-30

A227 PHASE 2- NEWLANDS LANE TO WHITEPOST LANE

PROPOSED MAJOR RECONDITIONING SCHEME

SITE INVESTIGATION

81.NAF/DC2/19

September 1985

15535

11th February 94

TQ66SW 20-30

M.N.T. Cottell C.Eng. F.I.C.E.,
County Surveyor,
Springfield,
Maidstone.

TQ66SW/20-30

A227 PHASE 2 - NEWLANDS LANE TO WHITEPOST LANE

PROPOSED MAJOR RECONDITIONING SCHEME

SITE INVESTIGATION

1] INTRODUCTION

During June 1985 the Kent County Council's (K.C.C.) Highways Laboratory was requested by Gravesham Borough Council to undertake a site investigation for the proposed improvement for the A227 between Newlands Lane to Whitepost Lane.

It is understood that the proposed major reconditioning scheme is to consist of the following:-

i] minor realignment and widening of the existing road;

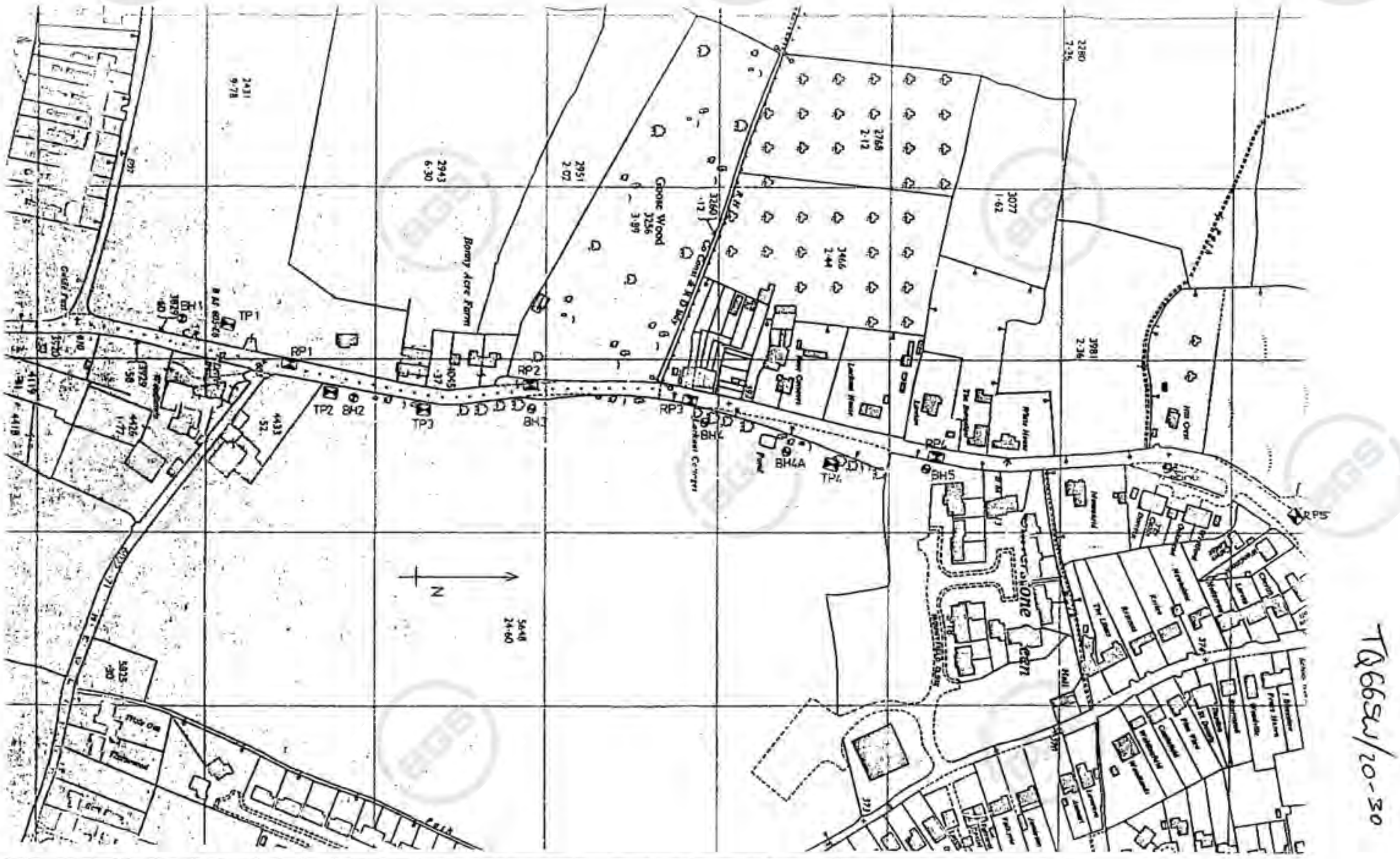
ii] the improvement of the present road construction to attain a 20 year life;

iii] The installation of a surface water drainage system to improve and replace the existing network;

This report also incorporates the findings of the Road Maintenance Appraisal Report (ref 1) issued in October 1984.

2] LOCATION, TOPOGRAPHY AND DESCRIPTION OF ROUTE

The A227 is a main distributor which links the industrial areas of north-west Kent with the urban areas of Tonbridge and Tunbridge Wells via Wrotham, Borough Green and Ightham. The section of the A227 under consideration for improvement extends from immediately north of the junction with Hodsoll Street (O.S. Grid Ref TQ 634624) to the first junction with Whitepost Lane (O.S. Grid ref. TQ 636629).



KENT C.C.	A227 PHASE 2 - NEWLANDS LANE TO WHITEPOST LANE	SCALE NOT TO	M.N.T. COTTELL, C.Eng., F.I.C.E. COUNTY SURVEYOR	DRAWN BY	K

Form No. 493

KEY

- Disturbed Sample
- Bulk Disturbed Sample
- 105 mm Undisturbed Sample
- Standard Penetration Test
- Water Sample

KENT COUNTY COUNCIL

HIGHWAYS LABORATORY

Sheet 1 of 2

BOREHOLE LOG TQ66SW 30

Date started 21st June 1985 Date completed 24th June 1985

Scheme A227 PHASE II - NEWLANDS LANE TO WHITEPOST LANE.

Location See drawing No. L/DC2/19/1. TQ 6346 6287

Borehole No. 6 Ground Level 127.29m A.O.D.

Sample No.	Sample Type	Sample Depth m.	Section	Depth about O.D. or below Ground Level	Thickness of Stratum m.	Description of Soil	Penetration Test Pen'tn mm.	Penetration Test No. of Blows
1	↕	0.30		0.50	0.50	TOPSOIL		
		0.50						
2	▮	0.60				Firm becoming stiff red mottled light brown very silty CLAY with flint GRAVEL and COBBLES. Some more silty areas.		
		1.05						
3	●	1.20						
4	●	2.00				Red brown mottled below 3 metres.		
5	●	3.00			5.50			
6	●	4.00						
7	●	5.00						
						(CLAY-WITH-FLINTS)		
8	●	6.00		6.00		Soft white puttified CHALK with fragments of weak chalk. Areas of brown silty clay and flint gravel.		
9	●	7.00			1.80			
						(UPPER CHALK - MUNDFORD GRADE VI)		
10	●	8.00		7.80		- - - - - - - - - - - - - - - - - -		
						(See following sheet)		
11	●	9.00			6.30			
12	●	10.00						

K.C.C. Highways Laboratory, Forstal, Aylesford, Kent.

Scale 1:50

00011819 2

Form No. 494

Continuation Log for Borehole No. 6 TQ66SW30.

Sheet 2 of 2

Sample No.	Sample Type	Sample Depth m.	Section	Depth ~~about O.D. or~~ below Ground Level	Thickness of Stratum m.	Description of Soil	Penetration Test Pen'tn mm.	Penetration Test No. of Blows
12	●	10.00				Moderately weak white friable to blocky white CHALK with some flint gravel. Becoming more blocky below 11.00 metres.		
13	●	11.00						
14	●	12.00			6.30			
15	●	13.00						
16	▌	13.50						
17	●	13.95				(UPPER CHALK - MUNDFORD GRADE IV - III)		
		14.10		14.10				

Borehole terminated at 14.10 metres.
No groundwater encountered.
Soakage Test undertaken at 13.5m.

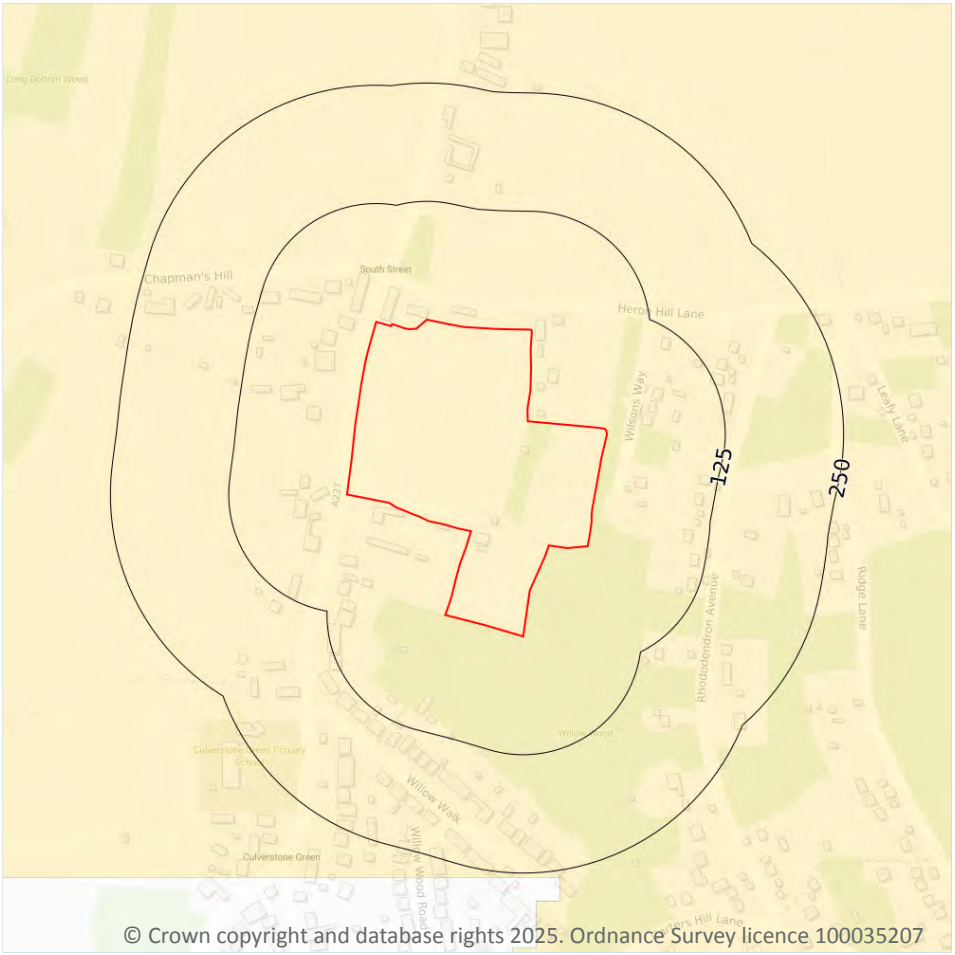
DEPTH (m)	NATURAL MOISTURE CONTENT (%)
0.85	26
13.70	30.

K.C.C. Highways Laboratory, Forstal, Aylesford, Kent.

Scale 1:50

APPENDIX 4 ▪ Radon Potential Dataset Mapping

20 Radon



Site Outline

Search buffers in metres (m)

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

20.1 Radon

Records on site	1

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

Features are displayed on the Radon map on **page 96 >**

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

APPENDIX 5 ▪ Photograph Appendix

Plate 1: Entrance gate

Plate 2: Entrance

Plate 3: Field 1 general view

Plate 4: Field 1 general view

Plate 5: Field 1 site boundaries

Plate 6: Field 1 gate

Plate 7: Field 1 overhead cables

Plate 8:

Plate 9:

Plate 10: Field 2 general view

Plate 11: Field 2 trees

Plate 12: Field 2 woodland band

Plate 13: Field 2

Plate 14: Field 3 general view

Plate 15: Field 3

Plate 16: Woodland band

Plate 17: Woodland band

Plate 18: Building located within woodland band

Plate 19: Building located within woodland band

Plate 20: Building located within woodland band

Plate 21: Stables

Plate 22: Potential asbestos containing material roofing

Plate 23: Stable building

Plate 24: Inside stable

Plate 25: Stable 3

Plate 26: Inside stable 3

Plate 27: Shed potential asbestos containing material

Plate 28: Zoom in of the shed

Plate 29: Waste disposed outside shed

Plate 30: Storage

Plate 31: Inside shed

Plate 32: Industrial multi-purpose plastic bottles outside shed

Plate 33: Riding area

Plate 34: Riding area surroundings

Plate 35: Portable storage unit

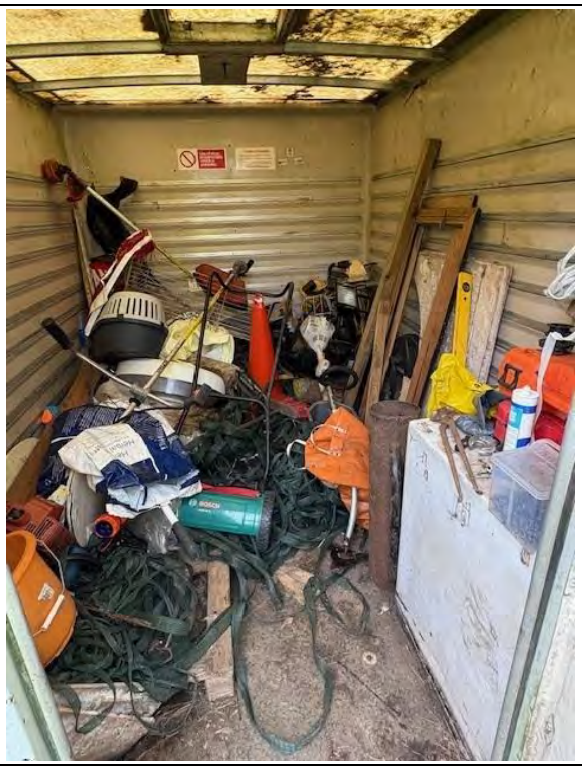


Plate 36: Inside portable storage unit

Plate 37: Flammable contents inside portable storage unit

Plate 38: Caravan

Plate 39: Caravan

Plate 40: Caravan and stable

Plate 41: Manure heap

Plate 42: Manure heap

Plate 43: Car park

Plate 44:

APPENDIX 6 ▪ Risk Assessment Methodology

RISK ASSESSMENT METHODOLOGY (FOLLOWING CIRIA C552, 2001)

The potential sources of contamination at the site and the implications with respect to development have been interpreted in accordance with the current government guidance on source-pathway-receptor risk assessment.

The existence of a pollutant linkage requires a pathway by which the receptor could be exposed to the source.

Where a complete pollutant linkage is deemed to be present, the level of *risk* is then determined taking into account the *likelihood* of significant impact and the *severity* of potential impact using the following classification tables which broadly follow the method set out in CIRIA C552.

Table A1: Classification of Severity (or Consequence)

CLASSIFICATION	DEFINITION
Severe	Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short term risk of sensitive water resource. Catastrophic damage to buildings/property. A short term risk to a particular ecosystem or organism forming part of such ecosystem (note: the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).
Medium	Chronic damage to Human Health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources, significant change in a particular ecosystem or organism forming part of such ecosystem.
Mild	Pollution of non sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm" as defined in the Draft Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve. Non permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). Easily repairable effects of damage to buildings, structures and services.

Table A2: Classification of Likelihood (Probability)

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

Table A3: Risk Estimation – Combination of Consequence and Probability(after CIRIA C552 and R&D66)

		MAGNITUDE OF POTENTIAL CONSEQUENCE (SEVERITY) OF RISK			
		SEVERE	**MEDIUM**	**MILD**	**MINOR**
LIKELIHOOD OF RISK	**HIGH LIKELIHOOD**	Very High Risk	High Risk	Moderate Risk	Low Risk
	LIKELY	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	LOW LIKELIHOOD	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	UNLIKELY	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table A4: Description of the Classified Risks and Likely Reaction Required

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

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