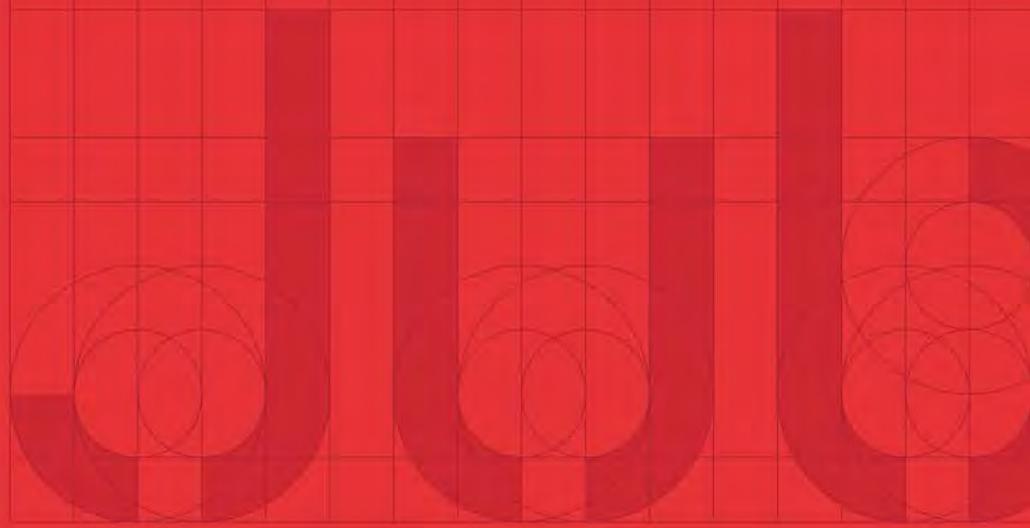


Geo-Environmental and  
Geotechnical  
Desktop Study



# Proposed Residential Development Gotherington

Jubb

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PREPARED BY:  
Jubb Consulting Engineers Ltd.

FOR:  
L&Q Estates

DATE:  
September 2019

REFERENCE:  
15163-G200-RevD

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## Contents

<b>1</b>	<b>Project Information.....</b>	<b>3</b>
1.1	Project Information.....	3
1.2	Project Details.....	3
1.3	Report Details .....	3
1.4	Project Authorisation.....	3
<b>2</b>	<b>Executive Summary .....</b>	<b>4</b>
<b>3</b>	<b>Introduction.....</b>	<b>5</b>
3.1	Commission .....	5
3.2	Objectives .....	5
3.3	Scope, Sources & Limitations .....	5
<b>4</b>	<b>Site Setting.....</b>	<b>6</b>
4.1	Site Location .....	6
4.2	Site Description .....	6
4.3	Site Proposals .....	7
<b>5</b>	<b>Geo-environmental Setting .....</b>	<b>7</b>
5.1	Geology and Ground Conditions .....	7
5.2	Hydrogeology .....	9
5.3	Hydrology and Flood Risk .....	10
5.4	Abstraction Consents.....	10
5.5	Discharge Consents .....	10
5.6	Pollution Incidents.....	10
5.7	Subsidence Risk.....	10
5.8	Coal or Metalliferous Mining.....	11
5.9	Land Fill Sites and Waste Management Operations .....	11
5.10	Radon Risks.....	11
5.11	Environmentally Sensitive Areas .....	11
5.12	Site History.....	12
<b>6</b>	<b>Risk Assessment Methodology.....</b>	<b>13</b>
6.1	General .....	13
6.2	Definition of Risk .....	13
6.3	The Concept of the 'Pollutant Linkage'.....	13
6.4	Conceptual Site Models.....	14
6.5	The Tiered Risk Assessment Approach.....	14
<b>7</b>	<b>Contamination Preliminary Risk Assessment .....</b>	<b>14</b>
7.1	General .....	14
7.2	Sources .....	14

7.3	Potential Receptors.....	15
7.4	Potential Pathways .....	15
7.5	Preliminary Conceptual Site Model (CSM) .....	15
<b>8</b>	<b>Preliminary Geotechnical Assessment.....</b>	<b>17</b>
8.1	Potential Foundation Options .....	17
8.2	Excavations and Groundwater .....	17
8.3	Buried Concrete.....	17
<b>9</b>	<b>Conclusions &amp; Recommendations.....</b>	<b>17</b>
9.1	Geo-Environmental Summary.....	17
9.2	Geotechnical Summary .....	18
9.3	Recommendations.....	18
	<b>Appendix A: Illustrative Masterplan .....</b>	<b>19</b>
	<b>Appendix B: Groundsure Geo-Insight &amp; Enviro-Insight Reports.....</b>	<b>20</b>
	<b>Appendix C: Groundsure Historic Mapping .....</b>	<b>21</b>
	<b>Appendix D: Geotechnical Risk Register .....</b>	<b>22</b>
	<b>Appendix E: Risk Assessment Definitions .....</b>	<b>23</b>

## 1 Project Information

### 1.1 Project Information

**Client** L&Q Estates

### 1.2 Project Details

**Project Name** Proposed Residential Development

**Location** Gotherington

**Jubb Project Number** P15163

### 1.3 Report Details

**Version** D

**Status** Revised

**Date** September 2019

### 1.4 Project Authorisation

#### ISSUE HISTORY:

#### AUTHORISATION:

Version	Date	Detail	Prepared By	Approved By
A	04/11/2015	First Issue	J Ham/ P Webber	M Campbell
B	19/07/16	Revised Layout Issue	J Ham	M Campbell
C	27/07/16	Minor Revisions	J Ham	M Campbell
D	19/09/2019	Revised Layout	J Ham	M Campbell

## 2 Executive Summary

### Site

The subject site extends to the south of the main residential area of Gotherington a small village north of Bishops Cleave in Gloucestershire, England.

The site is greenfield and covers approximately 7 hectares of open agricultural land. Detailed topographic information indicates the site to fall gradually from a high point on the east boundary to a low point on the western boundary. There is also a minimal fall noted from the northern to the southern boundary of the site (1-2m).

### Geology & Ground Conditions

The BGS Solid and Drift Mapping at 1:50000, Sheet 217: Moreton-in-Marsh identifies the solid geology at the site to comprise the Charmouth Mudstone Formation. The Charmouth Mudstone is a deposit containing laminated Shales and Mudstones with nodules and sporadic beds of Limestone.

There is the presence of superficial drift deposits on site comprising the Cheltenham Gravels and Sands.

### Previous Site Uses and History

The site has remained relatively unchanged from evidence in historic mapping, site use being agricultural.

Off-site, there has been significant residential construction in the area proximal to the site. Farm buildings and fields have been developed to the north of the site in the main residential area of Gotherington while areas to the south of the site remain as agricultural land.

### Contamination Assessment

In general, only relatively minor potential sources of contamination have been identified at the site, as follows:

- Potential Made Ground associated with farming of the site, or minor up filling of site levels, which is a potential source of heavy metals, PAHs and TPH, asbestos etc (low risk);
- Potential pesticides and herbicides concentrations with site soils (low risk);
- Potential ground gas generation of any peat or organic materials in near surface alluvial soils, or from historic agricultural land use;
- Potential naturally elevated sulphates and other aggressive substances within site soils (low risk).

Risk to controlled waters (groundwater and Dean Brook to the south) are generally considered to be low, but will need to be assessed as part of the Ground Investigation.

In general, the contamination potential of the site is considered to be low, although the potential sources identified above will need to be investigated as part of a Ground Investigation.

### Geotechnical Assessment

In terms of geotechnical risks, the following potential issues have been identified:

- Charmouth Mudstone – potentially weathered to silty clay near surface, may have high volume change potential, and may be unsuitable (in places) as foundation strata at shallow depth (require piles or deep foundations);
- Charmouth Mudstone – potentially elevated sulphates and sulphides, impact on below ground concrete design;

- Groundwater regime – perched groundwater may be encountered, and impact upon foundation options and excavations;
- Infiltration characteristics – likely to vary across site and need to be determined for drainage design purposes.

The above identified issues are not considered to be particularly high risk, and suitable engineering design should be able to overcome these, should they prove to be present.

## **Recommendations**

Prior to development, an intrusive Ground Investigations will be required to identify and quantify any contamination, determine depth and strength of underlying strata, and obtain suitable parameters for geotechnical design.

A suitable Interpretative Ground Investigation Report will be required, to determine foundation slab solutions, parameters for road pavement design, and an assessment of contamination risk.

## **3 Introduction**

### **3.1 Commission**

L&Q Estates are proposing to construct 50 no. residential units on the subject site, at Gotherington, Gloucestershire.

On instructions received from L&Q Estates, Jubb Consulting Engineers were appointed to undertake a Phase 1 Geo-Environmental Assessment of the site.

This report is for the private and confidential use of L&Q Estates (to whom alone is owed a duty of care) and their professional advisors and consultees; it may not be relied upon or reproduced by any third party for any use without the written agreement of Jubb Consulting Engineers Ltd.

### **3.2 Objectives**

The objectives of this assessment are:

- to undertake a suitable risk assessment of potential contamination risks, based on the established source-pathway-receptor pollution linkage based methods, and provide a summary of the potential contamination issues at the site with due regard to the proposed development;
- to identify existing geological and geotechnical issues at the site or problems associated with ground conditions, subsidence, mining or quarrying activity, slope stability, or any other such issues which may affect the proposed redevelopment;
- to make an initial evaluation of any potential geotechnical or geo-environmental hazards, risks and liabilities to the planned redevelopment of the site on the basis of the foregoing studies.

### **3.3 Scope, Sources & Limitations**

To establish past usages of the site and possible indications of contamination or ground instability, this report relies on publicly available historic maps, published geological information, information from Local Authority Building Control, and other statutory and non-statutory bodies, and data provided in a Groundsure report.

This report has been conducted in line with the source-pathway-receptor (SPR) linkage risk assessment based methods referred to in Part IIA of the Environmental Protection Act 1990, introduced by Section 57 of the Environment Act 1995.

The scope of this report is restricted to potential ground contamination and its environmental impact; it does not cover above ground hazards (e.g. asbestos in buildings; overhead services) potential ecological impacts (e.g. newts or bats) or botanical risks (e.g. Japanese Knotweed) or structural hazards (e.g. building or boundary wall stability) unless specifically referred to in the text of this report

All information, comments and opinions given in this report are based on documentary records made available to us at the present time. It should be noted that documentary sources and records may not be totally accurate, precise or complete. It is possible, therefore that there may be potential or actual contaminants or adverse ground conditions that remain undetected.

Advice and recommendations given in this report are provided for information; they are not exhaustive and do not constitute a specification for further investigation or other works.

## 4 Site Setting

### 4.1 Site Location

Gotherington is a small village north of Bishops Cleeve in Gloucestershire. The subject site extends to the south of the main residential area of Gotherington.

The grid reference at the centre of the site is SO 96146 29289.

The site location plan is indicated in Figure 1 below:

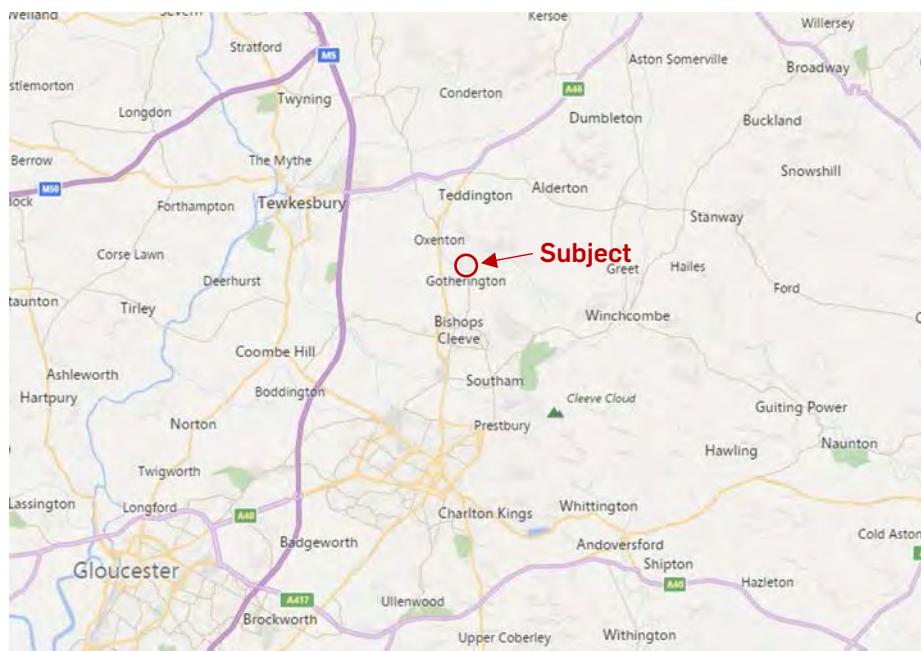


Figure 1- Site Location

### 4.2 Site Description

The site is Greenfield, and covers approximately 7 hectares of open agricultural land.

Topographic information indicates a high point on the eastern boundary of 61.53mAOD dropping to a low point of 56.38 within the orchard portion of the site close to the western boundary. This results in a level maximum level change of 5.15m, which is a fairly shallow gradient over the sites extent.

From the northern to southern extent there is a minor change in level with approximately 1-2m fall in a southerly direction.

An aerial photograph of the site is provided in Figure 2 below.



Figure 2 – Aerial Photograph

#### 4.3 Site Proposals

The outline development proposals for the site are for the construction of 50 no. residential units including infrastructure such as access roads and car parking.

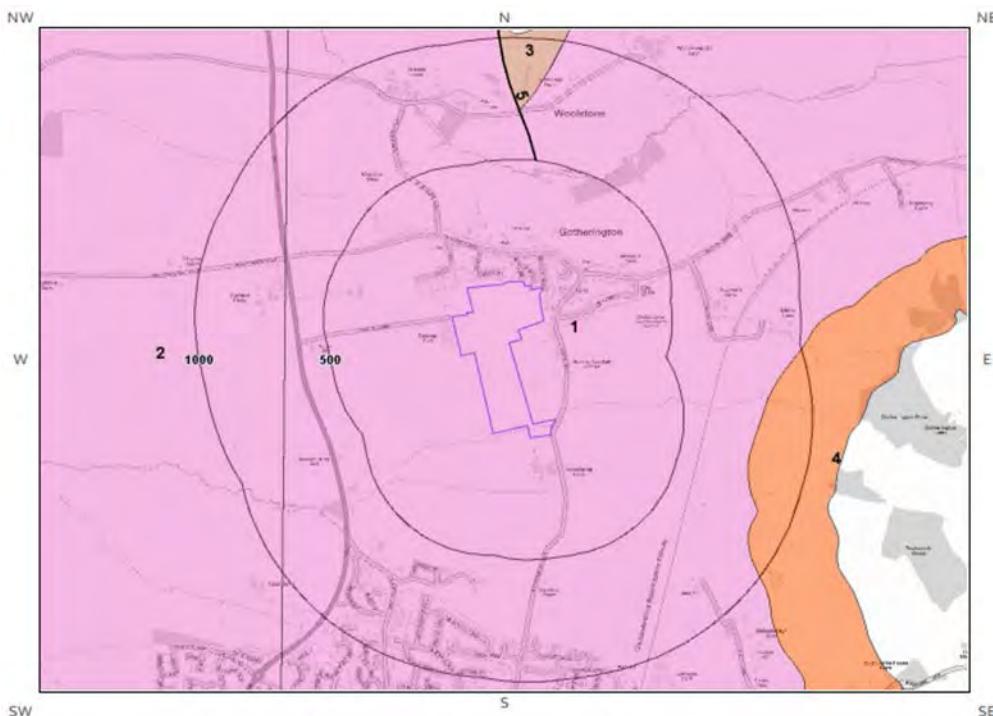
An illustrative site masterplan is included in **Appendix A**.

### 5 Geo-environmental Setting

The following information is obtained primarily from a Groundsure database report containing geological and environmental information, (and historic mapping) as contained in **Appendix B** and **C**. The Groundsure has been purchased for the entirety of the land in possession of the client but the proposed development only comprises the upper portion of the site and therefore the findings from this portion of the site have been used in the following assessment.

#### 5.1 Geology and Ground Conditions

The BGS Solid and Drift Mapping (1:50,000 Scale, Sheet 217, Moreton-in-Marsh) identifies the solid geology at the site to comprise the Charmouth Mudstone Formation, which comprises laminated Shales and Mudstones with nodules and sporadic beds of Limestone.



*Figure 3 – Solid Geological Mapping*

Key	
1	<b>Charmouth Mudstone Formation</b>
4	<b>Dryham Formation – Siltstone and Mudstone</b>
3	<b>Whitby Mudstone Formation</b>

Within the development boundary there is a single superficial drift deposit of which Cheltenham Gravels and Sands (sand and gravel deposits) noted as overlying the bedrock on the site.

A secondary superficial deposit of Alluvium (clay, silt, sands and gravels) underlie the area within the client's property boundary but not in close proximity to the development so is not considered in this assessment.

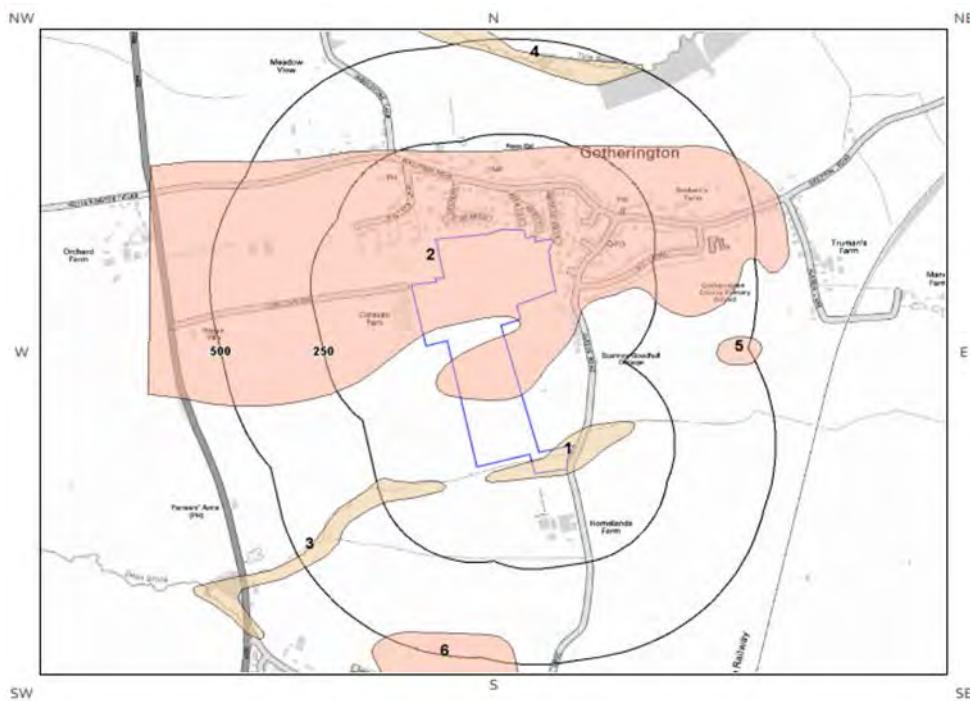


Figure 4 – Superficial Geological Mapping

Key	
2	<b>Cheltenham Sand and Gravel</b>
1	<b>Alluvium</b>

BGS borehole records from the vicinity of the site (1.2km to the northwest) indicates that the Charmouth Mudstone formation is encountered near surface as a completely weathered 'residual soil' comprising a firm to stiff fissured silty clay, underlain at depth by more competent mudstone bedrock.

## 5.2 Hydrogeology

The Groundsure environmental report identifies that the solid bedrock geology beneath the site is identified as a Secondary (Undifferentiated) Aquifer, and the superficial geology beneath the site is identified as a Secondary A aquifer.

Secondary (undifferentiated) aquifers are classified as follows: "*has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.*"

The Groundsure environmental report identifies that the superficial geology beneath the site is identified as a Secondary A aquifer.

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

The site is not located within an Environment Agency Groundwater source protection zone.

### 5.3 Hydrology and Flood Risk

A Tertiary Watercourse (the Dean Brook) is located on the southern boundary of the site.

The site is located in an Environment Agency Flood Zone 1 and is therefore considered to be at a very low risk from flooding.

### 5.4 Abstraction Consents

There are 3 no. historic groundwater abstraction consents located within 2000m of the site, all associated with general farming and domestic abstractions.

There are no surface or potable water abstractions within 2000m of the site.

### 5.5 Discharge Consents

There are no licensed 'Discharge Consents' to controlled waters within the vicinity of the subject site.

### 5.6 Pollution Incidents

There is one single pollution incident recorded within 500m of the site, relating to firefighting run-off on the 9th August 2002, recorded as having a minor impact on water quality.

### 5.7 Subsidence Risk

The ratings for various ground subsidence hazards within 50m of the site is outlined in the table below. This rating is obtained through the ground stability hazard dataset, which are supplied by the British Geological Survey (BGS):

Subsidence Type	Risk Rating	Notes
Shrink-Swell Clays	Low	Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink swell problems.
Landslides	Very Low	Slope instability problems are unlikely to be present.
Ground Dissolution of Soluble Rocks	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions.
Compressible Deposits	Negligible	No indicators for compressible ground identified. No special actions required to avoid problems due to compressible ground. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible ground.
Collapsible Deposits	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

Subsidence Type	Risk Rating	Notes
Running Sands	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

*Table 1 - Ground Risks***Table 1 – Subsidence Risks****5.8 Coal or Metalliferous Mining**

The Groundsure report identifies that there is no coal or other mining areas located in the vicinity of the study site.

**5.9 Land Fill Sites and Waste Management Operations**

The Environment Agency (EA) landfill data indicates a single historic landfill operation in the area, located approximately 900m to the North West of the site, and receiving inert waste from 4th November 1991 to 30th April 1994. The address of the landfill is Evesham Road, Gotherington, Bishops Cleeve, Gloucestershire with a Grid Reference of X: 395,208.71; Y: 230,091.87.

This landfill is likely to have a negligible effect on the proposed development with gas control measures in place on the landfill site.

**5.10 Radon Risks**

The Groundsure report indicates that radon emissions above the radon action level are encountered in less than 1% of homes in the area.

Therefore, no radon protection measures will need to be incorporated into any new development at the site.

**5.11 Environmentally Sensitive Areas**

The Groundsure report has identified 9 no. environmentally sensitive areas which are within 2000m of the site, as outlined below. These are shown in the table below.

Distance (m)	Direction	Designation	Name	Data Source
0	On-site	Nitrate Vulnerable Zone	Existing	DEFRA
420	N	Areas of Outstanding Natural Beauty (AONB)	Cotswolds	Natural England
441	N	Environmentally Sensitive Areas	Cotswold Hills	Natural England

474	N	Nitrate Vulnerable Zone	Existing	DEFRA
474	N	Environmentally Sensitive Areas	Cotswold Hills	Natural England
1183	E	Ancient Woodland	Unknown	Ancient and semi-natural woodland
1355	E	Ancient Woodland	Unknown	Ancient and semi-natural woodland
1564	E	Nitrate Vulnerable Zone	Existing	DEFRA
1762	SW	Green Belt Land	Gloucester Greenbelt	Tewkesbury District

Table 2 - Environmentally Sensitive Sites

### 5.12 Site History

The site history has been assessed by a study of historic Ordnance Survey Maps dating back to 1868 as supplied in a Groundsure Report. The historical maps obtained from this source, whilst considered to be fairly comprehensive, may not represent all of the historical maps possibly published for the site. The maps reviewed are presented for reference in **Appendix C**.

Date	Scale	Onsite	Offsite
1884	1:10560	The site is agricultural pasture land, split into a number of different fielded areas. Two of the fielded areas are noted to be plantation/woodland with trees covering these areas. A small river Dean Brook is noted to run through the south of the site.	The majority of the surrounding area is also agricultural land with a number of farms in the vicinity. To the north of the site is the main residential area of Gotherington which is sparsely populated with farm buildings
1924	1:10560	The site remains unchanged	A railway has been constructed 550m to the east of the site. There has also been a number of residential developments to the north of the site through the centre of Gotherington
1954	1:10560	The site remains unchanged	Further small residential developments to the north of the site
1977	1:10560	The site remains unchanged	There has been a significant amount of small residential housing constructed to the north of the site. Many of the farms previously within the area have been redeveloped for residential purposes. Areas to the

			south of the site are still mainly agricultural.
1994	1:10000	The site remains unchanged	There has been the construction of residential units at various locations along the northern boundary of the site
2014	1:10000	The site remains unchanged	Small amounts of residential construction in the local area

*Table 3 - Site History*

The site has remained relatively unchanged since the 1868 mapping.

Off-site, there has been significant residential construction in the area proximal to the site. Farm buildings and fields have been developed to the north of the site in the main residential area of Gotherington while areas to the south of the site remain as agricultural land.

## 6 Risk Assessment Methodology

### 6.1 General

The DEFRA and Environment Agency Contaminated Land Report 11 (CLR11) 'Model Procedures for the Management of Land Contamination' provides a technical framework for structured decision making about land contamination.

### 6.2 Definition of Risk

CLR11 defines risk as:

- a combination of probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences of the occurrence.

### 6.3 The Concept of the 'Pollutant Linkage'

In the context of contaminated land, there are three essential elements to any risk:

- a **contaminant (or source)** – a substance that is in, on or under land and has the potential to cause harm or cause pollution of controlled waters.
- a **receptor** - humans, ecological system, water body or property.
- a **pathway** – a route or means by which a receptor can be exposed to, or affected by, a contaminant.

Each of these elements can exist separately; however, they create a risk only where they are linked together forming a **pollutant linkage**.

## 6.4 Conceptual Site Models

A conceptual site model represents the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors (pollutant linkages).

For all potential pollutant linkages identified, the consequence and probability of occurrence is qualitatively assessed, and a risk assigned.

Refer to **Appendix E** for Risk Assessment Definitions.

## 6.5 The Tiered Risk Assessment Approach

CLR11 presents a tiered approach to risk:

### Tier 1 Preliminary risk assessment (PRA)

The purpose of the preliminary risk assessment is to develop an initial conceptual model of the site and to establish whether or not there are potentially unacceptable risks. If potential risks are identified the initial conceptual model is developed in subsequent tiers of the risk assessment process.

### Tier 2 Generic quantitative risk assessment (GQRA)

The purpose of the generic quantitative risk assessment is to establish whether generic assessment criteria and assumptions are appropriate for assessing the risks and, if so, to apply them to establish whether there are actual or potential unacceptable risks. It also determines whether further detailed quantitative risk assessment is required.

### Tier 3 Detailed quantitative risk assessment (DQRA)

The purpose of the detailed quantitative risk assessment is to establish and use more detailed site specific information and criteria to decide whether there are unacceptable risks. It may be used as the sole method of quantitative assessments of risks, or it may be used to refine earlier assessments using generic assessment criteria.

The following assessment comprises a Preliminary Risk Assessment (PRA) which will need to be developed during further ground investigation works.

## 7 Contamination Preliminary Risk Assessment

### 7.1 General

The following preliminary conceptual model information has been taken from the information obtained in sections 3.0.

### 7.2 Sources

The following past and present uses have been identified: -

- Potential Made Ground associated with farming of the site, or minor up filling of site levels, which is a potential source of heavy metals, PAHs and TPH, asbestos etc (low risk);
- Potential pesticides and herbicides concentrations with site soils (low risk);
- Potential ground gas generation of any peat or organic materials in near surface alluvial soils, or generated by the historic landfill site situated to north west (low risk);

- Potential naturally elevated sulphates and other aggressive substances within site soils (low risk).

### 7.3 Potential Receptors

The following potential receptors have been identified, based on the proposed redevelopment of the site for use as a commercial building:

- Ground workers and construction workers;
- Future site users;
- Groundwater (Secondary A aquifers beneath the site);
- Surface water (Dean Brook);
- Building materials (Buried concrete and buried water pipes).

### 7.4 Potential Pathways

The following potential pathways need to be considering in relation to the receptors described above: -

- Human uptake pathways (Ingestion, skin contact, inhalation);
- Leaching and migration of contaminants to groundwater (and migration within aquifers);
- Direct contact of soils and water with buried structures;
- Accumulation of ground gas within confined spaces (potential explosion risk).

### 7.5 Preliminary Conceptual Site Model (CSM)

The potential key contaminative substances, potential receptors and possible pathways are set out on the Table below, taking into account findings of the previous investigation.

Sources	Receptor	Pathway	Consequence	Probability	Risk	Recommended Action (to clarify level of risk and assess suitable mitigation measures or to mitigate the risk)
Made Ground which may be associated with former agricultural usage – heavy metals, PAH, TPH etc  Potential pesticide and herbicide residues.	Future Site Users;	Human uptake pathways	Medium	Low likelihood	Moderate 6.1/Low risk	General risk of contamination at the site is considered to be low. Site Investigation will be required to determine contamination potential of site soils, presence of made ground etc.
	Construction workers;	Human uptake pathways	Mild	Low likelihood	Low risk	Future mitigation measures to protect human health may be required depending upon results. Use of suitable PPE and good hygiene practice on the site to mitigate risk to construction workers.
	Groundwater	Percolation/leaching/ migration to groundwater;	Mild	Low likelihood	Low risk	The soils on site are not significant aquifers and therefore the potential for this pathway to be utilised is low. Although this is the case site investigation will be required to determine contamination potential of site soils, presence of made ground etc.
	Surface water	Percolation/leaching/ migration via groundwater; Direct run-off	Mild	Low likelihood	Low risk	
Ground Gas generated from onsite sources	Future Site Users;	Migration into confined spaces	Severe	Low likelihood	Moderate risk	Ground gas monitoring should be installed on site during any intrusive site investigations and based on this protection measures may be required to mitigate risk.
	Buildings /structures	Build up in confined spaces and potential combustion	Severe	Low likelihood	Moderate risk	
Naturally elevated sulphates and pH	Building Materials	Contact with subsoil or groundwater	Medium	Low likelihood	Moderate / Low risk	Suitable site investigation to quantify risk, spec. building materials accordingly.

Table 4 - Preliminary contamination sources assessment

## 8 Preliminary Geotechnical Assessment

There are several geotechnical issues associated with the site which have been identified in this preliminary assessment, although these are generally considered to be of low/moderate risk. None are likely to preclude development at the site.

A Preliminary Geotechnical Risk Register has been produced for the site outlining potential risks, this is reproduced in **Appendix D**.

### 8.1 Potential Foundation Options

The Cheltenham Gravels and Sands and Charmouth Mudstone deposits are likely to prove a suitable foundation strata, and potentially be suitable for shallow traditional foundations, although this will need to be confirmed by suitable Ground Investigation works.

The Charmouth Mudstone Formation may be encountered as a highly or completely weathered silty gravelly clay near the surface of the strata, and the volume change potential of any clay material encountered will have to be confirmed by suitable laboratory testing. Should such weathered clay materials prove to be deep or extensive across the site, then deeper foundation solutions such as trench fill or piled foundations may be applicable to some parts of the site.

### 8.2 Excavations and Groundwater

The groundwater regime on site may vary between deposits and perched groundwater levels could potentially be expected within the Cheltenham Gravels and Sands, which could impact viable foundation options and dewatering/support required for below ground excavations. The groundwater regime will need to be determined by suitable Ground Investigation, including installation of monitoring wells/piezometers and subsequent programme of monitoring.

The different deposits are also likely to have different infiltration characteristics, and a programme of infiltration testing is recommended during the Ground Investigation to determine the viability of soakaway and infiltration drainage.

### 8.3 Buried Concrete

The Charmouth Mudstone is also known to have naturally occurring elevated sulphates and sulphides, which can have a detrimental impact on building materials and are particularly aggressive to concrete especially below the groundwater table.

## 9 Conclusions & Recommendations

### 9.1 Geo-Environmental Summary

In summary, several minor source of potential geo-environmental risk have been identified at the site. These risks are essentially associated with potential made ground at the site (if proved to be present), naturally occurring ground gas or ground gas associated with offsite landfill, and potential pesticide/herbicides within site soils. In general, the contamination potential at the site is considered to be low.

Further contamination testing will be undertaken during ground investigation works to confirm the above.

## 9.2 Geotechnical Summary

In terms of geotechnical risks, the following potential issues have been identified:

- Charmouth Mudstone – potentially weathered to silty clay near surface, may have high volume change potential, and be unsuitable (in places) as foundation strata at shallow depth (require piles or deep foundations);
- Charmouth Mudstone – potentially elevated sulphates and sulphides, impact on below ground concrete design;
- Groundwater regime – perched groundwater may be encountered, and impact upon foundation options and excavations;
- Infiltration characteristics – likely to vary across site and need to be determined for drainage design purposes.

The above identified issues are not considered to be particularly high risk, and suitable engineering design should be able to overcome these, should they prove to be present.

## 9.3 Recommendations

Prior to development, an intrusive Ground Investigations will be required to identify and quantify any contamination, determine depth and strength of underlying strata, and obtain suitable parameters for geotechnical design purposes.

The results of the investigation will need to be incorporated into an Interpretative Ground Investigation Report, which will provide recommendations for foundations, floor slabs, excavations, road design, etc. The report will also provide a Generic Quantitative Assessment of contamination risk, comparing soil and groundwater laboratory test results with suitable generic thresholds appropriate for the proposed end use of the site.

Outline scope of the Ground Investigation will comprise:

- Trial Pitting across the site to determine shallow ground conditions, obtain samples for geotechnical and geo-environmental testing;
- Window Sample or Cable Percussion boreholes to determine ground conditions at depth and provide in-situ parameters for geotechnical design;
- Installation of groundwater and ground gas monitoring standpipes to enable post investigation monitoring to be undertaken;
- Suitable programme of contamination and geotechnical laboratory testing;
- Suitable Interpretative Reporting.

## **Appendix A: Illustrative Masterplan**

The scaling of this drawing cannot be assured

Revision  
E Illustrative Layout Updated

Date 22.11.16 Drn J.W. Ckd T.L.

**Site boundary**  
- 6.28Ha / 15.52Ac



Building



Garage



Main Road



Side Street



Lane / Private Drive



Footpath



Play Area



Project  
Gotherington

Drawing Title  
Illustrative Site Layout

Date 16.06.16 Scale 1:1,250@A2 Drawn by KD Check by TL  
Project No 25212 Drawing No RG-M-15 Revision E

0 10 20 30 40 50m

BARTON WILLMORE

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## **Appendix B: Groundsure Geo-Insight & Enviro-Insight Reports**

CENTREMAPS

Report Reference: CMAPS-CM-461194-5956-080915GEO

Open Space, Upper Interfields,  
Worcester, WR14 1UT

Your Reference: 5956

Report Date 8 Sep 2015

Report Delivery Email - pdf  
Method:

## Groundsure Geoinsight

Address: Gotherington Tewkesbury, GL52 9UH

Dear Sir/ Madam,

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

If you need any further assistance, please do not hesitate to contact our helpline on 01886 832972 quoting the above CENTREMAPS reference number.

Yours faithfully,

CENTREMAPS

Enc.  
Groundsure Geoinsight

# Groundsure Geoinsight

**Address:** Gotherington Tewkesbury, GL52 9UH

**Date:** 8 Sep 2015

**Reference:** CMAPS-CM-461194-5956-080915GEO

**Client:** CENTREMAPS



SW S SE  
Aerial Photograph Capture date: 30-Aug-2010  
Grid Reference: 396150,229205  
Site Size: 12.82ha

# Contents Page

Overview of Findings.....	5
1 Geology.....	8
1.1 Artificial Ground Map.....	8
1 Geology.....	9
1.1 Artificial Ground.....	9
1.1.1 Artificial/ Made Ground.....	9
1.1.2 Permeability of Artificial Ground.....	9
1.2 Superficial Deposits and Landslips Map.....	10
1.2 Superficial Deposits and Landslips.....	11
1.2.1 Superficial Deposits/ Drift Geology.....	11
1.2.2 Permeability of Superficial Ground.....	11
1.2.3 Landslip.....	12
1.2.4 Landslip Permeability.....	12
1.3 Bedrock and Faults Map.....	13
1.3 Bedrock, Solid Geology & Faults.....	14
1.3.1 Bedrock/ Solid Geology.....	14
1.3.2 Permeability of Bedrock Ground.....	14
1.3.3 Faults.....	14
1.4 Radon Data.....	15
1.4.1 Radon Affected Areas.....	15
1.4.2 Radon Protection.....	15
2 Ground Workings Map.....	16
2 Ground Workings.....	17
2.1 Historical Surface Ground Working Features derived from Historical Mapping.....	17
2.2 Historical Underground Working Features derived from Historical Mapping.....	17
2.3 Current Ground Workings.....	17
3 Mining, Extraction & Natural Cavities Map.....	18
3 Mining, Extraction & Natural Cavities.....	19
3.1 Historical Mining.....	19
3.2 Coal Mining.....	19
3.3 Johnson Poole and Bloomer.....	19
3.4 Non-Coal Mining.....	19
3.5 Non-Coal Mining Cavities.....	20
3.6 Natural Cavities.....	20
3.7 Brine Extraction.....	20
3.8 Gypsum Extraction.....	20
3.9 Tin Mining.....	20
3.10 Clay Mining.....	21
4 Natural Ground Subsidence.....	22
4.1 Shrink-Swell Clay Map.....	22
4.2 Landslides Map.....	23
4.3 Ground Dissolution Soluble Rocks Map.....	24
4.4 Compressible Deposits Map.....	25
4.5 Collapsible Deposits Map.....	26
4.6 Running Sand Map.....	27
4 Natural Ground Subsidence.....	28
4.1 Shrink-Swell Clays.....	28
4.2 Landslides.....	28
4.3 Ground Dissolution of Soluble Rocks.....	28

4.4 Compressible Deposits.....	29
4.5 Collapsible Deposits.....	29
4.6 Running Sands.....	29
5 Borehole Records Map.....	31
5 Borehole Records.....	32
6 Estimated Background Soil Chemistry.....	33
7 Railways and Tunnels Map.....	34
7 Railways and Tunnels.....	35
7.1 Tunnels .....	35
7.2 Historical Railway and Tunnel Features .....	35
7.3 Historical Railways.....	36
7.4 Active Railways.....	36
7.5 Railway Projects.....	36

# Overview of Findings

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

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

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

## Section 1:Geology

1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

Section 2:Ground Workings	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	2	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	0	0	0

Section 3:Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	2	1
3.4 Non-Coal Mining	0	0	0	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0
<b>Section 4:Natural Ground Subsidence</b>	<b>On-site</b>				
4.1 Shrink Swell Clay	Low				
4.2 Landslides	Very Low				
4.3 Ground Dissolution of Soluble Rocks	Negligible				
4.4 Compressible Deposits	Moderate				
4.5 Collapsible Deposits	Very Low				
4.6 Running Sand	Low				
<b>Section 5:Borehole Records</b>	On-site	0-50m	51-250		
5 BGS Recorded Boreholes	0	0	0		
<b>Section 6:Estimated Background Soil Chemistry</b>	On-site	0-50m	51-250		
6 Records of Background Soil Chemistry	10	4	20		
<b>Section 7:Railways and Tunnels</b>	On-site	0-50m	51-250	251-500	
7.1 Tunnels	0	0	0	Not Searched	
7.2 Historical Railway and Tunnel Features	0	0	1	Not Searched	
7.3 Historical Railways	0	0	0	Not Searched	
7.4 Active Railways	0	0	0	Not Searched	

Section 7: Railways and Tunnels

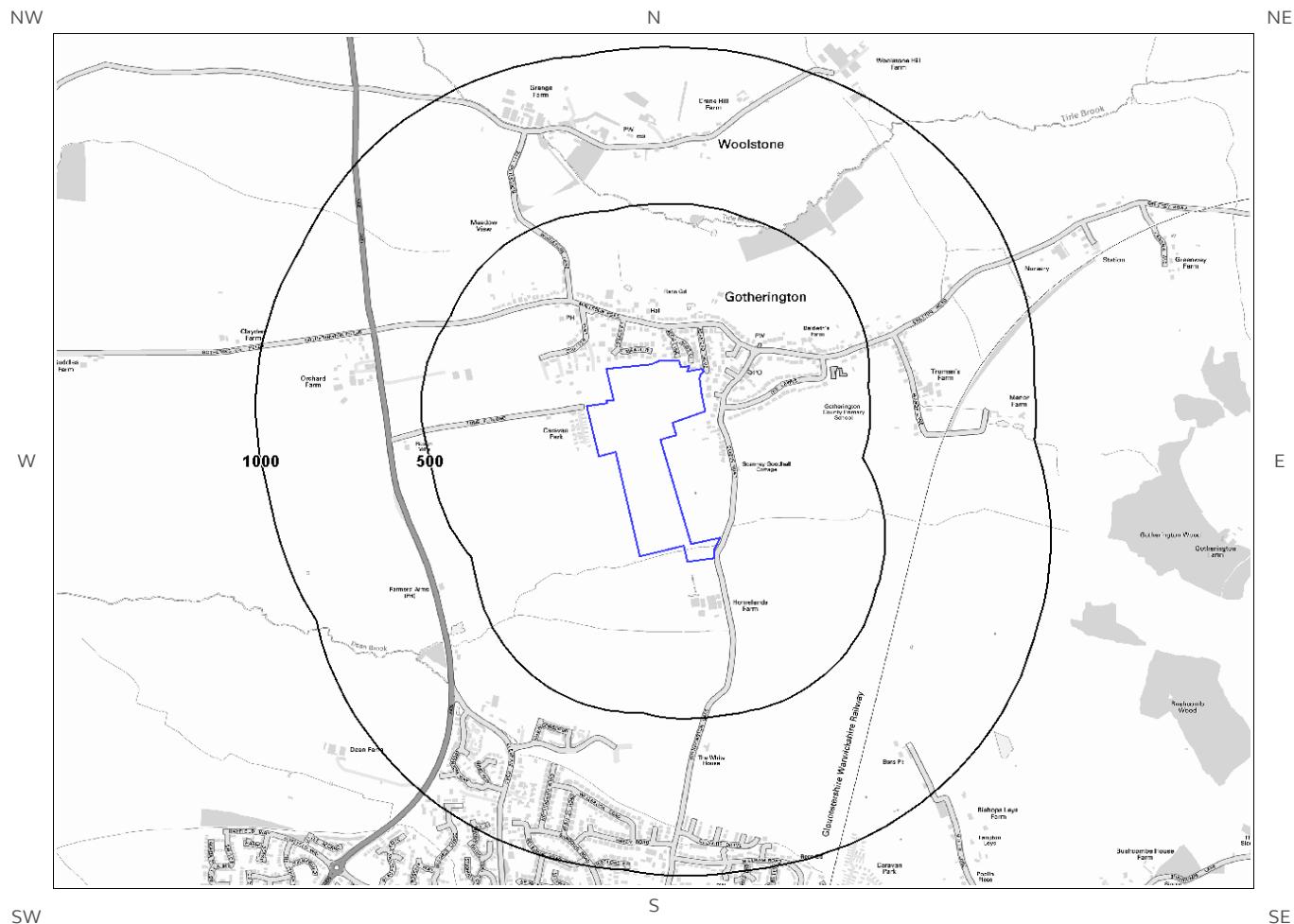
On-site    0-50m    51-250    251-500

7.5 Railway Projects

0    0    0    0

# 1 Geology

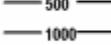
## 1.1 Artificial Ground Map



Artificial Ground Legend

 Mapping sourced from  Ordnance Survey®

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	Site Outline		Made Ground (undivided)		Disturbed Ground (undivided)
 	Search Buffers (m)		Worked Ground (undivided)		Landscaped Ground (undivided)
			Infilled Ground		Reclaimed Ground

# 1 Geology

## 1.1 Artificial Ground

### 1.1.1 Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:217

Are there any records of Artificial/Made Ground within 500m of the study site boundary? No

Database searched and no data found.

---

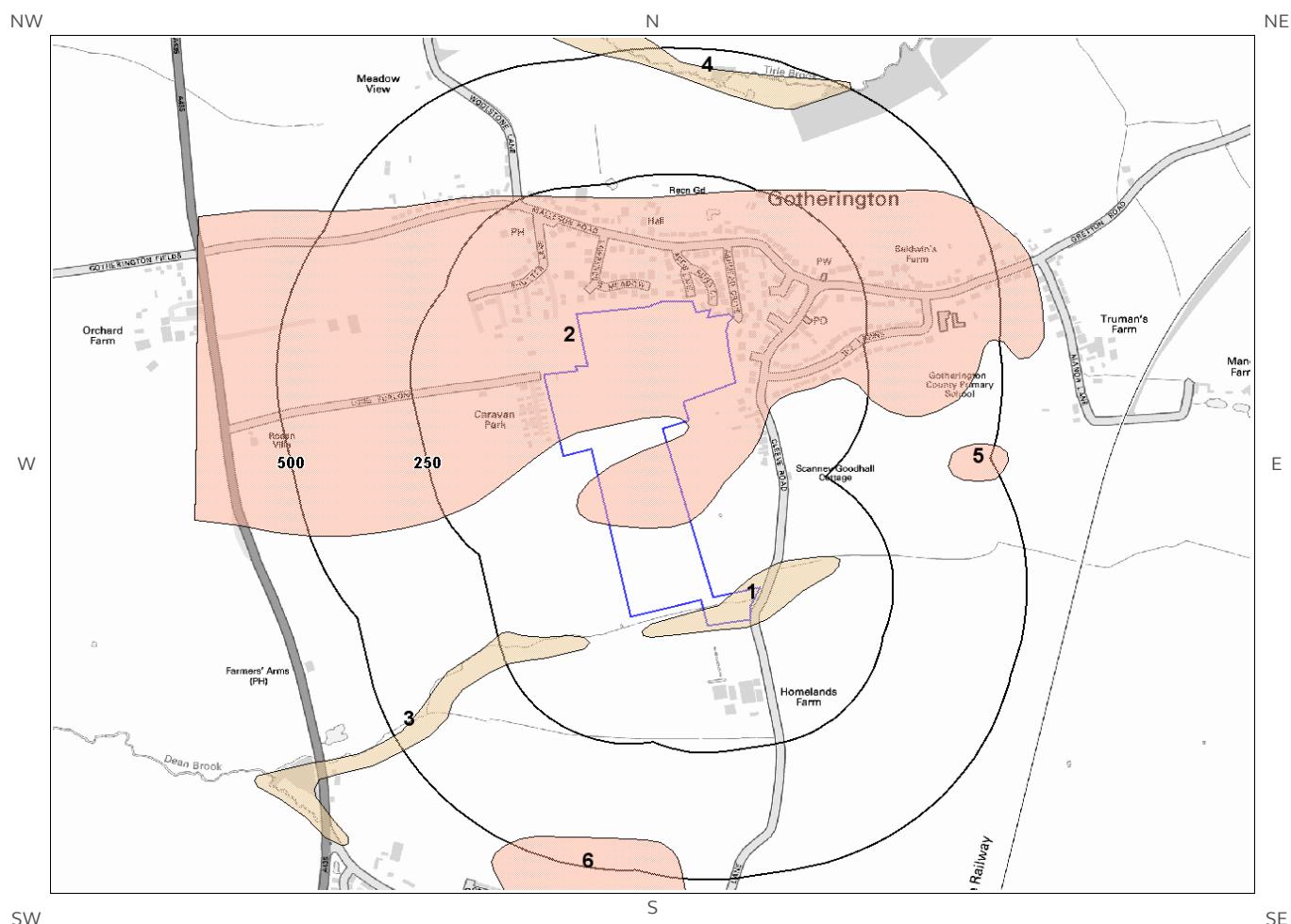
### 1.1.2 Permeability of Artificial Ground

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

Database searched and no data found.

---

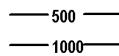
## 1.2 Superficial Deposits and Landslips Map



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Site Outline



Search Buffers (m)

# 1.2 Superficial Deposits and Landslips

## 1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
2	0.0	On Site	CHSG	CHELTENHAM SAND AND GRAVEL	SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
3	92.0	SW	ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
4	411.0	N	ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
5	424.0	NE	CHSG	CHELTENHAM SAND AND GRAVEL	SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
6	435.0	S	CHSG	CHELTENHAM SAND AND GRAVEL	SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]

## 1.2.2 Permeability of Superficial Ground

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

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

### 1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary?

No

Database searched and no data found.

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

---

### 1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site\*\* boundary?

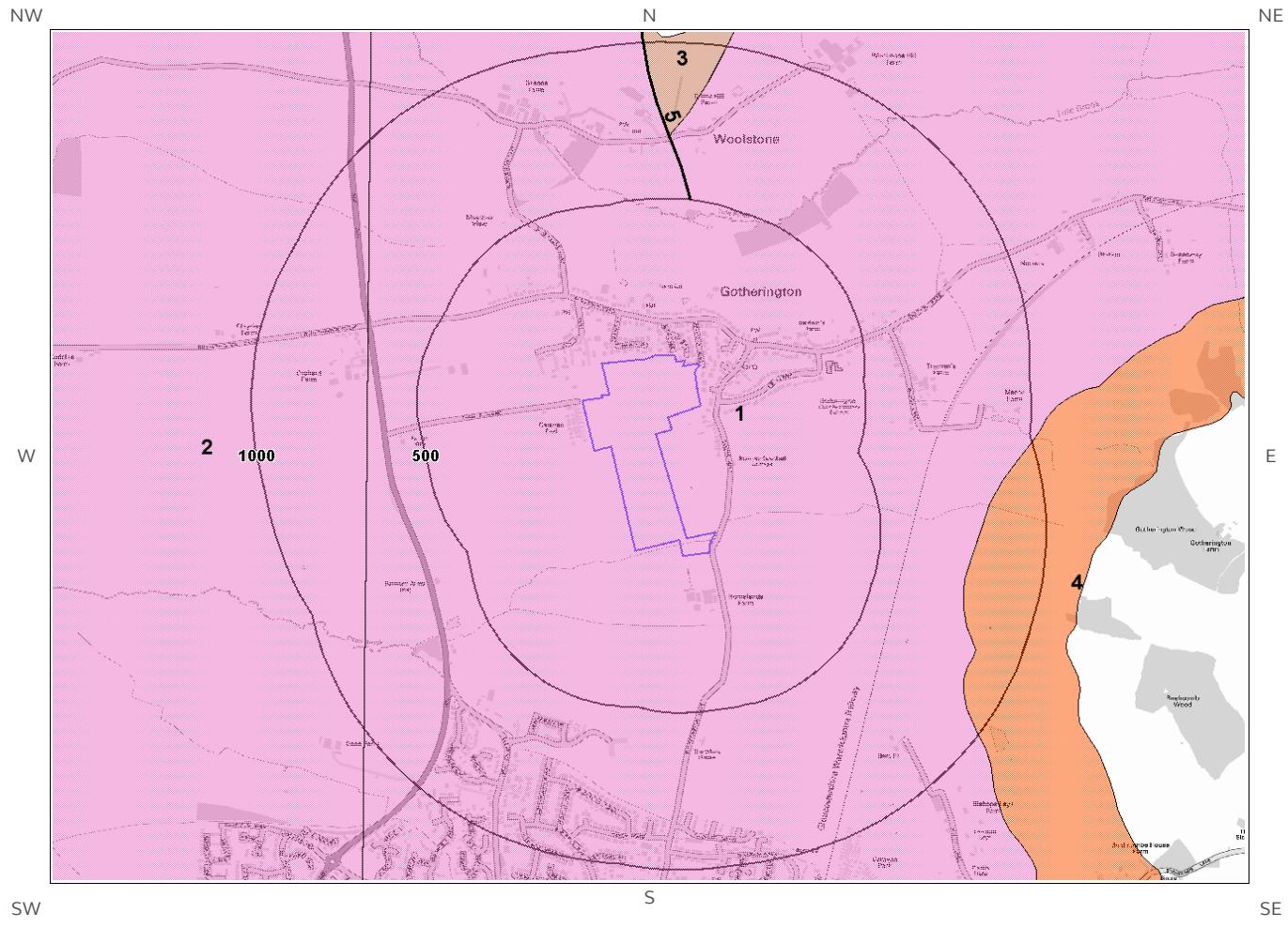
No

Database searched and no data found.

---

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

## 1.3 Bedrock and Faults Map



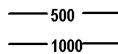
**Bedrock and Faults Legend**



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Site Outline



Search Buffers (m)

# 1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:217

## 1.3.1 Bedrock/ Solid Geology

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

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	CHAM-MDST	Charmouth Mudstone Formation - Mudstone	Pliensbachian / Sinemurian

## 1.3.2 Permeability of Bedrock Ground

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

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Low	Low

## 1.3.3 Faults

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

ID	Distance (m)	Direction	Category Description	Feature Description
5	498.0	N	FAULT	Fault, inferred, displacement unknown

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

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

---

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

# 1.4 Radon Data

## 1.4.1 Radon Affected Areas

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

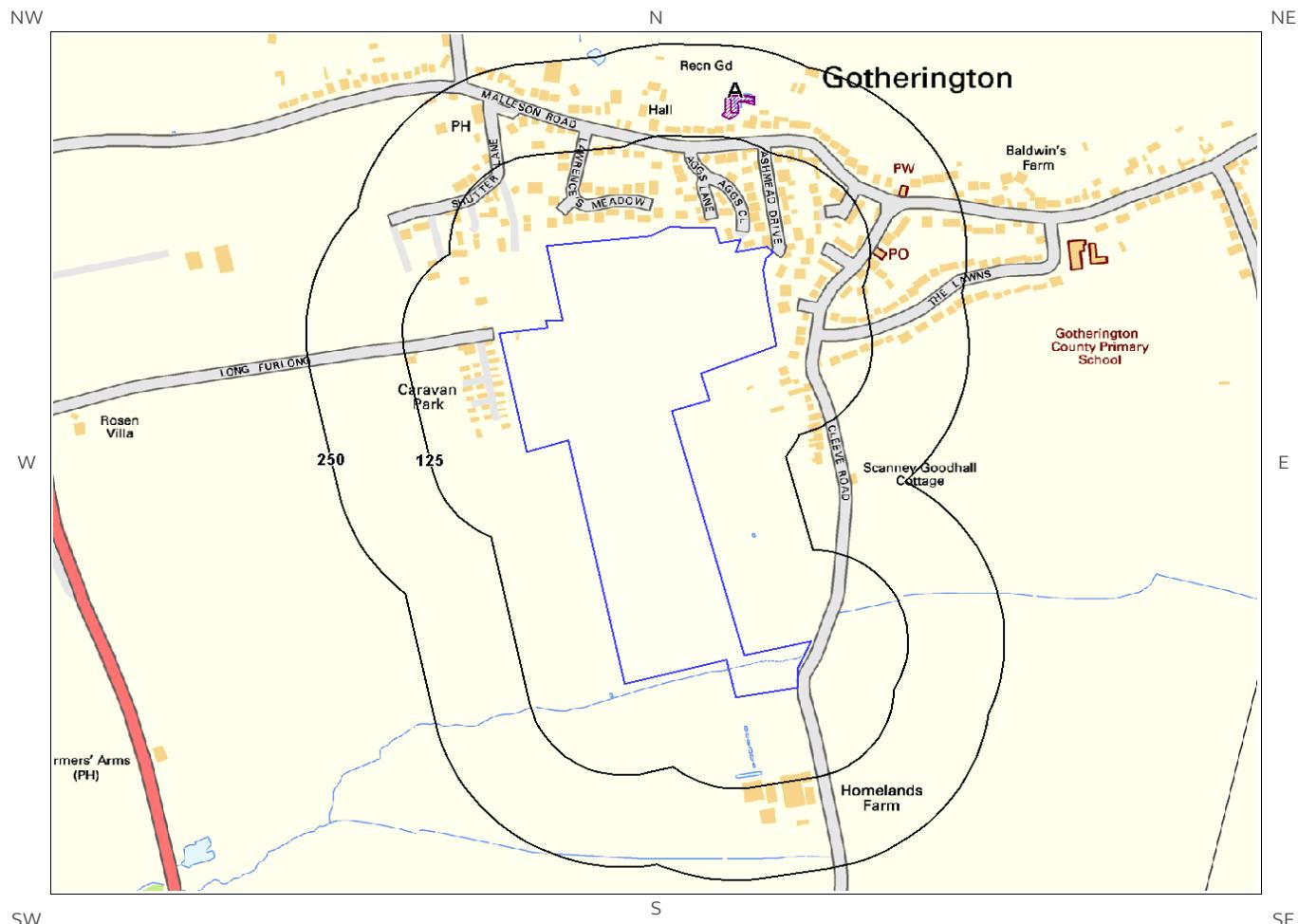
---

## 1.4.2 Radon Protection

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

---

## 2 Ground Workings Map



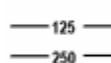
Ground Workings Legend

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 Historic Surface Ground Workings

 Search Buffers (m)

 Historic Underground Workings

 Current Ground Workings

# 2 Ground Workings

## 2.1 Historical Surface Ground Working Features derived from Historical Mapping

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

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

The following Historical Surface Ground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
1A	151.0	N	396249 229693	Pond	1883
2A	158.0	N	396252 229695	Pond	1924

---

## 2.2 Historical Underground Working Features derived from Historical Mapping

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

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

---

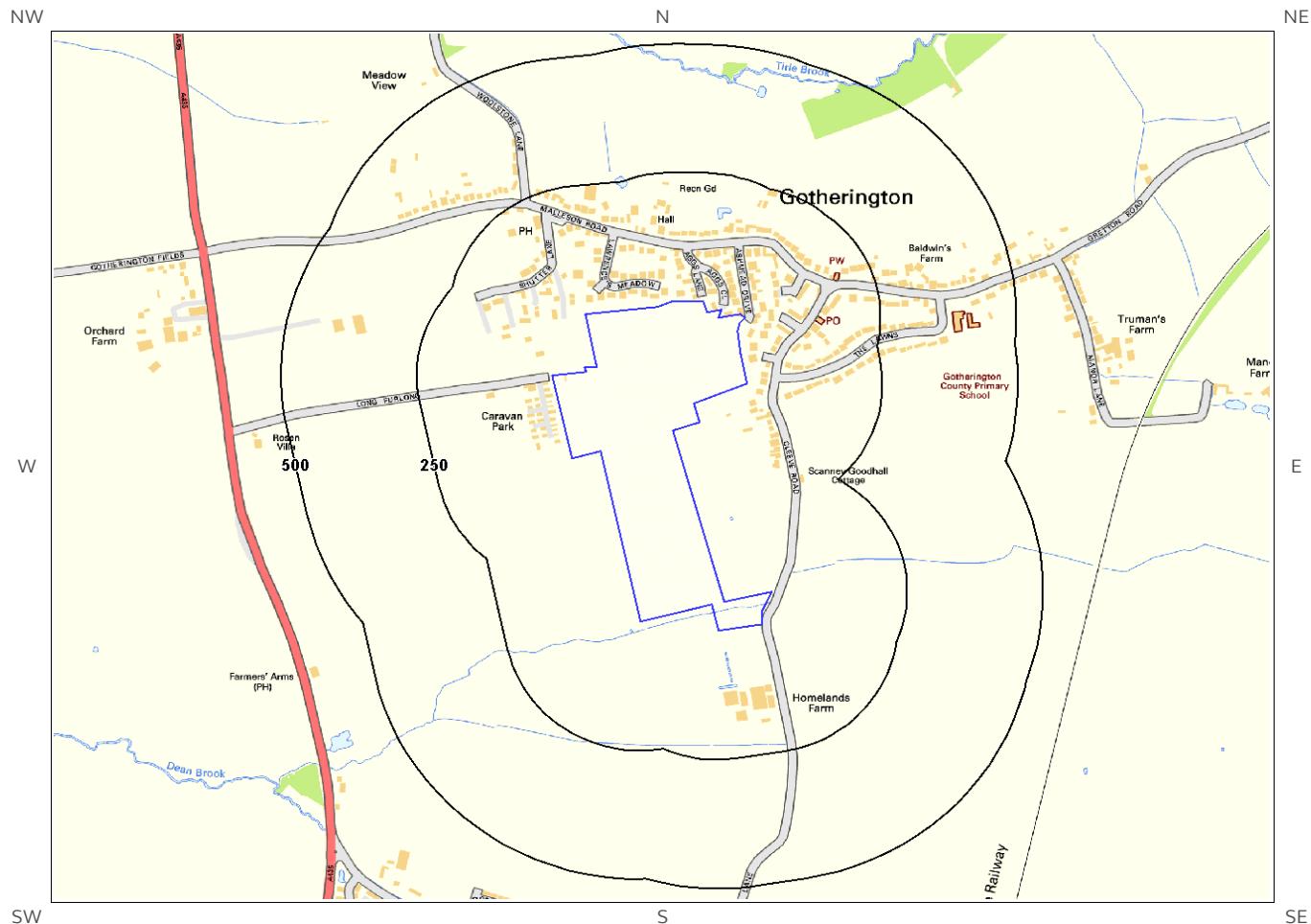
## 2.3 Current Ground Workings

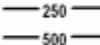
This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? No

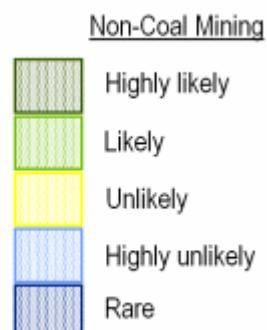
Database searched and no data found.

# 3 Mining, Extraction & Natural Cavities Map



-  Site Outline
-  Search Buffers (m)

-  Historical Mining
-  Non-Coal Mining Cavities
-  Natural Cavities



# 3 Mining, Extraction & Natural Cavities

## 3.1 Historical Mining

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

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

Database searched and no data found.

---

## 3.2 Coal Mining

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

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

Database searched and no data found.

---

## 3.3 Johnson Poole and Bloomer

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

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

The following information provided by JPB is not represented on mapping: Whilst outside of an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) have information such as mining plans and maps held within their archive of mining activities that have occurred within 1km of this property. Further details and a quote for services can be obtained by emailing this report to [enquiries.gs@jpb.co.uk](mailto:enquiries.gs@jpb.co.uk).

---

## 3.4 Non-Coal Mining

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

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

Database searched and no data found.

---

### 3.5 Non-Coal Mining Cavities

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

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

Database searched and no data found.

---

### 3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

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

Database searched and no data found.

---

### 3.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

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

Database searched and no data found.

---

### 3.8 Gypsum Extraction

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

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

Database searched and no data found.

---

### 3.9 Tin Mining

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

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

Database searched and no data found.

---

### 3.10 Clay Mining

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

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

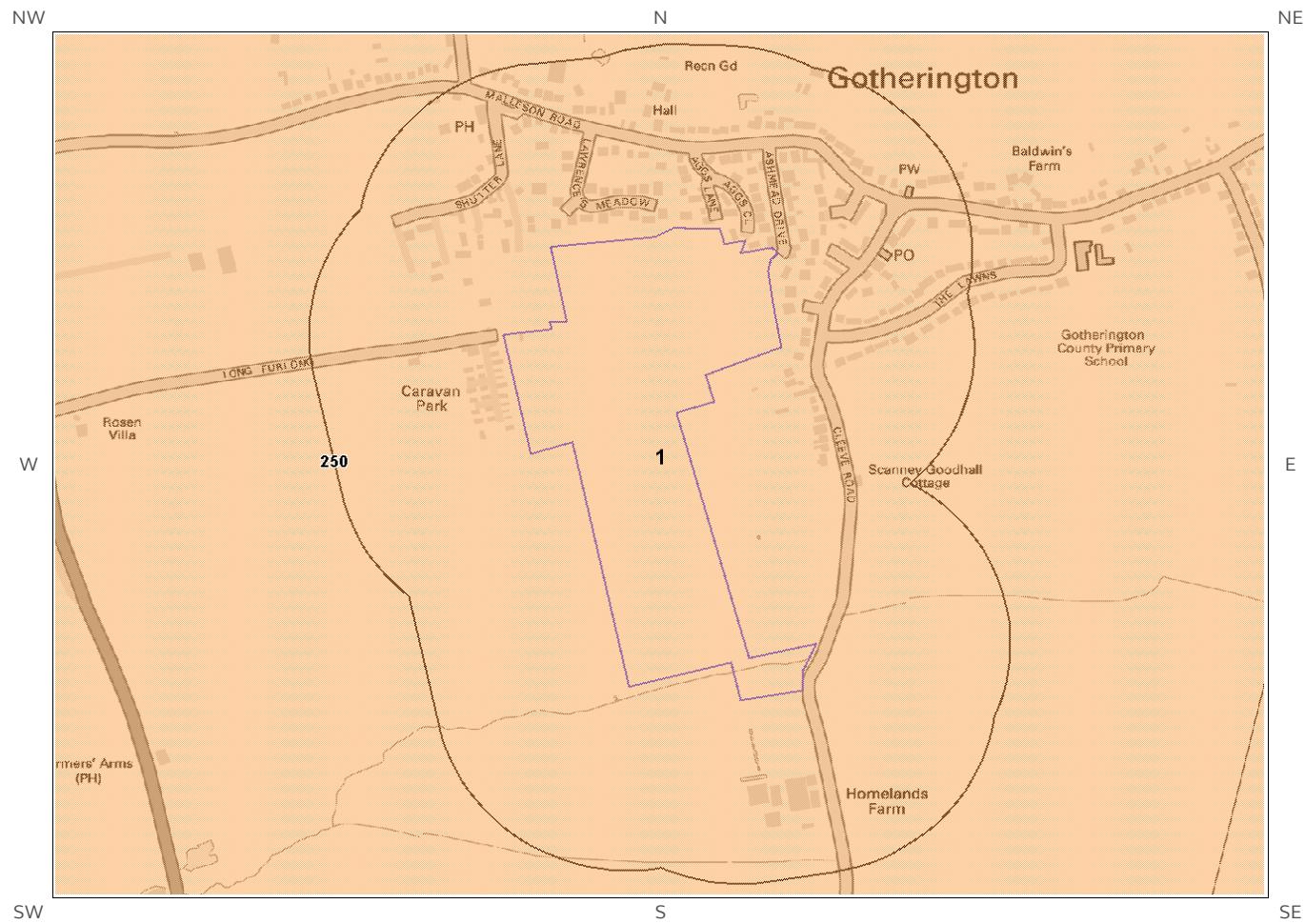
No

Database searched and no data found.

---

# 4 Natural Ground Subsidence

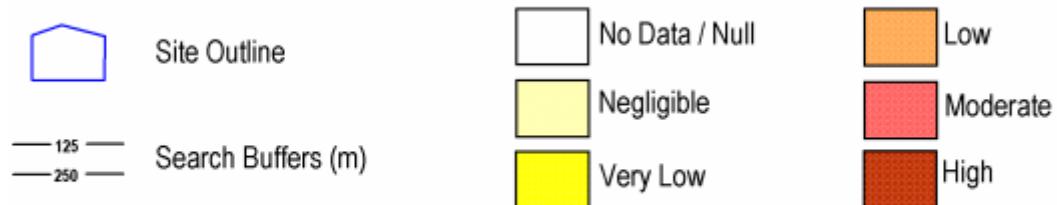
## 4.1 Shrink-Swell Clay Map



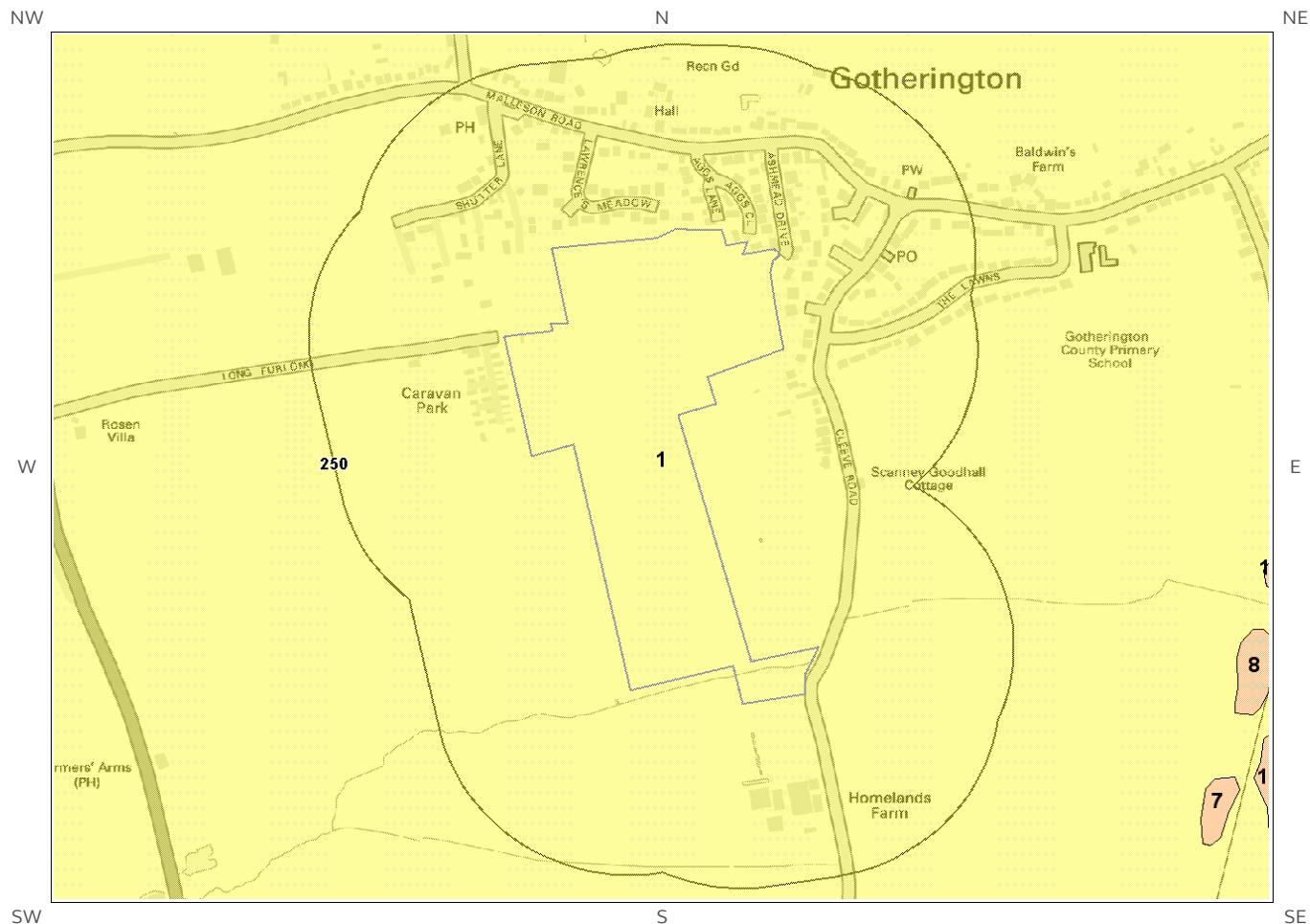
Shrink Swell Clay Legend

Mapping sourced from  Ordnance Survey®

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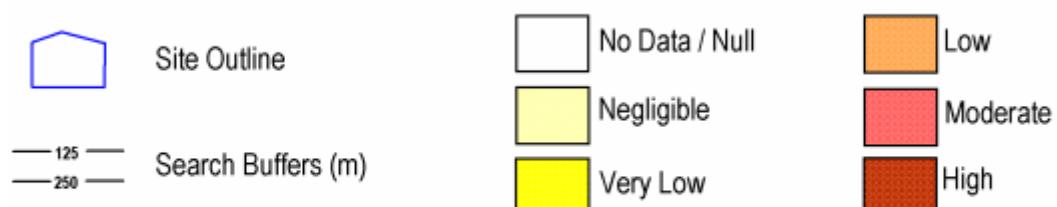
## 4.2 Landslides Map



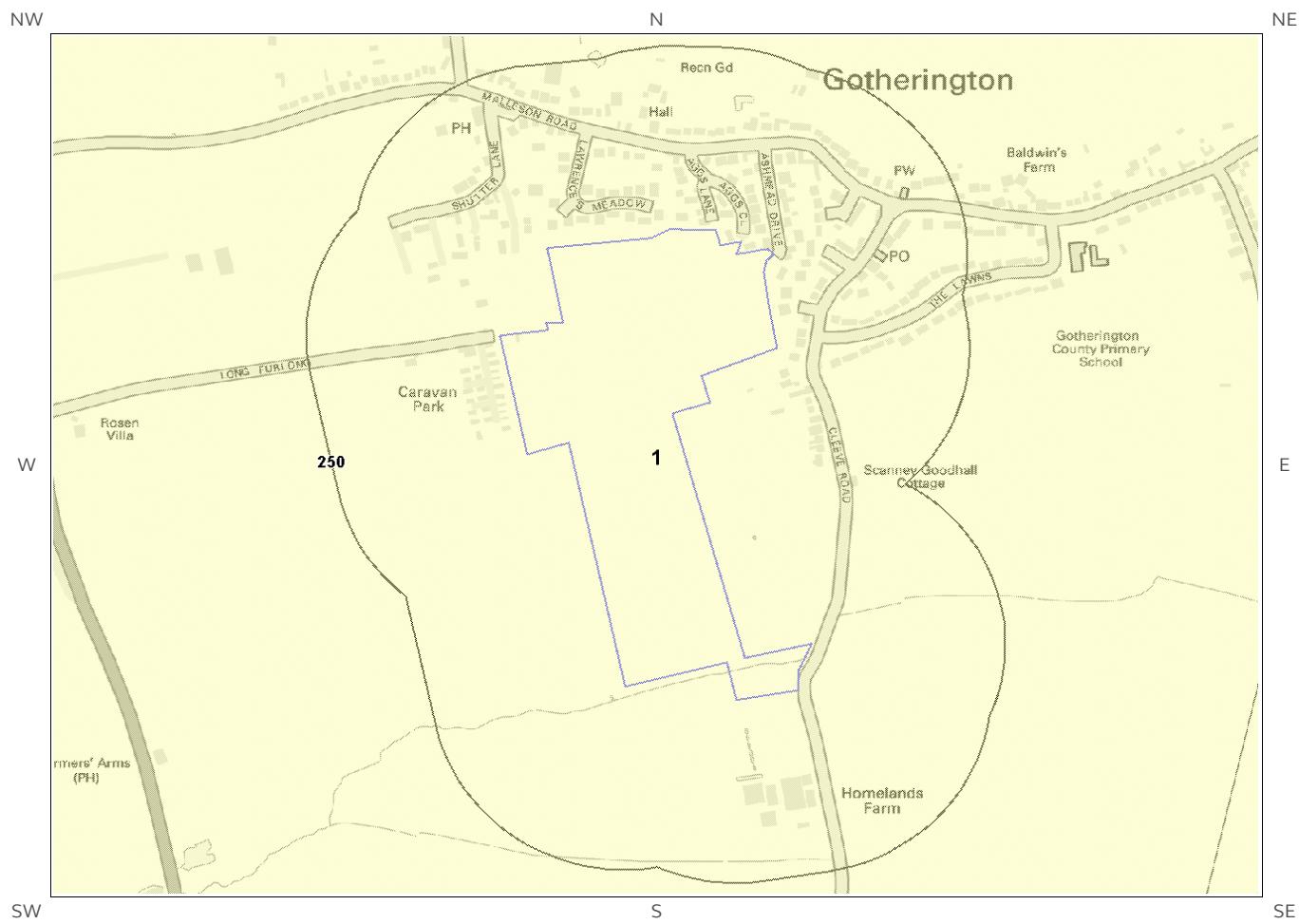
Landslides Legend

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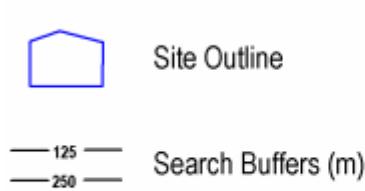
## 4.3 Ground Dissolution Soluble Rocks Map



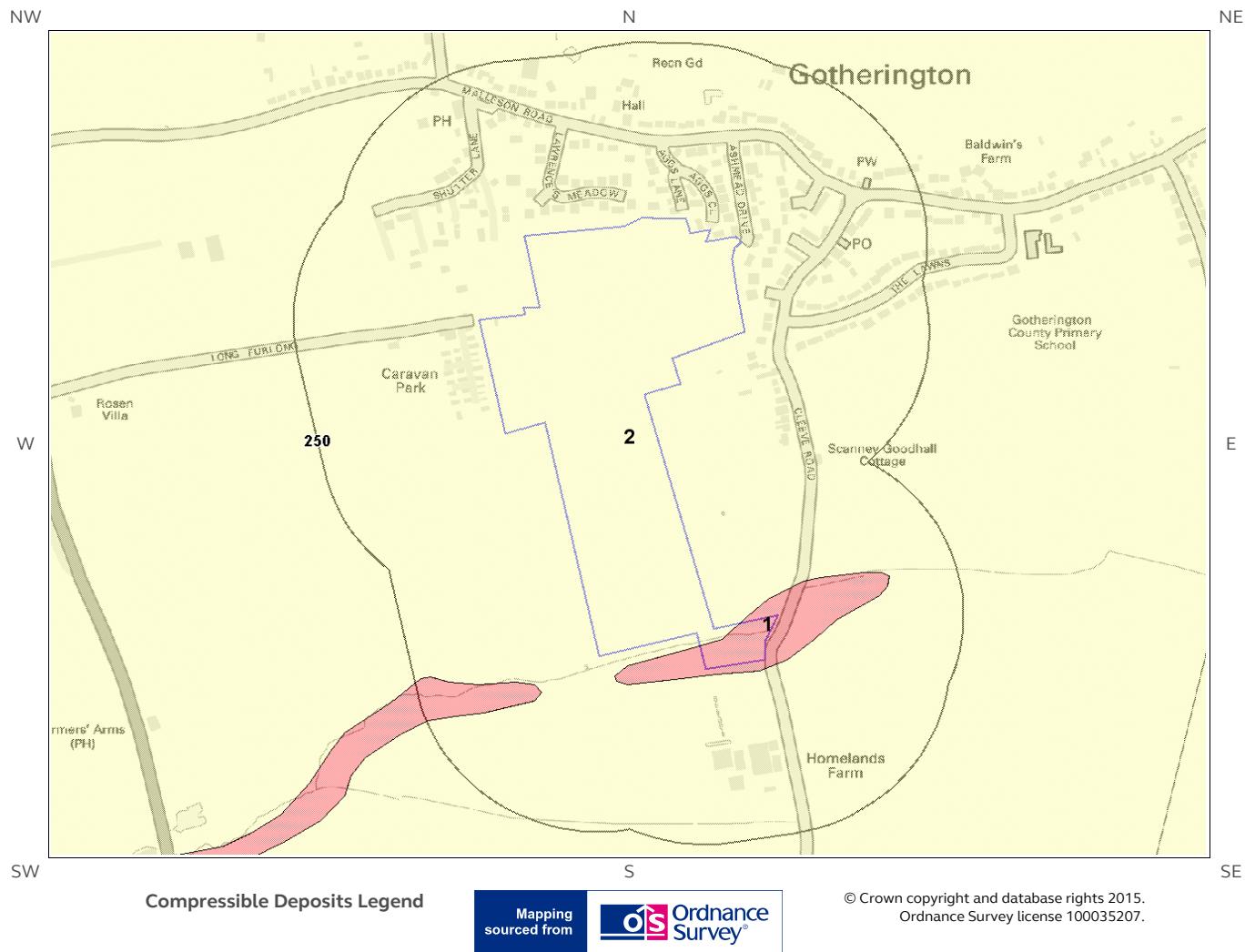
Ground Dissolution  
Soluble Rocks Legend

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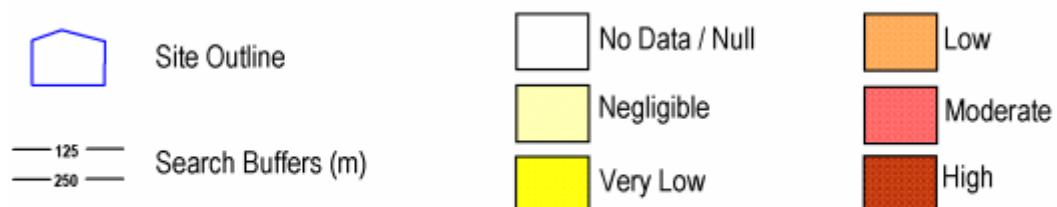
## 4.4 Compressible Deposits Map



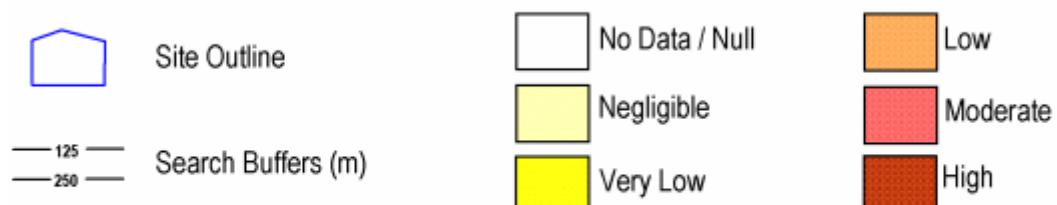
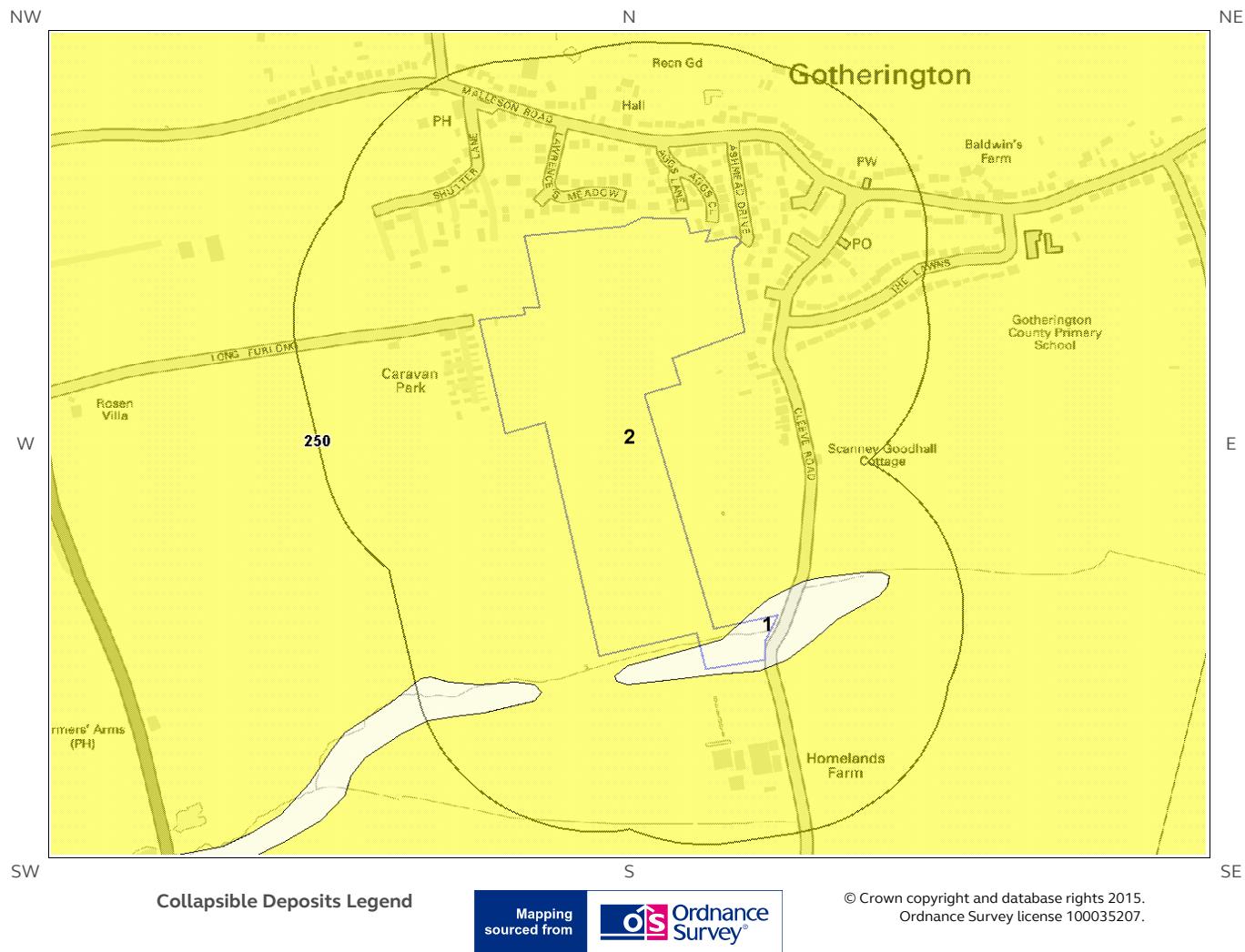
Compressible Deposits Legend

Mapping sourced from  Ordnance Survey®

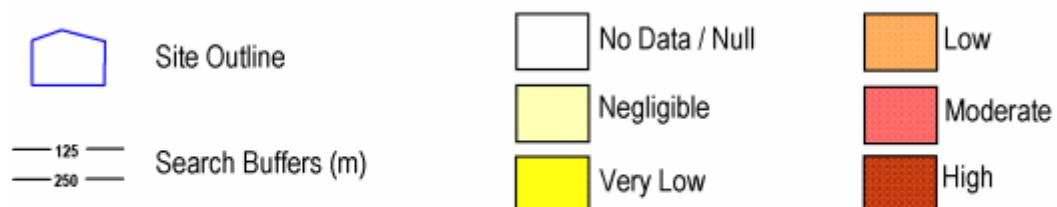
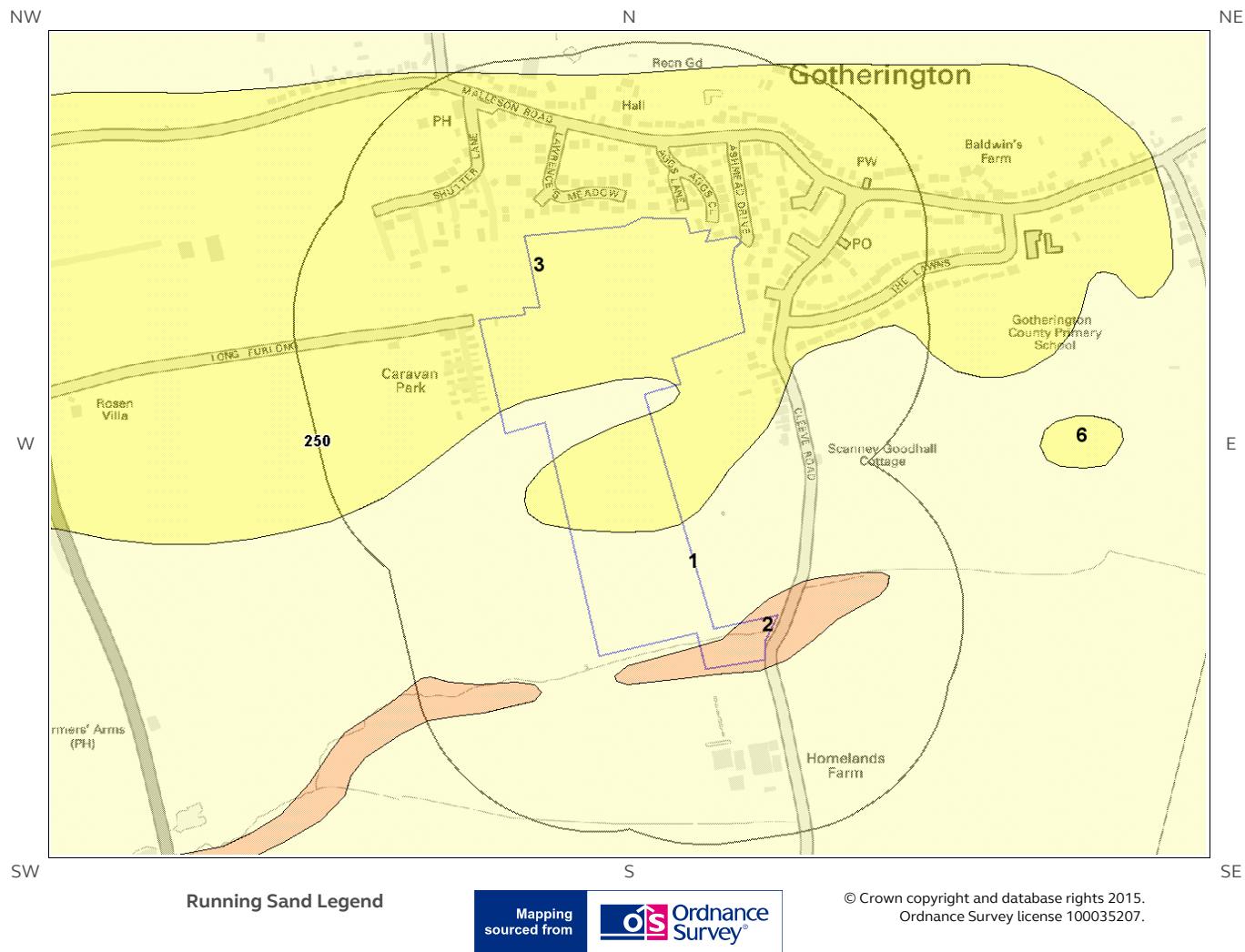
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# 4.5 Collapsible Deposits Map



# 4.6 Running Sand Map



# 4 Natural Ground Subsidence

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

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

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

## 4.1 Shrink-Swell Clays

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

## 4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

## 4.3 Ground Dissolution of Soluble Rocks

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

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

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

## 4.4 Compressible Deposits

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

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

## 4.5 Collapsible Deposits

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

## 4.6 Running Sands

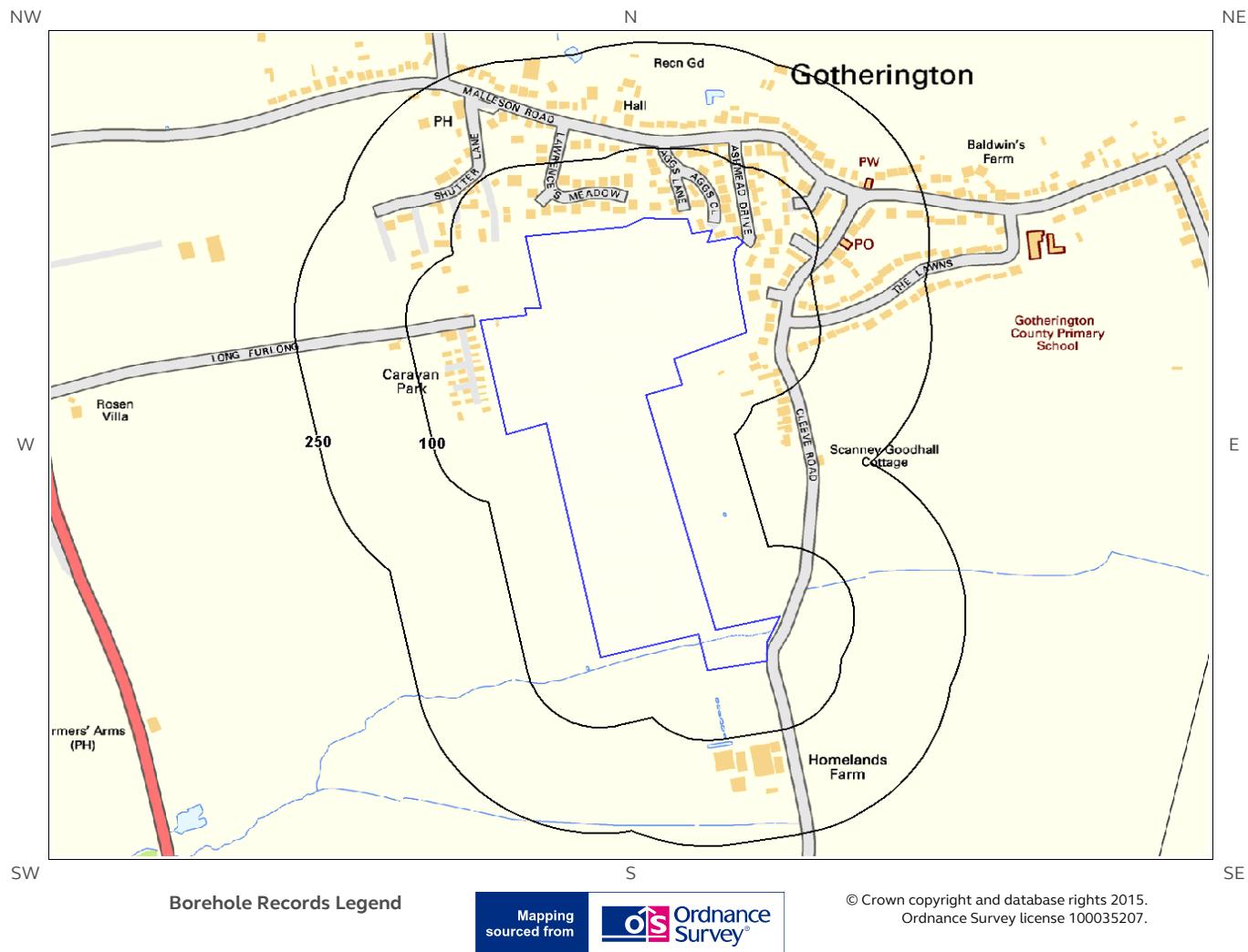
The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build, consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property, no significant increase in insurance risk due to running sand problems is likely.

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

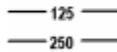
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# 5 Borehole Records Map



Site Outline

● Borehole Locations



Search Buffers (m)

# 5 Borehole Records

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

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

0

Database searched and no data found.

---

# 6 Estimated Background Soil Chemistry

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

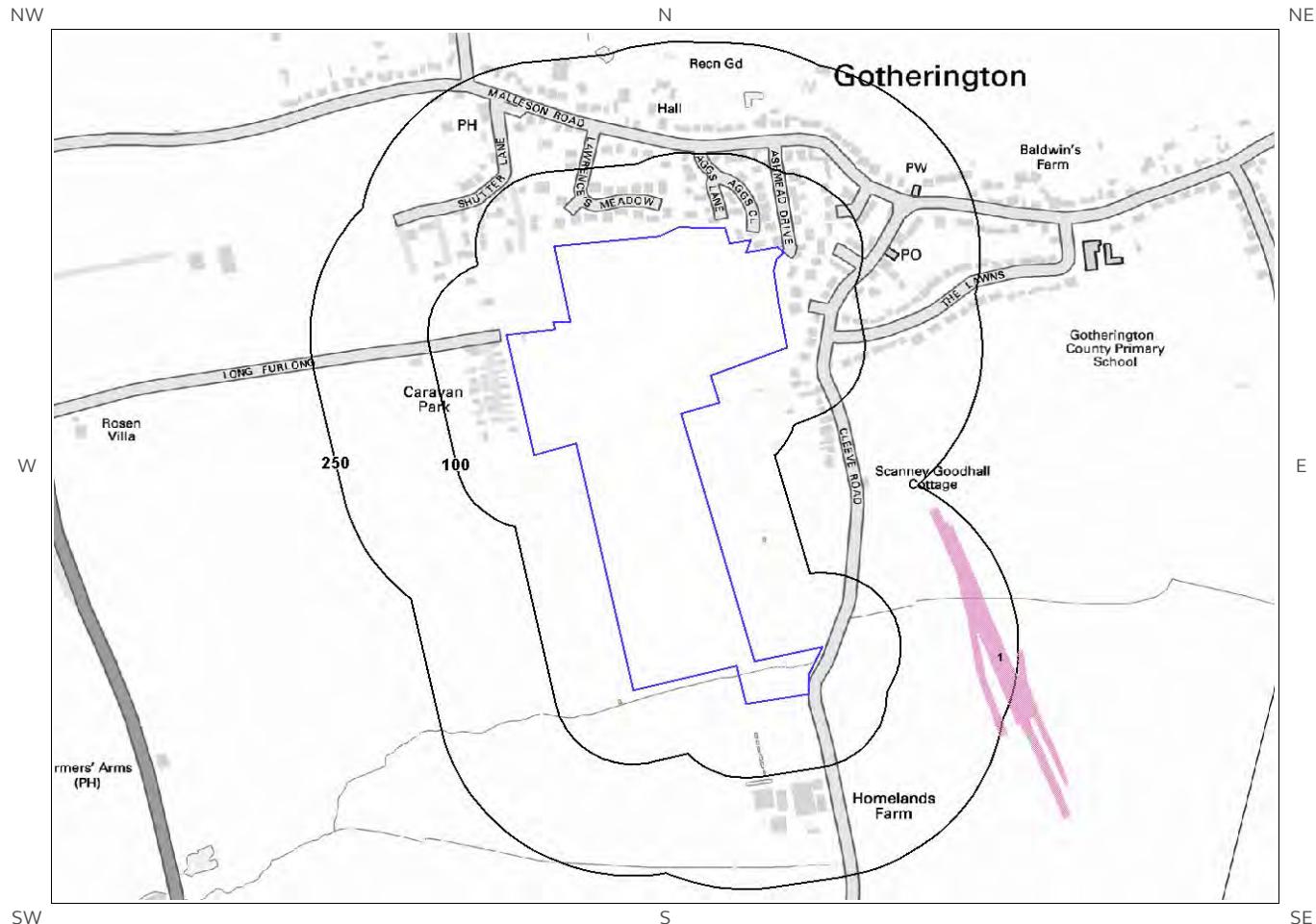
34

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

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
9.0	W	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
9.0	W	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
42.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
42.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
87.0	W	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
87.0	W	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
87.0	W	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<100 mg/kg
87.0	W	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<100 mg/kg
92.0	SW	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
116.0	W	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
116.0	W	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
130.0	SW	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
130.0	SW	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<100 mg/kg
148.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
150.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
150.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
153.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
153.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
155.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
194.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
197.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
206.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
230.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<100 mg/kg
230.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<100 mg/kg

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

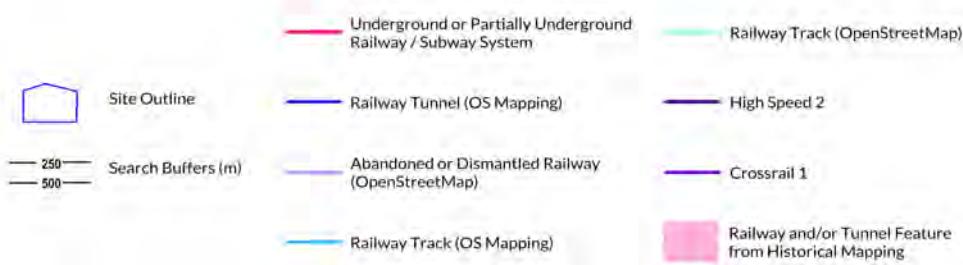
# 7 Railways and Tunnels Map



Railways and Tunnels Legend

Mapping sourced from  Ordnance Survey®

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# 7 Railways and Tunnels

## 7.1 Tunnels

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

- Have any underground railway lines been identified within the study site boundary? No  
 Have any underground railway lines been identified within 250m of the study site boundary? No  
 Database searched and no data found.

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

---

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

- Have any other railway tunnels been identified within the site boundary? No  
 Have any other railway tunnels been identified within 250m of the site boundary? No  
 Database searched and no data found.

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

---

## 7.2 Historical Railway and Tunnel Features

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

- Have any historical railway or tunnel features been identified within the study site boundary? No  
 Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	189	E	396578 228939	Railway Sidings	1885

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

---

### 7.3 Historical Railways

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

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

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

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

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

---

### 7.4 Active Railways

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

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

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

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

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

---

### 7.5 Railway Projects

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

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

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

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

---

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

# Contact Details

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Telephone: 01886 832972  
[Groundsure@centremaps.co.uk](mailto:Groundsure@centremaps.co.uk)  
CENTREMAPS, Brockamin House, Leigh, Worcester, London, WR6 5JU

Directors: M C Walker, MInst C.E.S., C M Walker,  
S J Hawkins BSc (Hons), S E Stewart BSc (Hons)  
Registered No. 1890261 Registered in England and Wales  
Registered Company: Laser Surveys Limited

#### British Geological Survey Enquiries

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Keyworth, Nottingham NG12 5GG  
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Fax: 0115 936 3276.  
Email:[enquiries@bgs.ac.uk](mailto:enquiries@bgs.ac.uk)  
Web:[www.bgs.ac.uk](http://www.bgs.ac.uk)

BGS Geological Hazards Reports and general geological enquiries

British Gypsum  
British Gypsum Ltd  
East Leake  
Loughborough  
Leicestershire  
LE12 6HX

centremapslive.com  
the mapping portal from Laser Surveys



#### The Coal Authority

200 Lichfield Lane  
Mansfield  
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Tel: 0345 7626 848  
DX 7116176 Mansfield 5  
[www.coal.gov.uk](http://www.coal.gov.uk)



#### Public Health England

Public information access office  
Public Health England, Wellington House  
133-155 Waterloo Road, London, SE1 8UG  
<https://www.gov.uk/government/organisations/public-health-england>  
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# Contact Details

Acknowledgements: Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028]. This report has been prepared in accordance with the Groundsure Ltd standard Terms and Conditions of business for work of this nature.

## Standard Terms and Conditions

### 1 Definitions

In these terms and conditions unless the context otherwise requires:  
“Beneficiary” means the person or entity for whose benefit the Client has obtained the Services.

“Client” means the party or parties entering into a Contract with Groundsure.

“Commercial” means any building or property which is not Residential.

“Confidential Information” means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by Groundsure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

“Support Services” means Support Services provided by Groundsure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

“Contract” means the contract between Groundsure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

“Third Party Data Provider” means any third party providing Third Party Content to Groundsure.

“Data Reports” means reports comprising factual data with no accompanying interpretation.

“Fees” has the meaning set out in clause 5.1.

“Groundsure” means Groundsure Limited, a company registered in England and Wales under number 03421028.

“Groundsure Materials” means all materials prepared by Groundsure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

“Intellectual Property” means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

“Mapping” means a map, map data or a combination of historical maps of various ages, time periods and scales.

“Order” means an electronic, written or other order form submitted by the Client requesting Services from Groundsure in respect of a specified Site.

“Ordnance Survey” means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

“Order Website” means the online platform through which Orders may be placed by the Client and accepted by Groundsure.

“Report” means a Risk Screening Report or Data Report for Commercial or Residential property.

“Residential” means any building or property used as or intended to be used as a single dwelling.

“Risk Screening Report” means a risk screening report comprising factual data with an accompanying interpretation by Groundsure.

“Services” means any Report, Mapping and/or Support Services which Groundsure has agreed to provide by accepting an Order pursuant to clause 2.6.

“Site” means the area of land in respect of which the Client has requested Groundsure to provide the Services.

“Third Party Content” means data, database information or other information which is provided to Groundsure by a Third Party Data Provider.

“User Guide” means the user guide, as amended from time to time, available upon request from Groundsure and on the website ([www.Groundsure.com](http://www.Groundsure.com)) and forming part of this Contract.

### 2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 Groundsure agrees to provide the Services in accordance with the Contract.

2.2 Groundsure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of Groundsure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, Groundsure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and Groundsure will have no liability therefor. In addition you acknowledge and agree that Groundsure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 Groundsure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by Groundsure.

Groundsure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by Groundsure. Groundsure's acceptance of an Order shall be binding only when made in writing and signed by Groundsure's authorised representative or when accepted through the Order Website.

### 3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to Groundsure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to Groundsure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as Groundsure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable Groundsure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the Groundsure Materials, or use the Groundsure Materials in a manner for which they were not intended. The Client may make the Groundsure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that Groundsure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

### 4 Reliance

4.1 The Client acknowledges that the Services provided by Groundsure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by Groundsure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by Groundsure. Any party considering such Reports and Services does so at their own risk.

### 5 Fees and Disbursements

5.1 Groundsure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by Groundsure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together “Fees”).

5.2 The Client shall pay all outstanding Fees to Groundsure in full without deduction, counterclaim or set off within 30 days of the date of Groundsure's invoice or such other period as may be agreed in writing between Groundsure and the Client (“Payment Date”). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of Groundsure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

### 6 Intellectual Property and Confidentiality

6.1 Subject to

(i) full payment of all relevant Fees and

(ii) compliance with this Contract, the Client is granted (and is permitted to sub-license to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the Groundsure Materials.

6.2 All Intellectual Property in the Groundsure Materials are and shall remain owned by Groundsure or Groundsure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure

acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the Groundsure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the Groundsure Materials in order to advise the Beneficiary in a professional capacity. However, Groundsure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify Groundsure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

## 7. Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of Groundsure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 Groundsure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

7.5 Groundsure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 Groundsure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of Groundsure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against Groundsure in relation to the Services or other matters arising pursuant to the Contract.

## 8 Groundsure's right to suspend or terminate

8.1 If Groundsure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, Groundsure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 Groundsure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

## 9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event  
(b) by their nature cannot be returned.

## 10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and

(ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

## 11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

## 12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through Groundsure.

12.3 Groundsure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of Groundsure.

12.4 No failure on the part of Groundsure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 Groundsure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

- (i) the Client or Beneficiary's failure to provide facilities, access or information;
- (ii) fire, storm, flood, tempest or epidemic;
- (iii) Acts of God or the public enemy;
- (iv) riot, civil commotion or war;
- (v) strikes, labour disputes or industrial action;
- (vi) acts or regulations of any governmental or other agency;
- (vii) suspension or delay of services at public registries by Third Party Data Providers;
- (viii) changes in law; or
- (ix) any other reason beyond Groundsure's reasonable control.

In the event that Groundsure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then Groundsure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 Groundsure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law.

CENTREMAPS

Open Space, Upper Interfields,  
Worcester, WR14 1UT

Groundsure  
Reference:

Your Reference: 5956

Report Date 8 Sep 2015

Report Delivery Email - pdf  
Method:

## Groundsure Enviroinsight

Address: Gotherington Tewkesbury, GL52 9UH

Dear Sir/ Madam,

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

If you need any further assistance, please do not hesitate to contact our helpline on 01886 832972 quoting the above CENTREMAPS reference number.

Yours faithfully,

CENTREMAPS

Enc.  
Groundsure Enviroinsight

# Groundsure Enviroinsight

Address: Gotherington Tewkesbury, GL52 9UH

Date: 8 Sep 2015

Reference: CMAPS-CM-461194-5956-080915EDR

Client: CENTREMAPS

NW

N

NE

W

E



S

SE

SW

Aerial Photograph Capture date: 30-Aug-2010

Grid Reference: 396150,229205

Site Size: 12.82ha

# Contents Page

Contents Page	3
Overview of Findings	6
Using this report	10
1. Historical Land Use	11
1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping.....	12
1.2 Additional Information – Historical Tank Database.....	12
1.3 Additional Information – Historical Energy Features Database.....	12
1.4 Additional Information – Historical Petrol and Fuel Site Database.....	13
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database.....	13
1.6 Potentially Infilled Land.....	13
2. Environmental Permits, Incidents and Registers Map	14
2.1 Industrial Sites Holding Licences and/or Authorisations.....	15
2.1.1 Records of historic IPC Authorisations within 500m of the study site:.....	15
2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:.....	15
2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:.....	15
2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:.....	15
2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:.....	15
2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: .....	16
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:.....	16
2.1.8 Records of Licensed Discharge Consents within 500m of the study site:.....	16
2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: .....	16
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:.....	17
2.2 Dangerous or Hazardous Sites.....	17
2.3 Environment Agency Recorded Pollution Incidents.....	17
2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:.....	17
2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:.....	17
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990.....	17
3. Landfill and Other Waste Sites Map	18
3.1 Landfill Sites.....	19
3.1.1 Records from Environment Agency landfill data within 1000m of the study site: .....	19
3.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site: .....	19
3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:.....	19
3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:.....	19
3.2 Other Waste Sites.....	20
3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site: .....	20
3.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site: .....	20
4. Current Land Use Map	21
4.1 Current Industrial Data.....	22
4.2 Petrol and Fuel Sites.....	22
4.3 National Grid High Voltage Underground Electricity Transmission Cables.....	22
4.4 National Grid High Pressure Gas Transmission Pipelines.....	23
5. Geology	24



5.1 Artificial Ground and Made Ground.....	24
5.2 Superficial Ground and Drift Geology .....	24
5.3 Bedrock and Solid Geology .....	24
6 Hydrogeology and Hydrology	25
6a. Aquifer Within Superficial Geology	25
6b. Aquifer Within Bedrock Geology and Abstraction Licenses	26
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses	27
6d. Hydrogeology – Source Protection Zones within confined aquifer	28
6e. Hydrology – Detailed River Network and River Quality	29
6.Hydrogeology and Hydrology	30
6.1 Aquifer within Superficial Deposits.....	30
6.2 Aquifer within Bedrock Deposits.....	30
6.3 Groundwater Abstraction Licences.....	31
6.4 Surface Water Abstraction Licences.....	31
6.5 Potable Water Abstraction Licences.....	31
6.6 Source Protection Zones.....	32
6.7 Source Protection Zones within Confined Aquifer.....	32
6.8 Groundwater Vulnerability and Soil Leaching Potential.....	32
6.9 River Quality.....	32
6.9.1 Biological Quality:.....	33
6.9.2 Chemical Quality:.....	33
6.10 Detailed River Network.....	33
6.11 Surface Water Features.....	34
7a. Environment Agency Flood Map for Planning (from rivers and the sea)	35
7b. Environment Agency Risk of Flooding from Rivers and the Sea (RoFRaS) Map	36
7 Flooding	37
7.1 River and Coastal Zone 2 Flooding.....	37
7.2 River and Coastal Zone 3 Flooding.....	37
7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating.....	37
7.4 Flood Defences.....	37
7.5 Areas benefiting from Flood Defences.....	37
7.6 Areas benefiting from Flood Storage.....	38
7.7 Groundwater Flooding Susceptibility Areas.....	38
7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? Yes.....	38
7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?.....	38
7.8 Groundwater Flooding Confidence Areas.....	38
8. Designated Environmentally Sensitive Sites Map	39
8. Designated Environmentally Sensitive Sites	40
8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:.....	40
8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:.....	40
8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:.....	40
8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:.....	40
8.5 Records of Ramsar sites within 2000m of the study site:.....	40
8.6 Records of Ancient Woodland within 2000m of the study site: .....	41
8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:.....	41
8.8 Records of World Heritage Sites within 2000m of the study site:.....	41
8.9 Records of Environmentally Sensitive Areas within 2000m of the study site: .....	41
8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site: .....	42
8.11 Records of National Parks (NP) within 2000m of the study site: .....	42



8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:.....	42
8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:.....	42
8.14 Records of Green Belt land within 2000m of the study site:.....	42
<b>9. Natural Hazards Findings</b>	<b>44</b>
9.1 Detailed BGS GeoSure Data.....	44
9.1.1 Shrink Swell.....	44
9.1.2 Landslides.....	44
9.1.3 Soluble Rocks.....	44
9.1.4 Compressible Ground.....	45
9.1.5 Collapsible Rocks.....	45
9.1.6 Running Sand.....	45
9.2 Radon.....	45
9.2.1 Radon Affected Areas.....	45
9.2.2 Radon Protection.....	46
<b>10. Mining</b>	<b>47</b>
10.1 Coal Mining.....	47
10.2 Non-Coal Mining.....	47
10.3 Brine Affected Areas .....	47
Contact Details	48
Standard Terms and Conditions	50

# Overview of Findings

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

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



Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-5000
3.1 Landfill Sites						
3.1.1 Environment Agency Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency Historic Landfill Sites	0	0	0	0	1	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency Licensed Waste Sites	0	0	0	0	1	0
Section 4: Current Land Use	On-site	0-50m	51-250	251-500		
4.1 Current Industrial Sites Data	0	0	2	Not searched		
4.2 Records of Petrol and Fuel Sites	0	0	0	0		
4.3 National Grid Underground Electricity Cables	0	0	0	0		
4.4 National Grid Gas Transmission Pipelines	0	0	0	0		
Section 5: Geology						
5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?				No		
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?				Yes		
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.						
Section 6: Hydrogeology and Hydrology		0-500m				
6.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?				Yes		
6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?				Yes		
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	3
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	0	0	Not searched	Not searched
	On-site	0-50m	51-250	251-500	501-1000	1000-1500



## Section 6: Hydrogeology and Hydrology

0-500m

6.9 Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	No	Yes
6.10 Detailed River Network entries within 500m of the site	1	1	2	5	Not searched	Not searched
6.11 Surface water features within 250m of the study site	Yes	Yes	Yes	Not searched	Not searched	Not searched

## Section 7: Flooding

7.1 Are there any Environment Agency Zone 2 floodplains within 250m of the study site?	No
7.2 Are there any Environment Agency Zone 3 floodplains within 250m of the study site	No
7.3 What is the Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site?	Very Low
7.4 Are there any Flood Defences within 250m of the study site?	No
7.5 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
7.6 Are there any areas used for Flood Storage within 250m of the study site?	No
7.7 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Potential at Surface
7.8 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Moderate

## Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
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8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	2
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	2	0	0
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	1	0	0



Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	1	0	0	1	0	1
8.14 Records of Green Belt land	0	0	0	0	0	1

## Section 9: Natural Hazards

9.1 What is the maximum risk of natural ground subsidence?	Moderate
9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Low
9.1.2 What is the maximum Landslides hazard rating identified on the study site?	Very Low
9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Negligible
9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Moderate
9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Very Low
9.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

## Section 10: Mining

10.1 Are there any coal mining areas within 75m of the study site?	No
10.2 Are there any Non-Coal Mining areas within 50m of the study site boundary?	No
10.3 Are there any brine affected areas within 75m of the study site?	No

# Using this report

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

## 1. Historical Industrial Sites

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

## 2. Environmental Permits, Incidents and Registers

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

## 3. Landfills and Other Waste Sites

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

## 4. Current Land Uses

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

## 5. Geology

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

## 6. Hydrogeology and Hydrology

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

## 7. Flooding

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

## 8. Designated Environmentally Sensitive Sites

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

## 9. Natural Hazards

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

## 10. Mining

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

## 11. Contacts

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

## Note: Maps

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

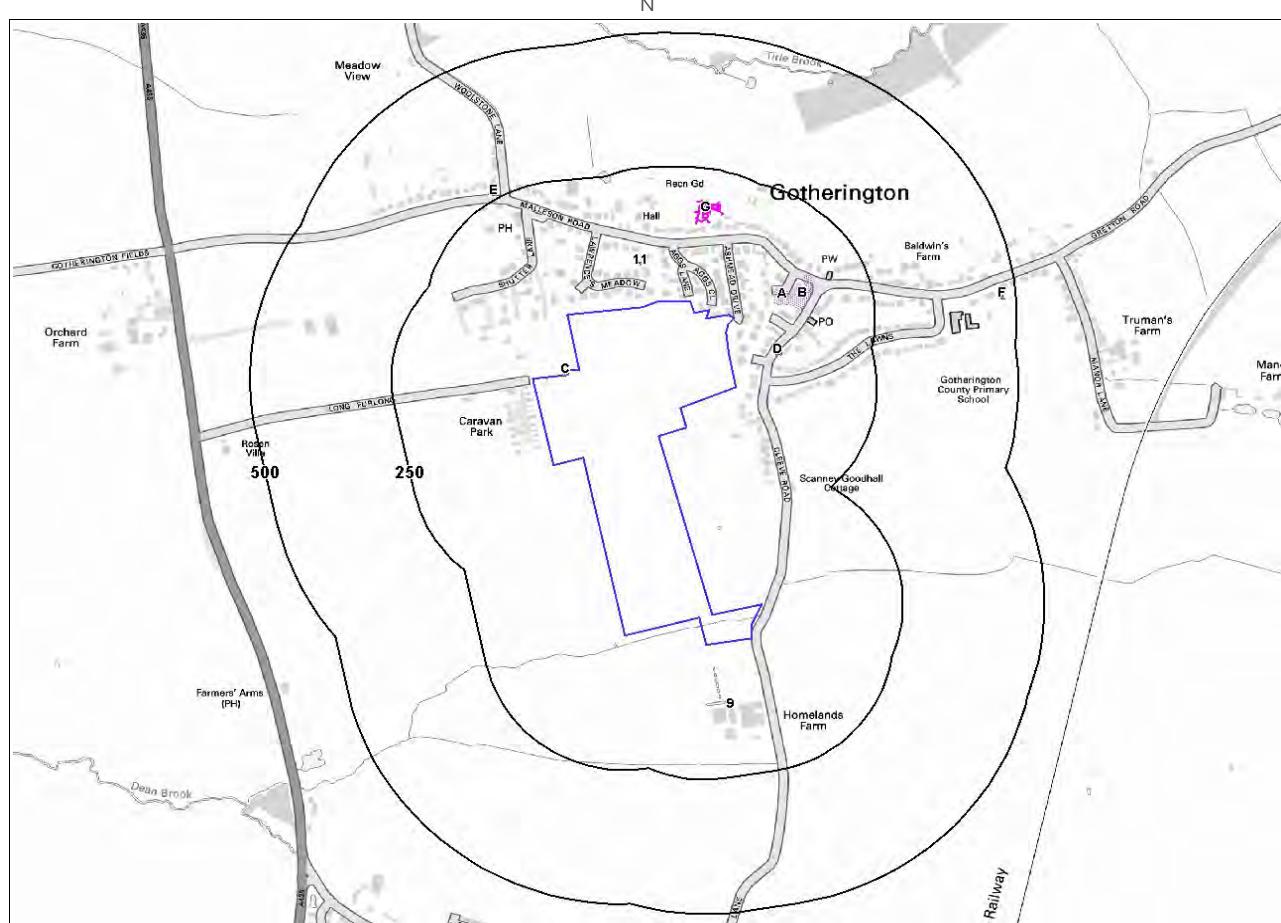
Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

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



# 1. Historical Land Use

NW



N

S

W

E

SW

SE

Mapping sourced from Ordnance Survey®

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Historical 1:10,000 and 1:10,560 scale mapping



Site Outline

Industrial Land Use

Potentially Infilled Land

Search Buffers (m)

Historical 1:2,500, 1:1,250 and 1:500 scale mapping

Energy Features

Petrol Stations

Tanks

Garages

# 1. Historical Industrial Sites

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

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

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 5

ID	Distance [m]	Direction	Use	Date
1A	76	E	Smithy	1921
2A	76	E	Smithy	1924
3A	76	E	Smithy	1900
4B	99	E	Smithy	1883
5B	130	E	Smithy	1949

---

## 1.2 Additional Information – Historical Tank Database

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

Records of historical tanks within 500m of the search boundary: 5

ID	Distance (m)	Direction	Use	Date
6C	0	On Site	Unspecified Tank	1989
7C	0	On Site	Unspecified Tank	1991
8C	0	On Site	Unspecified Tank	1972
9	119	S	Unspecified Tank	1970
10B	142	E	Unspecified Tank	1923

---

## 1.3 Additional Information – Historical Energy Features Database

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

Records of historical energy features within 500m of the search boundary: 9

ID	Distance (m)	Direction	Use	Date
11	74	NW	Electricity Substation	1991
12D	76	E	Electricity Substation	1991
13D	76	E	Electricity Substation	1989
14D	77	E	Electricity Substation	1972
15E	256	NW	Electricity Substation	1972



16E	256	NW	Electricity Substation	1991
17F	471	E	Electricity Substation	1989
18F	471	E	Electricity Substation	1991
19F	473	E	Electricity Substation	1972

## 1.4 Additional Information – Historical Petrol and Fuel Site Database

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

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

Database searched and no data found.

## 1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

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

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 0

Database searched and no data found.

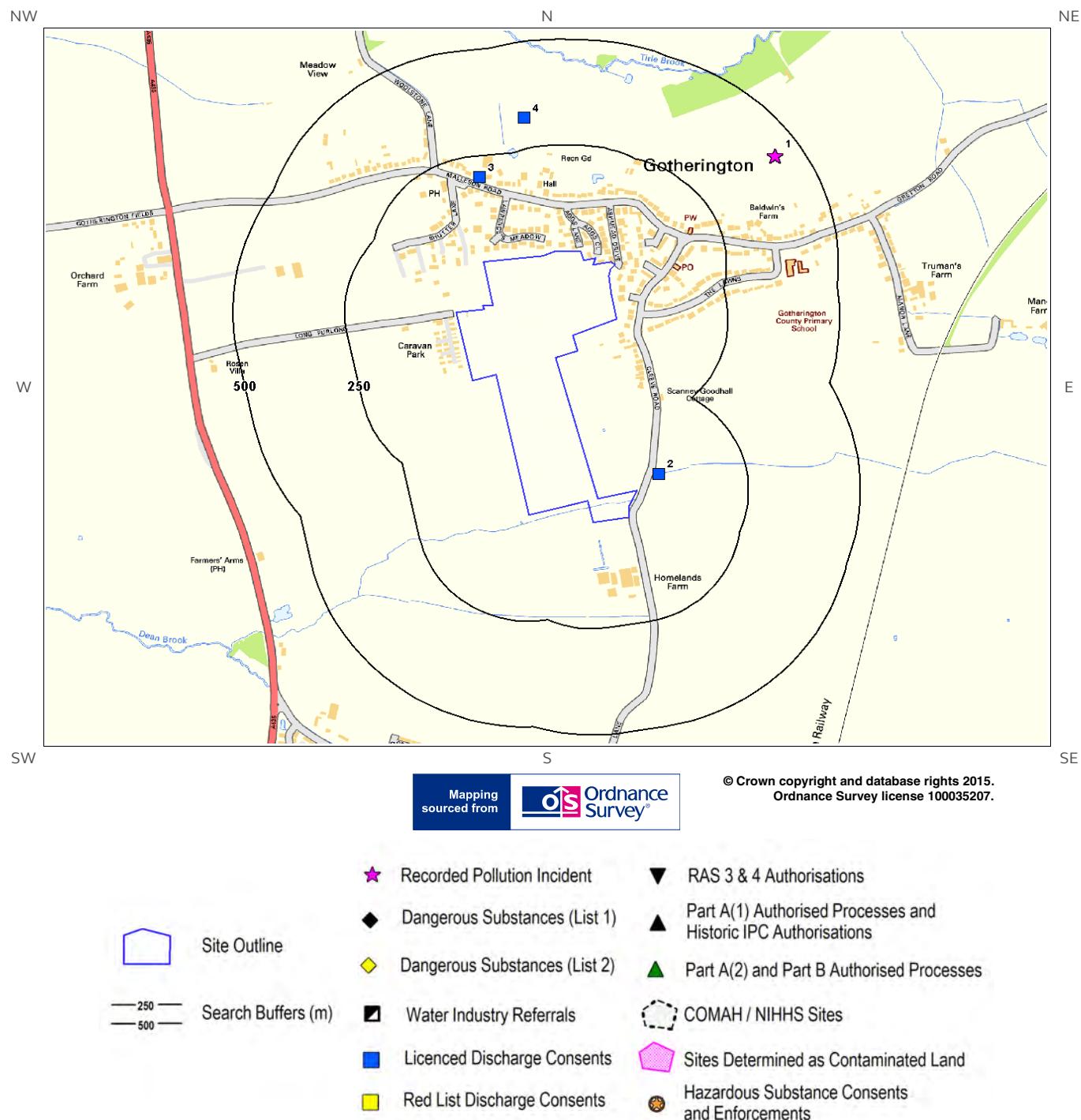
## 1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 2

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

ID	Distance(m)	Direction	Use	Date
20G	151	N	Pond	1883
21G	158	N	Pond	1924

## 2. Environmental Permits, Incidents and Registers Map



## 2. Environmental Permits, Incidents and Registers

### 2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

## 2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

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

3

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

ID	Distance (m)	Direction	NGR	Details
2	62	NE	396400 229000	Address: GOTHERINGTON VILLAGE DRAIN - NORTH, GOTHERINGTON, TEWKESBURY Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: S/17/05786/R Permit Version: 1
3	199	N	396000 229700	Address: HALES FARM, GOTHERINGTON, TEWKESBURY Effluent Type: TRADE DISCHARGES - PROCESS EFFLUENT - NOT WATER COMPANY Permit Number: S/17/05749/T Permit Version: 1
4	321	N	396100 229840	Address: GOTHERINGTON VILLAGE DRAIN (NORTH), GOTHERINGTON, TEWKESBURY Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: S/17/05785/R Permit Version: 1

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

0

Database searched and no data found.



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

0

Database searched and no data found.

---

## 2.2 Dangerous or Hazardous Sites

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

0

Database searched and no data found.

---

## 2.3 Environment Agency Recorded Pollution Incidents

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

1

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

ID	Distance (m)	Direction	NGR	Details
1	440	NE	396660 229750	Incident Date: 09-Aug-2002 Incident Identification: 98802 Pollutant: Contaminated Water Pollutant Description: Firefighting Run-Off Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

---

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

0

Database searched and no data found.

---

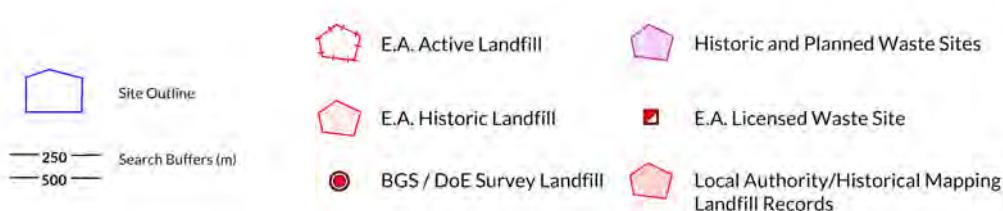
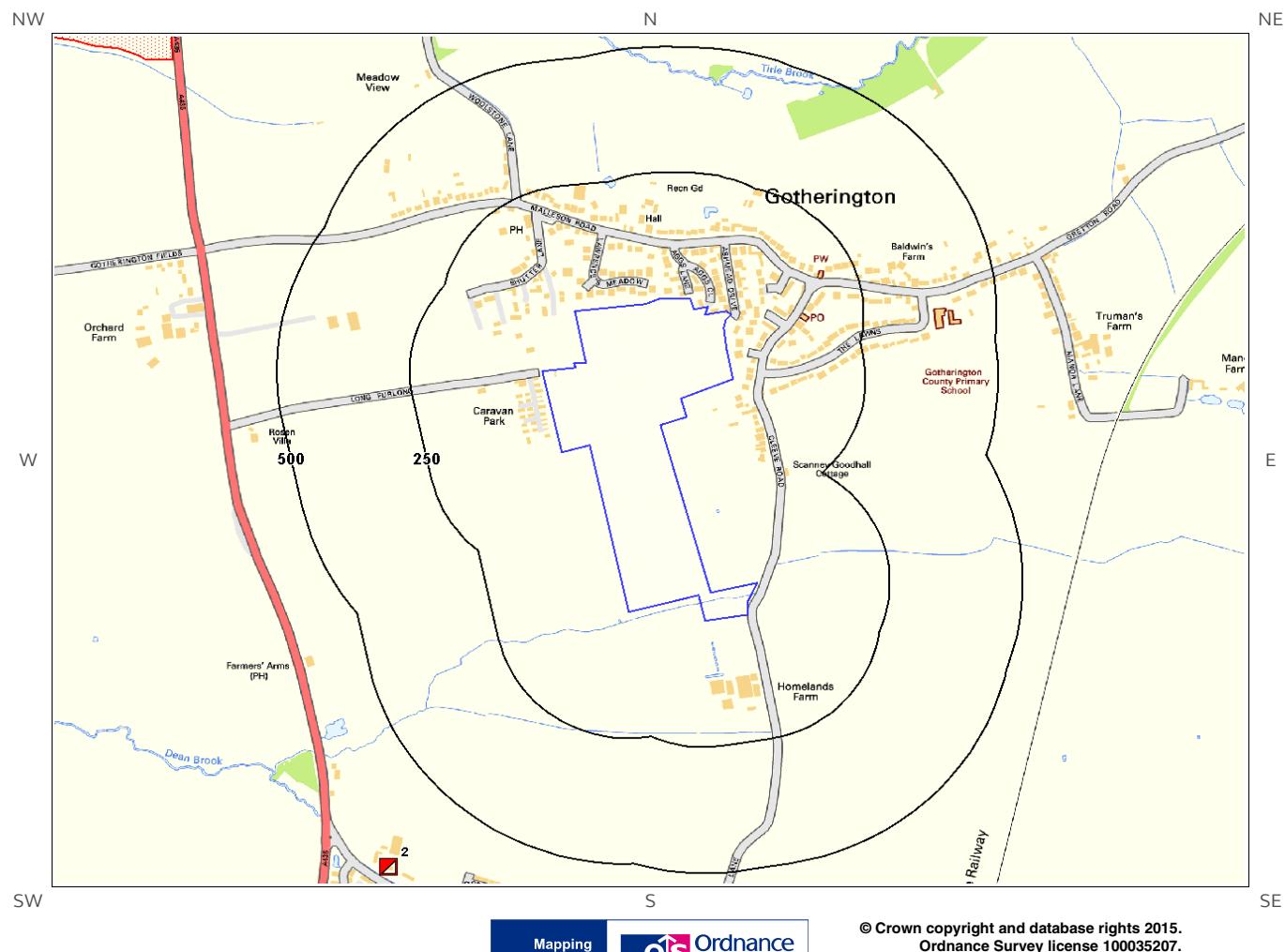
## 2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site?

0

Database searched and no data found.

### 3. Landfill and Other Waste Sites Map



# 3. Landfill and Other Waste Sites

## 3.1 Landfill Sites

### 3.1.1 Records from Environment Agency landfill data within 1000m of the study site:

0

Database searched and no data found.

### 3.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site:

1

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

ID	Distance (m)	Direction	NGR	Details
1	906	NW	395100 230100	<p>Site Address: Gotherington Site, Evesham Road, Gotherington, Bishops Cleeve, Gloucestershire</p> <p>Waste Licence: Yes</p> <p>Site Reference: 62/331</p> <p>Waste Type: Inert</p> <p>Environmental Permitting Regulations (Waste) Reference: -</p> <p>Licence Issue: 04-Nov-1991</p> <p>Licence Surrendered: 30-Apr-1994</p> <p>Licence Hold Address: Field House, Naunton Beauchamp, Pershore, Worcestershire</p> <p>Operator: -</p> <p>First Recorded: 04-Nov-1991</p> <p>Last Recorded: 30-Apr-1994</p>

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

0

Database searched and no data found.

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

0

Database searched and no data found.

## 3.2 Other Waste Sites

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

0

Database searched and no data found.

---

### 3.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site:

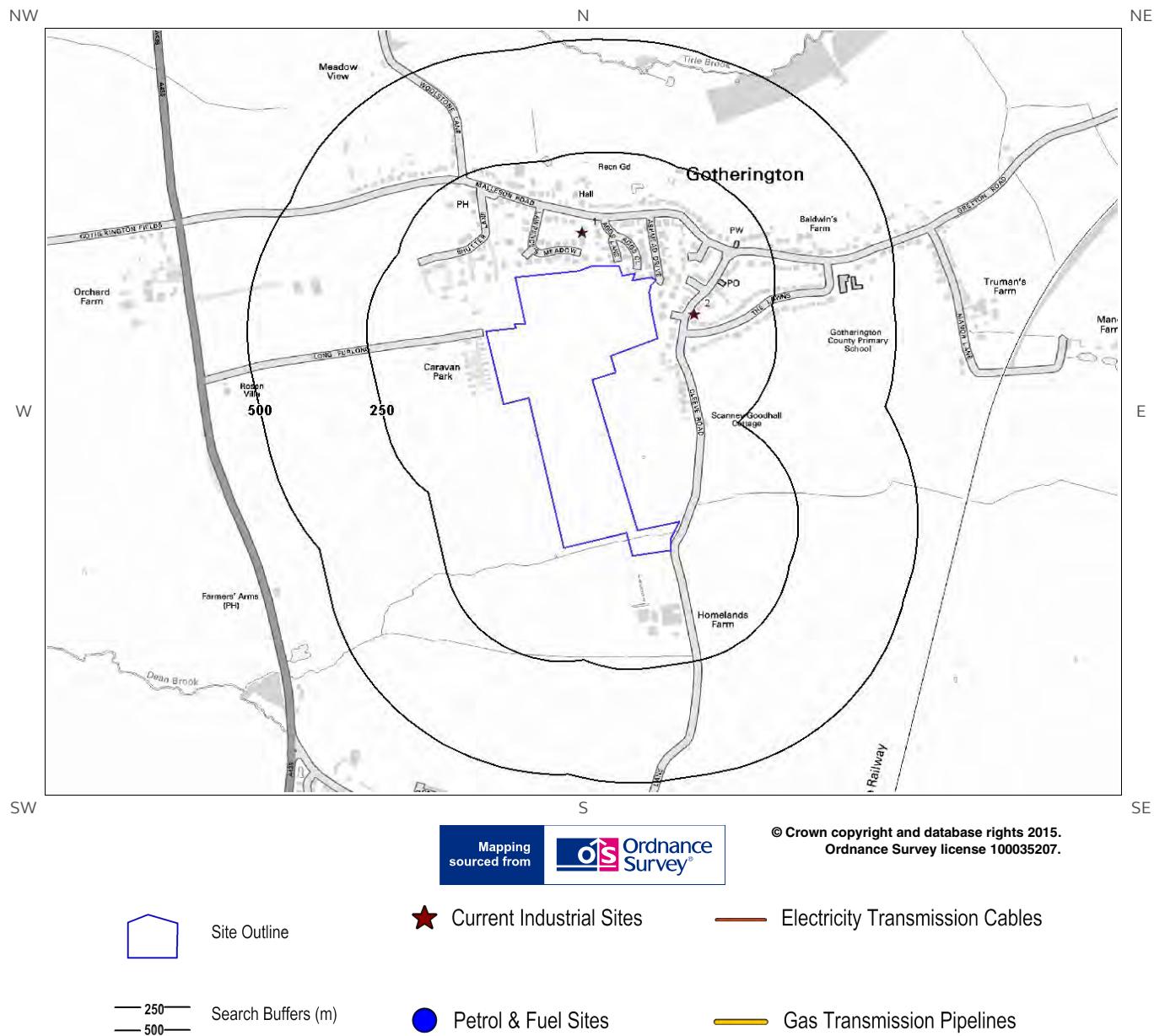
1

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

ID	Distance (m)	Direction	NGR	Details
2	678	SW	395658 228398	<p>Site Address: Mitchells Vehicle Dismantling, 74, Evesham Road, Bishops Cleeve, Cheltenham, Gloucestershire, GL52 8SA</p> <p>Type: Metal Recycling Site (Vehicle Dismantler)</p> <p>Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: MIT001</p> <p>EPR reference: EA/EPR/EP3695CA/A001</p> <p>Operator: Mitchell Robert Kenneth</p> <p>Waste Management licence No: 48064</p> <p>Annual Tonnage: 4999.0</p> <p>Issue Date: 11/12/1991 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Mitchells Vehicle Dismantling Ltd Correspondence Address: -, -</p>

---

## 4. Current Land Use Map



# 4. Current Land Uses

## 4.1 Current Industrial Data

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

2

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

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	77	N	Electricity Sub Station	396148 229600	GL52	Electrical Features	Infrastructure and Facilities
2	86	E	Electricity Sub Station	396383 229420	GL52	Electrical Features	Infrastructure and Facilities

---

## 4.2 Petrol and Fuel Sites

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

0

Database searched and no data found.

---

## 4.3 National Grid High Voltage Underground Electricity Transmission Cables

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

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

0

Database searched and no data found.



## 4.4 National Grid High Pressure Gas Transmission Pipelines

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

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

0

Database searched and no data found.

---

# 5. Geology

## 5.1 Artificial Ground and Made Ground

Database searched and no data found.

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

---

## 5.2 Superficial Ground and Drift Geology

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

Lex Code	Description	Rock Type
ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
CHSG	CHELTENHAM SAND AND GRAVEL	SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]

---

## 5.3 Bedrock and Solid Geology

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

Lex Code	Description	Rock Type
CHAM-MDST	CHARMOUTH MUDSTONE FORMATION	MUDSTONE

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

---

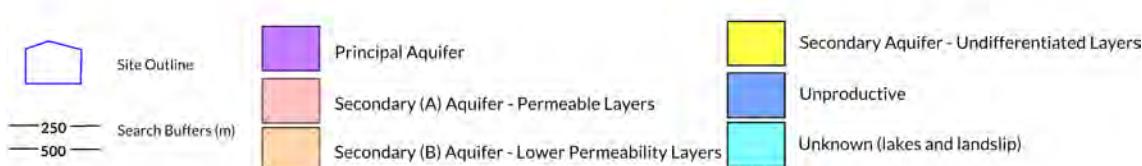
# 6 Hydrogeology and Hydrology

## 6a. Aquifer Within Superficial Geology

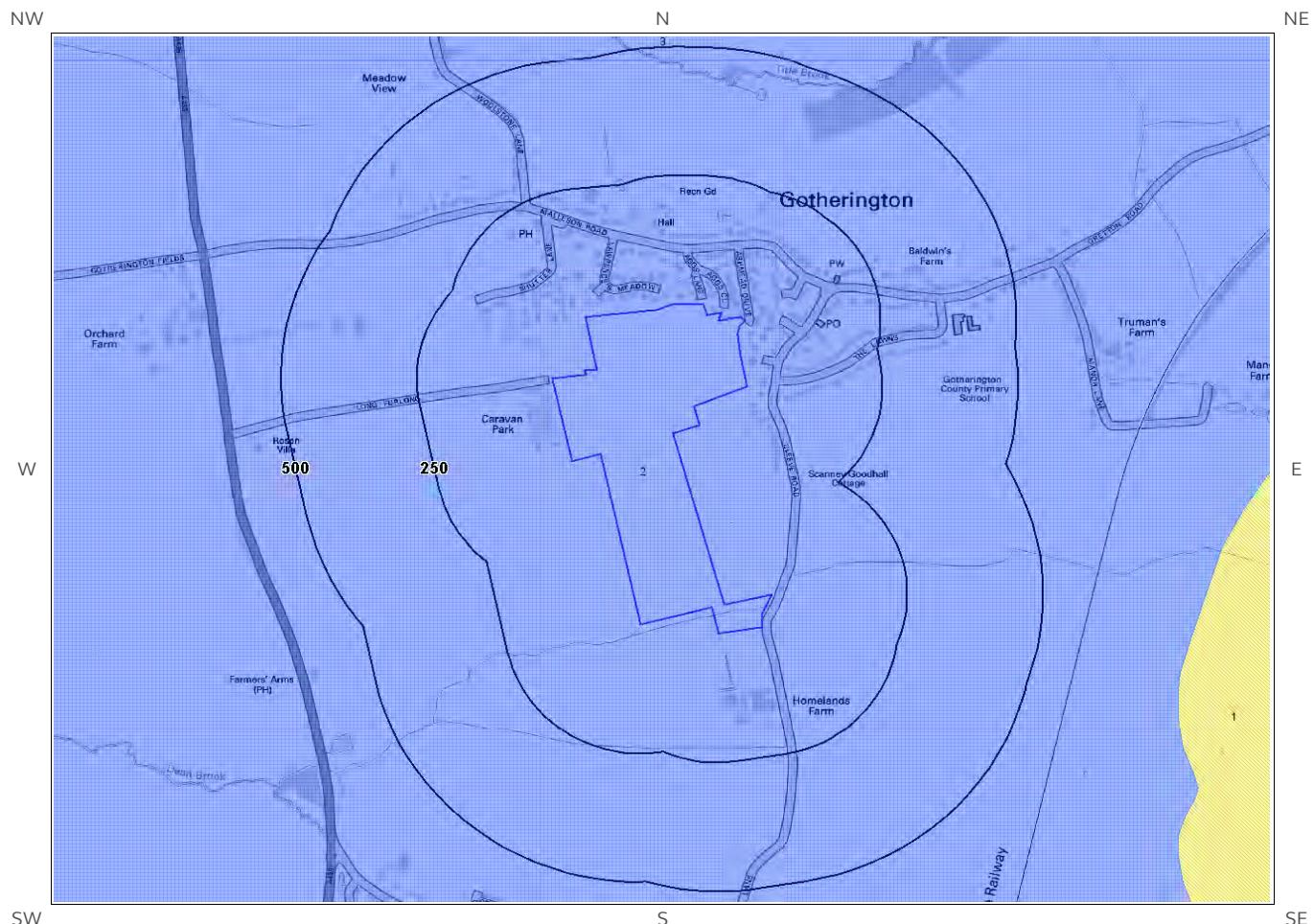


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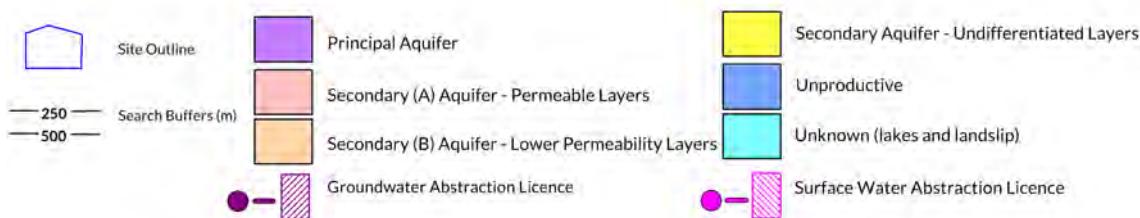


# 6b. Aquifer Within Bedrock Geology and Abstraction Licenses

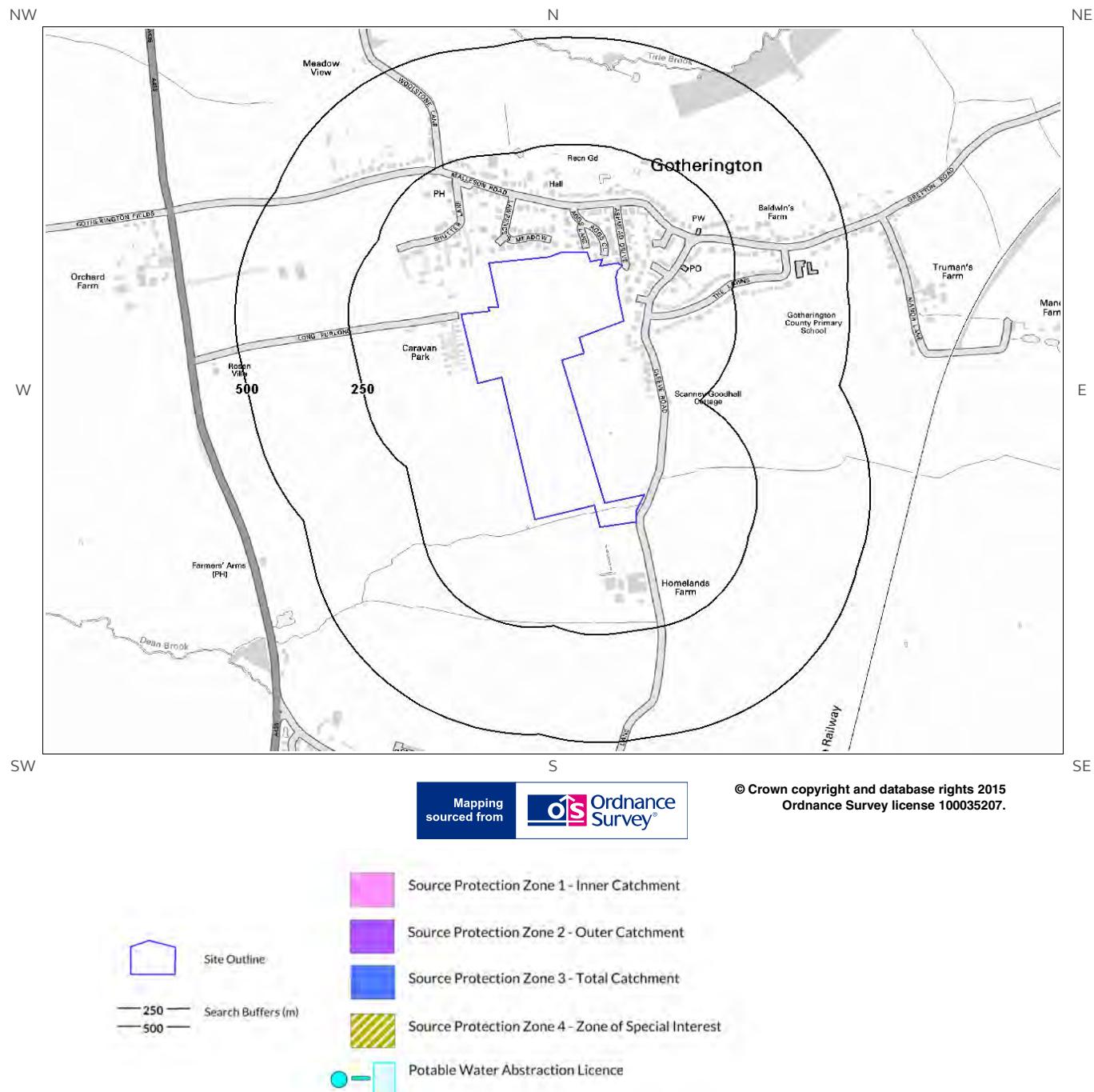


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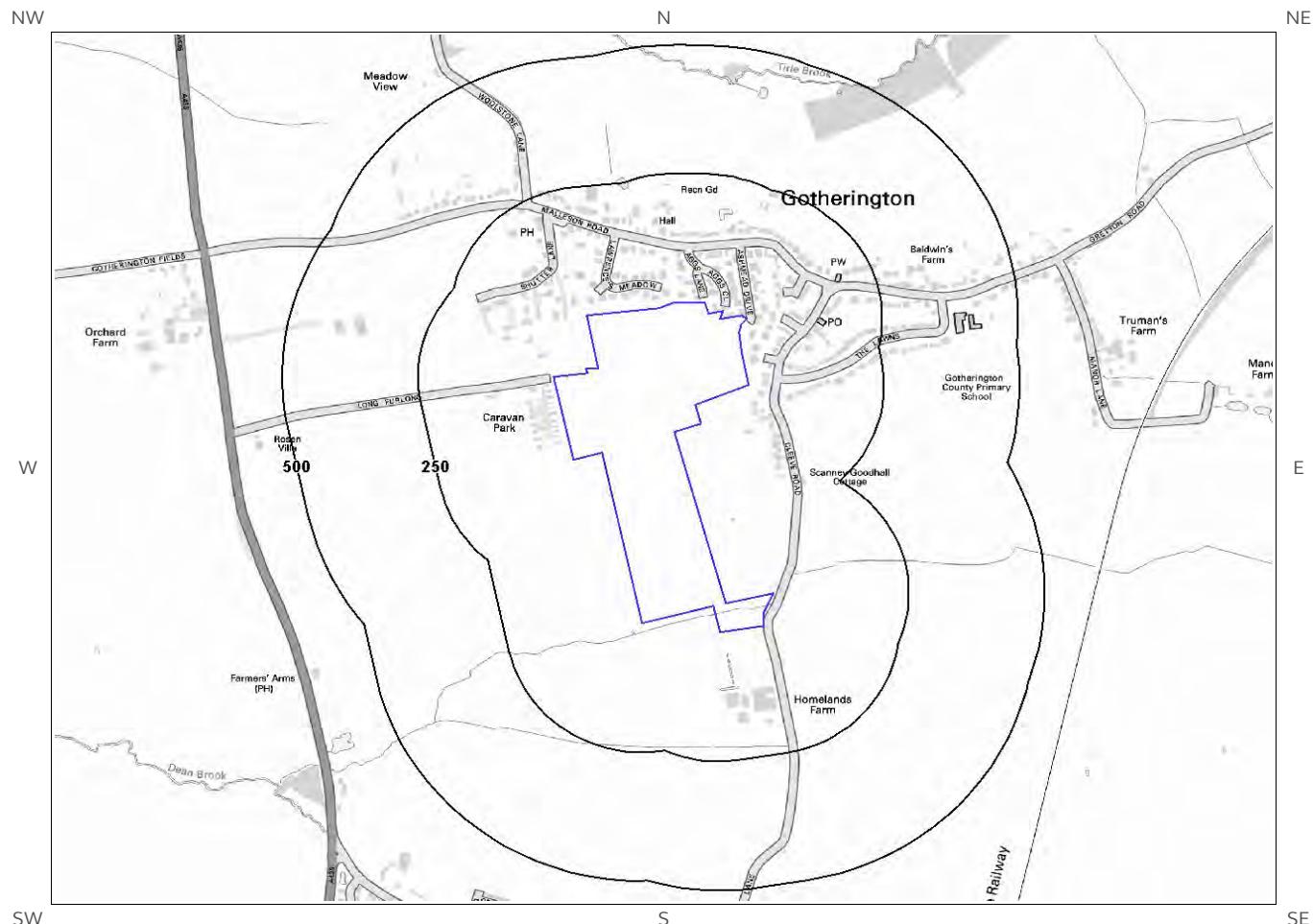
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## **6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses**

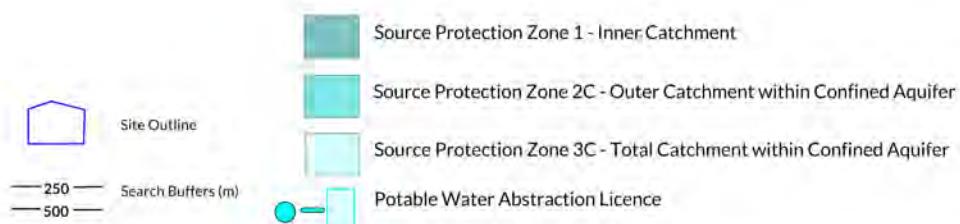


# 6d. Hydrogeology – Source Protection Zones within confined aquifer

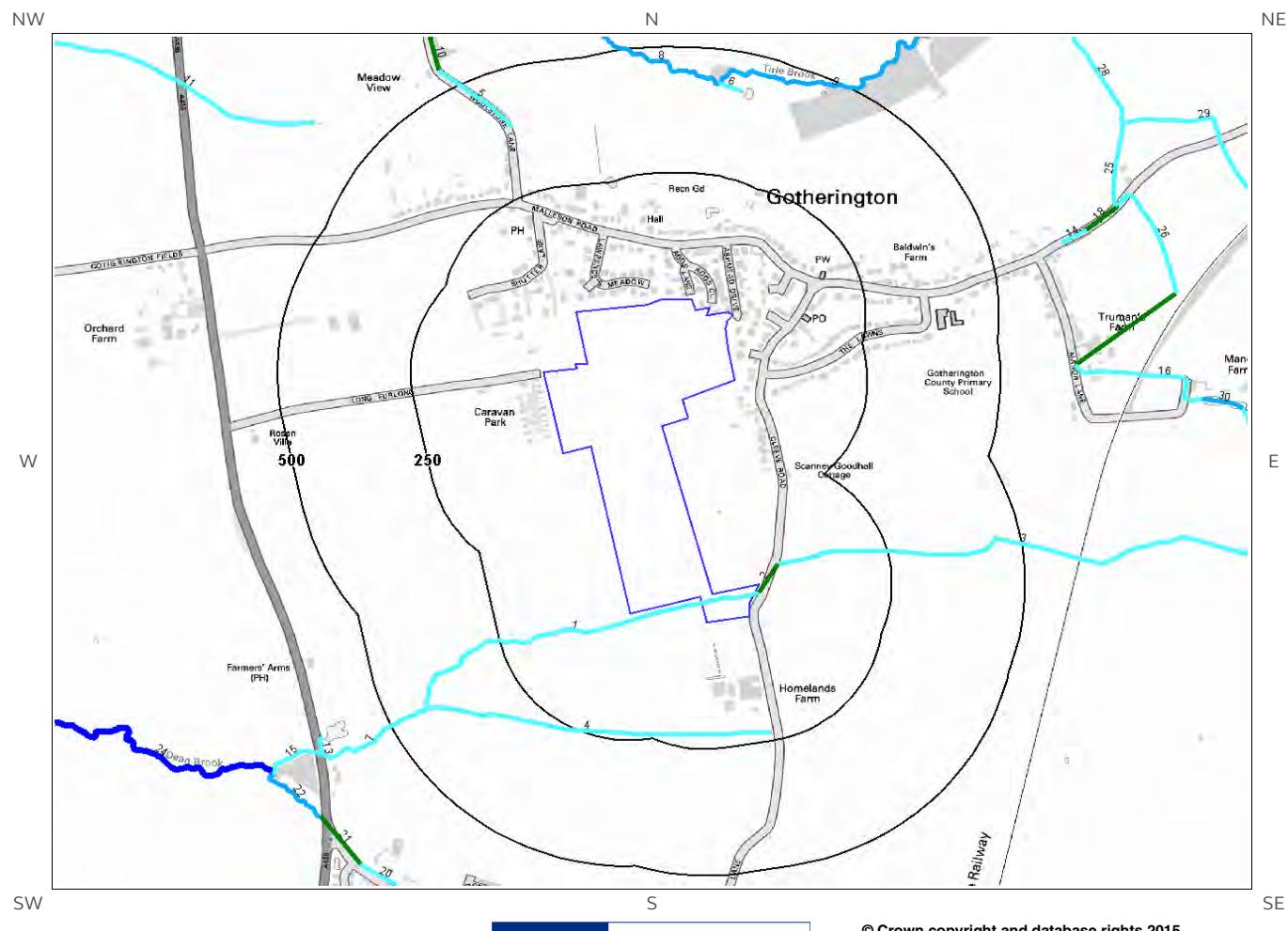


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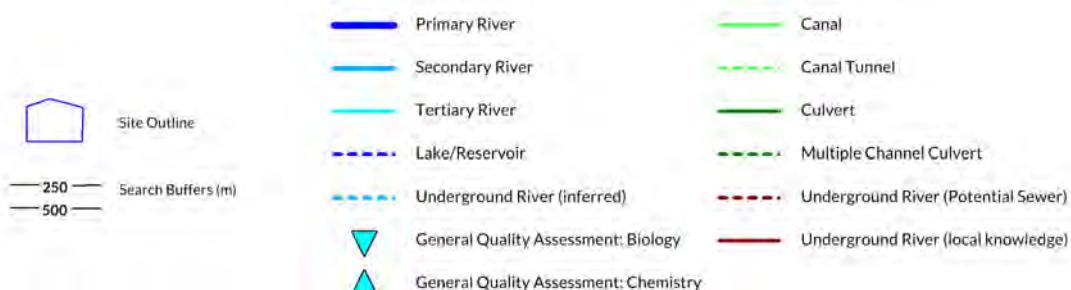


# 6e. Hydrology – Detailed River Network and River Quality



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# 6. Hydrogeology and Hydrology

## 6.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property?

Yes

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

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

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
3	92	SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	411	N	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
5	424	NE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
6	435	S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
7	474	N	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

## 6.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property?

Yes

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

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

ID	Distance (m)	Direction	Designation	Description
2	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
3	474	N	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

## 6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? Yes

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

ID	Distance (m)	Direction	NGR	Details
Not shown	1748	E	398100 229000	Status: Historical Licence No: 18/54/17/0475 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: Pardon Hill/dixton Manor Farms - Spring (2) Data Type: Point Name: V A NEWMAN & SON
Not shown	1849	E	398200 228900	Status: Historical Licence No: 18/54/17/0475 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: Pardon Hill/dixton Manor Farms - Spring (3) Data Type: Point Name: V A NEWMAN & SON
Not shown	1861	E	398210 229060	Status: Historical Licence No: 18/54/17/0475 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: Pardon Hill/dixton Manor Farms - Spring (1) Data Type: Point Name: V A NEWMAN & SON

## 6.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

## 6.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? No

Database searched and no data found.



## 6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site?

No

Database searched and no data found.

## 6.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site? No

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

Database searched and no data found.

## 6.8 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency information on groundwater vulnerability and soil leaching potential within 500m of the study site? Yes

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.

## 6.9 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site?

Yes

### 6.9.1 Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
Not shown	1256	NW	395400 230600	River Name: Tirle Brook Reach: Conf Below Dixton To Oxenton Stw End/Start of Stretch: End of Stretch NGR	C	C	C	C	C

### 6.9.2 Chemical Quality:

Database searched and no data found.

## 6.10 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site?

Yes

The following Detailed River Network records are represented on the Hydrology Map (6e):

ID	Distance (m)	Direction	Details
1	0	On Site	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
2	7	SE	River Name: - Welsh River Name: - Alternative Name: - River Type: Culvert Main River Status: Currently Undefined
3	54	NE	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
4	219	S	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
5	384	N	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
6	423	N	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
7	427	SW	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
8	430	N	River Name: Tirle Brook Welsh River Name: - Alternative Name: - River Type: Secondary River Main River Status: Currently Undefined



ID	Distance (m)	Direction	Details
9	431	N	River Name: Tirle Brook Welsh River Name: - Alternative Name: -  River Type: Secondary River Main River Status: Currently Undefined

## 6.11 Surface Water Features

Are there any surface water features within 250m of the study site?

Yes

The following surface water records are not represented on mapping:

Distance (m)	Direction
0	On Site
13	S
54	NE
70	NE
125	W
133	NE
219	S
220	S
229	S

# 7a. Environment Agency Flood Map for Planning (from rivers and the sea)

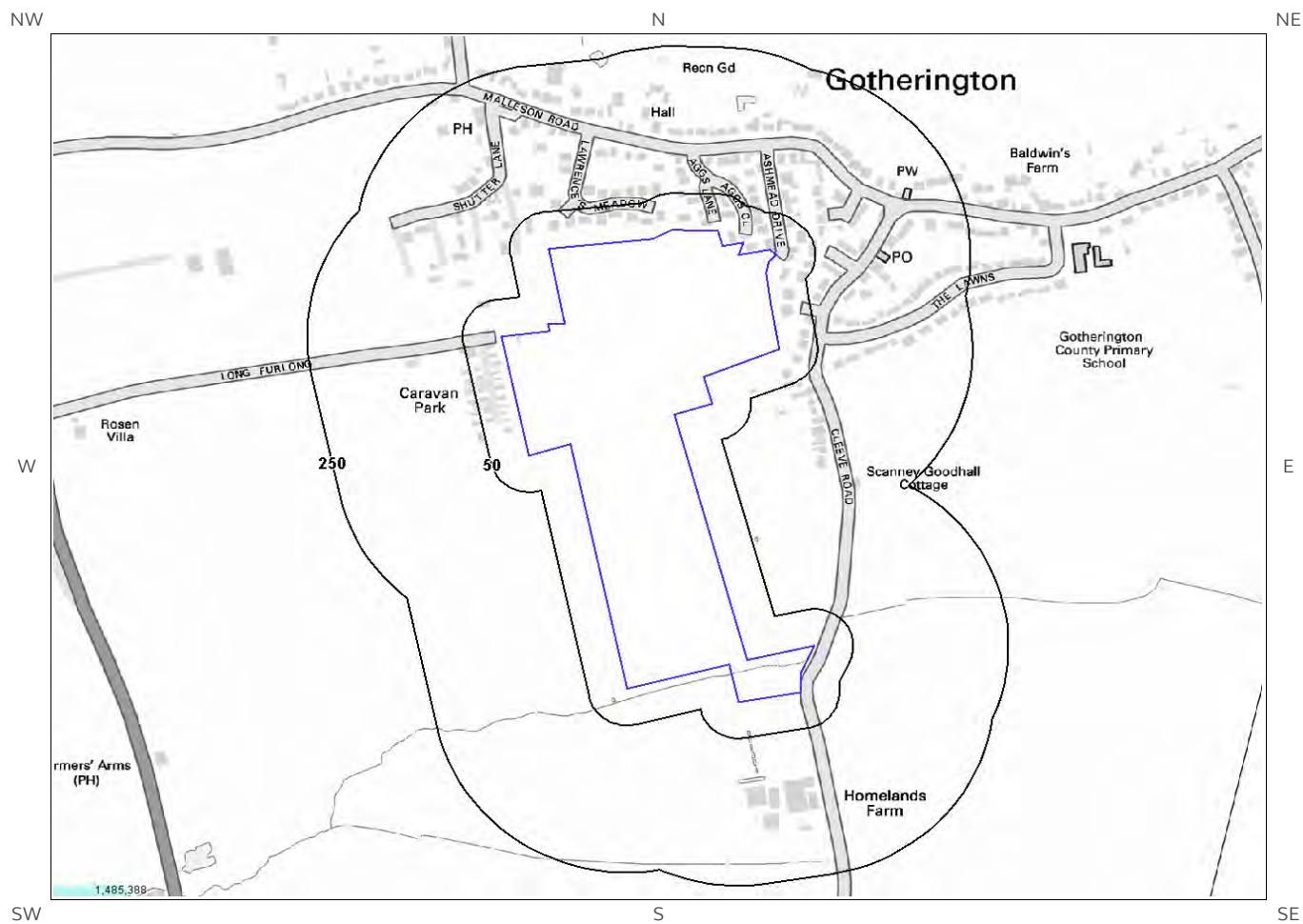


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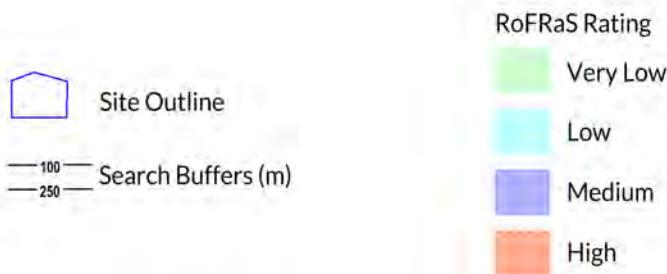


# 7b. Environment Agency Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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# 7 Flooding

## 7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency Zone 2 floodplain? No

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

Database searched and no data found.

## 7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency Zone 3 floodplain? No

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

Database searched and no data found.

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

What is the highest risk of flooding onsite? Very Low

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

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

## 7.4 Flood Defences

Are there any Flood Defences within 250m of the study site? No  
Database searched and no data found.

## 7.5 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

## 7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site?

No

## 7.7 Groundwater Flooding Susceptibility Areas

7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site?

Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding?      Superficial Deposits Flooding

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

7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Potential at Surface

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

## 7.8 Groundwater Flooding Confidence Areas

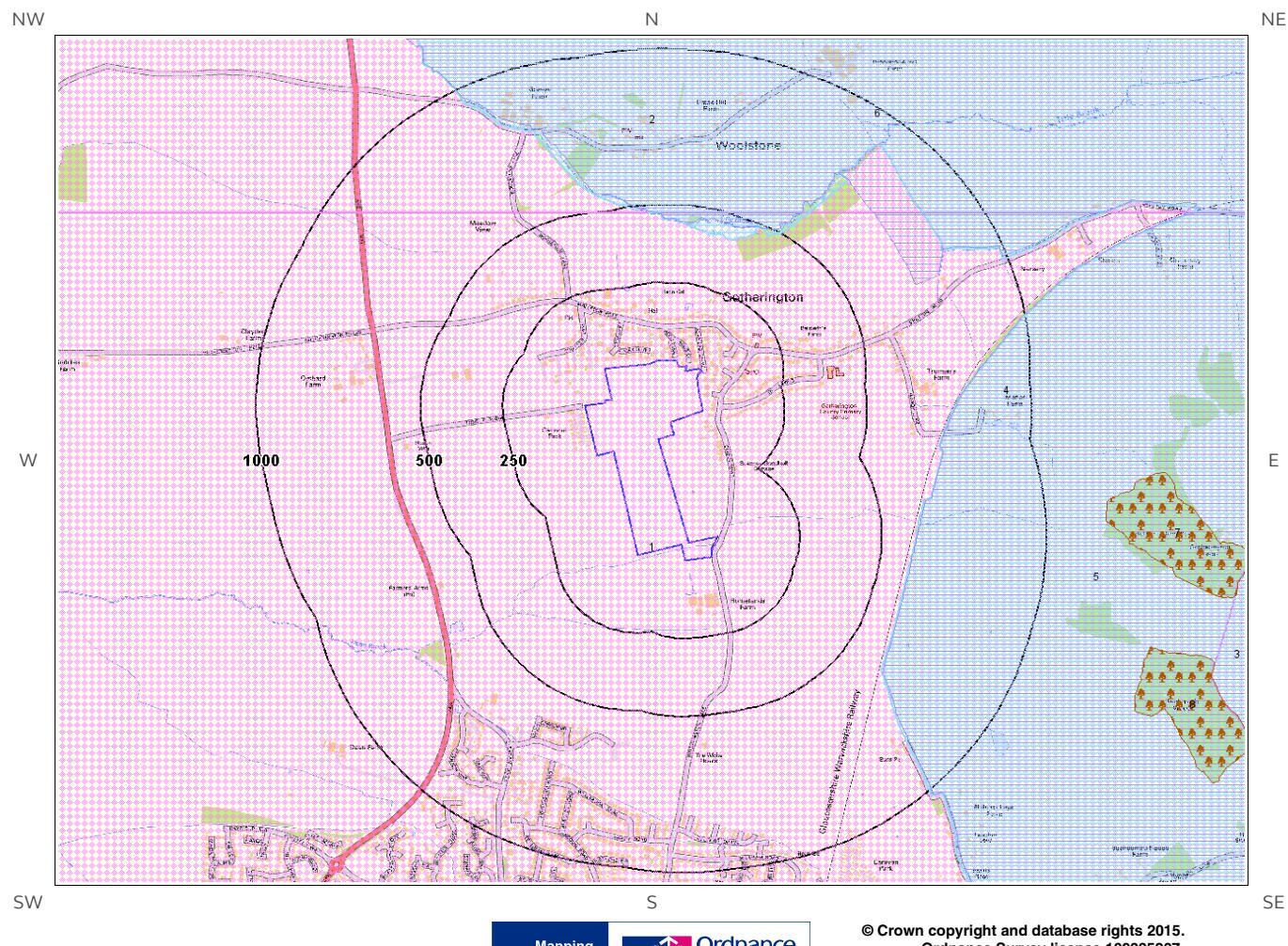
What is the British Geological Survey confidence rating in this result?

Moderate

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

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

# 8. Designated Environmentally Sensitive Sites Map



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## 8. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site?

Yes

---

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

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

2

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

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
7	1183	E	UNKNOWN	Ancient and Semi-Natural Woodland
8	1355	E	UNKNOWN	Ancient and Semi-Natural Woodland

---

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

---

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

2

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

ID	Distance (m)	Direction	ESA Name	Data Source
5	441	N	Cotswold Hills	Natural England
6	474	N	Cotswold Hills	Natural England

---



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

1

The following Area of Outstanding Natural Beauty (AONB) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	AONB/NSA Name	Data Source
4	420	N	Cotswolds	Natural England

---

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

0

Database searched and no data found.

---

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

0

Database searched and no data found.

---

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

3

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

ID	Distance (m)	Direction	NVZ Name	Data Source
1	0	On Site	Existing	DEFRA
2	474	N	Existing	DEFRA
3	1564	E	Existing	DEFRA

---

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

1

Green Belt data contains Ordnance Survey data © Crown copyright and database right [2015].

ID	Distance	Direction	Green Belt Name	Local Authority Name
Not shown	1762	SW	Gloucester Greenbelt	Tewkesbury District (B)



# 9. Natural Hazards Findings

## 9.1 Detailed BGS GeoSure Data

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

### 9.1.1 Shrink Swell

What is the maximum Shrink-Swell\* hazard rating identified on the study site? Low

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

#### Hazard

Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

### 9.1.2 Landslides

What is the maximum Landslide\* hazard rating identified on the study site? Very Low

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

#### Hazard

Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

### 9.1.3 Soluble Rocks

What is the maximum Soluble Rocks\* hazard rating identified on the study site? Negligible

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

#### Hazard

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

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



## 9.1.4 Compressible Ground

What is the maximum Compressible Ground\* hazard rating identified on the study site?

Moderate

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

### Hazard

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

## 9.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks\* hazard rating identified on the study site?

Very Low

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

### Hazard

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

## 9.1.6 Running Sand

What is the maximum Running Sand\*\* hazard rating identified on the study site?

Low

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

### Hazard

Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build → consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property → no significant increase in insurance risk due to running sand problems is likely.

## 9.2 Radon

### 9.2.1 Radon Affected Areas

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

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

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

### 9.2.2 Radon Protection

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

# 10. Mining

## 10.1 Coal Mining

Are there any coal mining areas within 75m of the study site?

No

Database searched and no data found.

---

## 10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary?

No

Database searched and no data found.

---

## 10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site?

No

Guidance: No Guidance Required.

---

# Contact Details

Groundsure@centremaps.co.uk  
CENTREMAPS, Brockamin House, Leigh, Worcester, London, WR6 5JU

Directors: M C Walker, MInst C.E.S., C M Walker,  
S J Hawkins BSc (Hons), S E Stewart BSc (Hons)  
Registered No. 1890261 Registered in England and Wales  
Registered Company: Laser Surveys Limited  
Brockamin House, Leigh, Worcester, WR6 5JU.

**British Geological Survey Enquiries**

Kingsley Dunham Centre  
Keyworth, Nottingham NG12 5GG  
Tel: 0115 936 3143.  
Fax: 0115 936 3276.  
Email:

Web:[www.bgs.ac.uk](http://www.bgs.ac.uk)

BGS Geological Hazards Reports and general geological enquiries:  
[enquiries@bgs.ac.uk](mailto:enquiries@bgs.ac.uk)

**centremapslive.com**  
the mapping portal from Laser Surveys



**Environment Agency**  
National Customer Contact Centre, PO Box 544  
Rotherham, S60 1BY  
Tel: 08708 506 506  
Web:[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)  
Email:[enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)



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



**Public Health  
England**

**The Coal Authority**  
200 Lichfield Lane  
Mansfield  
Notts NG18 4RG  
Tel: 0345 7626 848  
DX 716176 Mansfield 5  
[www.coal.gov.uk](http://www.coal.gov.uk)



**The Coal  
Authority**

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



**Local Authority**  
Authority: Tewkesbury Borough Council  
Phone: 01684 295 010  
Web: <http://tewkesbury.gov.uk/>  
Address: Council Offices, Gloucester Road, Tewkesbury,

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





# Groundsure

LOCATION INTELLIGENCE

centremaps*live*.com  
the mapping portal from Laser Surveys

Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England who retain the Copyright and Intellectual Property Rights for the data.

PointX © Database Right/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028]. This report has been prepared in accordance with the Groundsure Ltd standard Terms and Conditions of business for work of this nature.

## **Standard Terms and Conditions**

### **1 Definitions**

In these terms and conditions unless the context otherwise requires:

**"Beneficiary"** means the person or entity for whose benefit the Client has obtained the Services.

**"Client"** means the party or parties entering into a Contract with Groundsure.

**"Commercial"** means any building or property which is not Residential.

**"Confidential Information"** means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by Groundsure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

**"Support Services"** means Support Services provided by Groundsure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

**"Contract"** means the contract between Groundsure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

**"Third Party Data Provider"** means any third party providing Third Party Content to Groundsure.

**"Data Reports"** means reports comprising factual data with no accompanying interpretation.

**"Fees"** has the meaning set out in clause 5.1.

**"Groundsure"** means Groundsure Limited, a company registered in England and Wales under number 03421028.

**"Groundsure Materials"** means all materials prepared by Groundsure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

**"Intellectual Property"** means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

**"Mapping"** means a map, map data or a combination of historical maps of various ages, time periods and scales.

**"Order"** means an electronic, written or other order form submitted by the Client requesting Services from Groundsure in respect of a specified Site.

**"Ordnance Survey"** means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

**"Order Website"** means the online platform through which Orders may be placed by the Client and accepted by Groundsure.

**"Report"** means a Risk Screening Report or Data Report for Commercial or Residential property.

**"Residential"** means any building or property used as or intended to be used as a single dwelling.

**"Risk Screening Report"** means a risk screening report comprising factual data with an accompanying interpretation by Groundsure.

**"Services"** means any Report, Mapping and/or Support Services which Groundsure has agreed to provide by accepting an Order pursuant to clause 2.6.

**"Site"** means the area of land in respect of which the Client has requested Groundsure to provide the Services.

**"Third Party Content"** means data, database information or other information which is provided to Groundsure by a Third Party Data Provider.

**"User Guide"** means the user guide, as amended from time to time, available upon request from Groundsure and on the website ([www.Groundsure.com](http://www.Groundsure.com)) and forming part of this Contract.

### **2 Scope of Services, terms and conditions, requests for insurance and quotations**

2.1 Groundsure agrees to provide the Services in accordance with the Contract.

2.2 Groundsure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of Groundsure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, Groundsure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and Groundsure will have no liability therefor. In addition you acknowledge and agree that Groundsure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 Groundsure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by Groundsure. Groundsure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by Groundsure. Groundsure's acceptance of an Order shall be binding only when made in writing and signed by Groundsure's authorised representative or when accepted through the Order Website.

### **3 The Client's obligations**

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to Groundsure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to Groundsure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as Groundsure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable Groundsure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the Groundsure Materials, or use the Groundsure Materials in a manner for which they were not intended. The Client may make the Groundsure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that Groundsure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

### **4 Reliance**

4.1 The Client acknowledges that the Services provided by Groundsure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by Groundsure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by Groundsure. Any party considering such Reports and Services does so at their own risk.

### **5 Fees and Disbursements**

5.1 Groundsure shall charge and the Client shall pay fees at the rate and

frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by Groundsure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to Groundsure in full without deduction, counterclaim or set off within 30 days of the date of Groundsure's invoice or such other period as may be agreed in writing between Groundsure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of Groundsure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

## 6 Intellectual Property and Confidentiality

### 6.1 Subject to

(i) full payment of all relevant Fees and  
(ii) compliance with this Contract, the Client is granted (and is permitted to sub-license to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the Groundsure Materials.

6.2 All Intellectual Property in the Groundsure Materials are and shall remain owned by Groundsure or Groundsure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the Groundsure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the Groundsure Materials in order to advise the Beneficiary in a professional capacity. However, Groundsure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify Groundsure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

## 7.Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of Groundsure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or

subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

### 7.4 Groundsure shall not be liable for

- (i) loss of profits;
- (ii) loss of business;
- (iii) depletion of goodwill and/or similar losses;
- (iv) loss of anticipated savings;
- (v) loss of goods;
- (vi) loss of contract;
- (vii) loss of use;
- (viii) loss or corruption of data or information;
- (ix) business interruption;
- (x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;
- (xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;
- (xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;
- (xiii) loss or damage to a computer, software, modem, telephone or other property; and
- (xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

7.5 Groundsure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 Groundsure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of Groundsure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against Groundsure in relation to the Services or other matters arising pursuant to the Contract.

## 8 Groundsure's right to suspend or terminate

8.1 If Groundsure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, Groundsure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 Groundsure shall be entitled to terminate the Contract immediately on written notice in the event that:

- (i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or
- (ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or
- (iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or
- (iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

## 9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

- (a) supplied to the Client's specification(s) and in any event
- (b) by their nature cannot be returned.

## 10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and

(ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

## 11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

## 12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through Groundsure.

12.3 Groundsure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of Groundsure.

12.4 No failure on the part of Groundsure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 Groundsure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

(i) the Client or Beneficiary's failure to provide facilities, access or information;

(ii) fire, storm, flood, tempest or epidemic;

(iii) Acts of God or the public enemy;

(iv) riot, civil commotion or war;

(v) strikes, labour disputes or industrial action;

(vi) acts or regulations of any governmental or other agency;

(vii) suspension or delay of services at public registries by Third Party Data Providers;

(viii) changes in law; or

(ix) any other reason beyond Groundsure's reasonable control.

In the event that Groundsure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then Groundsure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 Groundsure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law. © **Groundsure Limited June 2013**

## **Appendix C: Groundsure Historic Mapping**

# Ordnance Survey® Historical Mapping Extract

[www.centremapslive.com](http://www.centremapslive.com)

## Site Details:

Gotherington (Tewkesbury),  
GL52 9UH

**Client Ref:** 5956  
**Report Ref:** CMAPS-CM-461194-5956-080915HIS  
**Grid Ref:** 396150, 229205

**Map Name:** County Series

**Map date:** 1883-1884

**Scale:** 1:10,560

**Printed at:** 1:10,560



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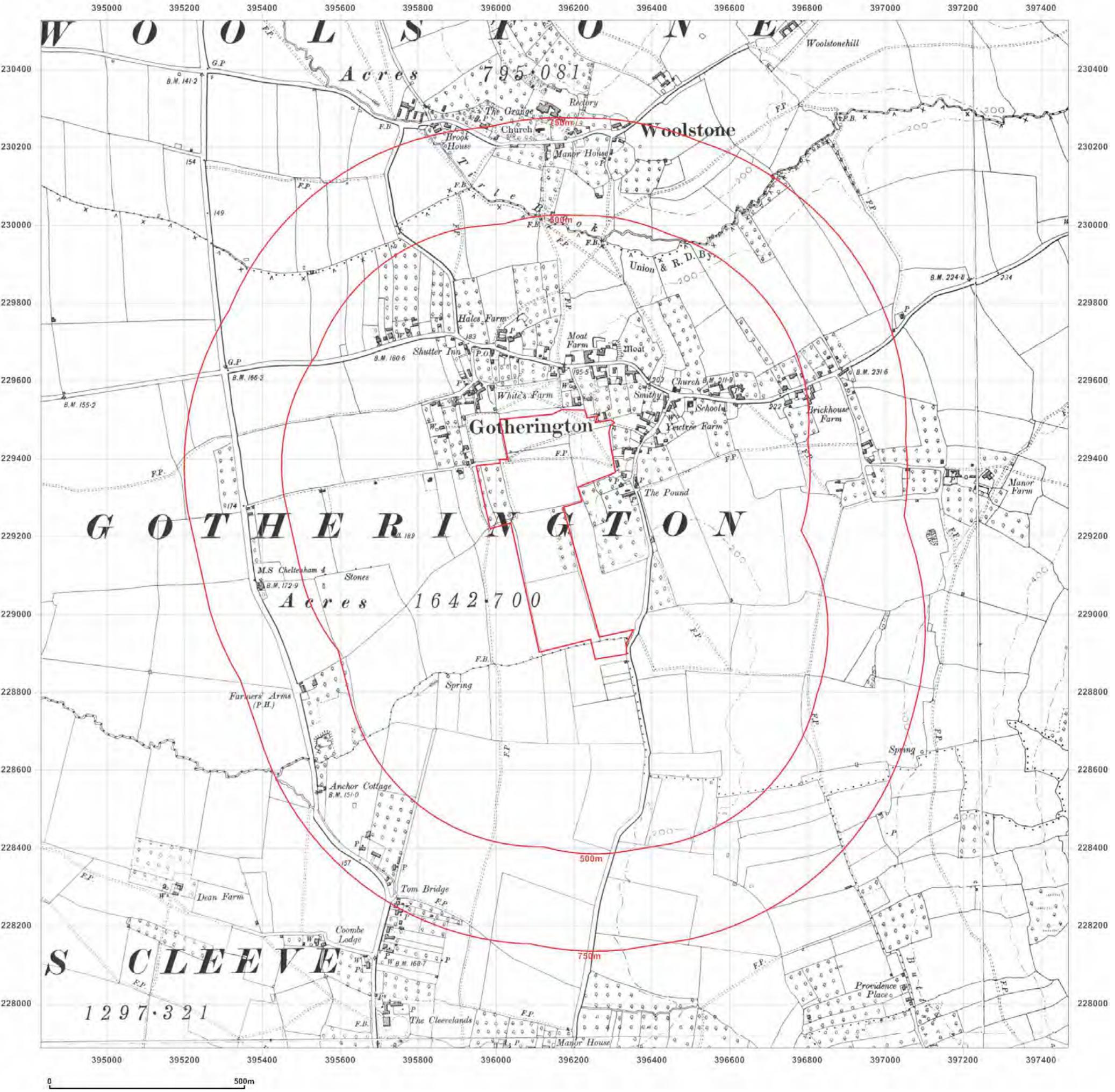
Production date: 08 September 2015

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## Site Details:

Gotherington (Tewkesbury),  
GL52 9UH

**Client Ref:** 5956  
**Report Ref:** CMAPS-CM-461194-5956-080915HIS  
**Grid Ref:** 396150, 229205

**Map Name:** County Series

**Map date:** 1921-1924

**Scale:** 1:10,560

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Surveyed 1882  
Revised 1924  
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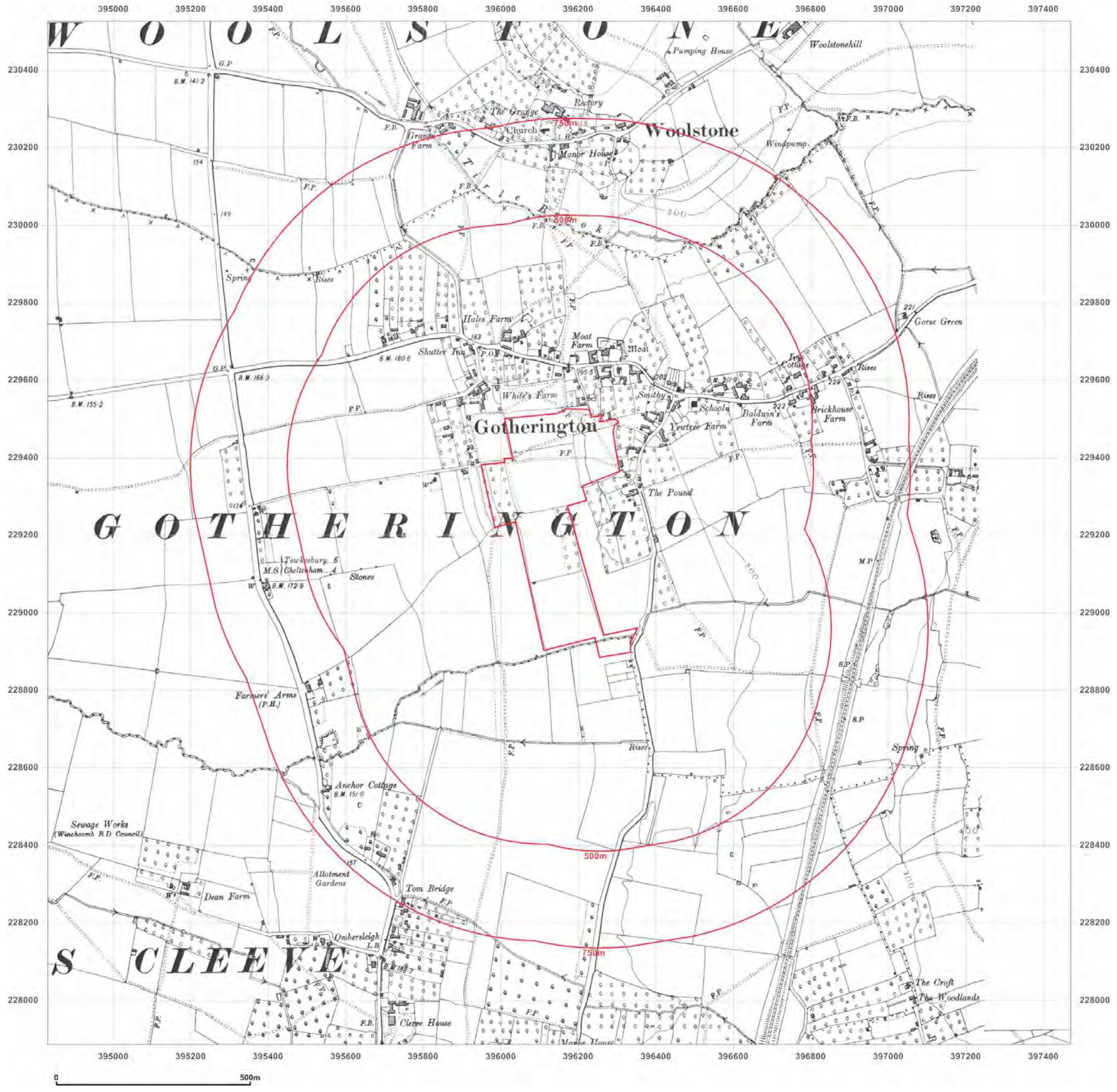
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GL52 9UH

Client Ref: 5956  
Report Ref: CMAPS-CM-461194-5956-080915HIS  
Grid Ref: 396150, 229205

Map Name: Provisional

Map date: 1949-1954

Scale: 1:10,560

Printed at: 1:10,560



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

Surveyed 1949  
Revised 1954  
Edition N/A  
Copyright N/A  
Levelled N/A

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

Surveyed N/A  
Revised 1954  
Edition 1954  
Copyright N/A  
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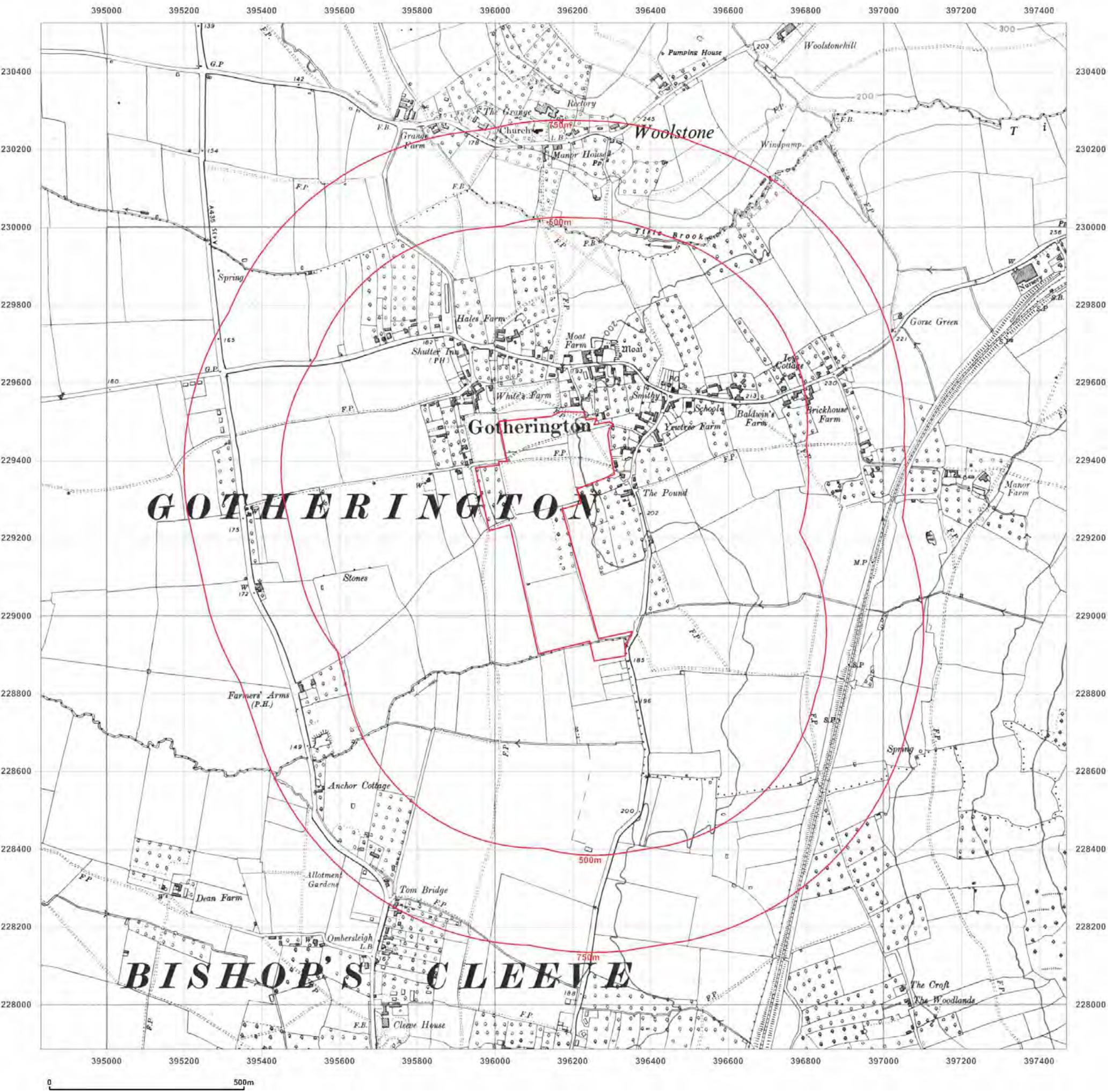
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Site Details:

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GL52 9UH

Client Ref: 5956  
Report Ref: CMAPS-CM-461194-5956-080915HIS  
Grid Ref: 396150, 229205

Map Name: National Grid

Map date: 1975-1977

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1972  
Revised 1977  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1972  
Revised 1975  
Edition N/A  
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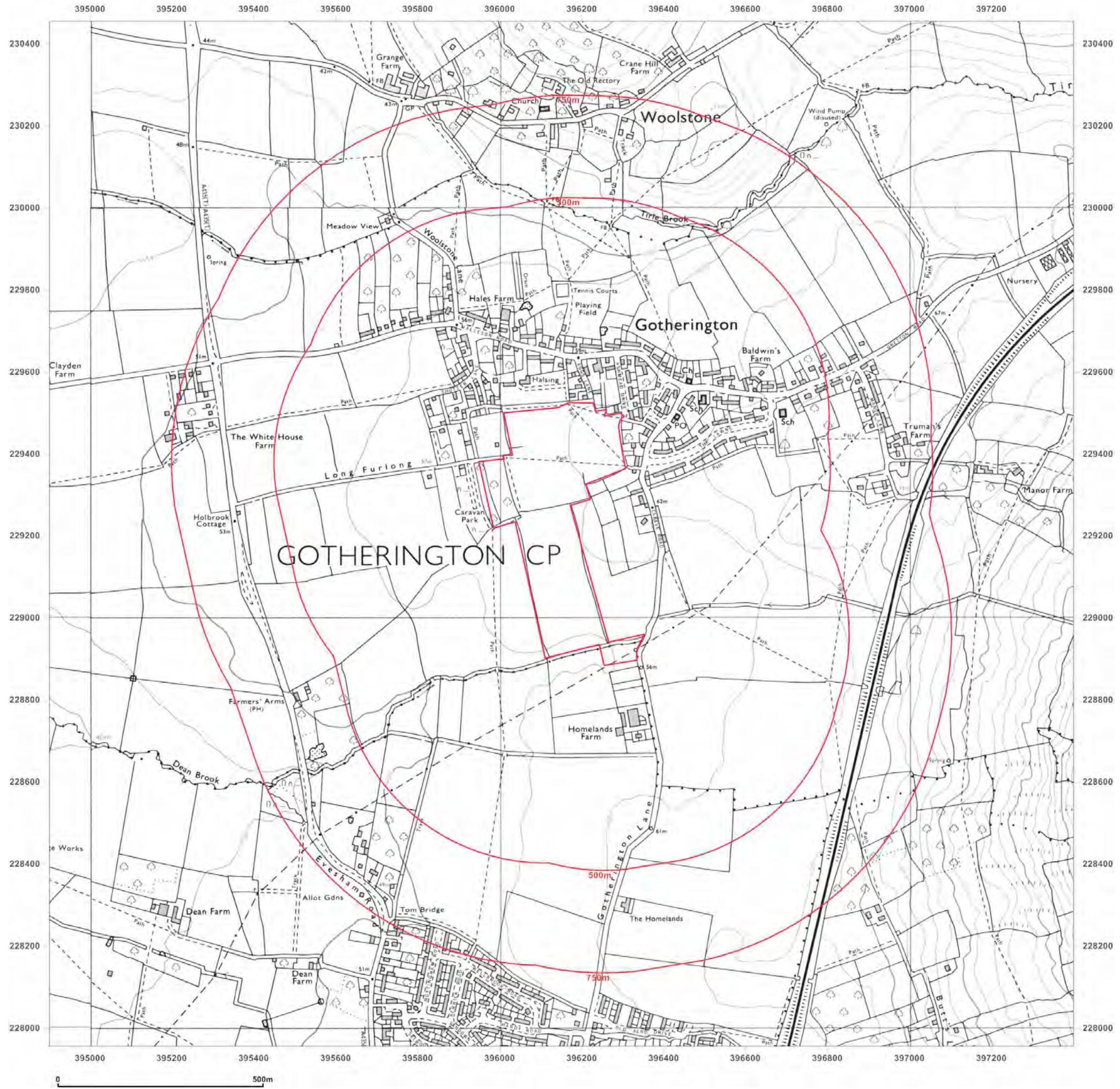
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Client Ref: 5956  
Report Ref: CMAPS-CM-461194-5956-080915HIS  
Grid Ref: 396150, 229205

Map Name: National Grid

Map date: 1991-1994

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1972  
Revised 1994  
Edition N/A  
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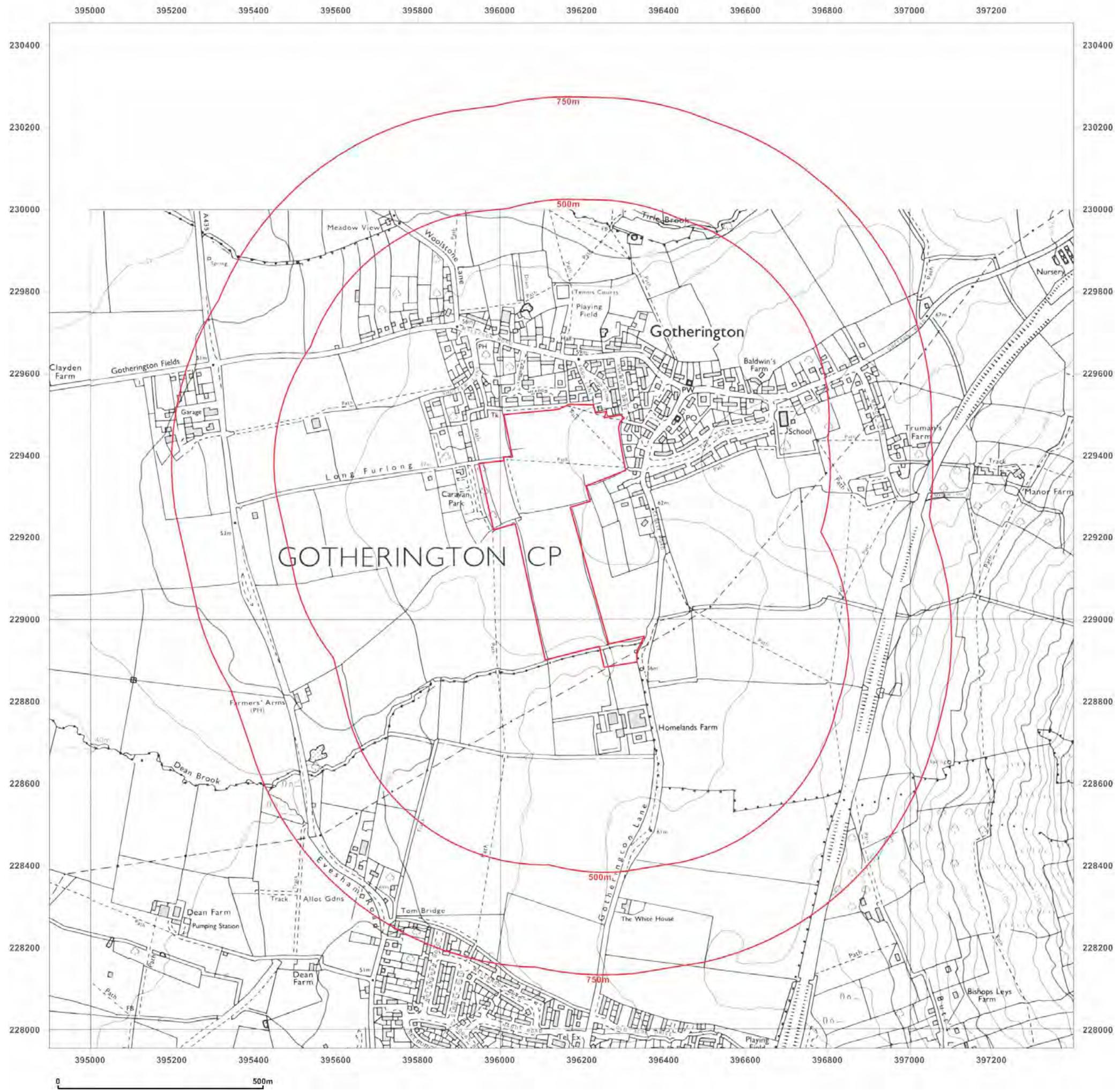
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Client Ref: 5956  
Report Ref: CMAPS-CM-461194-5956-080915HIS  
Grid Ref: 396150, 229205

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



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Client Ref: 5956  
Report Ref: CMAPS-CM-461194-5956-080915HIS  
Grid Ref: 396150, 229205

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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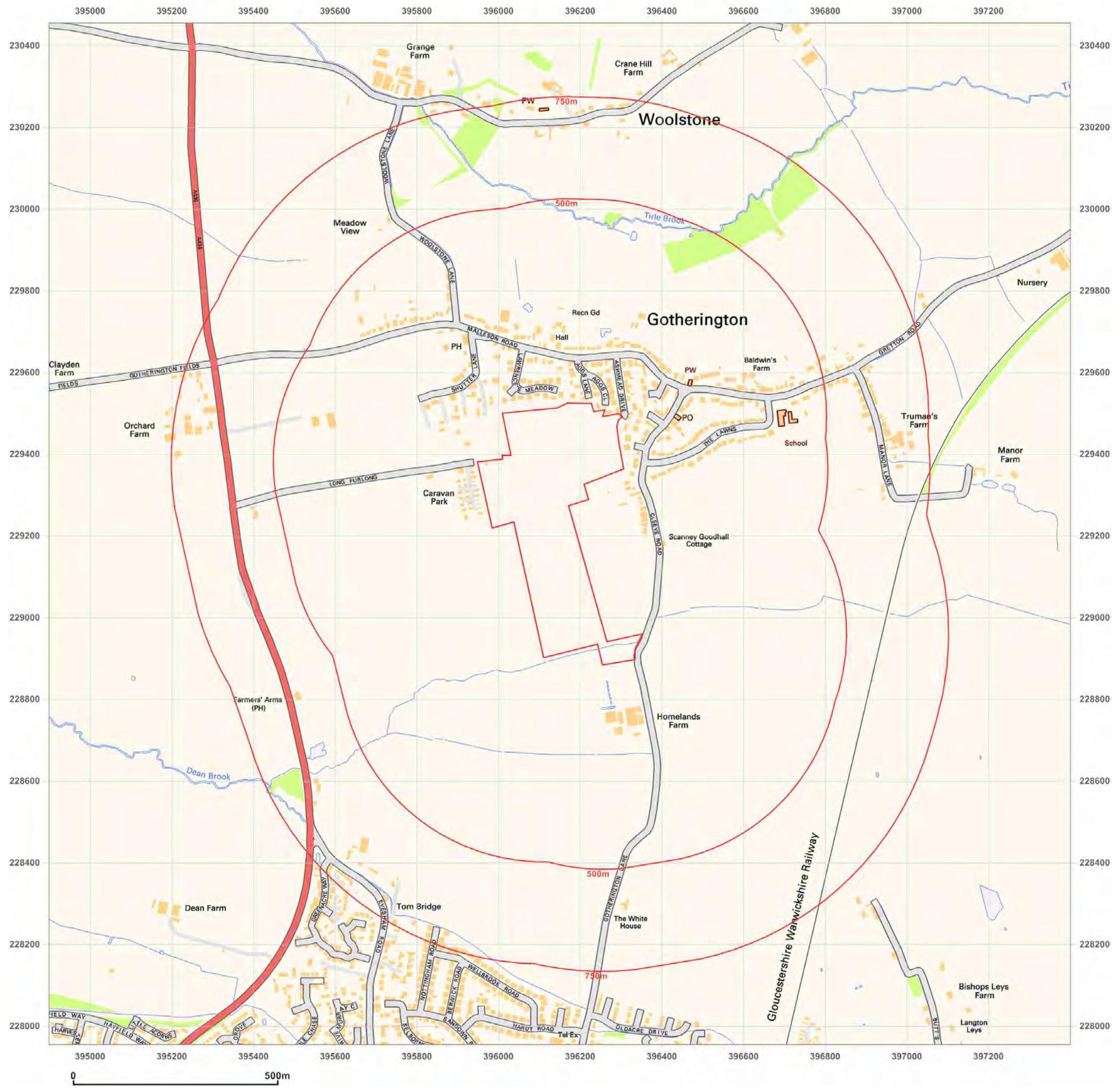
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## Site Details:

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Client Ref: 5956  
Report Ref: CMAPS-CM-461194-5956-080915HIS  
Grid Ref: 396150, 229205

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



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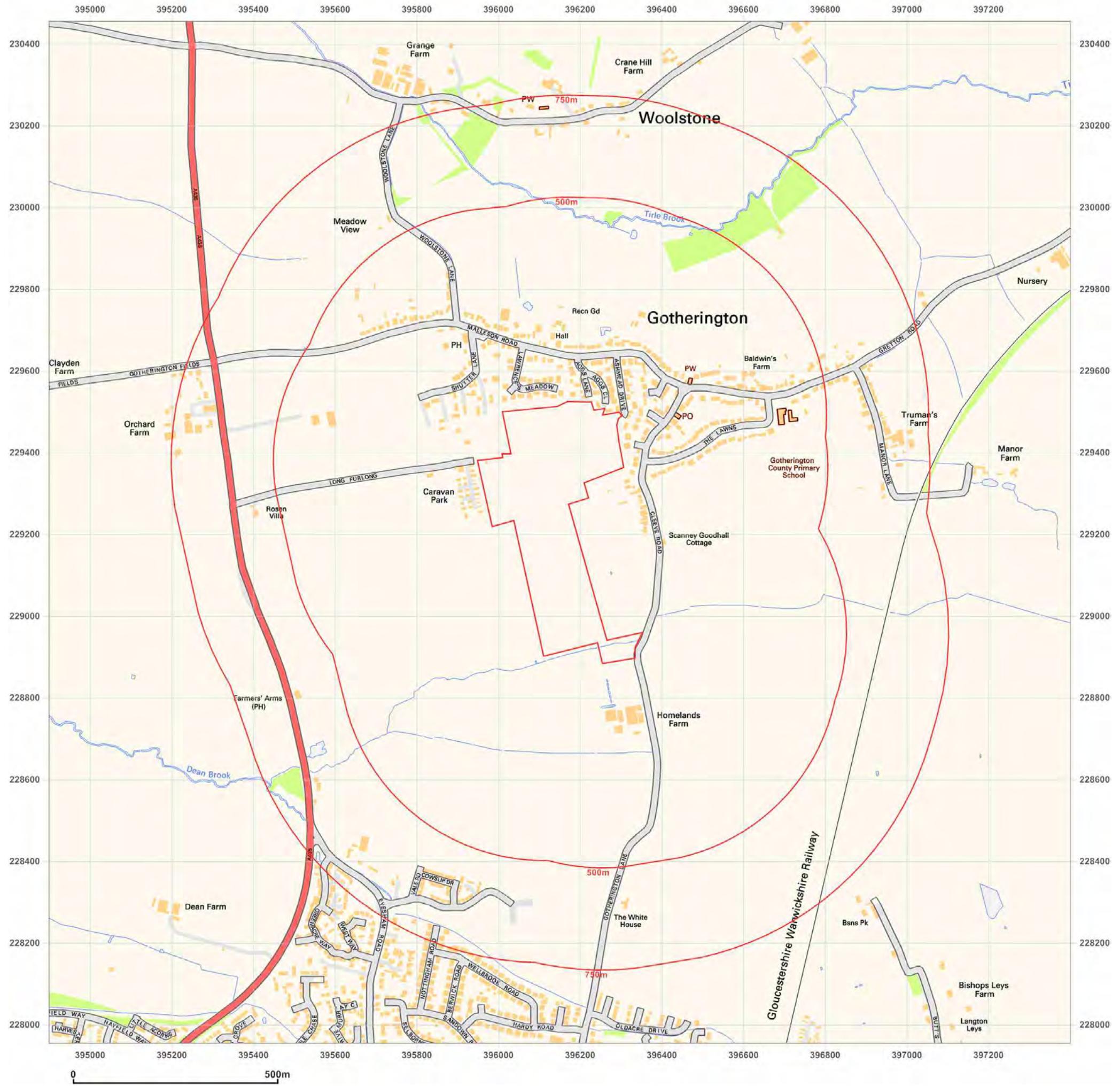
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## **Appendix D: Geotechnical Risk Register**

Title	Gotherington
Job no.	P15163

Date	20/09/2019
Revision	B



Section	Applicable	Details	Risk Rating	Constraints	Opportunities
<b>1. Scoping</b>	<input checked="" type="checkbox"/>				
1.1 Proposed Development	<input checked="" type="checkbox"/>	Construction of approximately 50 no. residential units with associated infrastructure			
1.2 Client/Developer	<input checked="" type="checkbox"/>	L&Q Estates			
1.3 Principal Contractor	<input type="checkbox"/>	TBC			
1.4 Principal Designer	<input checked="" type="checkbox"/>	Jubb Consulting Engineers Ltd			
1.5 Appraisal objectives	<input checked="" type="checkbox"/>	To assess the likely risk of a comprehensive range of geotechnical and geo-environmental constraints to development, together with the identification of any potential opportunities the site presents			
<b>2. Data Sources</b>	<input type="checkbox"/>				
2.1 Phase 1 Desk Study (PSSR)	<input type="checkbox"/>				
2.2 Phase 2 Ground Investigation Report (GIR)	<input type="checkbox"/>				
2.3 Additional GIR	<input type="checkbox"/>				
2.4 Geotechnical Design Report (GDR)	<input type="checkbox"/>				
2.5 Detailed Design	<input type="checkbox"/>				
2.5.1 Analysis	<input type="checkbox"/>				
2.5.2 Drawings	<input type="checkbox"/>				
2.5.3 Specification	<input type="checkbox"/>				
2.5.4 Design Risk Assessment	<input type="checkbox"/>				
2.5 Other Information	<input checked="" type="checkbox"/>	Groundsure Data Report & Historic Mapping			
<b>3. Published Geology</b>	<input checked="" type="checkbox"/>				
3.1 Solid Geology	<input checked="" type="checkbox"/>	BGS Sheet 217 (Moreton-in-Marsh) Solid and Drift: Charmouth Mudstone Formation - Mudstone with limestone nodules and rare thin beds of limestone	Low	Weathering could result in residual clay deposits, potentially unsuitable for shallow foundations, volume change potential, potential sulphate bearing	Potentially stiff clay, suited to low-moderate load spread foundations and bored piles
3.2 Drift	<input checked="" type="checkbox"/>	Cheltenham Sand and Gravel	Low		Sands and Gravels potentially good bearing stratum

Title	Gotherington
Job no.	P15163

Date	20/09/2019
Revision	B



Section	Applicable	Details	Risk Rating	Constraints	Opportunities
3.3 Made Ground	<input type="checkbox"/>				
<b>4. Geomorphology</b>	<input checked="" type="checkbox"/>				
4.1 Geomorphological Setting	<input checked="" type="checkbox"/>				
4.1.1 Mountains	<input type="checkbox"/>				
4.1.2 Hill Side	<input type="checkbox"/>				
4.1.3 Valley Side	<input checked="" type="checkbox"/>	Appears to be located on shallow south facing slope			
4.1.4 Fluvial	<input type="checkbox"/>				
4.1.5 Low Lying/flood plain	<input checked="" type="checkbox"/>	River Swilgate catchment - Dean Brook runs 350m from the southern part of the site	Low/Moderate		
4.1.6 Estuarine	<input type="checkbox"/>				
4.1.7 Coastal/Littoral	<input type="checkbox"/>				
4.1.8 Marine	<input type="checkbox"/>				
4.1.9 Plateau	<input type="checkbox"/>				
4.1.10 Karstic/Halite	<input type="checkbox"/>				
4.2 Slopes	<input checked="" type="checkbox"/>				
4.2.1 Aspect	<input checked="" type="checkbox"/>	Relatively level ground, small decline from North to South (approximately 3m level change to low point on site)	Low		
4.2.2 Average Slope Angle	<input checked="" type="checkbox"/>	Approximately 1:100	Low		
4.2.3 Slope Profile	<input checked="" type="checkbox"/>	Gradual	Low		
4.2.4 Terraced/Stepped Profile	<input type="checkbox"/>				
4.3 Groundwater	<input checked="" type="checkbox"/>				
4.3.1 Catchment	<input checked="" type="checkbox"/>	Site has Dean Brook to its southern extent with the primary River Swilgate to the west	Moderate	Flood risk to the west of the site	
4.3.2 Aquifer Status	<input checked="" type="checkbox"/>	Charmouth Mudstone is a Secondary (undifferentiated) Aquifer while the Cheltenham Sand and Gravels are noted to be a Secondary A Aquifer	Low		

Title	Gotherington
Job no.	P15163

Date	20/09/2019
Revision	B



Section	Applicable	Details	Risk Rating	Constraints	Opportunities
4.3.3 Surface Water	<input checked="" type="checkbox"/>	With the aquifer designations above, the Charmouth Mudstone is likely to have poor infiltration rates while the Cheltenham Sands and Gravels are likely to have good infiltration (This should be further tested through soakaways during the Phase II site investigation)	Low/Moderate		Potential for soakaways in areas where Cheltenham Sands and Gravels are Present
4.4 Geohazards	<input checked="" type="checkbox"/>				
4.4.1 Rock Mass Stability	<input type="checkbox"/>				
4.4.2 Rockfall	<input type="checkbox"/>				
4.4.3 Landslide	<input type="checkbox"/>				
4.4.4 Cambering	<input type="checkbox"/>				
4.4.5 Gullyling	<input type="checkbox"/>				
4.4.6 Debris and earth flow	<input type="checkbox"/>				
4.4.7 Rotational Slips	<input type="checkbox"/>				
4.4.8 Translational Slips	<input type="checkbox"/>				
4.4.9 Slope Creep	<input type="checkbox"/>				
4.4.10 Seismic	<input type="checkbox"/>				
4.4.11 Faulting	<input type="checkbox"/>				
4.4.12 Flooding	<input checked="" type="checkbox"/>	Not within a flood zone but there is brook running to the south of the site	Low	Potential for surface water flooding and a small amount of fluvial flooding (further assessed through FRA)	
4.4.13 Subsidence	<input checked="" type="checkbox"/>				

Title	Gotherington
Job no.	P15163

Date	20/09/2019
Revision	B



Section	Applicable	Details	Risk Rating	Constraints	Opportunities
4.4.14 Heave	<input checked="" type="checkbox"/>	Heave will depend on the composition (Plasticity and Liquid Index's) of the deposits on site. Could heave as result of soil removal during earthworks and changes to the groundwater regime during construction. It is also likely that the Cheltenham Sands and Gravels will be frost susceptible	Moderate	Potential for heaving, cracking and break-up of foundations	
4.4.15 Collapsible Ground	<input type="checkbox"/>				
4.4.16 Springs	<input type="checkbox"/>				
4.4.17 Artesian Water	<input type="checkbox"/>				
4.4.18 Scour/washout	<input type="checkbox"/>				
4.5 Anthropogenic hazards	<input type="checkbox"/>				
4.5.1 Mine Workings	<input type="checkbox"/>				
4.5.2 Shafts	<input type="checkbox"/>				
4.5.3 Adits/Level/issues	<input type="checkbox"/>				
4.5.4 Mineral extraction	<input type="checkbox"/>				
4.5.5 Contaminated land	<input checked="" type="checkbox"/>	Brief outline qualitative assessment indicates few potential sources (made ground, pesticides/herbicides, ground gas), to be confirmed by GIR	Low		
4.5.6 Climate Change	<input checked="" type="checkbox"/>	Increase in river levels associated with climate change means future potential for flooding on site (Assessed in FRA)	Low		
4.6 Vegetation	<input checked="" type="checkbox"/>				
4.6.1 Woodland	<input type="checkbox"/>				
4.6.2 Scrub	<input type="checkbox"/>				
4.6.3 Grassed/pasture	<input checked="" type="checkbox"/>	Site is currently Farmed	Low		
4.6.4 Arable	<input type="checkbox"/>				
4.6.5 Hydrophyllic	<input type="checkbox"/>				
5. Land Use	<input checked="" type="checkbox"/>				
5.1 Classification	<input type="checkbox"/>				
5.1.1 Greenfield	<input checked="" type="checkbox"/>	Farmed Pasture	Low	Minor potential for contamination identified - made ground, pesticides/herbicides, ground gas	

Title	Gotherington
Job no.	P15163

Date	20/09/2019
Revision	B



Section	Applicable	Details	Risk Rating	Constraints	Opportunities
5.1.2 Brownfield	<input type="checkbox"/>				
5.1.3 Contaminated	<input type="checkbox"/>				
5.2 Category	<input checked="" type="checkbox"/>				
5.2.1 Urban	<input type="checkbox"/>				
5.2.2 Suburban	<input type="checkbox"/>				
5.2.3 Rural	<input checked="" type="checkbox"/>				
5.2.4 Wilderness	<input type="checkbox"/>				
5.3 Historic and Current Land use	<input checked="" type="checkbox"/>				
5.3.1 Industrial	<input type="checkbox"/>				
5.3.2 Residential	<input type="checkbox"/>				
5.3.3 Commercial	<input type="checkbox"/>				
5.3.4 Agricultural	<input checked="" type="checkbox"/>	Current land use - Pasture	Low		
5.3.5 Public Utility	<input type="checkbox"/>				
5.3.6 Other	<input checked="" type="checkbox"/>	Off site historic landfill	Low	Minor potential for ground gas migration	
5.4 Proposed Development	<input type="checkbox"/>				
5.4.1 Heavy/Industrial	<input type="checkbox"/>				
5.4.2 Light/Commercial	<input type="checkbox"/>				
5.4.3 Residential	<input checked="" type="checkbox"/>	90 no. residential units	Low		
5.4.4 Civil Engineering Structures	<input type="checkbox"/>				
5.4.5 Roads/Pavements	<input checked="" type="checkbox"/>	Infrastructure associates with the development	Low		
5.4.6 Reclamation	<input type="checkbox"/>				

## **Appendix E: Risk Assessment Definitions**

## General

The following classification and definition of risk assessment has been based on that set out in NHBC and EA Publication R&D 66 – Guidance on the Safe Development of Housing on Land Affected by Contamination (2008).

The key to the classification is that the designation of risk is based upon the consideration of both:

- a) the magnitude of the potential consequence (i.e. severity), which takes into account both the potential severity of the hazard and the sensitivity of the receptor.
- b) the magnitude of probability (i.e. likelihood), which takes into account both the presence of the hazard and receptor and the integrity of the pathway.

## Classification of Consequence

Classification	Definition	Examples
<b>Severe</b>	<p>Highly elevated concentrations likely to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs.</p> <p>Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.</p> <p>Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.</p> <p>Catastrophic damage to crops, buildings or property.</p>	<p>Significant harm to humans is defined in circular 01/2006 as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions.</p> <p>Major fish kill in surface water from large spillage of contaminants from site.</p> <p>Highly elevated concentrations of List I and II substances present in groundwater close to small potable abstraction (high sensitivity).</p> <p>Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).</p>

<b>Medium</b>	<p>Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs.</p> <p>Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.</p> <p>Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.</p> <p>Significant damage to crops, buildings or property.</p>	<p>Significant harm to humans is defined in circular 01/2006 as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions.</p> <p>Damage to building rendering it unsafe to occupy e.g. foundation damage resulting in instability.</p> <p>Ingress of contaminants through plastic potable water pipes.</p>
<b>Mild</b>	<p>Exposure to human health unlikely to lead to "significant harm".</p> <p>Equivalent to EA Category 3 pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce.</p> <p>Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population.</p> <p>Minor damage to crops, buildings or property.</p>	<p>Exposure could lead to slight short-term effects (e.g. mild skin rash).</p> <p>Surface spalling of concrete.</p>
<b>Minor</b>	<p>No measurable effect on humans.</p> <p>Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.</p> <p>Repairable effects of damage to buildings, structures and services.</p>	<p>The loss of plants in a landscaping scheme.</p> <p>Discoloration of concrete.</p>

\* For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction or extensive skin ailments. Mental dysfunction is included only insofar as it is attributable to the effects of a pollutant on the body of the person concerned.

## Classification of Probability

Only applies if there is a possibility of a pollutant linkage being present.

Classification	Definition	Examples
<b>High likelihood</b>	There is pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.	<p>a) Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden.</p> <p>b) Ground/groundwater contamination could be present from chemical works, containing a number of USTs, having been in operation on the same site for over 50</p>
<b>Likely</b>	There is pollutant 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.	<p>a) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space.</p> <p>b) Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.</p>
<b>Low likelihood</b>	There is pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.	<p>a) Elevated concentrations of toxic contaminants are present in soils at depths &gt;1m in a residential garden, or 0.5-1.0m in public open space.</p> <p>b) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.</p>
<b>Unlikely</b>	There is pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.	<p>a) Elevated concentrations of toxic contaminants are present below hardstanding.</p> <p>b) Light industrial unit &lt;10 yrs old containing a double-skinned UST with annual integrity testing results available.</p>

Note: A pollution linkage must first be established before probability is classified. If there is no pollution linkage then there is no potential risk. If there is no pollution linkage then there is no need to apply tests for probability and consequence.

For example if there is surface contamination and a major aquifer is present at depth, but this major aquifer is overlain by an aquiclude of significant thickness then there is no pollution linkage and the risks to the major aquifer are not assessed. The report should identify both the source and the receptor but state that because there is no linkage there are no potential risks.

## The Classification of Risk

Probability		Consequence			
		Severe	Medium	Mild	Minor
High likelihood	Very high risk	High risk	Moderate risk	Low risk	Low risk
Likely	High risk	Moderate risk	Moderate/low risk	Low risk	Low risk
Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk	Very low risk
Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk	Very low risk

### Very High Risk

There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.

### High risk

Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.

### Moderate risk

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

### Low risk

It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.

### Very low risk

It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

### No potential risk

There is no potential risk if no pollution linkage has been established.

<b>Definitions</b>	
<b>Hazard</b>	A property or situation which in certain circumstances could lead to harm. The properties of different hazards must be assessed in relation to their potential to affect the various different receptors.

<b>Risk</b>	A combination of the probability or frequency of the occurrences of a defined hazard AND the magnitude of the consequences of that occurrence.
<b>Probability</b>	The mathematical expression of the chance of a particular event in a given period of time [e.g. probability of 0.2 is equivalent to 20% or a 1 in 5 chance].
<b>Likelihood</b>	Probability; the state or fact of being likely.
<b>Consequences</b>	The adverse effects (or harm) arising from a defined hazard which impairs the quality of the environment or human health in the short or longer term.
<b>Pollution linkage</b>	An identified pathway is capable of exposing a receptor to a contaminant and that contaminant is capable of harming the receptor.

## **Appendix F: Limitations and Exceptions**

**Limitations and Exceptions**

1. The advice given in this report is based on the guidelines available at the time of writing.
2. This investigation was conducted so as to generally comply with the relevant principles and requirements of BS10175: 2011 "Investigation of potentially contaminated sites - Code of Practice" and BS 5930: 1999 +A2:2010 "Code of Practice for Site Investigations".
3. The Client is advised that the conditions observed on site by Jubb Consulting Engineers Ltd (JCE) at the time of the investigation or assessment are subject to change. Certain indicators of the presence of hazardous substances may have been latent at the time of the most recent site reconnaissance or investigation and they may subsequently have become observable. Ground conditions, including geotechnical properties may vary between points of observation, sampling and testing.
4. Certain areas of site had restricted access or were inaccessible due to the presence of in-use buildings, facilities and live services, as identified in this report. These may require further investigation outside the scope of this present investigation.
5. Comments made relating to land gas or groundwater conditions are based on observations made at the time of an investigation unless otherwise stated. Land gas and groundwater conditions may vary as a result of seasonal or other effects.
6. Ground contamination often exists as small discrete areas of contamination and there can be no certainty that any or all such areas have been located, sampled and/or identified.
7. The findings and opinions conveyed in this report are based on information obtained from a variety of sources, including that from previous site investigations and chemical and geotechnical testing laboratories, and which JCE has assumed are correct. Nevertheless, JCE cannot and does not guarantee the authenticity or reliability of the information it has used or cited. JCE can accept no responsibility for inaccuracies within the data supplied by other parties.
8. This report is written in the context of an agreed scope of work between JCE and the Client and should not be used in a different context. In the light of additional information becoming available, improved practices and changes in legislation, amendment or re-interpretation of the assessment or report in whole or part may be necessary after its original submission.
9. This report is provided for sole use by the Client and is confidential to them. No responsibility whatsoever for the contents of the report will be accepted to anyone other than the Client.
10. This report is not a specification for works.
11. JCE believes that providing information about limitations is essential to help the Client identify and thereby manage risks.
12. JCE does not provide legal advice and the advice of the Clients' legal advisors may also be required.
13. JCE retain the copyright in this report and all drawings reproduced in it.