

**Tillbridge Solar Project**  
**EN010142**

**Volume 6**  
**Environmental Statement**  
Appendix 17-4 Ground Conditions Cable Route  
Corridor Preliminary Risk Assessment  
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Regulation 5(2)(a)  
Infrastructure Planning (Applications: Prescribed Forms and  
Procedure) Regulations 2009

April 2024  
Revision Number: 00

This report was issued with the Preliminary Environmental Information Report (PEIR) (April 2023) and uses the Scheme extents defined at that stage. Since the preparation of the PEIR, there have been minor updates to the Scheme, however, these do not impact on the conclusions of this report.

**Prepared for:**

Tillbridge Solar Ltd

**Prepared by:**

AECOM Limited

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The site reconnaissance consisted of a general external inspection of the site aimed at identifying any obvious signs of geotechnical hazards and potential sources of ground contamination affecting the site. An environmental compliance audit and/or detailed structural inspection of existing buildings were outside the project brief. Similarly, the site visit excluded detailed consideration of the ecological or archaeological aspects of the site, and if such are believed to be of potential significance then it is recommended that specialist advice is sought.

Any risks identified in this Report are perceived risks, based on the information reviewed during the desk study and therefore partially based on conjecture from available information. The study is limited by the non-intrusive nature of the work and actual risks can only be assessed following a physical investigation of the site.

The opinions expressed in this report and the comments and recommendations given are based on a desk assessment of readily available information and an initial site reconnaissance by an AECOM Engineer. At this stage intrusive investigations have yet to be undertaken at site to establish actual ground and groundwater conditions and to provide data for an assessment of the geo-environmental status of the site.

Where assessments of works or costs identified in this Report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

Reference to historical Ordnance Survey (OS) maps and/or data provides invaluable information regarding the land use history of a site. However, it should be noted that historical evidence will be incomplete for the period pre-dating the first edition and between the release of successive maps and/or data.

Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. AECOM specifically does not guarantee or warrant any estimate or projections contained in this Report.

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## 1. Executive Summary

A Stage 1, Tier 1 Preliminary Risk Assessment (PRA) of a proposed Cable Route Corridor, associated with Tillbridge Solar (the “Scheme”), has been undertaken by AECOM Limited to support a Development Consent Order (DCO).

The Site is the proposed Cable Route Corridor where the grid connection infrastructure (400 kV cables) will be routed, between the Principal Site and Cottam Power Station. This PRA does not consider the Principal Site, which has been assessed in a prior report.

The Site comprises of agricultural fields and sits across seven Water Framework Directive (WFD) surface water bodies, including Fillingham Beck, Skellingthorpe Main Drain, River Till, Tributary of Till, Marton Drain Catchment, Trent from Carlton-on-Trent to Laughton Drain and Seymour Drain Catchment.

The anticipated geology includes Quaternary deposits over sedimentary bedrock of mudstone and limestone formations. The superficial deposits are classified as Secondary A Aquifers and Secondary Undifferentiated Aquifers and the bedrock is classified as Secondary B and Secondary Undifferentiated Aquifers.

The Site passes through several areas of fluvial Flood Zone 3 associated with tributaries of the River Till; and associated with the River Trent and Skellingthorpe Main Drain water body, between Marton and Cottam Power Station.

Based on a review of historical maps, the Site was undeveloped land/agricultural fields since the earliest available historical maps (late 1800’s). Areas formerly associated with Sturgate Airfield extend across the northern edge of the Site at Cow Lane and borders the Site to the west and north. Cottam Power Station extends across the south-western edge of the Site since the 1970’s. Potential contaminative sources identified on-site also include small areas of infilled land (associated with former pits/ground working) which may have been filled with a variety of (potentially unlicensed) waste materials; railway land (Great Northern and Great Eastern Joint Railway and Leverton Branch Railway); a former hospital and pumping station. Potential sources of land contamination adjacent to the Site include (inter alia) current and historical landfill sites.

The potential risks identified have been assessed by the preliminary risk assessment as being very low to low, considering the proposed use of the Site as a Cable Route Corridor. A site walkover could not be carried out due to access constraints, and as such is recommended to further inform this PRA. It is assumed that site investigation information may be required along the cable run to inform soil disposal and the health and safety (H&S) of construction workers, and limited investigation is therefore likely to be required in the areas of potential contamination to confirm the results of this PRA.

The information collected as part of this PRA suggests that there are no significant constraints with regards to contamination of soil and groundwater that would limit the development of the Site as a Cable Route Corridor associated with a solar farm.

The regional unexploded bomb (UXB) mapping published by Zetica shows that the Site lies within a zone that experiences a low risk of UXB. However, part of the Site extends across/adjacent to areas formerly occupied by a currently operative airfield, which is considered a wartime site of interest. A Pre-desk Study Assessment from Zetica was obtained for the Principal Site and it may be considered relevant to part



of the Site, as well. The Pre-desk Study Assessment recommends that a detailed Unexploded Ordnance (UXO) Assessment is commissioned to assess, and potentially zone, the UXO hazard level at the Site, prior to the commencement of any intrusive works, due to the presence of the airfield.

## 2. Introduction

### 2.1 Terms of Appointment

On the instructions of Tillbridge Solar Limited (the Applicant), AECOM Limited (AECOM) has undertaken a Stage 1, Tier 1 Preliminary Risk Assessment (PRA) of the Cable Route Corridor associated with the Tillbridge Solar scheme (the “Scheme”).

The Scheme will comprise the construction, operation and maintenance, and decommissioning of a solar photovoltaic (PV) array electricity generating facility and energy storage facility with export connection to the National Grid.

This report covers the land associated with the Cable Route Corridor (the Site) which is outside of the Principal Site. The Site covers an area where the proposed grid connection infrastructure (400 kV cables) could be routed. The Principal Site has been assessed separately in a prior report (Ref 1 and Appendix E of the EIA Scoping Report).

A Site location map is included in Appendix A as Figure 1.

### 2.2 Report Objectives

The primary objective of this report is to determine whether potentially contaminative uses have taken place within, or in close proximity to, the Site which could have led to the contamination of underlying soils or groundwater. This report aims to identify and evaluate potential land quality risks and development constraints associated with the Scheme and to construct an initial conceptual site model (CSM) that can be used to inform future decision making and the design of future ground investigation (if needed).

This report is prepared in support of a DCO Application under the requirements of Planning Act 2008 (as amended) (Ref 2), the National Planning Policy Framework (2021) (Ref 3), and considers the potential implications of Part 2A of the Environmental Protection Act 1990 (Part 2A) (Ref 4) and the associated Contaminated Land (England) Regulations 2006 (as amended) (Ref 5).

The planning policies from relevant National Policy Statements (NPS) that have been considered in this assessment include:

- Overarching NPS for Energy (NPS EN-1) (Ref 6), with particular reference to sections 5.3 Biodiversity and Geological Conservation and 5.15 Water Quality and Resources; and
- NPS for Electricity Networks Infrastructure (NPS EN-5), (Ref 7), with particular reference to impact of electricity networks on soils and geological conservation.

This report has been prepared in general accordance with the technical guidance and procedures described in the UK Government guidance Land Contamination: Risk Management (LCRM) (2020) (Ref 8); British Standard (BS) 5930:2015+A1:2020 Code of Practice for Ground Investigations (BSI) (Ref 9) and BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites – Code of Practice (BSI) (Ref 10) to:

- Describe the geology, hydrogeology and shallow mining potential;

- Describe the environmental setting/sensitivity and current/historical land use of the Site and surrounding area;
- Summarise the findings of any historical ground investigation work (if available);
- Provide an initial CSM for the prevailing ground conditions; and
- Using the source-pathway-receptor model present a preliminary qualitative risk assessment of potential land contamination risks to human (chronic), environmental, and controlled water receptors from contamination sources on or in the vicinity of the Site.

At the time of writing a site reconnaissance visit could not be undertaken due to land access constraints.

### **2.3 Sources of Information**

This report has been prepared using a combination of published records (e.g. from the British Geological Survey (BGS), Environment Agency (EA) and Department for Environment, Food & Rural Affairs (Defra)). These include statutory records and historical mapping supplied within a Groundsure Report (February 2023) (Appendix B), split into nine smaller segments due to the size of the Site (Ref 11), published geological and hydrogeological mapping, historical borehole records. The Public Register for Determined Contaminated Land Sites (Ref 45) and List of Landfill Sites (Ref 46) available from the West Lindsey District Council have also been reviewed for any contaminated land within the Site/surrounding areas.

Specific information sources are referenced throughout the document and a bibliography is included in Section 13 of this report.

### 3. Site Setting

#### 3.1 Location

The Site is diagonally orientated north-east to south-west, south of Gainsborough and north of Lincoln. The north-eastern boundary of the Site is north of Cow Lane, east of Upton. Proceeding to the south-west, the Site runs through Willingham by Stow, Marton and Cottam, to the existing National Grid Cottam Substation, which is located at the decommissioned Cottam Power Station in Cottam, near the Nottinghamshire border. The Site is within the administrative areas of West Lindsey District Council.

#### 3.2 Description and Setting

The Site is defined by the blue area shown in Figure 1 in Appendix A. It is important to note at this stage that Figure 1 shows the maximum extent of land for the Cable Route Corridor and will be refined as the Scheme design progresses, taking into account the findings of the ongoing environmental and technical assessments, and consultation responses.

To facilitate the assessment, the Site has been divided into Sections (A – C) and Areas (1 – 9) (refer to Figure 2 in Appendix A, with extracts below):

##### Section A (north-eastern section)

Area 1 – from Cow Lane to Fillingham Lane (refer to the Groundsure Report GSIP-2023-13376-12945\_1).

Area 2 – from Fillingham Lane to Normanby Gorse (refer to the Groundsure Report GSIP-2023-13376-12945\_2).



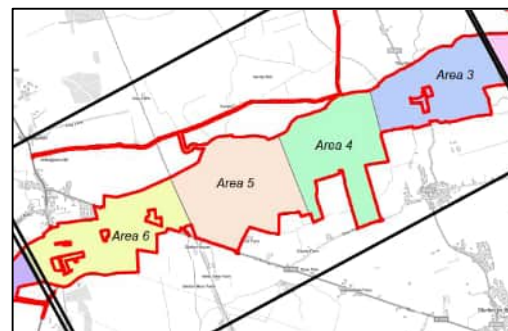
##### Section B (central section):

Area 3 – from Normanby Gorse to Marton Road (refer to the Groundsure Report GSIP-2023-13376-12945\_3).

Area 4 – from Marton Road to Highfield Farm (refer to the Groundsure Report GSIP-2023-13376-12945\_4).

Area 5 – from Highfield Farm to Great Northern & Great Eastern Joint Railway (refer to the Groundsure Report GSIP-2023-13376-12945\_5).

Area 6 – from Great Northern & Great Eastern Joint Railway to Trent Port Road (refer to the Groundsure Report GSIP-2023-13376-12945\_6).

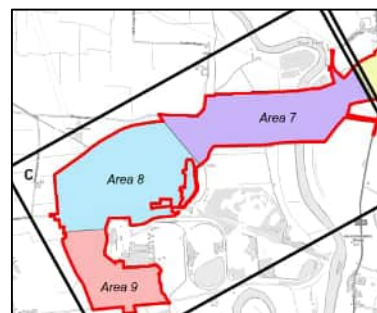


### Section C (south-western section):

Area 7 – from Trent Port Road to Headstead Bank (refer to the Groundsure Report GSIP-2023-13376-12945\_7).

Area 8 – from Headstead Bank to Cow Pasture Lane (refer to the Groundsure Report GSIP-2023-13376-12945\_8).

Area 9 – from Cow Pasture Lane to Cottam Power Station (refer to the Groundsure Report GSIP-2023-13376-12945\_9).



Section A is mainly agricultural fields under arable production with parcels of pasture, individual trees, hedgerows, areas of woodland and farm access tracks. Where there are hedgerows, these generally form the boundaries of fields as they adjoin roads. Cow Lane is included in the Site Boundary. A few small ponds are located on-site to the north of Fillingham Lane. The fields are separated by a few minor roads (Cow Lane, Kerby Road, Glentworth Road and Fillingham Lane) and tracks. There are also some agricultural buildings and dwellings close to the Site but excluded from within the Site Boundary.

Section B is similar, but it transects the following features: the River Till, the B1241 Normanby Road, a railway line (Great Northern and Great Eastern Joint Railway), the A1500 Stow Park Road and the A156 High Street. This section also includes South Lane, Fillingham Lane, Marton Road and Willington Road. Residential buildings are located along South Lane, but are excluded from the Site Boundary. Residential buildings, warehouses and offices are located along the B1241 Normanby Road, but are excluded from the Site Boundary. A solar farm is located on the Site to the north of Manor Farm and the A1500 Stow Park Road. A tributary of the River Till runs within Section B in a southerly direction, south of Fillingham Lane. A residential property (Station House) is located within the Site Boundary, in an area adjacent to the north of A1500 Till Bridge Lane and east of the Great Northern and Great Eastern Joint Railway. Miscellaneous farm / smallholding storage is shown adjacent to the east of the Great Northern and Great Eastern Joint Railway, north of A1500 Till Bridge Lane. Grange Farm Stable on A1500 Stow Park Road, Poplar Farm and residential areas on A156 High Street are excluded from the Site Boundary.

Section C runs through agricultural land as described above and the River Trent, Carr Drain and Seymour Drain all transect the Site. The Site includes Town Street, Cottam Road, Outgang Lane and a railway (Leverton Branch) connected to Cottam Power Station. The Site includes a section of Cottam Power Station.

The topography of the Site is relatively flat with existing ground levels generally between 10m and 30m Above Ordnance Datum (AOD), and gently sloping to the southwest, according to online Ordnance Survey (OS) (Ref 12). Where the Site intersects the River Trent the ground level drops to less than 10m AOD.

Relevant features immediately surrounding the Site are summarised in Table 3-1.

**Table 3-1. Features Surrounding the Site**

**Section      Feature surrounding the Site**

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Section A    **North** – Agricultural land. Areas formerly associated with Sturgate Airfield extend adjacent west and north-west of Cow Lane.  
**East** – Agricultural land and woodland. A few farms and small ponds are located within 250m of the Site to the east.  
**South** - A woodland (Normanby Gorse) is located adjacent to the south.  
**West** – Agricultural land, woodland and isolated residential properties. Farms are located adjacent to the north and south of Fillingham Lane.

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Section B    **North-west** – Agricultural fields separated by minor roads and footpaths. Farms and residential properties are located adjacent to the west of Site at various locations. Commercial and residential properties are along Marton Road and through Willingham by Stow (towards Area 1). The village of Marton is adjacent to the north-west of Section B, at its western end.  
  
**South-east** – Agricultural fields separated by minor roads and footpaths. Residential properties are located adjacent to Section B on Normanby Road. Stow Park Road borders part of Section B to the south. Solar panels are located within a field adjacent to the south of Section B, near the on-site existing solar farm. Till Bridge Lane borders part of Section B to the south. Manor farm is adjacent to the south of Section B on Till Bridge Lane. Residential and commercial properties are adjacent south of the Site adjacent to the Great Northern and Great Eastern Joint Railway.

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Section C    **North** – Agricultural land and pasture. Coates Road and Broad Lane border part of the Site to the north. A food products supplier is approximately 150m north of Section C on Coates Road.  
**South** – Agricultural land. Fleet Plantation is 70m south of Section C south of Torksey Ferry Road.  
**West** – Agricultural land. A farm (Westbrecks Farm) is located 100m west of Section C on Westbrecks Lane.  
**East** – Cottam Power Station extends on-site and off-site to the east of the southern extent of Section C.

## 4. Geological and Environmental Setting

### 4.1 Introduction

The environmental setting including the topography, geology, hydrogeology and hydrology are the key factors that influence the way in which contaminants in the soil or groundwater can be transported on-site or off-site, and also the way in which contamination can affect applicable receptors including controlled waters and users of the Site and surrounding areas.

The environmental setting of the Site has been assessed by making reference to the information sources detailed in Section 2.3.

### 4.2 Geology and Soils

#### 4.2.1 Published Geology & Exploratory Hole Records

AECOM has reviewed publicly available information. The published 1:50,000 scale geological map of the area produced by the BGS (Sheet 102, Market Rasen, 1999; and Sheet 101, East Retford, 1967) (Ref 13 and Ref 14) and the BGS Geoindex Onshore online geological mapping (Ref 15) (accessed February 2023) indicates that the Site is underlain by the geological succession summarised in Table 4-1.

**Table 4-1. Geological Succession from Published Mapping**

Age	Group or Parent	Geological Stratum	Description	Anticipated Thickness (m)	Location
<b>Superficial deposits (from east to west)</b>					
0.781 to 0.126 million years ago	Wragby Till	Till	Clayey diamicton, commonly chalky	Variable	Across most of Section A and the eastern edge of Section B; and along Willingham Road, east of the Great Northern & Great Eastern Joint Railway, in Section B.
2.588 million years ago to the present	Not available	River Terrace Deposits	Sand and gravel	Variable	Across Section A, south of South Lane.
0.86 to 0.116 million years ago	Proglacial deposits	Glaciofluvial deposits	Sand and gravel	Variable	Across the Site, to the south and east of Marton (Section B).
2.588 million years ago to the present	Fluvial deposits	Alluvium	Clay, silt, sand and gravel	Variable	Across the southern part of Section A, along the tributary of the River Till, along Fillingham Lane. Across Section B, along River Till and the tributary of River Till, south and east of Willingham by Stow;

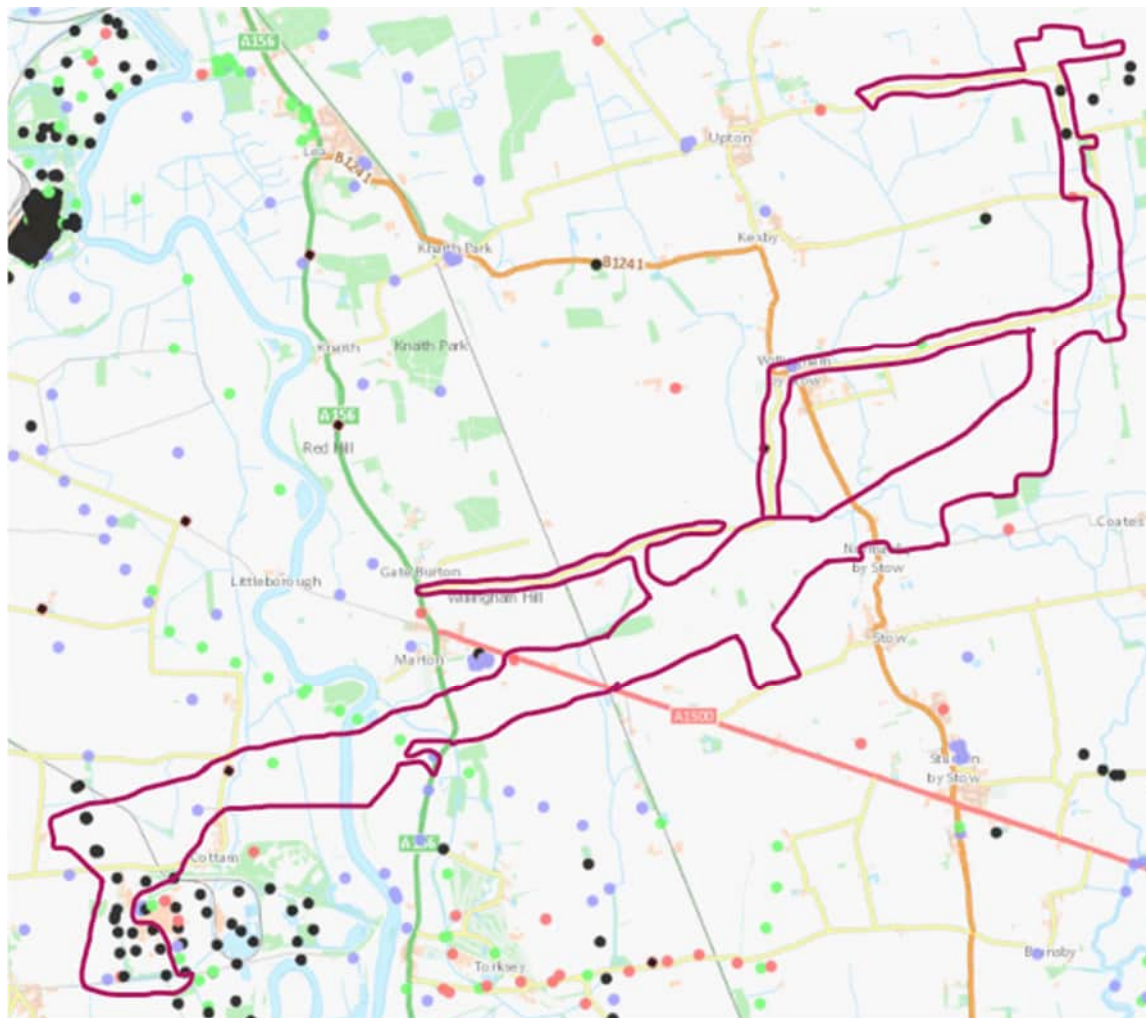
Age	Group or Parent	Geological Stratum	Description	Anticipated Thickness (m)	Location
					and around Willingham Road, east of the Great Northern & Great Eastern Joint Railway. Surrounding River Trent, in Section B and C. Along minor watercourses in Section C, and at Cottam Power Station.
0.126 to 0.0118 million years ago	Trent Valley Formation of the Trent-Witham Catchments Subgroup	Holme Pierrepont Sand and Gravel Member	Sand and gravel	Typically, up to approximately 8m in the middle Trent valley.	Across Section B, to the east and west of the Great Northern & Great Eastern Joint Railway and to the east of River Trent. Across most of Section B, at Cottam.
<b>Bedrock (from east to west)</b>					
199.3 to 182.7 million years ago	Lias Group	Charmouth Mudstone Formation (mudstone)	Mudstone	Up to approximately 335m	Eastern extent of the Site, to the east of Glentworth Road.
190.8 to 209.5 million years ago	Lias Group	Scunthorpe Mudstone Formation	Mudstone and limestone; interbedded.	Up to approximately 128m	Between the western extent of Section A (to the east of Glentworth Road) and Marton (western edge of Section B).
201.3 to 209.5 million years ago (Triassic period)	Penarth Group	NA	Mudstone	Up to approximately 12m	South of Marton (Section B).
201.3 to 241.5 million years ago (Triassic period)	Mercia Mudstone Group	NA	Mudstone	Variable (up to 1350m)	Across the western part of the Site, from west of Marton to Cottam Power Station.

Source: Geological Map BGS Sheet 102, Market Rasen, 1999. Geological Map BGS Sheet 101, East Retford, 1967. BGS Geindex Onshore online geological mapping (accessed February 2023).

The BGS maintains an archive of historical exploratory borehole records throughout the UK. AECOM has searched the database and those which are considered to provide useful information on the ground profile at the Site are highlighted as part of



the extract shown in Plate 4-1 below. There are 34 borehole records shown on the BGS geolindex viewer website across the Site. However, many of these are inaccessible to the public and hence have not been referenced in producing this report. The records (shown in black below) are confidential. Copies of these exploratory hole records are included as Appendix C and relevant information from the records are considered as part of the Preliminary Ground Model in Section 8.



Contains OS data © Crown Copyright and database right 2023

**Plate 4-1: Screenshot of exploratory borehole locations from BGS GeolIndex Viewer**

*(Site Boundary is shown in red and is approximate)*

#### 4.2.2 Soils and Soil Chemistry

Natural England reports the Agricultural Land Classification for the Site to be Grade 3 (good to moderate), though a strip of land following the River Trent is classified as Grade 4 (poor) (Ref 16). Natural England maps represent a generalised pattern of land classification grades and are not sufficiently accurate for use in the assessment of individual fields. The maps do not show the subdivisions of Grade 3 which are normally mapped by a more detailed survey.

The Groundsure Report provides the likely background of five potentially harmful elements in topsoil: arsenic, cadmium, chromium, nickel, lead and bioaccessible Lead in soil. Elevated concentrations of these PHEs can exist because of natural geological conditions or possible anthropogenic contamination. The values are

estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km<sup>2</sup> (presented in Table 4-2).

**Table 4-2. Estimated Soil Chemistry**

Potentially Harmful Element	BGS Estimated Background Soil Chemistry (mg/kg)
Arsenic	(Section A) 15
	(Section B, Areas 3, 4, 5) 15
	(Section B, Area 6) 15 and 15 - 25
	(Section C, Area 7) 15 and 15 - 25 (Section C, Areas 8 and 9) 15
Cadmium	(Section A) 1.8
	(Section B, Areas 3, 4, 5) 1.8
	(Section B, Area 6) 1.8 and 1.8 to 2.2
	(Section C, Area 7) 1.8; 1.8 - 2.2; 2.2 - 3.0 (Section C, Areas 8 and 9) 1.8
Chromium	(Section A) 20 – 40 and 60 - 90
	(Section B, Areas 3, 4, 5) 60 – 90 and 20 – 40
	(Section B, Area 6) 20 - 40; 40 – 60; 60 - 90 and 90 - 120
	(Section C, Area 7) 40 - 60; 60 - 90; 90 – 120 (Section C, Areas 8 and 9) 60 - 90; 90 – 120
Lead	(Section A) 100
	(Section B, Areas 3, 4, 5) 100
	(Section B, Area 6) 100 and 200 - 300
	(Section C, Area 7) 100; 100 - 200 and 200 – 300 (Section C, Areas 8 and 9) 100
Bioaccessible Lead	(Section A) 60
	(Section B, Areas 3, 4, 5) 60
	(Section B Area 6) 60 and 120 - 240
	(Section C Areas 7 and 8) 60; 60 - 120 and 120 – 240 (Section C Area 9) 60
Nickel	(Section A – Area 1) 15 - 30
	(Section A – Area 2) 15 and 15 - 30
	(Section B, Areas 3, 4, 5) 15 and 15 - 30
	(Section B, Areas 6) 15; 15 - 30 and 45 - 60
	(Section C, Area 7) 15 - 30; 30 - 45; 45 - 60
	(Section C, Areas 8 and 9) 15 - 30; 30 - 45

Source: Groundsure Report

#### 4.2.3 Ground Stability Records

Table 4-3 shows the variable risk of ground stability hazards across the Site, taken from the Groundsure Report (Ref 11). All hazard ratings apply to a 50m radius surrounding the Site Boundary.

**Table 4-3 Ground Stability Records**

Hazard Type	Hazard Potential
Collapsible Hazard	Very low
Compressible Hazard	Moderate
Ground Dissolution Hazard	Negligible
Landslide Hazard	Low to very low
Running Sand Hazard	Low
Shrinking or Swelling Clay Hazard	Low to very low

Source: Groundsure Reports

#### 4.2.4 Mining and Mineral Extraction

##### 4.2.4.1 Aggregate/Mineral Quarrying, Mining and Mineral Sites

The BGS geindex viewer records one hydrocarbon well labelled 'Normanby 1' (BGS borehole SK88SE12). The geindex viewer shows the well to be approximately 50m west of the Site and Marton Road (Section B), south of Willingham by Stow, however the aerial photographs in the Groundsure report and online show what may be the well in a fenced off enclosure on-site (to the south of the right angle in Marton Road). The depth of the borehole is up to 2,303m and it was drilled in 1985. The log is not available.

Table 4-4 presents the available information on mining and quarrying operations, past or present that are known to have taken place on-site and within 250m of the Site Boundary.

**Table 4-4. Quarrying (<250m of Site)**

National Grid Reference	Distance and Direction	Name	Status/ Material Quarried
489398 385012	10m north-east of the Site, on Fillingham Lane (Area 4)	Willingham Clay Pit	Ceased/ Clay and Shale
483881 381171	On-site, south of Marton (in Area 6)	Brampton Grange Sand Pit	Ceased/ Sand
481303 379334	130m east of the most southerly section of the Site (Area 9)	Cottam Power Station / desulphurisation plant	Active/ desulphogypsum
481303 379334	130m east of the most southerly section of the Site (Area 9)	Cottam Power Station / ash plant	Active/ pulverised-fuel ash
481303 379334	130m east of the most southerly section of the Site (Area 9)	Cottam Power Station / ash plant	Active/ furnace bottom ash
481303 379334	130m east of the most southerly section of the Site (Area 9)	Cottam Power Station / ash plant	Ceased/ furnace bottom ash

National Grid Reference	Distance and Direction	Name	Status/ Material Quarried
481303 379334	130m east of the most southernly section of the Site (Area 9)	Cottam Power Station / ash plant	Ceased/ pulverised-fuel ash

Source: Groundsure Reports

#### 4.2.4.2 Coal Mining

The Coal Authority's online mining checker (Ref 19) and the Groundsure Reports (Ref 11) identify the Site as not being located on a coal field or an area that has been affected by coal mining. This is supported by the Coal Authority's Interactive Map Viewer (Ref 20), which also states that no evidence of historical or current mining is present.

#### 4.2.5 Radon

The UK Health Security Agency (UKHSA) and BGS interactive map for radon (UKRadon.org) (Ref 22) indicates that most of the Site is within a low probability radon area (less than 1% of homes are estimated to be at or above the Action Level). The UKHSA interactive map indicates that a small section of the Site, north-east of Willingham by Stow where the Site is with Fillingham Lane (Area 2) is characterised by 1-3 % of homes estimated to be above the Action Level.

#### 4.2.6 Hydrogeology

##### 4.2.7 Aquifer Classification

The EA's Groundwater Protection Policy adopts aquifer designations that are consistent with the Water Framework Directive. Definitions of the various aquifer types can be found on the EA section of the gov.uk website (Ref 21). According to this system, the superficial deposits underlying the Site are classified as Secondary A Aquifers (Glaciofluvial deposits, Alluvium, River Terrace Deposits and Holme Pierrepont Sand and Gravel Member) and Secondary Undifferentiated Aquifers (Till). The solid geology of the Mercia Mudstone Group and the Scunthorpe Mudstone Formation as Secondary B Aquifers; and Charmouth Mudstone Formation and Penarth Group as Secondary Undifferentiated Aquifers.

##### 4.2.8 Groundwater Vulnerability

The EA's Simplified Groundwater Vulnerability Map in Magic (Ref 17) shows that the Site is located in an area where the groundwater vulnerability to pollution is:

- Medium (in the northern extent of Section 1, where the Site is mostly underlain by the Till; and in a small outcrop close where the Site transects the River Trent);
- Medium-high (in Section 3, from Cottam to Marton and in an elongated strip along the Great Northern and Great Eastern Joint Railway, where the Site is mostly underlain by Secondary A aquifers associated with the superficial deposits); and
- High (in Section 2, where generally the bedrock directly underlies the Site).

All associated terminology/definitions can be found on the EA section of the gov.uk website (Ref 21).

#### 4.2.8.1 Source Protection Zones and Drinking Water Safeguarding Zones for Groundwater

In terms of identifying the risk of contamination from potentially polluting activities in a given area to groundwater sources (wells, boreholes and springs) used for supplying public drinking water, the EA identifies Source Protection Zones (SPZ). These show the extent of a groundwater source catchment and are divided into three zones, which can be found on the EA section of the gov.uk website.

The Site does not lie within a SPZ (Ref 17). There are no SPZs within 1km of the Site. The closest SPZ is an area of Zone II – Outer Protection Zone, 4km east of the Site, east of the B1398 Middle Street.

The Site does not lie within any Drinking Water Safeguard Zones (for groundwater) (Ref 17).

#### 4.2.9 Licensed Groundwater Abstractions

The Groundsure Report indicates that a historical groundwater abstraction, used for boiler feed, was located at Cottam Power Station, 60m north of the western edge of the Site. The licence was expired in March 2018. An active groundwater abstraction is indicated 590m south-east of the western extent of the Site, at Rampton Quarry for mineral washing. No further licensed groundwater abstractions have been identified within 1km of the Site.

Consultation regarding records of private abstractions held by West Lindsey District Council will be provided within the water chapter of the ES.

#### 4.2.10 Risk of Flooding from Groundwater

The Groundsure Report (Ref 11) indicates that the risk of groundwater flooding occurring at the Site is generally low to negligible. Moderate to high risk is indicated at the eastern extent of the Site, along a tributary of the River Till, in the proximity of Fillingham Lane (Area 1). Moderate risk is indicated to the east of the River Trent (Area 7); to the west of Cottam (Area 8); and across part of Cottam Power Station and at the western edge of the Site (Area 9).

#### 4.2.11 Surface Water Courses and Drainage

The Site sits across seven Water Framework Directive (WFD) surface water bodies which fall equally into two WFD River Basin Districts (RBDs), the Anglian and the Humber; two WFD Management Catchments (Lower Trent and Erewash and Witham); and two operational Catchments (Trent and Tributaries and Upper Witham) (Ref 23) as shown in Table 4-5.

**Table 4-5: WFD RBD, Management and Operational Catchments, and Water bodies**

RBD	Management Catchment	Operational Catchment	Water body
Anglian	Witham	Upper Witham	Fillingham Beck – GB105030062490
			Skellingthorpe Main Drain – GB105030062390
			River Till – GB105030062500
			Tributary of Till – GB105030062480
Humber	Trent Lower and Erewash	Trent and tributaries	Marton Drain Catchment (trib of Trent) – GB104028057840

RBD	Management Catchment	Operational Catchment	Water body
			Trent from Carlton-on-Trent to Laughton Drain – GB104028058480
			Seymour Drain Catchment (trib of Trent) – GB104028058340

The Fillingham Beck – GB105030062490 water body drains a small catchment, discharging to the River Till. The water body has an overall Moderate Ecological Potential under the WFD and is designated as a heavily modified water body. The water body comprises a network of small, straightened Ordinary Watercourses that are likely to be artificial drainage ditches, or natural watercourses. The water body is failing to reach Good Ecological Potential and failing to meet Good Chemical Status. The primary watercourse crosses the Site to the north of Normanby by Stow (Section 2).

The Till – GB105030062411 is currently at Moderate Ecological Potential under the WFD and it is designated as a heavily modified water body. The water body is also failing to meet Good Chemical Status. The primary watercourse (River Till) crosses the Site at Fillingham Lane, east of Willingham by Stow; and to the east of Normanby by Stow (Section 2).

The Tributary of Till – GB105030062480 drains a small catchment area and discharges to the River Till. This water body has a Poor Ecological Status and is failing to meet Good Chemical Status. The primary watercourse of the Tributary of Till water body crosses the Site at Marton Road and north of Normanby by Stow (Section 2).

The Skellingthorpe Main Drain – GB105030062390 is a large water body, discharging to the River Trent. This water body has an overall Ecological Potential of Moderate and is designated as heavily modified. The water body is failing to meet Good Ecological Potential.

The Marton Drain Catchment (Tributary of Trent) – GB104028057840 is a small WFD water body that lies immediately adjacent to the River Trent. The water body is designated as heavily modified and is at Moderate Ecological Potential and failing to meet Good Chemical Status. The primary watercourse of this water body crosses the Site south-west of Marton.

The Trent from Carlton-on-Trent to Laughton Drain – GB104028058480 is a sizable water body. The River Trent is a very large river that supports significant industry and has historically been an important route for navigation. As such, the water body is designated artificial under the WFD and is at Moderate Ecological Potential and failing to meet Good Ecological Potential. The primary watercourse (River Trent) crosses the Site west of Marton.

The Seymour Drain Catchment (tributary of Trent) – GB104028058340 water body is designated as heavily modified and is at Moderate Ecological Potential and is failing to meet Good Chemical Status. This water body is located at the western end of the Site and the primary watercourse crosses the Site to the north-east of Cottam.

A Drinking Water Protected Area (Surface Water) is located on site, to the east of Cottam, along the River Trent (Ref 17).

#### **4.2.12 Licensed Surface Water Abstractions**

The Groundsure Report indicates that five licensed surface water abstraction entries have been identified on Site or within 250m of the Site, including an historical abstraction located in Area 7, on the tributary of River Trent; an active abstraction located 100m south of Area 6; two historical and one active water abstractions in Area 7, north of Cottam; and an active water abstraction located 20m north of Area 7. All these abstractions are for spray irrigation. There are further licensed groundwater abstractions between 250m and 1km of the Site, for spray irrigation and for mineral washing.

#### **4.2.13 Risk of Flooding from Surface Water**

The indicative floodplain map (Ref 24) for the area, published by the EA, shows that the risk of surface water flooding at the Site is generally very low (annual chance of flooding of less than 0.1%) with areas of low (chance of flooding of between 0.1% and 1%), medium (chance of flooding of between 1% and 3%) and high risk (chance of flooding of greater than 3.3%) associated with the watercourses. The Site passes through several areas of fluvial Flood Zone 3 associated with tributaries of the River Till; and associated with the River Trent and Skellingthorpe Main Drain water body, between Marton and Cottam Power Station.

## 5. Historical & Planned Development

### 5.1 Historical Ordnance Survey Mapping

Historical Ordnance Survey (OS) maps of the Site and the wider environs were provided in the Groundsure Report (scales 1:2,500, 1:10,560 and 1:10,000) and these are reviewed in this section. Table 5-1 presents a summary of the main features present on, and within approximately 250m radius of, the Site. It should be noted that only indicative map scales are provided. Where dates are stated, these refer to the dates of maps on which the features are present, have changed use or are no longer annotated, and do not necessarily refer to the exact dates of existence of a particular feature. Development that may have occurred between map editions is recorded as occurring on the later published map, hence there are some limitations to the accuracy of the date of development unless supplementary evidence is available.

**Table 5-1. Summary of Historical Mapping**

Location	Key Features on-site	Key Features off-site
Area 1 (Groundsure Report GSIP-2023-13376-12945_1)	Areas associated with Sturgate Airfield are indicated in the historical maps between 1951 and 1979, at the western end of Cow Lane.	Areas associated with Sturgate airfield are indicated in the historical maps dated between 1951 and 1979, extending to the north and north-west of the Site.
Area 2 (Groundsure Report GSIP-2023-13376-12945_2)	No features considered relevant to contaminated land.	No features considered relevant to contaminated land.
Area 3 (Groundsure Report GSIP-2023-13376-12945_3)	No features considered relevant to contaminated land.	A smithy is indicated in the historical map dated 1885, adjacent to the Site, in the area excluded from the site boundary.
Area 4 (Groundsure Report GSIP-2023-13376-12945_4)	A clay pit is shown on Marton Road to the east of Willingham by Stow, in the historical map dated 1885. A hospital is shown on Marton Road in Willingham by Stow, on the historical maps dated between 1885 and 1951.	A pump house is shown on Marton Road to the east of Willingham by Stow, on the historical map dated 1978. Sewage works and an unspecified tank are shown on Marton Road to the east of Willingham by Stow, on the historical map dated 1978. A cemetery is shown on Marton Road to the west of Willingham by Stow, on the historical maps dated between 1885 and 1978
Area 5 (Groundsure Report GSIP-2023-13376-12945_5)	Railway (on a cutting) (Great Northern and Great Eastern Joint Railway) crosses the Site at Willingham Road and between Willingham Road and A1500 Stow Park Road, since late 1800s.	A railway station is indicated adjacent to the south of the Site on the A1500 Stow Park Road, in the historical map dated between 1885 and 1951. Sidings are also shown from adjacent south of the Site on historical maps dated between 1885 and 1978.



Location	Key Features on-site	Key Features off-site
		<p>An oil depot is indicated 20m south of the Site in the historical map dated 1978, with the 2001 and 2010 maps showing a depot in the same location. A goods shed and railway buildings (including tanks) are indicated 50m south of the Site between 1885 and 1978.</p>
<p>Area 6 (Groundsure Report GSIP-2023-13376-12945_6)</p>	<p>Unspecified pits/ground working and heaps are indicated on-site to the south of Marton, adjacent to the A156 High Street.</p>	<p>A sewage farm and an unspecified tank are indicated on the historical map dated 1978, in the central part of Area 6, but excluded from the Site Boundary.</p>
<p>Area 7 (Groundsure Report GSIP-2023-13376-12945_7)</p>	<p>Marton pumping station is shown on-site, on Trent Port Road, adjacent to the east of the River Trent, on the historical maps dated between 1900 and 2010. A windmill is shown on-site, on Trent Port Road, adjacent east of the River Trent, on the historical maps dated between 1900 and 1947. Unspecified ground working are shown on-site, to the south-west of Marton, on the historical map dated 1885, and later indicated as unspecified heaps.</p>	<p>Unspecified ground working are shown adjacent to the north of the Site to the east of Headstead Bank, in the historical maps dated between 1900 and 1947 and to the south-west of Marton, on the historical map dated 1885. These are later indicated as unspecified heaps. A cemetery is located in Marton, 90m north of the Site.</p>
<p>Area 8 (Groundsure Report GSIP-2023-13376-12945_8)</p>	<p>Railway line (Leverton Branch) crosses the Site, east of Cow Pasture Lane, since 1978. A cutting is shown in the central part of the Site, adjacent to the east of the railway line, on the historical map dated 1885</p>	<p>A railway station/railway buildings and railway sidings are shown adjacent east of the Site, in Cottam, on the historical maps dated between 1884 and 1951. A sand pit is shown 20m east of the Site in Cottam in the historical map dated 1900 (no longer shown in 1916). Cottam Power Station extends from adjacent to the south of Area 8, since the 1970's, with an ash lagoon beyond. A sewage works is shown within the Power Station from 1978.</p>
<p>Area 9 (Groundsure Report GSIP-2023-13376-12945_9)</p>	<p>Unspecified heaps/ground working are shown in the western extent of Area 9 on the historical map dated 1978. Cottam Power Station extends across the eastern part of Area 9, since 1970's.</p>	<p>Cottam Power Station extends off-site to the east of Area 9 since the 1970's.</p>

## 5.2 Planning Authority Records

A search of planning application records for the Site and within 250m of the Site using the search facility on the website of West Lindsey District Council (Ref 25) has been undertaken. Table 5-2 summarises the most relevant applications (where potential impact to the ground may have been occurred) found during the search which dated back to 2010 and included Harpswell, Willingham by Stow, Stow, Marton and Cottam.

**Table 5-2. Planning Authority Record**

Decision date	Application Status	Location	Reference	Description
1 <sup>st</sup> February 2023	Granted (time limit plus conditions)	Marton – Land off Snow Park Road. Within 100m from the Site.	144697	Hybrid planning application to include outline planning application for the erection of up to 39no. dwellings with all matters reserved and change of use of agricultural land to school car park - being removal of condition 11 of planning permission 133907 granted 24 October 2017 - re: completion of first 60m of the estate road.
26 <sup>th</sup> April 2011	Granted (time limit plus conditions)	Stow – overlapping with the Site in agricultural fields between Stow and Marston (Section 2)	126864	Planning application to instal 3.2724MWh ground array of photovoltaic panels on agricultural land.
4 <sup>th</sup> December 2015	Granted without conditions	Stow – overlapping with the proposed Cable Route Corridor in agricultural fields between Stow and Marston (Section 2)	132892	Application for non-material amendment to planning permission 131968 granted 4th December 2014 regarding relocation of substation
17 <sup>th</sup> August 2021	Granted (time limit plus conditions)	Stow – overlapping with the Site on the B1241 connecting Stow to Willingham by Stow (Section 2)	143127	Description: Planning application for the installation of a ground mounted Solar PV system.
11 <sup>th</sup> November 2022	Condition discharged	Stow – overlapping with the Site on the B1241 connecting Stow to Willingham by Stow.	145615	Request for confirmation of compliance with conditions 2 (landscaping) & 3 (package treatment plant & soakaways) of planning permission
22 <sup>nd</sup> April 2015	Granted with conditions	Willingham by Stow – overlaps the Site	132326	Planning application to erect building to house vintage tractors

Decision date	Application Status	Location	Reference	Description
		in Willingham by Stow		

## 5.3 Other Relevant Site History

### 5.3.1 Sturgate Airfield

Sturgate Airfield is currently operational and located over 800m north-west of the Site (800m north-west of Cow Lane). On-line sources (Bomber County Aviation Resource website (Ref 29)) and historical maps (refer to Table 5-1) indicate that the Site (at the western end of Cow Lane – Area 1) is located within areas historically occupied by the airfield. The website indicates that the construction of the airfield started in early 1943 and the airfield opened in March 1944. Post-war, the airfield was used by the US Air Force until 1959, when it was transferred back to the RAF. Currently, most areas have returned to the original use as farmland, with only a small part of the airfield in use by civilian aircrafts.

## 5.4 Unexploded Ordnance Risk

### 5.4.1 Wartime Land-use

Based on a review of historical maps, the Site was mostly open land during wartime Britain and was undeveloped, meaning it was possible for bomb strikes to go unobserved. Part of the Site is located within/adjacent to areas formerly occupied by the Sturgate Airfield, which is considered a wartime site of interest.

### 5.4.2 Post War Development

An analysis of the post war historical map does not show visible changes on the land uses of the Site which could indicate potential aerial bombing. However, due to its rural nature, the chances of unexploded Ordnance (UXO) going unnoticed do exist. An on-line search has been undertaken for any mention of recent ordnance discovery reported at or around the Site. The search did not identify any records of ordnance in the study area.

### 5.4.3 Unexploded Ordnance Mapping

The regional unexploded bomb (UXB) mapping published by Zetica (Ref 32 and Appendix D) show that the Site lies within a zone that experiences a low risk of UXB. It is estimated that the bombing density of the area is 15 bombs or less within 1000 acres.

However, since a strategic target was present on-site and in the vicinity of the Site, a detailed Unexploded Ordnance (UXO) Assessment may need to be considered to assess, and potentially zone, the UXO hazard level at the Site, prior to the commencement of any intrusive works. a Pre-desk Study Assessment from Zetica (developed for the Principal Site) (Appendix E) recommended the commissioning of a detailed UXO Assessment, prior to the commencement of any intrusive works, due to the presence of Sturgate Airfield in the area.

#### Historical Development Key Findings:

The maps show that areas formerly associated with Sturgate Airfield, constructed in the early 1940's, extended across the north-western edge of the Site in Cow Lane, and border the

Site to the west and north. The remaining areas of the Site were undeveloped land/agricultural fields since the earliest available historical maps (late 1800's), with potential contamination sources limited to potential application of pesticides and fertilisers for agricultural purposes. Potential contaminative sources identified locally on-site may be associated with small areas of infilled land (associated with former pits/ground working) which may have been filled with a variety of (potentially unlicensed) waste materials. Great Northern and Great Eastern Joint Railway crosses the Site at Willingham Road and between Willingham Road and A1500 Stow Park Road since the late 1800s; and Leverton Branch Railway crosses the Site, east of Cowpasture Lane, since 1978. Cottam Power Station extends across the western edge of the Site, since the 1970's.

Other potential sources of land contamination located on-site include a former hospital and a pumping station. Potential sources of land contamination adjacent the Site include a former smithy, a former pump house, former sewage works and sewage farm, former railway stations and sidings, former oil depot, former goods shed and railway buildings and a cemetery. Farmland, including farm buildings and yards where fuel and agricultural materials were/are stored, are shown at various locations adjacent to the Site.

## 6. Regulated Activities and Statutory Consultation

### 6.1 Introduction

The key relevant features that characterise the Site and surrounding area are summarised in this section, along with an indication of the risk to the land quality of the Site.

Generally, any regulated activities within 250m of the Site could, depending upon their nature, represent potential off-site sources of contamination. This section indicates the activities present within 250m. The extent of this study area has been developed using professional judgement on the basis that contamination migration beyond this distance is likely to be minimal. This principle has been applied in assessing similar sites.

### 6.2 Regulated Processes / Current Industrial Land Use

Table 6-1 summarises information on regulated processes / industrial land use contained in the Groundsure Report (Ref 11). The Groundsure Report collates data from a variety of sources including the Environment Agency and the BGS.

There were no instances of the following data (within 250m of the Site) identified within the information sources reviewed:

- Current or recent petrol stations;
- Electricity cables;
- Gas pipelines;
- Site determined as Contaminated Land;
- Regulated explosive sites;
- Hazardous substance storage/usage;
- Licenced pollutant release (Part A(2)/B);
- Radioactive substance authorisations;
- Pollutant release to surface waters (red list);

- Pollutant release to public sewer;
- Pollution inventory radioactive waste.

The Contaminated Land Register (Ref 45) accessed from the West Lindsey District Council website indicates that there are currently no entries within the West Lindsey District Council area for:

- Remediation notices;
- Appeals against remediation notices;
- Remediation declarations;
- Remediation statements;
- Appeals against charging notices;
- Designation of special sites;
- Notification of claimed remediation;
- Convictions for offences under Section 78M of the Act;
- Guidance issued under Section 78V(1) of the Act; and
- Other matters prescribed by Regulations.

**Table 6-1. Summary of Regulatory Information**

Subject	Groundsure report area	Number present		Details
		On site	0-250m	
<b><u>Agency &amp; Hydrological</u></b>				
Licensed Discharges to controlled waters	Area 1	0	2	One (revoked) licenced discharge entry is listed at Upton Grange Farm, 130m south of the Site (130m south of Cow Lane) and relates to sewage discharges to an unspecified receiving water. One (revoked) licenced discharge entry is listed at Low Farm, 200m south of the Site. The effluent type is unspecified. The discharge is to land.
	Area 4	0	11	One licenced discharge entry is listed at Fillingham Lane, adjacent to the north of the Site in Willingham by Stow, and relates to sewage discharge from a pumping station. The receiving water is the River Till. The license was issued in March 1989 and remains effective. Eleven licenced discharge entries are indicated 100m north of the Site in Willingham by Stow. All relate to sewage discharge, of either storm overflow or treated effluent, into the River Till. None of the licenses were revoked before December 2009. Two of the licenses were issued in November 2009 and remain effective.
	Area 5	0	2	Two licenced discharge entries are listed at Stow Park Station, 130m south of the Site, for trade discharges of site drainage to underground strata. The first entry was issued in 1975 and revoked in

Subject	Groundsure report area	Number present		Details
		On site	0-250m	
				2012, the second was issued in 2012 and remains effective.
	Area 6	8	0	Eight licenced discharge entries are listed south of Marton, in the central part of the Site but excluded from the Site Boundary, at Marton sewage treatment works (STW). The entries are for sewage discharge of either storm overflow or treated effluent into a tributary of Marton Drain. Seven have since been revoked prior to March 2010. The final license was issued in March 2010 and remains effective.
	Area 7	0	1	One licenced discharge entry is listed at Marton dredging treatment lagoons, 220m north of the Site, for trade discharges of process effluent to the tributary of the River Trent. The license was revoked in August 2014.
	Area 8	0	4	Two licenced discharge entries are linked to Cottam STW, 60m south-east of the Site, for sewage discharges of treated effluent to land. One entry is no longer effective and was revoked in July 2012. The most recent license was awarded in 2011 and remains effective. Two licenced discharge entries are listed to Cottam Power Station for combined sewage and trade into the River Trent Seymour Drain. One was issued in 1995 and is no longer effective. The second was issued in 2017 and remains effective.
Historical Integrated Pollution Control (IPC) (IPC records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded)	Area 8	35	1	Thirty of the IPC records are operated by EDF Energy (Cottam Power) Ltd for combustion processed, within Cottam Power Station. Five of the IPC records are operated by E. ON UK Plc located on the southwest of Site, with Cottam Power Station. All are listed for combustion processes. One record is listed 230m south of the Site and was operated by EDF Energy for combustion processes.
Pollution Incidents to Controlled	Area 6	1	1	One pollution incident to controlled water is reported on-site to the north on A1500 Littleborough Lane. The incident occurred in March 2003 and relates to release of an

Subject	Groundsure report area	Number present		Details
		On site	0-250m	
Waters (EA/NRW)				unidentified oil. The incident was a Category 3 (minor) impact to water. A second pollution incident was reported 180m south of the Site, adjacent to Station House. The incident occurred in April 2003 and relates to release of an unidentified oil. The incident was a Category 3 (minor) impact to water.
Control of major Accident Hazards (COMAH)	Area 8	1	0	The historical archive of COMAH sites includes the EDF Energy (Thermal Generation) Limited, at Cottam Power Station.
List 1 Dangerous Substances	Area 8	1	0	Authorised substances associated with Cottam Power Station include mercury (other), cadmium, hexachlorocyclohexane, pentachlorophenol, aldrin, dieldrin, endrin, hexachlorobenzene, hexachlorobutadiene, 1,2-dichloroethane, trichlorobenzene, Total DDT. Status: not active.
List 2 Dangerous Substances	Area 8	1	0	Authorised substances associated with Cottam Power Station include arsenic, boron, chromium, copper, dichlorvos, lead, nickel, tributyltin, triphenyltin, vanadium, zinc, atrazine & simazine, azinphos-methyl, endosulphan, fenitrothion, malathion, trifluralin, 4-chloro-3-methyl-phenol, 2-chlorophenol, 2,4-dichloropheno. Status: active.

Source: Groundsure Reports

### 6.3 Licensed Waste Management Facilities

The Groundsure Report indicates that an active or recently closed landfill is present within 1km of the Site, adjacent to the north of Area 7, to the west of the River Trent. This landfill is operated by British Waterways Board as 'A06: Landfill taking other wastes'.

Two historical landfills are indicated within 1km of the Site. The nearest historical landfill is shown 170m east of Area 8 (and 320m south of Area 7), to the east of Cottam. The licence was issued in January 1978 to Powergen Plc, to receive industrial waste. The other historical landfill is indicated 380m south of the western part of The Site (380m south of Cottam Power Station). The licence was issued in January 1993 to Powergen Plc. Type of waste is not specified.

A licenced waste site (a lagoon) and an historical waste site (an ash processing plant) are also indicated at Cottam Power Station.

### 6.4 Sensitive Land Uses

The Site does not lie within any land-based designations, such as Sites of Special Scientific Interest (SSSI), conserved wetland sites (Ramsar sites), Special Areas of Conservation, Special Protection Areas, National Nature Reserves, Local Nature

Reserves, Designated Ancient Woodland, Forest Parks, Green Belt, Proposed Ramsar Sites, Possible Special Areas of Conservation and Potential Special Protection Areas (Ref 11). None of these sensitive land uses are located within 250m of the Site.

The Site spans across four Nitrate Vulnerable Zones (NVZ) (including Lower Witham NVZ, River Trent from Carlton-on-Trent to Laughton NVZ, Marton Drain Catchment NVZ and Seymour Drain Catchment).

Priority habitats have been identified within the Site at a few locations, including deciduous woodland, good quality semi-improved grassland, traditional orchard and coastal and floodplain grazing marsh (Ref 11).

## **6.5 Regulatory Consultation**

Liaison will be undertaken with West Lindsey District Council to obtain records of private and / or unlicensed groundwater and surface water abstractions within the study area.

## **7. Site Reconnaissance**

At the time of writing a site reconnaissance visit could not be undertaken due to land access constraints.



## 8. Preliminary Ground Model

Based on the review of published geological and hydrogeological information and a selection of historical borehole records, the ground conditions within the Site are considered to comprise the following sequence presented in Table 8-1.

**Table 8-1. Preliminary Ground Model**

<b>Geology</b>	<b>Description</b>	<b>Thickness</b> <i>(from specific BGS BH referenced)</i>	<b>Groundwater</b>
Glaciofluvial deposits (Refer to SK88SW21, located adjacent the Site, in Marton)	Sand and gravel.	1.7	Groundwater level not provided.
Alluvium (Refer to SK88SW27, located on-site, adjacent east of the River Trent)	Silty clay and clayey silt	3.96	2.74m bgl (Refer to SK88SW27, located on-site, adjacent east of the River Trent)
Holme Pierrepont Sand and Gravel Member (Refer to SK88SW27, located on-site, adjacent east of the River Trent)	Sand and gravel	3.66	Groundwater level not provided.
Lias (Refer to SK98NW4, located approximately 500m east of Area 1)	Mudstone	106.68	Groundwater level not provided.
(Likely) Mercia Mudstone Group (Refer to SK88SW27, located on-site, adjacent east of the River Trent)	Marl	Full thickness not proven	Groundwater level not provided.

### 8.1 Preliminary Gas Risk Assessment

The CLAIRE Research Bulletin RB17 A Pragmatic Approach to Ground Gas Risk Assessment 2012, describes a method of estimating the potential gas risk of a site based on the site geology and historical use. Table 8-2 presents the considerations included in the RB17 methodology together with the likely status for the Site, based upon the data collected and reviewed in the above sections of this report.

**Table 8-2. Consideration of Potential Gas Risk**

<b>Considerations from RB17</b>	<b>Applicable information for the Site</b>
If there is a credible source underlying or in the close vicinity of the site.	A registered landfill is present adjacent to the north of the Site (adjacent to the north of Area 7).

## Considerations from RB17

## Applicable information for the Site

If the site been registered as a landfill (not including general Made Ground) or whether there are mine openings nearby.	No landfill or mine entries.
If the maximum Made Ground depth is greater than 5m or there is an average depth greater than 3m.	Although the presence of Made Ground at the Site is possible, significant thickness is unlikely, based on the Site's development history.
If the Total Organic Carbon (TOC) in Made Ground exceeds 4% or 6% where the Made Ground is greater than 20 years old.	Unknown, but Made Ground likely to be thin and of low significance.
Whether radon protective measures are required.	None required.
If an off-site source is present, is there a credible pathway to the development site based on the distance, the specific ground conditions and topography, or whether there are potential effects such as rising ground water which would have the potential to force large volumes of gas from the ground in a short period.	No significant pathway identified.

## 9. Initial Conceptual Site Model

### 9.1 Introduction

This section is aimed at identifying possible risks, if any, arising from substances used or deposited on-site, or from other sources of land contamination. Both past and current potentially contaminative land uses have been considered. The aim of the initial CSM is to inform future decision making and the design of any future ground investigation (if needed).

### 9.2 Assessment Framework

The Site, in terms of potential land contamination, will be regulated by the Local Planning Authority (West Lindsey District Council), taking account of the NPPF 2021 (Ref 3), with the Environment Agency, Natural England and Historic England acting as potential statutory consultees.

Environmental liabilities can arise through provisions contained within statutory legislation including Part 2A of the Environmental Protection Act 1990 (Ref 4), the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (Ref 37), the Water Resources Act 1991 (Ref 38), the Environmental Permitting (England and Wales) Regulations 2016 and the Water Act 2003 (Ref 40).

Current industry good practice recommends that the determination of health hazards due to contaminated land is based on the principle of risk assessment, as outlined in the Statutory Guidance to Part 2A (2012) and Land Contamination Risk Management (LCRM) (Ref 8).

The “suitable for use” approach is adopted for the assessment of contaminated land where remedial measures are undertaken where unacceptable risks to human health or the environment are realised taking into account the use (or proposed use) of the land in question and the environmental setting. The proposed end-use for the Site is for grid connection infrastructure.

The risk assessment process for environmental contaminants is based on a source-pathway-receptor analysis. These terms can be defined as follows:

- **Source:** hazardous substance that has the potential to cause adverse impacts; and
- **Pathway:** route whereby a hazardous substance may come into contact with the receptor: examples include ingestion of contaminated soil and leaching of contaminants from soil into watercourses; and
- **Receptor:** target that may be affected by contamination: examples include human occupants/ users of site, water resources (surface waters or groundwater), or structures.

For a risk to be present, there must be a relevant/viable contaminant linkage; i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway.

The following sections detail the CSM which has been developed for the Site with a view to assessing the potential risks/liabilities and constraints associated with the Site in its current condition prior to any proposed development. Risks associated with the proposed development have also been assessed based on a future land use scenario as a solar farm, including any potential sources of contamination, potential

receptors and potential contaminant pathways identified during this desk-based assessment.

## 9.3 Sources of Potential Contamination

### 9.3.1 On Site

The potential for contamination has been identified on the Site. The most significant sources include the areas historically occupied by the Sturgate Airfield (north-eastern edge of the Site, in Cow Lane) and areas of Cottam Power Station (south-western edge of the Site).

Sources of potential contamination also include railway land, including Great Northern and Great Eastern Joint Railway and Leverton Branch.

Potential contaminative sources identified locally on-site may be associated with small areas of infilled land (associated with former pits/ground working) which may have been filled with a variety of (potentially unlicensed) waste materials. Other potential sources of land contamination located on-site include a former hospital and a pumping station.

Potential contaminants associated with the above sources include metals, semi-metals, asbestos, organic and inorganic compounds. In addition, there is the potential for landfill gases such as methane or carbon dioxide and leachate.

The Site is occupied by agricultural land comprising arable fields. It is considered that although chemicals such as pesticides, herbicides and insecticides may have been used on-site and in its proximity, these chemicals typically have a low residency time in soils and they degrade rapidly in compliance with the requirements for crops and grazing prior to products being used for human consumption. Therefore, agricultural uses are not considered a potential significant source of contamination.

Pollution Incidents to Controlled Waters of Category 3 – Minor Accident identified on the Site occurred 20 years ago and are therefore not considered of concern.

### 9.3.2 Off Site

The following potential sources of off-site contamination have been identified as requiring consideration:

- Registered landfill site, located adjacent north of Site (adjacent north of Area 7), to the west of the River Trent;
- Historical landfill site, located 170m east of Area 8 (and 320m south of Area 7), to the east of Cottam;
- Licenced waste site (a lagoon), an historical waste site (an ash processing plant), and sewage works within the Cottam Power Station area;
- Farm buildings and yards where fuel, and agricultural materials were/are stored, at various locations adjacent to the Site.
- Former smithy (adjacent to the Site – Area 1);
- Former pump house and former sewage works (adjacent to the Site – Area 4);
- Former railway stations and sidings (adjacent to the Site – Area 5);

- Former oil depot (20m south of the Site – Area 5);
- Former goods shed and railway buildings (50m south of the Site – Area 5);
- Former sewage farm and unspecified tank (adjacent to the Site – Area 6); and
- Two cemeteries (adjacent to the Site – Area 4; 90m north of the Site – Area 7).

## 9.4 Summary of potential sources

Table 9-1 indicates the potential contaminants that may be associated with the current land use.

**Table 9-1. Potential Sources of Contamination**

Source Reference	Location	Potential Sources	Associated Contaminants of Potential Concern (CoPC)
<b>S1</b>	On Site	Areas formerly occupied by the Sturgate Airfield	Heavy metals and inorganics (including acidic/alkaline pH, cyanide complex), oil/fuel hydrocarbons, aromatic hydrocarbons, chlorinated aliphatic hydrocarbons, Polychlorinated biphenyls (PCBs), Per-and polyfluoroalkyl substances (PFAS).
<b>S2</b>	On Site	Cottam Power Station	Metals, polyaromatic hydrocarbons (PAH), total petroleum hydrocarbon (TPH), PCB, inorganic compounds (ammonium salts, boron, hydrazine, sulphide, sulphate, phosphate, chloride), asbestos. (Ref 48)
<b>S3</b>	On Site	Current and former railway lines	Metals, TPH, PAH, semi-volatile organic compound (SVOCs), Volatile Organic Compound (VOCs), asbestos and asbestos containing materials (ACMs), sulphate. Glycols – associated with the potential use of antifreeze liquids on the rail tracks. Herbicides – typically associated with running lines. Creosote (includes phenolic compounds) – associated with running lines.
<b>S4</b>	On Site	Made Ground (associated with former pits/ground working) Former hospital and a pumping station.	Heavy metals and inorganics (including sulphate, nitrate, phosphate, ammoniacal nitrogen, acidic/alkaline pH), TPH, PAH, SVOCs, VOCs, asbestos and ACMs. Ground gases (such as methane or carbon dioxide) and leachate.
<b>S5</b>	Off Site	Farm buildings and yards where fuel and agricultural materials were/are stored.	Heavy metals and inorganics (including sulphate, nitrate, phosphate, ammoniacal nitrogen, acidic/alkaline pH), TPH, SVOCs, VOCs, asbestos ACMs, pesticides and fertilisers.
<b>S6</b>	Off Site	Current and historical landfill sites and licenced	Heavy metals and inorganics (including sulphate, nitrate, phosphate, ammoniacal nitrogen, acidic/alkaline pH), TPH, SVOCs, VOCs, asbestos, ACMs.

Source Reference	Location	Potential Sources	Associated Contaminants of Potential Concern (CoPC)
		and historical waste sites	Ground gases (such as methane or carbon dioxide) and leachate.
<b>S7</b>	Off Site	Former smithy, former pump house and former sewage works and sewage farm, former railway stations and sidings, former oil depot, former goods shed and railway buildings and unspecified tank.	Heavy metals and inorganics (including sulphate, nitrate, phosphate, ammoniacal nitrogen, acidic/alkaline pH), TPH, SVOCs, VOCs, asbestos, ACMs, pesticides and fertilisers.
<b>S8</b>	Off Site	Cemeteries	Ammoniacal nitrogen, total oxidised nitrogen (nitrate and nitrite), formaldehyde, metals, pathogens, phosphorus and calcium (Ref 49)

## 9.5 Potential Receptors

### 9.5.1 On-Site Receptors

The principal human receptors relevant to the Site are considered to be construction and maintenance workers. Exposure to other human receptors such as current and future site users is unlikely to be changed except during the cable run construction, and risks to such users are considered outside of the scope of this assessment.

The groundwater receptors include Secondary A Aquifers (glaciofluvial deposits, Alluvium, River Terrace Deposits and Holme Pierrepont Sand and Gravel Member), Secondary Undifferentiated Aquifers (Till, Charmouth Mudstone Formation and Penarth Group) and Secondary B Aquifers (Mercia Mudstone Group and the Scunthorpe Mudstone Formation).

Surface water receptors include the water bodies with the Site (Fillingham Beck, Skellingthorpe Main Drain, River Till, Tributary of Till, Marton Drain Catchment (tributary of Trent), Trent from Carlton-on-Trent to Laughton Drain, Seymour Drain Catchment (tributary of Trent)).

Exposure to property receptors such as crops, livestock and existing buildings, is unlikely to be changed except during the cable run construction, and risks to such receptors are considered outside of the scope of this assessment.

The Site does not lie within, or within 250m of, any land-based designations, such as SSSI, SAC, RAMSAR sites etc. Priority habitats, including deciduous woodland, good quality semi-improved grassland, traditional orchard and coastal and floodplain grazing marsh have been identified within the site at a few locations.

### 9.5.2 Off-Site Receptors

The principal human receptors off-site are considered to be neighbours in residential/commercial properties adjacent to the Site and the general public in the areas adjacent the Site. Property receptors (off-site) include residential and commercial buildings.

### 9.5.3 Summary of Potential Receptors

Potential receptors associated with the potential development are shown on Table 9-2.

**Table 9-2. Potential Receptors**

<b>Receptor Reference</b>	<b>Receptor</b>	<b>Description</b>
<b>R1</b>	Human Health: Acute <sup>1</sup>	Construction and maintenance workers
<b>R2</b>	Human Health:	Adjacent site users during earthworks (neighbours in residential/commercial properties adjacent to the Site and general public in the areas adjacent the Site)
<b>R3</b>	Water Environment: Aquifers	Secondary A Aquifers (glaciofluvial deposits, Alluvium, River Terrace Deposits and Holme Pierrepont Sand and Gravel Member).  Secondary Undifferentiated Aquifers (Till, Charmouth Mudstone Formation and Penarth Group).  Secondary B Aquifers (Mercia Mudstone Group and the Scunthorpe Mudstone Formation).
<b>R4</b>	Water Environment: Surface waters	Water bodies on the Site: Fillingham Beck, Skellingthorpe Main Drain River Till Tributary of River Till Marton Drain Catchment (tributary of River Trent) River Trent from Carlton-on-Trent to Laughton Drain Seymour Drain Catchment (tributary of River Trent).
<b>R5</b>	Buildings & Infrastructure: Concrete	Future proposed infrastructures (cables)
<b>R6</b>	Buildings & Infrastructure: Structures	Proposed structures

<sup>1</sup> Refers to a considerable exposure to contaminated land in a short period of time (for example during construction activities).

## 9.6 Potential Pathways

### 9.6.1 On-Site Pathways

The human health exposure pathways that are considered viable based on UK guidance (Environment Agency, Contaminated Land Exposure Model “CLEA UK”) (Ref 31) are listed below:

- Direct contact, dermal absorption or ingestion of soil.
- Inhalation of soil particulates derived from soils.
- Migration of hazardous gases/vapours via permeable strata into confined spaces (asphyxiation/ explosion).

The evaluation of exposure pathways for controlled waters receptors requires an understanding of geological and hydrogeological pathways beneath the Site. The controlled waters pathways considered viable with respect to the Site are as follows:

- Spillage/loss/run off from surface direct to receiving water.
- Leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater.
- Lateral migration in groundwater and baseflow into surface waters.

The buildings and infrastructure pathways considered viable with respect to the Site are as follows:

- Direct contact of any buried concrete within the proposed cable run with contaminated soils (i.e. hydrocarbons) and aggressive ground conditions (pH and sulphate).
- Migration of hazardous gases/vapours via permeable strata into enclosed spaces and service/utility trenches.

### 9.6.2 Summary of Potential Pathways

Potential pathways associated with the Scheme are shown in Table 9-3.

**Table 9-3. Potential Pathways**

Pathway Reference	Receptor	Description
P1	Human Health/Property: People (Human Health)	Direct Pathway: direct contact, dermal absorption or ingestion of soil.
P2	Human Health/Property: People (Human Health)	Indirect Pathway: inhalation of soil particulates or vapour derived from soils.
P3	Human Health: People (Human Health)	Indirect Pathway: migration of hazardous gases/vapours via permeable strata into confined spaces (asphyxiation/explosion)
P4	Water Environment: Groundwater	Indirect Pathway: leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater. Spillage/loss/run off from surface direct to receiving water
P5	Water Environment: Surface water	Indirect Pathway: lateral migration in groundwater and baseflow into surface waters



<b>Pathway Reference</b>	<b>Receptor</b>	<b>Description</b>
<b>P6</b>	Buildings and Infrastructure: Concrete	Direct Pathway: direct contact of buried concrete (proposed cables) with contaminated soils (i.e. hydrocarbons) and aggressive ground conditions (pH and sulphate).
<b>P7</b>	Buildings & Infrastructure: Structures	Indirect Pathway: Migration of hazardous gases/vapours via permeable strata into enclosed spaces and service/utility trenches

## 10. Environmental Risk Assessment

### 10.1 Risk Assessment Principles

Current industry good practice recommends that the determination of hazards due to contaminated land is based on the principle of risk assessment, as outlined in the Environment Agency guidance on LCRM (Ref 8).

For a risk to be present, there must be a viable contaminant linkage (at the current site condition and/or during construction and/or when the Scheme is complete and operational); i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway.

Assessments of risks associated with each of these contaminant linkages are discussed in the following sections. The methodology adopted within this Preliminary Risk Assessment does not intend to reflect the EIA Methodology, as described in PEI Report Volume I Chapter 5: Methodology.

Using criteria broadly based on those presented in in Section 6.3 of the CIRIA Report “Contaminated Land Risk Assessment: A Guide to Good Practice” (CIRIA Report C552) (Ref 34), the magnitude of the risk associated with potential contamination at the DCO Site has been assessed. To do this an estimate is made of:

- The magnitude of the potential consequence (i.e. severity); and
- The magnitude of probability (i.e. likelihood).

The severity of the risk is classified according to the criteria in Table 10-1.

### 10.2 Risk Assessment Framework

**Table 10-1. Description of Severity of Risk**

Term	Description
Severe	<ul style="list-style-type: none"> <li>– Highly elevated concentrations likely to result in significant harm to human health.</li> <li>– Catastrophic damage to crops, buildings or property (e.g. by explosion).</li> <li>– Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects of water quality.</li> <li>– Major damage to aquatic or other ecosystems.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>– Elevated concentrations which could result in significant harm to human health.</li> <li>– Significant damage to crops, buildings or property (e.g. damage to building rendering it unsafe).</li> <li>– Equivalent to EA Category 2 pollution incident including significant effect on water quality.</li> <li>– Significant damage to aquatic or other ecosystems.</li> </ul>
Mild	<ul style="list-style-type: none"> <li>– Exposure to human health unlikely to lead to significant harm.</li> <li>– Minor damage to crops, buildings or property (e.g. surface spalling to concrete).</li> <li>– Equivalent to EA Category 3 pollution incident including minimal or short-lived effect on water quality.</li> <li>– Minor or short-lived damage to aquatic or other ecosystems.</li> </ul>
Minor	<ul style="list-style-type: none"> <li>– No measurable effect on humans.</li> <li>– Repairable effects of damage to buildings, structures and services.</li> </ul>

Term	Description
	– Equivalent to insubstantial pollution incident with no observed effect on water quality of ecosystems.

The probability of the risk occurring is classified according to the criteria in Table 10-2.

**Table 10-2. Likelihood of Risk Occurrence**

Likelihood	Explanation
High	Contaminant linkage may be present that appears very likely in the short-term and risk is almost certain to occur in the long term, or there is evidence of harm to the receptor.
Likely	Contaminant linkage may be present, and it is probable that the risk will occur over the long term.
Low	Contaminant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.

An overall evaluation of the level of risk is gained from a comparison of the severity and probability, as shown in Table 10-3.

**Table 10-3. Risk based on Comparison of Likelihood and Severity**

		Severity			
		SEVERE	MEDIUM	MILD	MINOR
Likelihood	HIGH	Very High	High	Moderate	Low
	LIKELY	High	Moderate	Moderate/Low	Low
	LOW	Moderate	Moderate/Low	Low	Very Low
	UNLIKELY	Moderate/Low	Low	Very Low	Very Low

### 10.3 Preliminary Risk Assessment

A CSM illustrating plausible contaminant linkages has been formulated for the Site. The qualitative PRA of the possible linkages of the above sources (S1 to S8), transport pathways (P1 to P7) and receptors (R1 to R6) is provided in the Table 10-4.

The level of risk is determined based on the current condition of the Site (i.e. the effects of mitigation measures are not included).

The preliminary risk assessment undertaken within this section does not consider acute<sup>2</sup> linkages for construction and maintenance workers. It is anticipated that these acute linkages will be managed by appropriate health and safety measures. As construction workers are protected under existing health and safety legislation, any potential effects are considered to be temporary and will be avoided, prevented and reduced through the implementation of standard mitigation measures to be incorporated into a CEMP. Work will be undertaken in accordance with relevant Construction Design Management (CDM) Regulations 2015 (Ref 42).

<sup>2</sup> Refers to a considerable exposure to contaminated land in a short period of time (for example during construction activities).

**Table 10-4. Potential Sources, Pathways and Receptors**

<b>Source</b>	<b>Pathway</b>	<b>Receptor</b>	<b>Potential Severity</b>	<b>Likelihood of Occurrence</b>	<b>Potential Risk</b>	<b>Justification</b>
<b>S1:</b> Areas formerly occupied by the Sturgate Airfield  Heavy metals and inorganics (including acidic/alkaline pH, cyanide complex), oil/fuel hydrocarbons, aromatic hydrocarbons, chlorinated aliphatic hydrocarbons, PCBs, PFAS.	P4: Leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater	R3: Aquifers	Minor	Unlikely	Very Low	The area of the former Sturgate Airfield is underlain by Secondary Undifferentiated Aquifer of the Till. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the Site as a Cable Route Corridor. The risk of harm to groundwater from leaching of contaminants is considered very low.
	P5: Lateral migration in groundwater and baseflow into surface waters	R4: Surface waters	Minor	Unlikely	Very Low	A stream is located adjacent north of Cow Lane, within areas formerly occupied by the Sturgate Airfield. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the Site as a cable corridor. The risk of harm to surface waters from lateral migration in groundwater and baseflow into surface waters is very low.
	P6: Direct contact of buried concrete with contaminated soils (i.e. hydrocarbons) and aggressive	R5: Buildings and Infrastructure: Concrete (cables)	Minor	Unlikely	Very Low	Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the Site as a Cable Route Corridor. Potential risk from direct contact with contaminated soils for buried concrete and infrastructure (cables) is considered very low.

<b>Source</b>	<b>Pathway</b>	<b>Receptor</b>	<b>Potential Severity</b>	<b>Likelihood of Occurrence</b>	<b>Potential Risk</b>	<b>Justification</b>
	ground conditions (pH and sulphate).					
	P7: Migration of hazardous gases/vapours via permeable strata into enclosed spaces and service/utility trenches	R6: Buildings and Infrastructure: Structures	Minor	Unlikely	Very Low	Risk from ground gas may be present during construction only, within service/utility trenches and buildings located adjacent the construction area.
<b>S2: Cottam Power Station</b>	P4: Leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater	R3: Aquifers	Medium	Unlikely	Low	The area of the Cottam Power Station is underlain by Secondary A Aquifers of the Alluvium and Holme Pierrepont Sand and Gravel Member. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the Site as a Cable Route Corridor. The risk of harm to groundwater from leaching of contaminants is considered low.
Metals, PAH), TPH, PCB, inorganic compound (ammonium salts, boron, hydrazine, sulphide, sulphate, phosphate, chloride), sulphuric, hydrochloric, asbestos	P5: Lateral migration in groundwater	R4: Surface waters	Medium	Unlikely	Low	Seymour Drain (a tributary of the River Trent) borders the Site to the south, at the location of Cottam Power Station. Contaminant linkage may

<i>Source</i>	<i>Pathway</i>	<i>Receptor</i>	<i>Potential Severity</i>	<i>Likelihood of Occurrence</i>	<i>Potential Risk</i>	<i>Justification</i>
	and baseflow into surface waters					be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the Site as a Cable Route Corridor. The risk of harm to surface waters from lateral migration in groundwater and baseflow into surface waters is considered low.
	P6: Direct contact of buried concrete with contaminated soils (i.e. hydrocarbons) and aggressive ground conditions (pH and sulphate).	R5: Buildings and Infrastructure : Concrete (cables)	Minor	Low	Very low	Contaminant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.
	P7: Migration of hazardous gases/vapours via permeable strata into enclosed spaces and service/utility trenches	R6: Buildings and Infrastructure : Structures	Minor	Low	Very low	Contaminant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so. Risk from ground gas may be present during construction within service/utility trenches and buildings located adjacent the construction area.

<b>Source</b>	<b>Pathway</b>	<b>Receptor</b>	<b>Potential Severity</b>	<b>Likelihood of Occurrence</b>	<b>Potential Risk</b>	<b>Justification</b>
<b>S3:</b> Current and former railway lines  Metals, TPH, PAH, SVOCs, VOCs, asbestos and ACMs, sulphate. Glycols. Herbicides. Creosote (includes phenolic compounds).	P4: Leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater	R3: Aquifers	Medium	Unlikely	Low	The areas of the current and former railway lines are underlain by Secondary A Aquifers of the Alluvium or Holme Pierrepont Sand and Gravel Member. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the Site as a Cable Route Corridor.
	P5: Lateral migration in groundwater and baseflow into surface waters	R4: Surface waters	Minor	Unlikely	Very low	Streams associated with the Seymour Drain water body border the Leverton Branch on-site, across the western extent of the Site. A stream associated with the Skellingthorpe Main Drain Water Body borders the Great Northern and Great Eastern Joint Railway on-site. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the Site as a Cable Route Corridor.
	P6: Direct contact of buried concrete with contaminated soils (i.e. hydrocarbons)	R5: Buildings and Infrastructure : Concrete (cables)	Minor	Low	Very low	Contaminant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.

Source	Pathway	Receptor	Potential Severity	Likelihood of Occurrence	Potential Risk	Justification
	and aggressive ground conditions (pH and sulphate).					
	P7: Migration of hazardous gases/vapours via permeable strata into enclosed spaces and service/utility trenches	R6: Buildings and Infrastructure : Structures	Minor	Low	Very low	Contaminant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so. Risk from ground gas may be present during construction only, within service/utility trenches and buildings located adjacent the construction area.
<b>S4:</b> Made Ground (associated with former pits/ground working). Former hospital and a pumping station.	P4: Leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater	R3: Aquifers ( <i>Secondary A</i> )	Medium to	Unlikely	Low	Contaminant hotspot and Made Ground may be associated with former pits/ground working, former hospital and pumping station.
Heavy metals and inorganics (including sulphate, nitrate, phosphate, ammoniacal nitrogen, acidic/alkaline pH), TPH, SVOCs, VOCs, asbestos, ACMs, pesticides and fertilisers.		R3: Aquifers ( <i>Secondary B and Undifferentiated</i> )	Minor	Unlikely	Very low	The risk of harm to groundwater from leaching of contaminants is considered between low (for Secondary A Aquifers) and very low (for Secondary B and Undifferentiated Aquifers).
Ground gases (such as methane or carbon dioxide) and leachate.	P5: Lateral migration in groundwater and baseflow	R4: Surface waters	Medium to minor	Unlikely	Low to very low	Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the Site as a Cable Route Corridor.



<i>Source</i>	<i>Pathway</i>	<i>Receptor</i>	<i>Potential Severity</i>	<i>Likelihood of Occurrence</i>	<i>Potential Risk</i>	<i>Justification</i>
	into surface waters					The risk of harm to surface waters from lateral migration in groundwater and baseflow into surface waters is considered low to very low.
	P6: Direct contact of buried concrete with contaminated soils (i.e. hydrocarbons) and aggressive ground conditions (pH and sulphate).	R5: Buildings and Infrastructure : Concrete (cables)	Minor	Low	Very low	Contaminant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.
	P7: Migration of hazardous gases/vapours via permeable strata into enclosed spaces and service/utility trenches	R6: Buildings and Infrastructure : Structures	Minor	Low	Very low	Contaminant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so. Risk from ground gas may be present during construction only, within service/utility trenches and buildings located adjacent the construction area.

Source	Pathway	Receptor	Potential Severity	Likelihood of Occurrence	Potential Risk	Justification
<p><b>S5:</b> Off-site farm buildings and yards where fuel and agricultural materials were/are stored. Heavy metals and inorganics (including sulphate, nitrate, phosphate, ammoniacal nitrogen, acidic/alkaline pH), TPH, SVOCs, VOCs, asbestos, ACMs, pesticides and fertilisers.</p>	<p>P4: Leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater</p>	<p>R3: Aquifers (Secondary A)</p>	<p>Medium</p>	<p>Unlikely</p>	<p>Low</p>	<p>Several areas of potentially contaminated land have been identified adjacent to the Site, including landfill sites, sewage works and cemeteries. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the Site as a Cable Route Corridor.</p> <p>The risk of harm to groundwater from leaching of contaminants is considered between low (for Secondary A Aquifers) and very low (for Secondary B and Undifferentiated Aquifers).</p>
<p><b>S6:</b> Off-site current and historical landfill sites and licenced and historical waste sites. Heavy metals and inorganics (including sulphate, nitrate, phosphate, ammoniacal nitrogen, acidic/alkaline pH), TPH, SVOCs, VOCs, asbestos, ACMs. Ground gases (such as methane or carbon dioxide) and leachate.</p>		<p>R3: Aquifers (Secondary B and Undifferentiated)</p>	<p>Minor</p>	<p>Unlikely</p>	<p>Very low</p>	
<p><b>S7:</b> Off-site former smithy, former pump house and former sewage works and sewage farm, former railway stations and sidings, former oil depot, former goods shed and railway buildings and unspecified tank. Heavy metals and inorganics (including sulphate, nitrate, phosphate,</p>						

<i>Source</i>	<i>Pathway</i>	<i>Receptor</i>	<i>Potential Severity</i>	<i>Likelihood of Occurrence</i>	<i>Potential Risk</i>	<i>Justification</i>
<p>ammoniacal nitrogen, acidic/alkaline pH), TPH, SVOCs, VOCs, asbestos, ACMs, pesticides and fertilisers.</p> <p><b>S8:</b> Off-site cemeteries.            Ammoniacal nitrogen, total oxidised nitrogen (nitrate and nitrite), formaldehyde, metals, pathogens, phosphorus and calcium.</p>						

## 10.4 Environmental Design and Management

A number of environmental mitigation measures are expected to be employed as standard to minimise impacts to both human health and controlled waters from the Scheme. The mitigation measures are anticipated to be implemented in order to avoid, prevent, reduce or offset the following potential impacts:

- Human exposure through direct contact / inhalation / dermal uptake of contaminants;
- Creation of preferential pathways and mobilisation of contamination;
- Contamination of natural soils, driving of contamination into an aquifer during piling, contamination of groundwater with concrete, paste or grout;
- Pollution and degradation of water quality of any underlying aquifer;
- Infiltration and / or run off into the local drainage / sewerage network – pollution of drainage and sewerage network and any adjacent surface water features;
- Run-off and infiltration of contaminants from material stockpiles;
- Contamination of drainage and sewerage network and / or groundwater; and
- Spread of nuisance dusts and soils to the wider environment and local roads.

A Framework Construction Environmental Management Plan (CEMP) has been developed as part of the Preliminary Environmental Information ('PEI') Report for the Scheme (refer to PEI Report Volume II Appendix 3-1). A detailed CEMP will be produced for the Scheme following the appointment of the contractor in accordance with a Requirement of the DCO, prior to commencing construction.

Table 10-5 lists the standard or tertiary mitigation measures, defined by IEMA (Ref 44) which are considered to be standard measures that form part of the general environmental management of the Scheme.

The assessment of potential effects set out in the following sections takes into account that these measures will be implemented.

**Table 10-5. Construction Standard or Tertiary Environmental Mitigation Measures**

Potential Impact	Mitigation / Enhancement Measure
Potential for risks to human health associated with waste generation, land contamination, airborne contamination and groundwater contamination. The discovery of ground contamination during groundworks. Levelling of the Site including the possible introduction of new fill materials.	Ground investigation works (if required) will be undertaken prior to commencing construction. Results would be reviewed by the appointed contractor, including any additional investigation or mitigation measures beyond the impact avoidance measures stated here. Best practice avoidance and mitigation measures proposed include: <ul style="list-style-type: none"> <li>• All workers would be required to wear Personal Protective Equipment (PPE) such as dust masks as applicable;</li> <li>• Containment measures would be implemented, including drip trays, bunding or double-skinned tanks of fuels and oils; all chemicals would be stored in accordance with their COSHH guidelines, whilst spill kits would be provided in areas of fuel/oil storage;</li> </ul>

## Potential Impact

## Mitigation / Enhancement Measure

- All plant and machinery would be kept away from surface water bodies wherever possible, checked regularly and, where necessary, the use of drip trays would be employed. Refuelling and delivery areas would be located away from surface water drains;
- An emergency spillage action plan will be produced, which staff would have read and understood, and provisions made to contain any leak/spill;
- Should any potentially contaminated ground, including isolated 'hotspots' of contamination and/or potential deposits of asbestos containing materials (ACM), be encountered, the contractor would be required to investigate the areas and assess the need for containment or disposal of the material. The contractor would also be required to assess whether any additional health and safety measures are required;
- To further minimise the risks of contaminants being transferred and contaminating other soils or water, construction workers would be briefed as to the possibility of the presence of such materials;
- In the event that contamination is identified, appropriate remediation measures would be taken to protect construction workers, future site users, water resources, structures and services;
- The contractor would be required to place arisings and temporary stockpiles away from watercourses and drainage systems, whilst surface water would be directed away from stockpiles to prevent erosion;
- The risk to surface water and groundwater from run-off from any contaminated stockpiles during construction works would be reduced by implementing suitable measures to minimise rainwater infiltration and/or capture runoff and leachates, through use of bunding and/or temporary drainage systems. These mitigation measures would be designed in line with current good practice, follow appropriate guidelines and all relevant licences/permits;
- The contractor would ensure that all material is suitable for its proposed use and would not result in an increase in contamination-related risks on identified receptors, including any landscaped areas and underlying groundwater;
- Any waters removed from excavations by dewatering would be discharged appropriately, subject to the relevant permits being obtained from the Environment Agency;

## Potential Impact

## Mitigation / Enhancement Measure

- The contractor will implement a dust suppression/management system in order to control the potential risk from airborne contamination migrating off-site to adjacent sites; and
- Piling design and construction works will be completed following the preparation of a piling risk assessment

### 10.5 Discussion of Acute Risk to Future Construction Workers & Off-Site Receptors.

The proposed works will be undertaken in compliance with Construction Design and Management (CDM) 2015 Regulations (Ref 42).

Prior to work commencing, a health and safety risk assessment should be undertaken by the appointed principal contractor and developed in accordance with current health and safety regulations. This assessment should cover potential risks to construction staff, permanent site staff and the local population. Based on the findings of this risk assessment, appropriate mitigation measures should be implemented during the construction period. These mitigation measures, defined by IEMA (Ref 44) are considered to be standard measures that form part of the general environmental management of the Scheme, and are integrated within the CEMP (refer to Table 10-5).

The greatest potential for generation of dust will be during the construction phase. Dust generation should be kept to a minimum in accordance with general industry good practice, as outlined in, for example, 'Environmental Good Practice on Site Guide', CIRIA Publication C741 (Ref 34) (refer to Table 10-5).

The risk to construction workers during the site preparation and construction phases in terms of potential exposure to high concentrations of contaminants is considered to be low given the historic and current land uses identified at the Site. Should gross contamination be identified during the construction phase, then this may pose a potential acute risk to construction works. It is likely that the risks to construction workers can be effectively managed through good health and safety practices and protocols. Adoption of appropriate dust suppression techniques would also mitigate the degree of potential particulate migration off-site; these will be included within the CEMP for the Scheme.

### 10.6 Decommissioning

Potential impacts from the decommissioning of the Site are similar in nature to those during construction, as some ground work would be required to remove infrastructure installed. A detailed Decommissioning Environmental Management Plan will be prepared to identify required measures to prevent pollution during this phase of the development.

As a result, it is considered the decommissioning impacts and effects would mirror those of the construction phase. Standard mitigation measures (refer to Table 10-5) are expected to be applied during decommissioning.

## 11. Conclusions

The potential risks that have been identified from contaminated land have been assessed by the preliminary risk assessment as being very low to low.

A number of environmental design and management measures will be employed as standard best practice to minimise impacts to both human health and controlled waters during the construction and decommissioning phases of the Scheme. These will be incorporated into the Framework CEMP which will be provided alongside the ES as part of the DCO application.

The information collected as part of this PRA suggests that there are no significant constraints with regards to contamination of soil and groundwater that would limit the development of the Site as a Cable Route Corridor.

## 12. Recommendations

A detailed unexploded ordnance (UXO) assessment may need to be considered prior to the commencement of any intrusive works. While it is acknowledged that the UXB mapping published by Zetica shows that the Site is characterised by a low risk of UXB, part of the Site lies across / borders areas formerly occupied by the Sturgate airfield, which is considered a wartime site of interest.

A Site reconnaissance or non-intrusive walkover survey to visually identify the range of activities undertaken on the Site, and any obvious potential sources of ground contamination was unable to be carried out due to access constraints. A Site reconnaissance would normally be carried out as part of a Phase 1 PRA. It is recommended that a Site reconnaissance is carried out to further refine this PRA.

It is assumed that information may be required along the Cable Route Corridor to inform soil disposal and H&S of construction workers, and limited investigation is therefore likely to be required in the following areas (where features are off-site, the investigation locations will be on-site but adjacent/around the feature):

- Areas historically occupied by the Sturgate airfield (north-eastern edge of the Site);
- Areas within the Cottam Power Station (south-western edge of the Site);
- Areas of infilled land (associated with former on-site pits/ground working);
- Railway land, including Great Northern & Great Eastern Joint Railway (which crosses the Site at Willingham Road and between Willingham Road and A1500 Stow Park Road) and Leverton Branch (which crosses the Site, east of Cowpasture Lane, in the western part of the Site);
- On-site areas of former hospital and pumping station;
- Near to the registered landfill site, (adjacent north of Area 7), to the west of the River Trent;
- Near to the historical landfill site, located 170m east of Area 8, to the east of Cottam;

- Near the farm buildings and yards where fuel, and agricultural materials were/are stored, at various locations adjacent to the Site;
- Near the former smithy (adjacent to the Site – Area 1);
- Near the former pump house and former sewage works (adjacent to the Site – Area 4);
- Near the former railway stations and sidings (adjacent to the Site – Area 5);
- Near the former oil depot (20m south of the Site – Area 5);
- Near the former goods shed and railway buildings (50m south of the Site – Area 5);
- Near the former sewage farm and unspecified tank (adjacent to the Site – Area 6); and
- Near the cemeteries (adjacent to the Site – Area 4; 90m north of the Site – Area 7).

If investigation is required the results of the investigation can be used to refine the findings of this PRA, allow for any recommendations for further works, and allow for appropriate treatment and disposal of any contaminated soils to an appropriate facility, during the construction works.



## 13. References

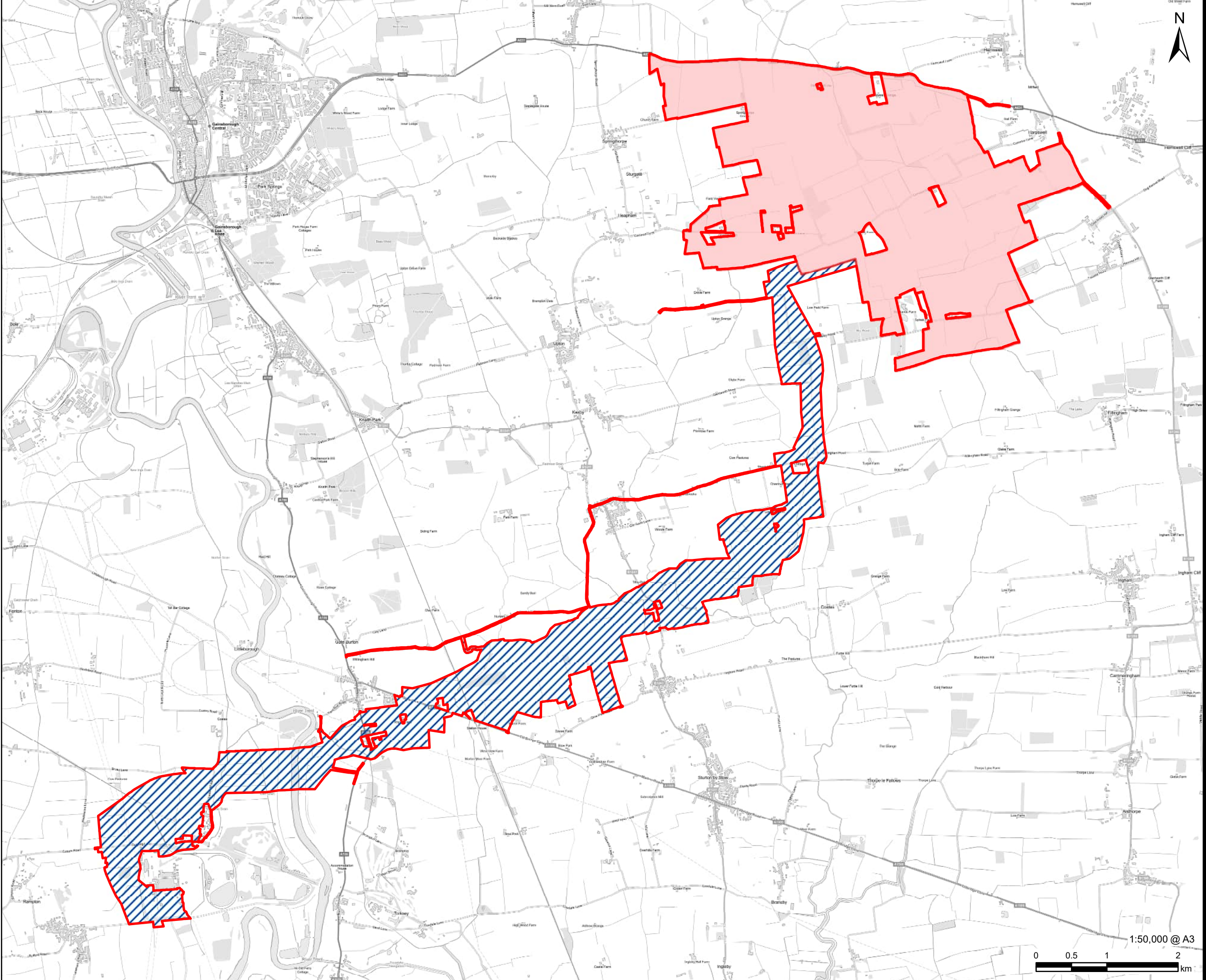
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## Appendix A Figures

Revision: 0 Drawn: LL Checked: MV Approved: ST Date: 2023-04-04  
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**AECOM**  
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Tillbridge Solar Project

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LEGEND  
[Red Outline] Scheme Boundary  
[Light Red Fill] Principal Site Boundary  
[Blue Hatched] Cable Route Boundary

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ISSUE PURPOSE  
PEI Report

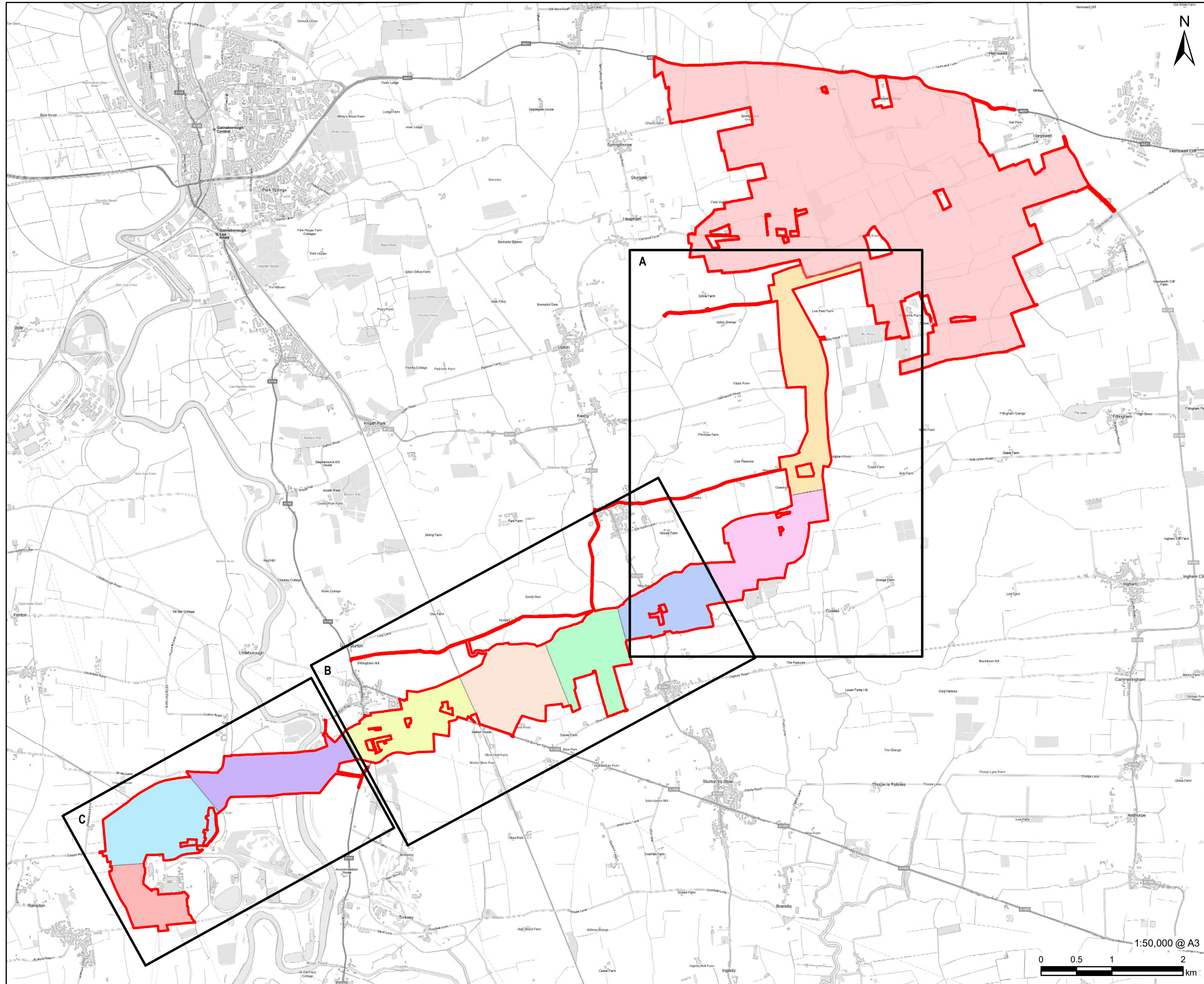
PROJECT NUMBER  
60677969

FIGURE TITLE  
Scheme Location

FIGURE NUMBER  
Figure 1

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**PROJECT**  
Tillbridge Solar Project

**CLIENT**  
Tillbridge Solar Ltd

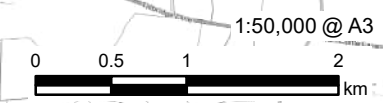
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- LEGEND**
- Scheme Boundary
  - Principal Site Boundary
  - Site Setting Boundary**
  - Area 1
  - Area 2
  - Area 3
  - Area 4
  - Area 5
  - Area 6
  - Area 7
  - Area 8
  - Area 9

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**ISSUE PURPOSE**  
PEI Report  
**PROJECT NUMBER**  
60677969  
**FIGURE TITLE**  
Site Setting

**FIGURE NUMBER**  
Figure 2



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## **Appendix B Groundsure Report Extracts**

*(Full Groundsure Enviro+Geo Insight Report to go with the figures contained in Appendix B and Historical maps are available on request)*

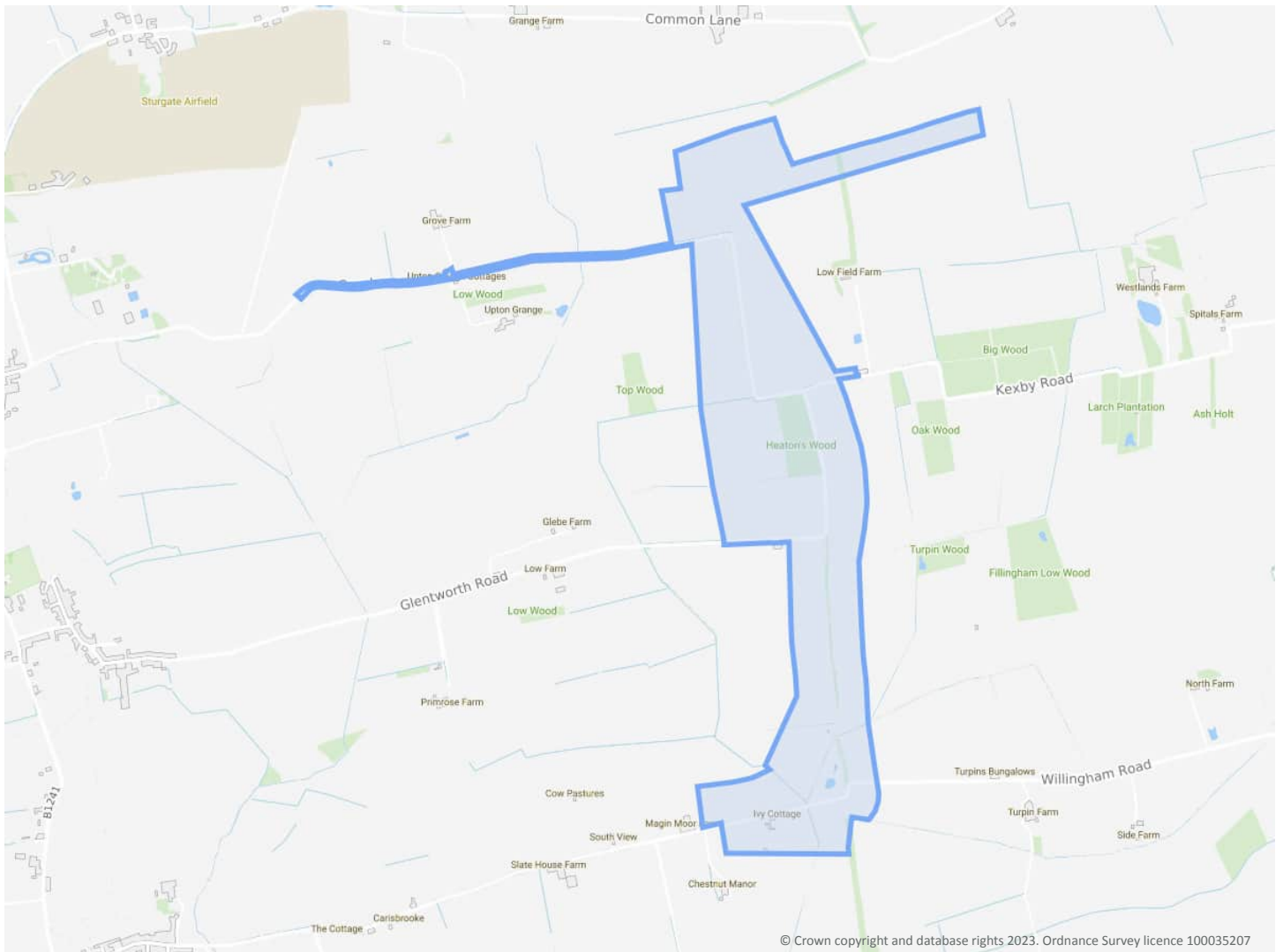
## Tillbridge cable run area

### Order Details

**Date:** 14/02/2023  
**Your ref:** ref 60677969  
**Our Ref:** GSIP-2023-13376-12945\_1

### Site Details

**Location:** 489699 386758  
**Area:** 143.98 ha  
**Authority:** [West Lindsey District Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

N/A: >10ha

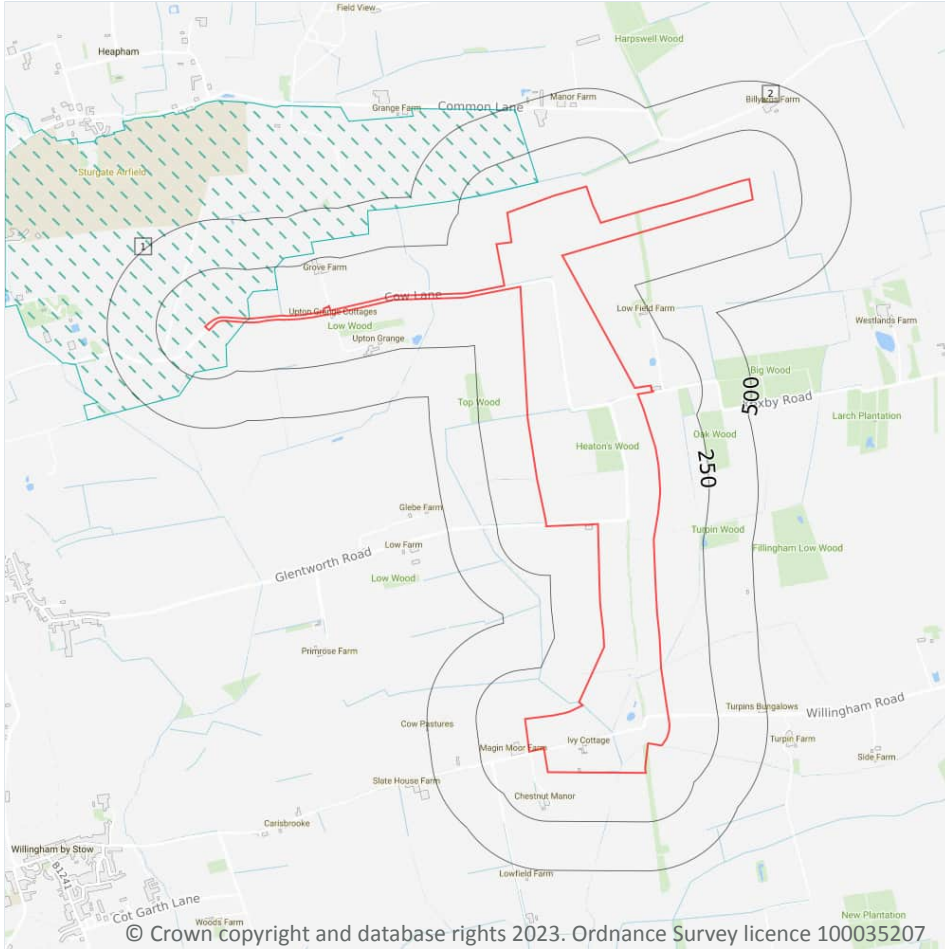
Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000



# 1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks

## 1.1 Historical industrial land uses

Records within 500m

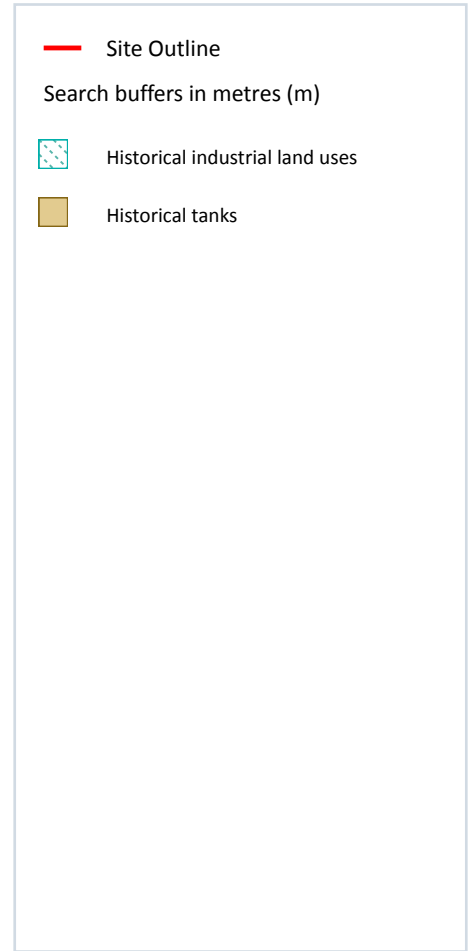
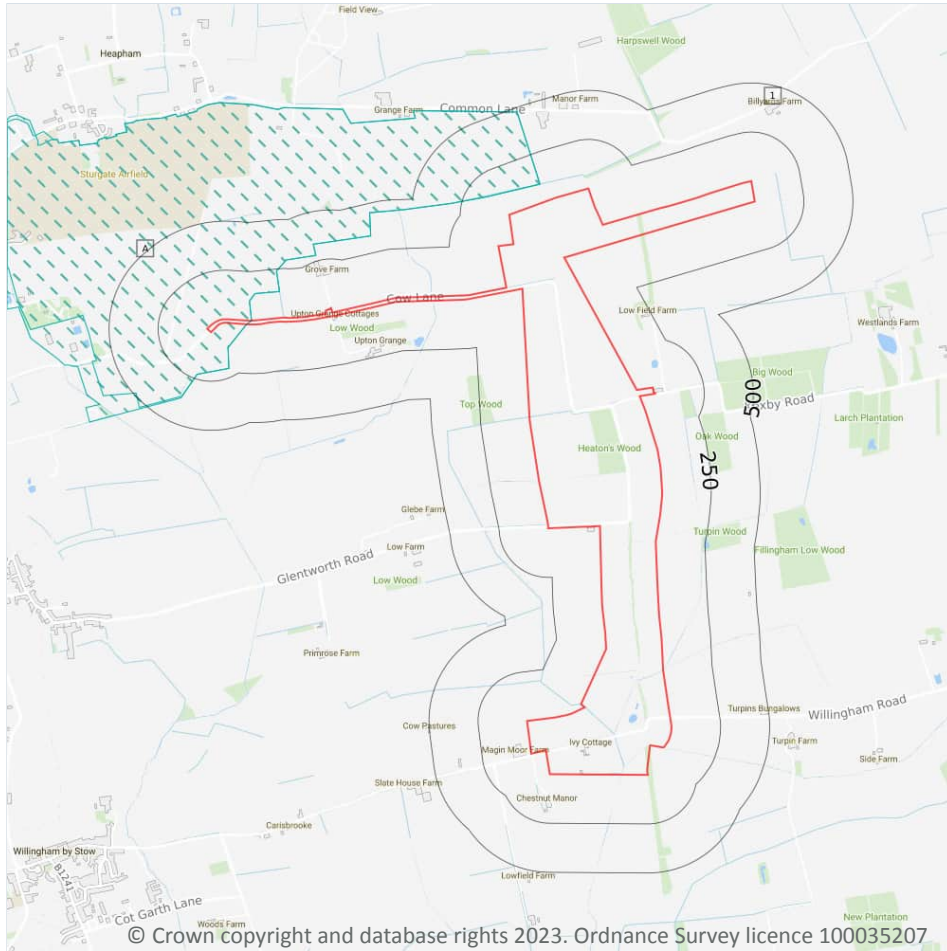
1

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

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

ID	Location	Land use	Dates present	Group ID
1	On site	Airfield	1951 - 1979	1743755

## 2 Past land use - un-grouped



### 2.1 Historical industrial land uses

Records within 500m

2

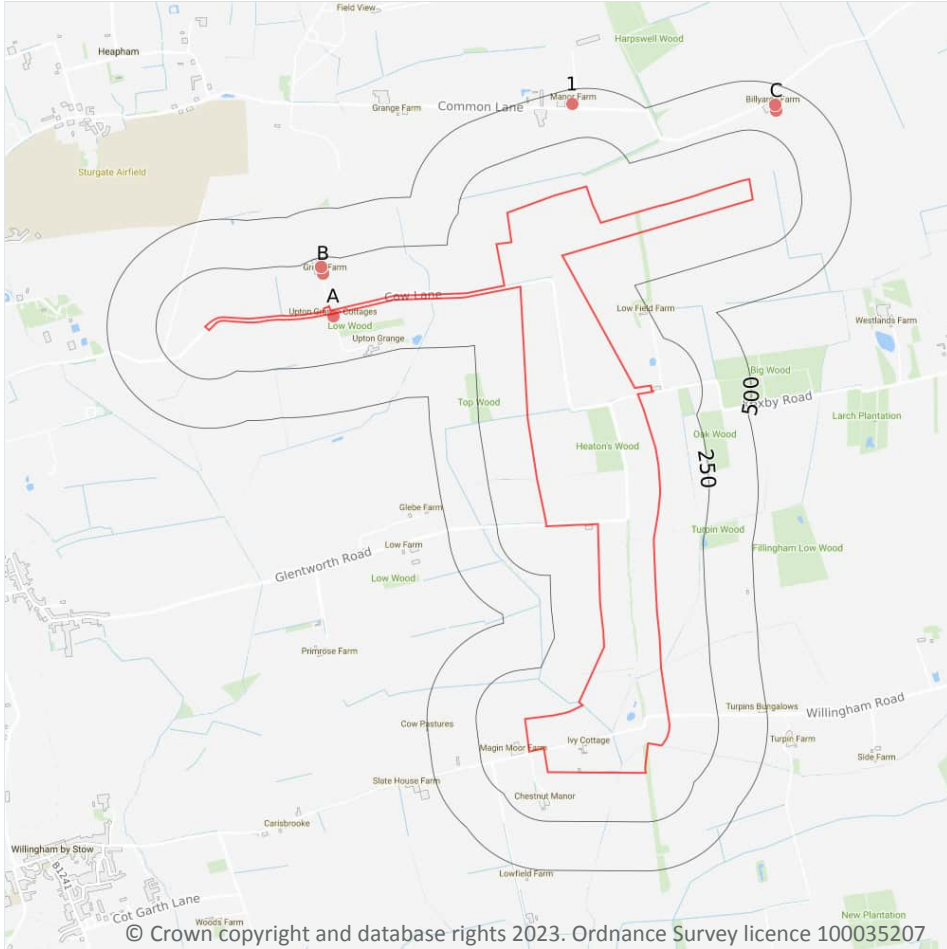
Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group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

Features are displayed on the Past land use - un-grouped map on **page 16**

ID	Location	Land Use	Date	Group ID
A	On site	Airfield	1951	1743755
A	On site	Airfield	1979	1743755

*This data is sourced from Ordnance Survey / Groundsure.*

## 3 Waste and landfill



### 3.1 Active or recent landfill

Records within 500m

0

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

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

### 3.2 Historical landfill (BGS records)

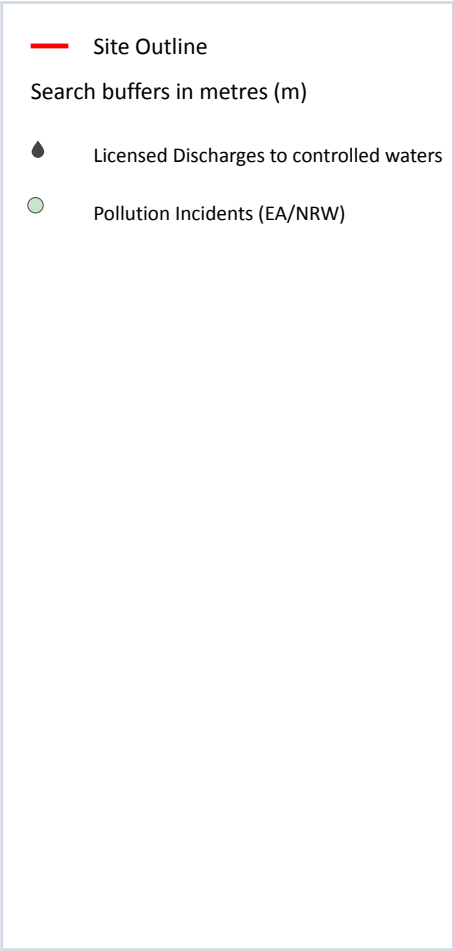
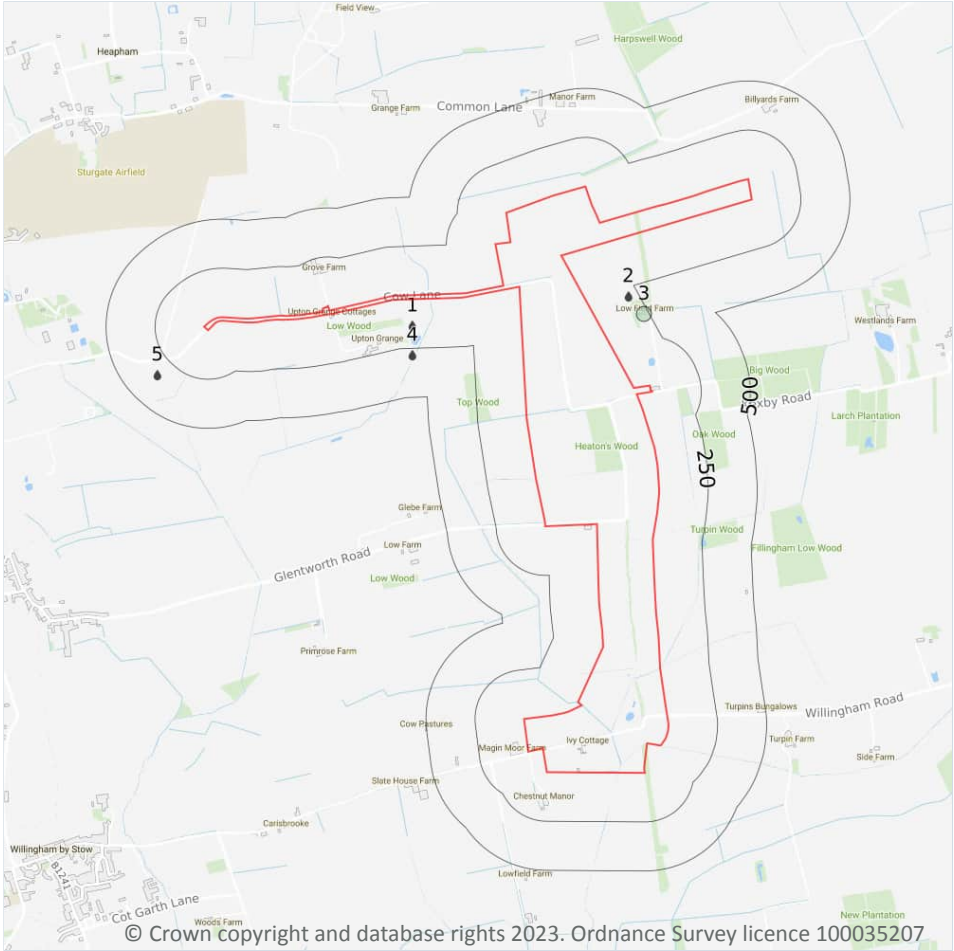
Records within 500m

0

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

*This data is sourced from the British Geological Survey.*

## 4 Current industrial land use



### 4.1 Recent industrial land uses

**Records within 250m** **0**

Current potentially contaminative industrial sites.

*This data is sourced from Ordnance Survey.*

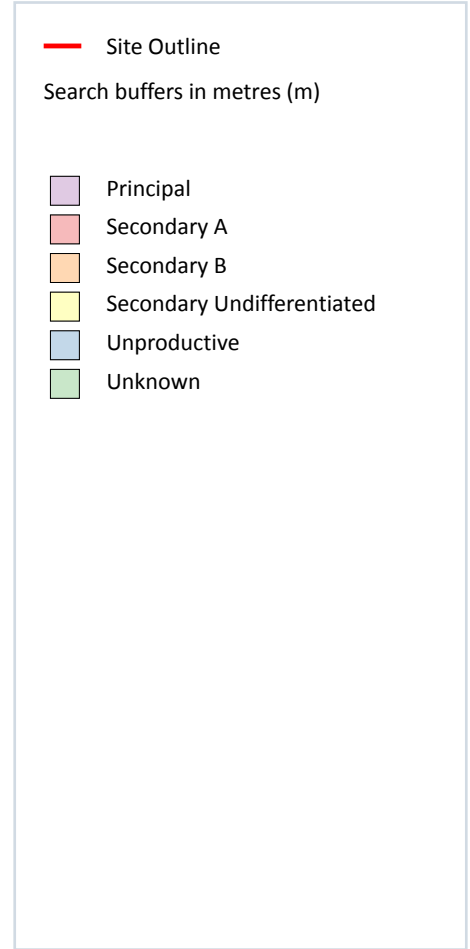
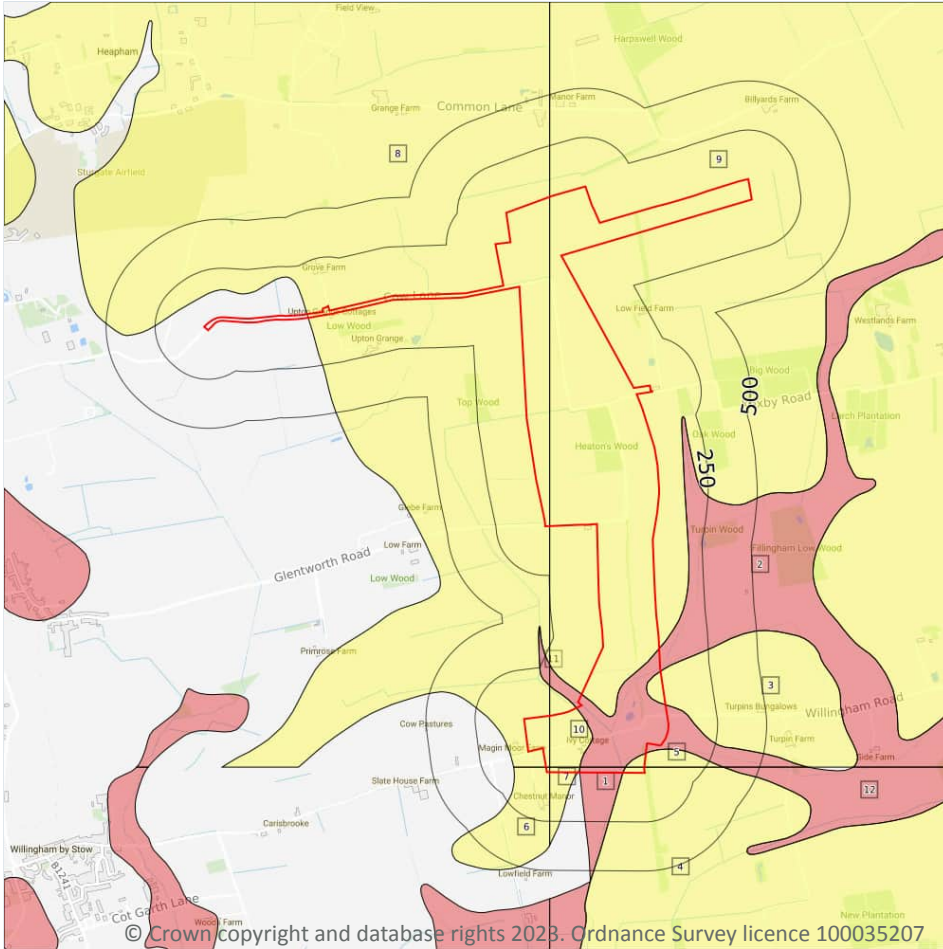
### 4.2 Current or recent petrol stations

**Records within 500m** **0**

Open, closed, under development and obsolete petrol stations.

*This data is sourced from Experian.*

## 5 Hydrogeology - Superficial aquifer



### 5.1 Superficial aquifer

Records within 500m

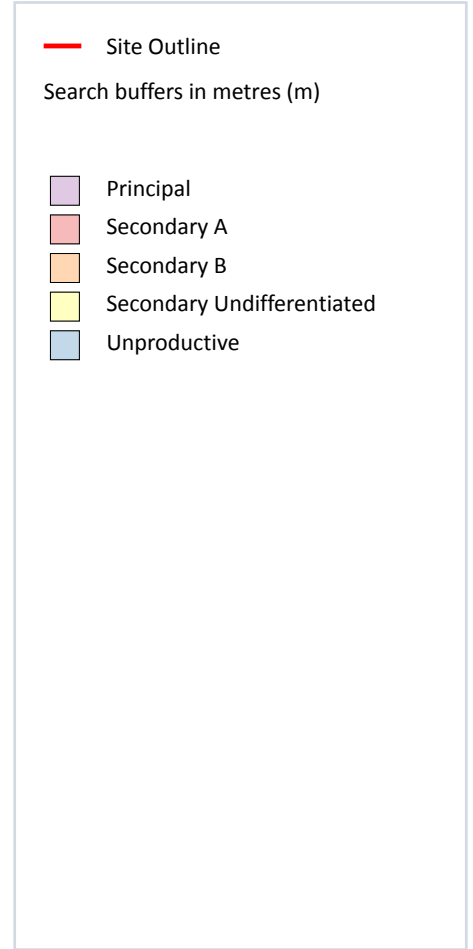
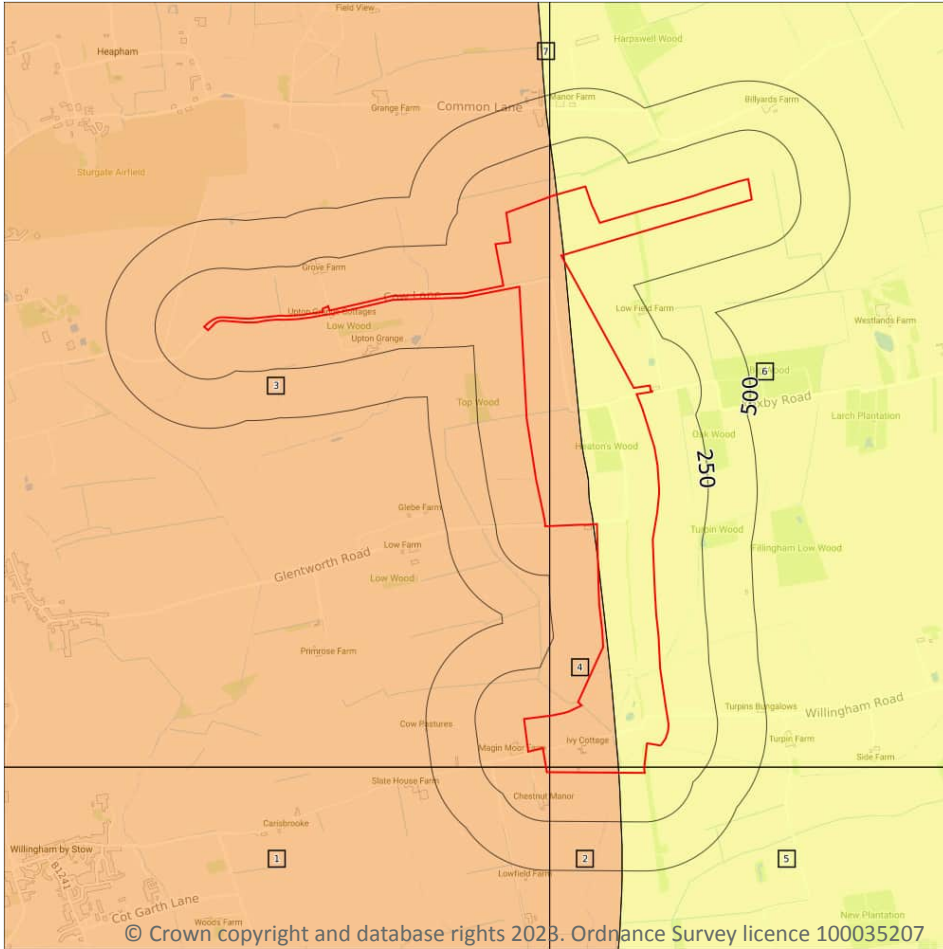
12

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 31**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	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

## Bedrock aquifer



### 5.2 Bedrock aquifer

Records within 500m

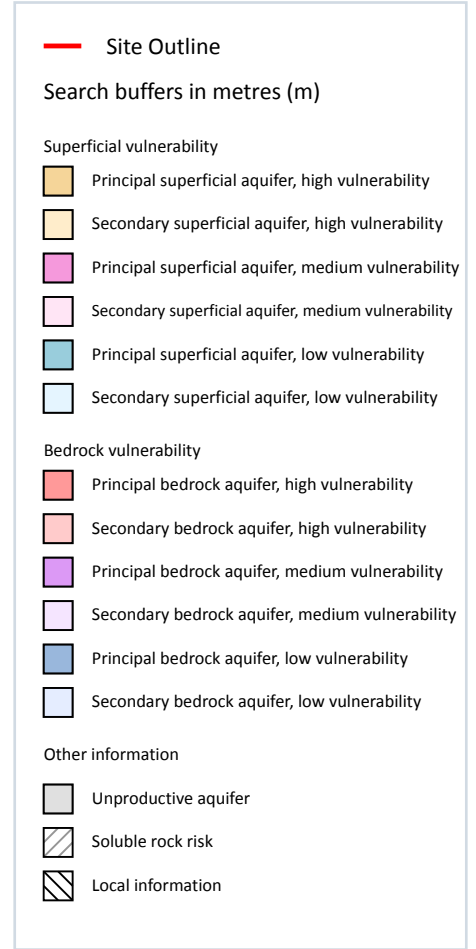
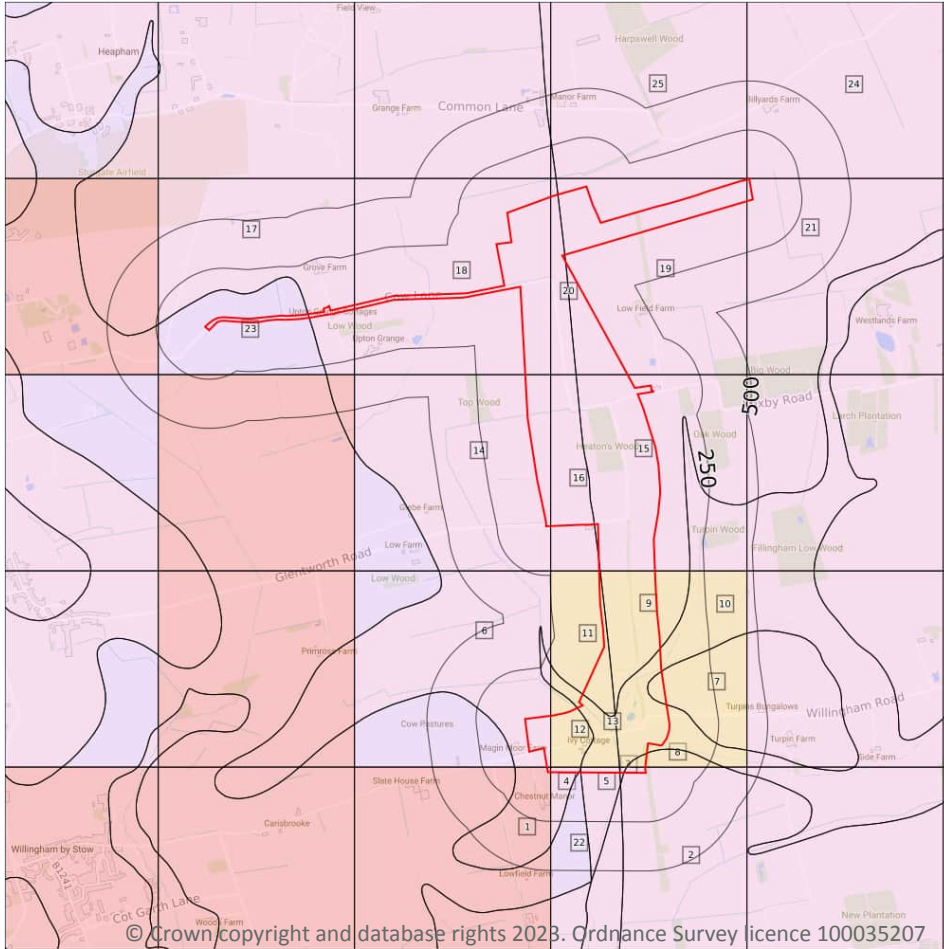
7

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 33**

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

## Groundwater vulnerability



### 5.3 Groundwater vulnerability

Records within 50m

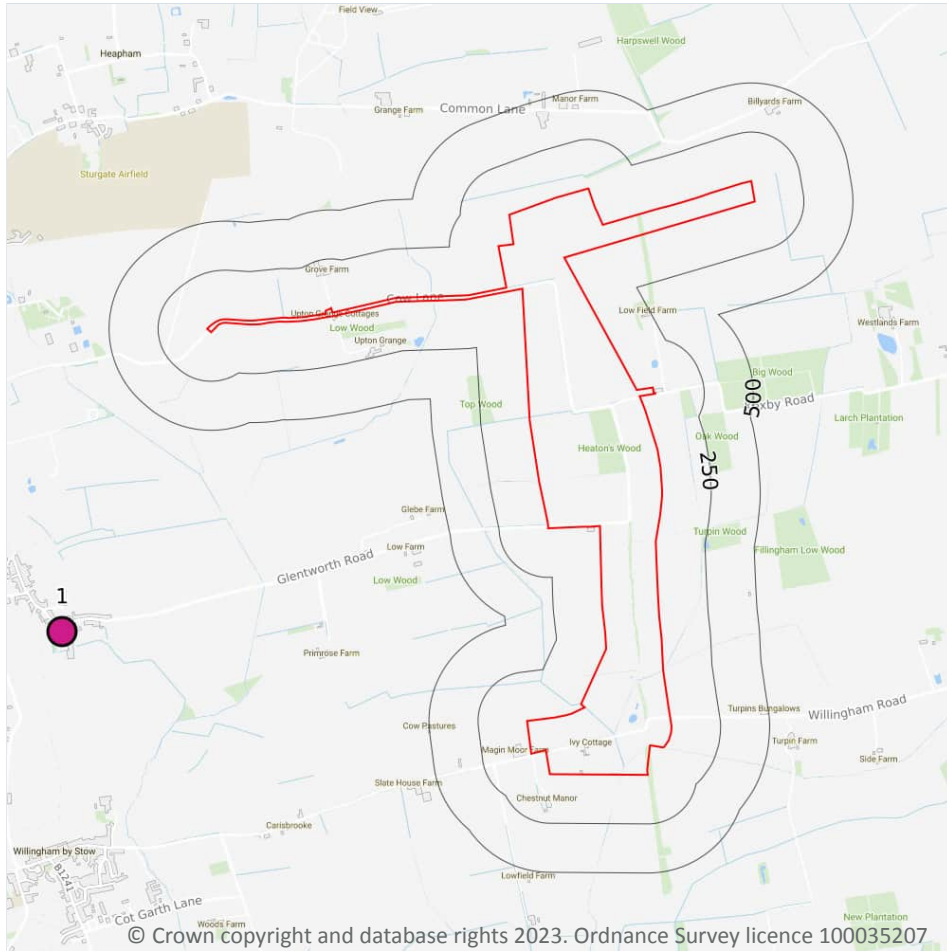
25

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

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

Features are displayed on the Groundwater vulnerability map on **page 35**

## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

Records within 2000m

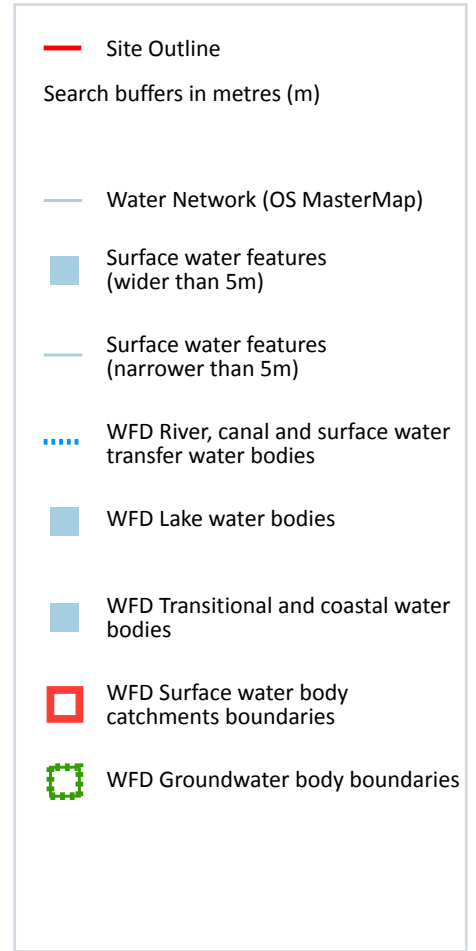
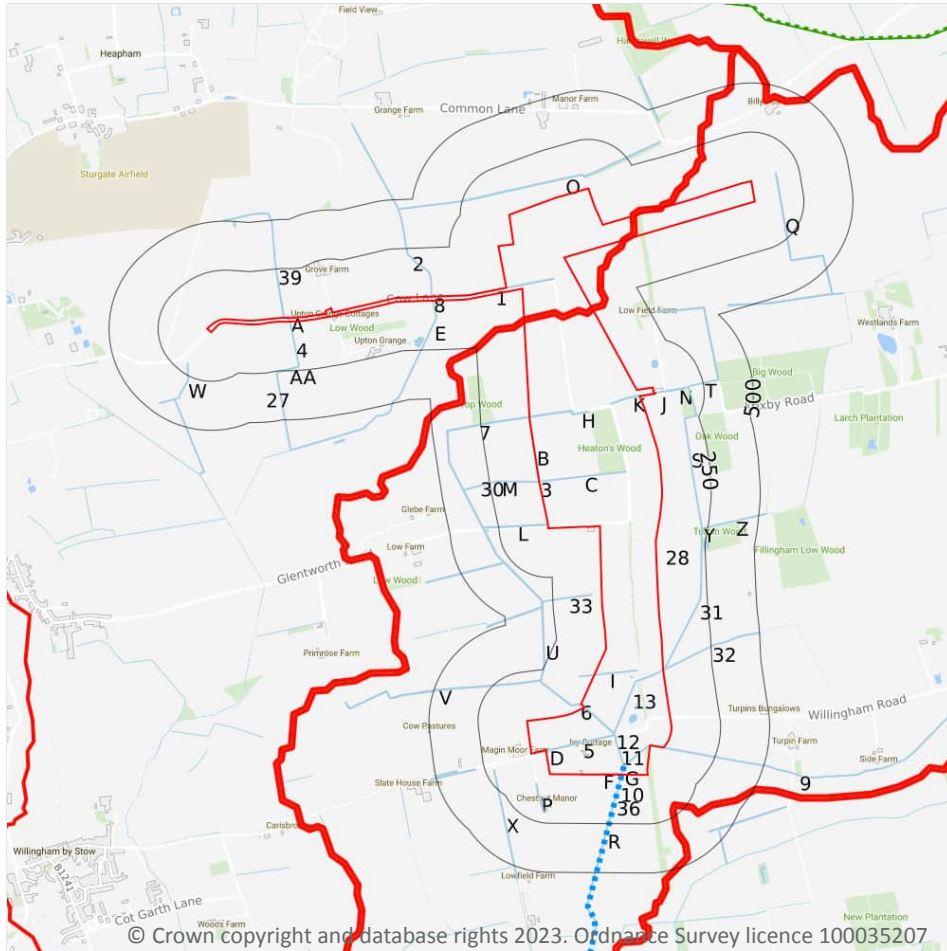
1

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

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



## 6 Hydrology



### 6.1 Water Network (OS MasterMap)

Records within 250m

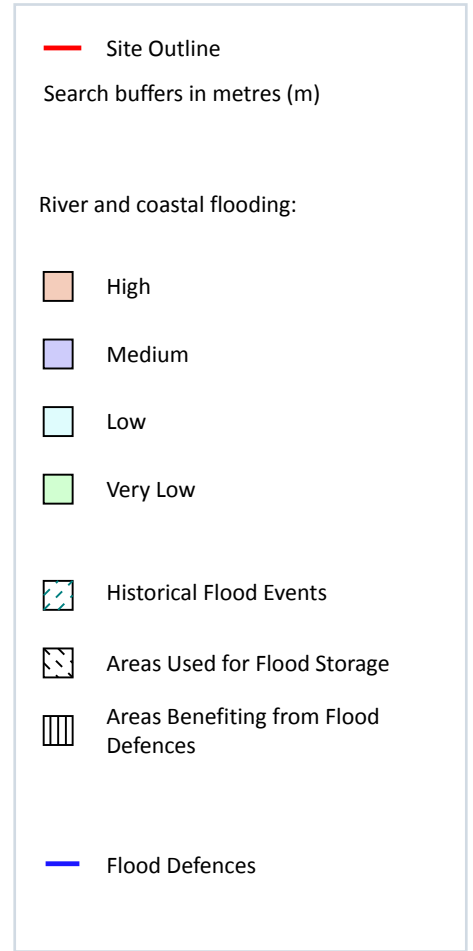
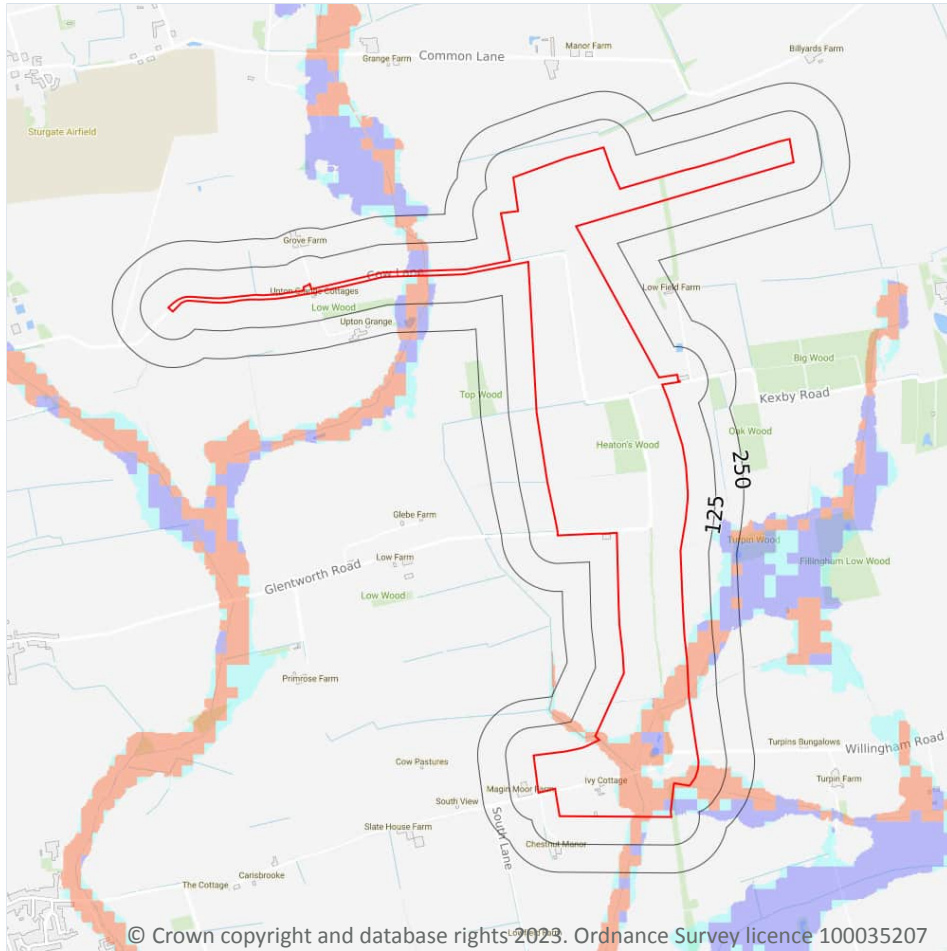
56

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

Features are displayed on the Hydrology map on **page 44**

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

## 7 River and coastal flooding



### 7.1 Risk of flooding from rivers and the sea

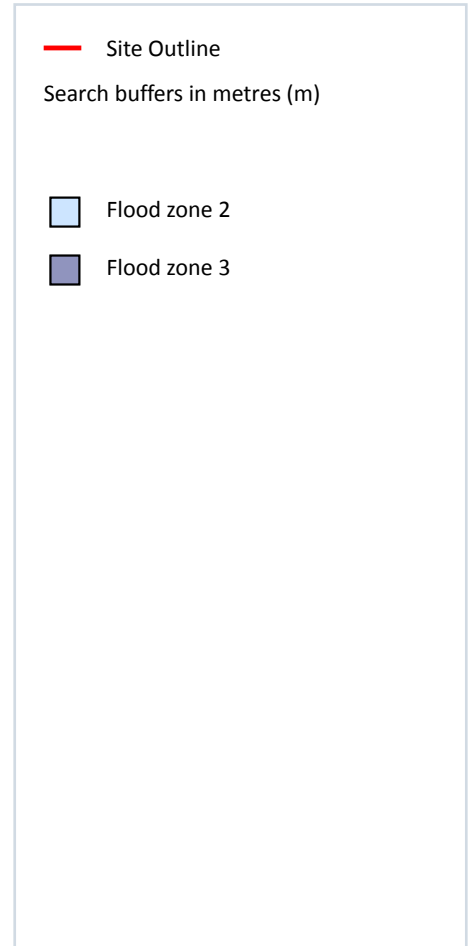
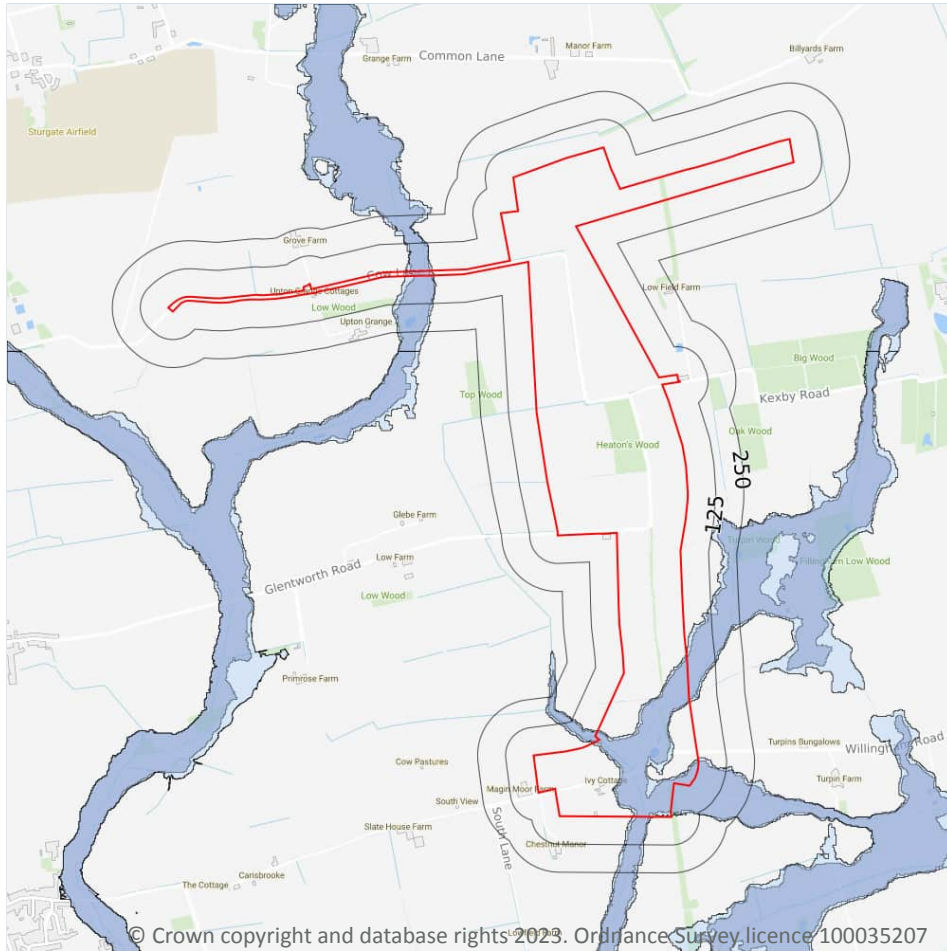
Records within 50m

42

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

Features are displayed on the River and coastal flooding map on **page 51**

## River and coastal flooding - Flood Zones



### 7.6 Flood Zone 2

Records within 50m

1

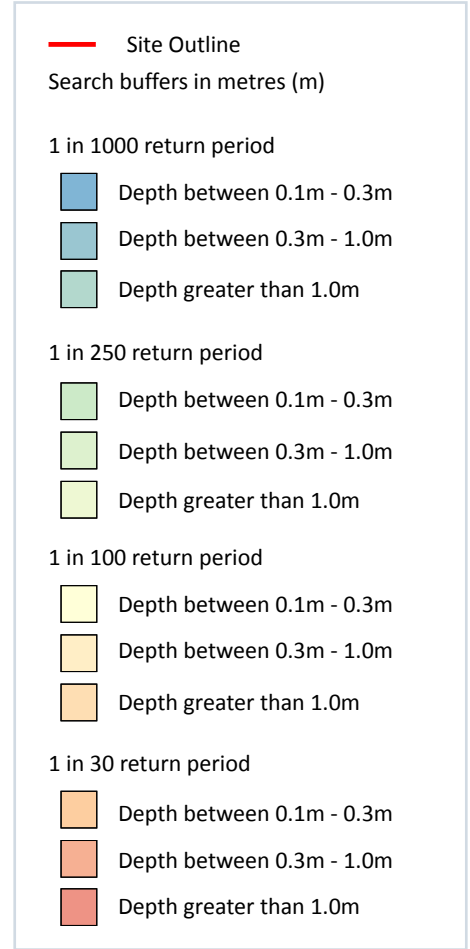
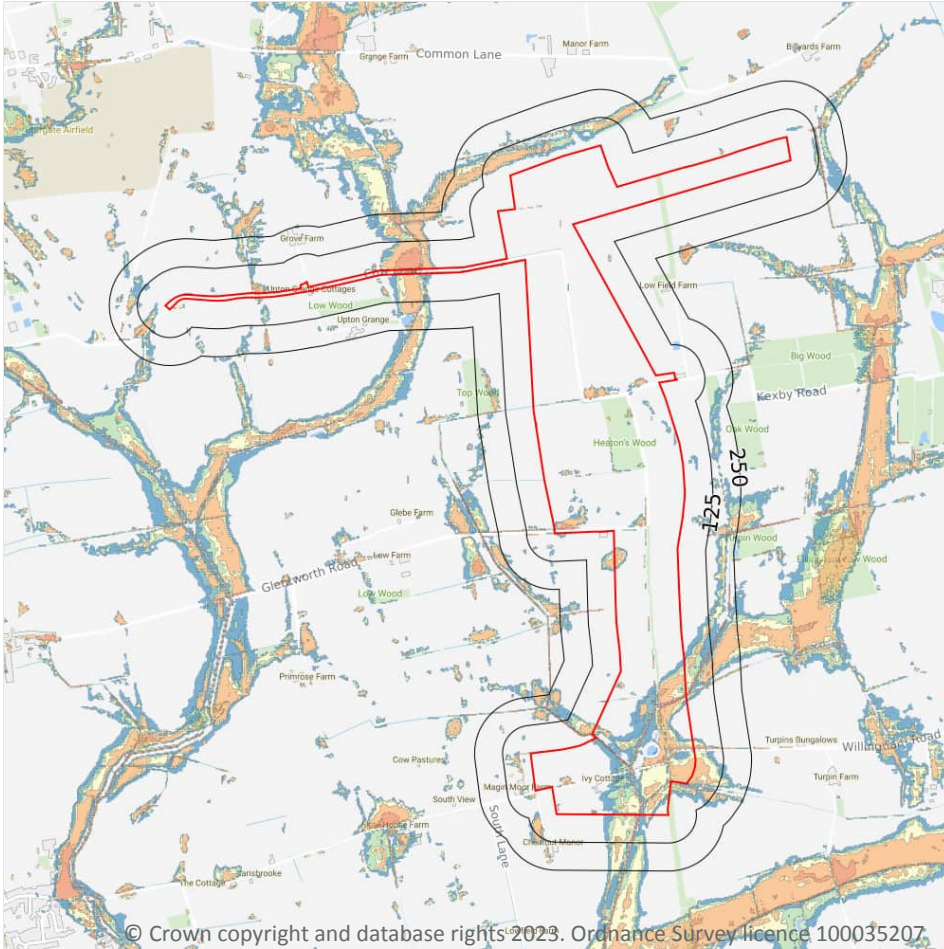
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 51**

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

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

## 8 Surface water flooding



### 8.1 Surface water flooding

**Highest risk on site**

**1 in 30 year, Greater than 1.0m**

**Highest risk within 50m**

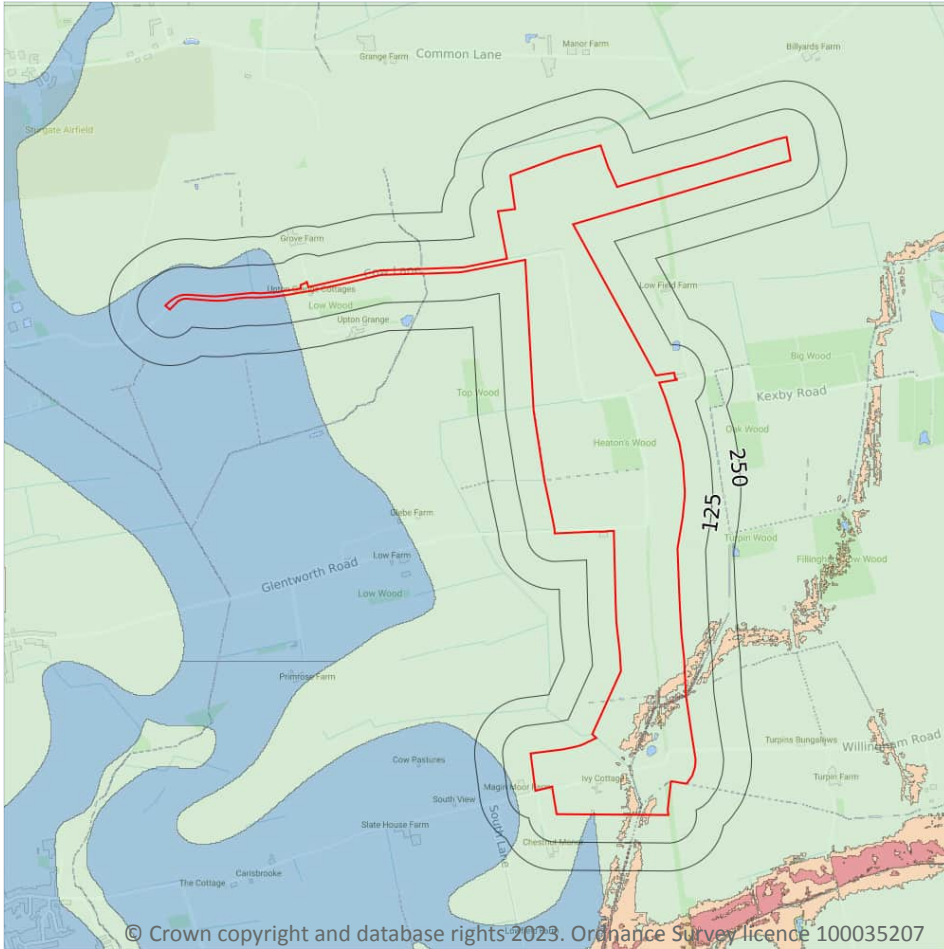
**1 in 30 year, Greater than 1.0m**

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

Features are displayed on the Surface water flooding map on **page 55**

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

## 9 Groundwater flooding



### 9.1 Groundwater flooding

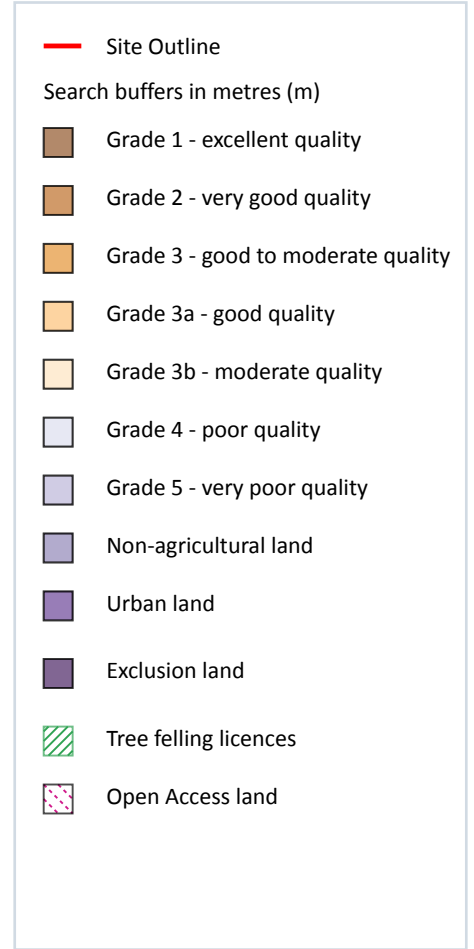
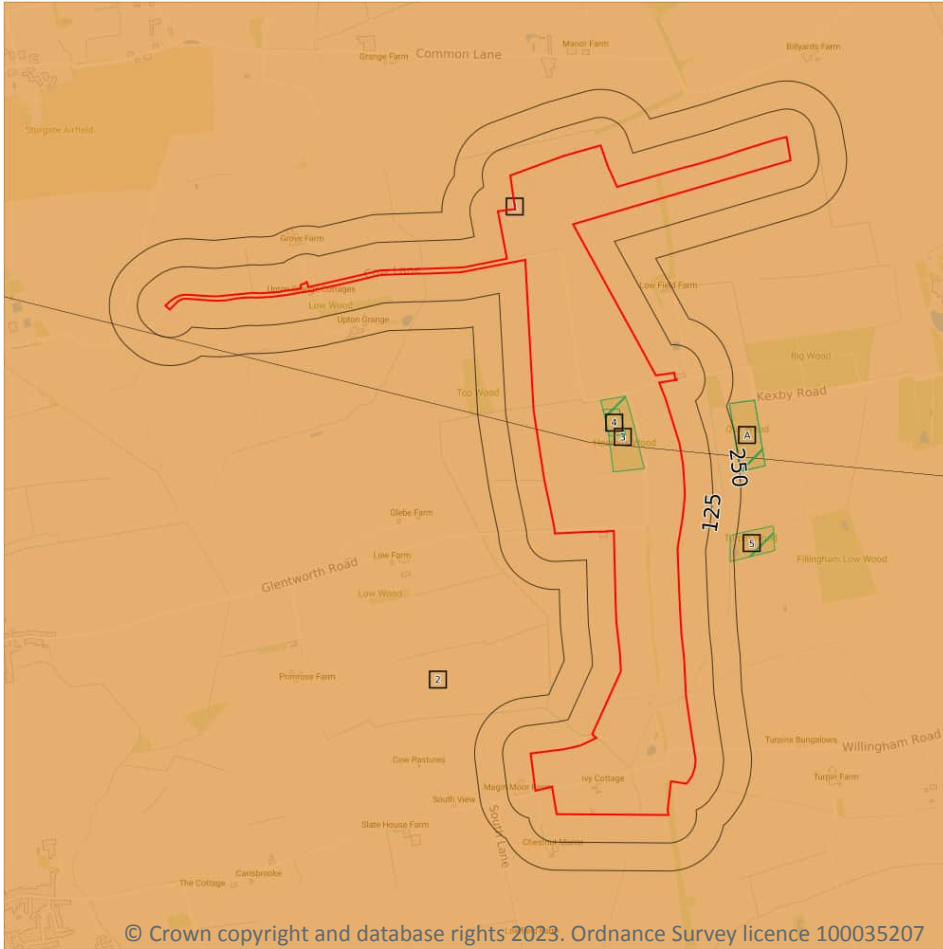
Highest risk on site	<b>High</b>
Highest risk within 50m	<b>High</b>

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

Features are displayed on the Groundwater flooding map on **page 57**

*This data is sourced from Ambiental Risk Analytics.*

## 12 Agricultural designations



### 12.1 Agricultural Land Classification

Records within 250m

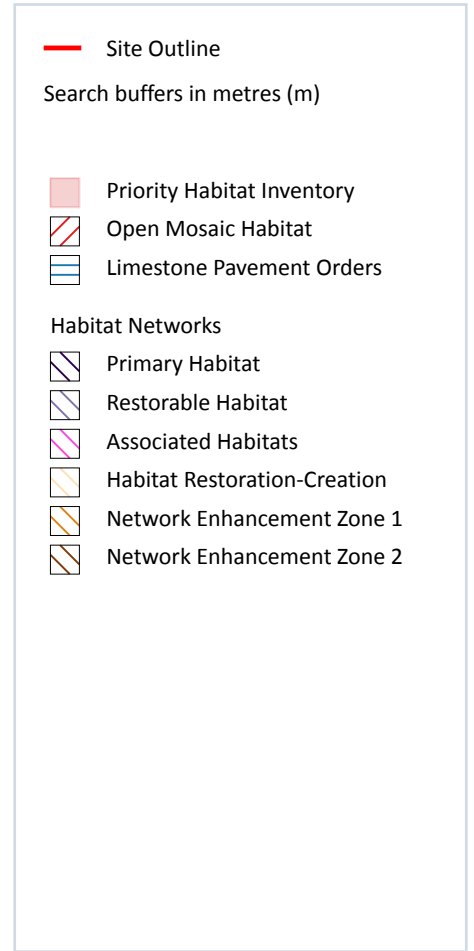
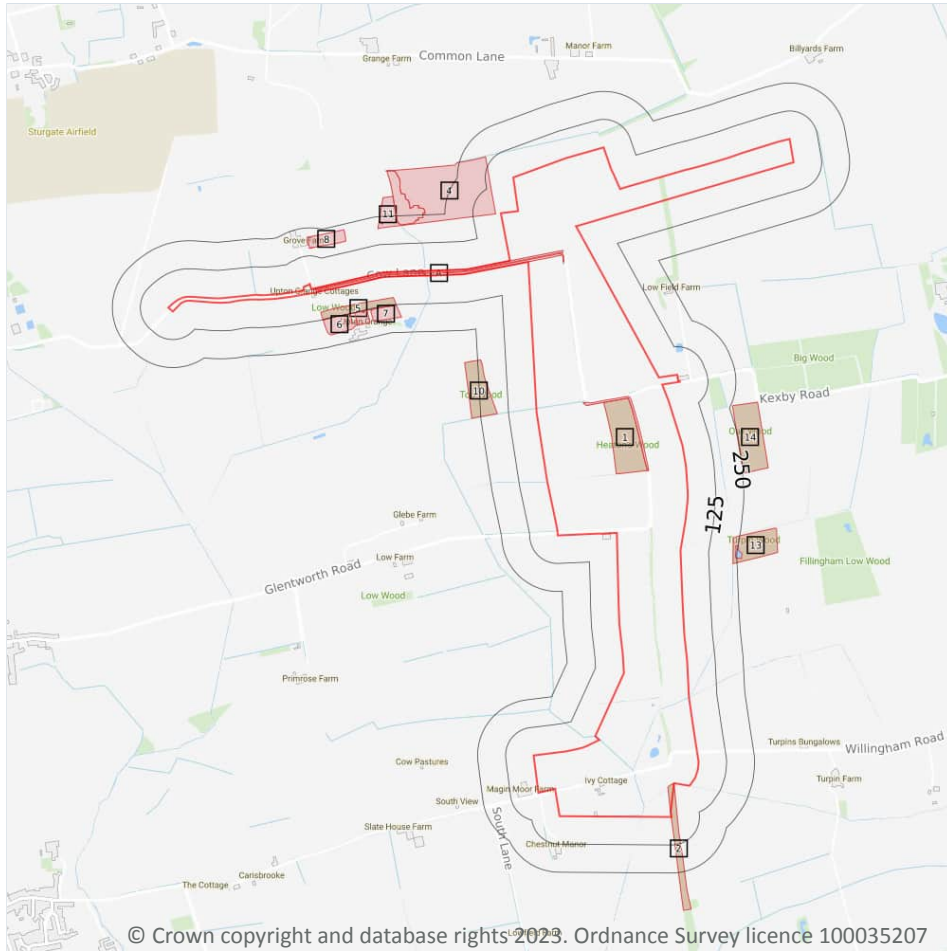
2

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

Features are displayed on the Agricultural designations map on **page 65**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

## 13 Habitat designations



### 13.1 Priority Habitat Inventory

Records within 250m

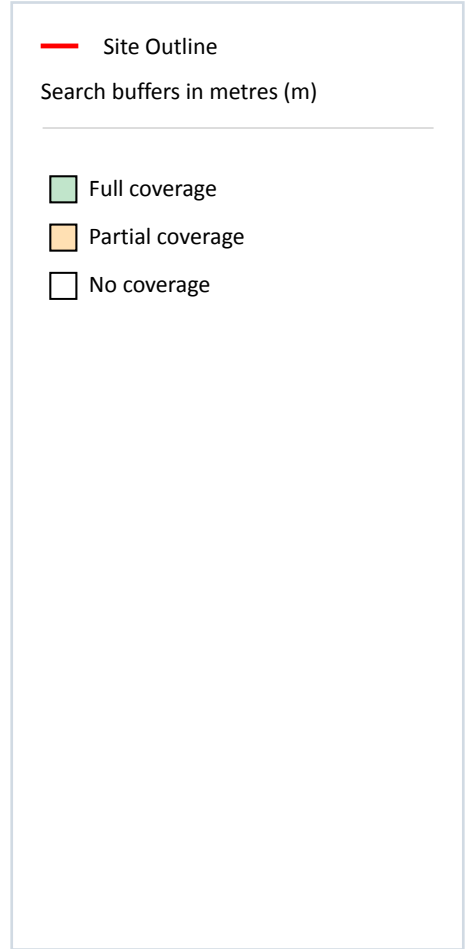
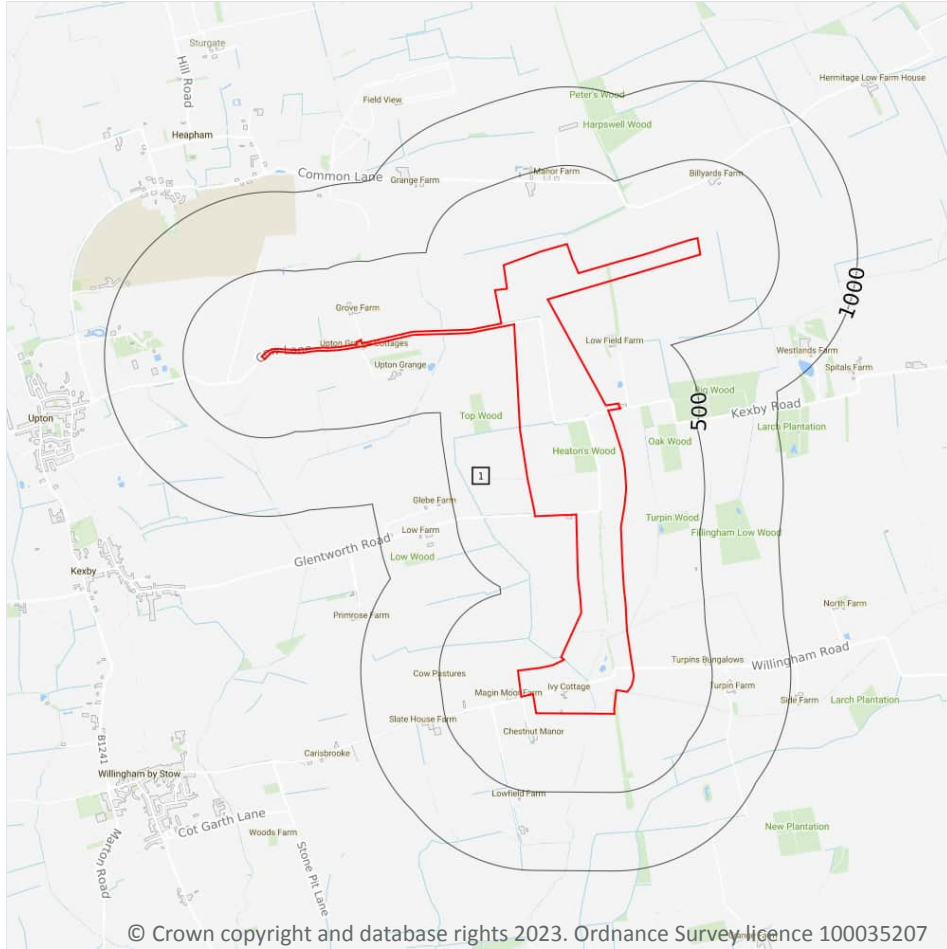
18

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

Features are displayed on the Habitat designations map on **page 69**

ID	Location	Main Habitat	Other habitats
1	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	On site	Good quality semi-improved grassland	Main habitat: LMEAD (INV > 50%)

## 14 Geology 1:10,000 scale - Availability



### 14.1 10k Availability

Records within 500m

1

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

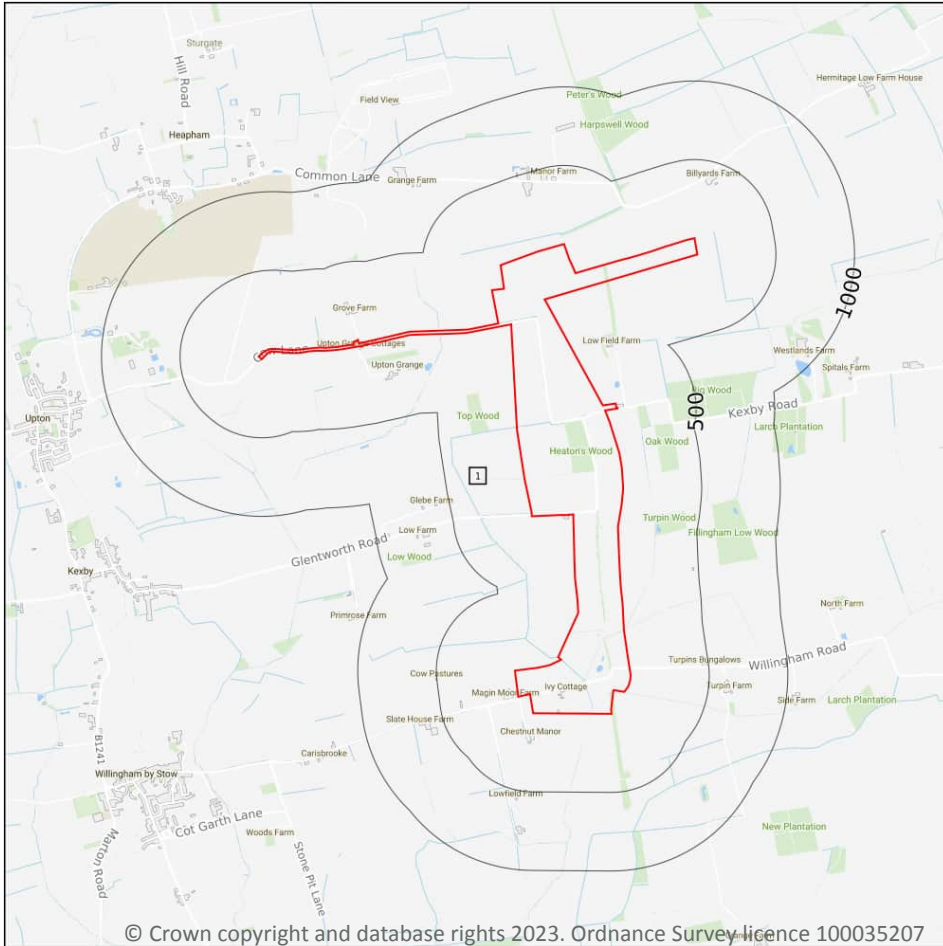
Features are displayed on the Geology 1:10,000 scale - Availability map on **page 72**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.



## 15 Geology 1:50,000 scale - Availability



**— Site Outline**

Search buffers in metres (m)

---

**□ Geological map tile**

### 15.1 50k Availability

**Records within 500m**

**1**

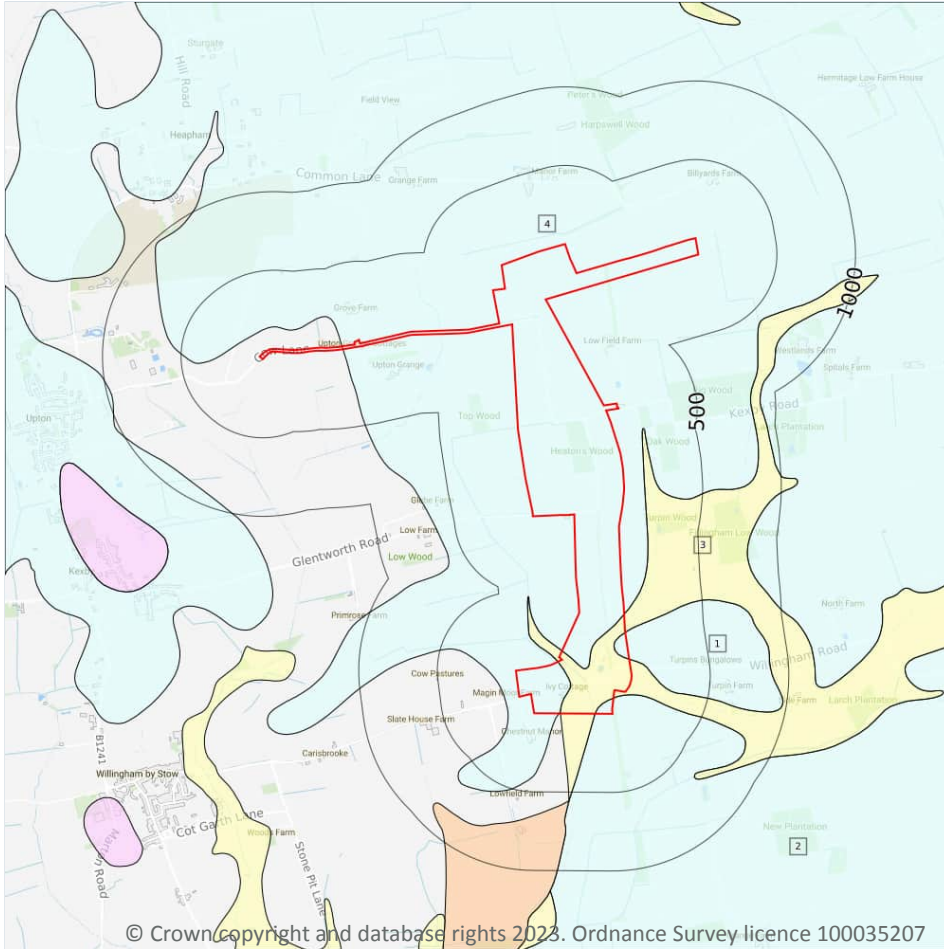
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 76**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW102_market_rasen_v4

*This data is sourced from the British Geological Survey.*

## Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)  
Please see table for more details.

### 15.4 Superficial geology (50k)

Records within 500m

4

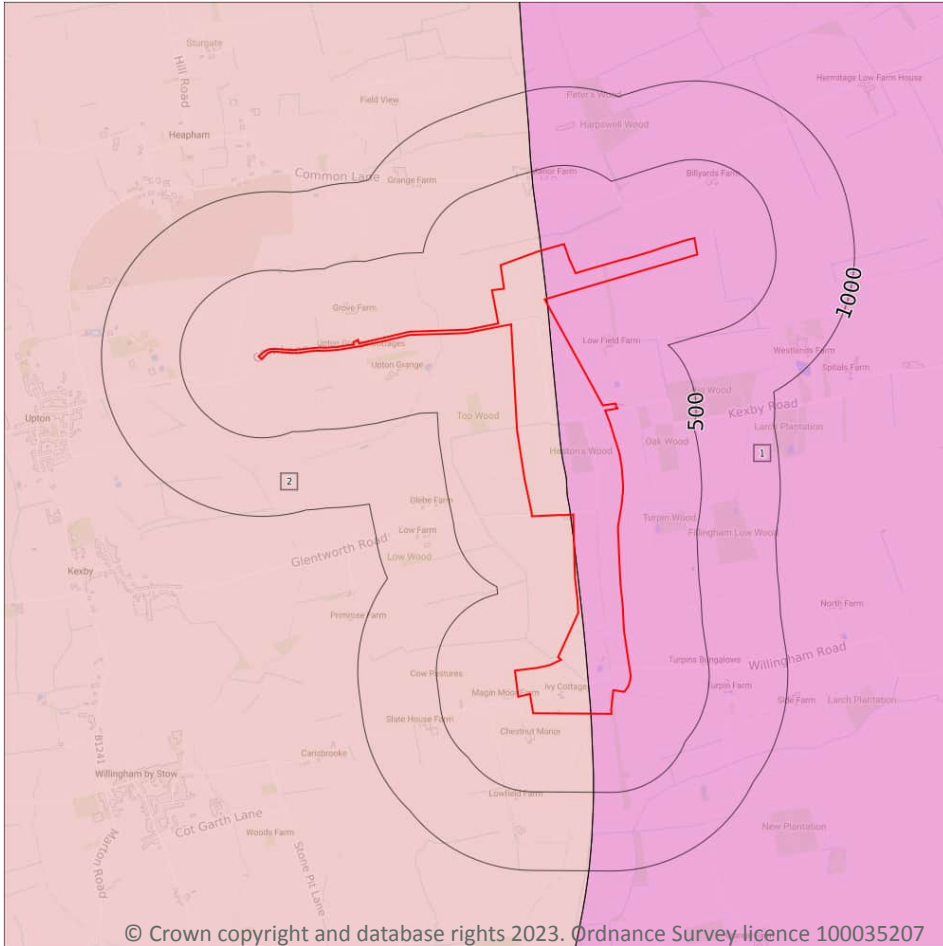
Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 78**

ID	Location	LEX Code	Description	Rock description
1	On site	TILMP-DMTN	TILL, MID PLEISTOCENE	DIAMICTON
2	On site	TILMP-DMTN	TILL, MID PLEISTOCENE	DIAMICTON
3	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL



## Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (50k)
- Bedrock geology (50k)  
Please see table for more details.

### 15.8 Bedrock geology (50k)

Records within 500m

2

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

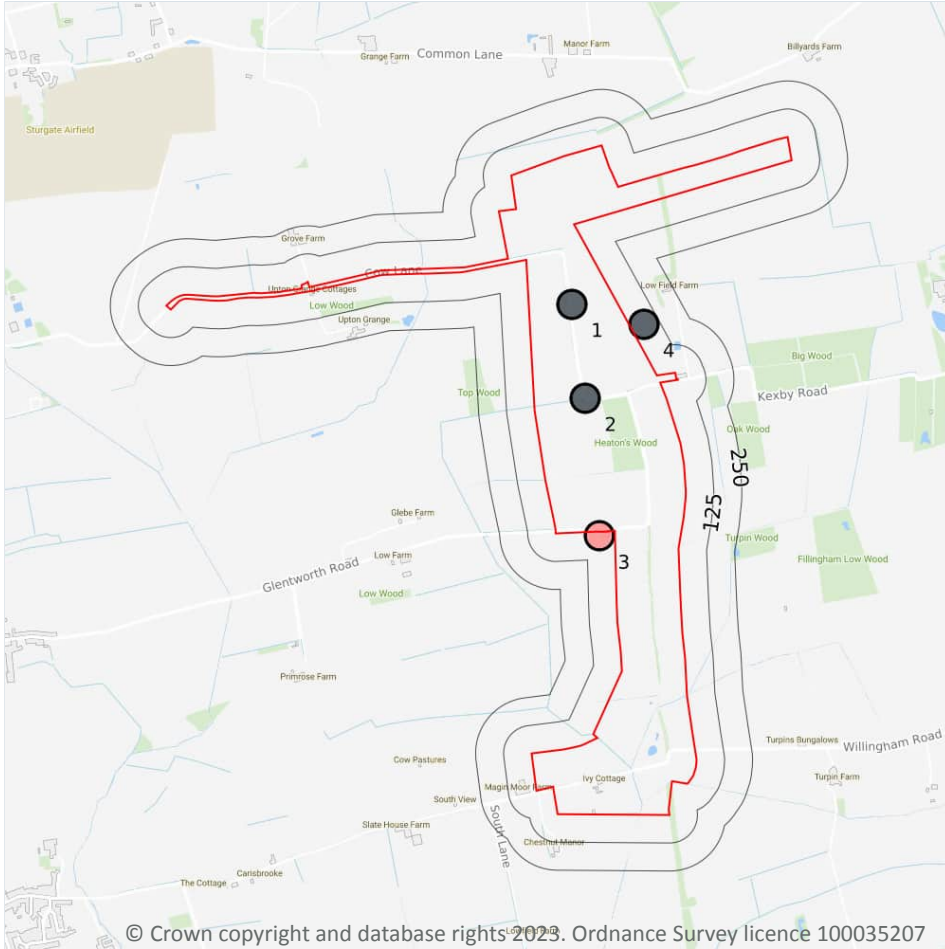
Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 81**

ID	Location	LEX Code	Description	Rock age
1	On site	CHAM-MDST	CHARMOUTH MUDSTONE FORMATION - MUDSTONE	SINEMURIAN
2	On site	SMD-MDLM	SCUNTHORPE MUDSTONE FORMATION - MUDSTONE AND LIMESTONE, INTERBEDDED	RHAETIAN

*This data is sourced from the British Geological Survey.*



## 16 Boreholes



— Site Outline  
Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

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### 16.1 BGS Boreholes

Records within 250m

4

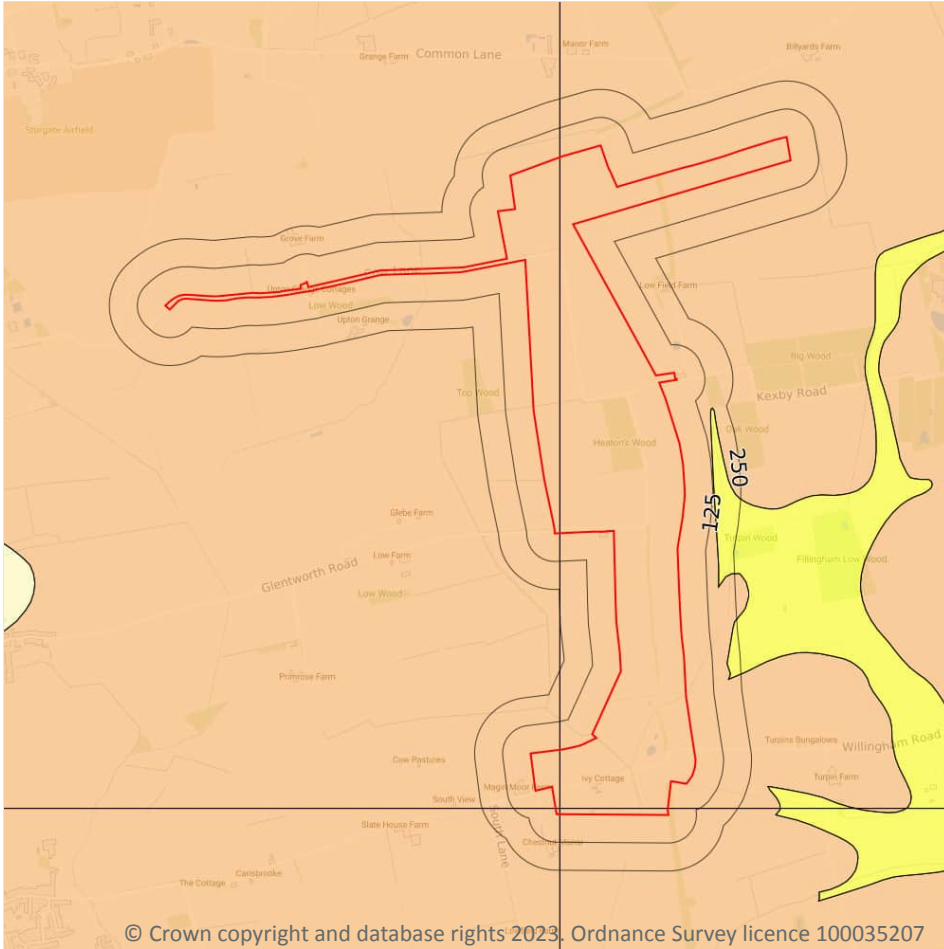
The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several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

Features are displayed on the Boreholes map on **page 83**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	490050 387250	SHOT HOLE RECORDS - GAINSBOROUGH 470	-	Y	N/A
2	On site	490110 386830	SHOT HOLE RECORDS - GAINSBOROUGH 471	-	Y	N/A
3	17m S	490170 386218	HEATONS WOOD	1400.5	N	<a href="#">251587</a>



## 17 Natural ground subsidence - Shrink swell clays



### 17.1 Shrink swell clays

Records within 50m

1

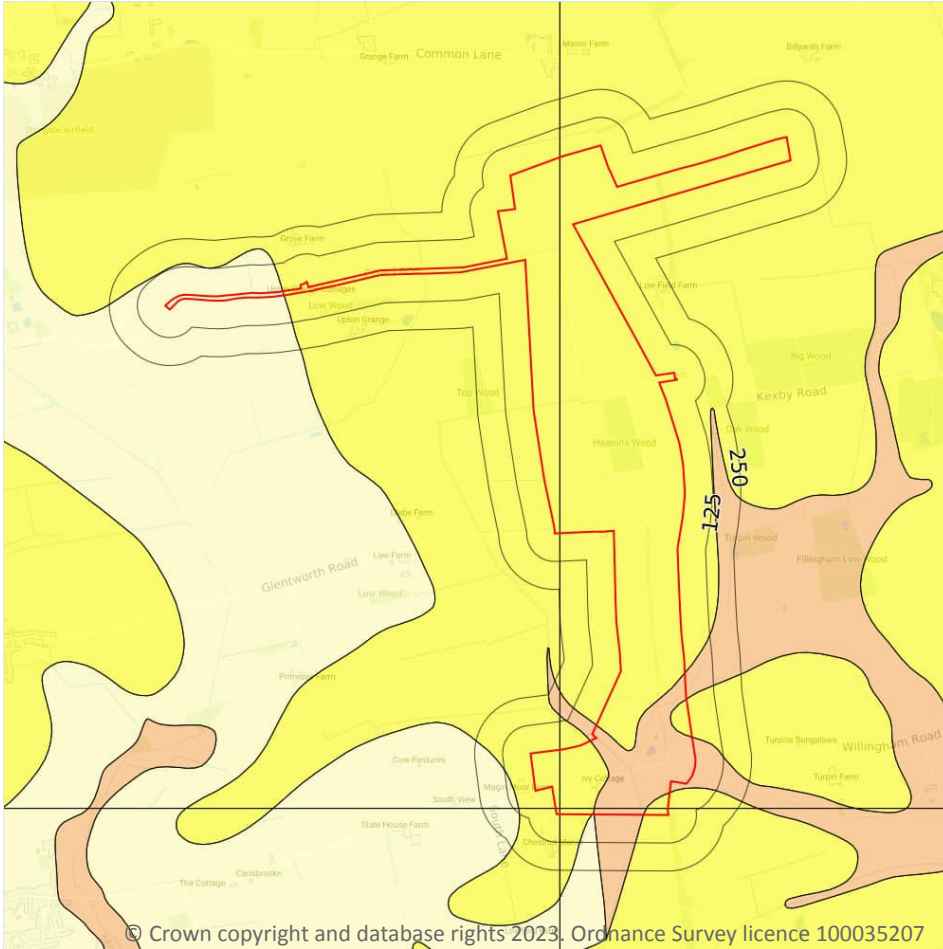
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 85**

Location	Hazard rating	Details
On site	Low	Ground conditions predominantly medium plasticity.

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Running sands



— Site Outline  
Search buffers in metres (m)

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

### 17.2 Running sands

Records within 50m

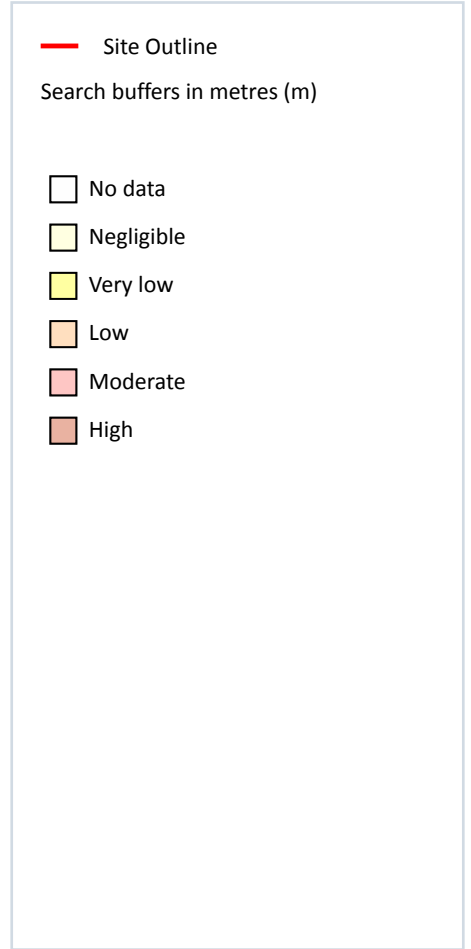
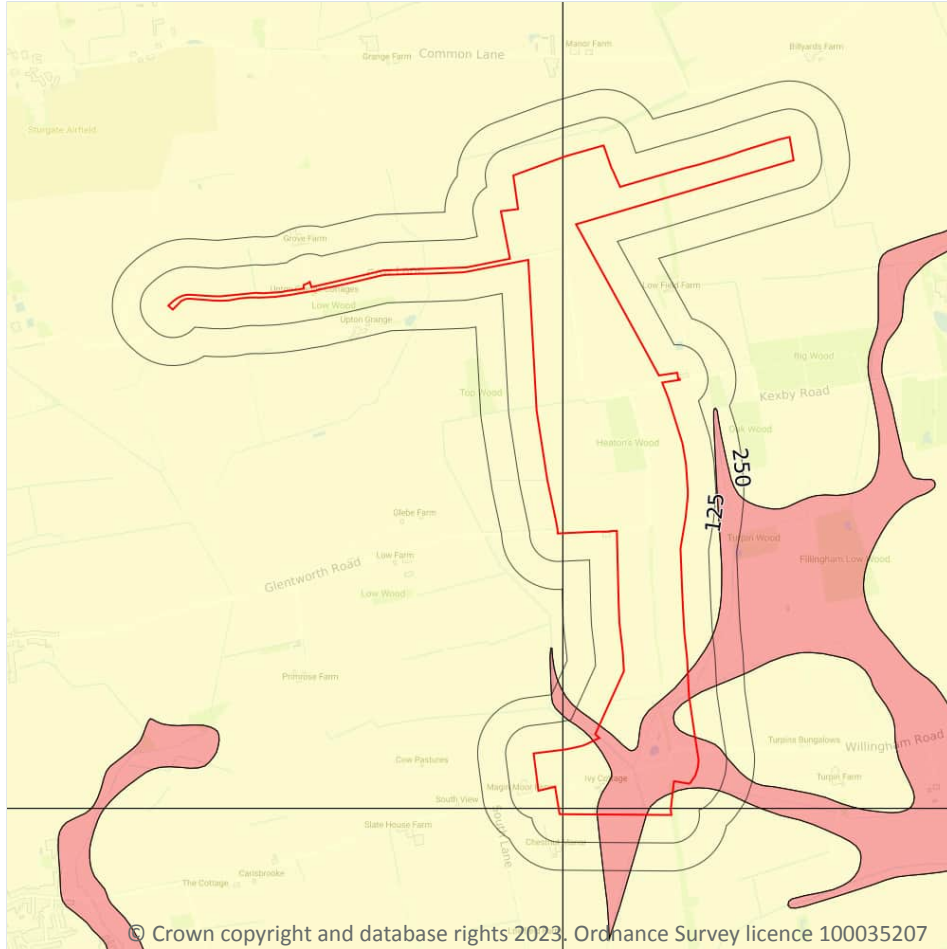
3

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

Features are displayed on the Natural ground subsidence - Running sands map on **page 86**

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

## Natural ground subsidence - Compressible deposits



### 17.3 Compressible deposits

Records within 50m

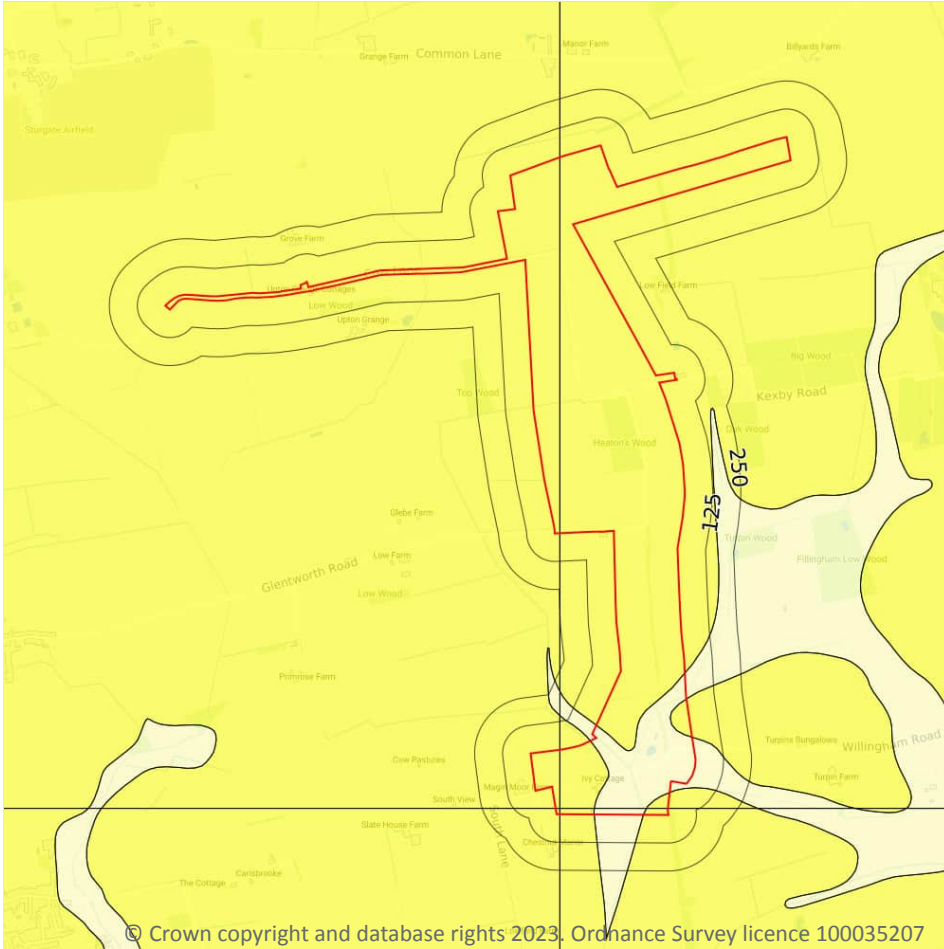
2

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 88**

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

## Natural ground subsidence - Collapsible deposits



### 17.4 Collapsible deposits

Records within 50m

2

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

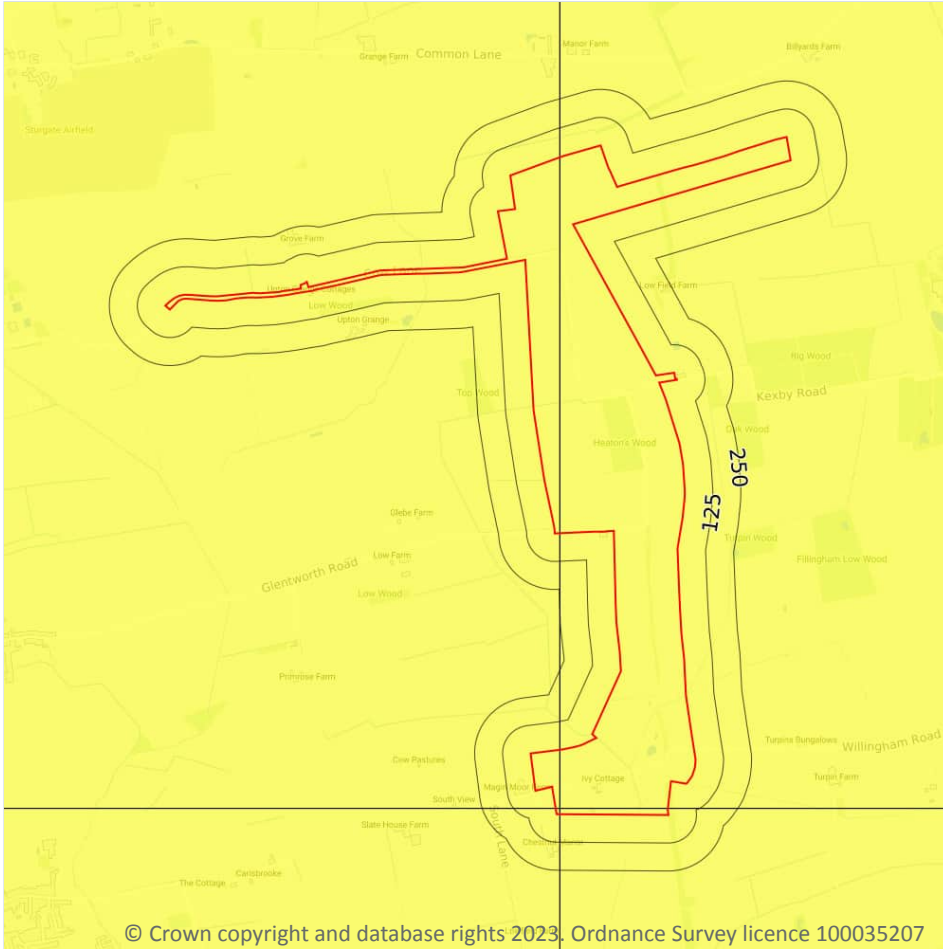
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 90**

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

*This data is sourced from the British Geological Survey.*



## Natural ground subsidence - Landslides



### 17.5 Landslides

Records within 50m

1

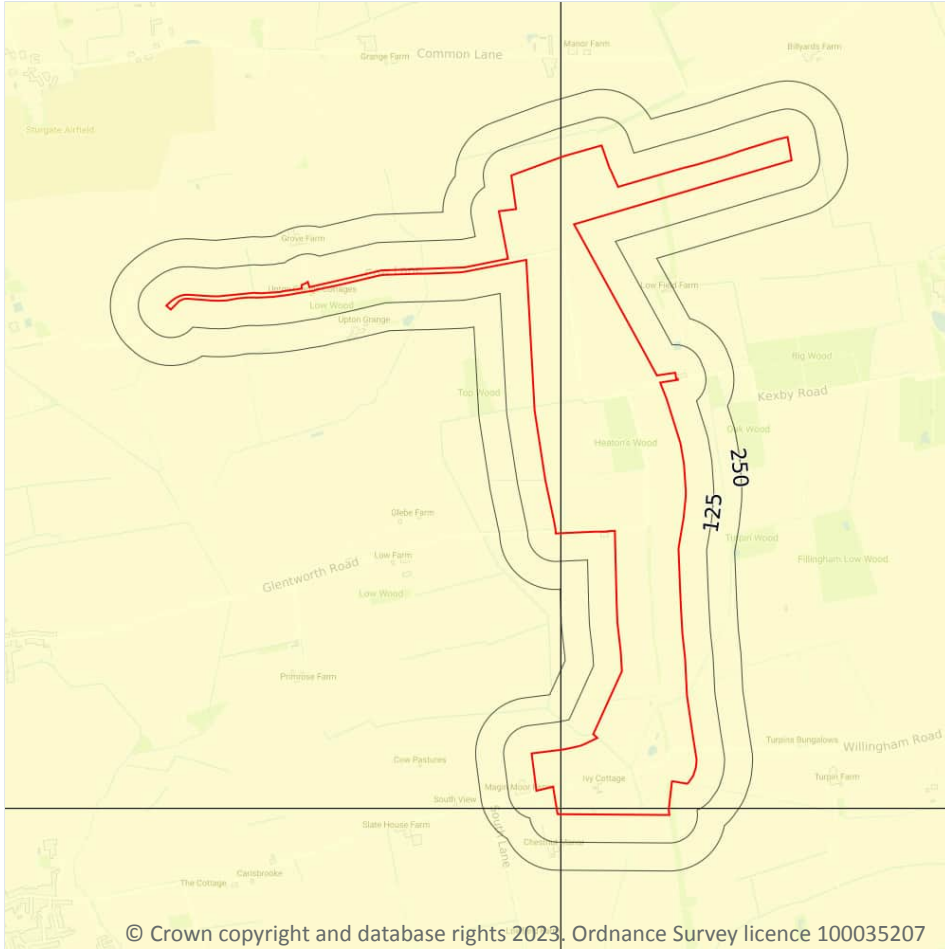
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 91**

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

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

Records within 50m

1

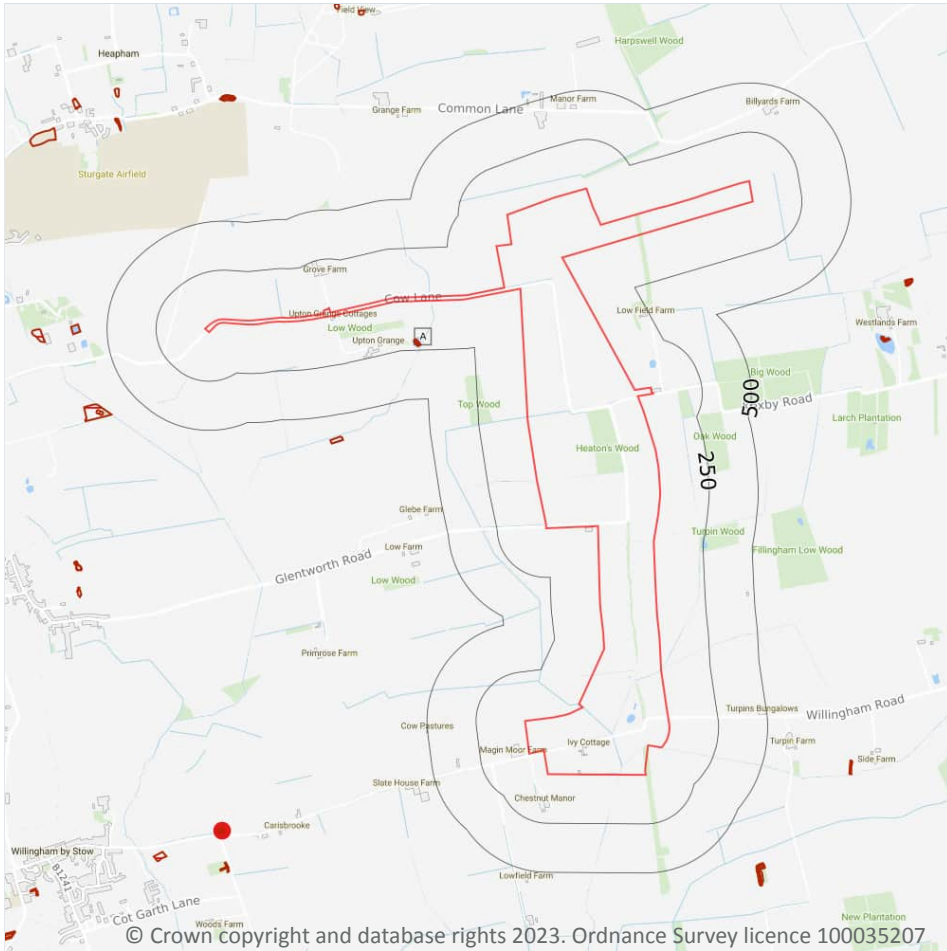
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 92**

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

*This data is sourced from the British Geological Survey.*

## 18 Mining, ground workings and natural cavities



### 18.1 Natural cavities

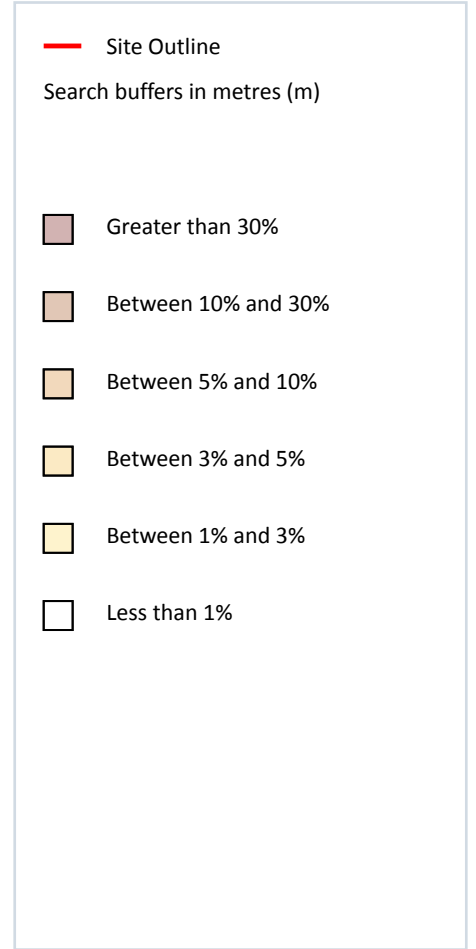
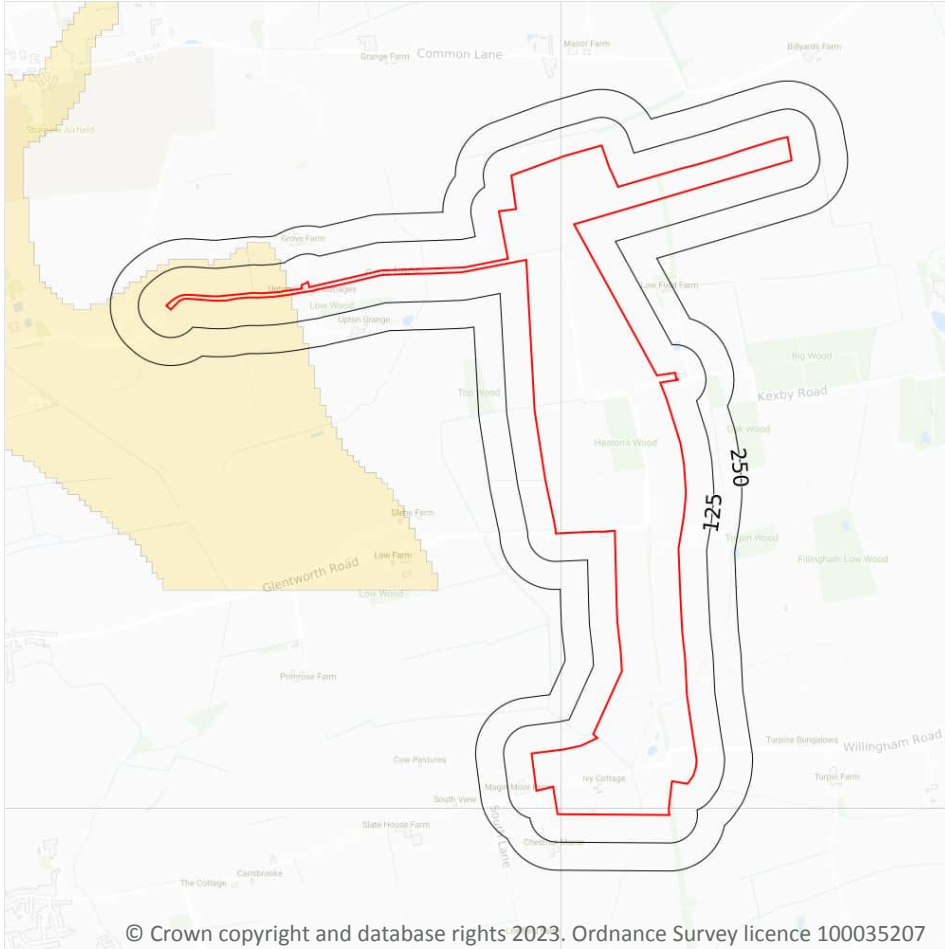
Records within 500m

0

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

*This data is sourced from Stantec UK Ltd.*

## 19 Radon



### 19.1 Radon

#### Records on site

2

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

Features are displayed on the Radon map on **page 97**

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

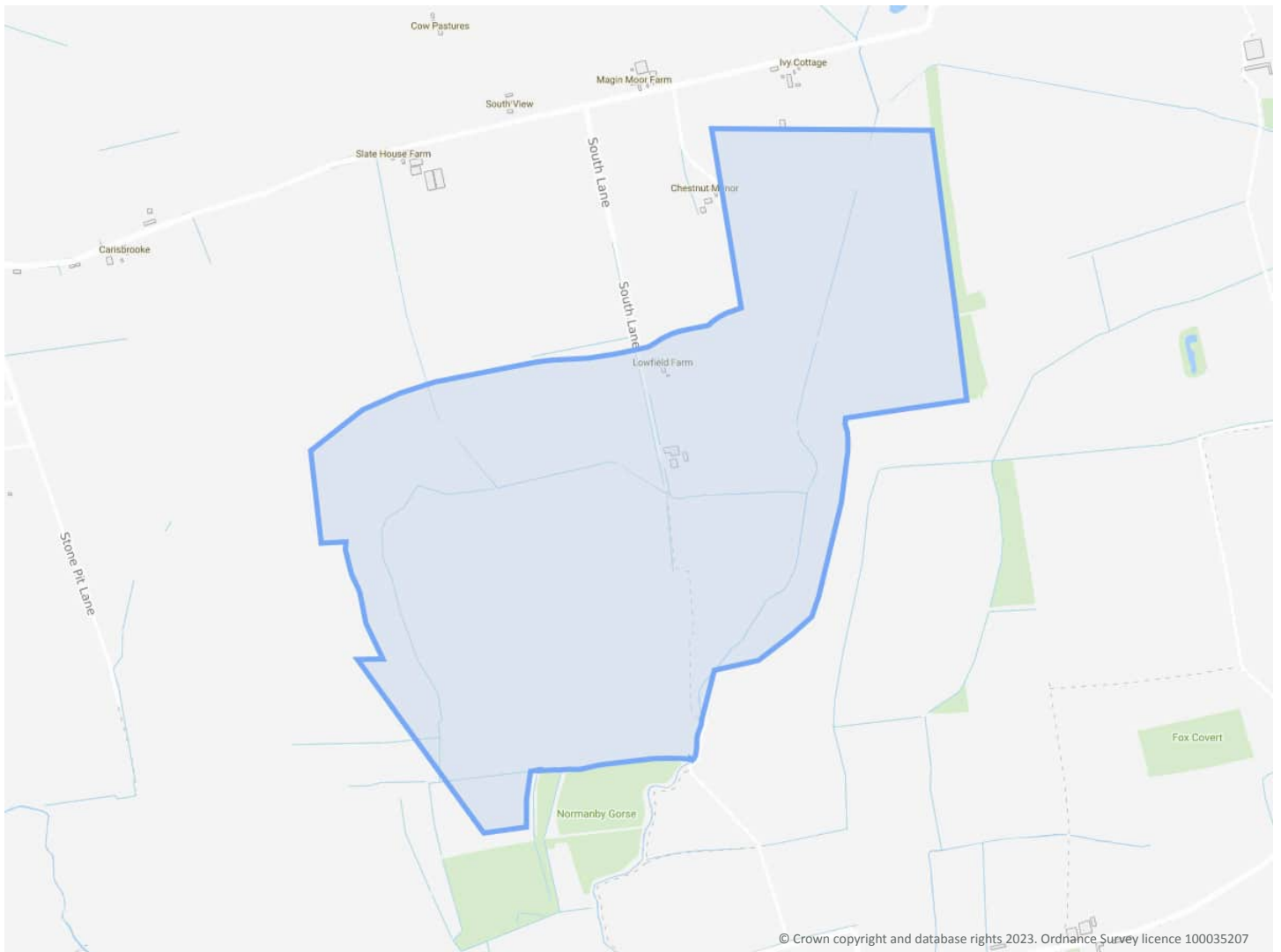
## Tillbridge cable run area

### Order Details

**Date:** 13/02/2023  
**Your ref:** ref 60677969  
**Our Ref:** GSIP-2023-13376-12945\_2

### Site Details

**Location:** 489803 384002  
**Area:** 122.37 ha  
**Authority:** [West Lindsey District Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

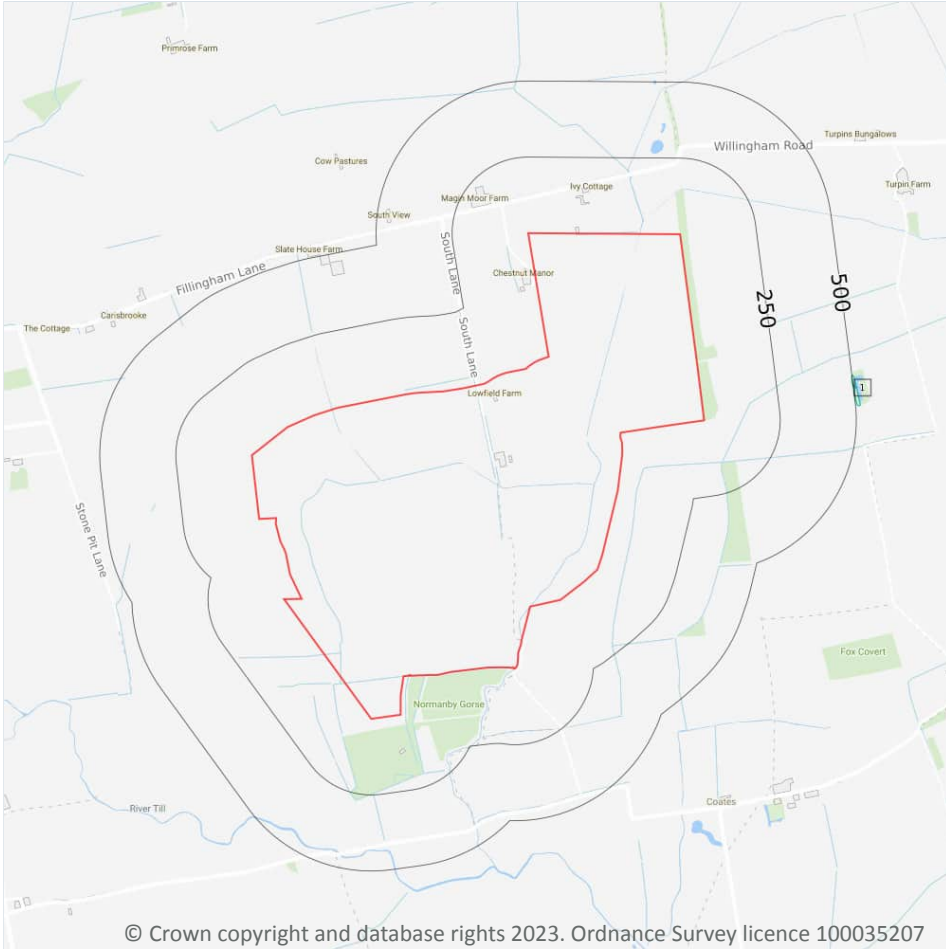
N/A: >10ha

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)


08444 159 000

# 1 Past land use



**— Site Outline**

Search buffers in metres (m)

 **Historical industrial land uses**

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## 1.1 Historical industrial land uses

**Records within 500m**

**1**

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

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

ID	Location	Land use	Dates present	Group ID
1	498m E	Unspecified Heap	1885	1724450

## 2 Past land use - un-grouped



**— Site Outline**

Search buffers in metres (m)

 Historical industrial land uses

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### 2.1 Historical industrial land uses

Records within 500m

2

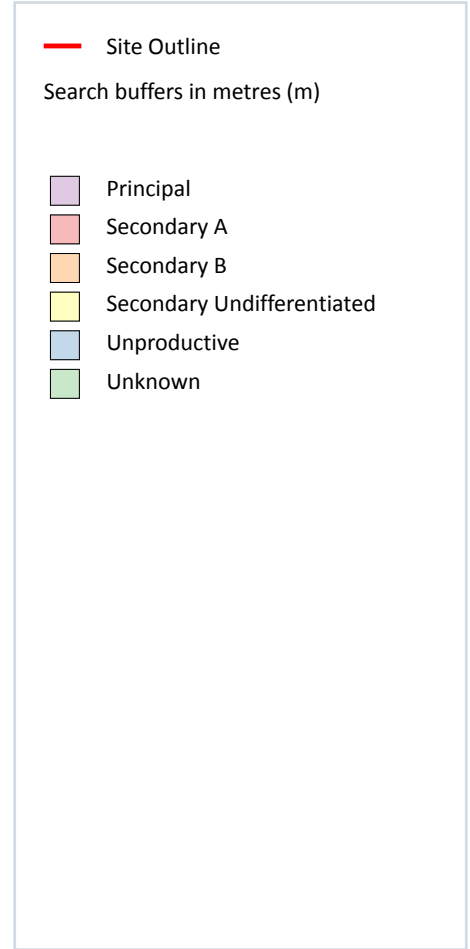
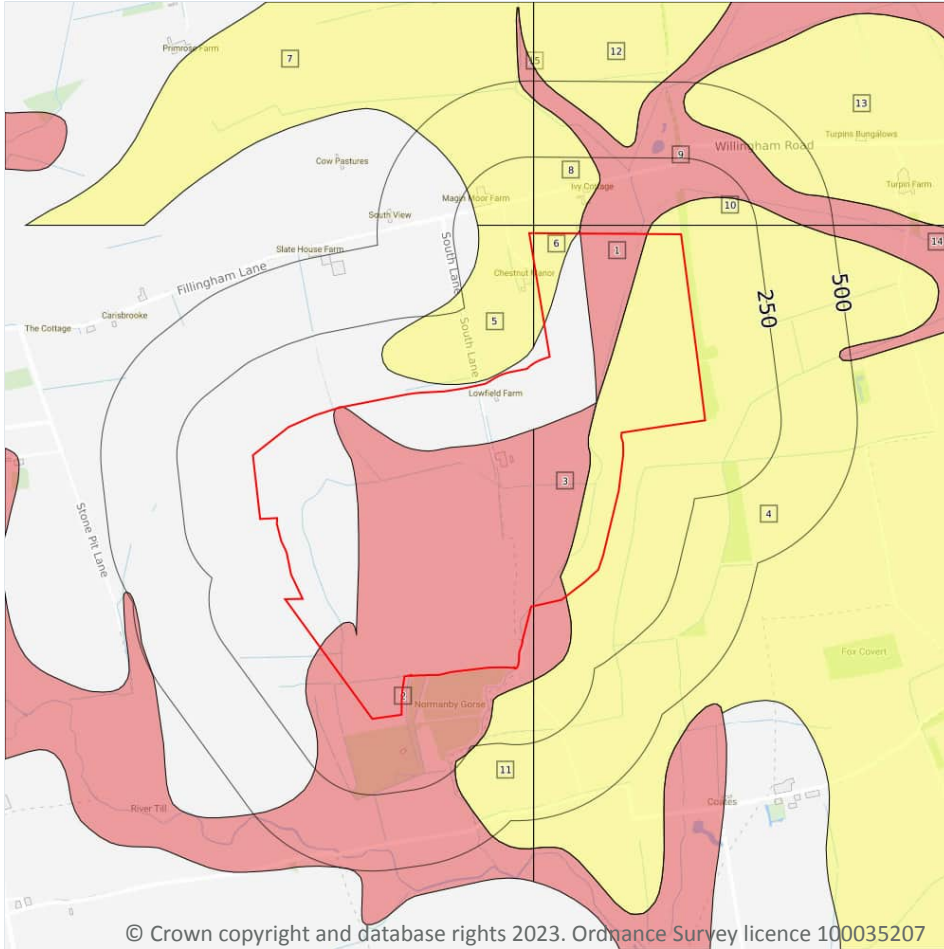
Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group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

Features are displayed on the Past land use - un-grouped map on **page 16**

ID	Location	Land Use	Date	Group ID
A	498m E	Unspecified Heap	1885	1724450
A	498m E	Unspecified Heap	1885	1724450

*This data is sourced from Ordnance Survey / Groundsure.*

## 5 Hydrogeology - Superficial aquifer



### 5.1 Superficial aquifer

Records within 500m

15

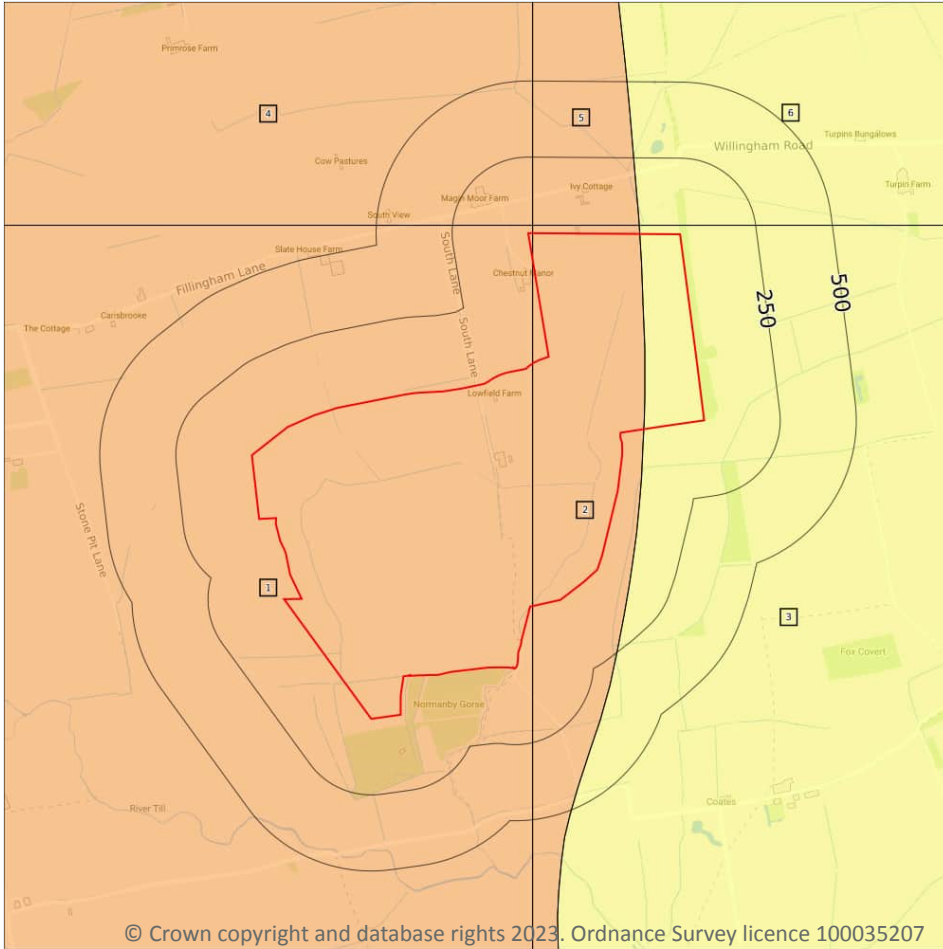
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 25**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	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



## Bedrock aquifer



**— Site Outline**

Search buffers in metres (m)

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

### 5.2 Bedrock aquifer

Records within 500m

6

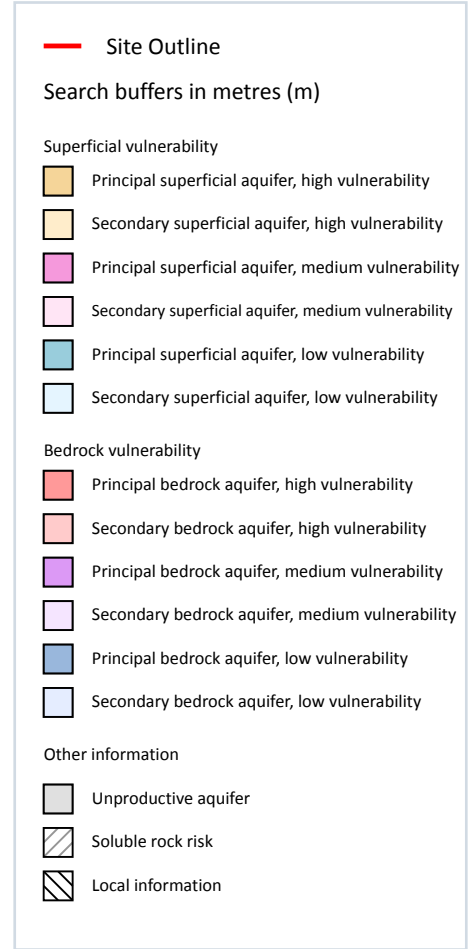
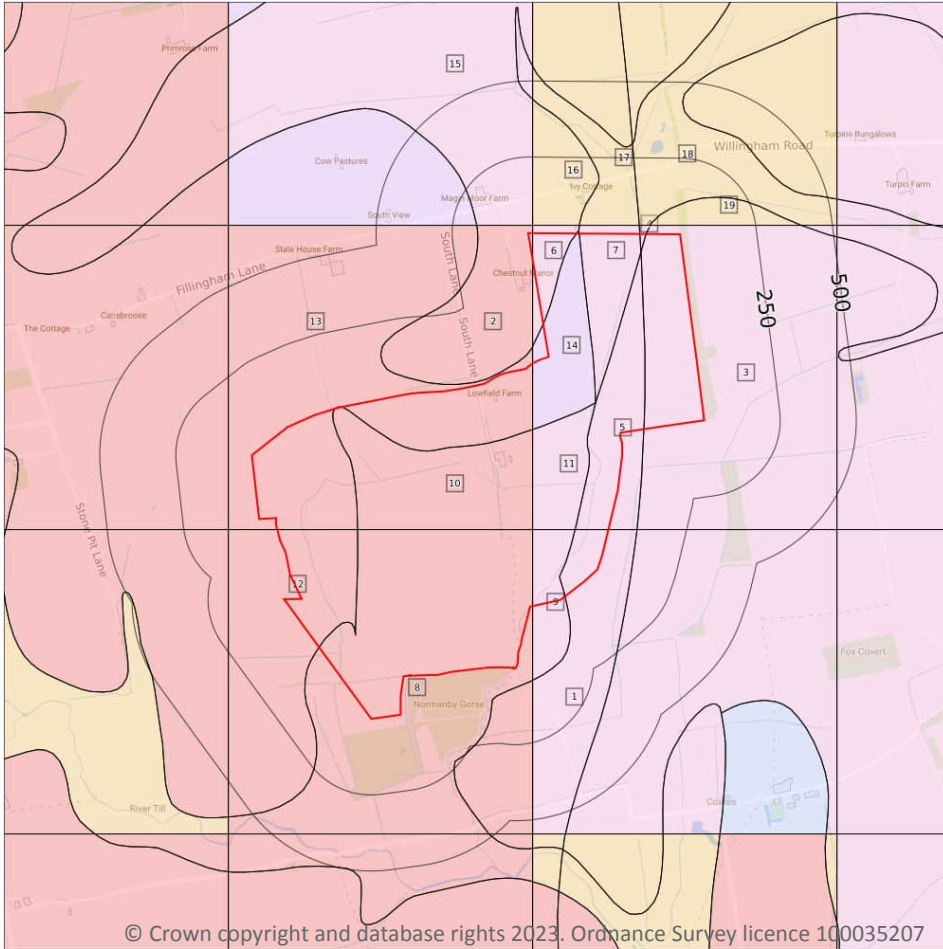
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 27**

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers



## Groundwater vulnerability



### 5.3 Groundwater vulnerability

Records within 50m

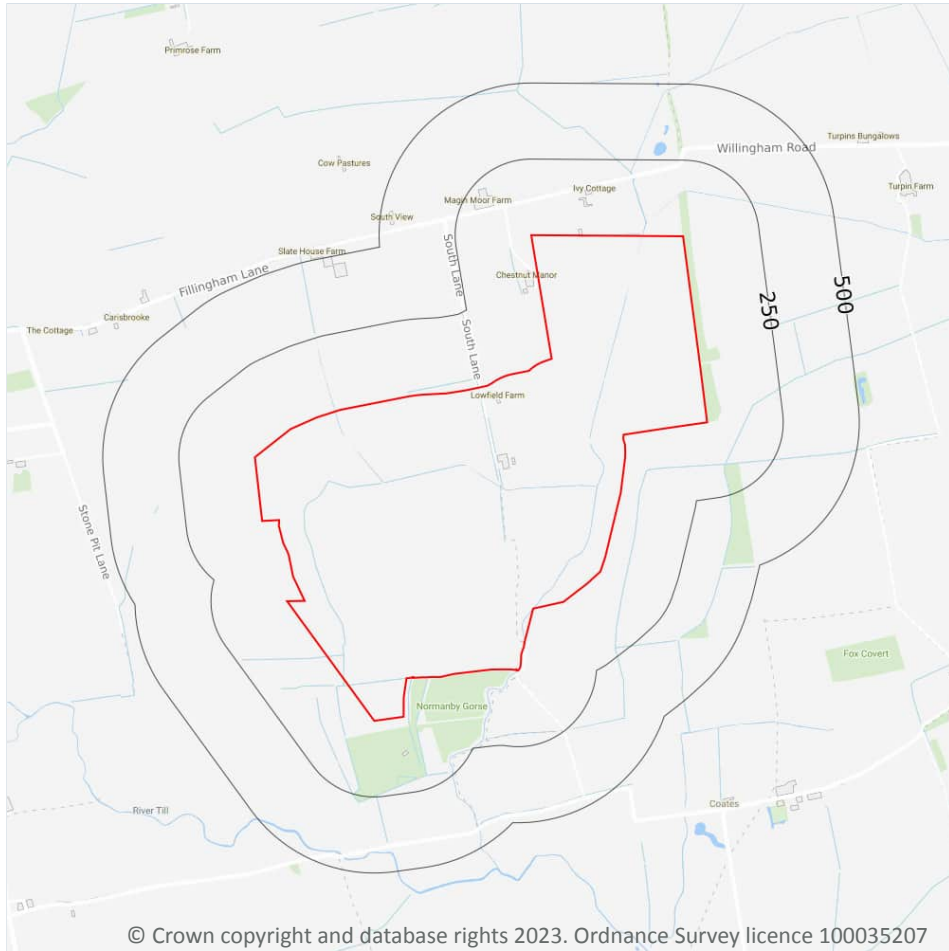
19

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

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

Features are displayed on the Groundwater vulnerability map on **page 29**

## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

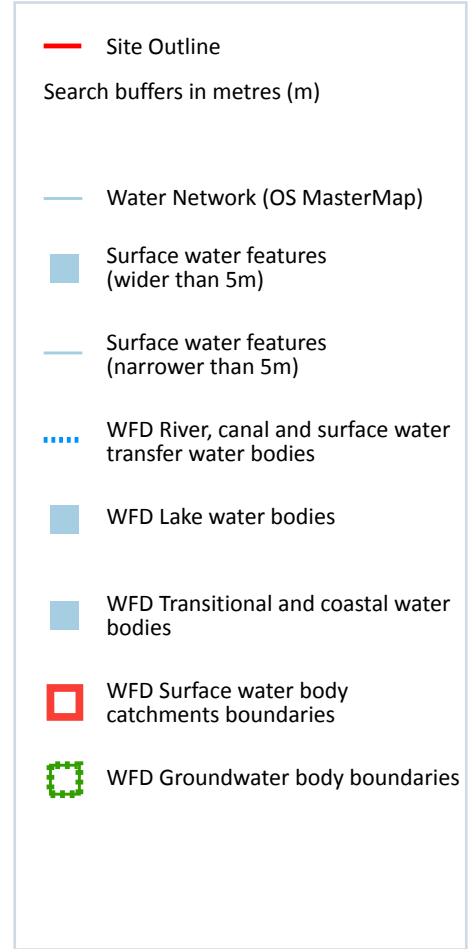
Records within 2000m

0

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

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

## 6 Hydrology



### 6.1 Water Network (OS MasterMap)

Records within 250m

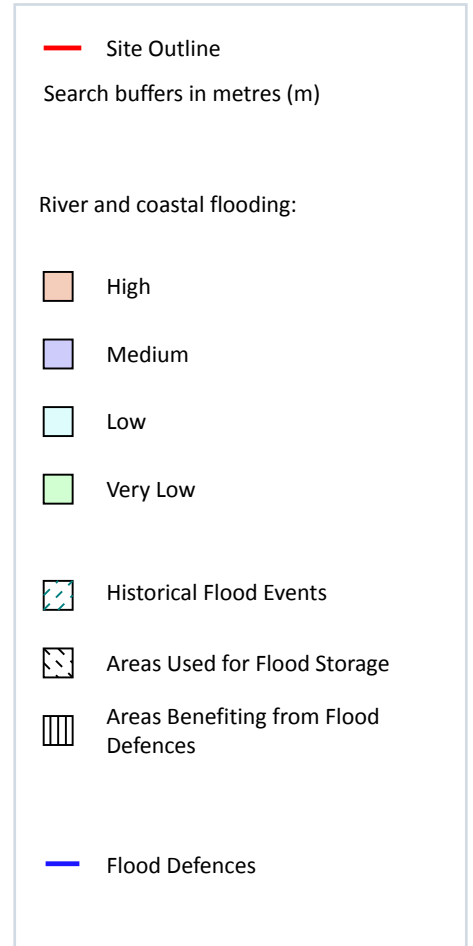
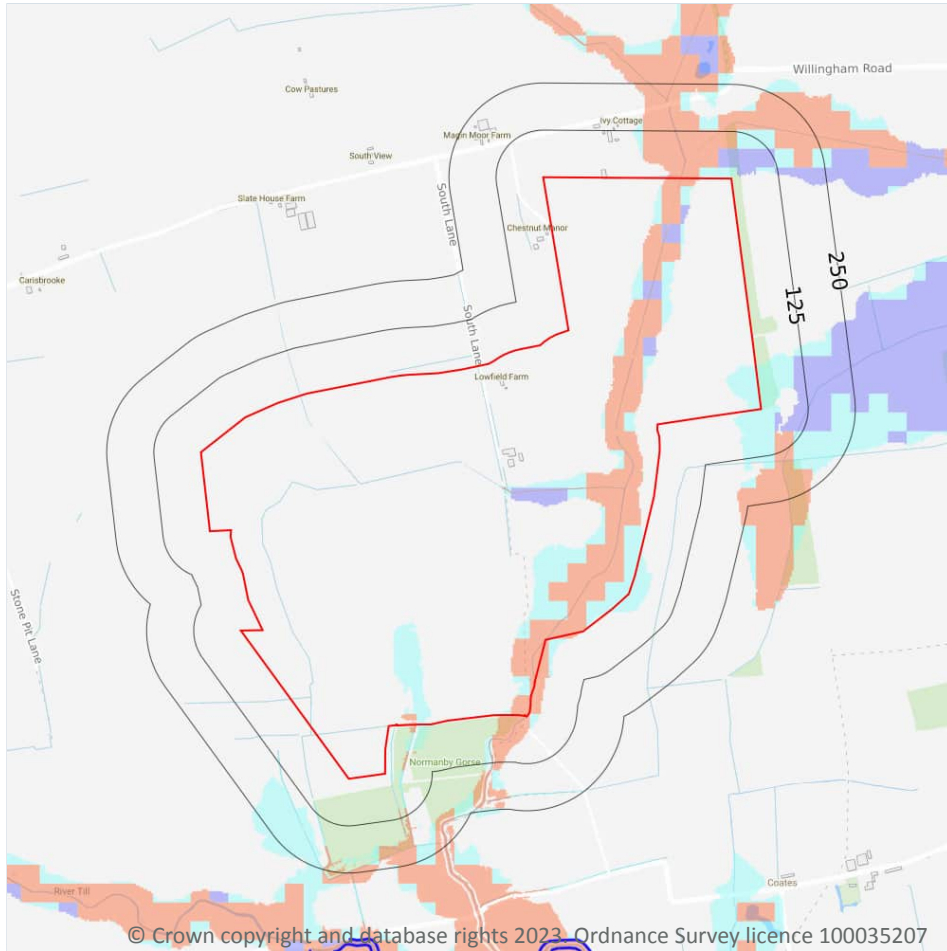
91

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

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

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

## 7 River and coastal flooding



### 7.1 Risk of flooding from rivers and the sea

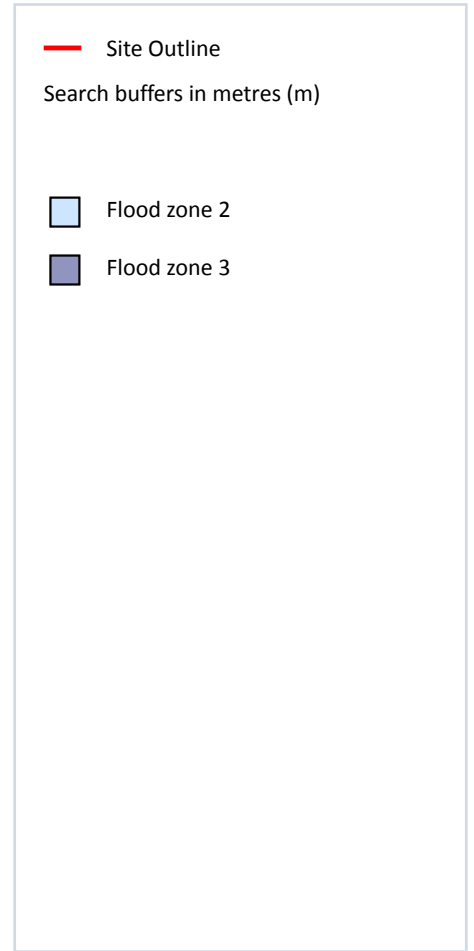
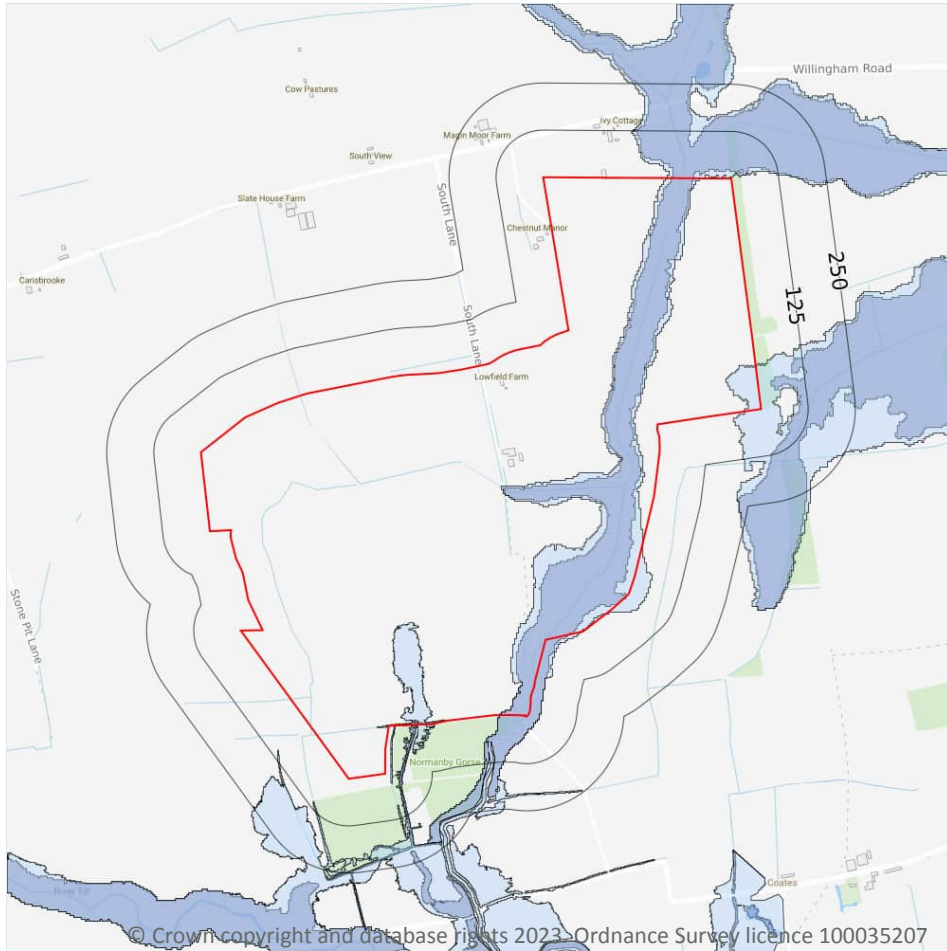
Records within 50m

50

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

Features are displayed on the River and coastal flooding map on **page 47**

## River and coastal flooding - Flood Zones



### 7.6 Flood Zone 2

Records within 50m

1

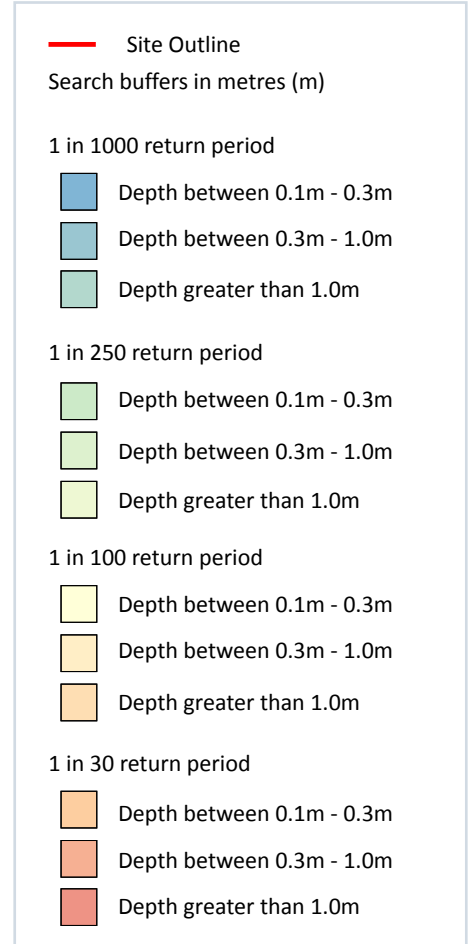
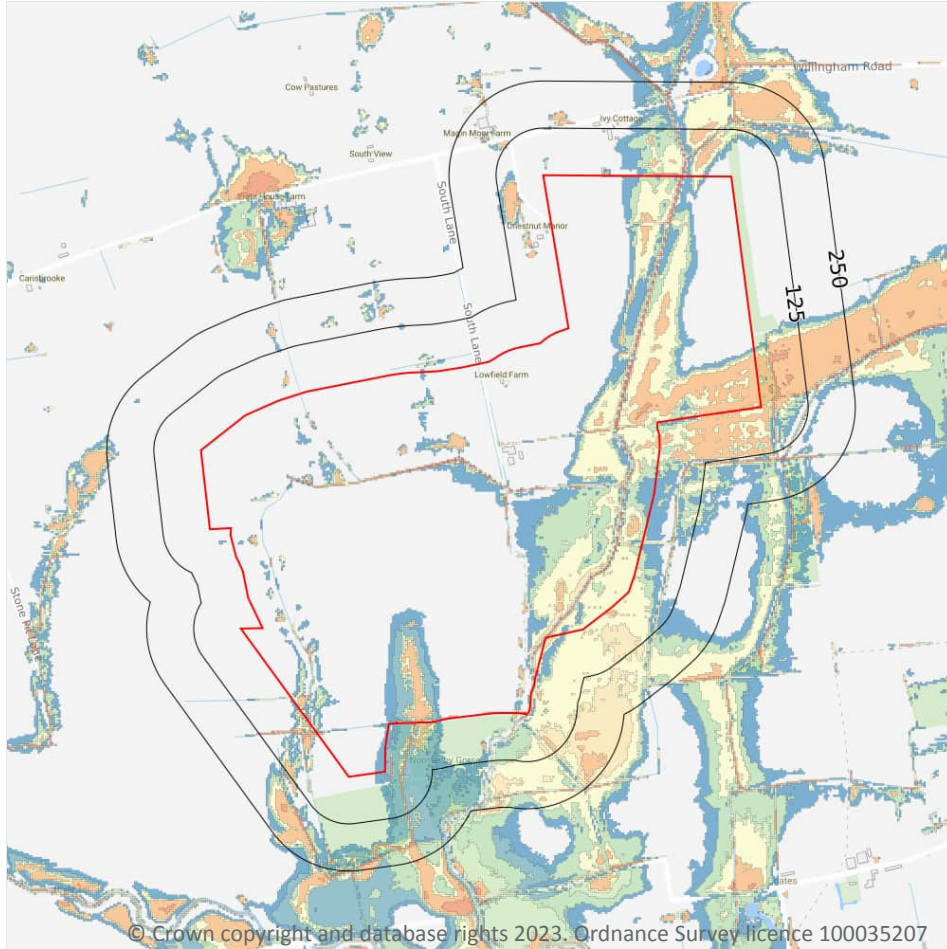
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 47**

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

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

## 8 Surface water flooding



### 8.1 Surface water flooding

Highest risk on site

**1 in 30 year, Greater than 1.0m**

Highest risk within 50m

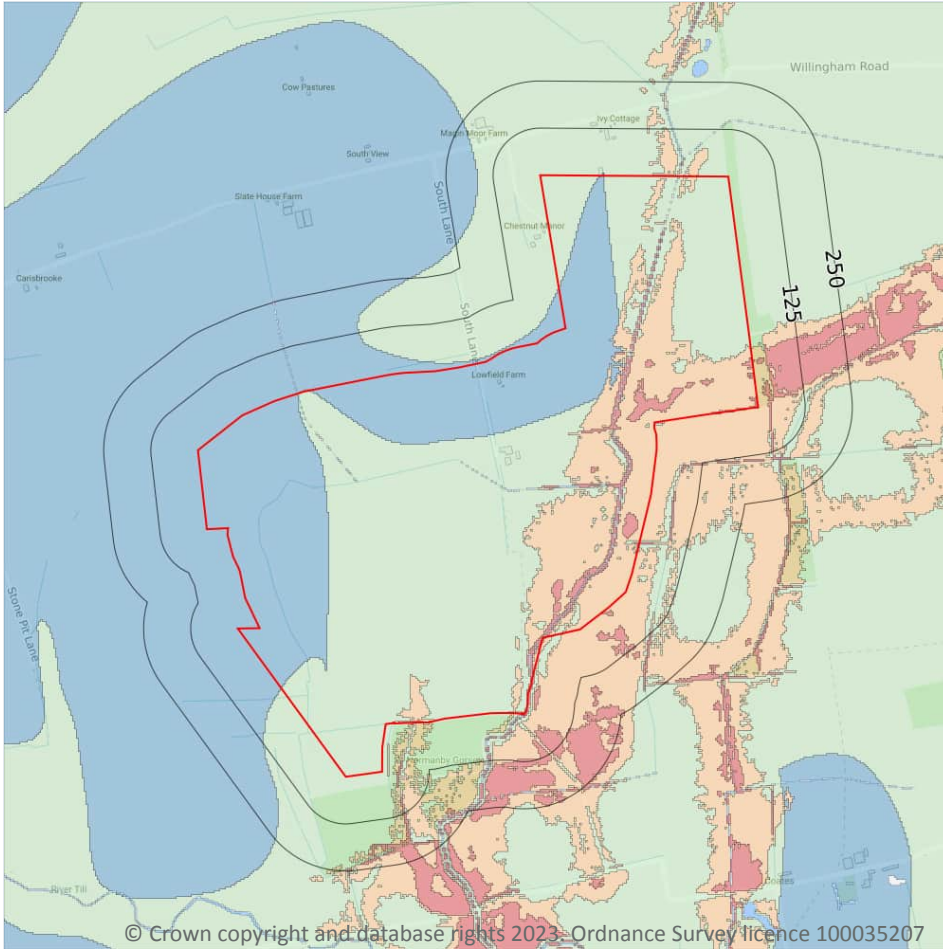
**1 in 30 year, Greater than 1.0m**

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

Features are displayed on the Surface water flooding map on **page 51**

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

## 9 Groundwater flooding



### 9.1 Groundwater flooding

**Highest risk on site**

**High**

**Highest risk within 50m**

**High**

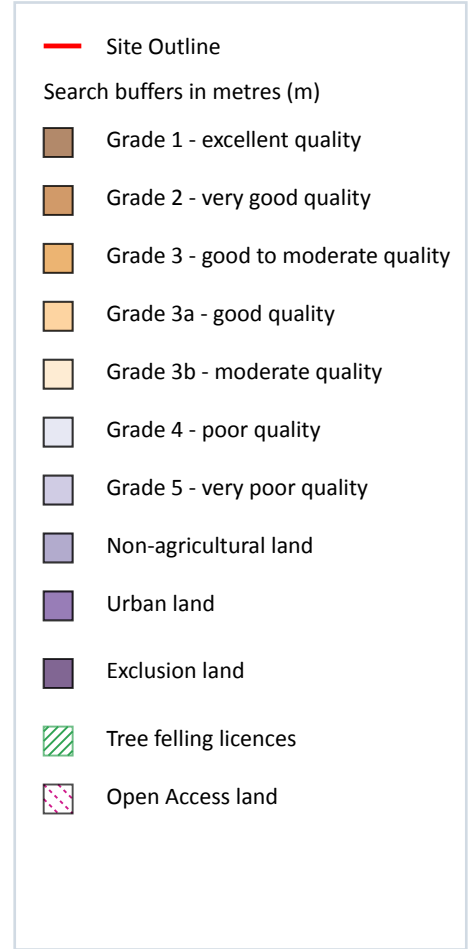
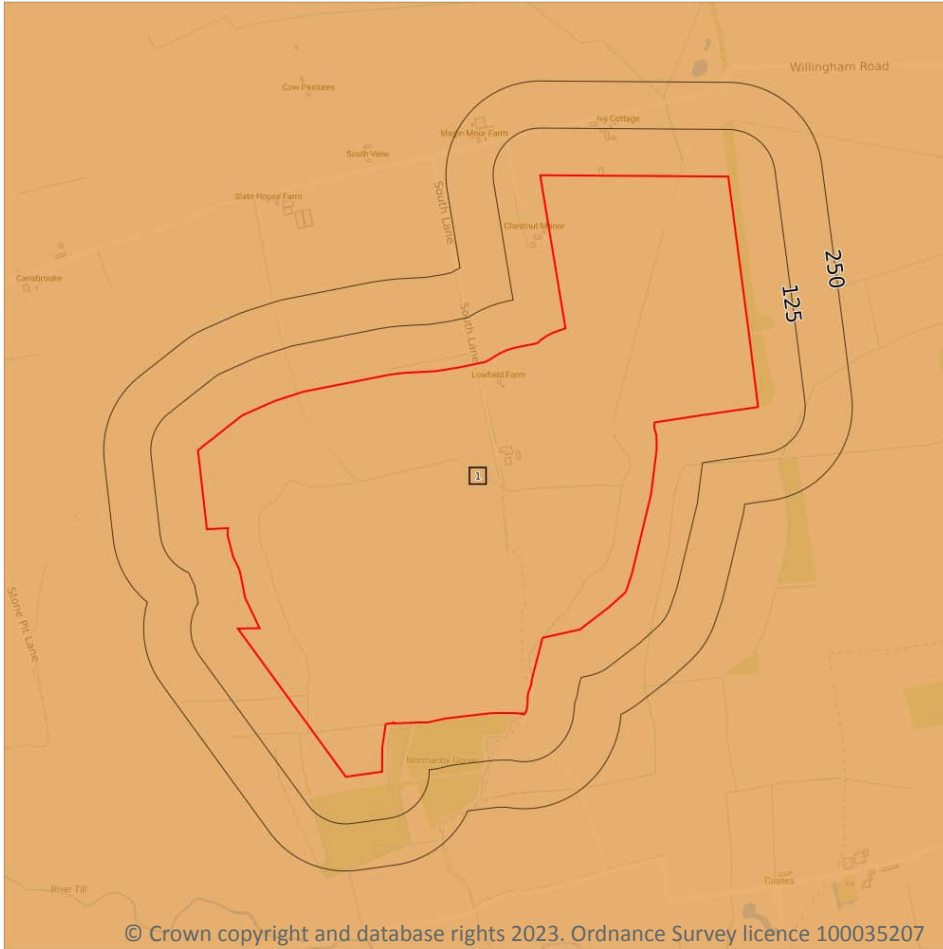
Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks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

Features are displayed on the Groundwater flooding map on **page 53**

*This data is sourced from Ambient Risk Analytics.*



## 12 Agricultural designations



### 12.1 Agricultural Land Classification

Records within 250m

1

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

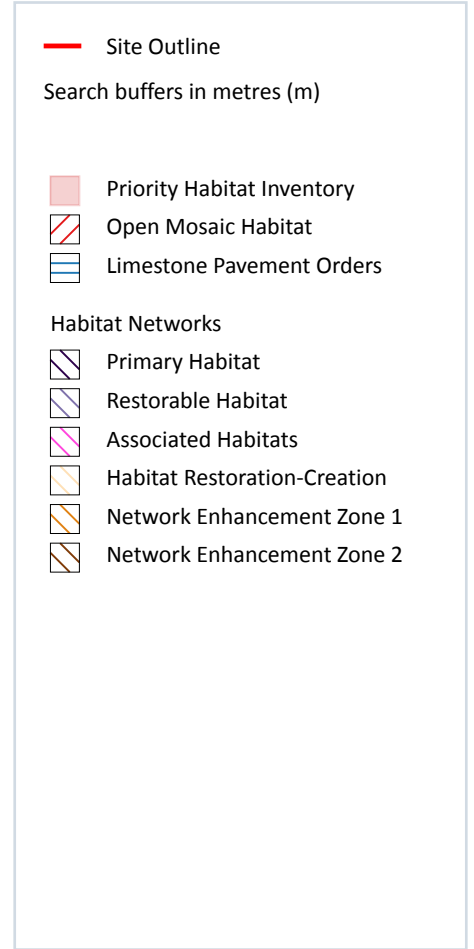
Features are displayed on the Agricultural designations map on **page 61**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

This data is sourced from Natural England.



## 13 Habitat designations



### 13.1 Priority Habitat Inventory

Records within 250m

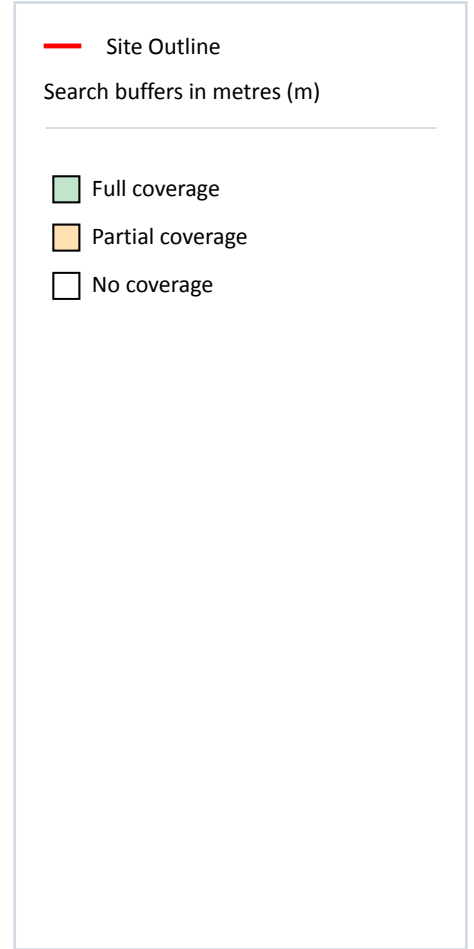
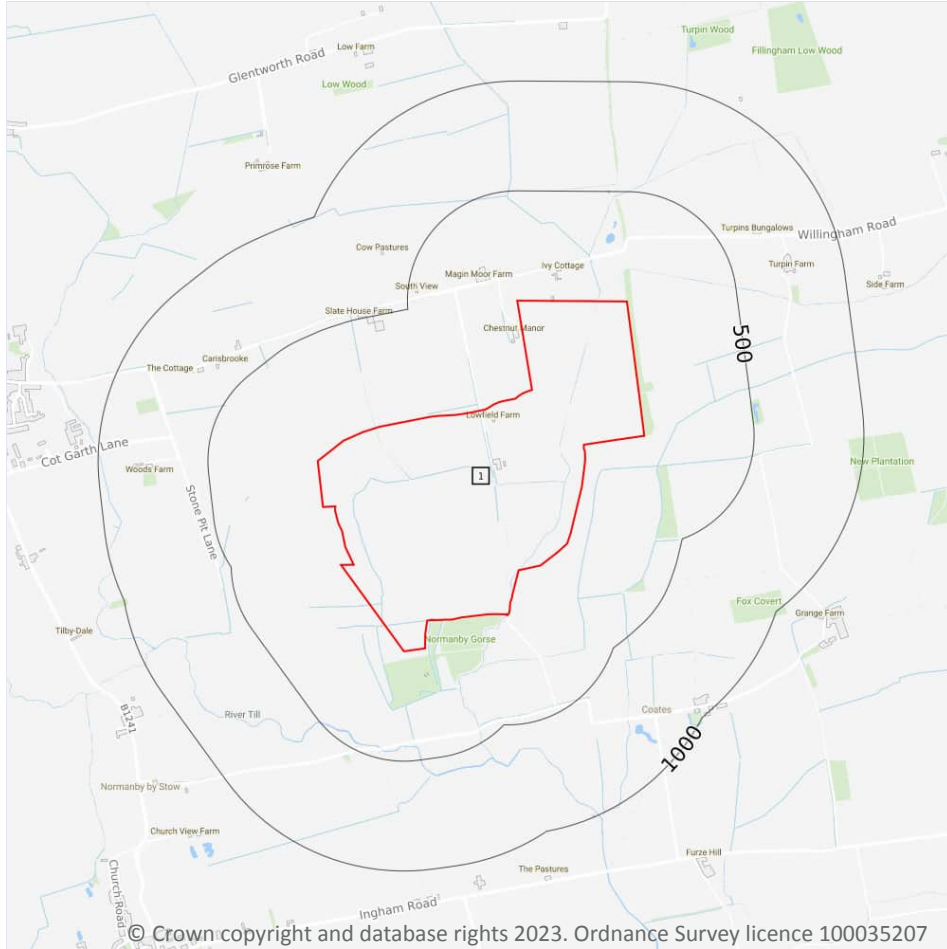
12

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

Features are displayed on the Habitat designations map on **page 64**

ID	Location	Main Habitat	Other habitats
1	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

## 14 Geology 1:10,000 scale - Availability



### 14.1 10k Availability

Records within 500m

1

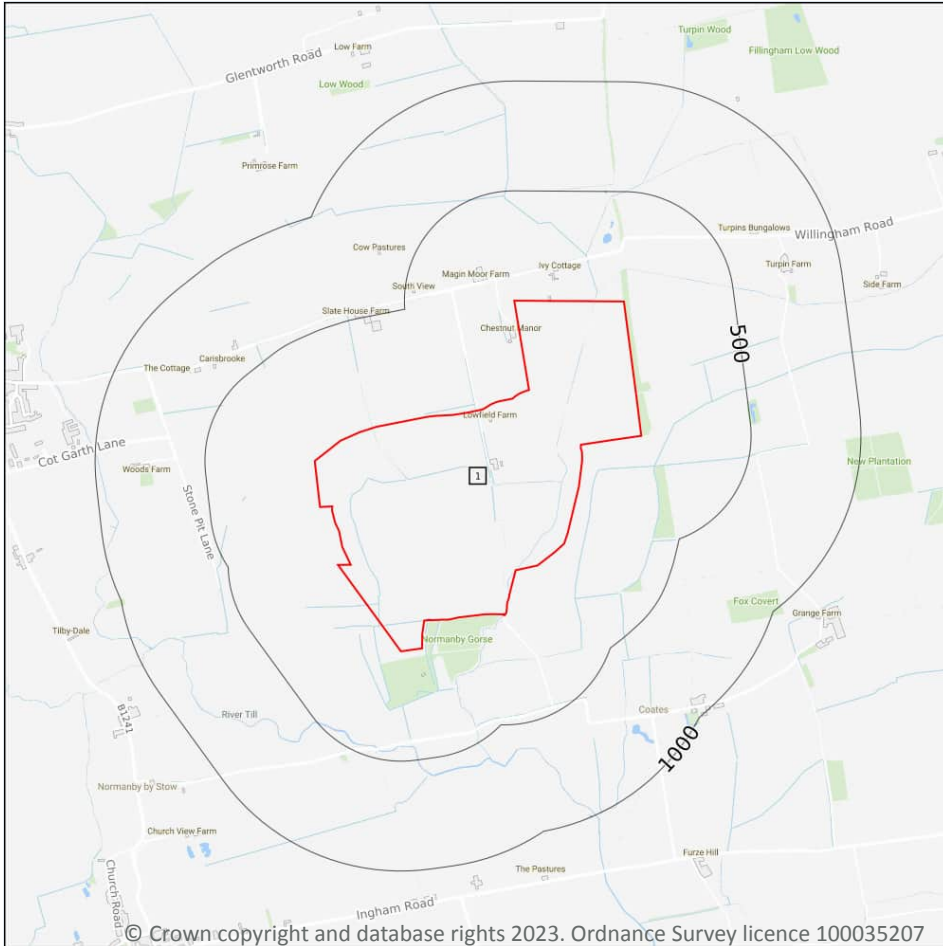
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 67**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

*This data is sourced from the British Geological Survey.*

## 15 Geology 1:50,000 scale - Availability



— Site Outline

Search buffers in metres (m)

---

□ Geological map tile

### 15.1 50k Availability

Records within 500m

1

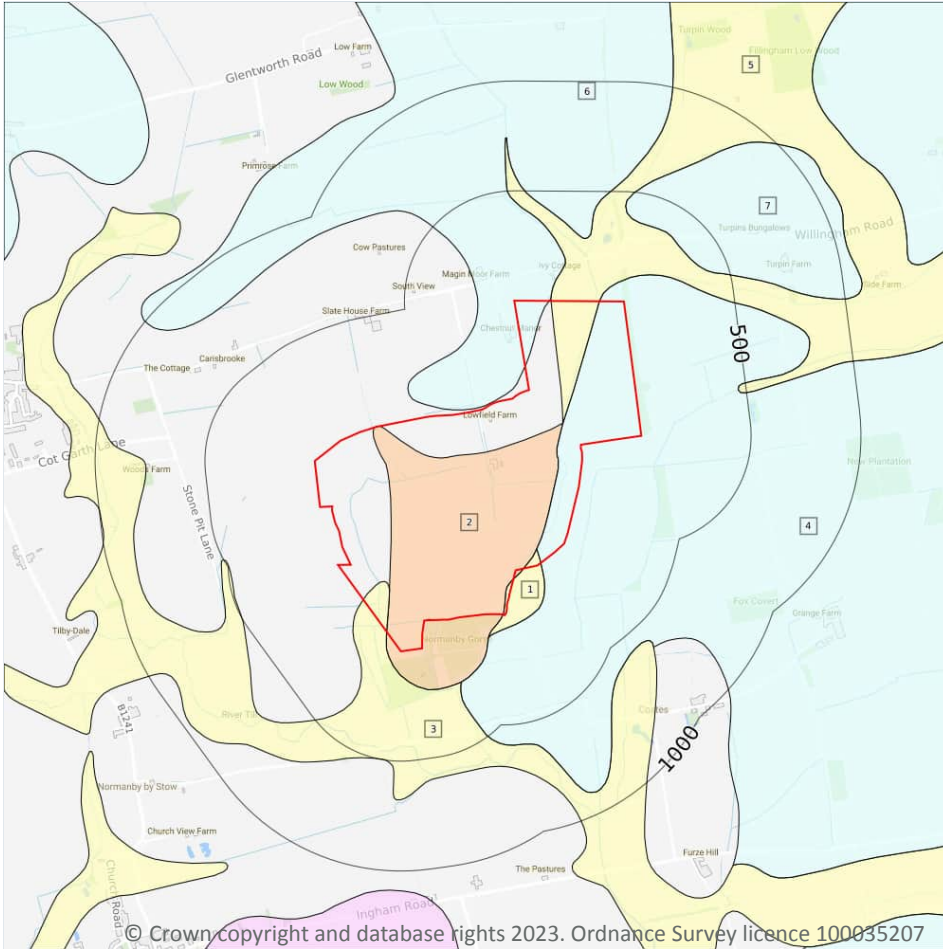
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 71**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW102_market_rasen_v4

*This data is sourced from the British Geological Survey.*

## Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)  
Please see table for more details.

### 15.4 Superficial geology (50k)

Records within 500m

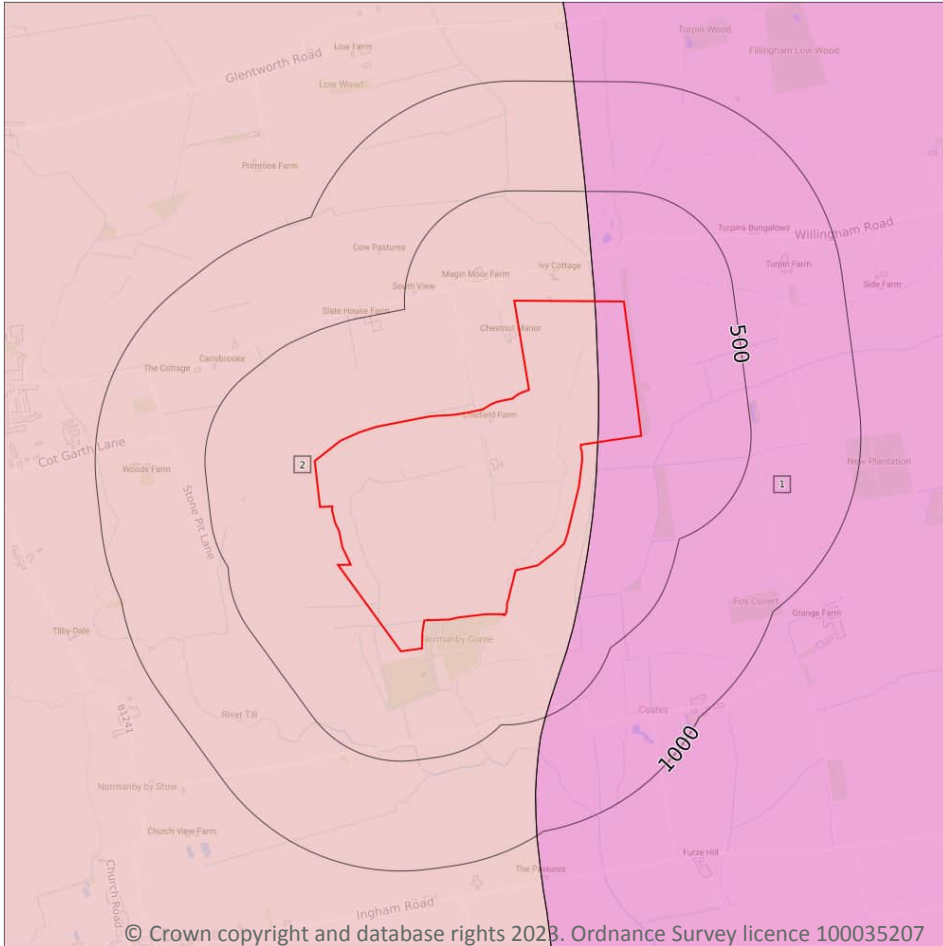
7

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 73**

ID	Location	LEX Code	Description	Rock description
1	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
2	On site	RTDU-XSV	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND AND GRAVEL
3	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

## Geology 1:50,000 scale - Bedrock



**— Site Outline**

Search buffers in metres (m)

**.... Bedrock faults and other linear features (50k)**

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

### 15.8 Bedrock geology (50k)

Records within 500m

2

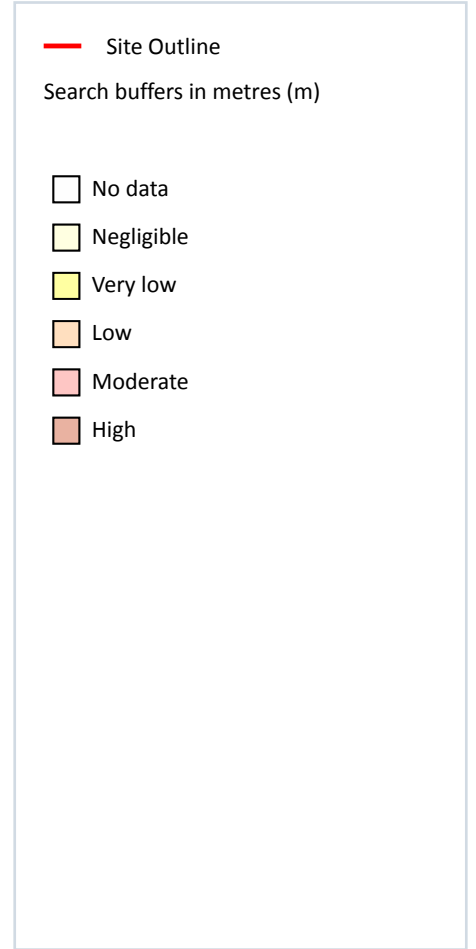
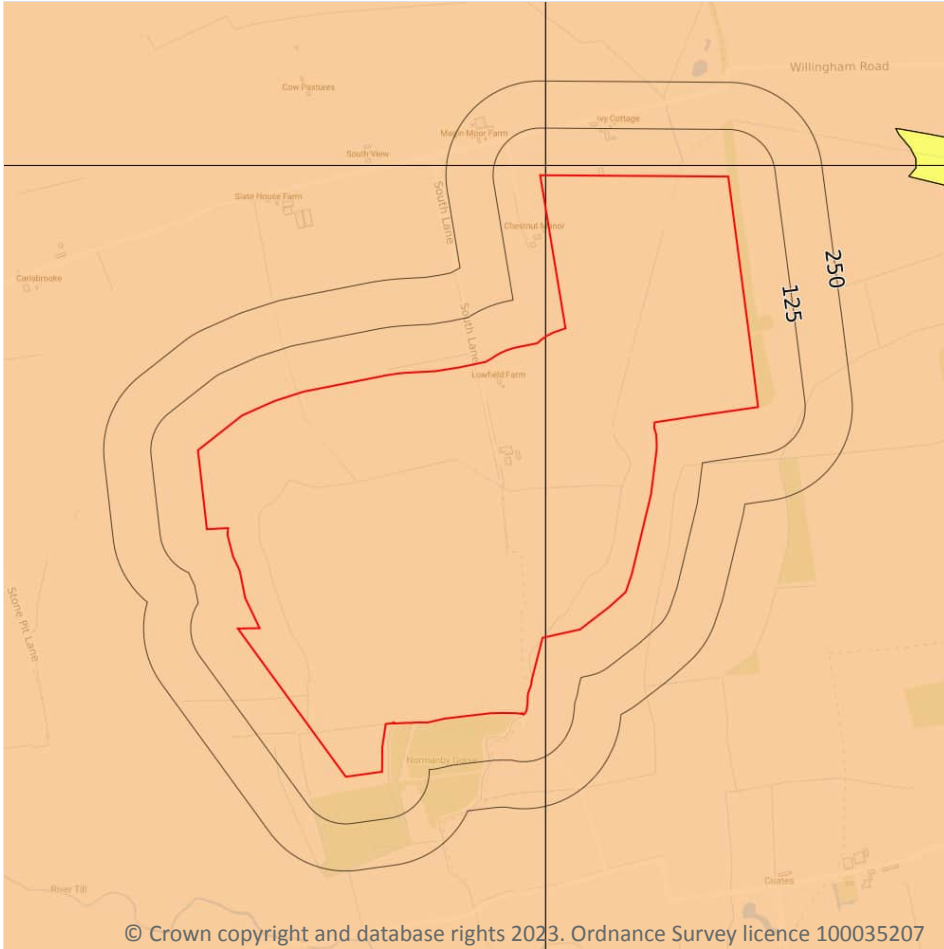
Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 76**

ID	Location	LEX Code	Description	Rock age
1	On site	CHAM-MDST	CHARMOUTH MUDSTONE FORMATION - MUDSTONE	SINEMURIAN
2	On site	SMD-MDLM	SCUNTHORPE MUDSTONE FORMATION - MUDSTONE AND LIMESTONE, INTERBEDDED	RHAETIAN

*This data is sourced from the British Geological Survey.*

## 17 Natural ground subsidence - Shrink swell clays



### 17.1 Shrink swell clays

Records within 50m

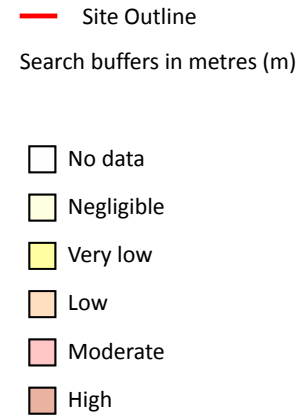
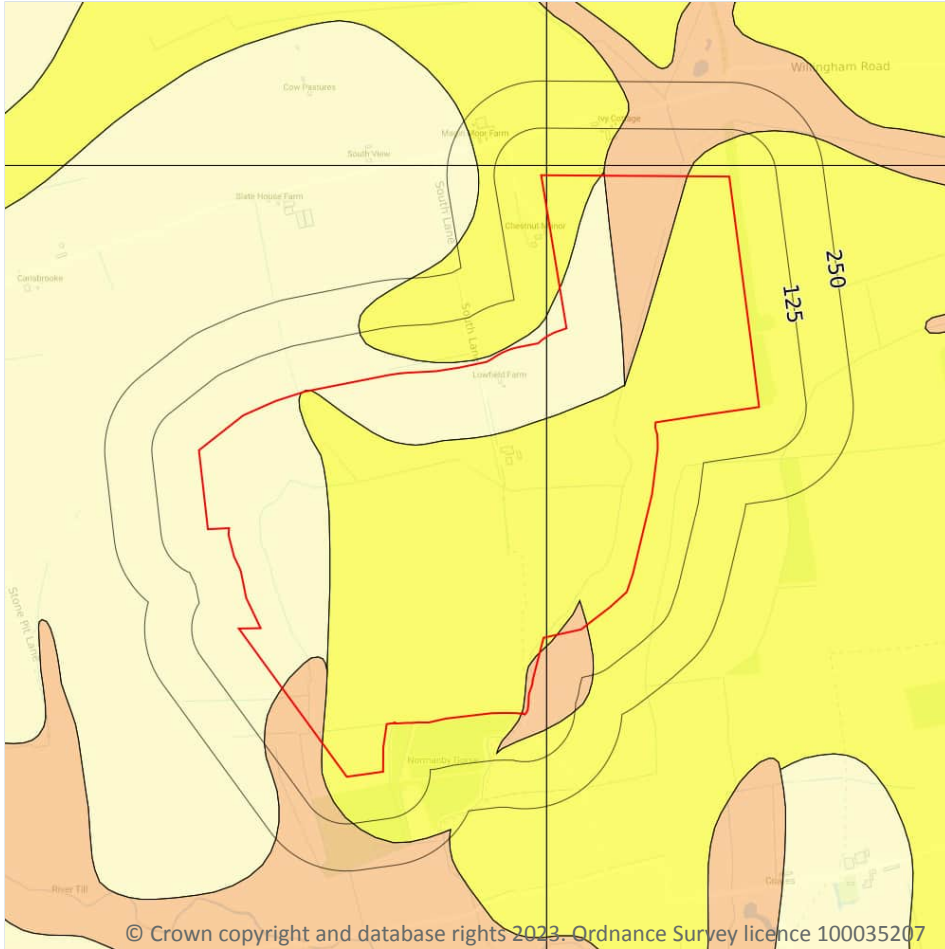
3

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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 79**

Location	Hazard rating	Details
On site	Low	Ground conditions predominantly medium plasticity.
26m N	Low	Ground conditions predominantly medium plasticity.
26m N	Low	Ground conditions predominantly medium plasticity.

## Natural ground subsidence - Running sands



### 17.2 Running sands

Records within 50m

7

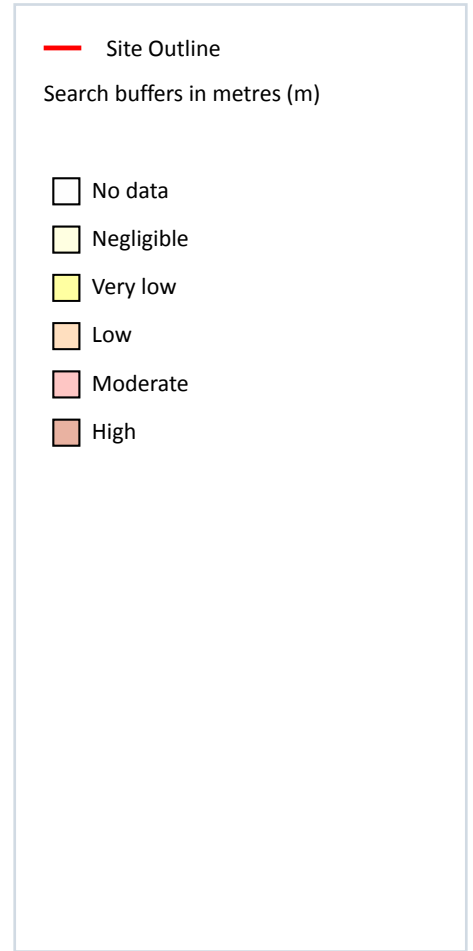
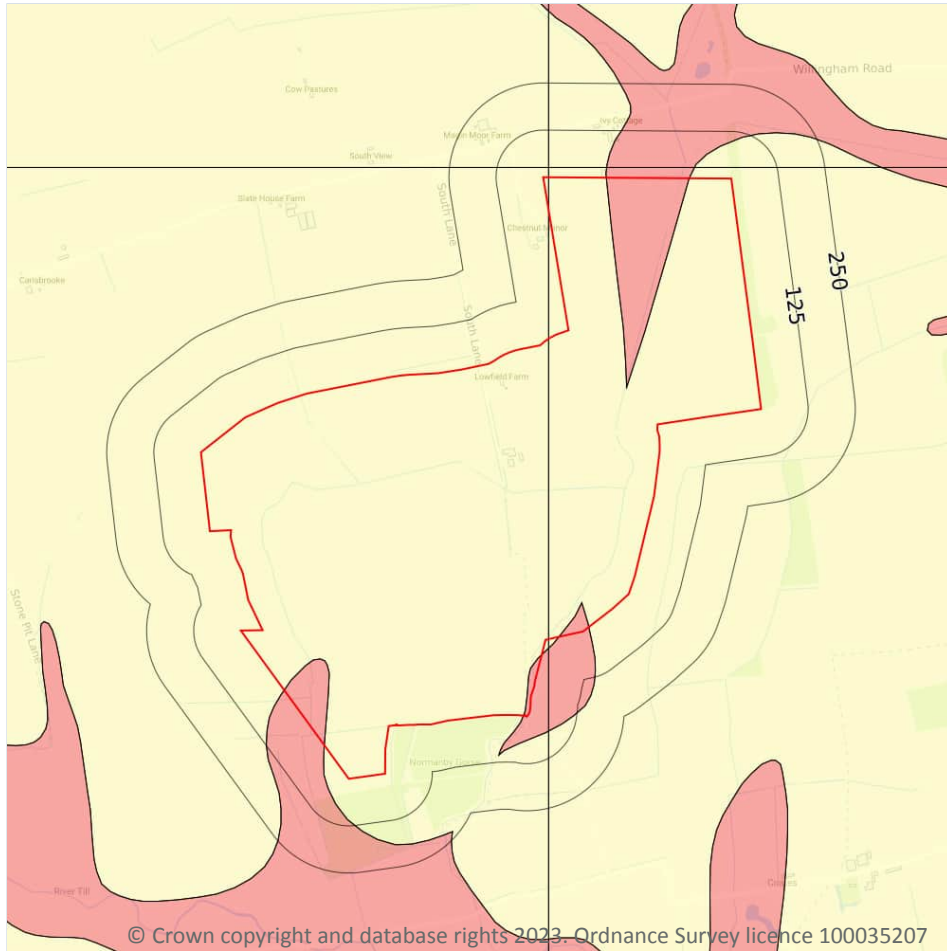
The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 81**

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



## Natural ground subsidence - Compressible deposits



### 17.3 Compressible deposits

Records within 50m

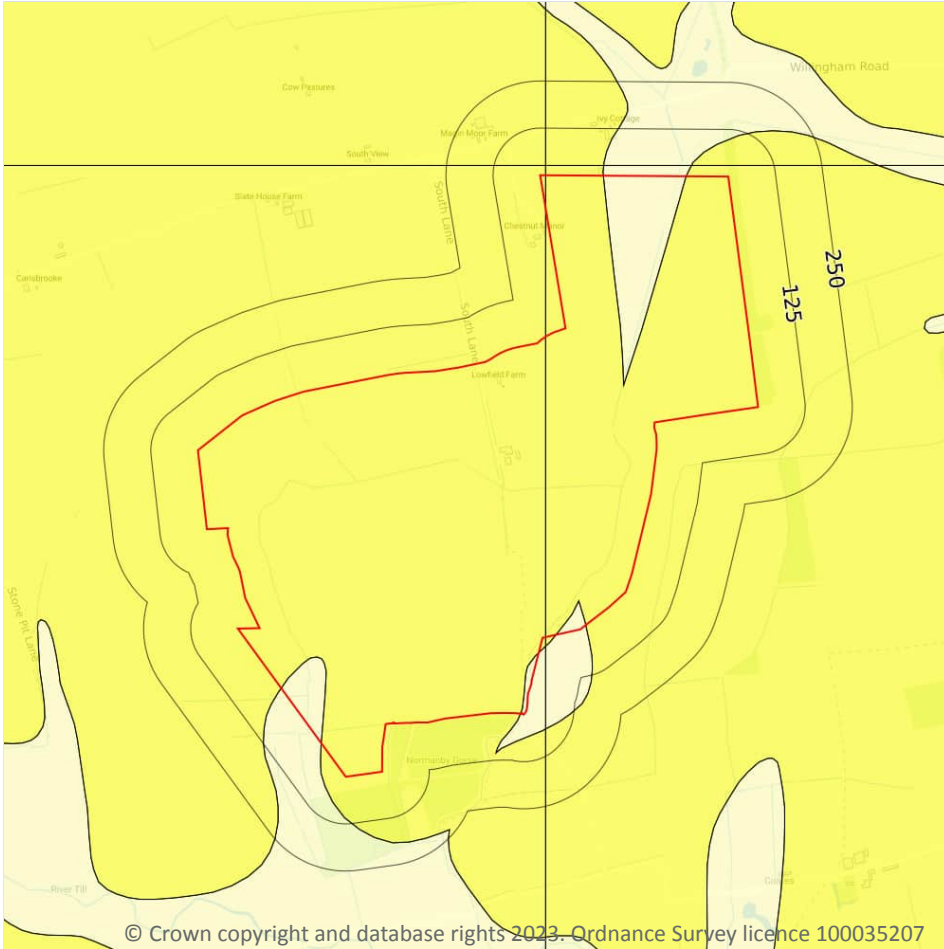
6

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 83**

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

## Natural ground subsidence - Collapsible deposits



### 17.4 Collapsible deposits

Records within 50m

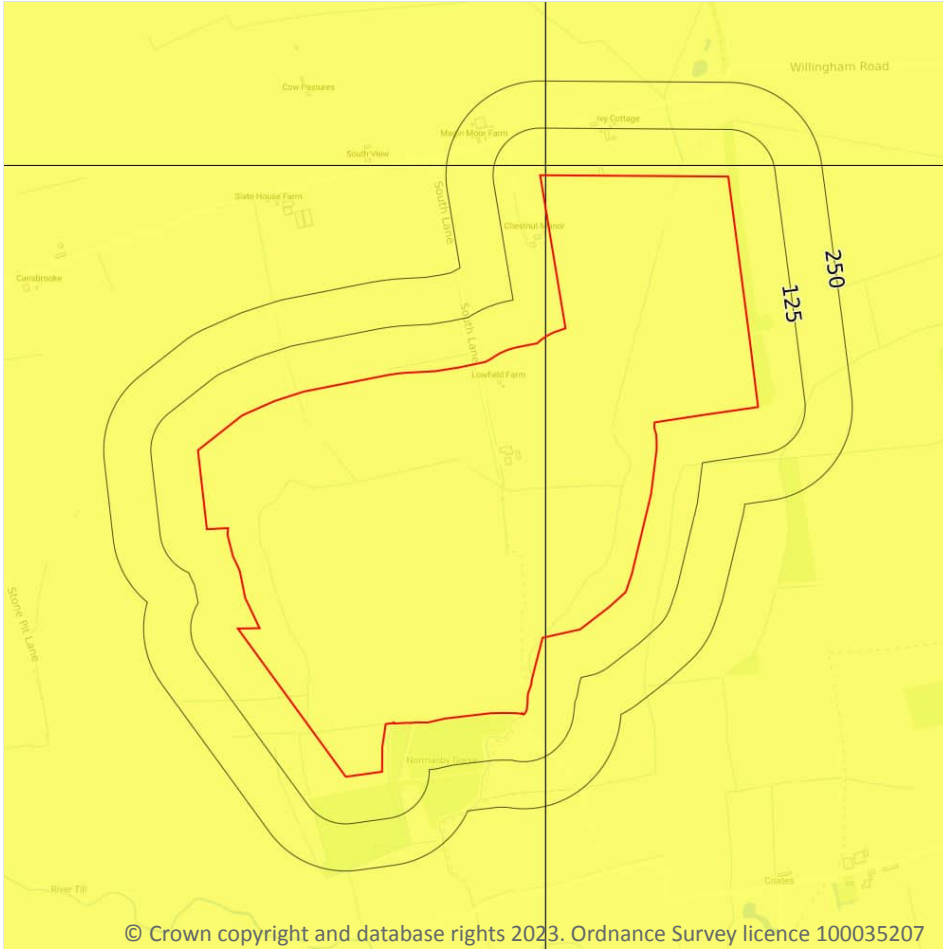
6

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

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 85**

Location	Hazard rating	Details
On site	Negligible	Deposits with potential to collapse when loaded and saturated are believed not to be present.
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
26m N	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

## Natural ground subsidence - Landslides



— Site Outline

Search buffers in metres (m)

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

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### 17.5 Landslides

Records within 50m

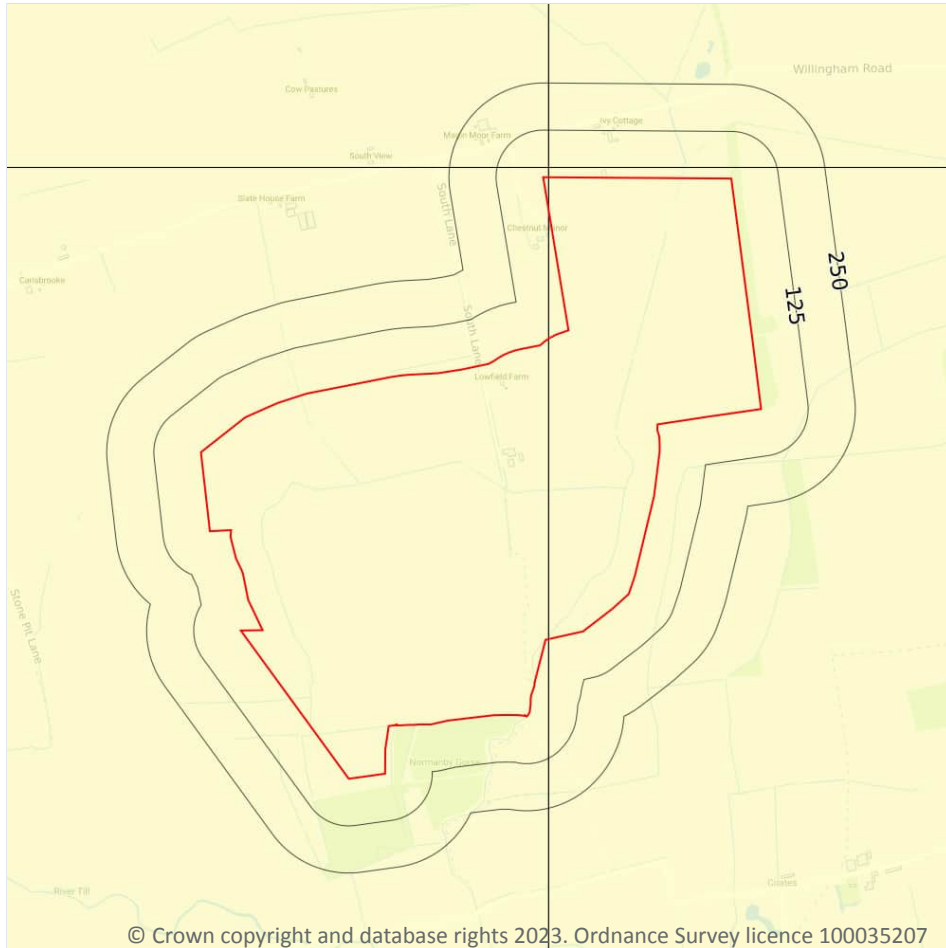
3

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

Features are displayed on the Natural ground subsidence - Landslides map on **page 87**

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

## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

Records within 50m

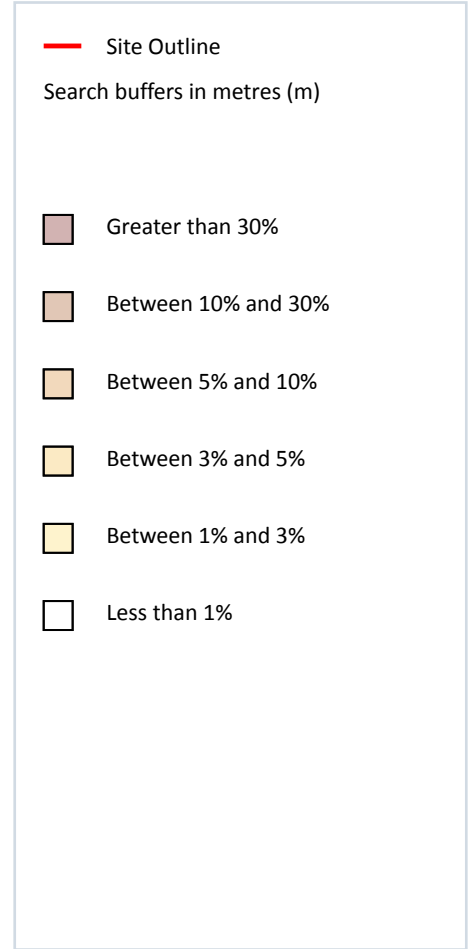
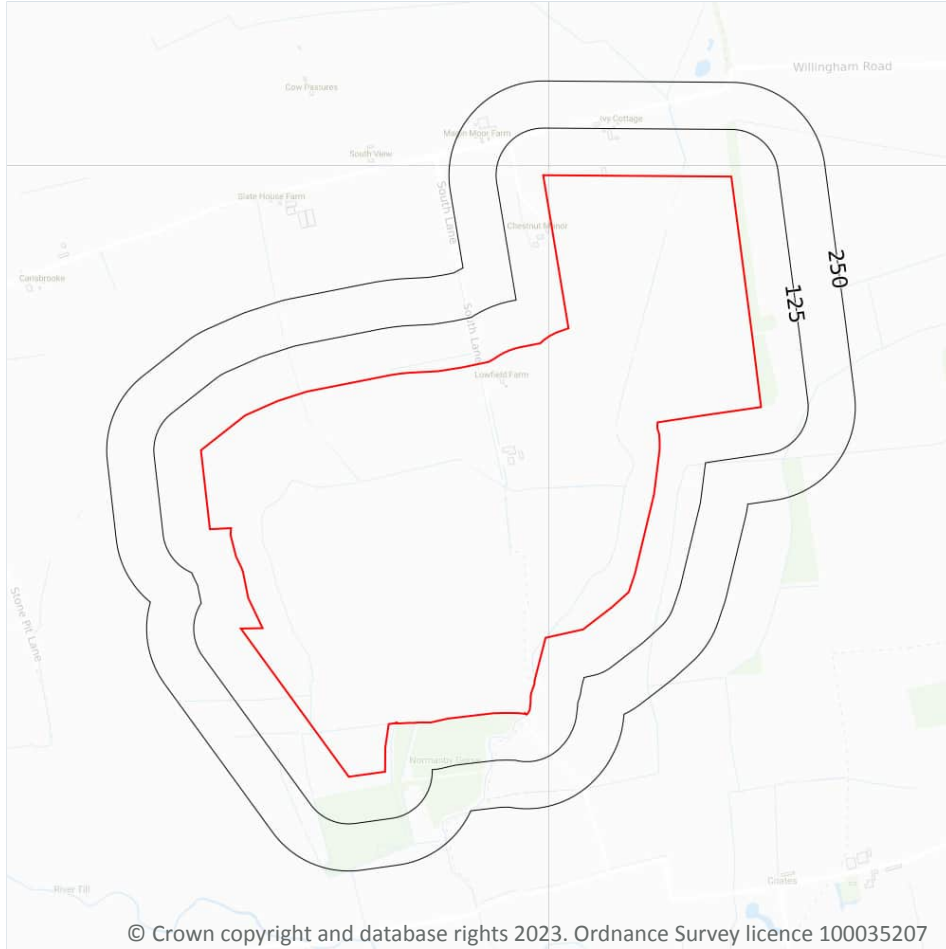
3

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

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 89**

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

## 19 Radon



### 19.1 Radon

#### Records on site

1

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

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

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None

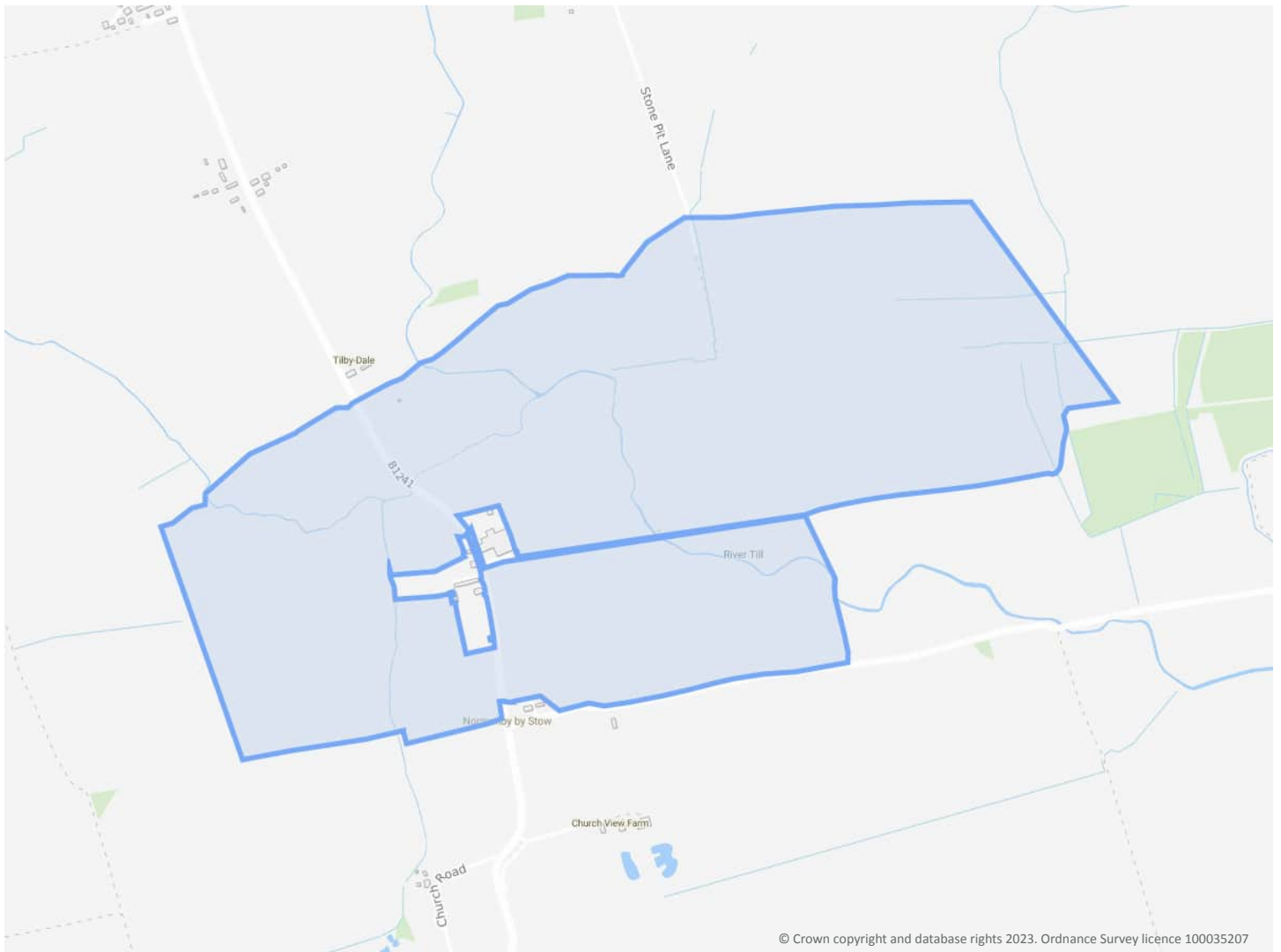
## Tillbridge cable run area

### Order Details

**Date:** 14/02/2023  
**Your ref:** ref 60677969  
**Our Ref:** GSIP-2023-13376-12945\_3

### Site Details

**Location:** 488426 383130  
**Area:** 118.49 ha  
**Authority:** [West Lindsey District Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

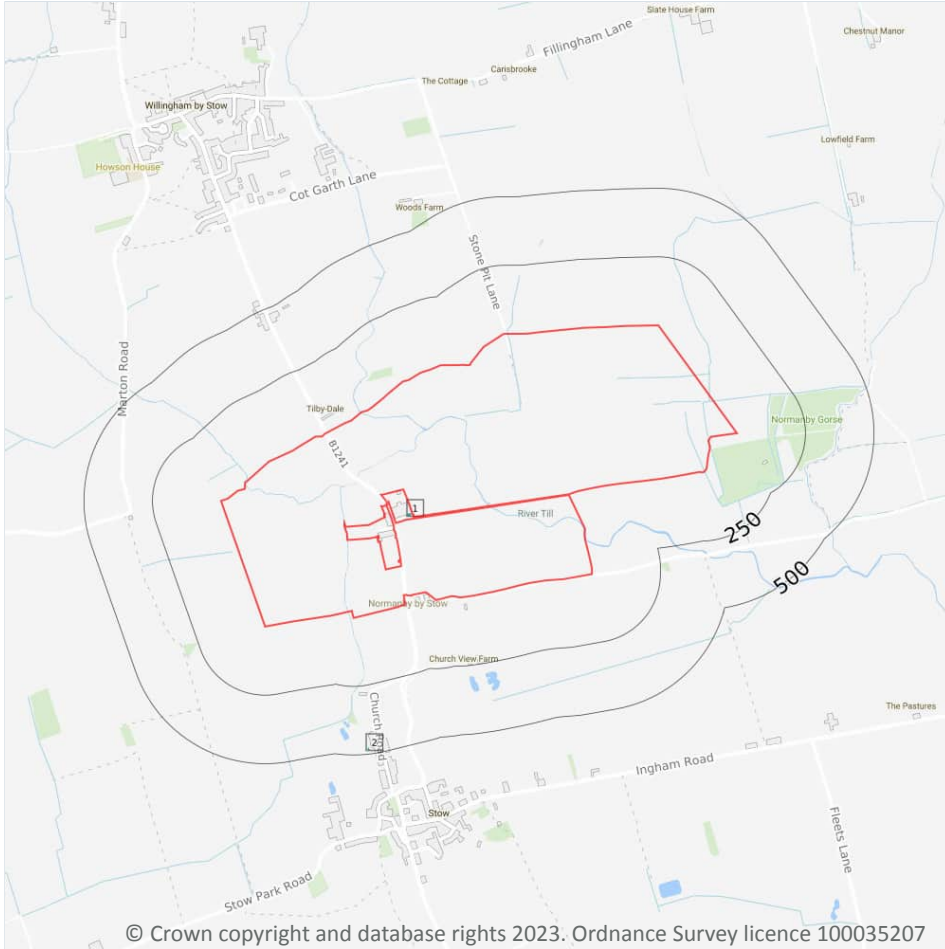
N/A: >10ha

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000

# 1 Past land use



**Site Outline**

**Search buffers in metres (m)**

**Historical industrial land uses**

## 1.1 Historical industrial land uses

Records within 500m

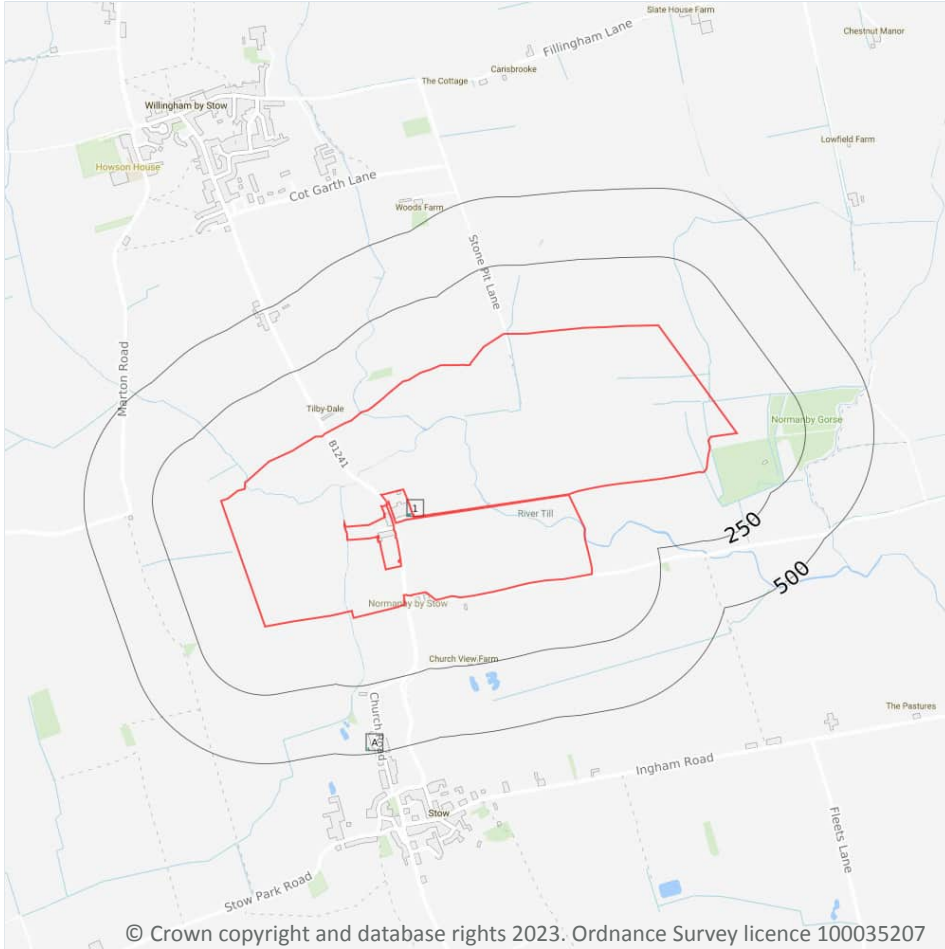
2

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

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

ID	Location	Land use	Dates present	Group ID
1	7m SW	Smithy	1885	1612896

## 2 Past land use - un-grouped



— Site Outline

Search buffers in metres (m)

Historical industrial land uses

### 2.1 Historical industrial land uses

Records within 500m

3

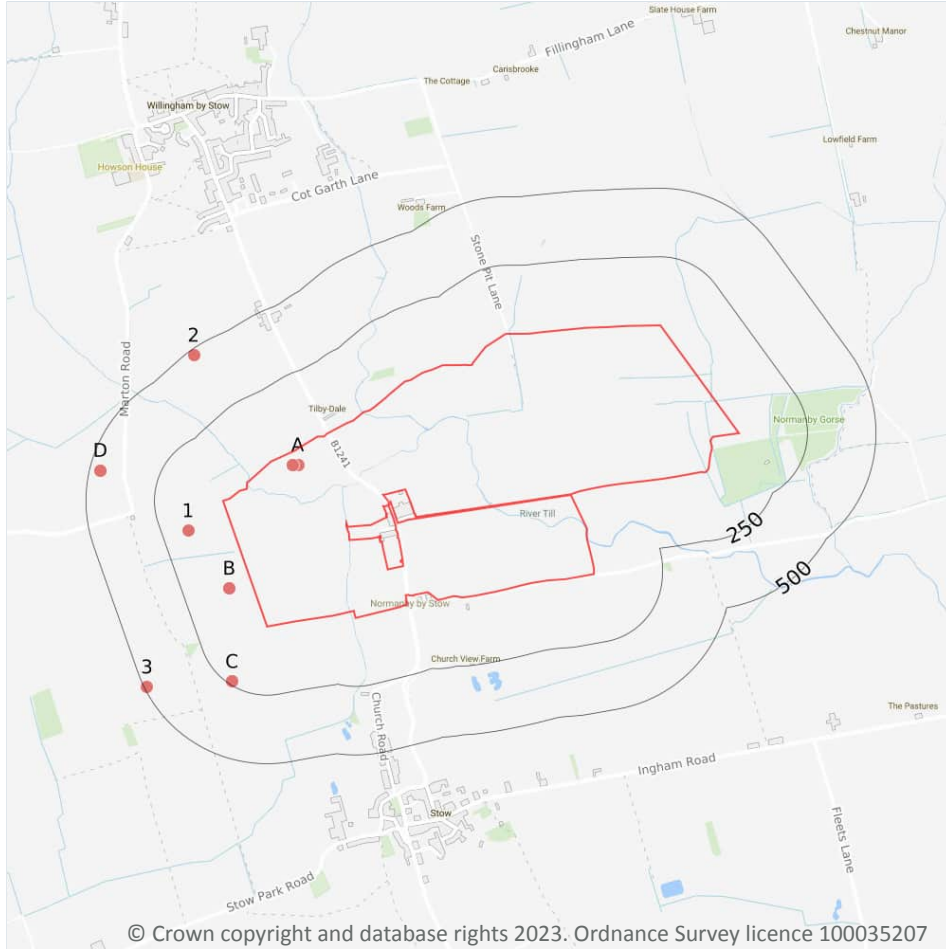
Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group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

Features are displayed on the Past land use - un-grouped map on **page 16**

ID	Location	Land Use	Date	Group ID
1	7m SW	Smithy	1885	1612896
A	478m S	Saw Pit	1885	1639285
A	478m S	Saw Pit	1885	1639285



## 3 Waste and landfill



### 3.1 Active or recent landfill

Records within 500m

0

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

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

### 3.2 Historical landfill (BGS records)

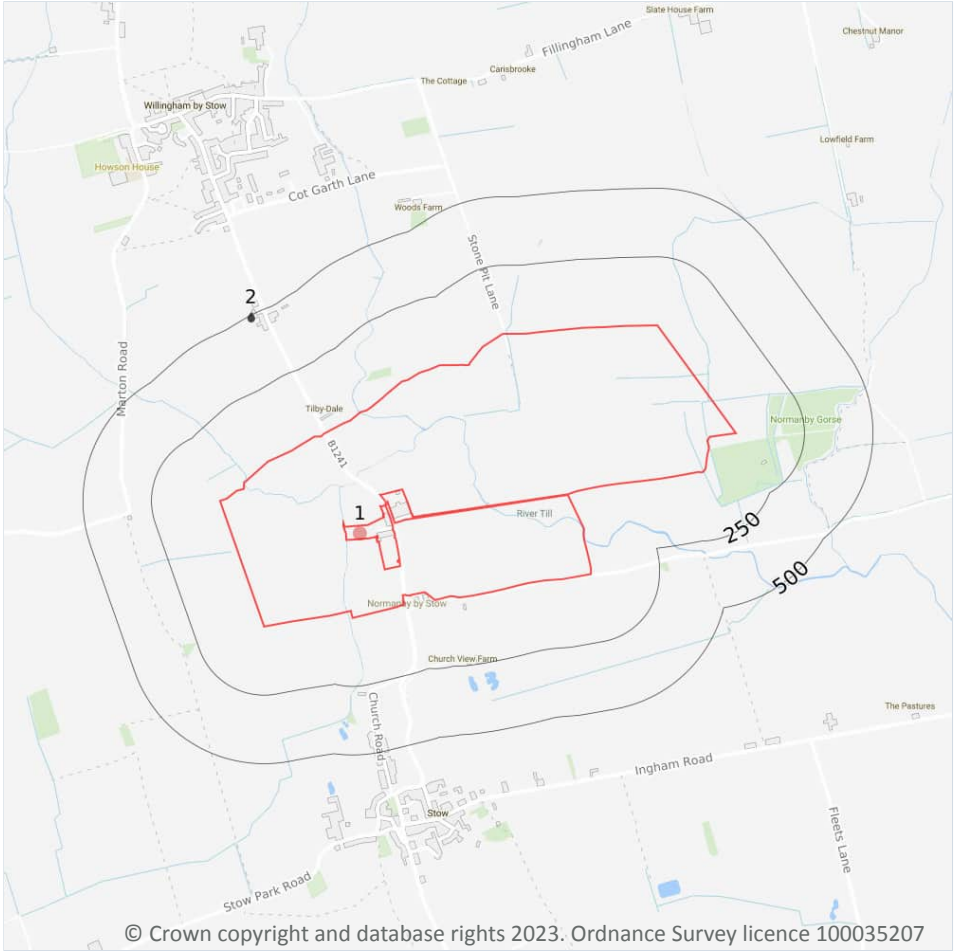
Records within 500m

0

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

*This data is sourced from the British Geological Survey.*

## 4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Licensed Discharges to controlled waters

### 4.1 Recent industrial land uses

**Records within 250m** **1**

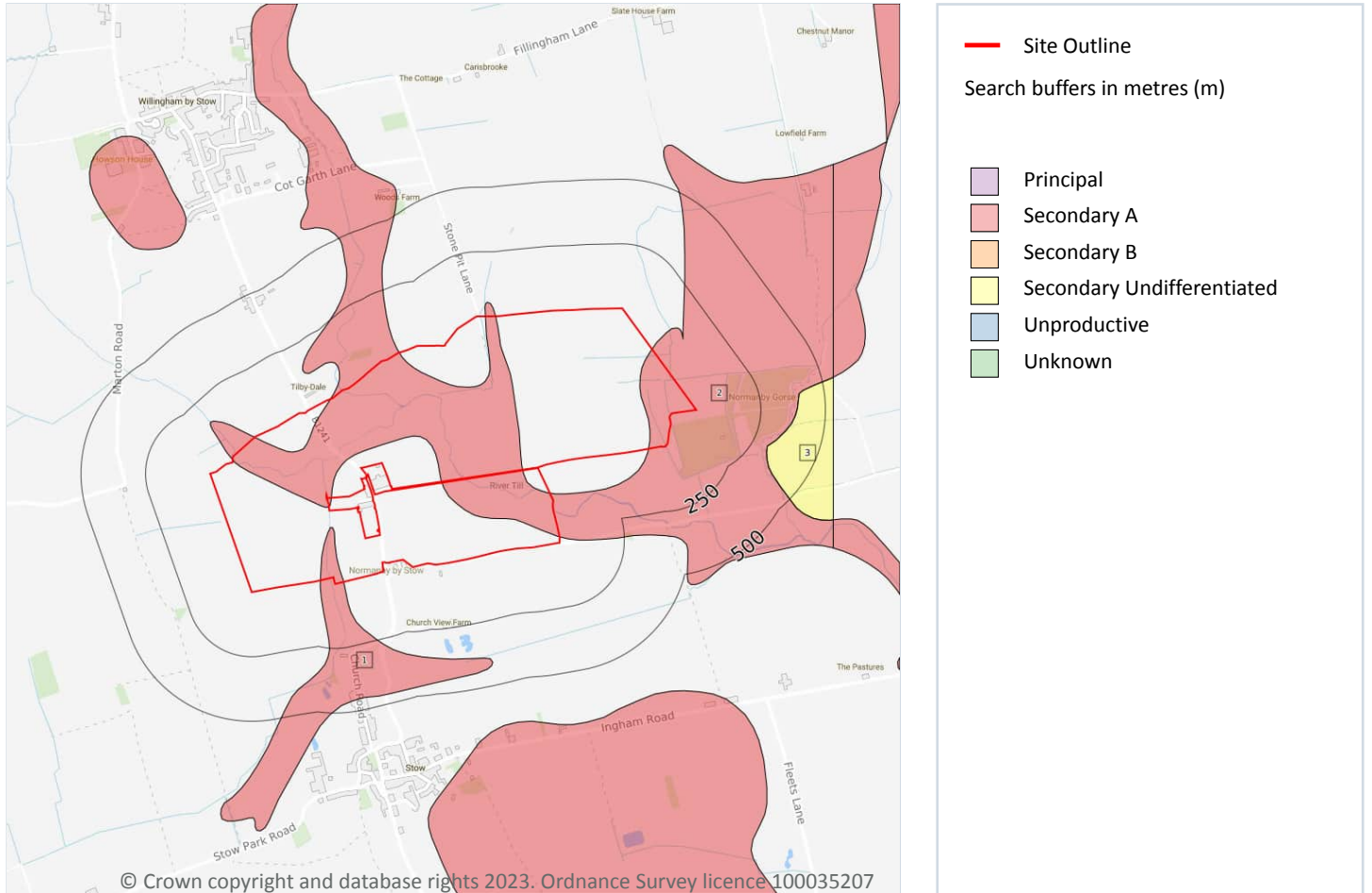
Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 21**

ID	Location	Company	Address	Activity	Category
1	19m SW	Sheep Dip	Lincolnshire, DN21	Sheep Dips and Washes	Farming

*This data is sourced from Ordnance Survey.*

## 5 Hydrogeology - Superficial aquifer



### 5.1 Superficial aquifer

Records within 500m

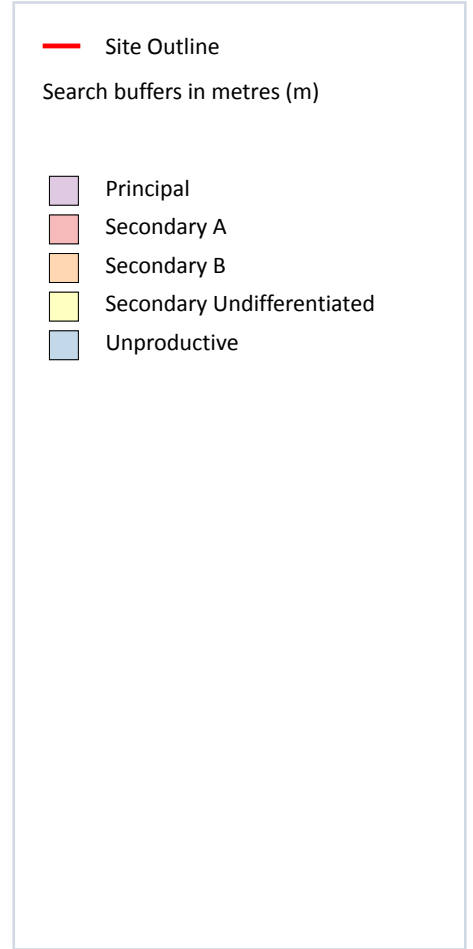
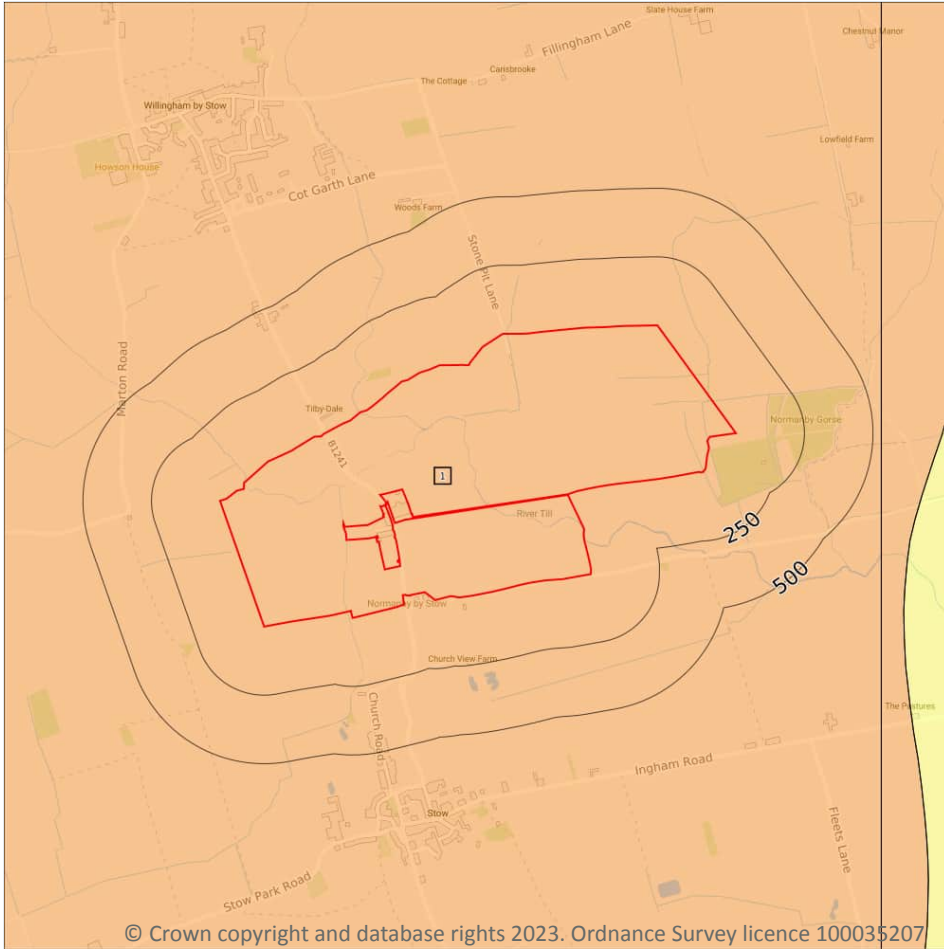
3

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 27**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	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

## Bedrock aquifer



### 5.2 Bedrock aquifer

Records within 500m

1

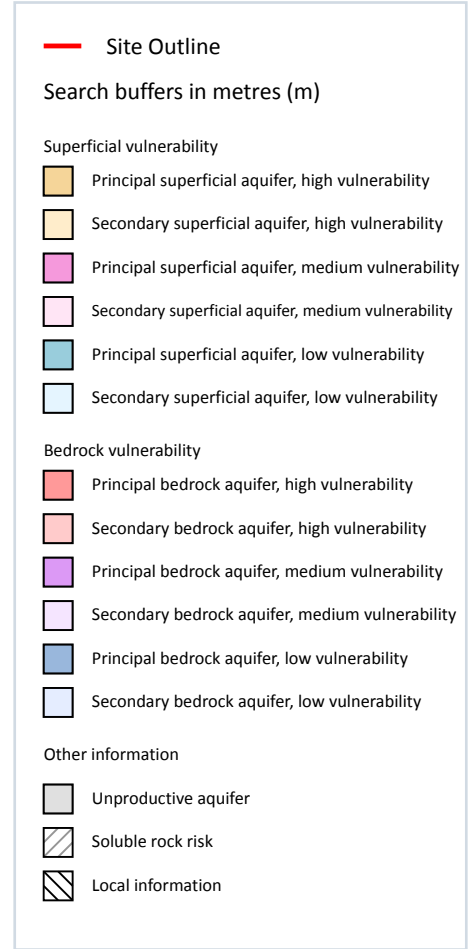
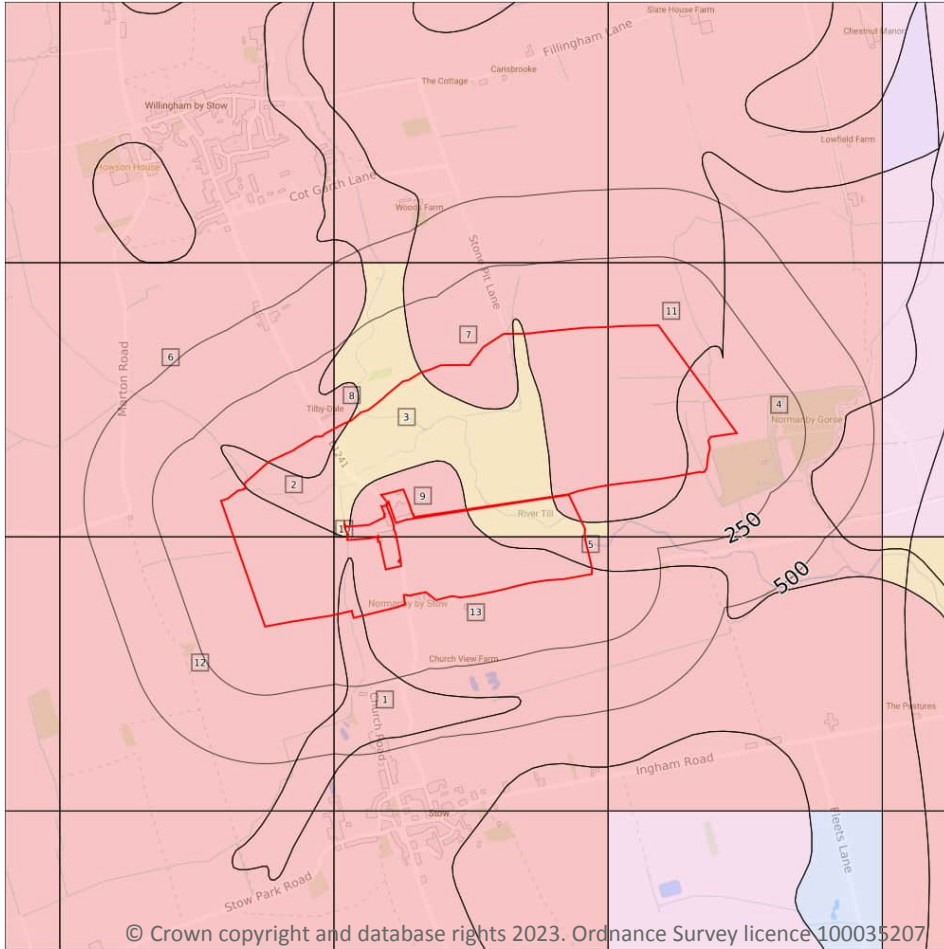
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 29**

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

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

## Groundwater vulnerability



### 5.3 Groundwater vulnerability

Records within 50m

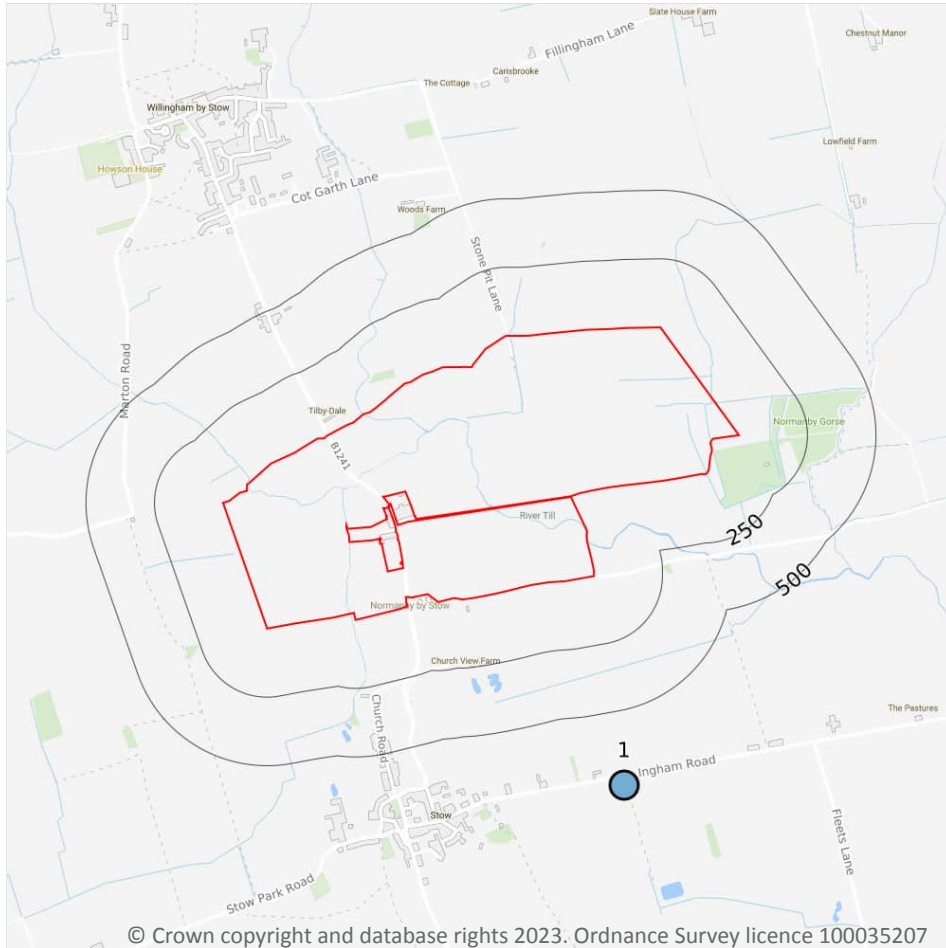
13

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

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

Features are displayed on the Groundwater vulnerability map on **page 30**

## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

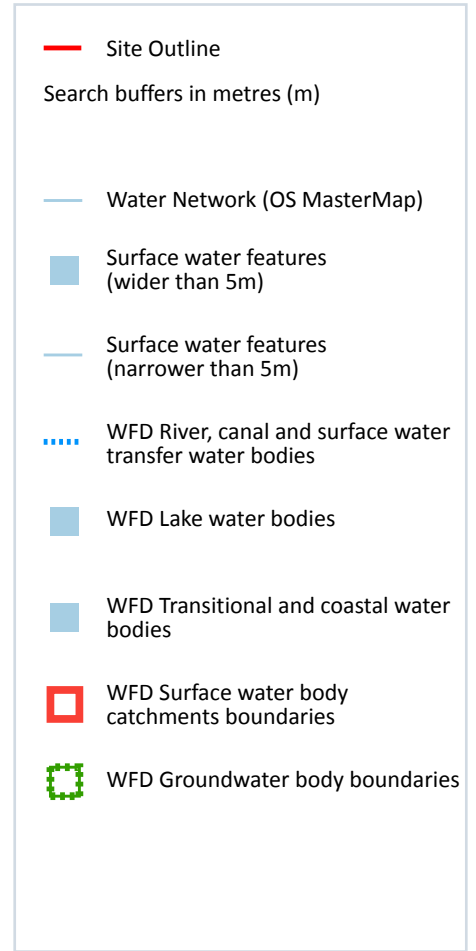
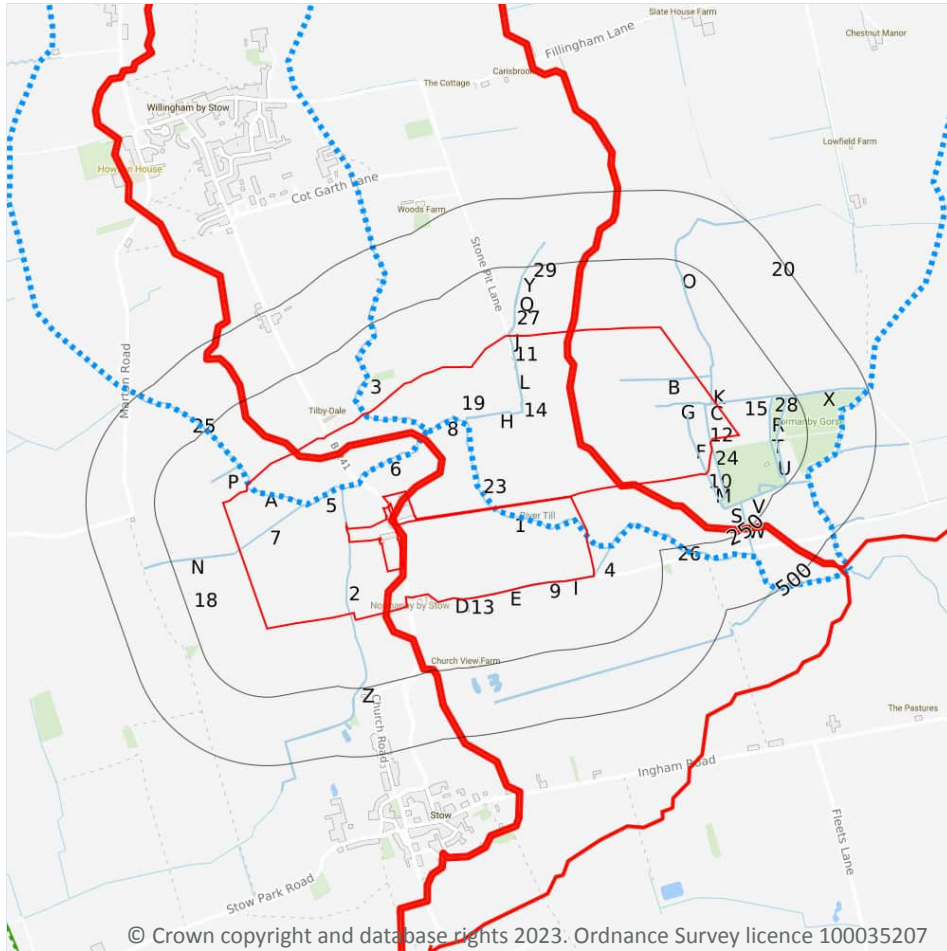
Records within 2000m

0

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

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

## 6 Hydrology



### 6.1 Water Network (OS MasterMap)

Records within 250m

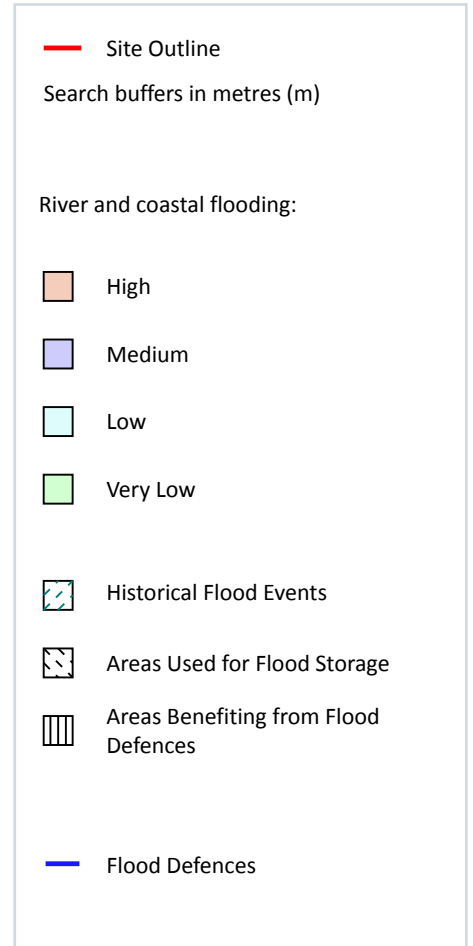
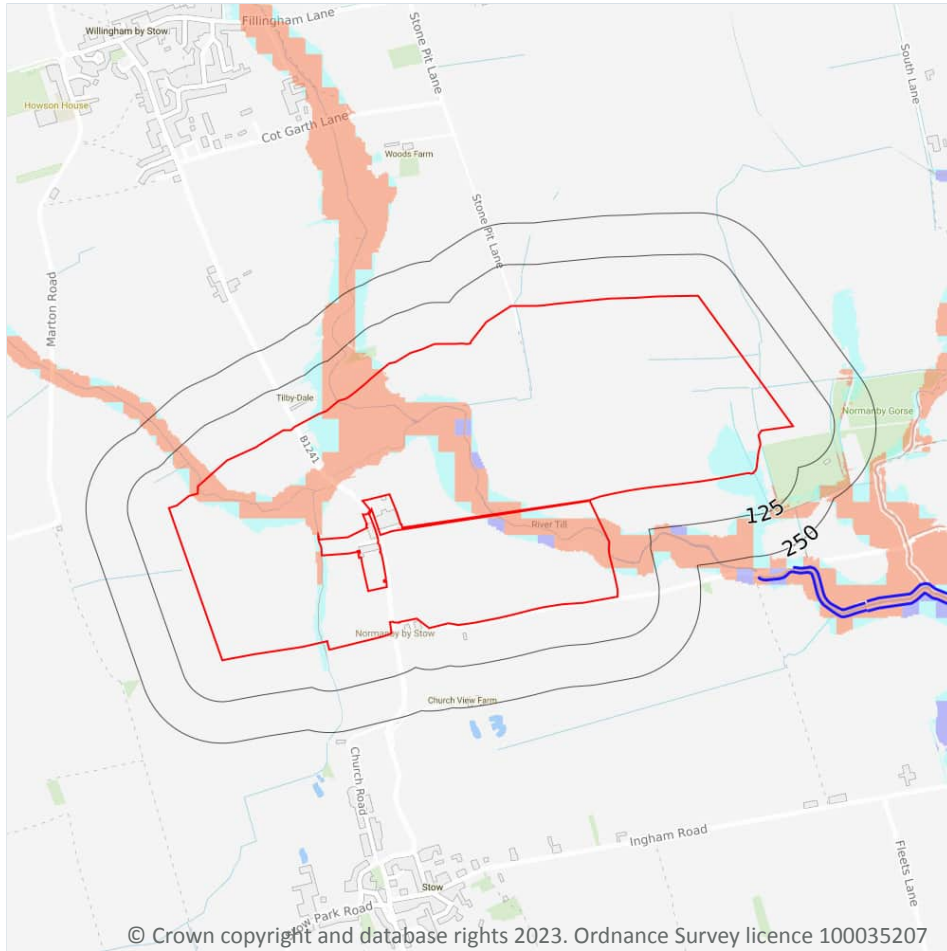
61

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

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

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

## 7 River and coastal flooding



### 7.1 Risk of flooding from rivers and the sea

Records within 50m

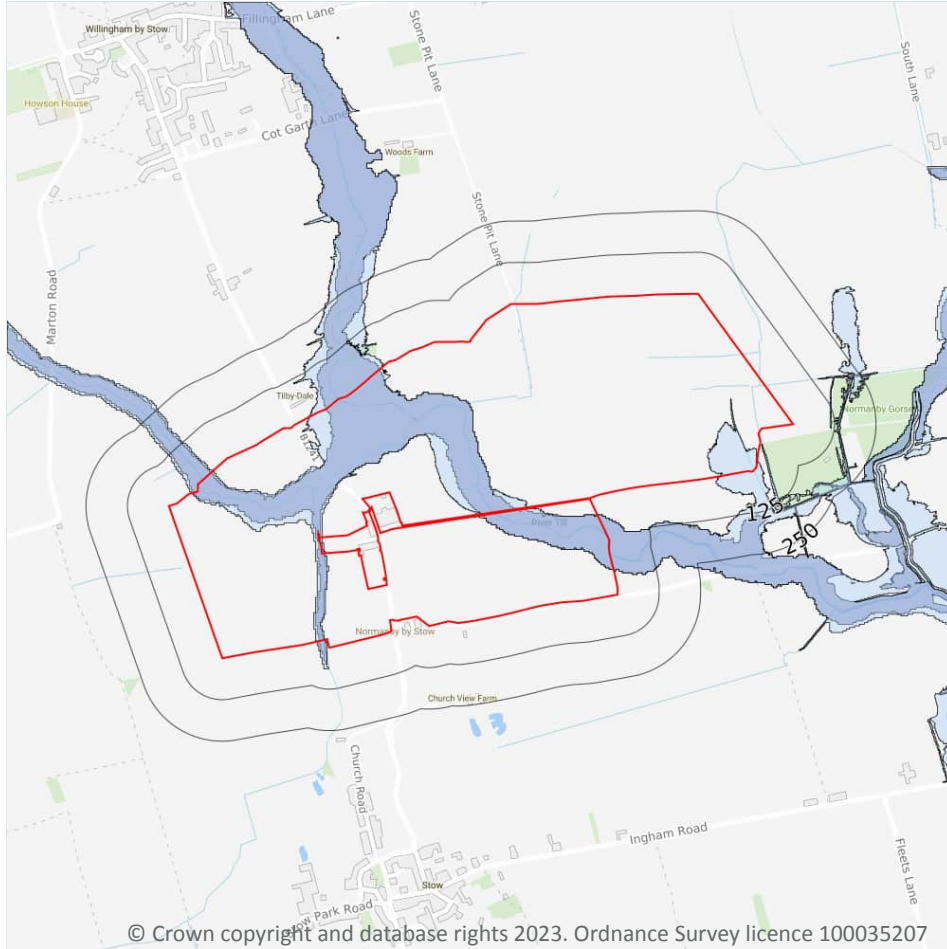
43

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

Features are displayed on the River and coastal flooding map on **page 45**



## River and coastal flooding - Flood Zones



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— Site Outline  
Search buffers in metres (m)

□ Flood zone 2

□ Flood zone 3

### 7.6 Flood Zone 2

Records within 50m

1

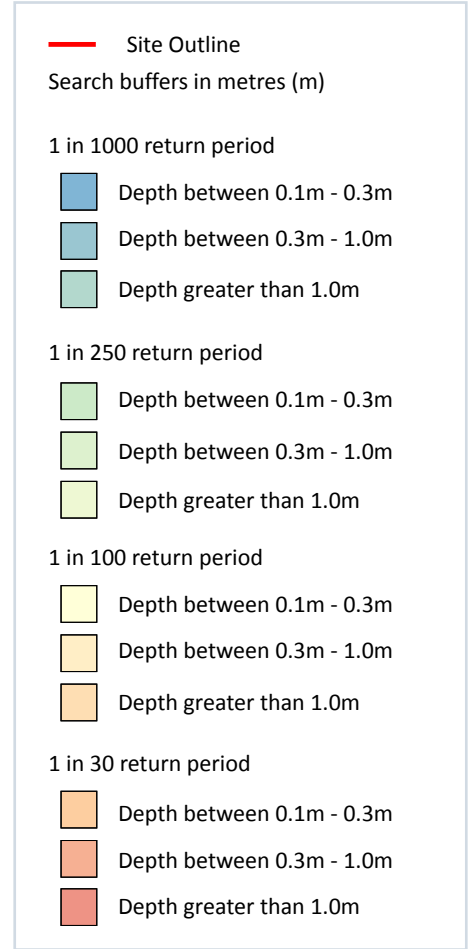
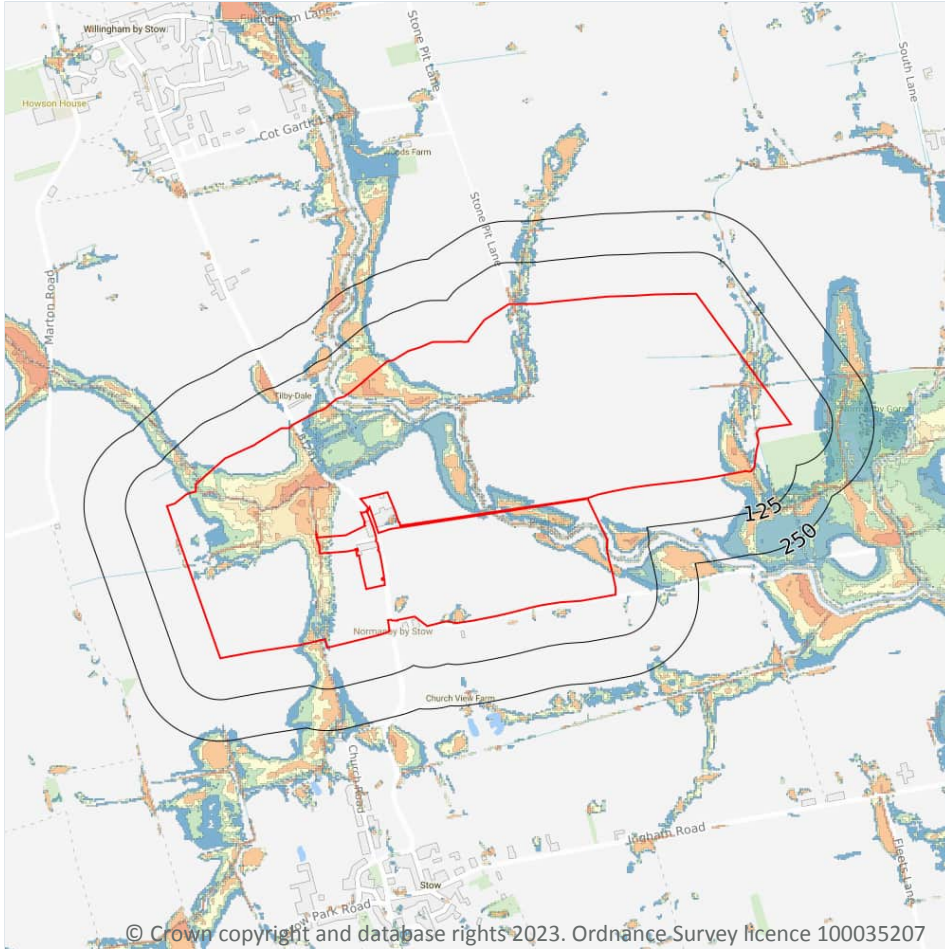
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 45**

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

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

## 8 Surface water flooding



### 8.1 Surface water flooding

Highest risk on site

**1 in 30 year, Greater than 1.0m**

Highest risk within 50m

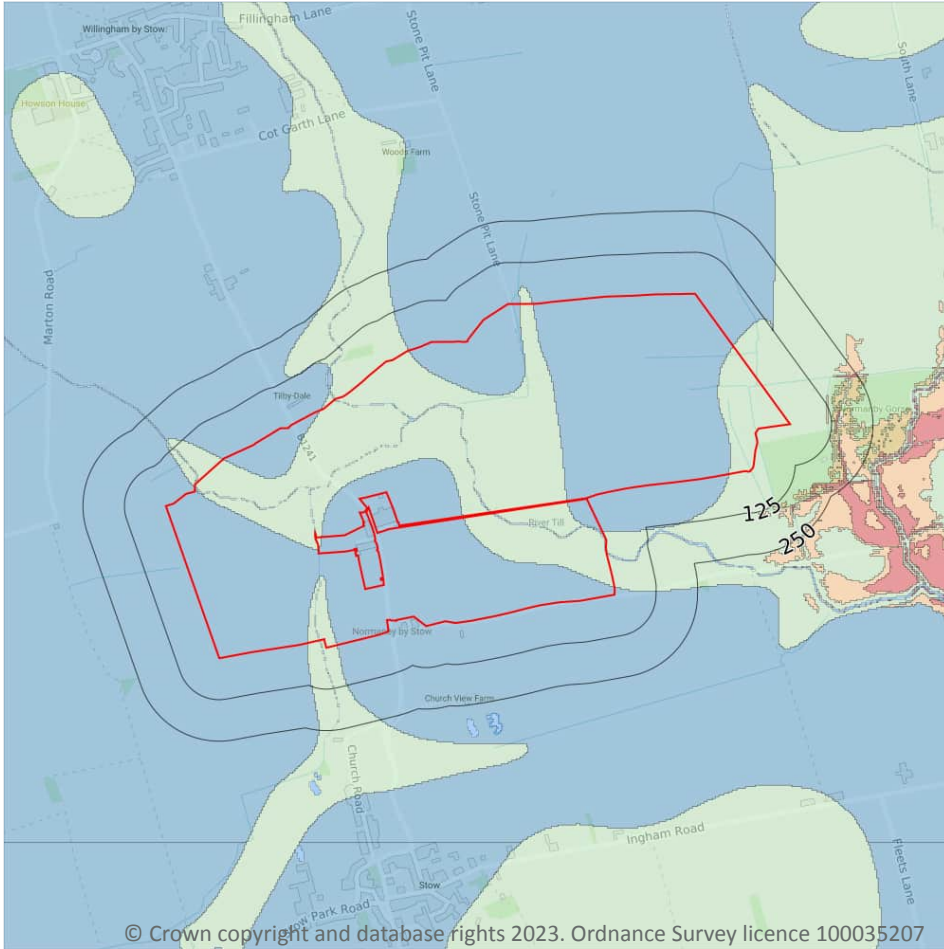
**1 in 30 year, Greater than 1.0m**

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

Features are displayed on the Surface water flooding map on **page 49**

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

## 9 Groundwater flooding



### 9.1 Groundwater flooding

**Highest risk on site**

**Low**

**Highest risk within 50m**

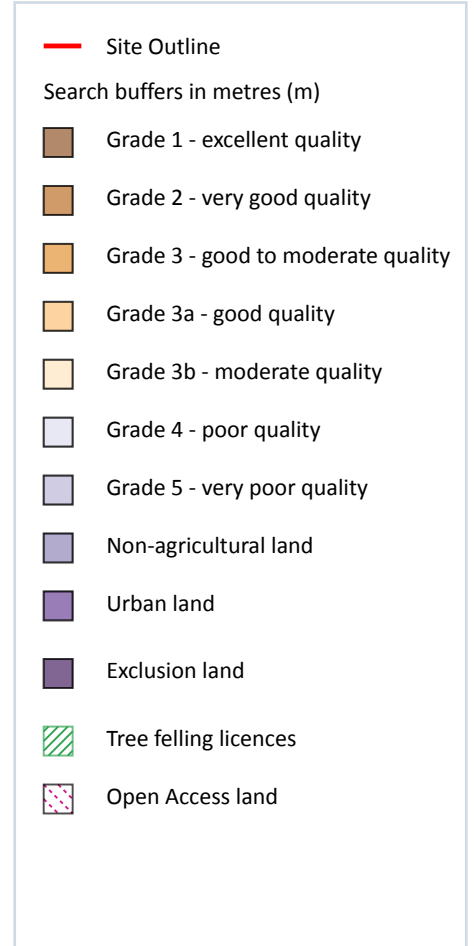
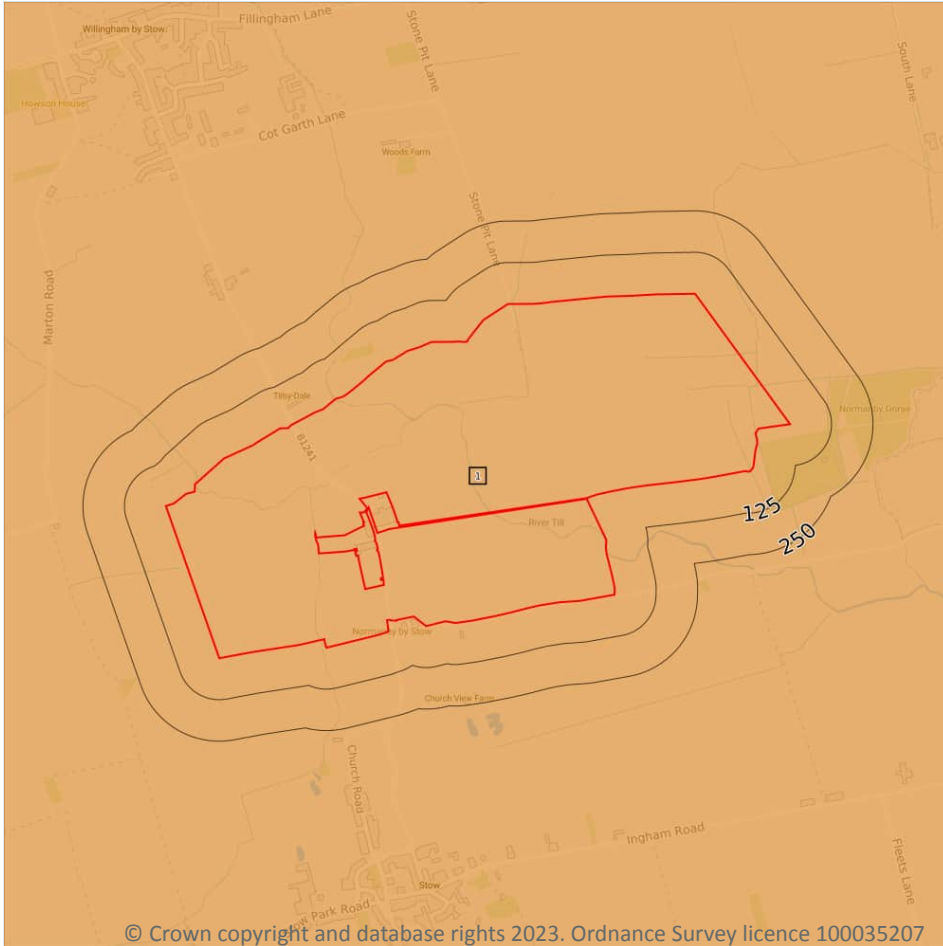
**Low**

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

Features are displayed on the Groundwater flooding map on **page 51**

*This data is sourced from Ambiental Risk Analytics.*

## 12 Agricultural designations



### 12.1 Agricultural Land Classification

**Records within 250m** **1**

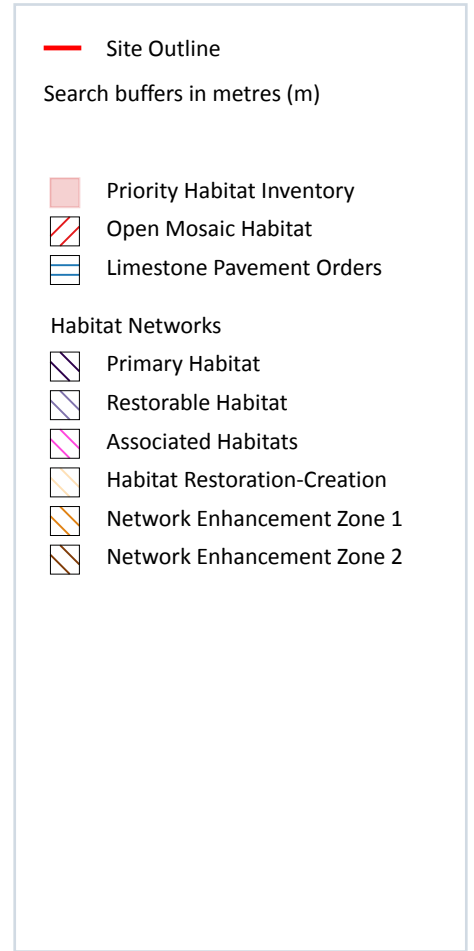
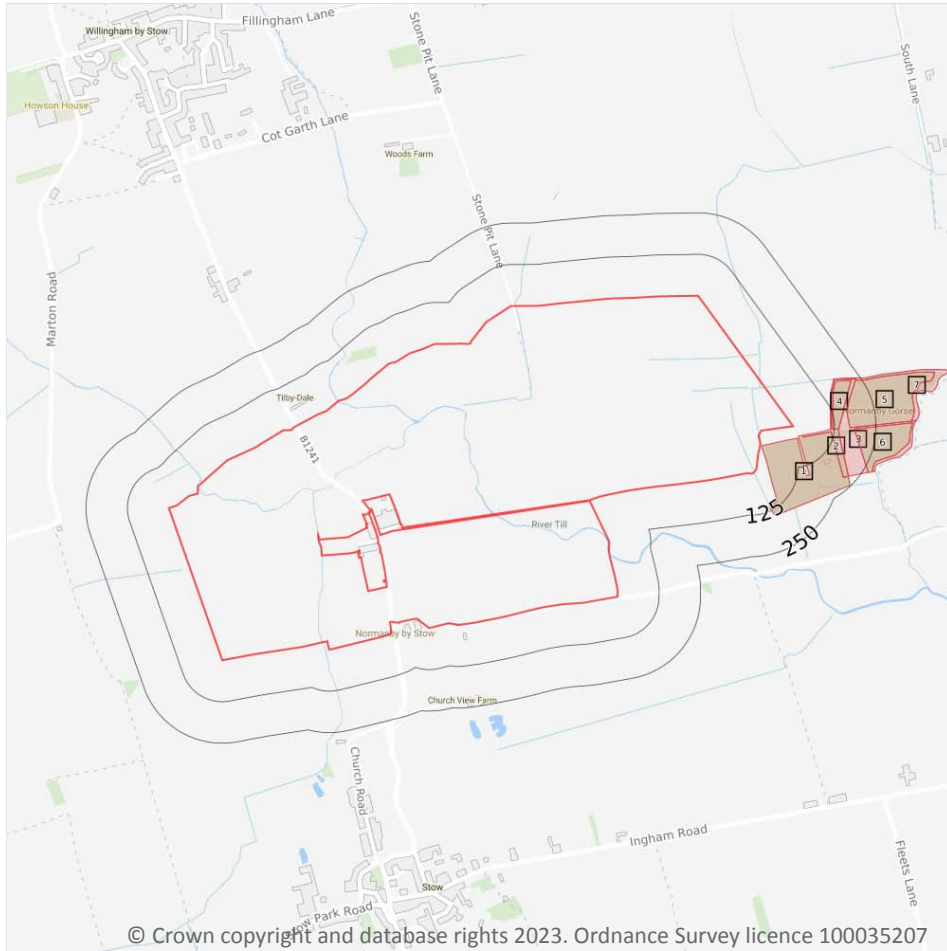
Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 59**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

*This data is sourced from Natural England.*

## 13 Habitat designations



### 13.1 Priority Habitat Inventory

Records within 250m

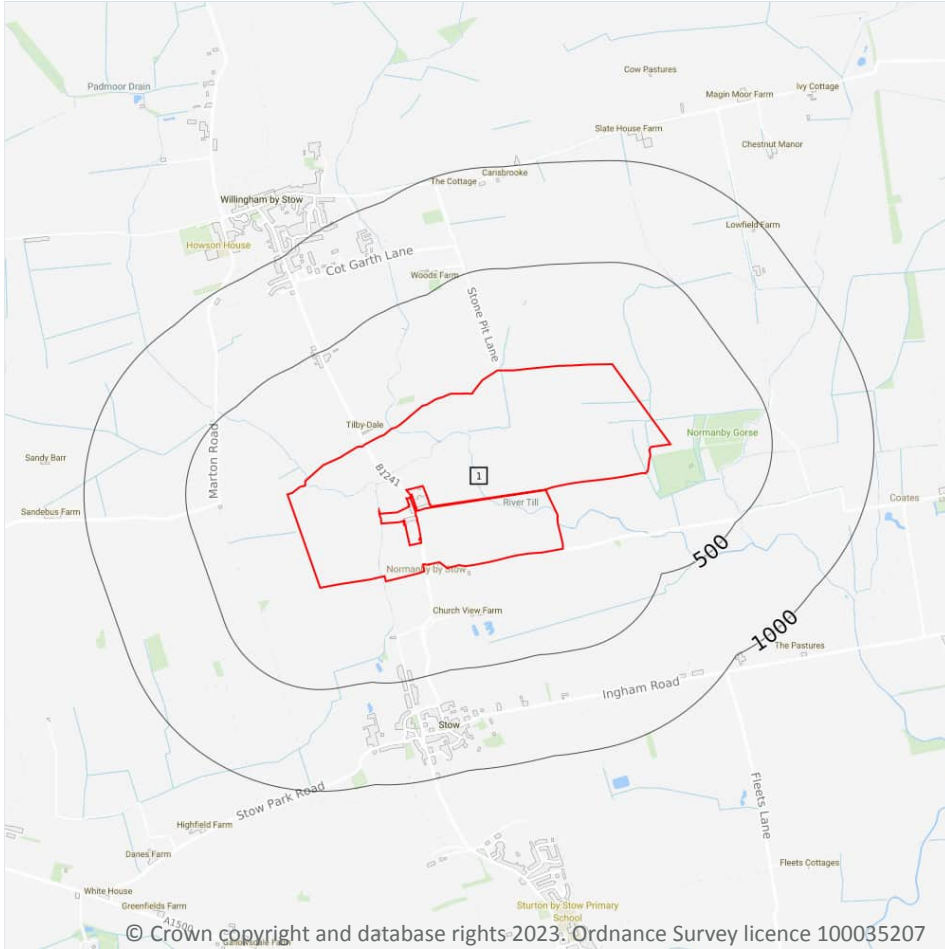
7

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

Features are displayed on the Habitat designations map on **page 62**

ID	Location	Main Habitat	Other habitats
1	5m E	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	41m E	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	115m E	No main habitat but additional habitats present	Additional: DWOOD (INV 50%)
4	120m E	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

## 14 Geology 1:10,000 scale - Availability



**— Site Outline**

Search buffers in metres (m)

---

Full coverage

Partial coverage

No coverage

### 14.1 10k Availability

**Records within 500m**

**1**

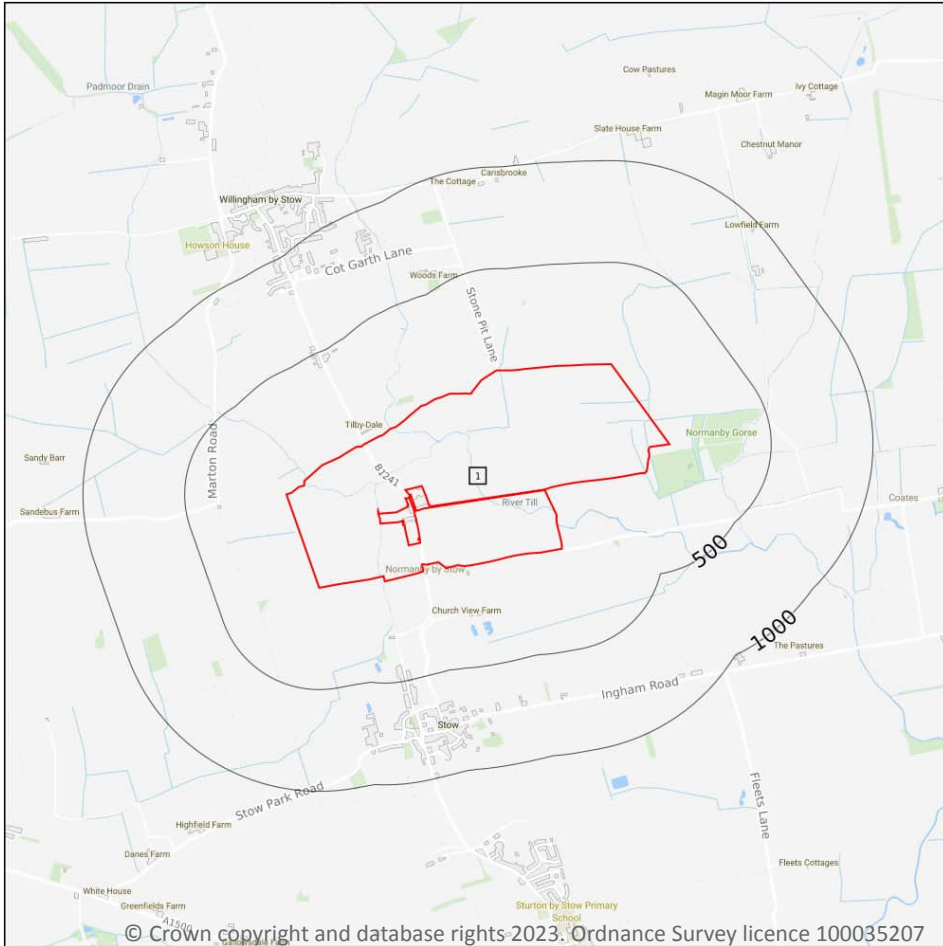
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 64**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

*This data is sourced from the British Geological Survey.*

## 15 Geology 1:50,000 scale - Availability



**— Site Outline**

Search buffers in metres (m)

---

**□ Geological map tile**

### 15.1 50k Availability

**Records within 500m**

**1**

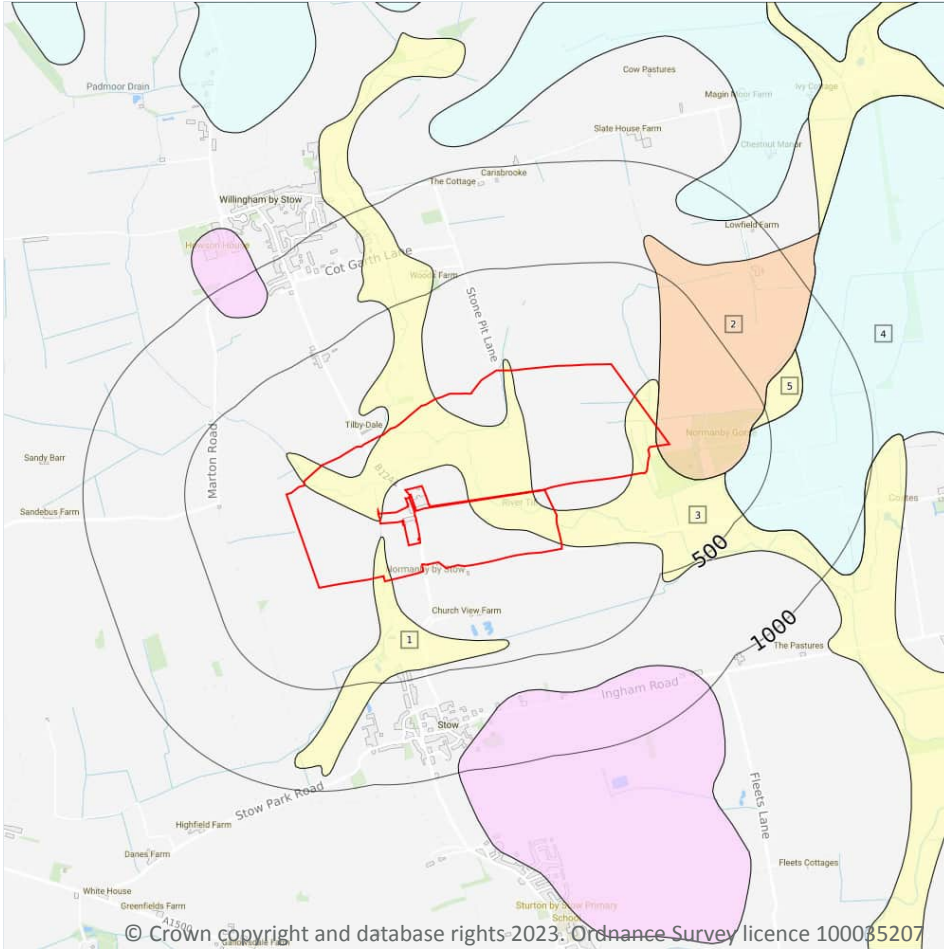
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 68**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW102_market_rasen_v4

*This data is sourced from the British Geological Survey.*

## Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)  
Please see table for more details.

### 15.4 Superficial geology (50k)

Records within 500m

5

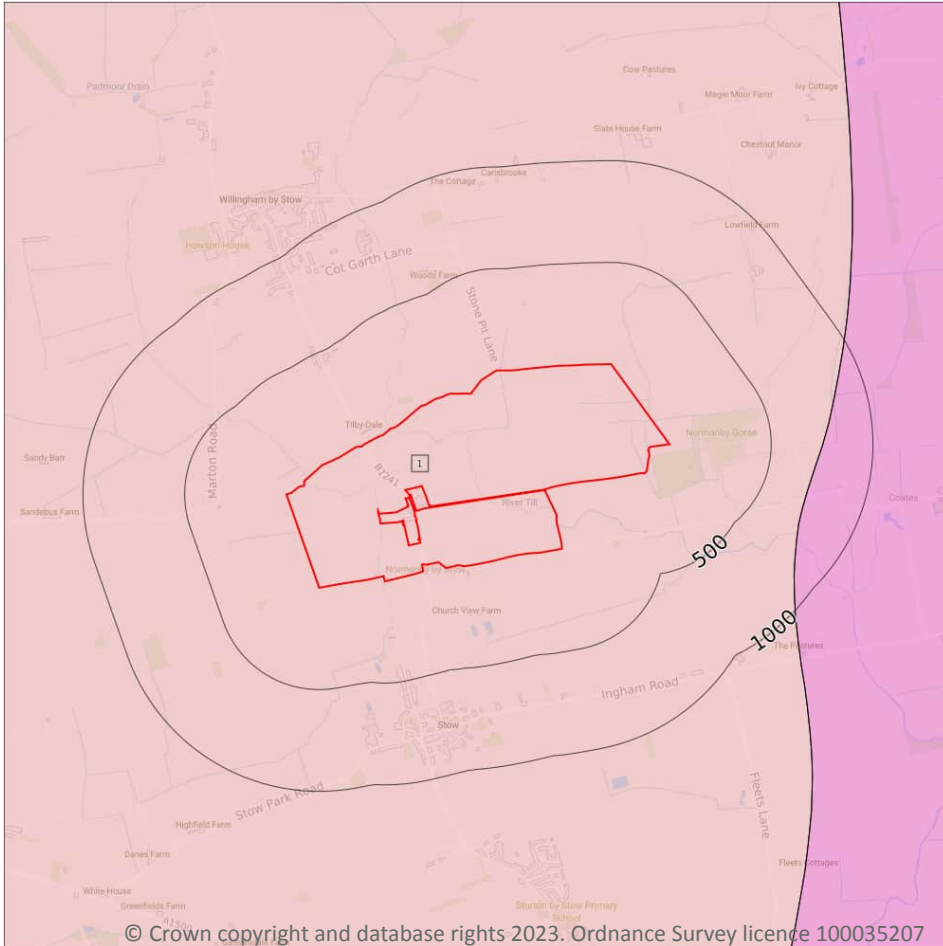
Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 70**

ID	Location	LEX Code	Description	Rock description
1	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
2	On site	RTDU-XSV	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND AND GRAVEL
3	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL



## Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- ..... Bedrock faults and other linear features (50k)
- Bedrock geology (50k)  
Please see table for more details.

### 15.8 Bedrock geology (50k)

Records within 500m

1

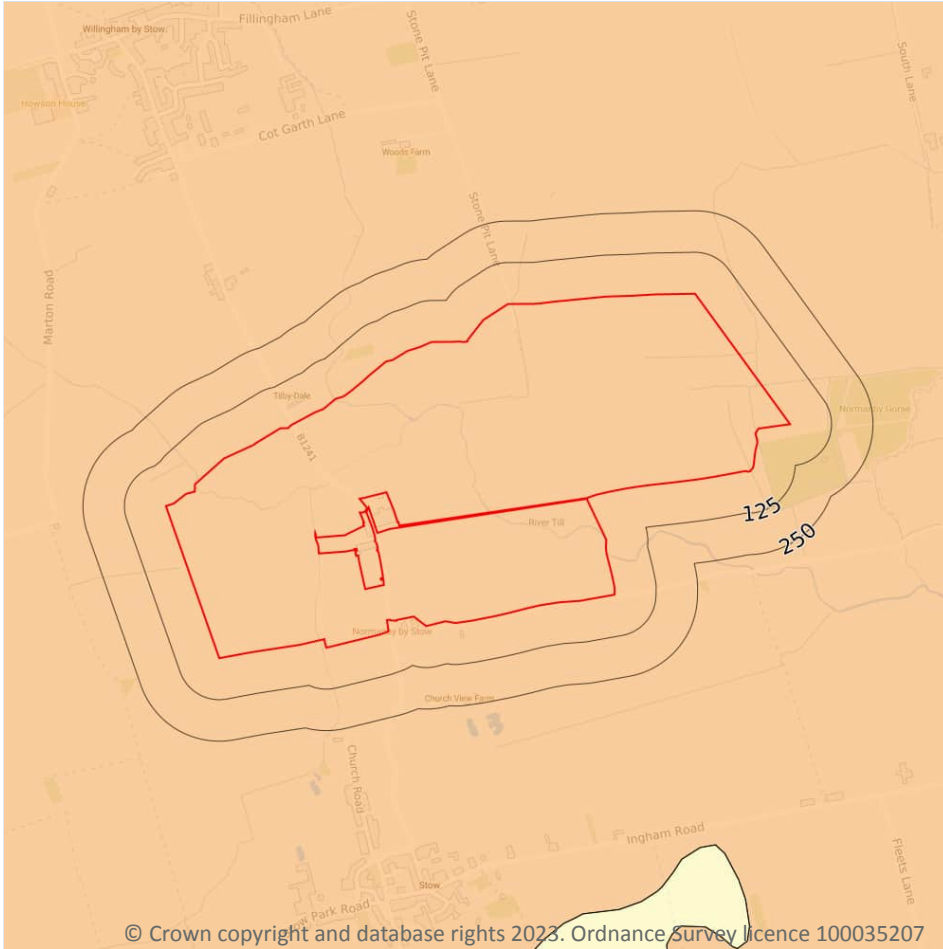
Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 72**

ID	Location	LEX Code	Description	Rock age
1	On site	SMD-MDLM	SCUNTHORPE MUDSTONE FORMATION - MUDSTONE AND LIMESTONE, INTERBEDDED	RHAETIAN

*This data is sourced from the British Geological Survey.*

## 17 Natural ground subsidence - Shrink swell clays



### 17.1 Shrink swell clays

Records within 50m

1

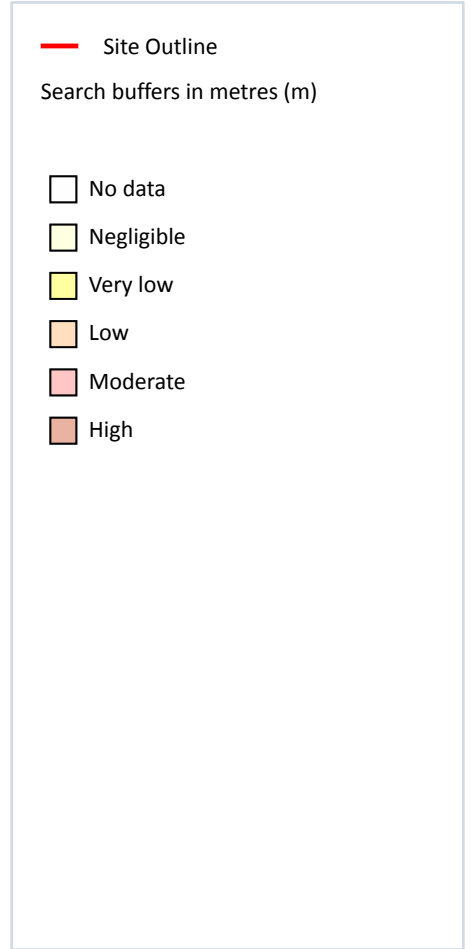
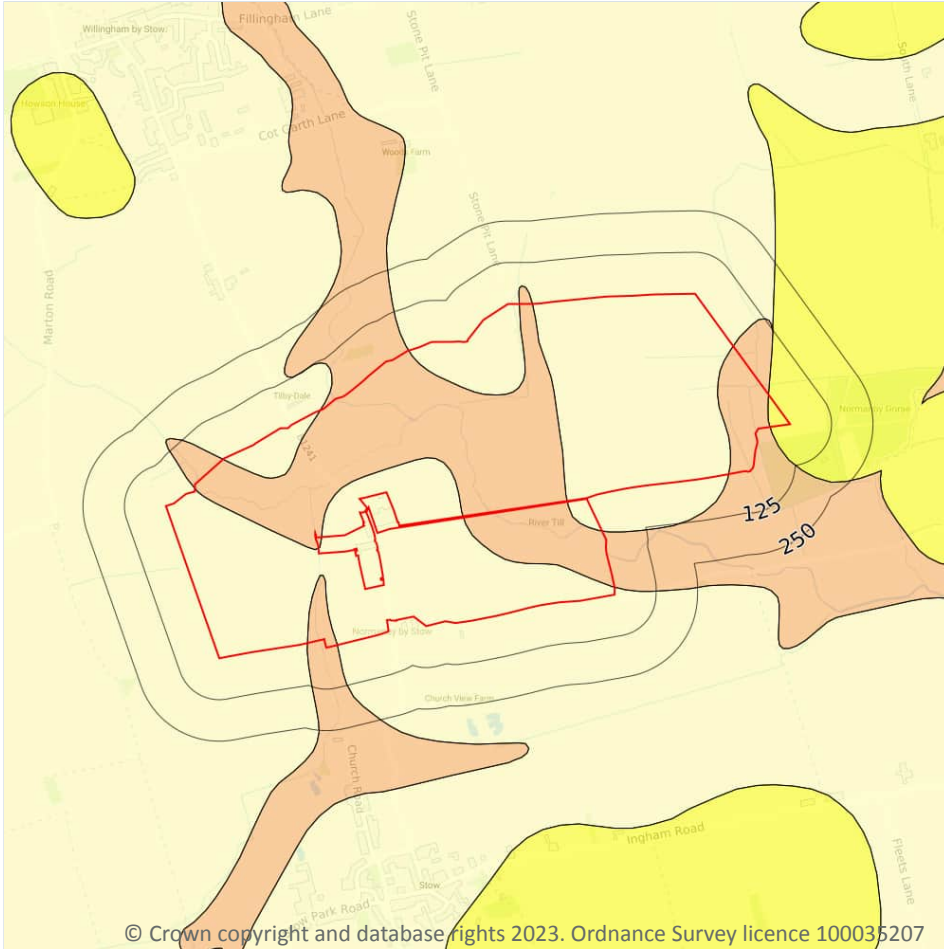
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 75**

Location	Hazard rating	Details
On site	Low	Ground conditions predominantly medium plasticity.

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Running sands



### 17.2 Running sands

Records within 50m

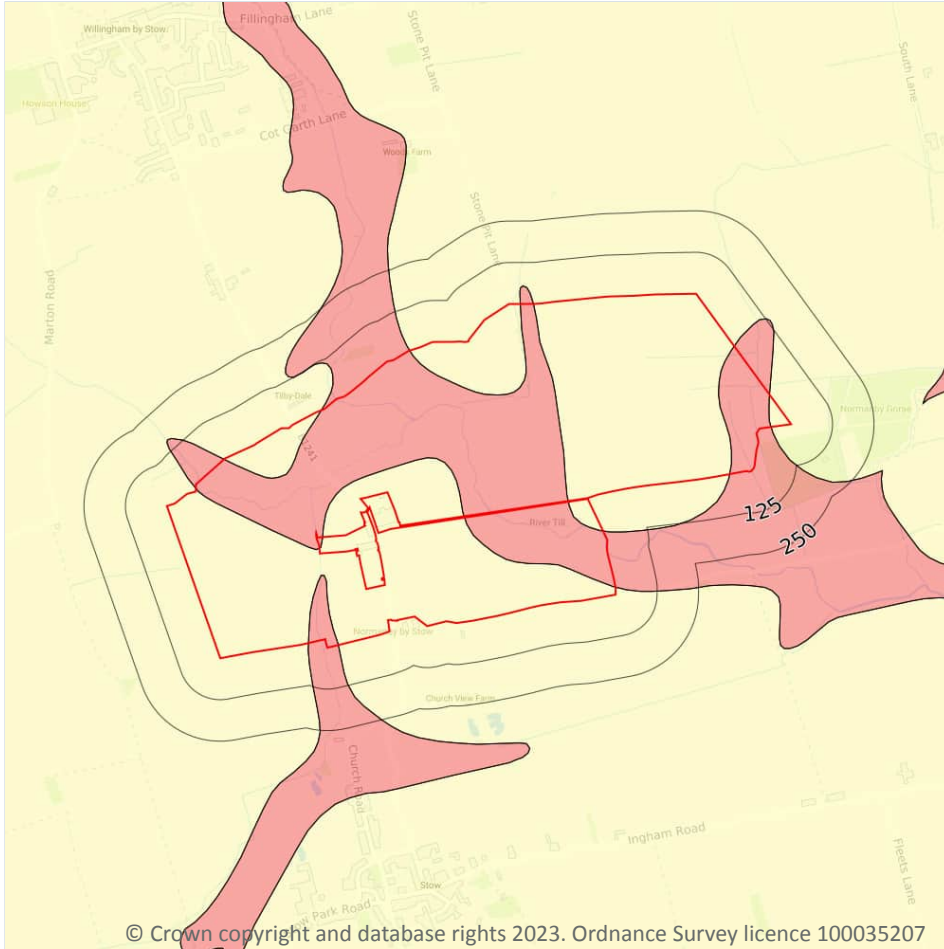
3

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

Features are displayed on the Natural ground subsidence - Running sands map on **page 76**

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

## Natural ground subsidence - Compressible deposits



### 17.3 Compressible deposits

Records within 50m

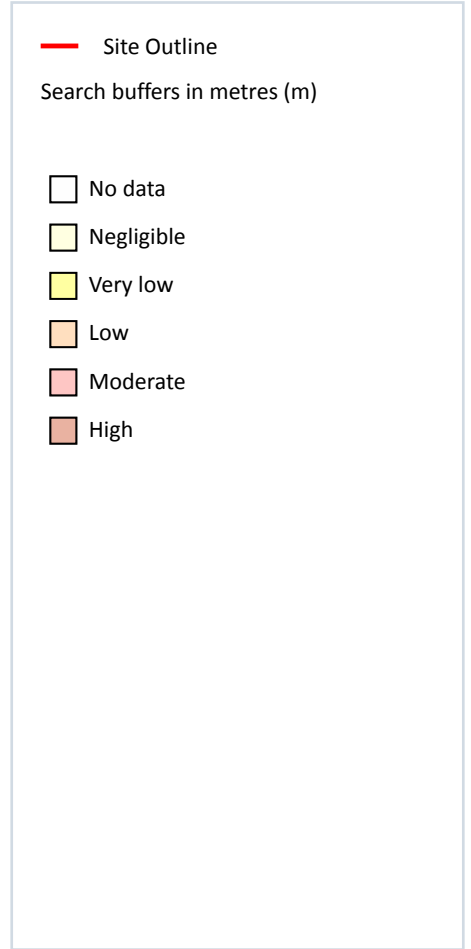
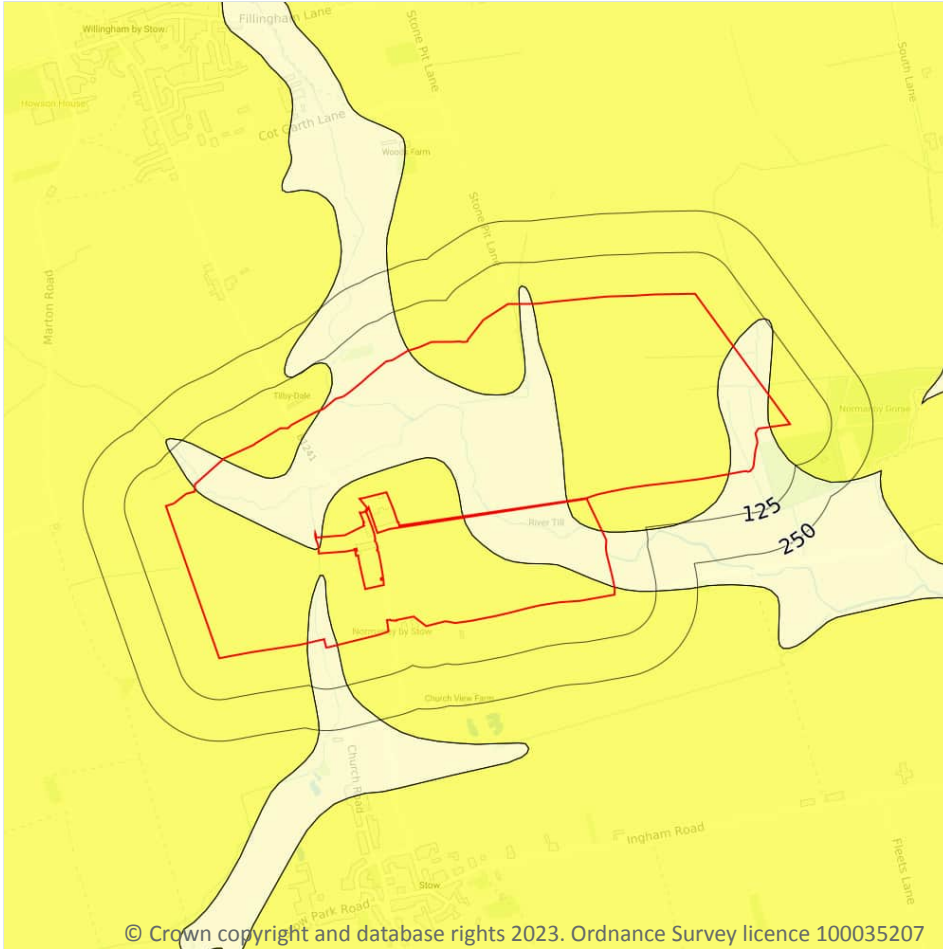
2

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 78**

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

## Natural ground subsidence - Collapsible deposits



### 17.4 Collapsible deposits

Records within 50m

2

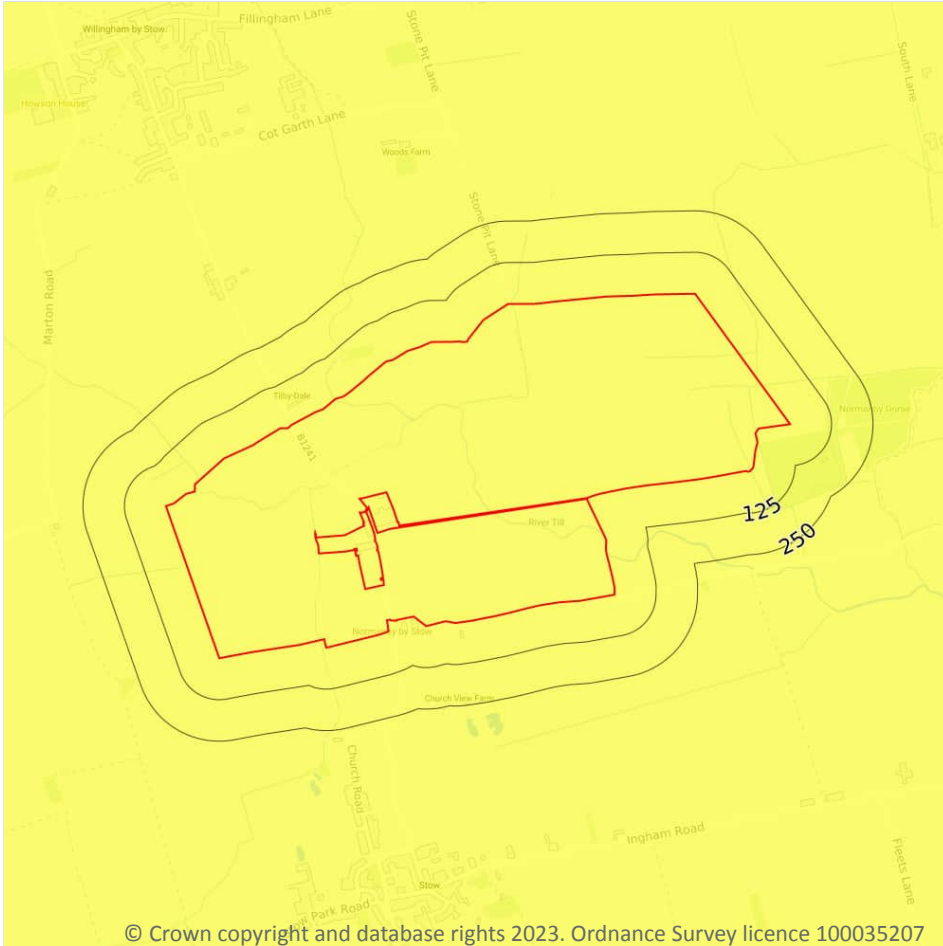
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 80**

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

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Landslides



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### 17.5 Landslides

Records within 50m

1

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

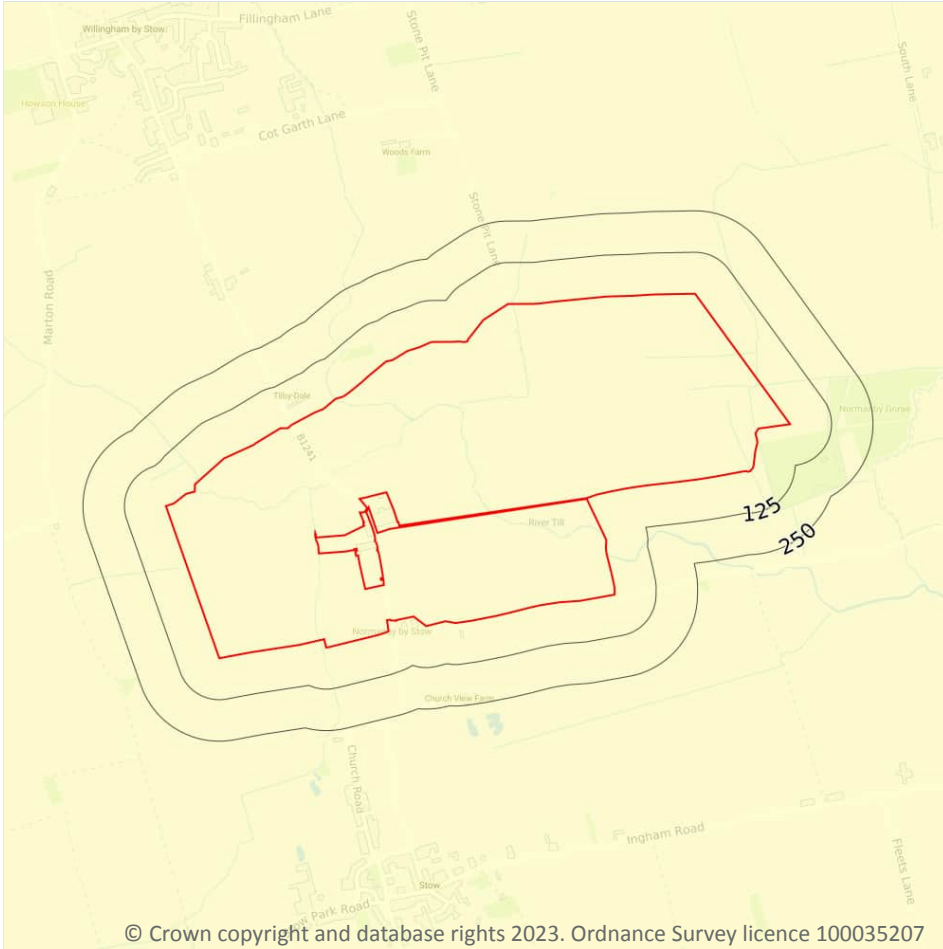
Features are displayed on the Natural ground subsidence - Landslides map on **page 81**

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

*This data is sourced from the British Geological Survey.*



## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

Records within 50m

1

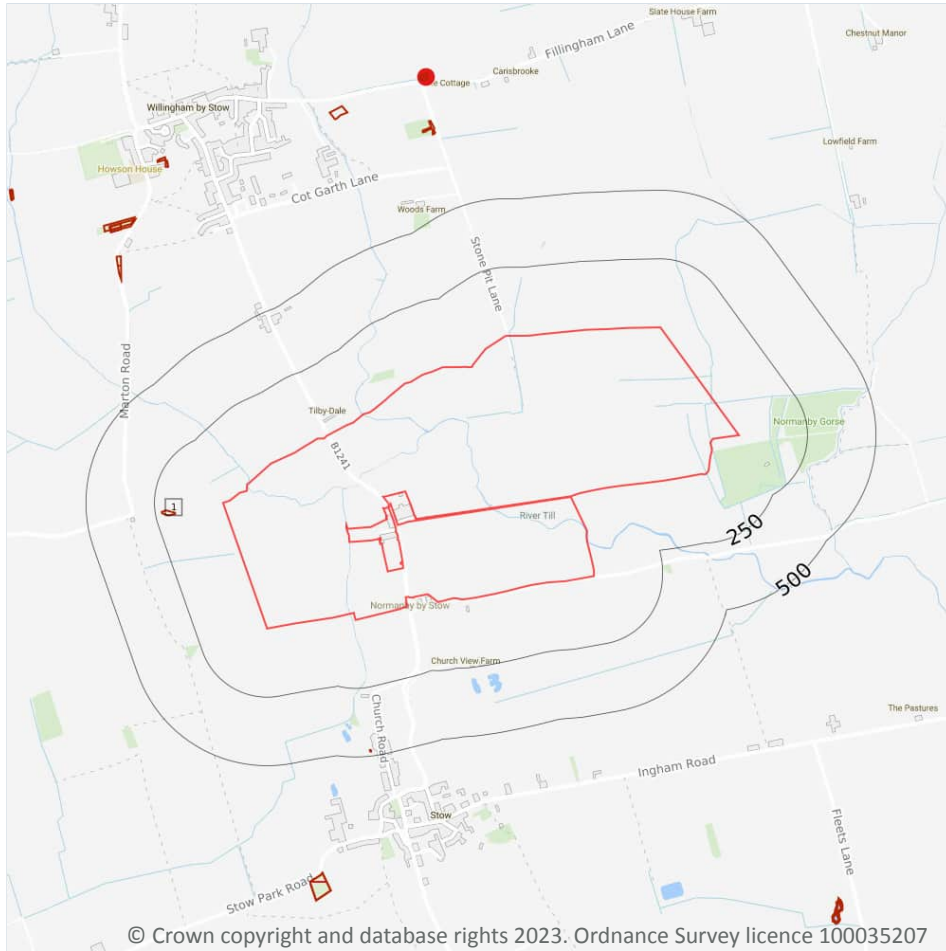
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 82**

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

This data is sourced from the British Geological Survey.

## 18 Mining, ground workings and natural cavities



### 18.1 Natural cavities

Records within 500m

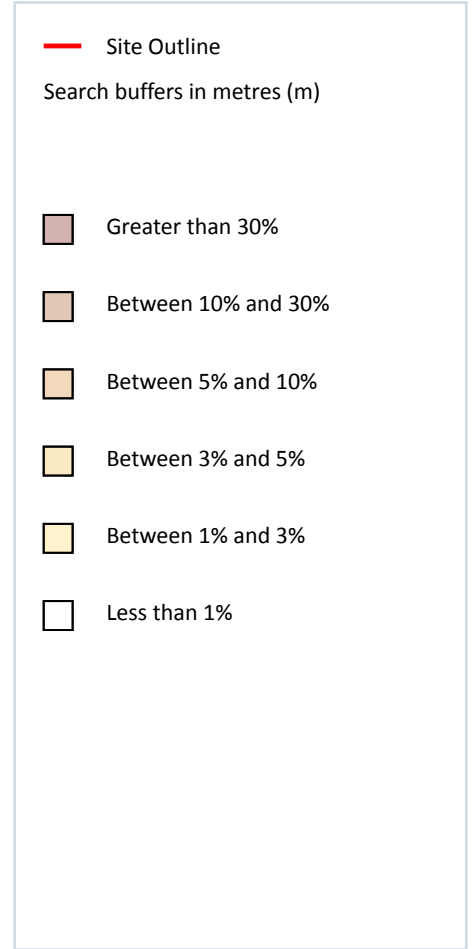
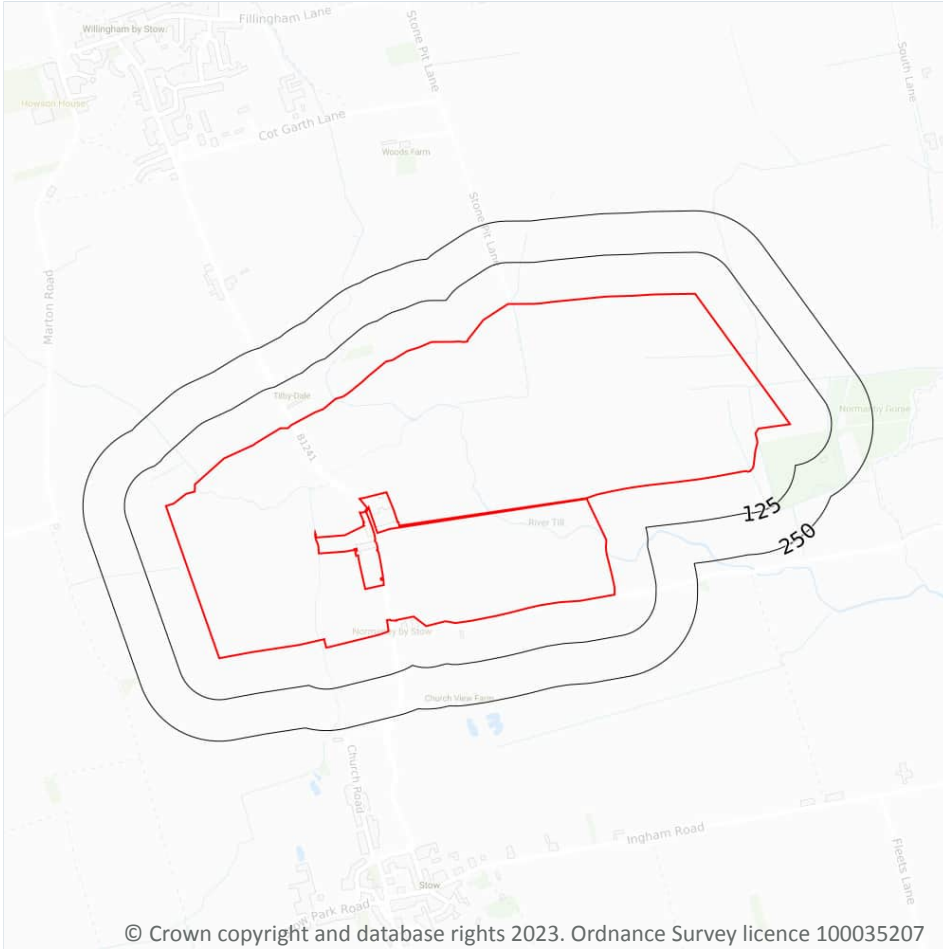
0

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

*This data is sourced from Stantec UK Ltd.*



## 19 Radon



### 19.1 Radon

#### Records on site

1

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

Features are displayed on the Radon map on **page 87**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None

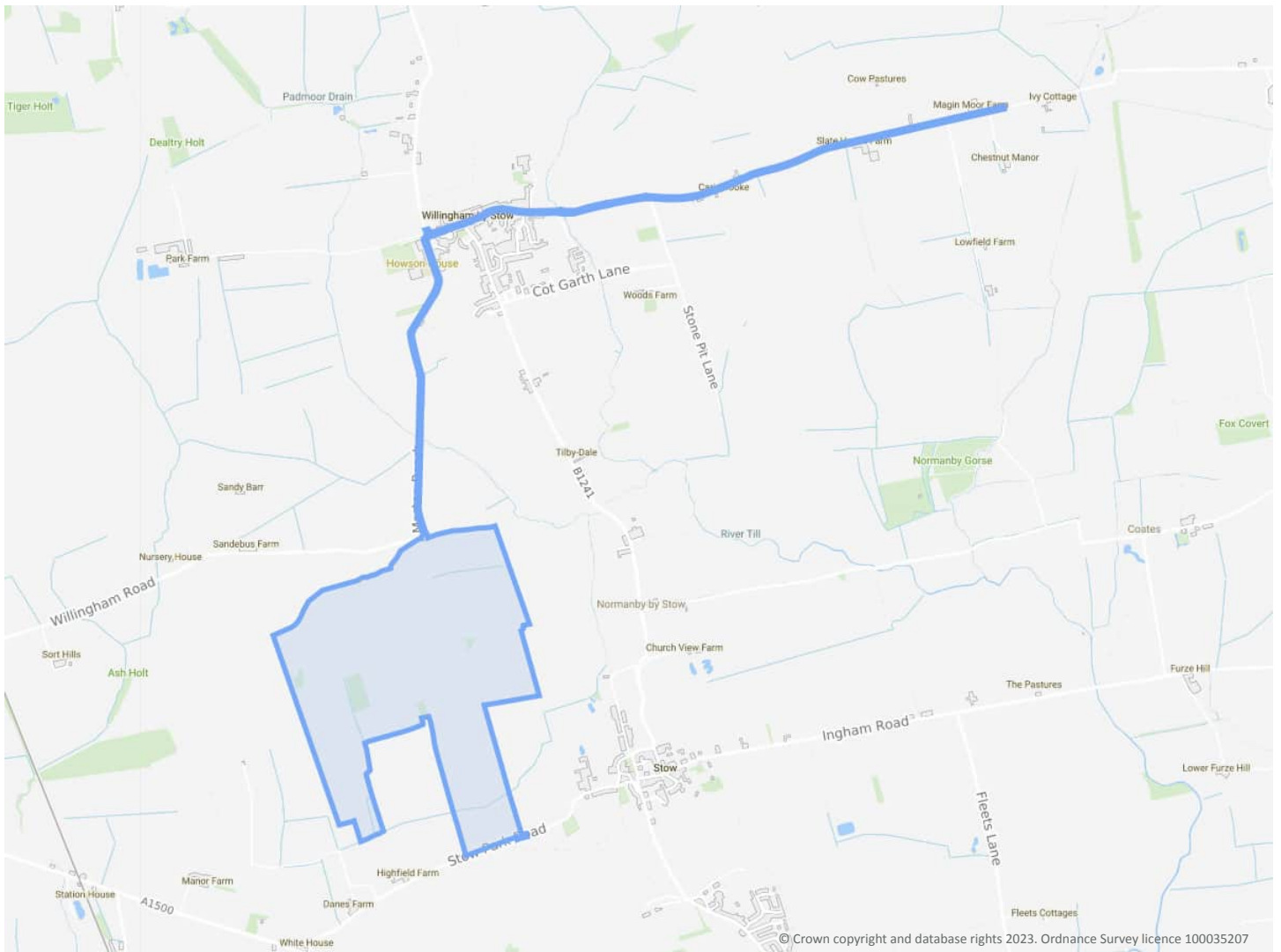
## Tillbridge cable run area

### Order Details

**Date:** 14/02/2023  
**Your ref:** ref 60677969  
**Our Ref:** GSIP-2023-13376-12945\_4

### Site Details

**Location:** 487722 383833  
**Area:** 116.48 ha  
**Authority:** [West Lindsey District Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

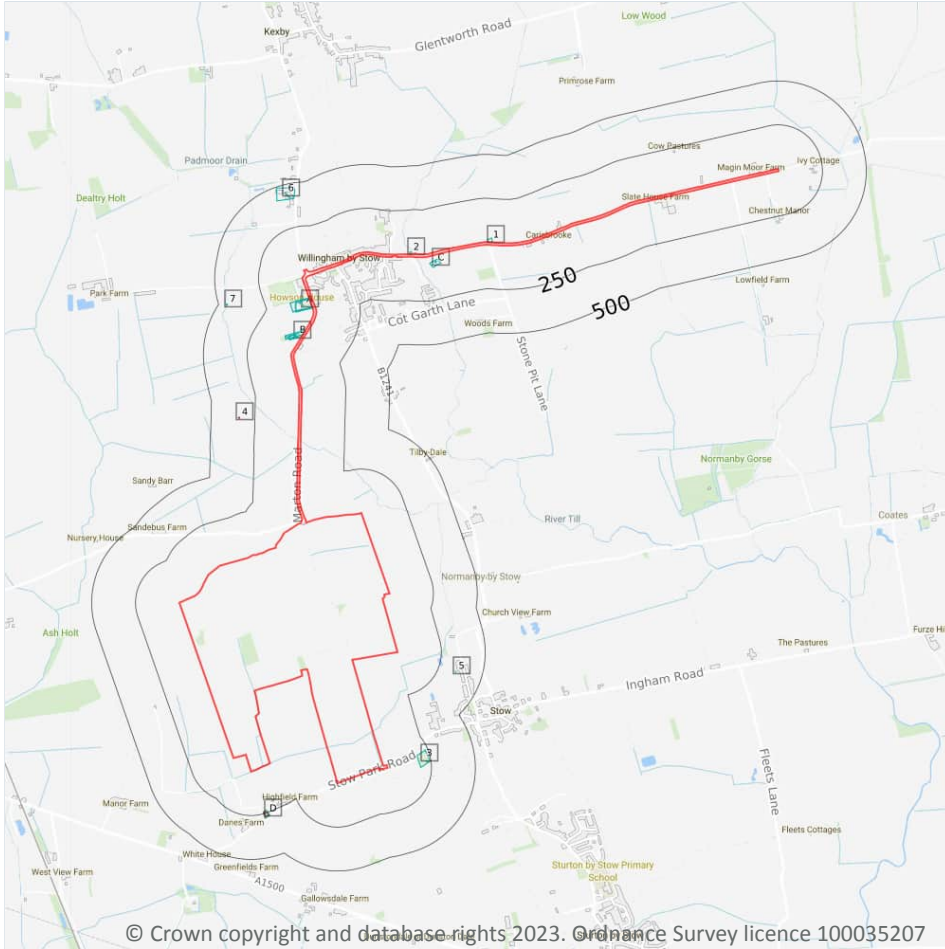
N/A: >10ha

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000

# 1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical energy features

## 1.1 Historical industrial land uses

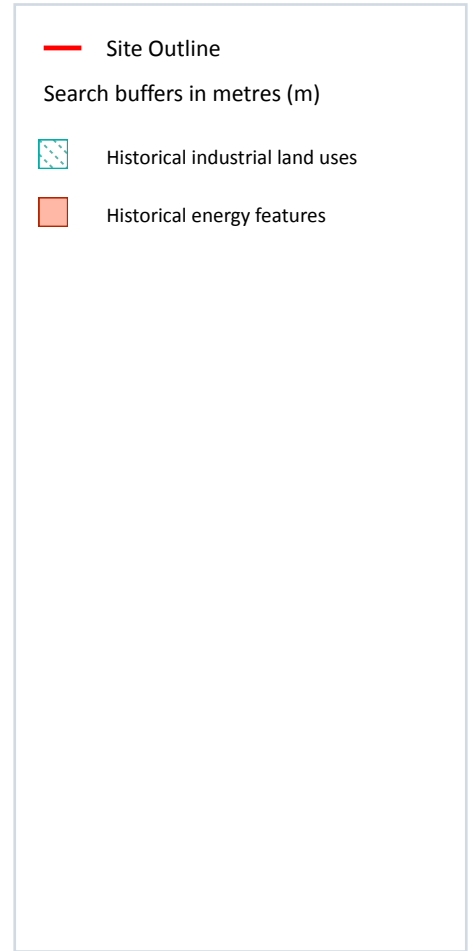
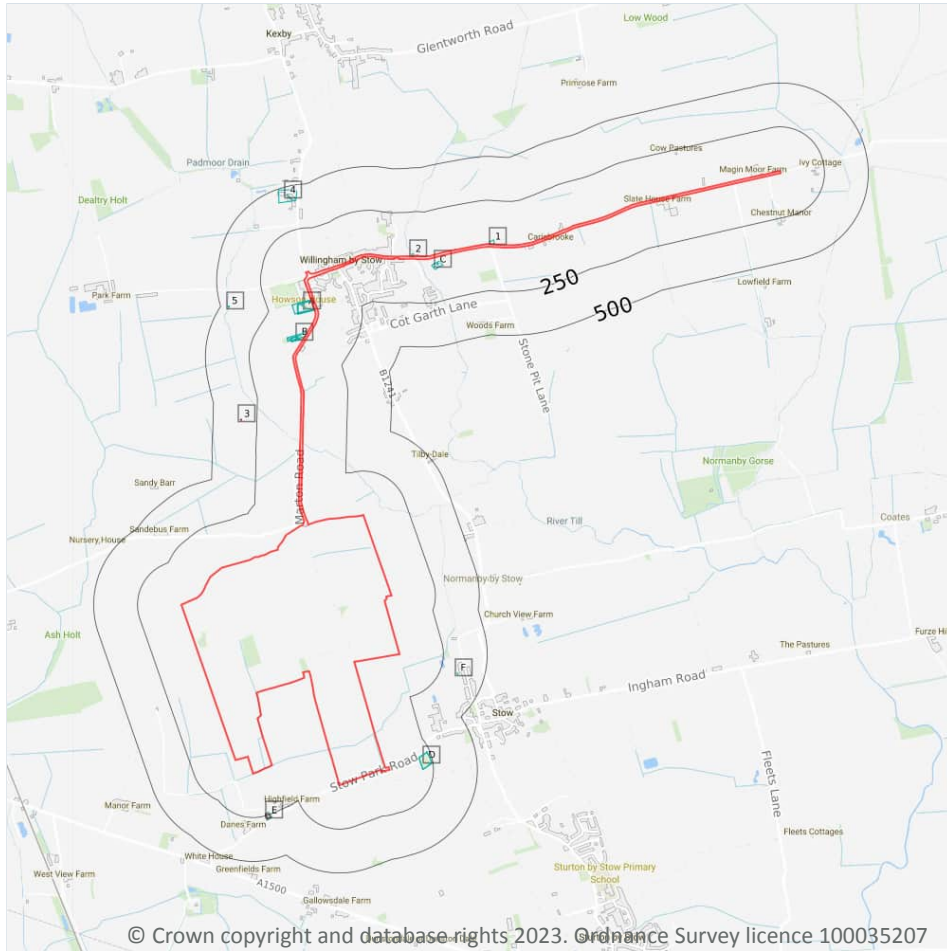
**Records within 500m** **16**

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

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

ID	Location	Land use	Dates present	Group ID
1	On site	Clay Pit	1885	1595705

## 2 Past land use - un-grouped



### 2.1 Historical industrial land uses

Records within 500m

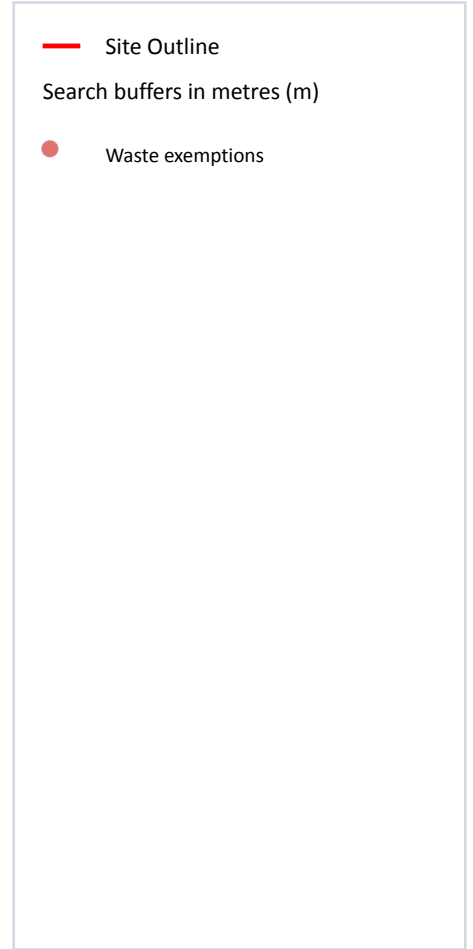
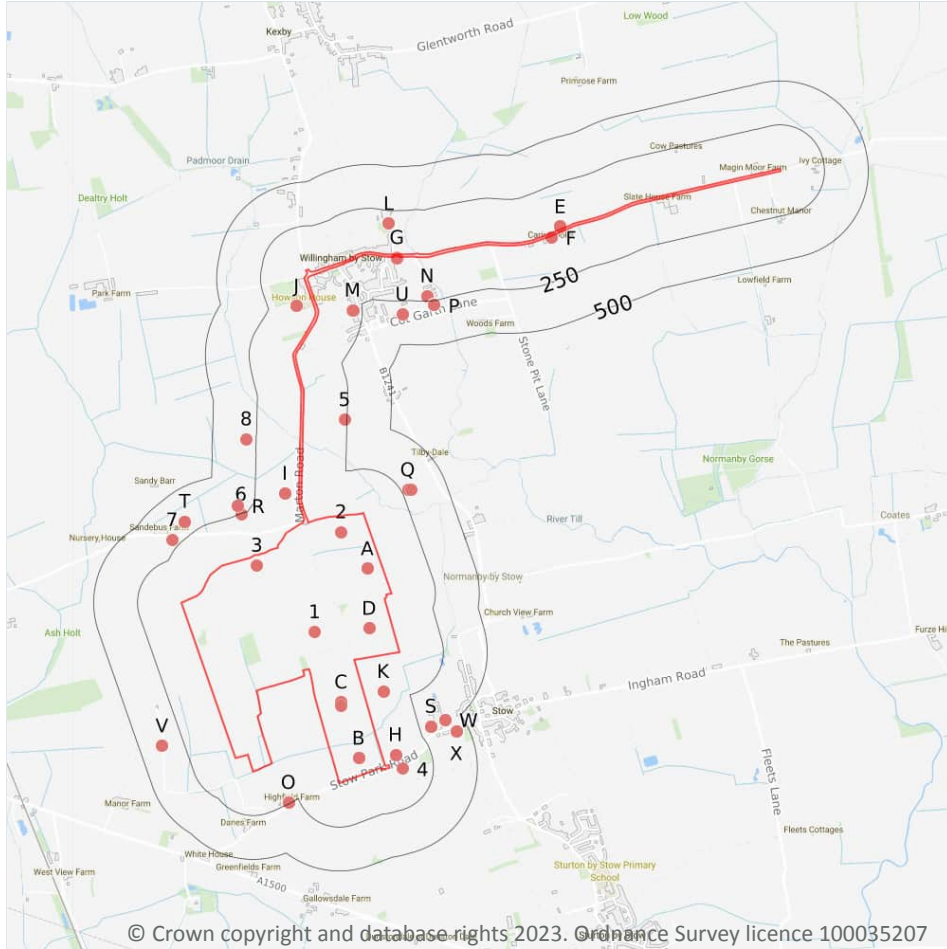
19

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

Features are displayed on the Past land use - un-grouped map on **page 17**

ID	Location	Land Use	Date	Group ID
1	On site	Clay Pit	1885	1595705
A	On site	Hospital	1947	1681169
A	On site	Hospital	1905	1681169

## 3 Waste and landfill



### 3.1 Active or recent landfill

Records within 500m

0

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

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

### 3.2 Historical landfill (BGS records)

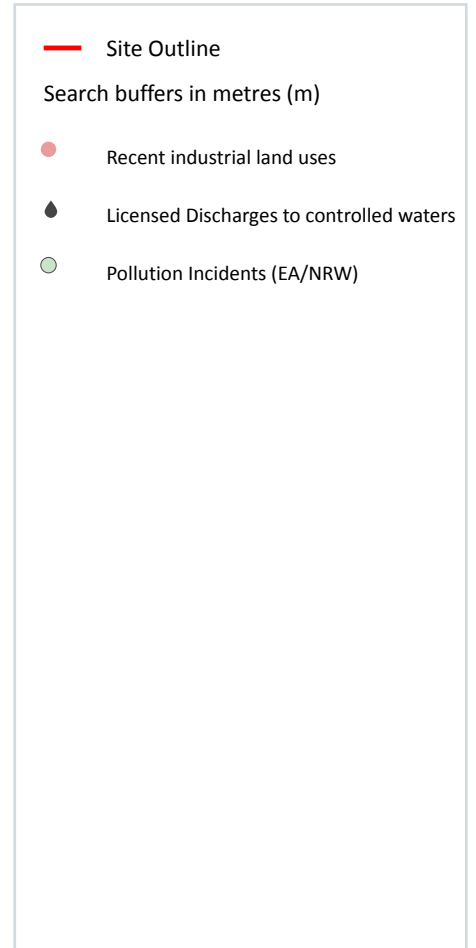
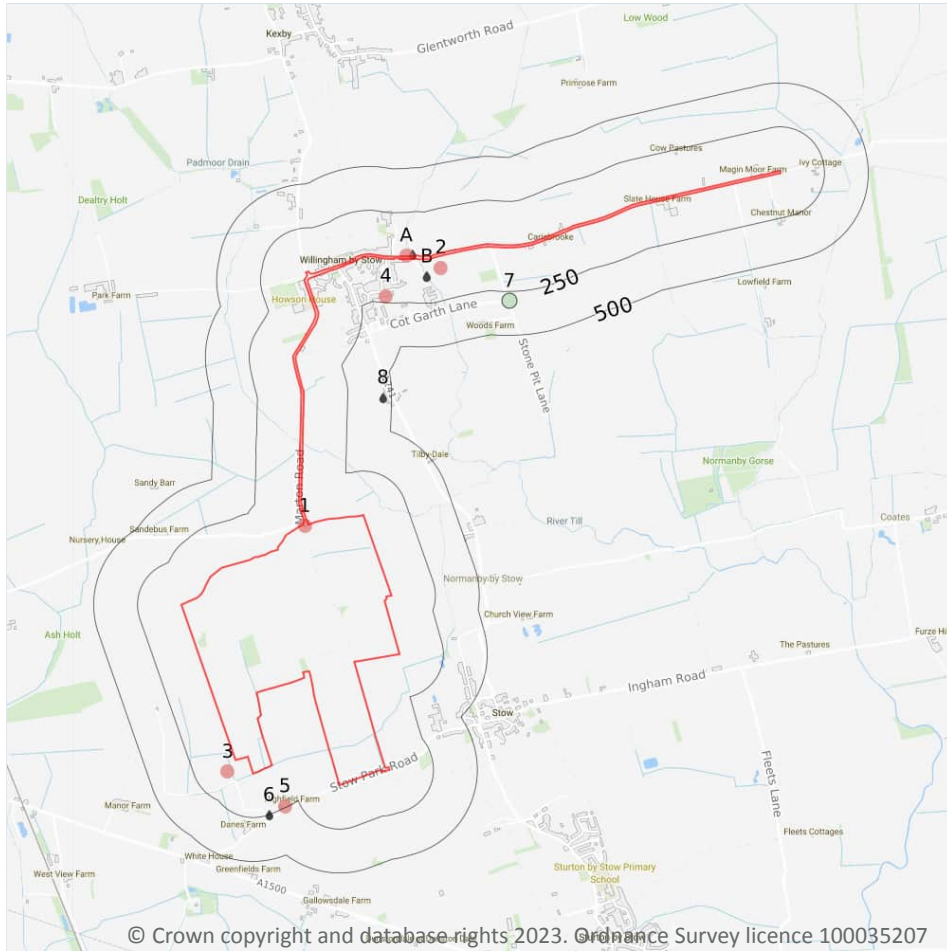
Records within 500m

0

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

*This data is sourced from the British Geological Survey.*

## 4 Current industrial land use



### 4.1 Recent industrial land uses

Records within 250m

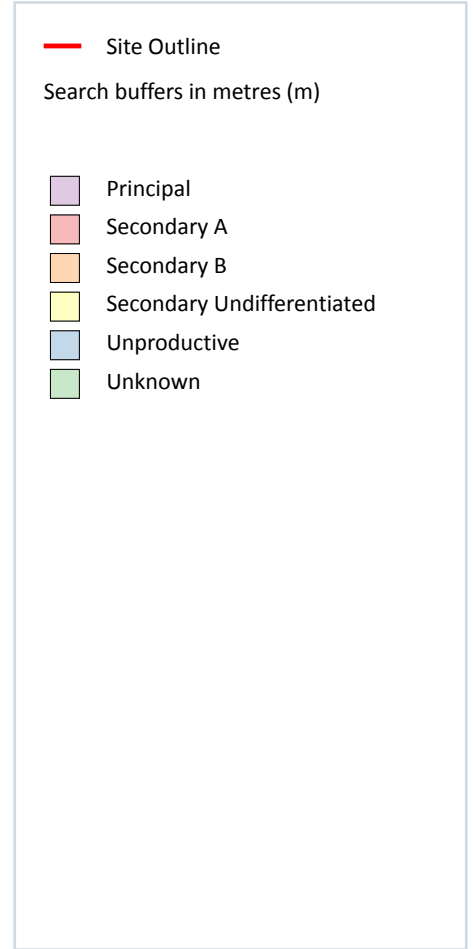
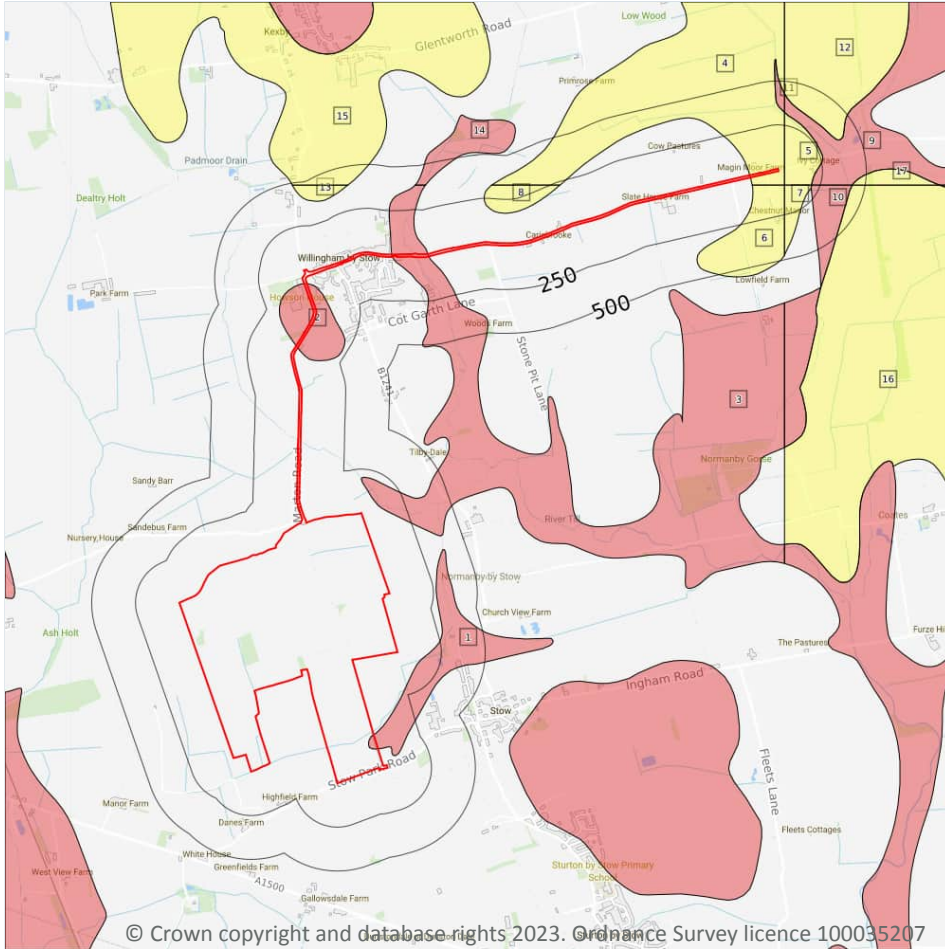
6

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 37**

ID	Location	Company	Address	Activity	Category
1	On site	Gas Valve Compound	Lincolnshire, DN21	Gas Features	Infrastructure and Facilities
A	4m N	Pump House	Lincolnshire, DN21	Water Pumping Stations	Industrial Features
2	66m N	Sewage Works	Lincolnshire, DN21	Waste Storage, Processing and Disposal	Infrastructure and Facilities

## 5 Hydrogeology - Superficial aquifer



### 5.1 Superficial aquifer

Records within 500m

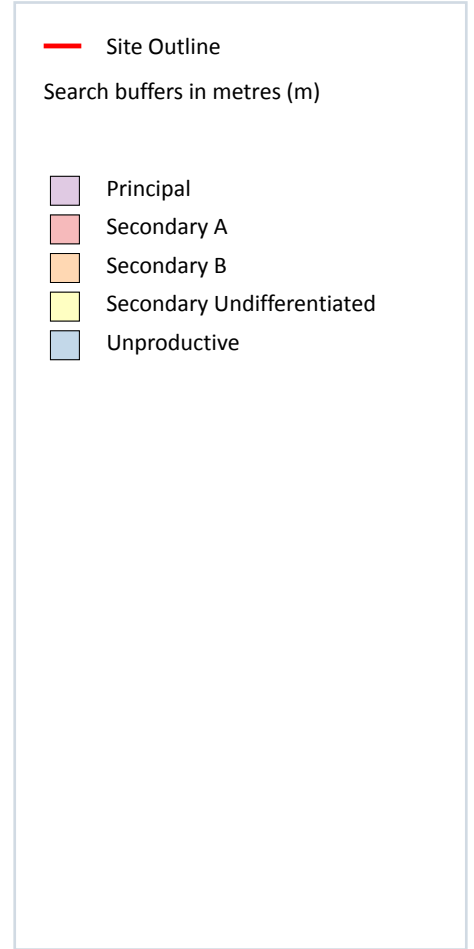
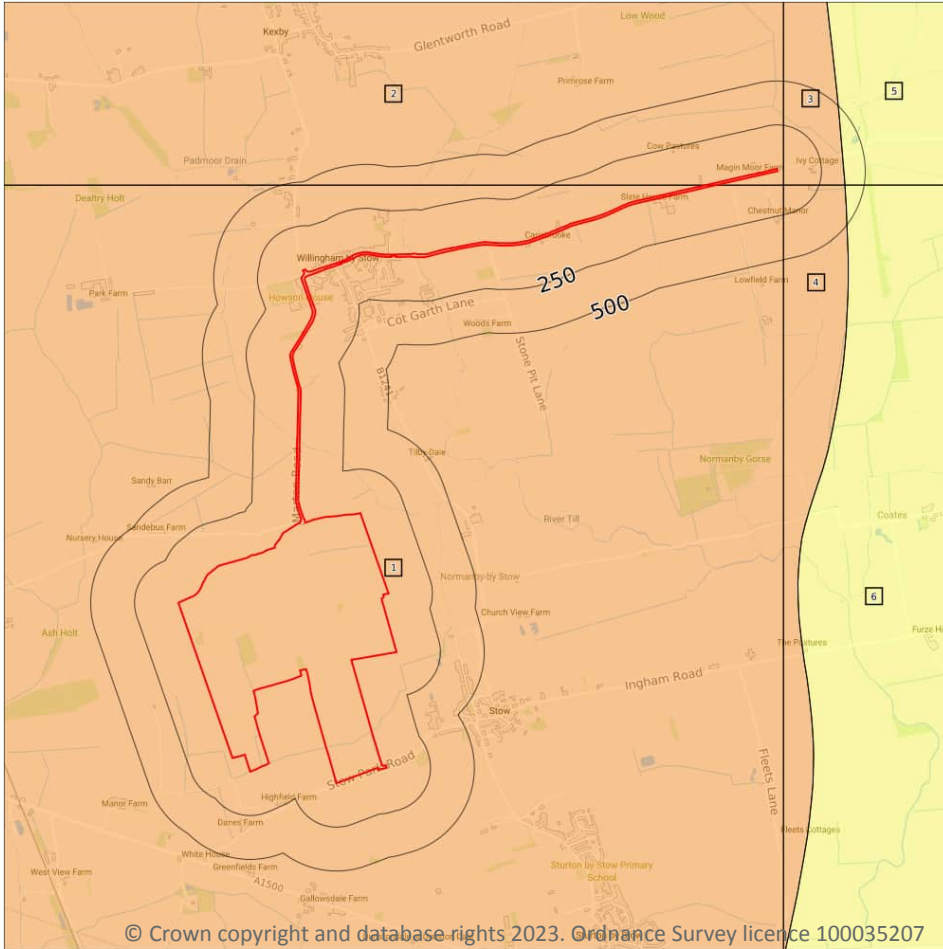
17

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 45**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	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

## Bedrock aquifer



### 5.2 Bedrock aquifer

Records within 500m

6

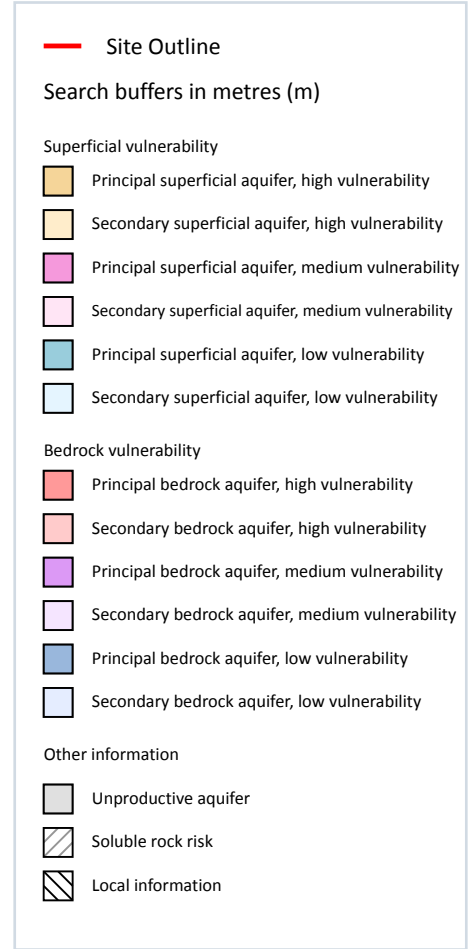
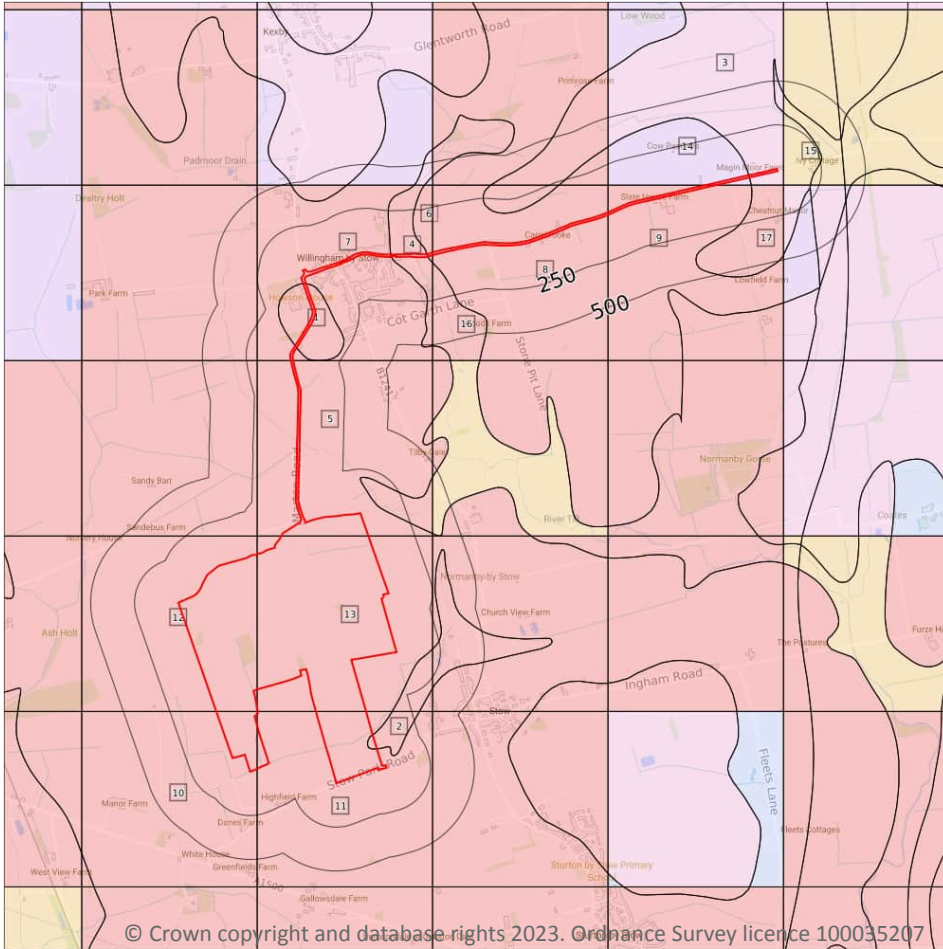
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 48**

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers



## Groundwater vulnerability



### 5.3 Groundwater vulnerability

Records within 50m

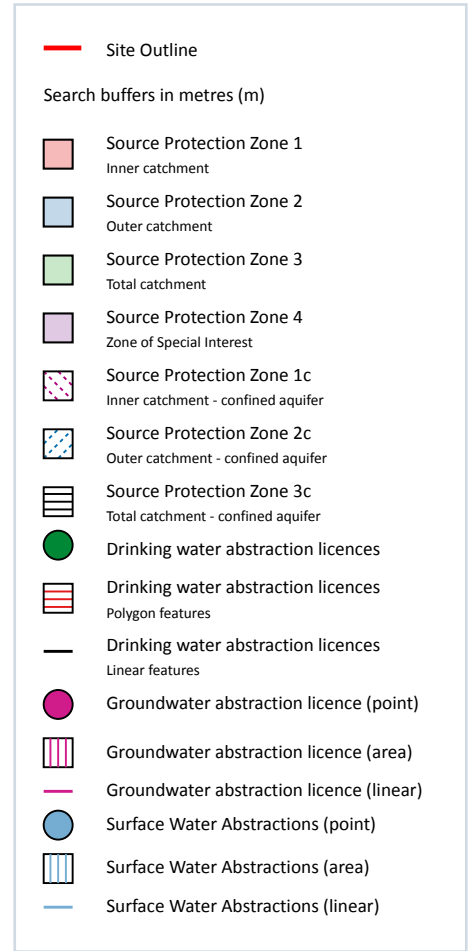
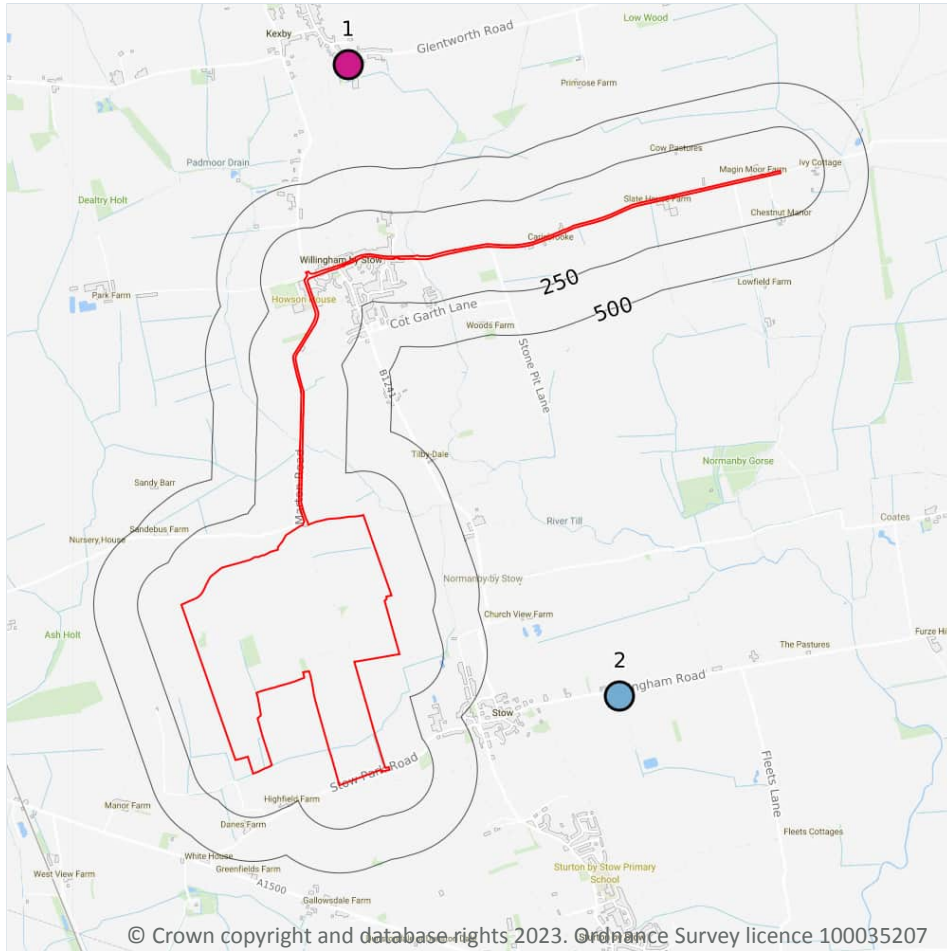
17

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

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

Features are displayed on the Groundwater vulnerability map on **page 50**

## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

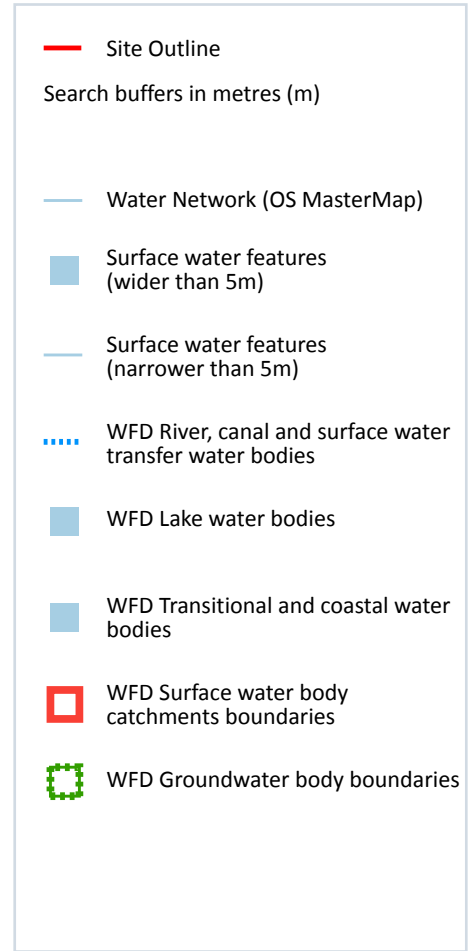
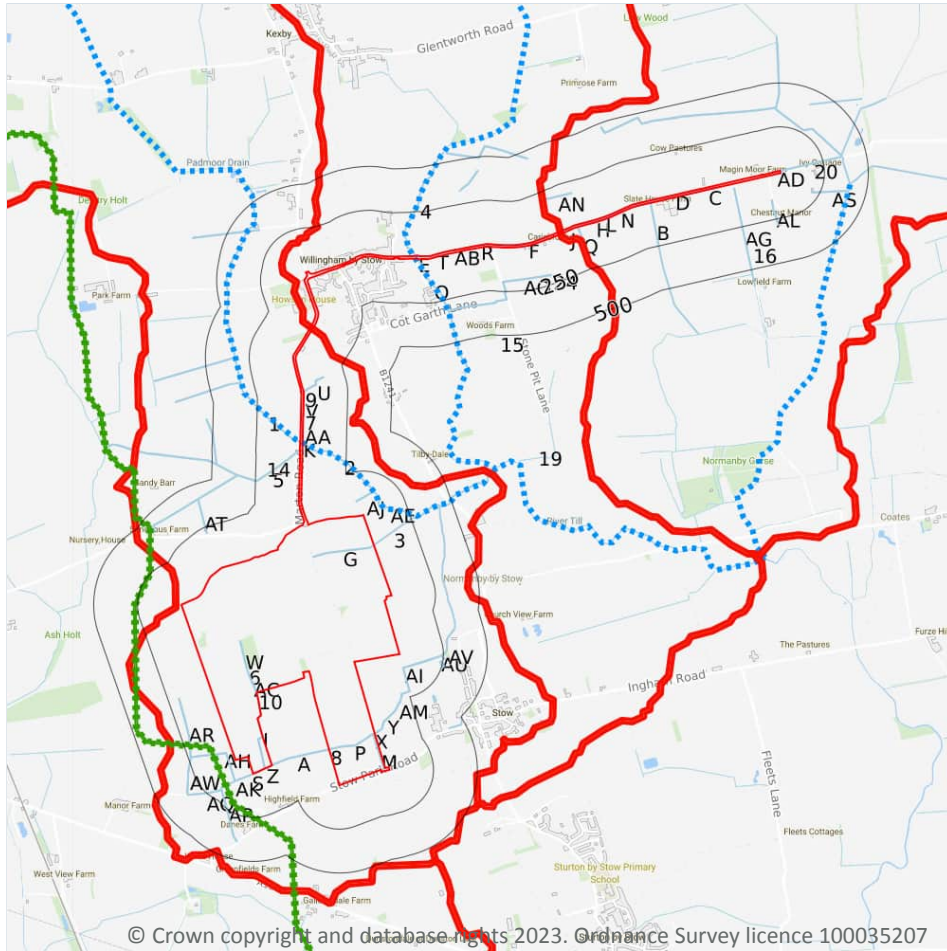
Records within 2000m

1

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 55**

## 6 Hydrology



### 6.1 Water Network (OS MasterMap)

Records within 250m

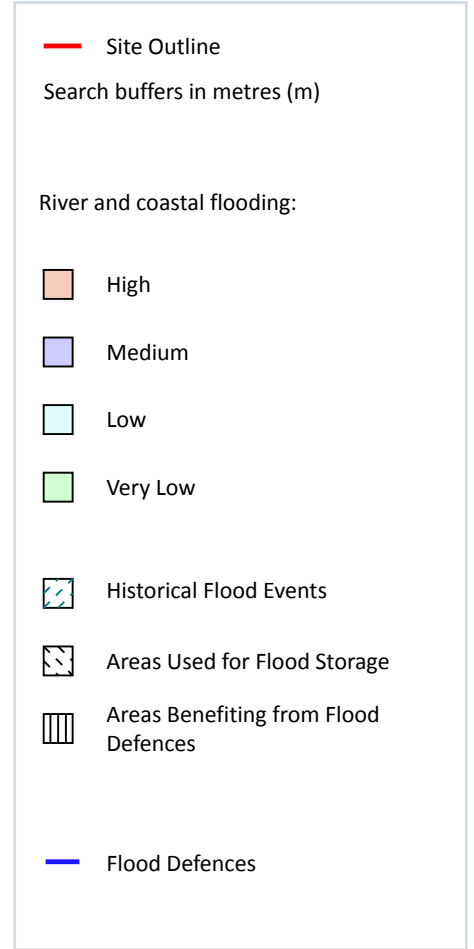
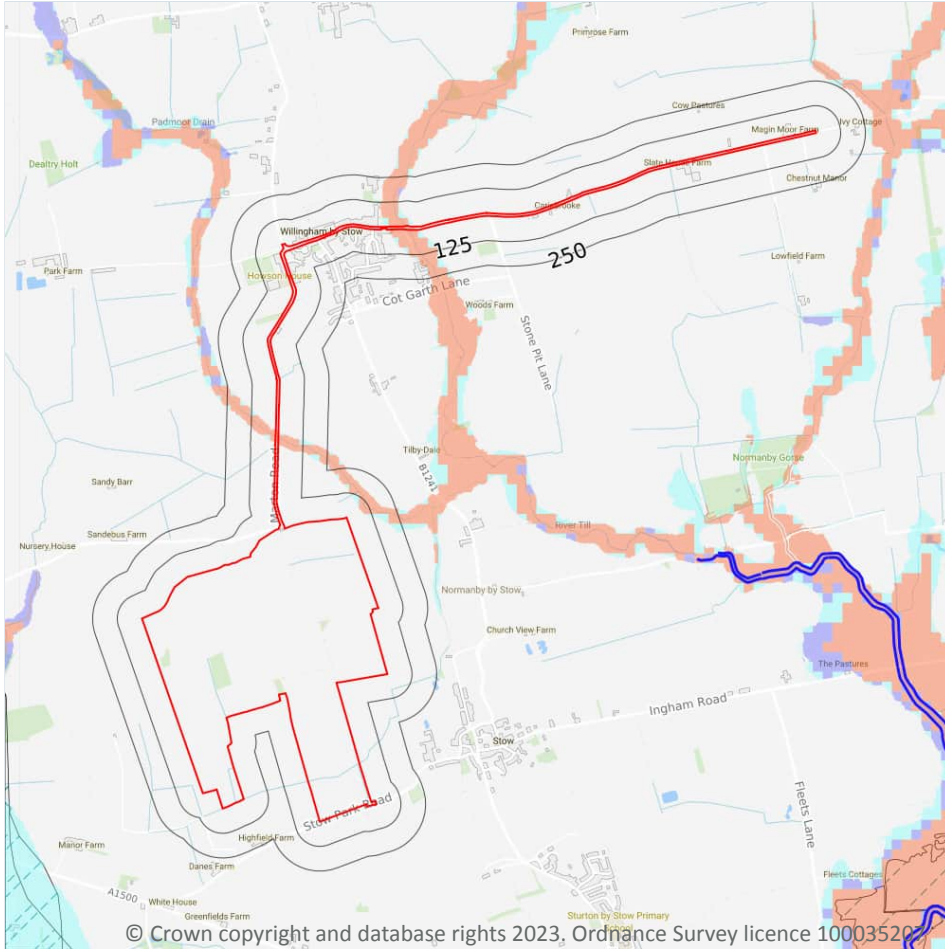
109

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

Features are displayed on the Hydrology map on **page 58**

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

## 7 River and coastal flooding



### 7.1 Risk of flooding from rivers and the sea

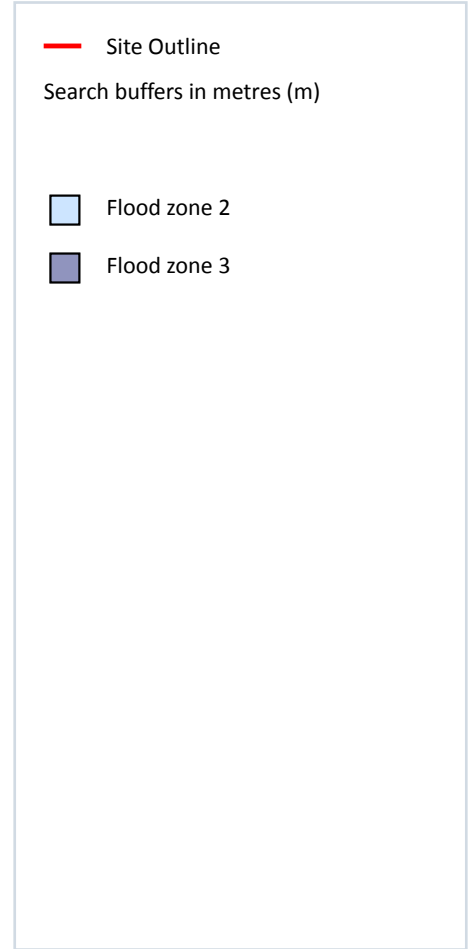
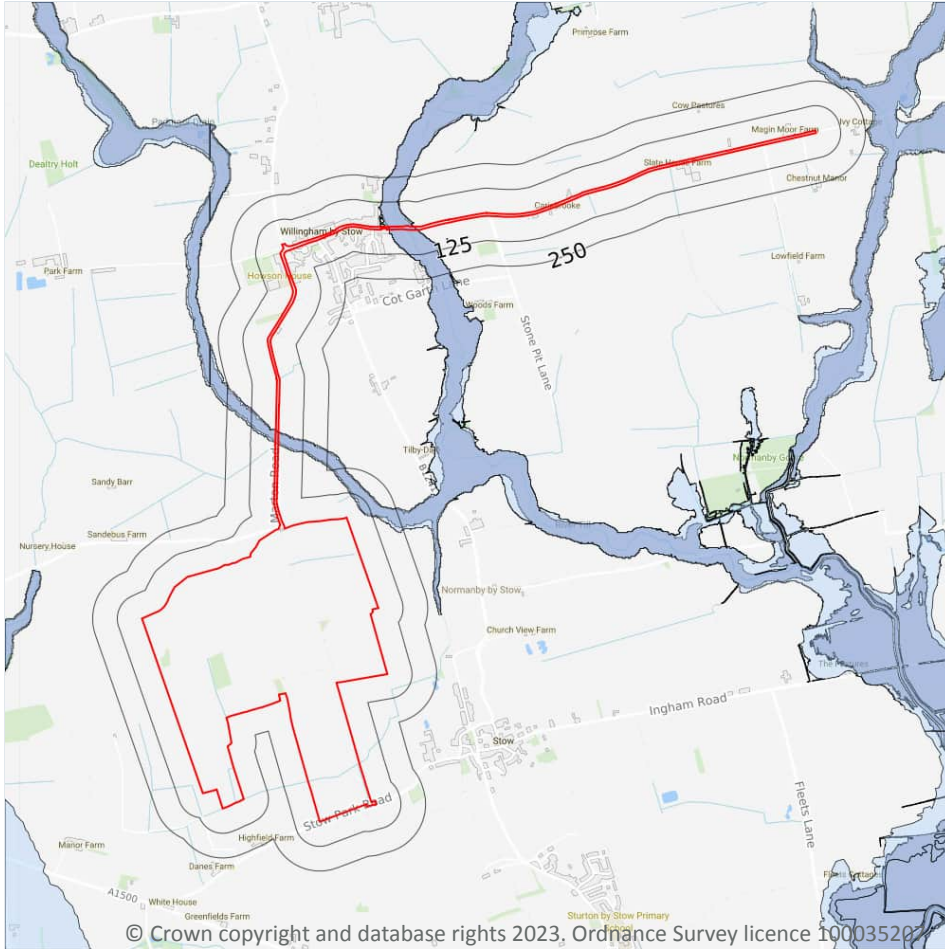
#### Records within 50m

9

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

Features are displayed on the River and coastal flooding map on **page 69**

## River and coastal flooding - Flood Zones



### 7.6 Flood Zone 2

Records within 50m

1

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

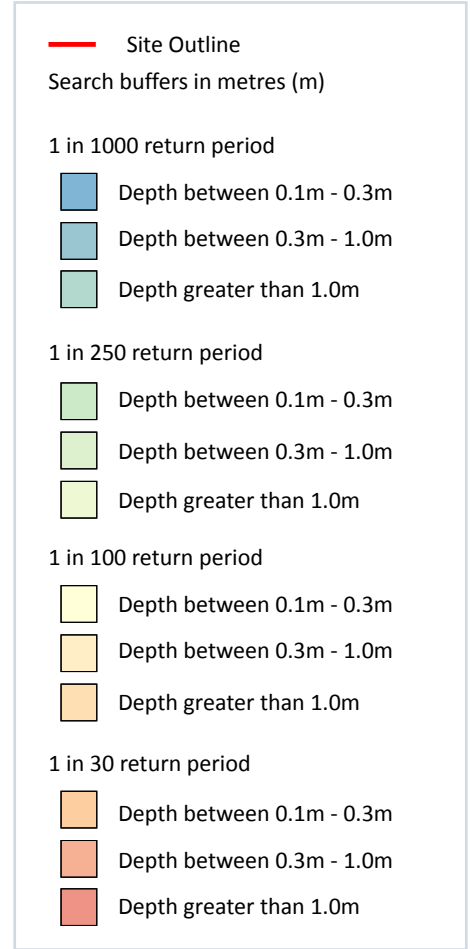
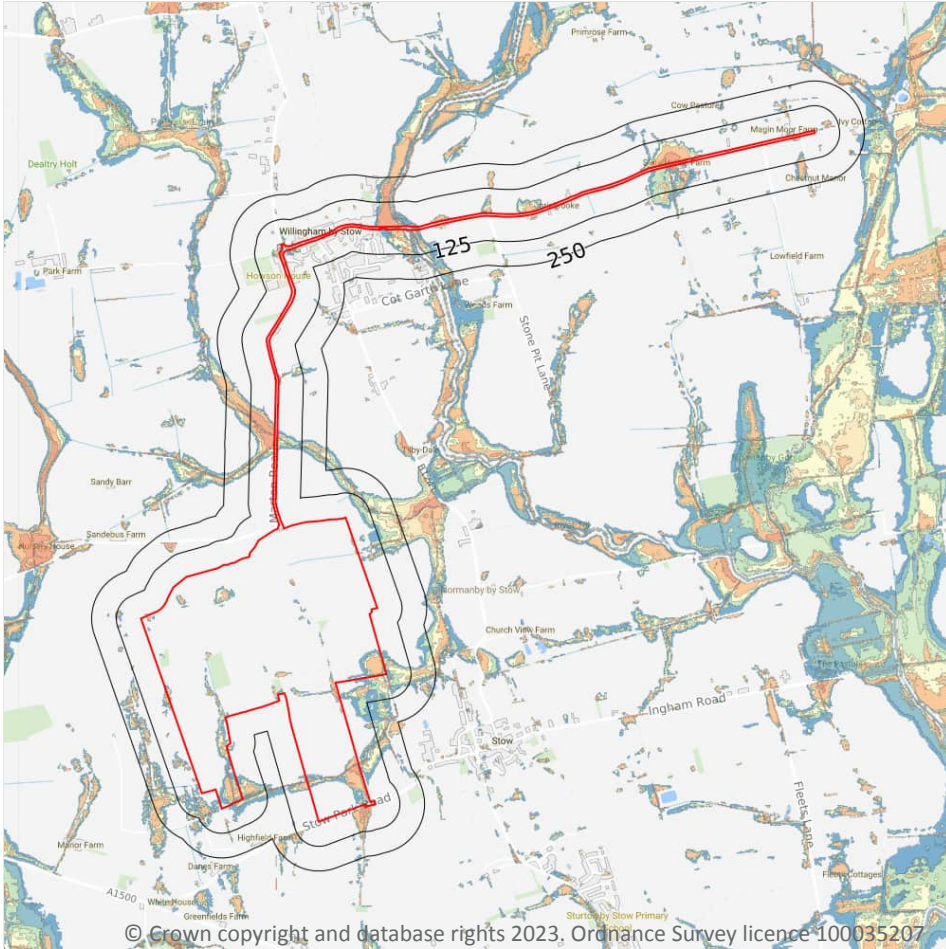
Features are displayed on the River and coastal flooding map on **page 69**

Location	Type
----------	------

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

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

## 8 Surface water flooding



### 8.1 Surface water flooding

**Highest risk on site**

**1 in 30 year, Greater than 1.0m**

**Highest risk within 50m**

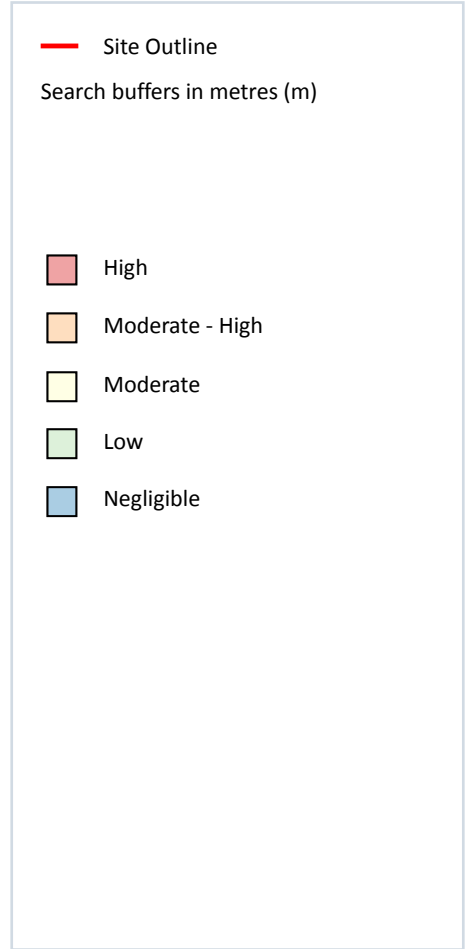
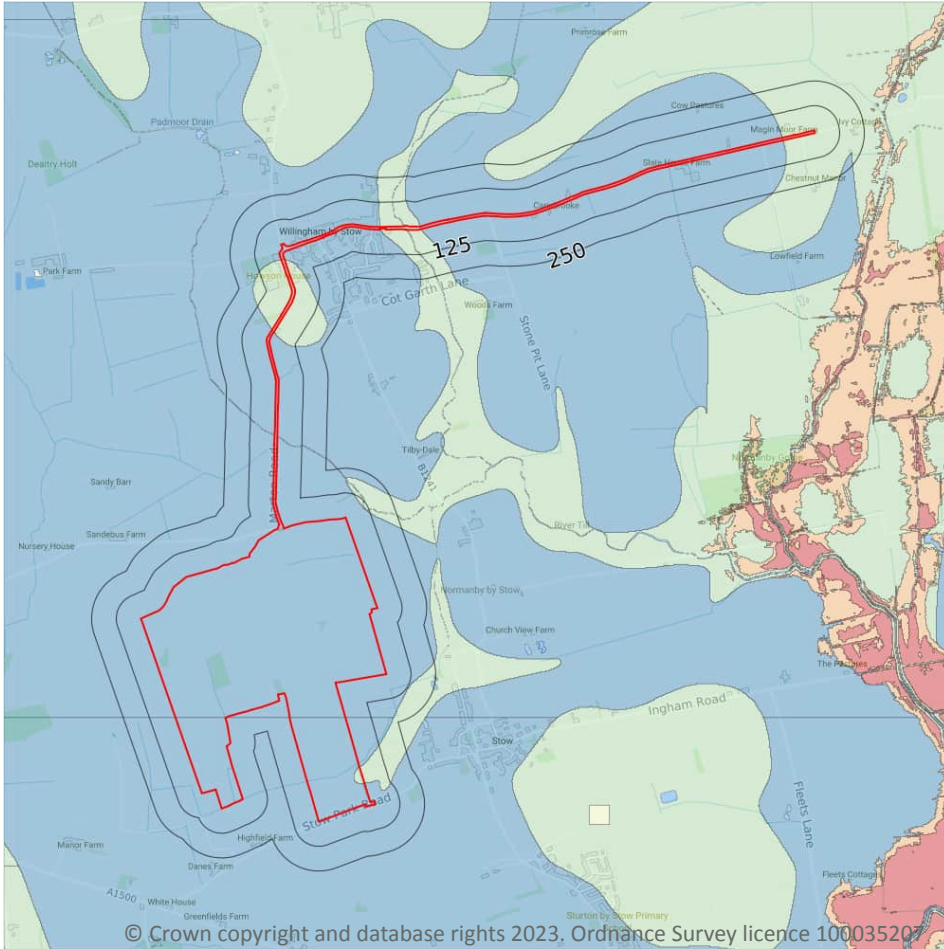
**1 in 30 year, Greater than 1.0m**

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

Features are displayed on the Surface water flooding map on **page 73**

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

## 9 Groundwater flooding



### 9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

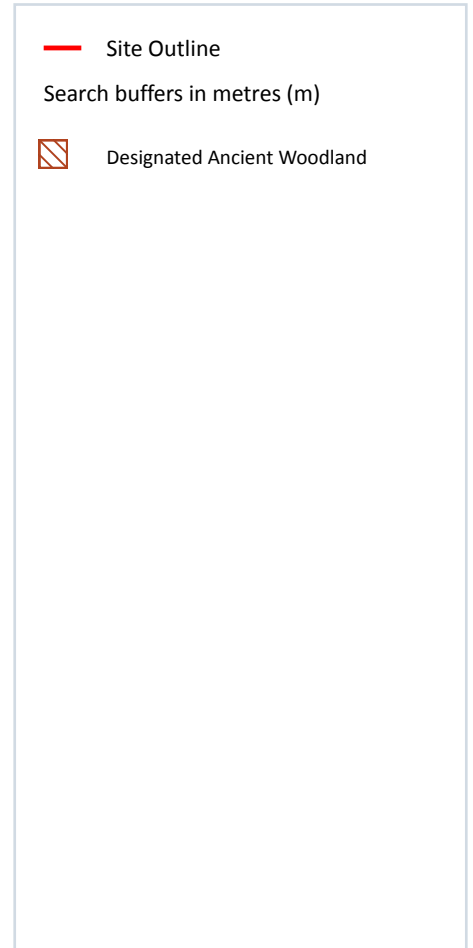
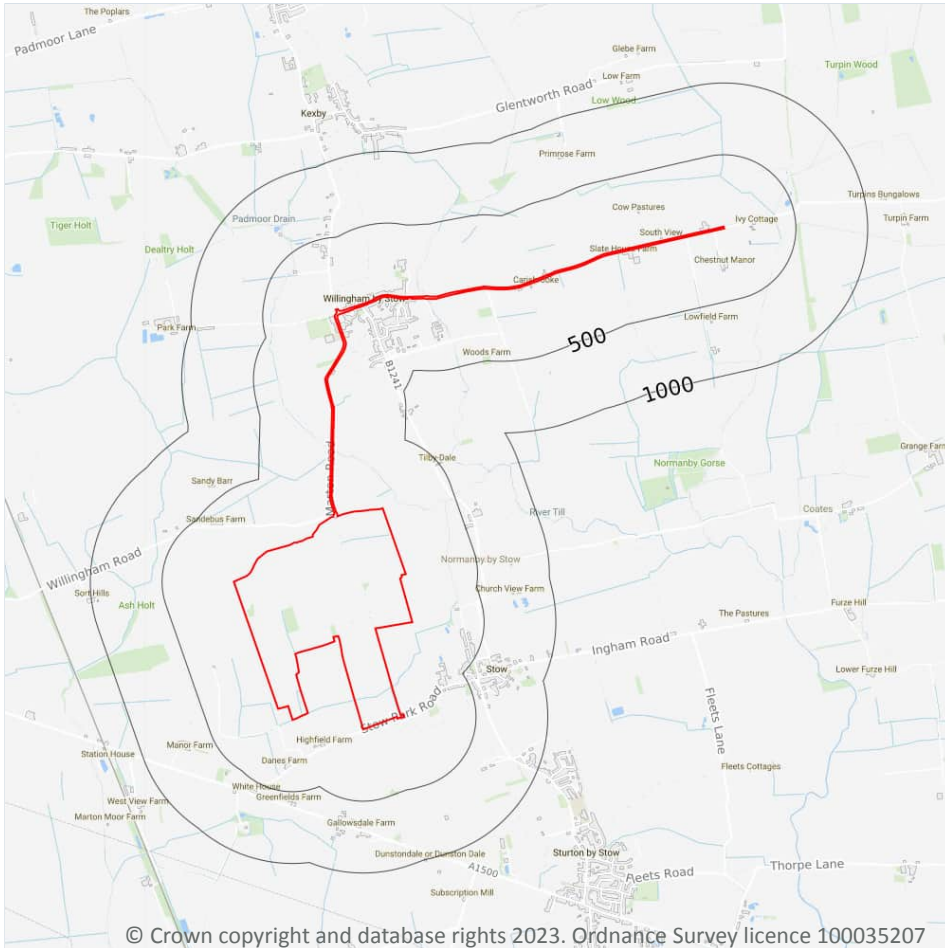
Low

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

Features are displayed on the Groundwater flooding map on **page 75**

*This data is sourced from Ambiental Risk Analytics.*

## 10 Environmental designations



### 10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

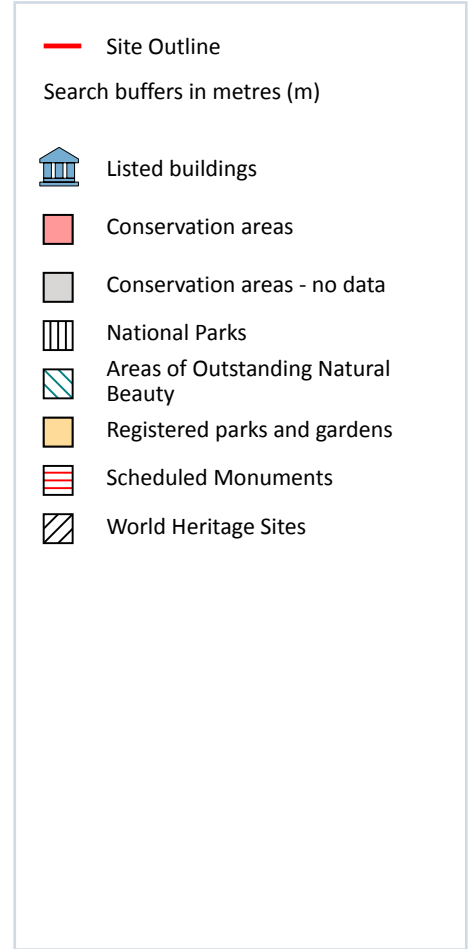
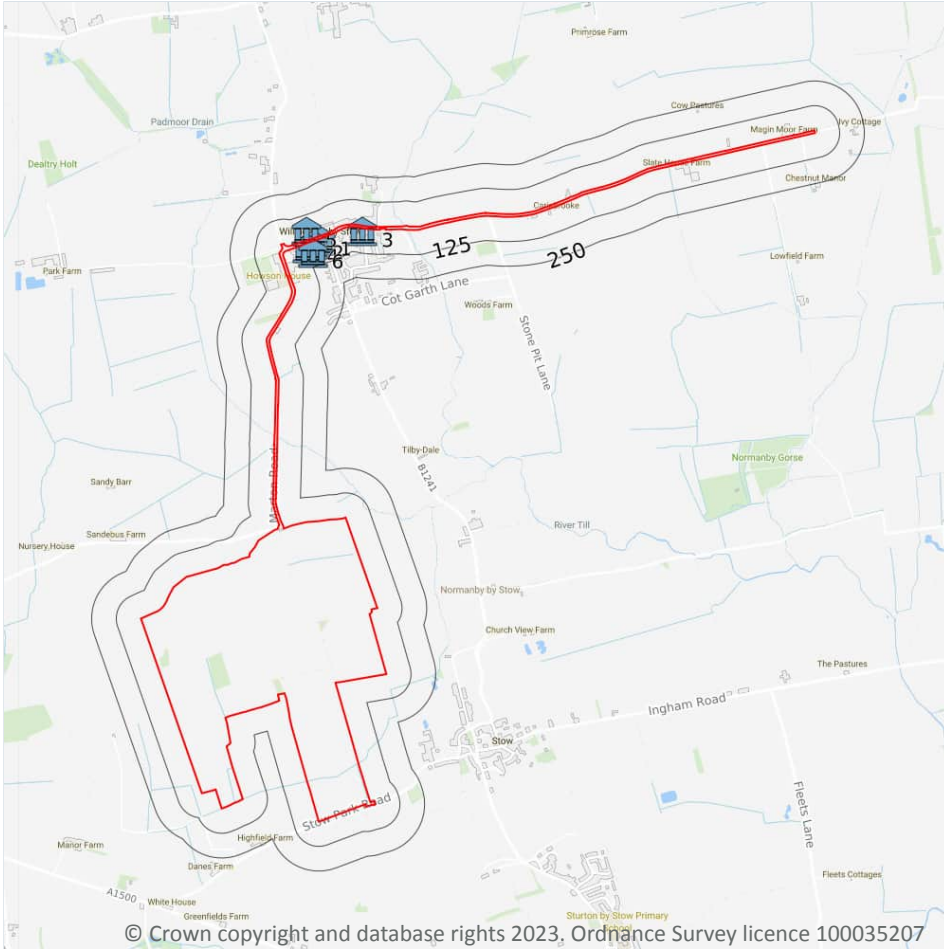
0

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

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



## 11 Visual and cultural designations



### 11.1 World Heritage Sites

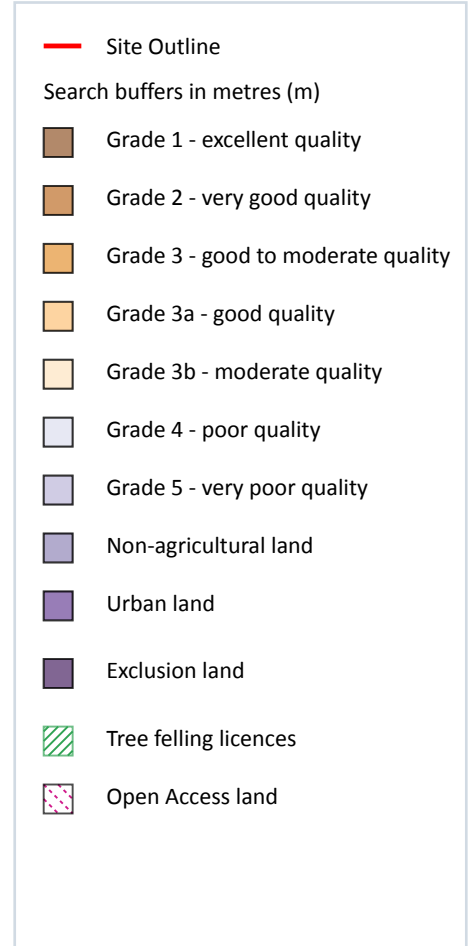
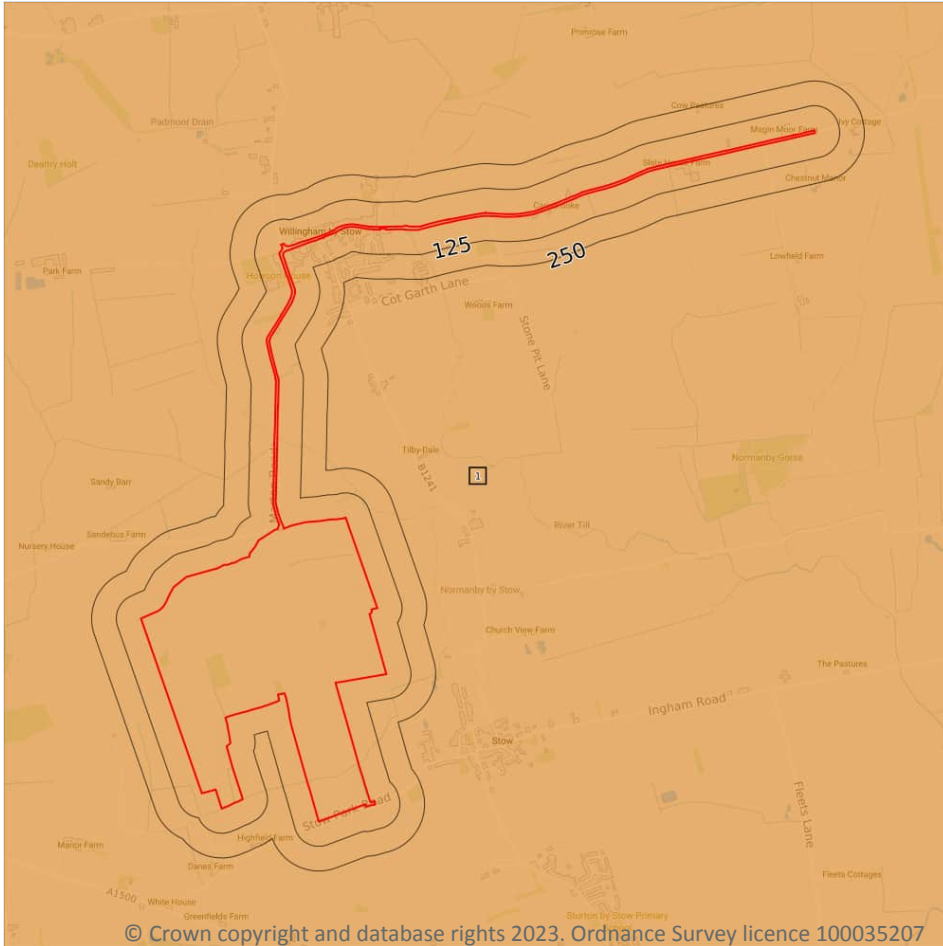
Records within 250m

0

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

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

## 12 Agricultural designations



### 12.1 Agricultural Land Classification

Records within 250m

1

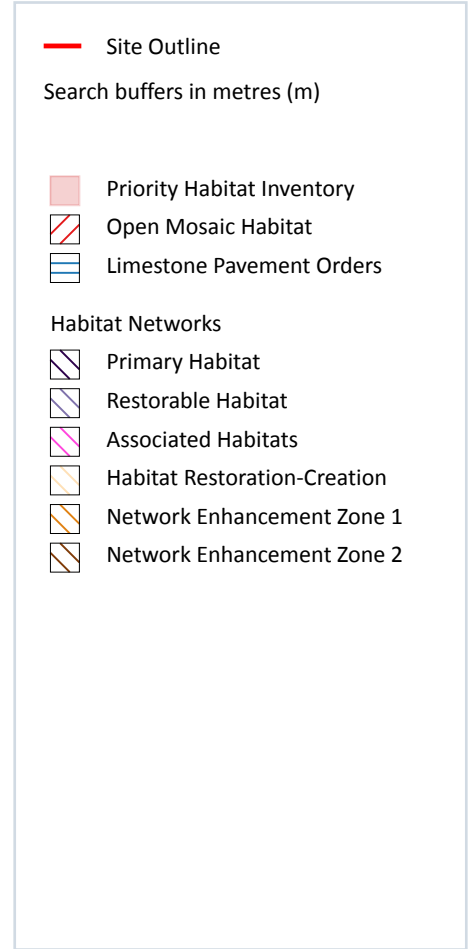
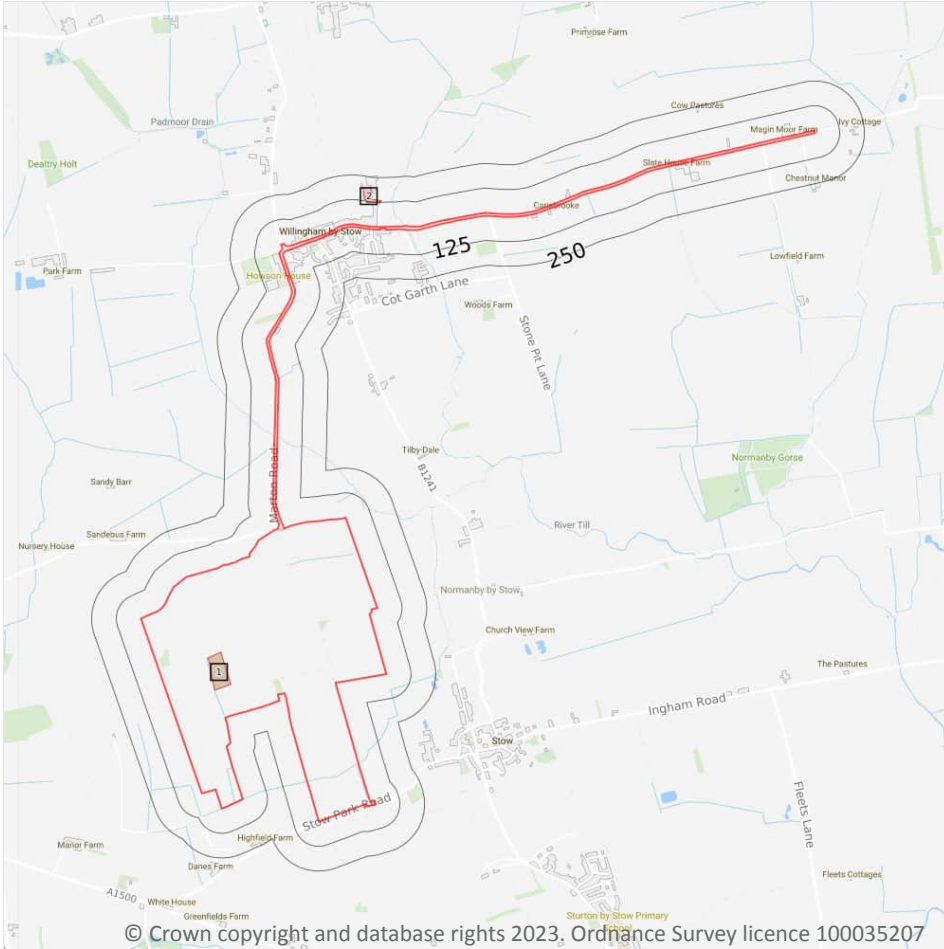
Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 85**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

*This data is sourced from Natural England.*

## 13 Habitat designations



### 13.1 Priority Habitat Inventory

Records within 250m

2

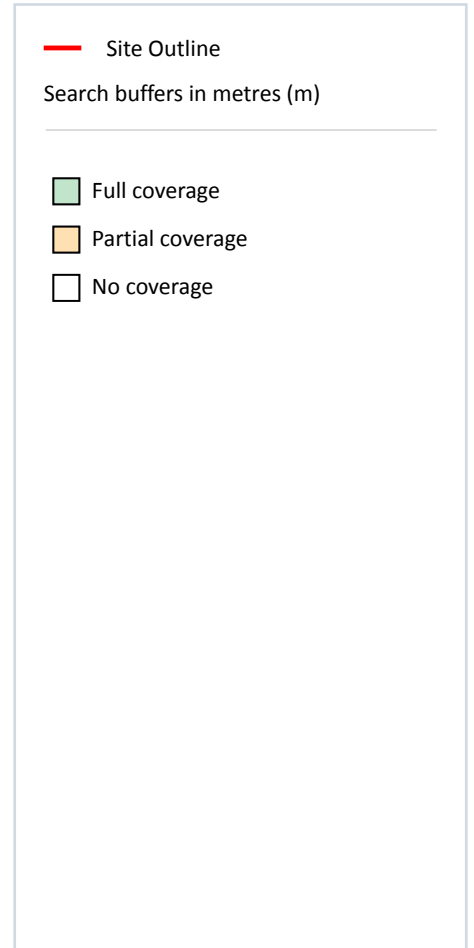
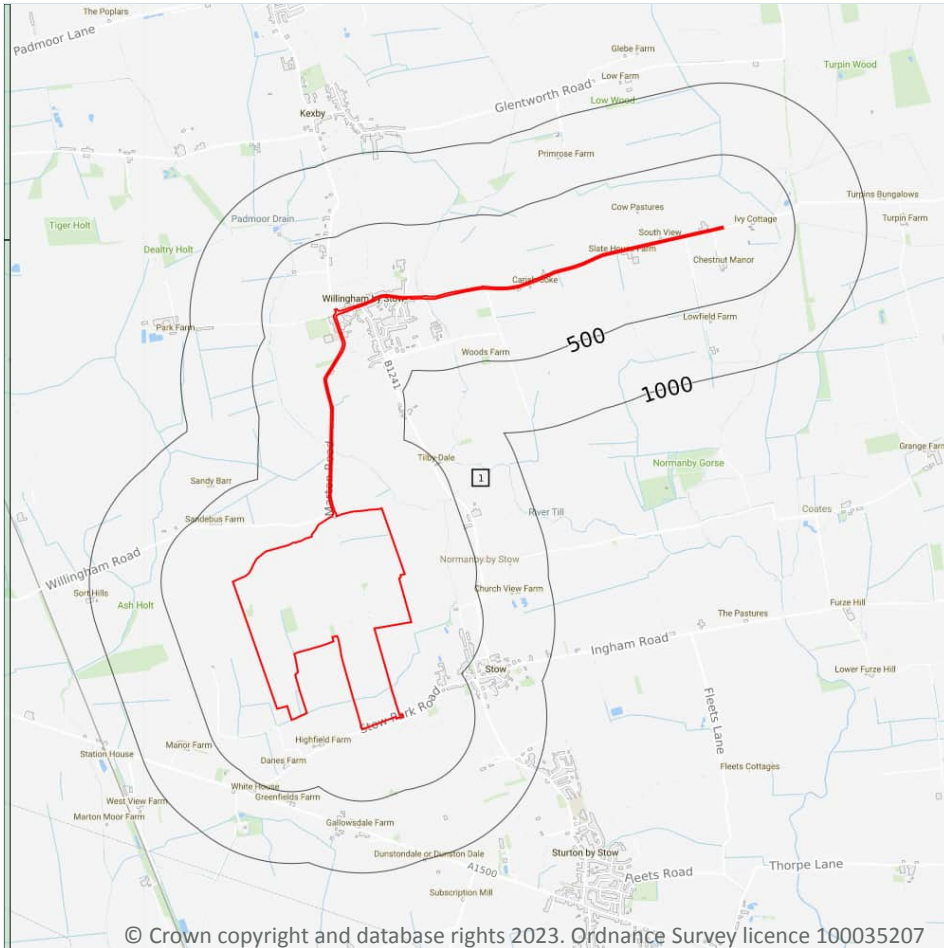
Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 88**

ID	Location	Main Habitat	Other habitats
1	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	117m N	Traditional orchard	Overruled by Traditional Orchards HAP Inventory dataset

This data is sourced from Natural England.

## 14 Geology 1:10,000 scale - Availability



### 14.1 10k Availability

Records within 500m

1

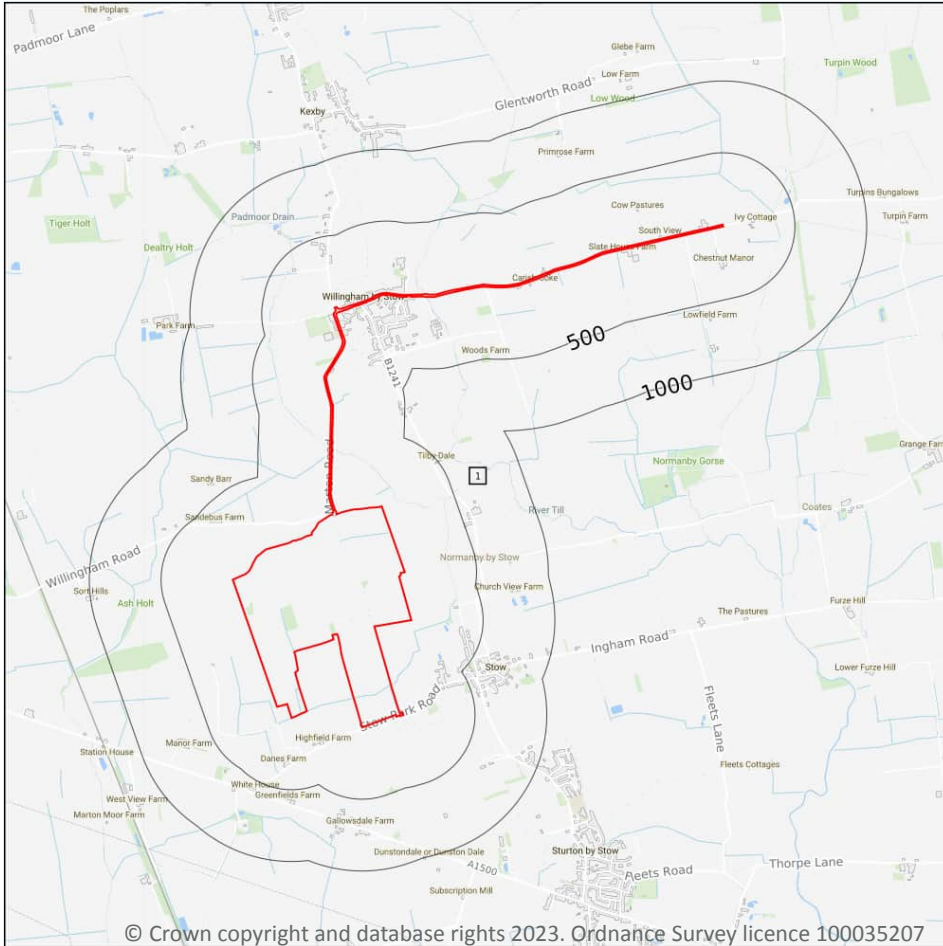
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 90**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.

## 15 Geology 1:50,000 scale - Availability



— Site Outline  
Search buffers in metres (m)

□ Geological map tile

### 15.1 50k Availability

Records within 500m

1

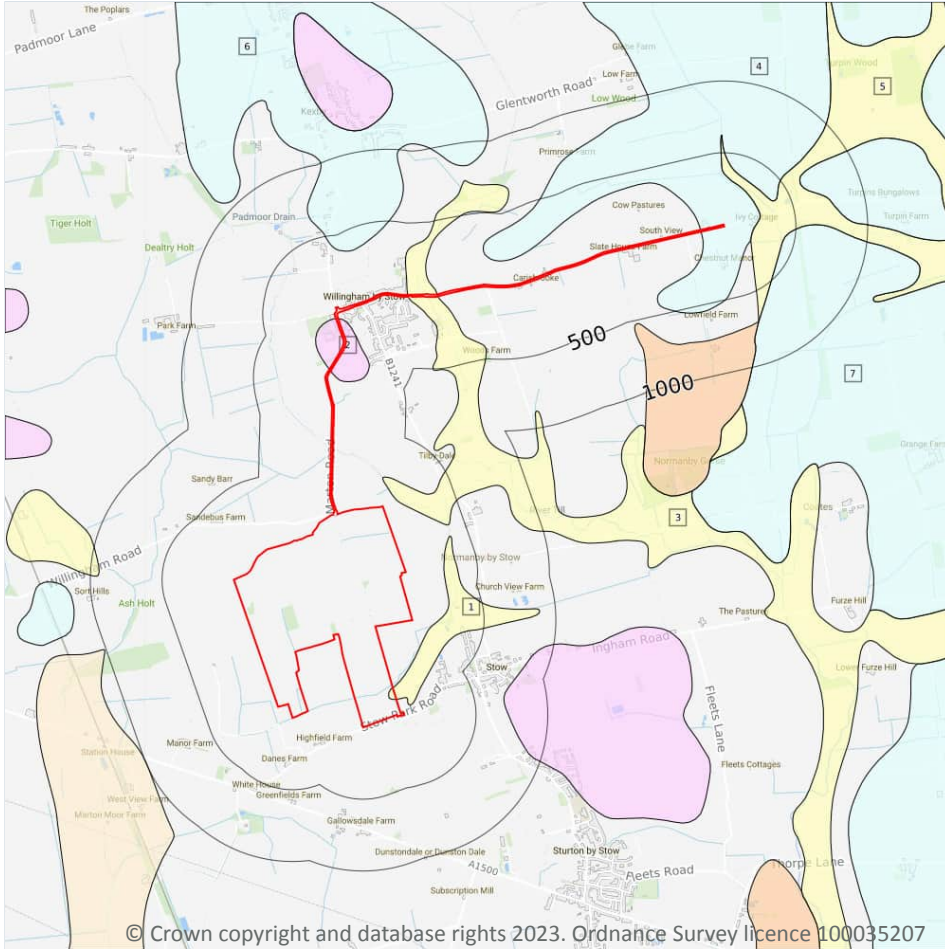
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 94**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW102_market_rasen_v4

This data is sourced from the British Geological Survey.

## Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)  
Please see table for more details.

### 15.4 Superficial geology (50k)

Records within 500m

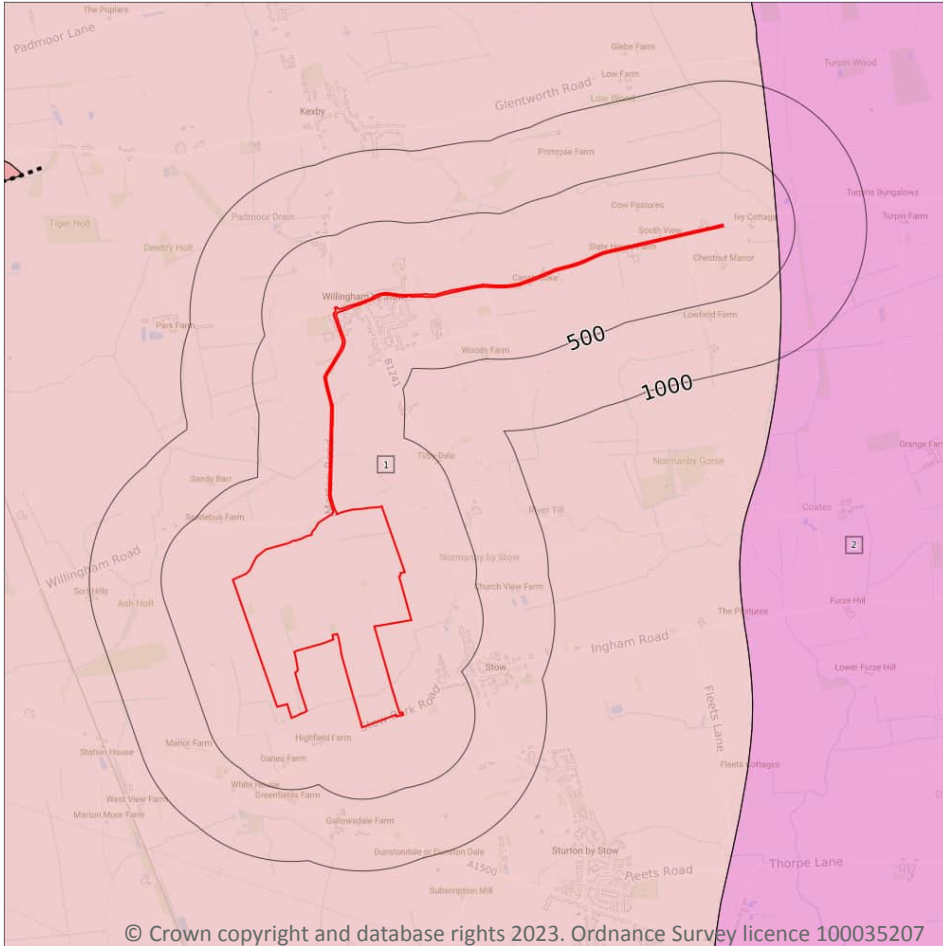
7

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 96**

ID	Location	LEX Code	Description	Rock description
1	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
2	On site	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
3	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

## Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (50k)
- Bedrock geology (50k)  
Please see table for more details.

### 15.8 Bedrock geology (50k)

Records within 500m

2

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

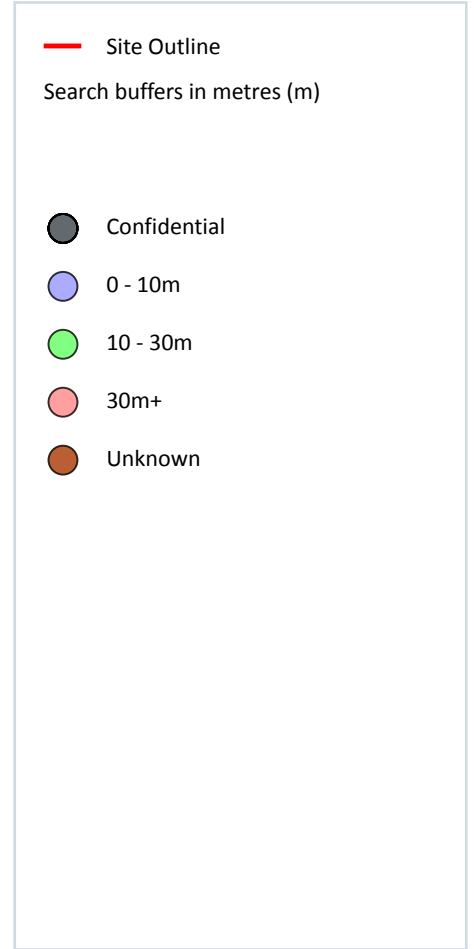
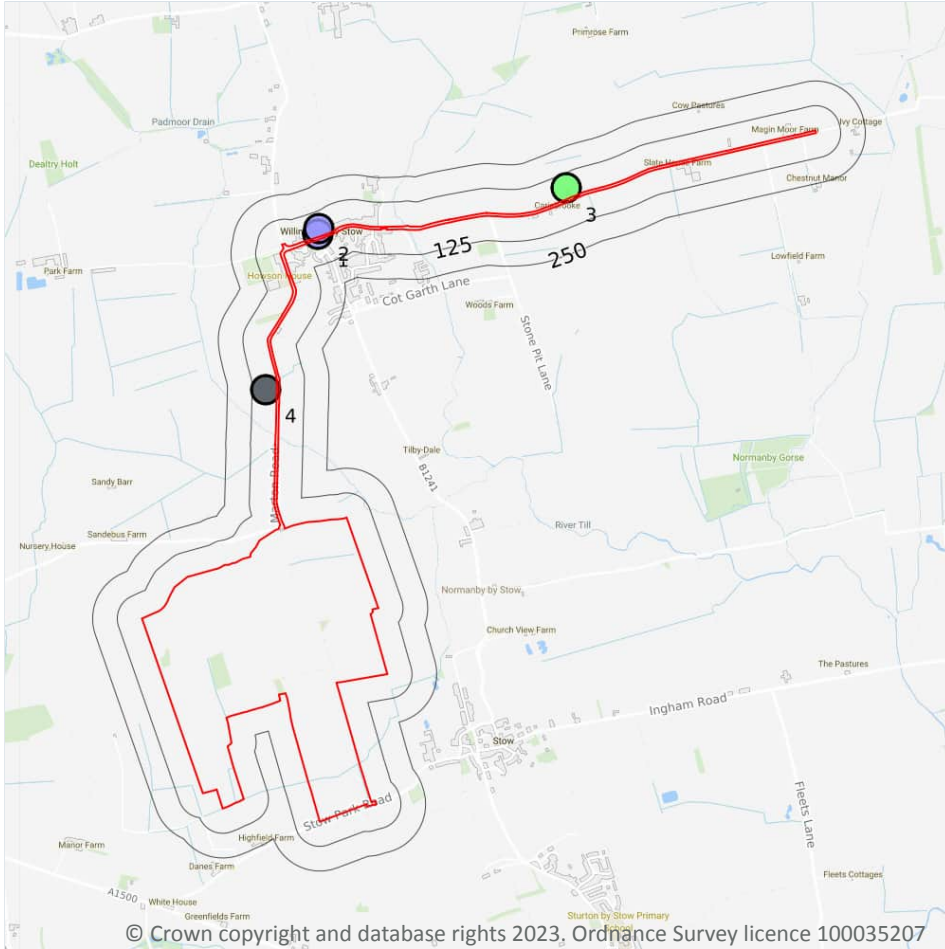
Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 99**

ID	Location	LEX Code	Description	Rock age
1	On site	SMD-MDLM	SCUNTHORPE MUDSTONE FORMATION - MUDSTONE AND LIMESTONE, INTERBEDDED	RHAETIAN
2	376m NE	CHAM-MDST	CHARMOUTH MUDSTONE FORMATION - MUDSTONE	SINEMURIAN

*This data is sourced from the British Geological Survey.*



## 16 Boreholes



### 16.1 BGS Boreholes

Records within 250m

4

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

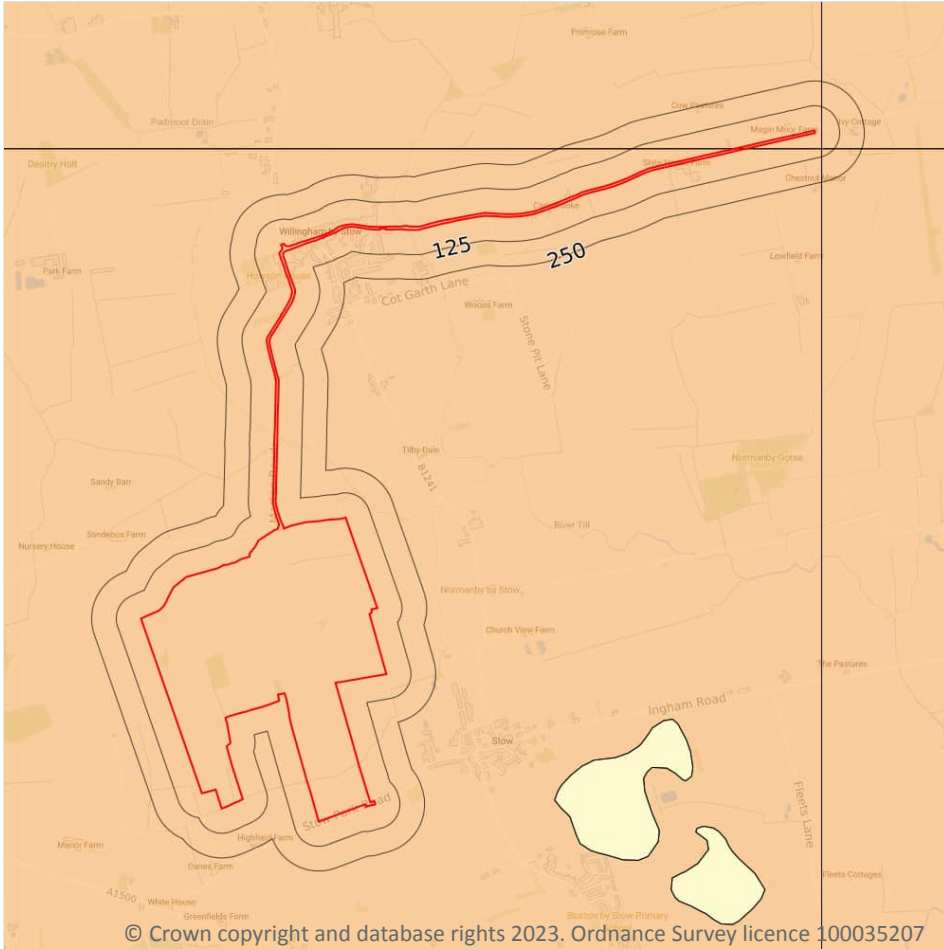
Features are displayed on the Boreholes map on **page 101**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	13m N	487444 384567	ORCHARD FARM TP 1	1.6	N	<a href="#">16108934</a>
2	42m N	487447 384598	ORCHARD FARM TP 2	1.6	N	<a href="#">16108935</a>
3	52m NE	488700 384800	RETFORD 873	15.24	N	<a href="#">244147</a>





## 17 Natural ground subsidence - Shrink swell clays



### 17.1 Shrink swell clays

Records within 50m

2

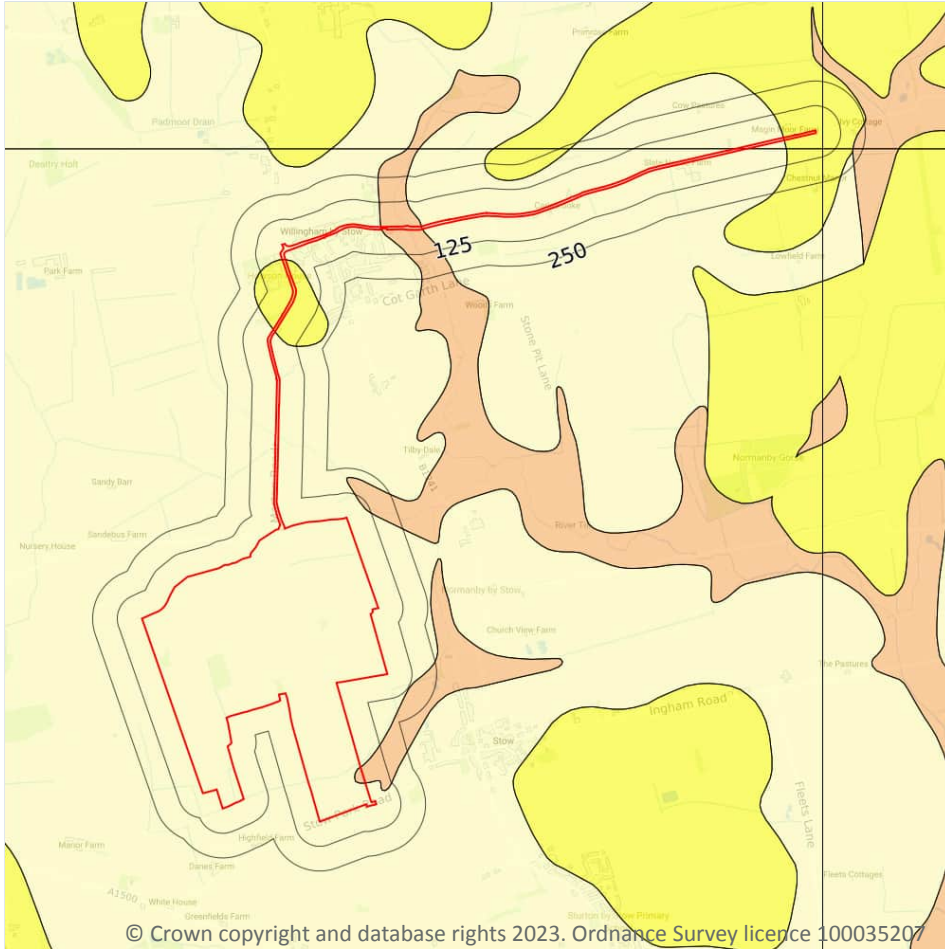
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 103**

Location	Hazard rating	Details
On site	Low	Ground conditions predominantly medium plasticity.
34m NE	Low	Ground conditions predominantly medium plasticity.

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Running sands



— Site Outline  
Search buffers in metres (m)

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

### 17.2 Running sands

Records within 50m

5

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

Features are displayed on the Natural ground subsidence - Running sands map on **page 104**

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

## Natural ground subsidence - Compressible deposits



— Site Outline  
Search buffers in metres (m)

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

### 17.3 Compressible deposits

Records within 50m

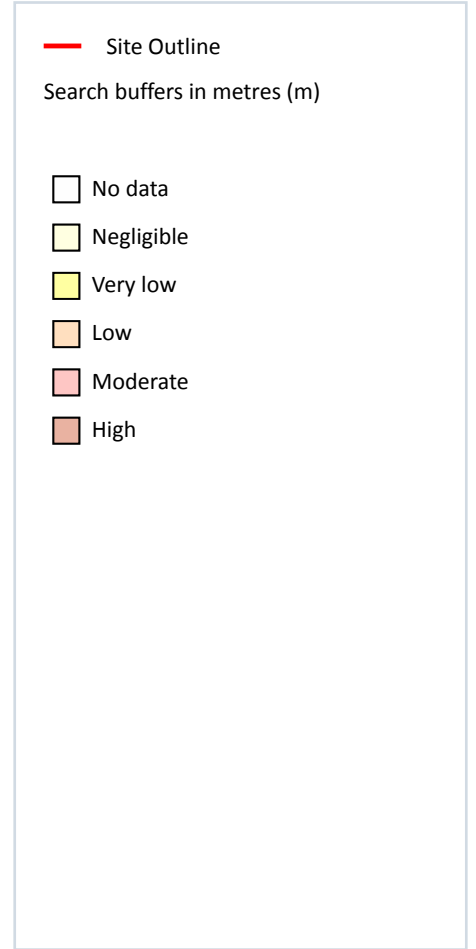
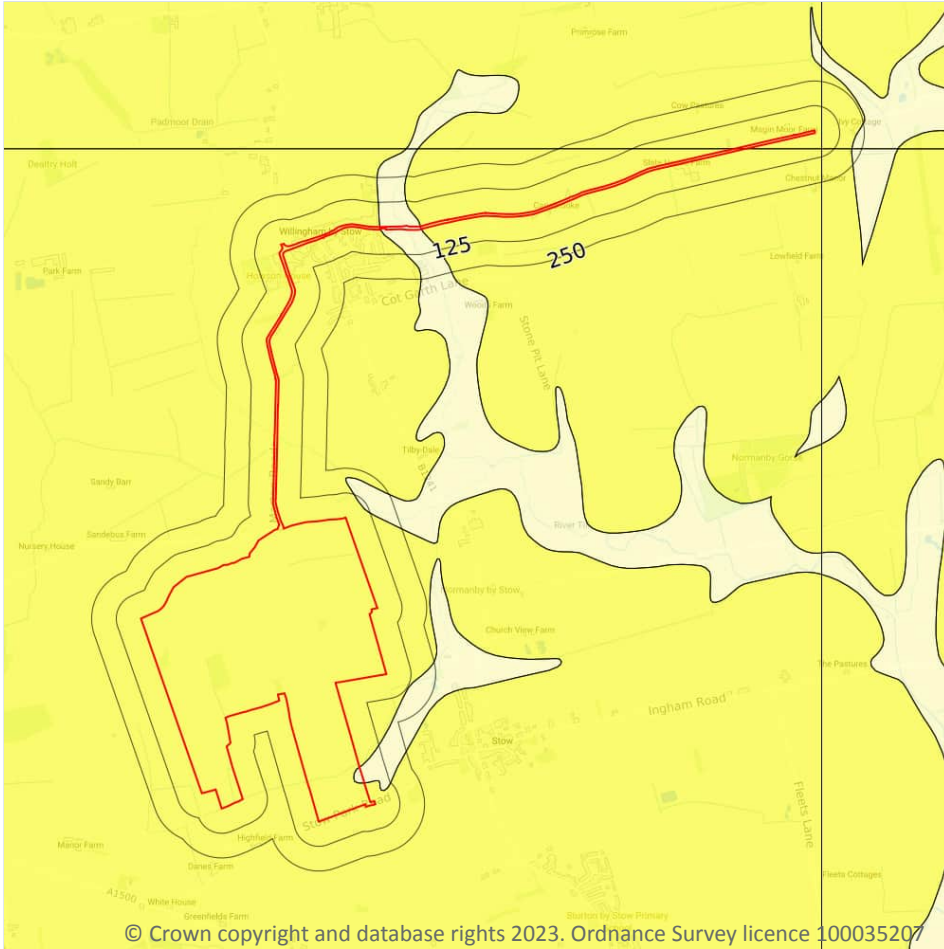
3

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 106**

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

## Natural ground subsidence - Collapsible deposits



### 17.4 Collapsible deposits

Records within 50m

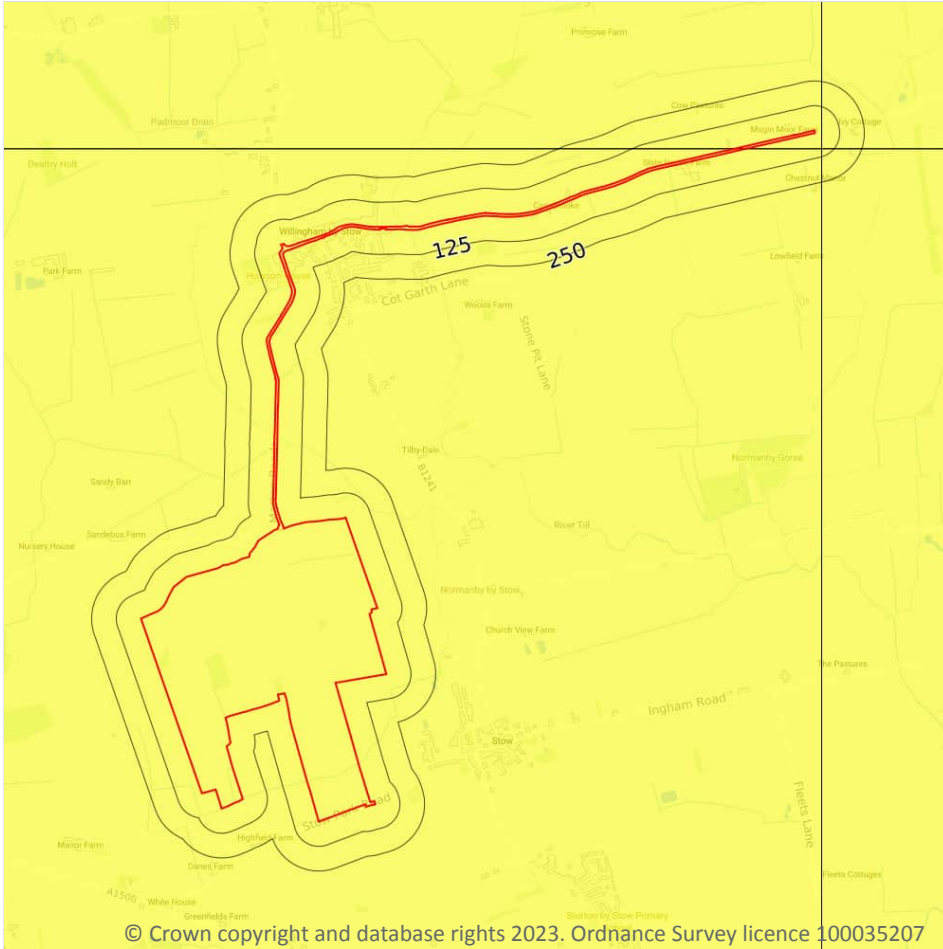
3

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

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 108**

Location	Hazard rating	Details
On site	Negligible	Deposits with potential to collapse when loaded and saturated are believed not to be present.
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
34m NE	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

## Natural ground subsidence - Landslides



— Site Outline  
Search buffers in metres (m)

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

### 17.5 Landslides

Records within 50m

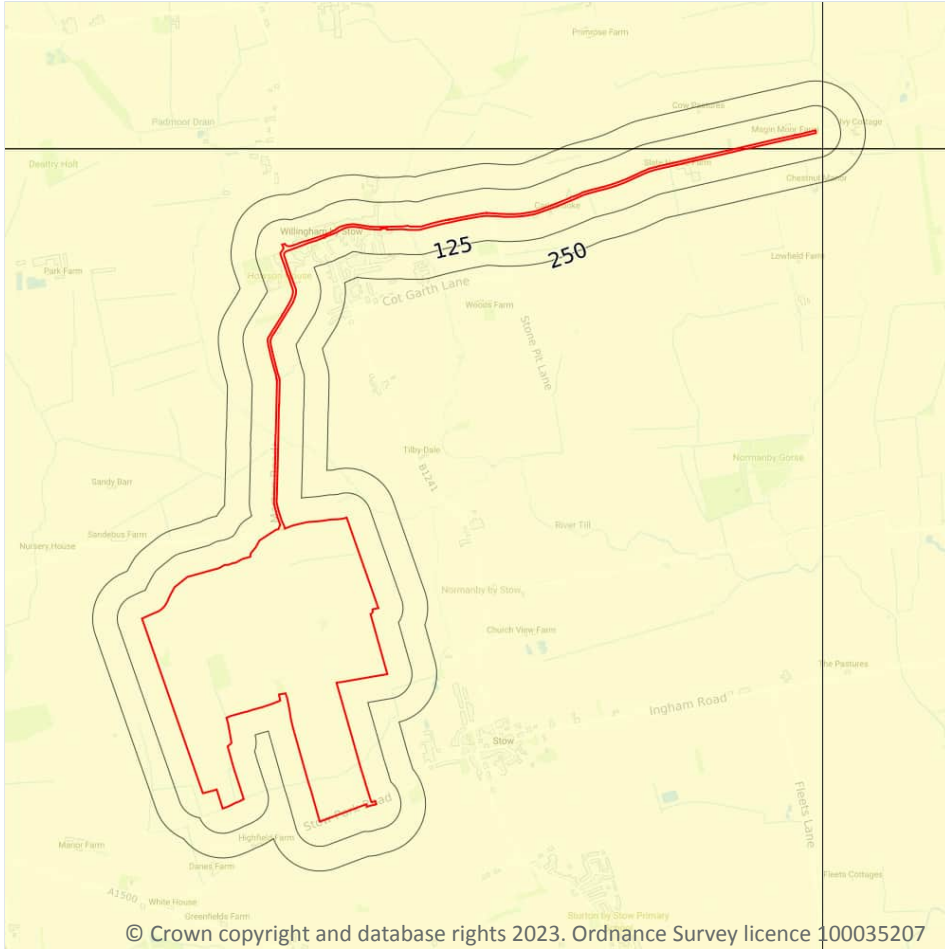
2

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

Features are displayed on the Natural ground subsidence - Landslides map on **page 110**

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

## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

Records within 50m

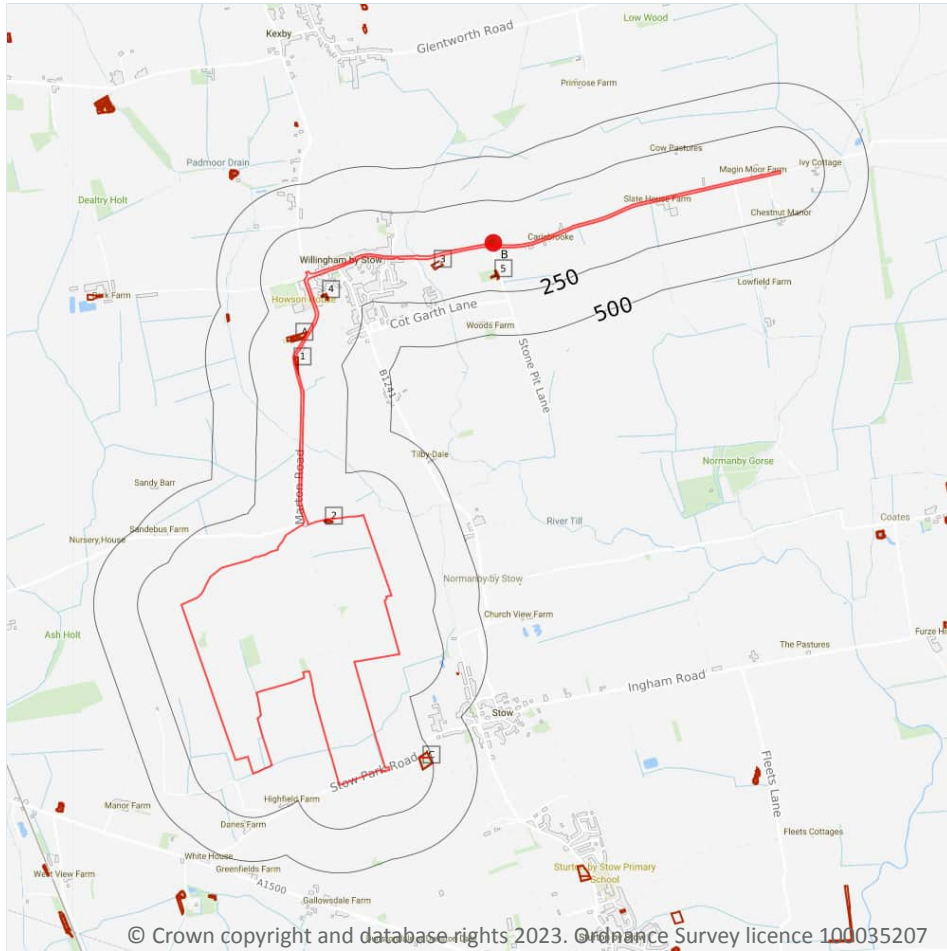
2

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

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 112**

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

## 18 Mining, ground workings and natural cavities



### 18.1 Natural cavities

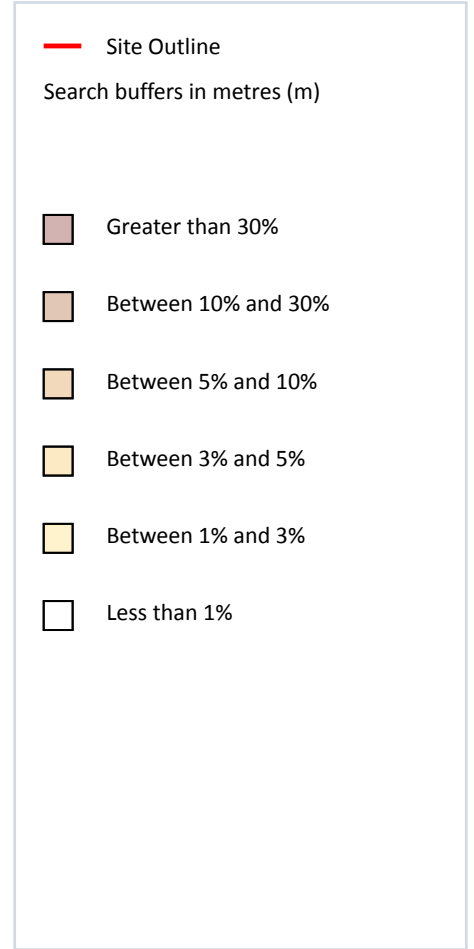
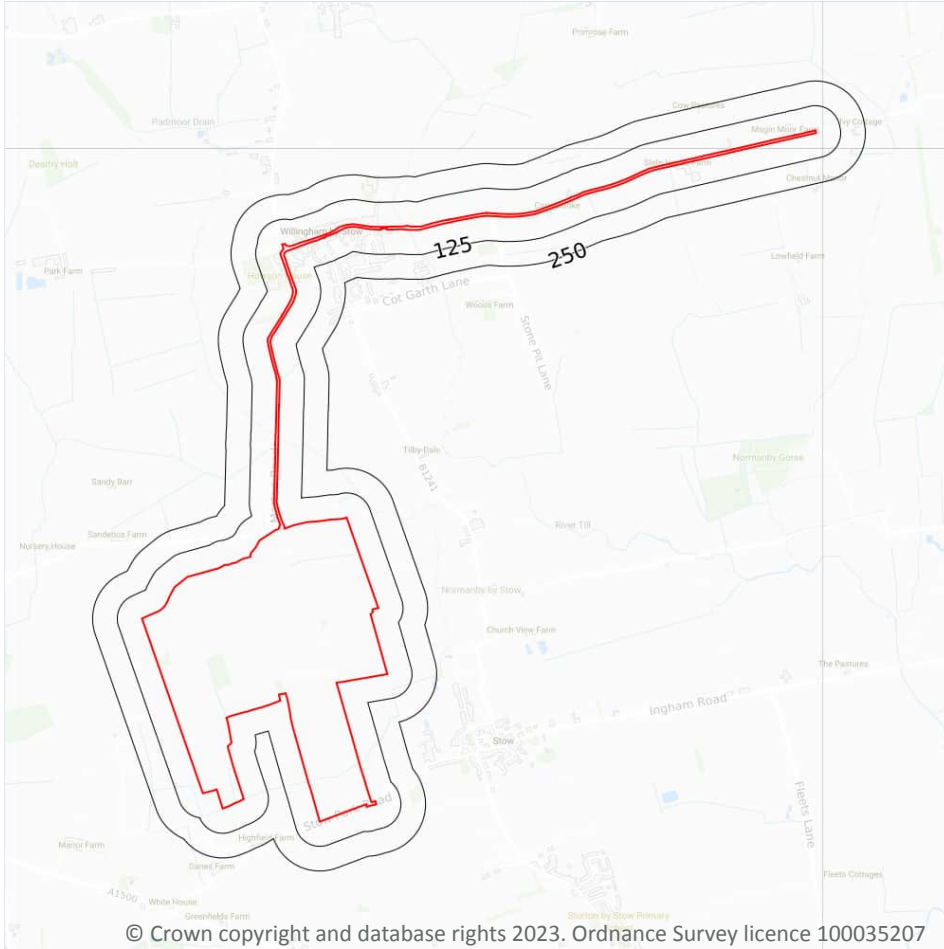
Records within 500m

0

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

*This data is sourced from Stantec UK Ltd.*

## 19 Radon



### 19.1 Radon

#### Records on site

1

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

Features are displayed on the Radon map on **page 119**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None



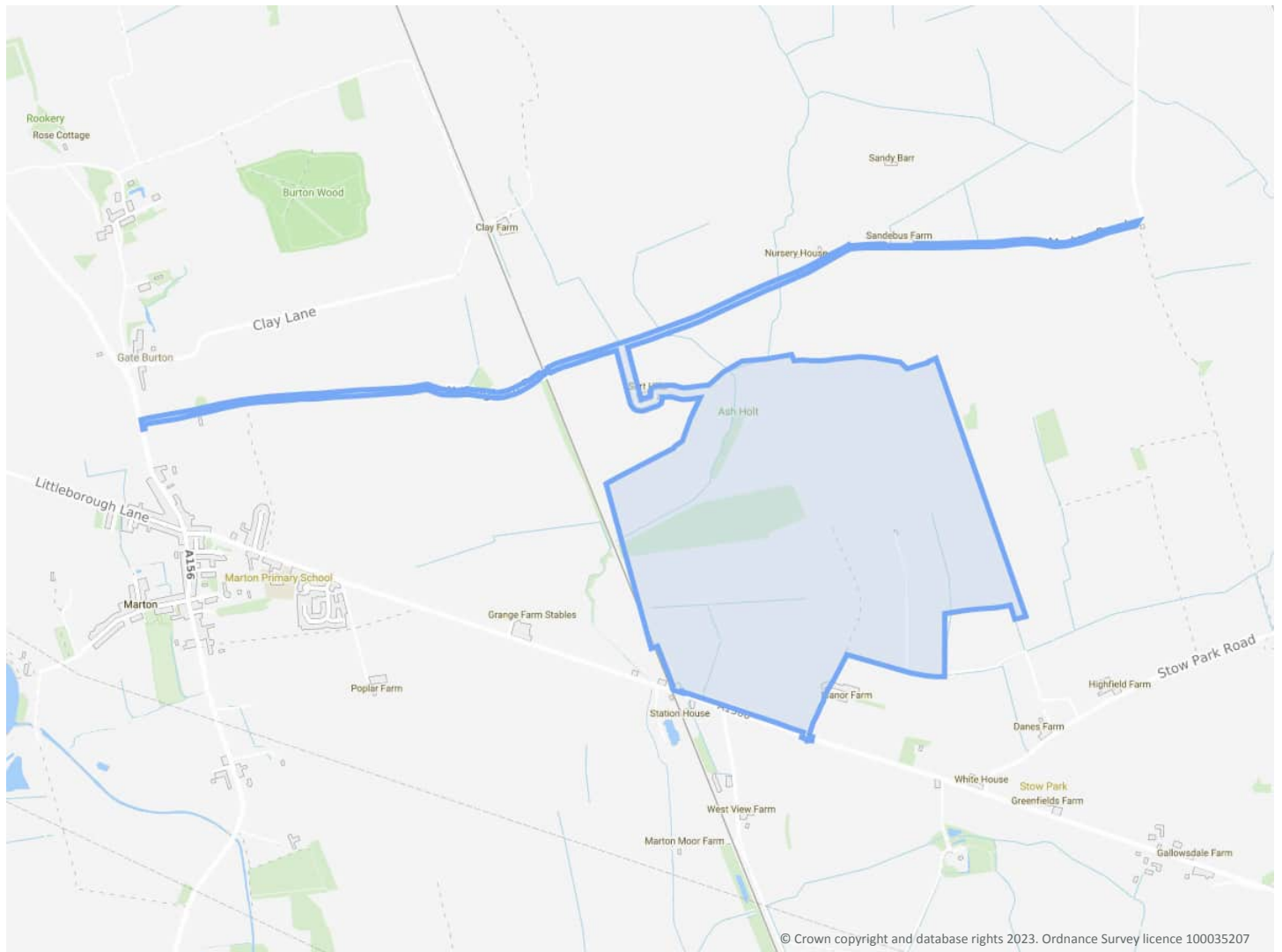
## Tillbridge cable run area

### Order Details

**Date:** 14/02/2023  
**Your ref:** ref 60677969  
**Our Ref:** GSIP-2023-13376-12945\_5

### Site Details

**Location:** 485698 382446  
**Area:** 132.05 ha  
**Authority:** [West Lindsey District Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

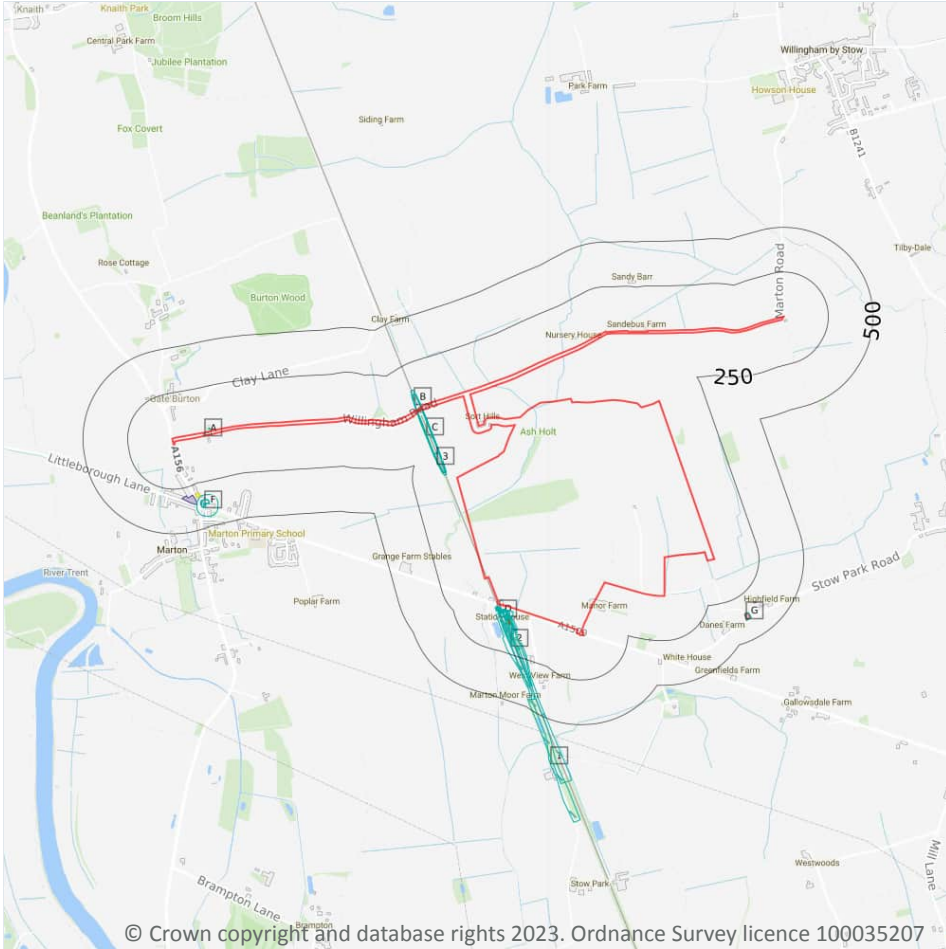
N/A: >10ha

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000

# 1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical petrol stations
- Historical garages

## 1.1 Historical industrial land uses

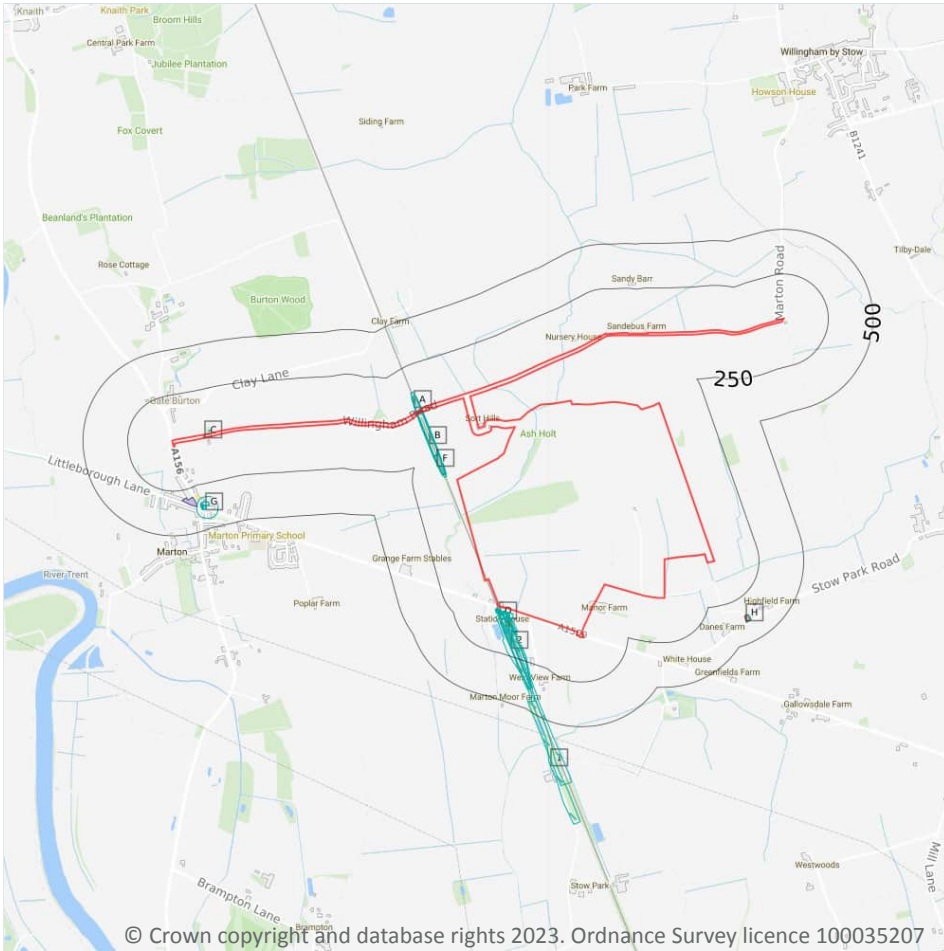
**Records within 500m** **43**

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

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

ID	Location	Land use	Dates present	Group ID
A	On site	Cuttings	1885	1562145

## 2 Past land use - un-grouped



**Site Outline**

Search buffers in metres (m)

- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical petrol stations
- Historical garages

### 2.1 Historical industrial land uses

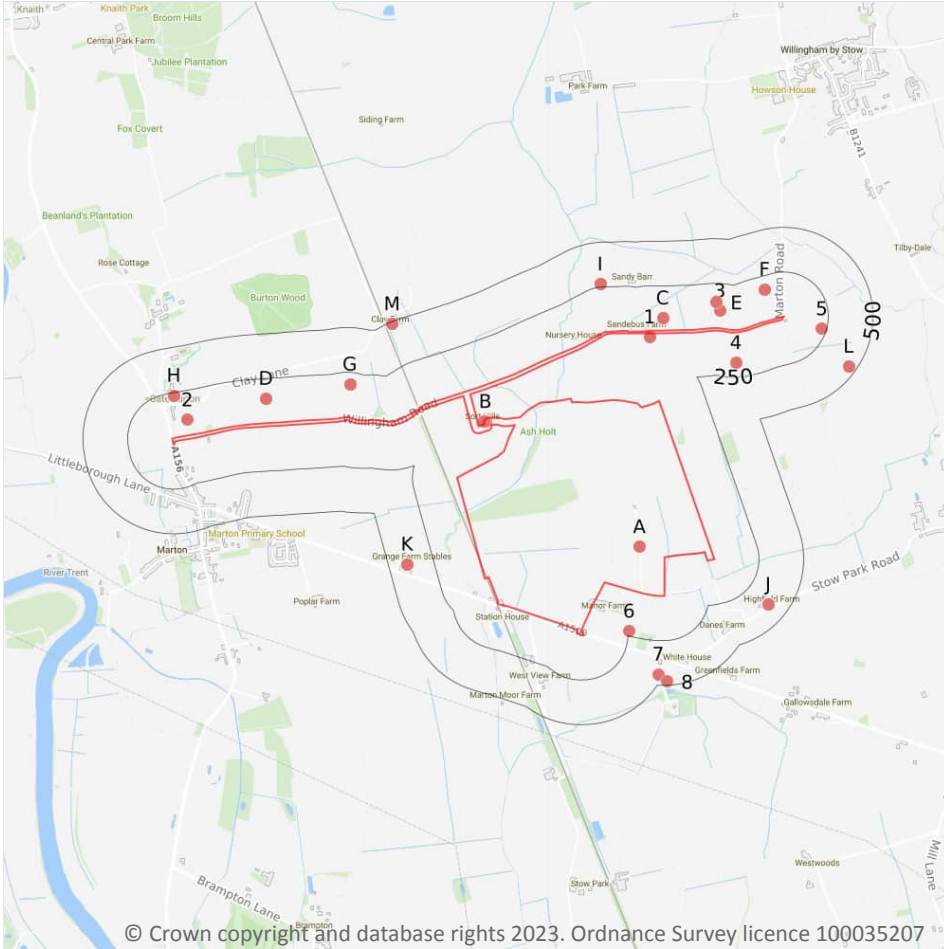
**Records within 500m** **57**

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

Features are displayed on the Past land use - un-grouped map on **page 18**

ID	Location	Land Use	Date	Group ID
A	On site	Cuttings	1951	1728454
A	On site	Cuttings	1978	1728454
A	On site	Cuttings	1916	1717386

## 3 Waste and landfill



### 3.1 Active or recent landfill

Records within 500m

0

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

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

### 3.2 Historical landfill (BGS records)

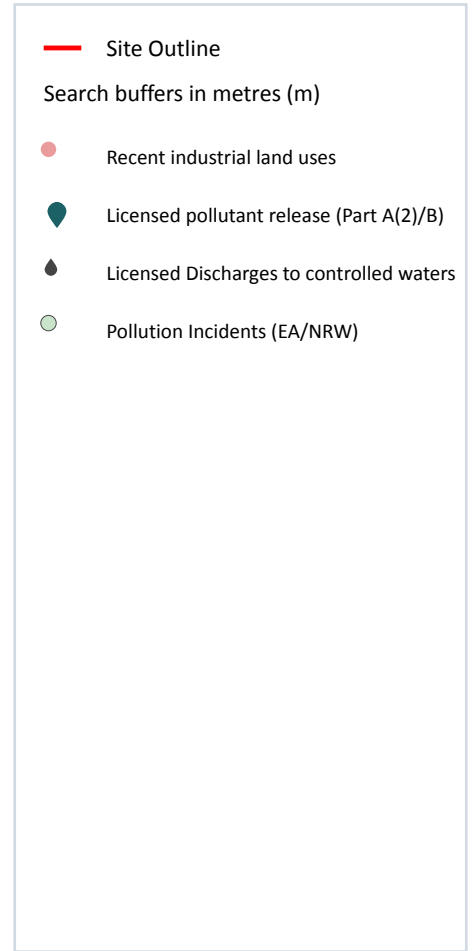
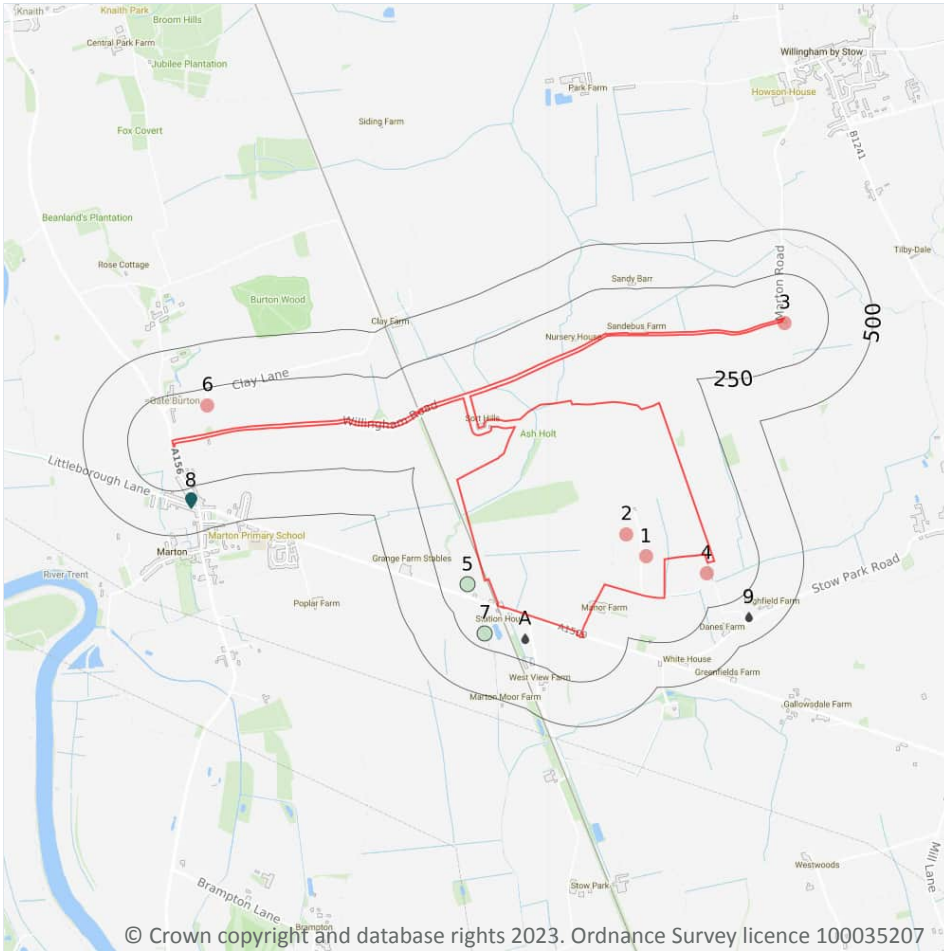
Records within 500m

0

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

*This data is sourced from the British Geological Survey.*

## 4 Current industrial land use



### 4.1 Recent industrial land uses

Records within 250m

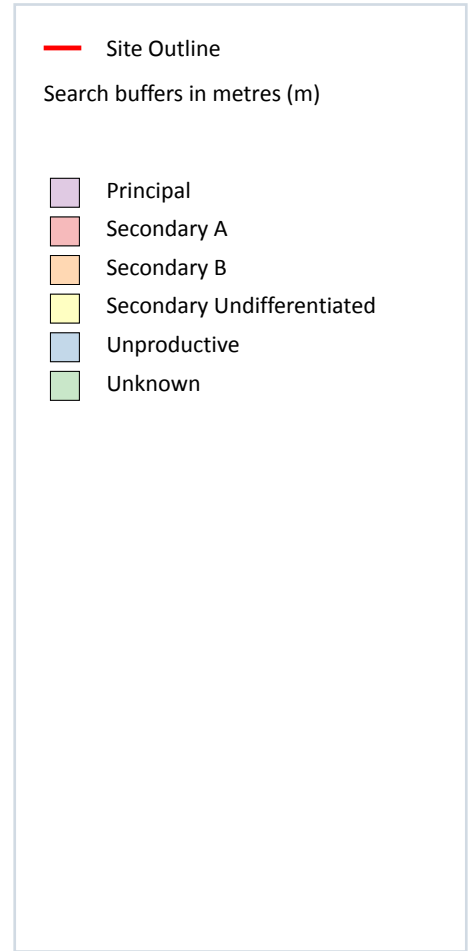
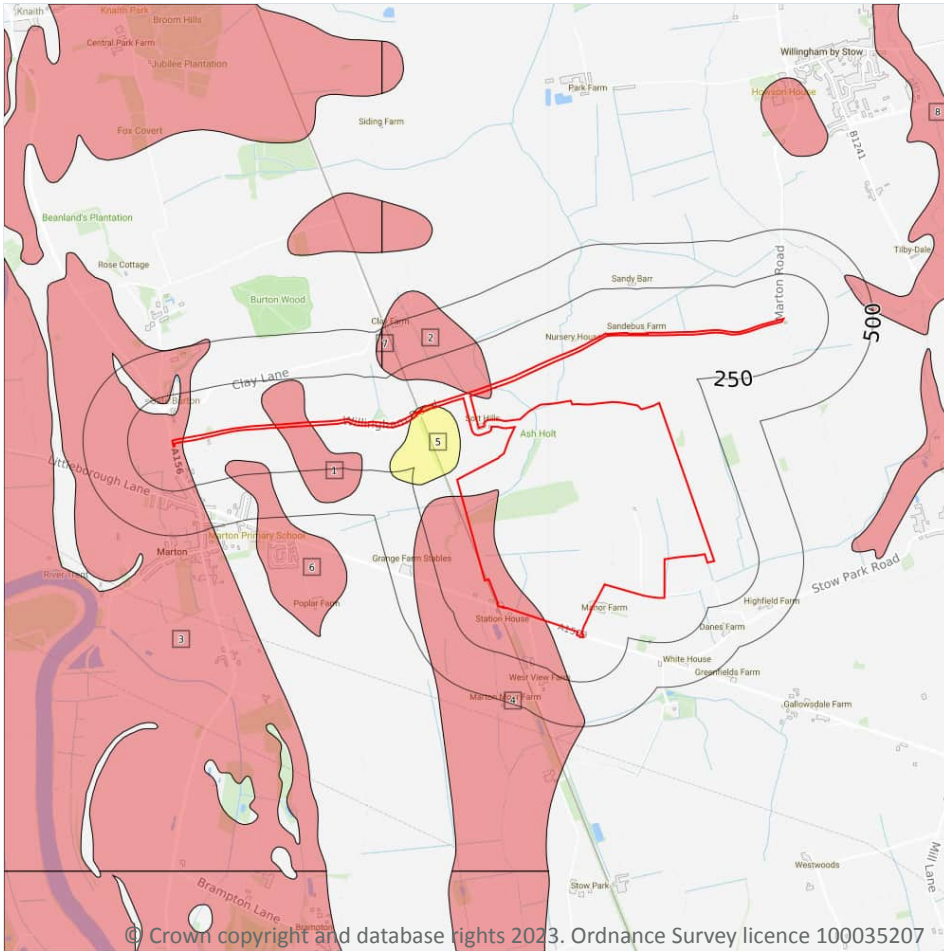
5

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 30**

ID	Location	Company	Address	Activity	Category
1	On site	Stow Solar Farm - Solar Photovoltaics (BEIS)	Stow Park Road, Stow, Lincoln, Lincolnshire, LN1 2AJ	Energy Production	Industrial Features
2	On site	Solar Panels	Lincolnshire, LN1	Energy Production	Industrial Features

## 5 Hydrogeology - Superficial aquifer



### 5.1 Superficial aquifer

Records within 500m

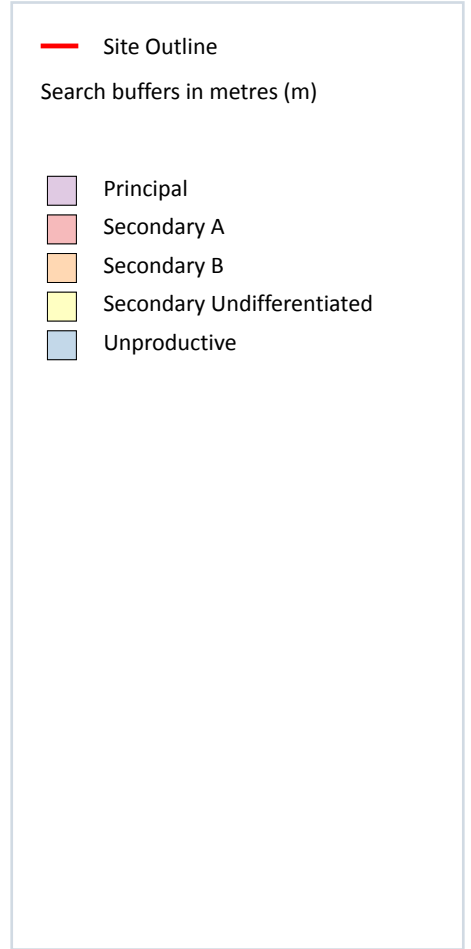
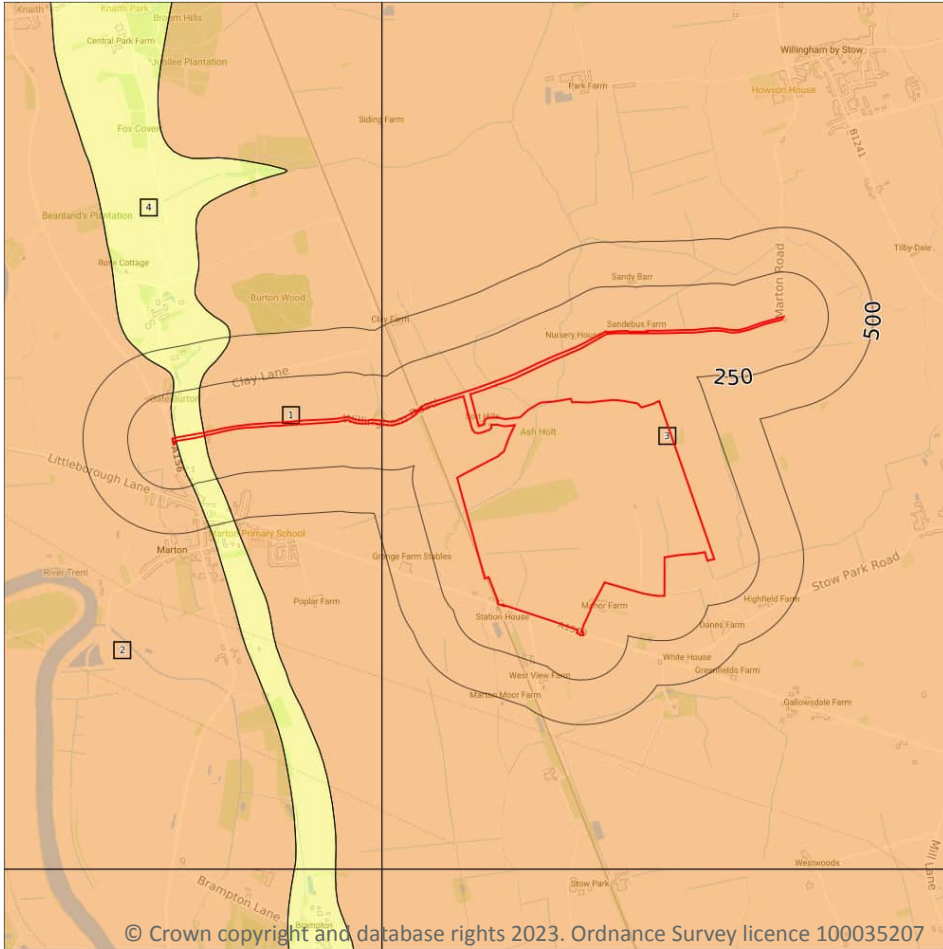
8

Aquifer status of groundwater held within superficial geology.

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

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	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

## Bedrock aquifer



### 5.2 Bedrock aquifer

Records within 500m

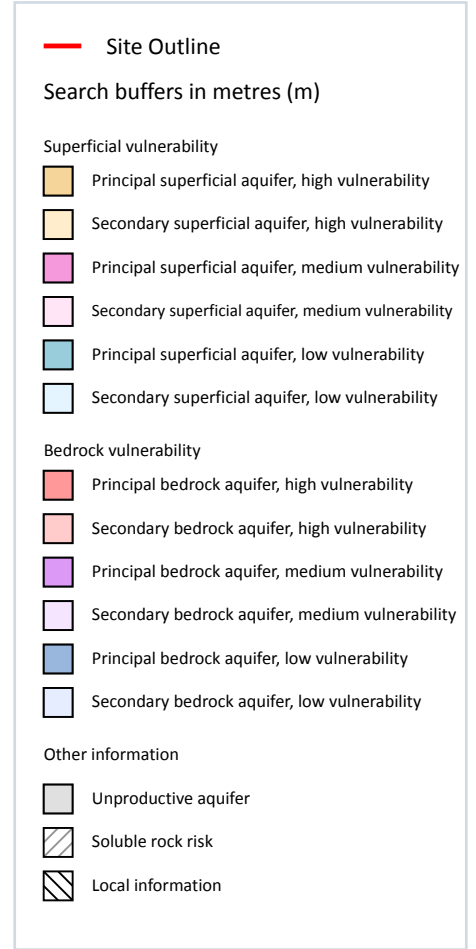
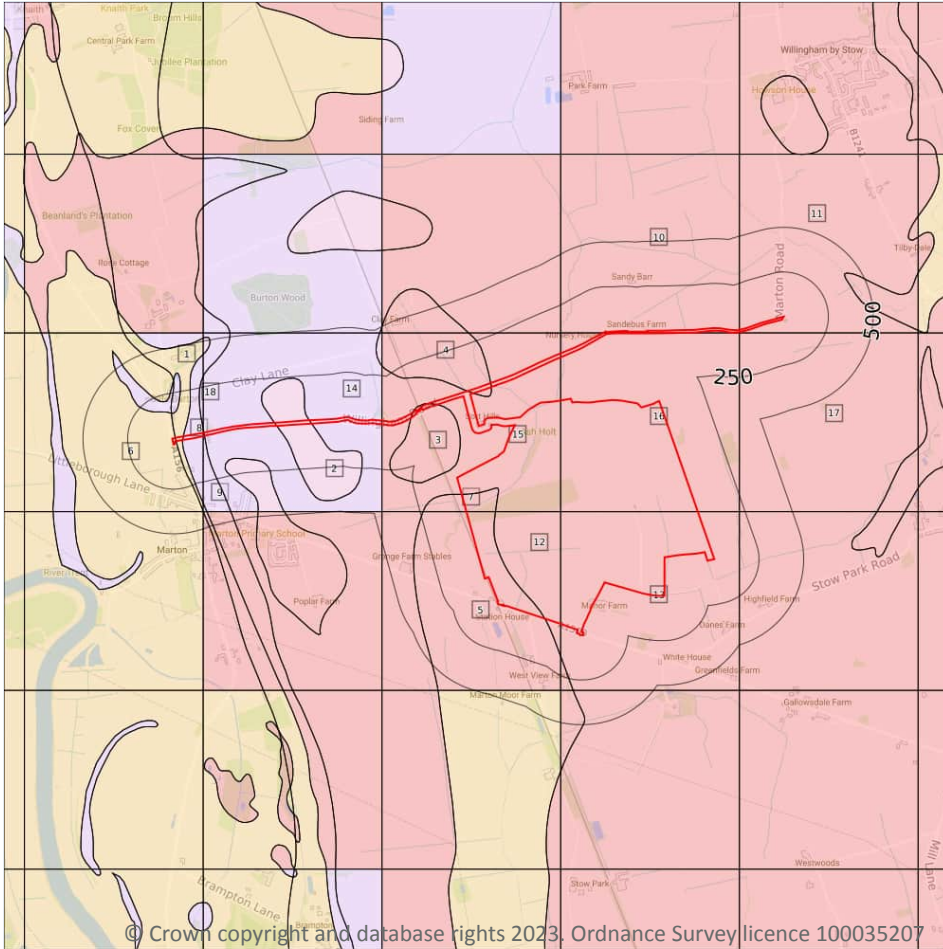
4

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on [page 39](#)

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

## Groundwater vulnerability



### 5.3 Groundwater vulnerability

Records within 50m

18

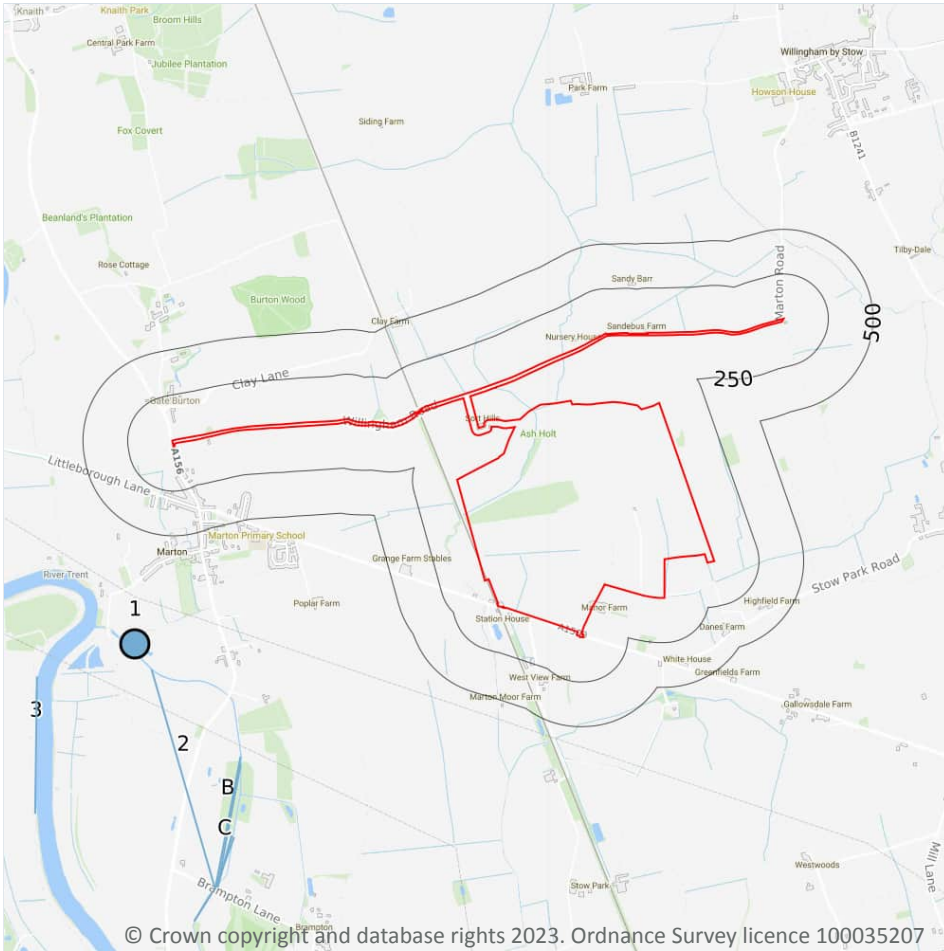
An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

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

Features are displayed on the Groundwater vulnerability map on **page 41**



## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

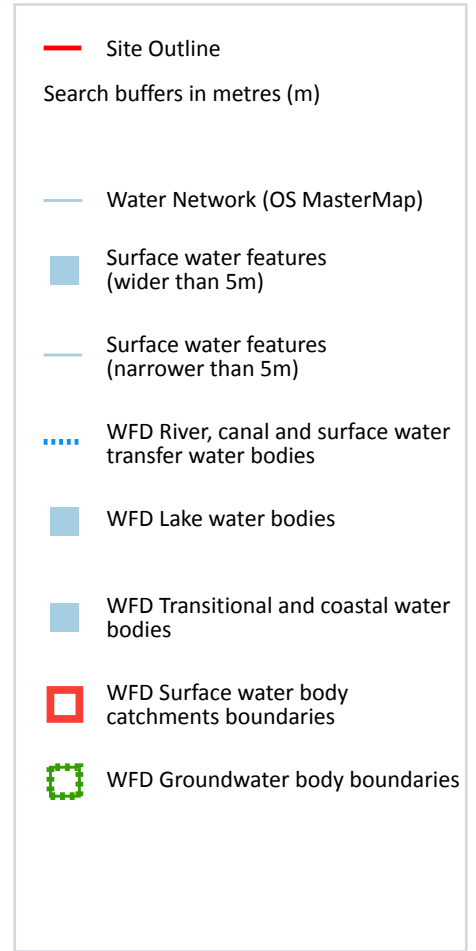
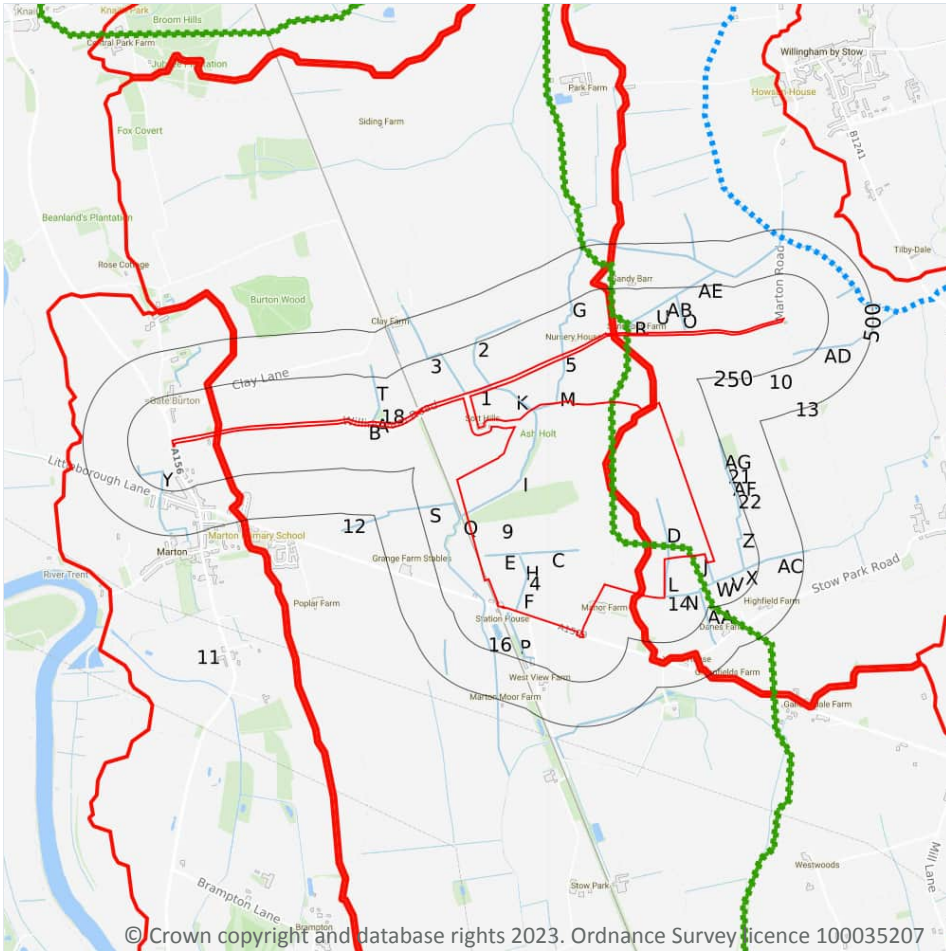
Records within 2000m

0

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

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

## 6 Hydrology



### 6.1 Water Network (OS MasterMap)

Records within 250m

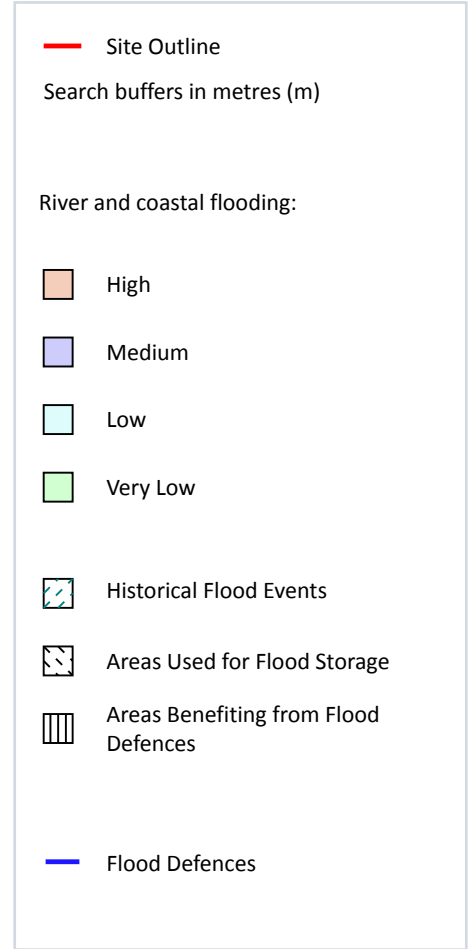
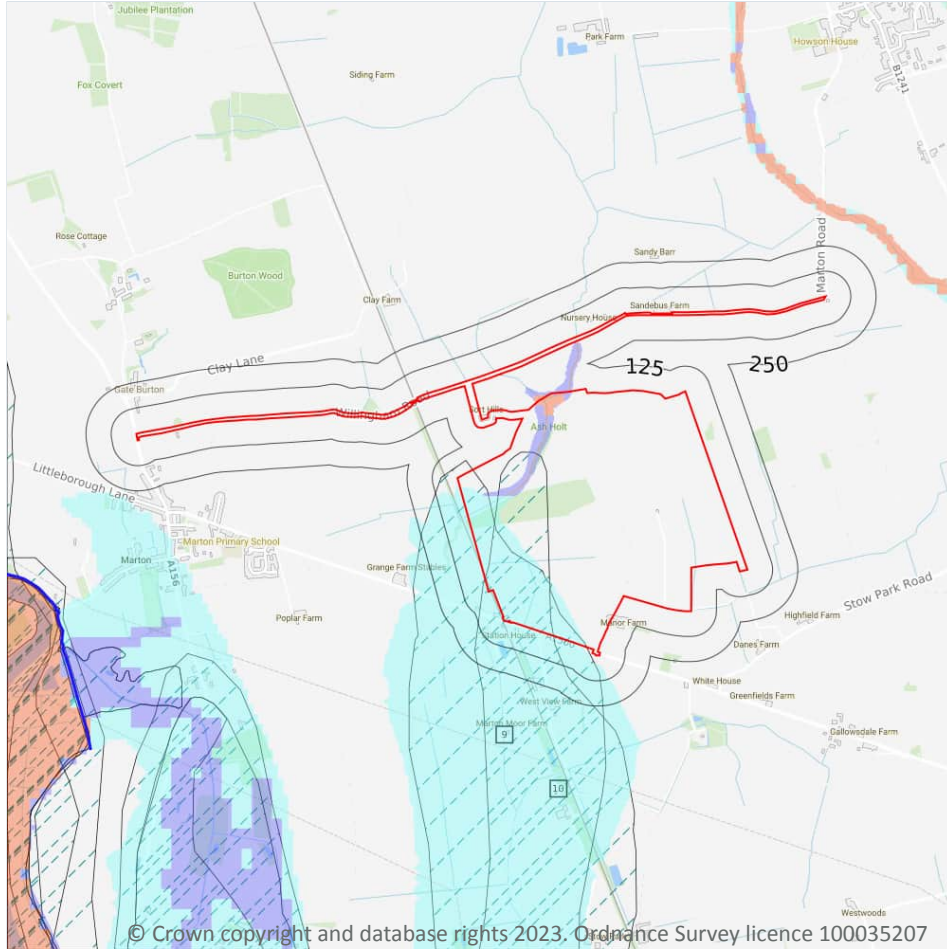
54

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

Features are displayed on the Hydrology map on **page 50**

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

## 7 River and coastal flooding



### 7.1 Risk of flooding from rivers and the sea

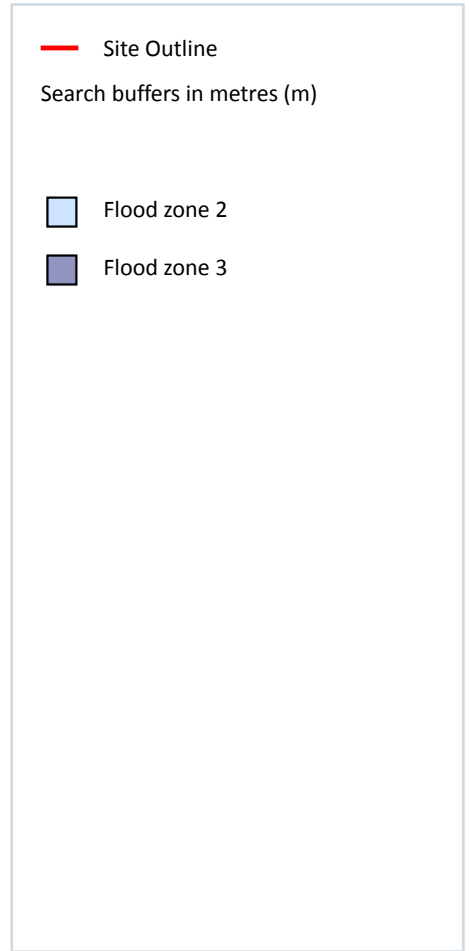
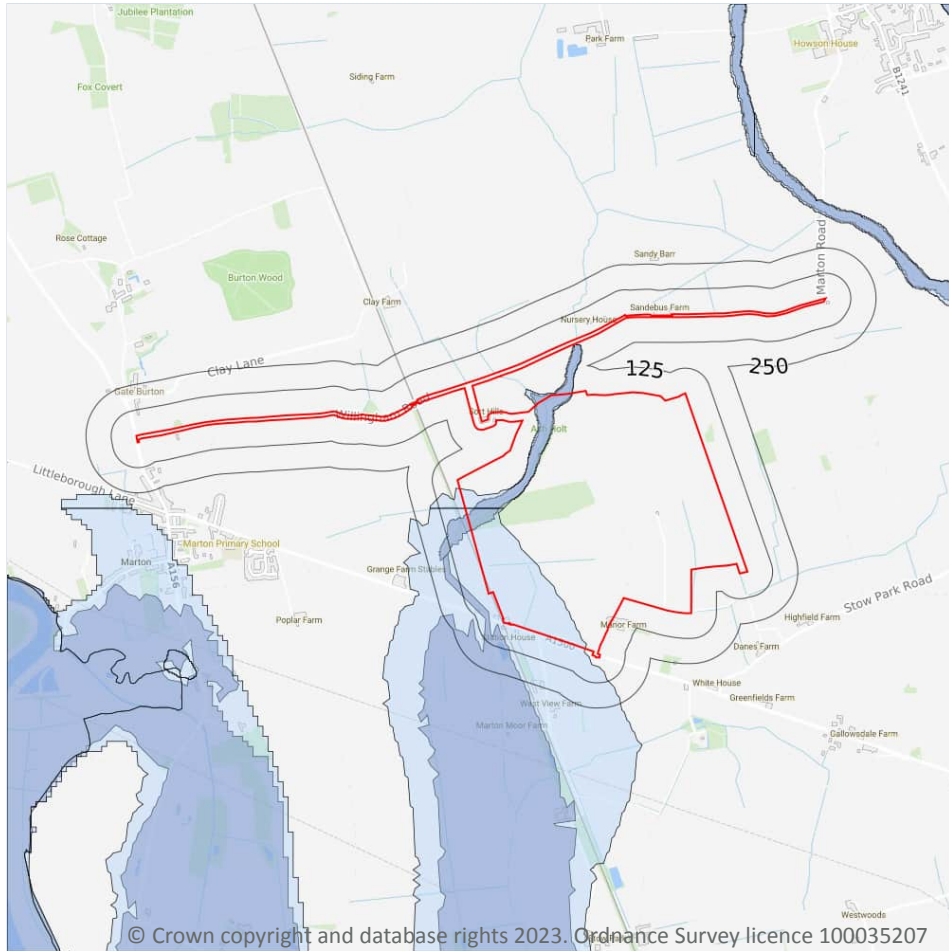
#### Records within 50m

8

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

Features are displayed on the River and coastal flooding map on **page 57**

## River and coastal flooding - Flood Zones



### 7.6 Flood Zone 2

Records within 50m

1

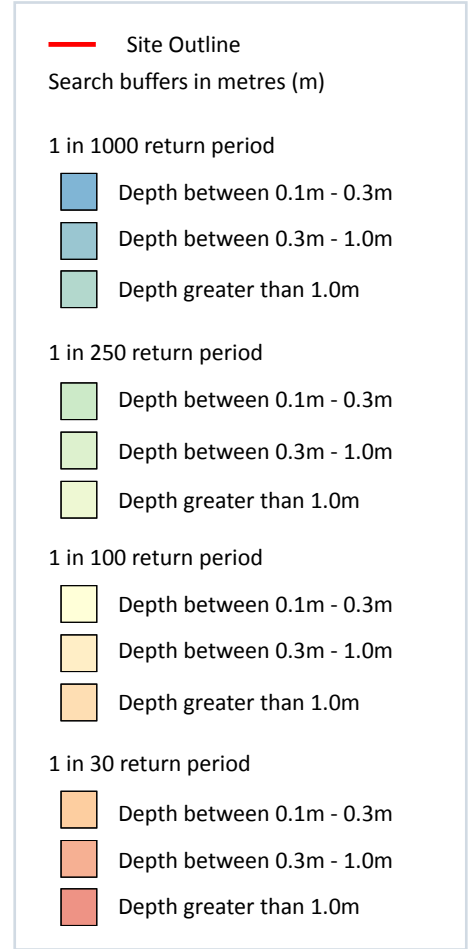
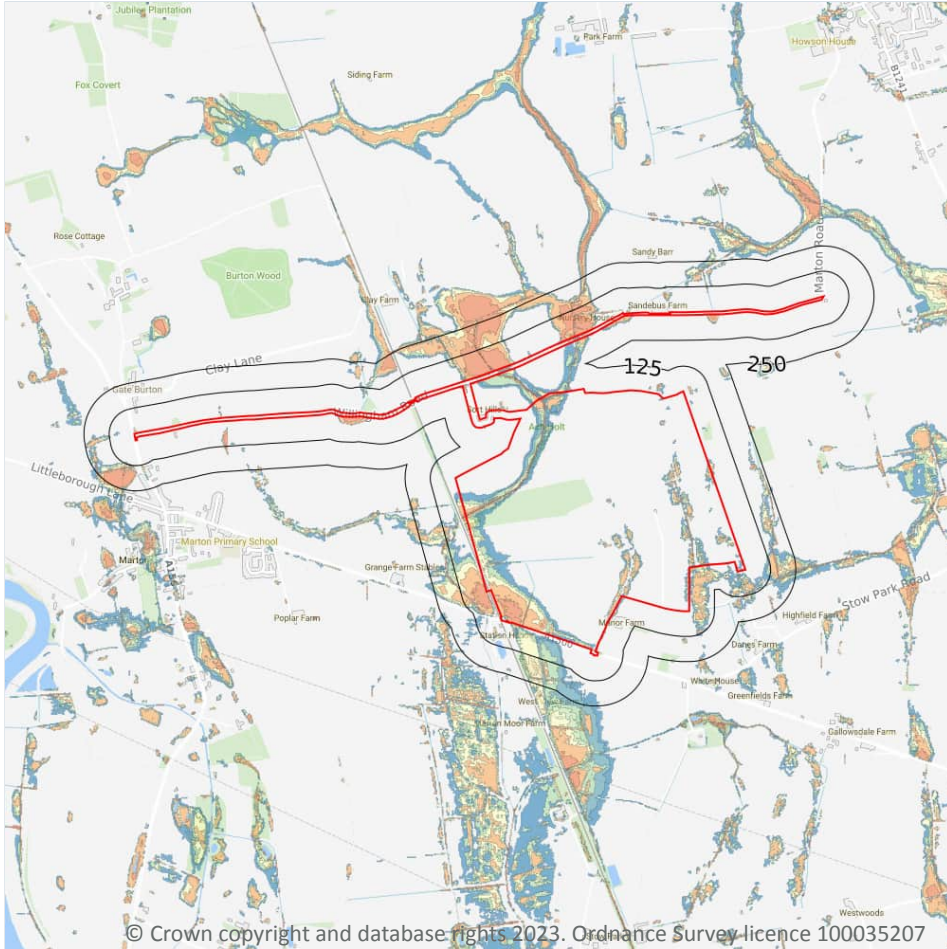
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 57**

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

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

## 8 Surface water flooding



### 8.1 Surface water flooding

**Highest risk on site**

**1 in 30 year, Greater than 1.0m**

**Highest risk within 50m**

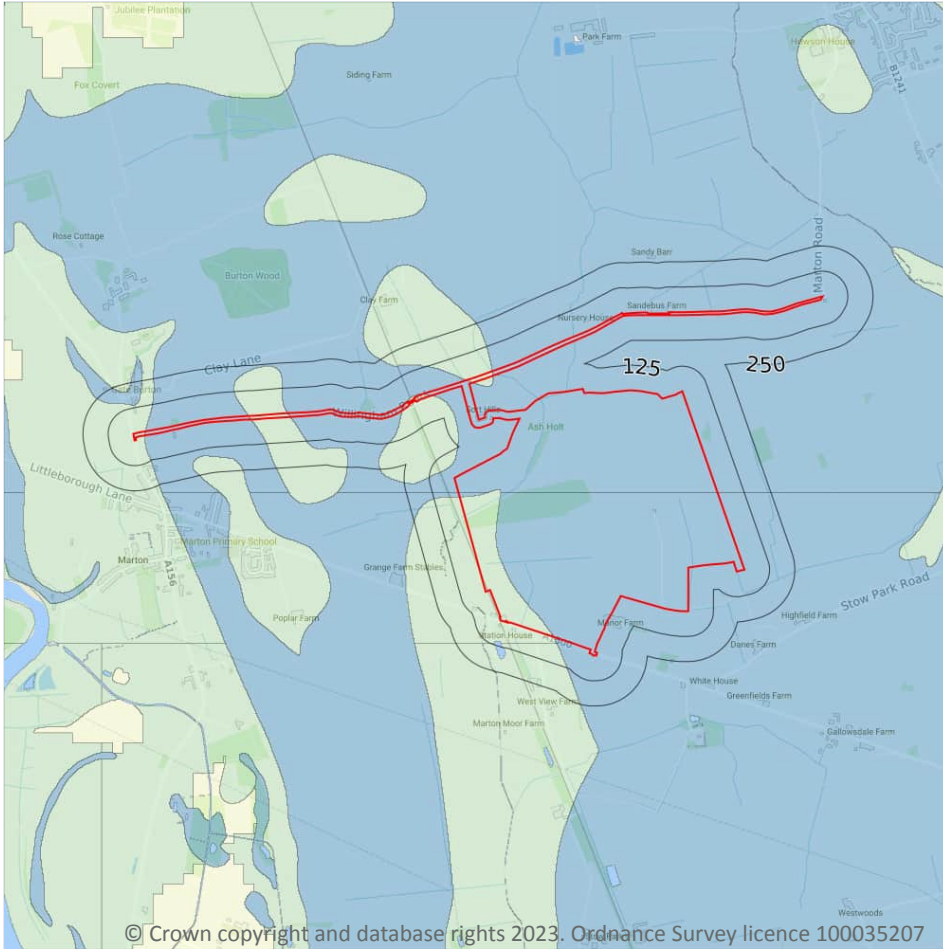
**1 in 30 year, Greater than 1.0m**

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

Features are displayed on the Surface water flooding map on **page 62**

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

## 9 Groundwater flooding



### 9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

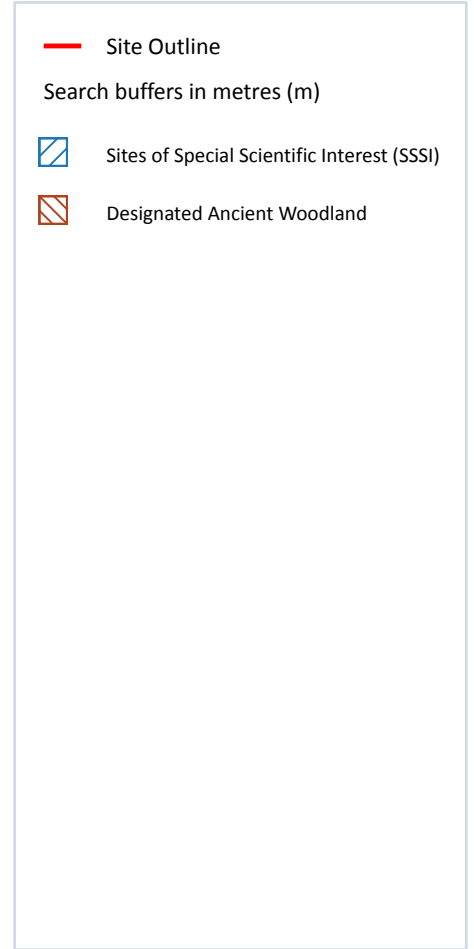
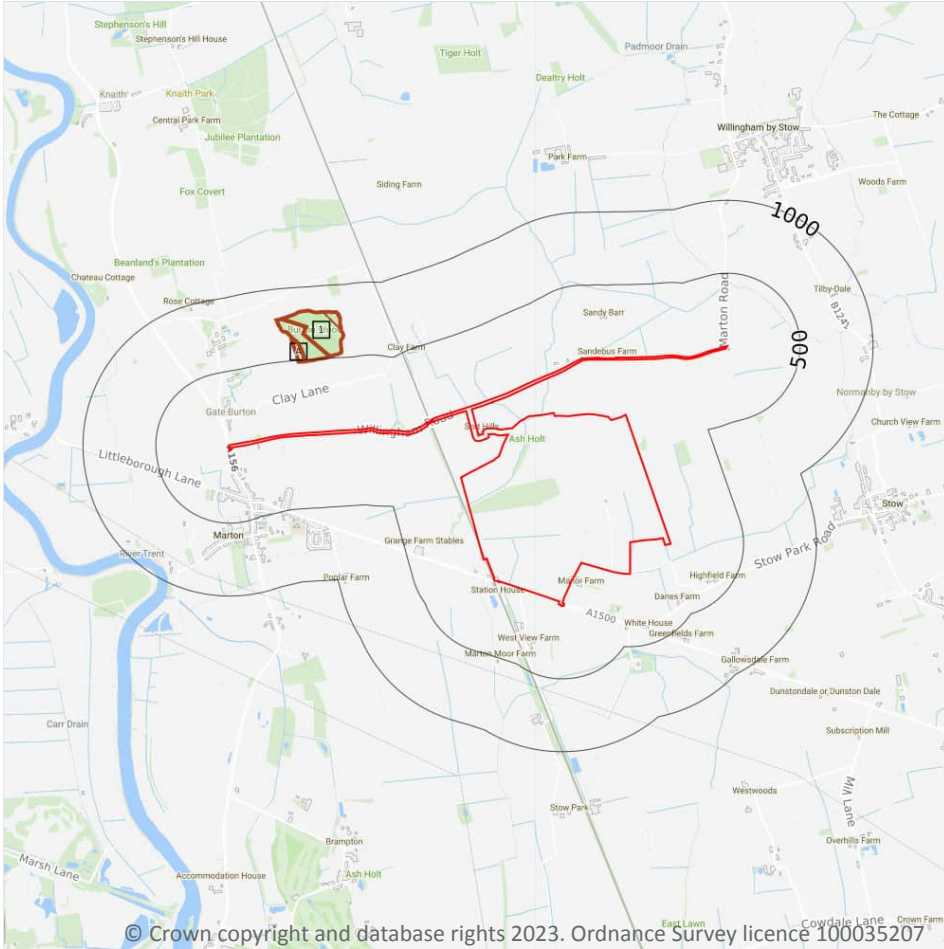
Low

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

Features are displayed on the Groundwater flooding map on **page 64**

*This data is sourced from Ambiental Risk Analytics.*

## 10 Environmental designations



### 10.1 Sites of Special Scientific Interest (SSSI)

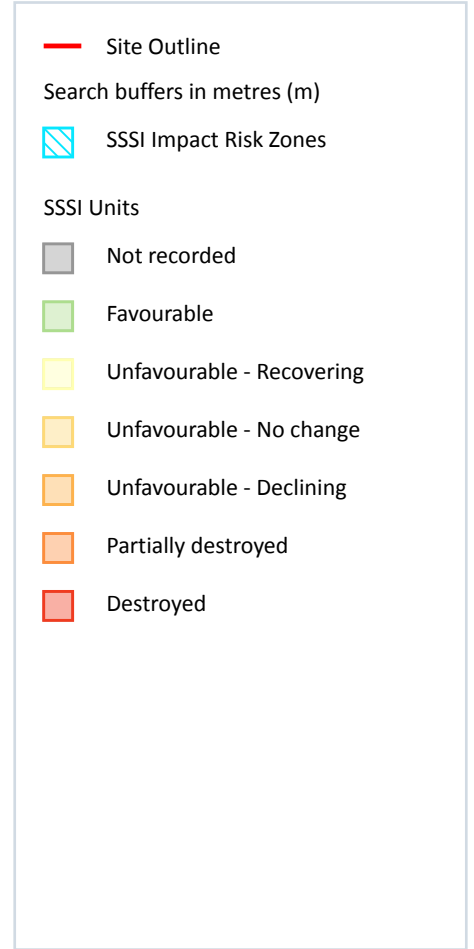
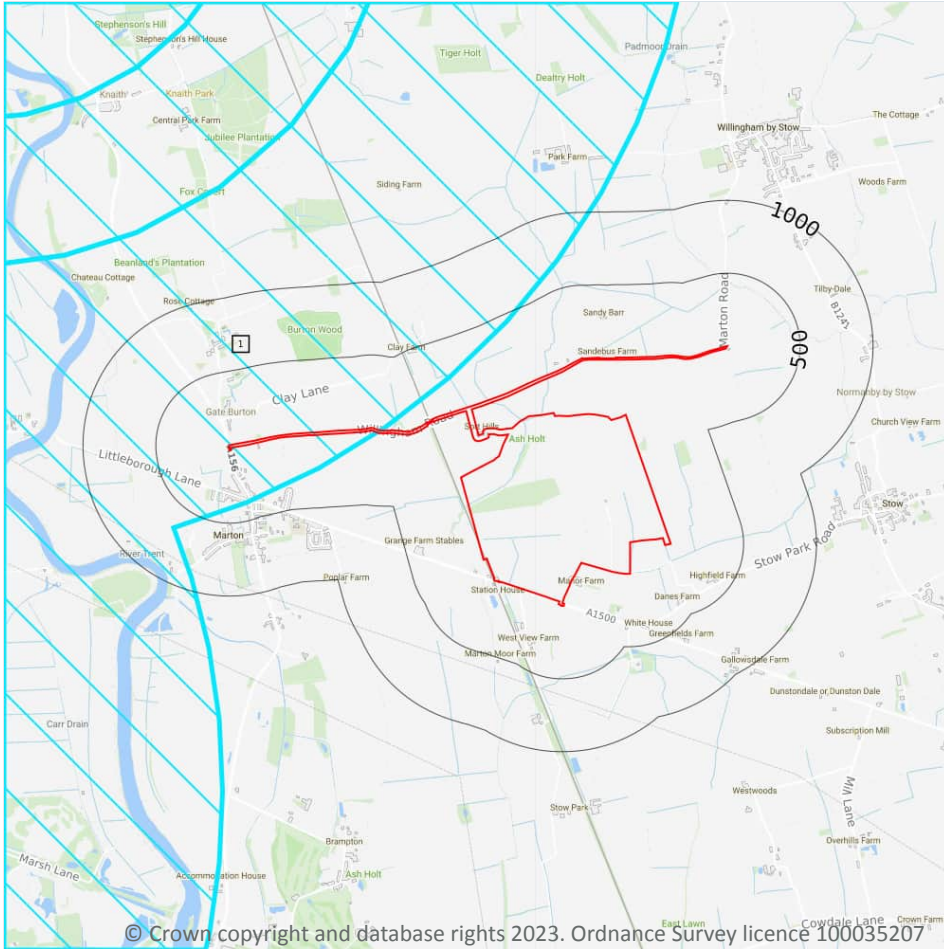
Records within 2000m

0

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

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

## SSSI Impact Zones and Units



### 10.17 SSSI Impact Risk Zones

#### Records on site

1

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

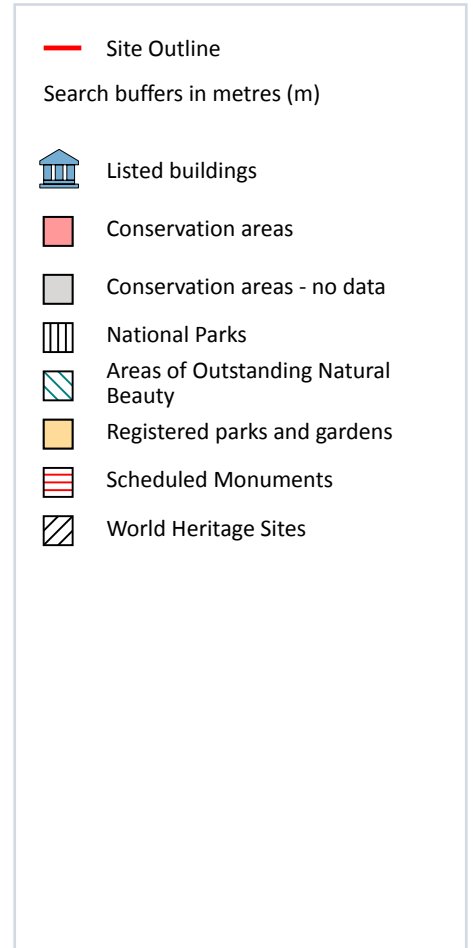
Features are displayed on the SSSI Impact Zones and Units map on **page 71**

ID	Location	Type of developments requiring consultation
1	On site	<b>Infrastructure - Airports, helipads and other aviation proposals.</b> <b>Air pollution - Livestock &amp; poultry units with floorspace &gt; 500m<sup>2</sup>, slurry lagoons &amp; digestate stores &gt; 750m<sup>2</sup>, manure stores &gt; 3500t.</b>

*This data is sourced from Natural England.*



## 11 Visual and cultural designations



### 11.1 World Heritage Sites

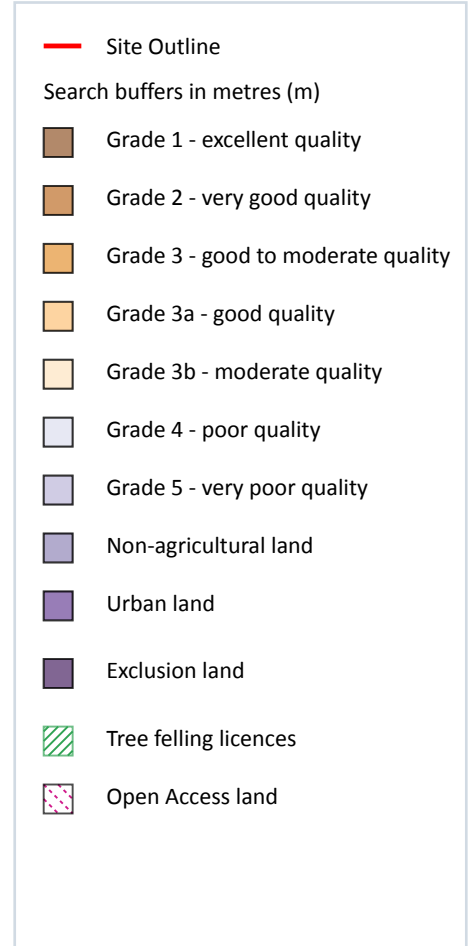
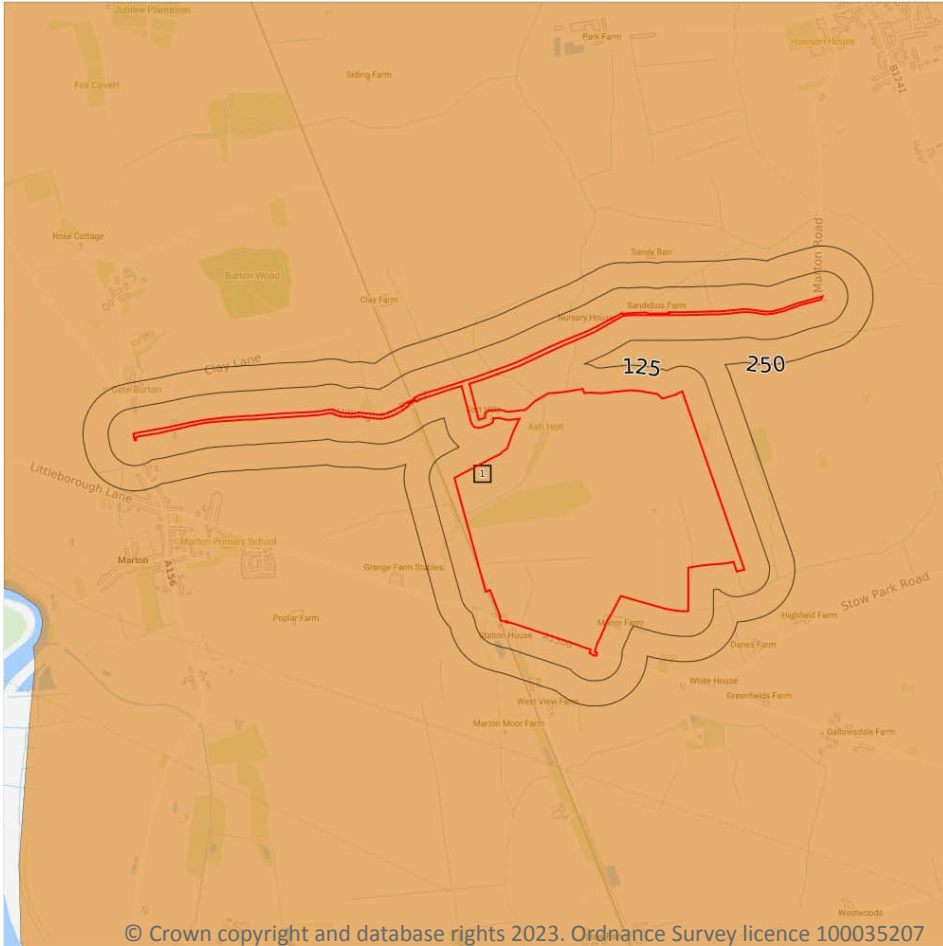
Records within 250m

0

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

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

## 12 Agricultural designations



### 12.1 Agricultural Land Classification

Records within 250m

1

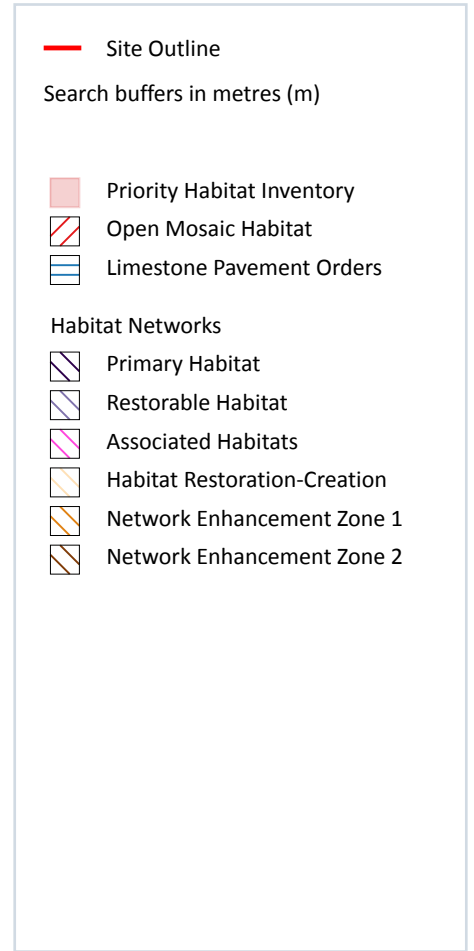
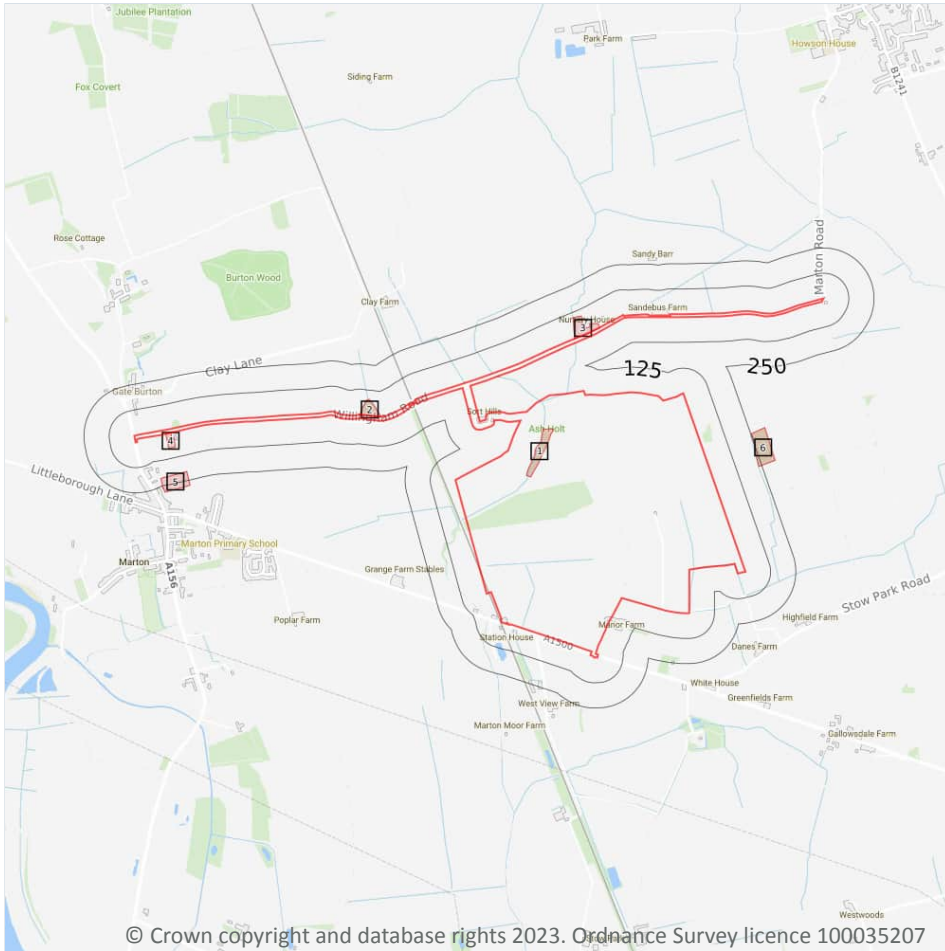
Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

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

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

*This data is sourced from Natural England.*

## 13 Habitat designations



### 13.1 Priority Habitat Inventory

Records within 250m

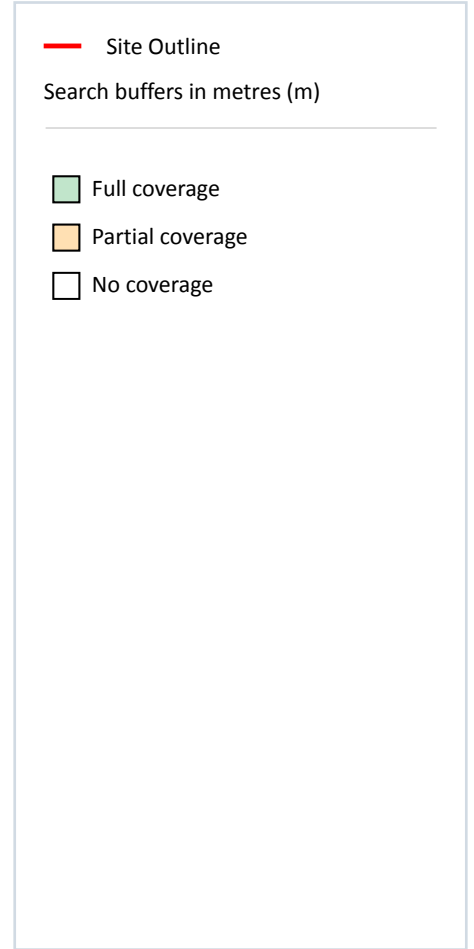
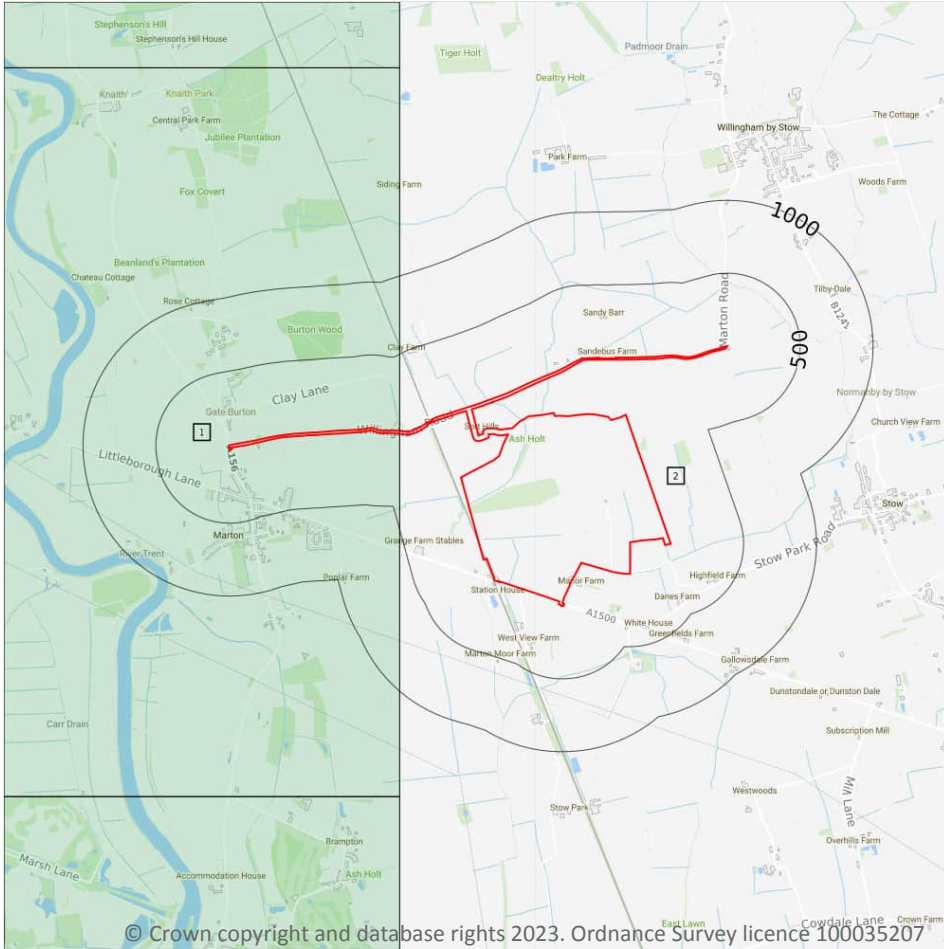
6

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

Features are displayed on the Habitat designations map on **page 79**

ID	Location	Main Habitat	Other habitats
1	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	On site	No main habitat but additional habitats present	Main habitat: DWOOD (INV > 50%)
4	On site	Traditional orchard	Overruled by Traditional Orchards HAP Inventory dataset

## 14 Geology 1:10,000 scale - Availability



### 14.1 10k Availability

Records within 500m

2

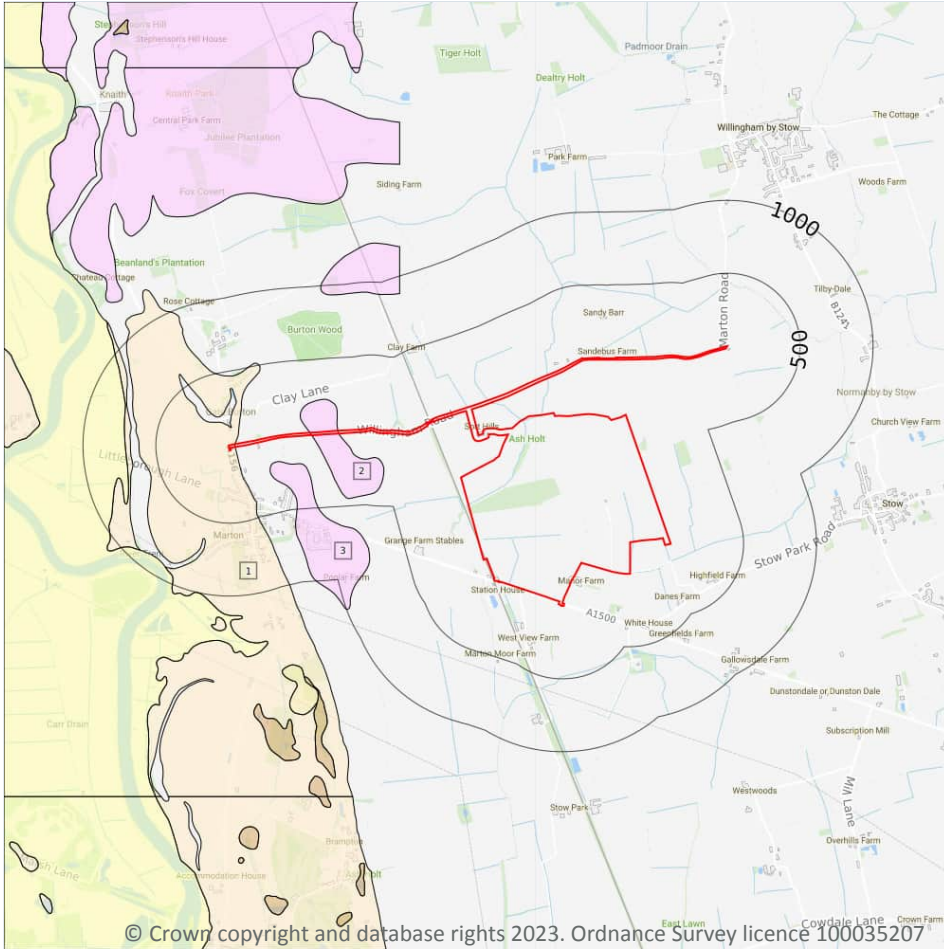
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

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

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	SK88SW
2	On site	No coverage	No coverage	No coverage	No coverage	NoCov

*This data is sourced from the British Geological Survey.*

## Geology 1:10,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (10k)
- Superficial geology (10k)  
Please see table for more details.

### 14.3 Superficial geology (10k)

Records within 500m

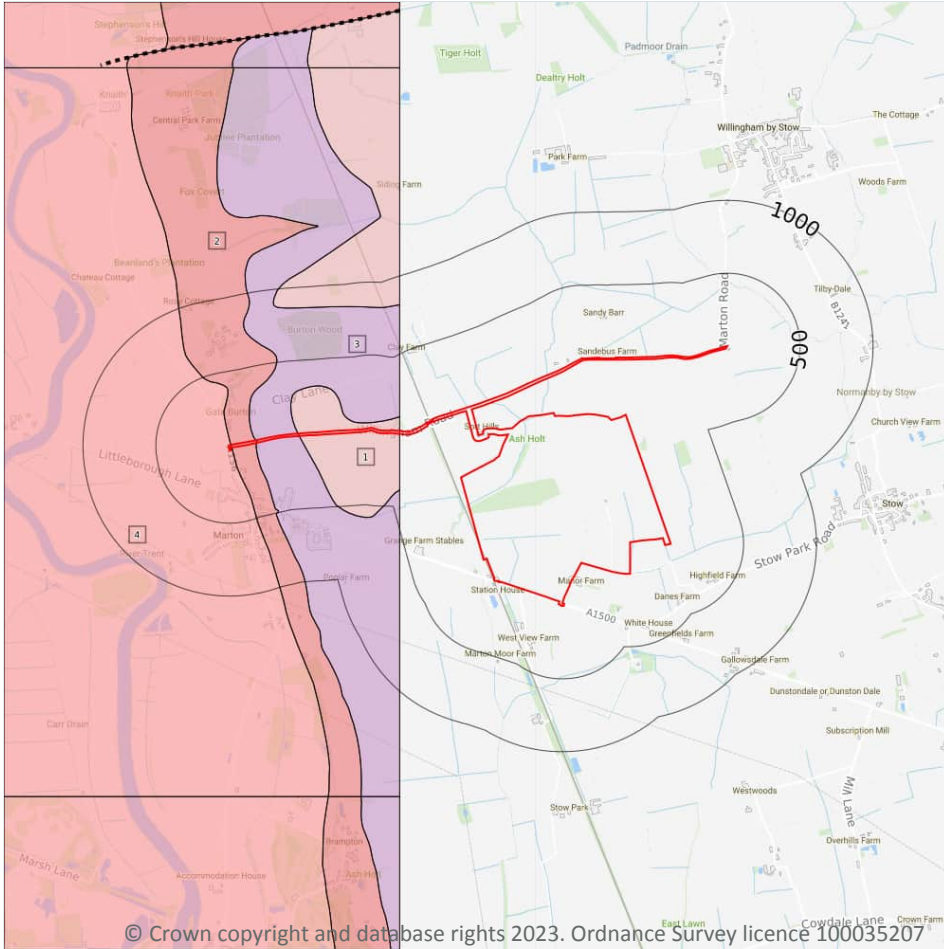
3

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

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

ID	Location	LEX Code	Description	Rock description
1	On site	HPSG-XSV	Holme Pierrepont Sand And Gravel Member - Sand And Gravel	Sand And Gravel
2	On site	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
3	158m W	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel

## Geology 1:10,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (10k)
- Bedrock geology (10k)  
Please see table for more details.

### 14.5 Bedrock geology (10k)

Records within 500m

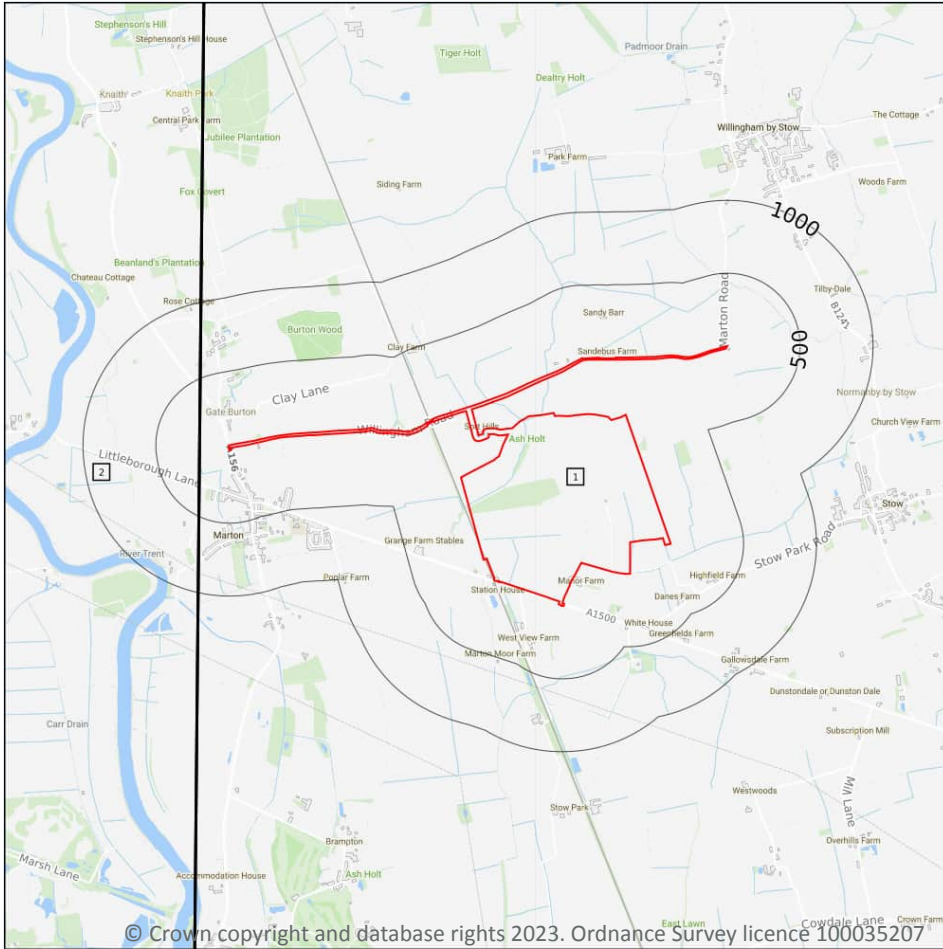
4

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

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 85**

ID	Location	LEX Code	Description	Rock age
1	On site	SMD-MDLM	Scunthorpe Mudstone Formation - Mudstone And Limestone, Interbedded	Sinemurian Age - Rhaetian Age
2	On site	PNG-MDST	Penarth Group - Mudstone	Rhaetian Age
3	On site	SMD-LMST	Scunthorpe Mudstone Formation - Limestone	Sinemurian Age - Rhaetian Age

## 15 Geology 1:50,000 scale - Availability



— Site Outline  
 Search buffers in metres (m)

□ Geological map tile

### 15.1 50k Availability

Records within 500m

2

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

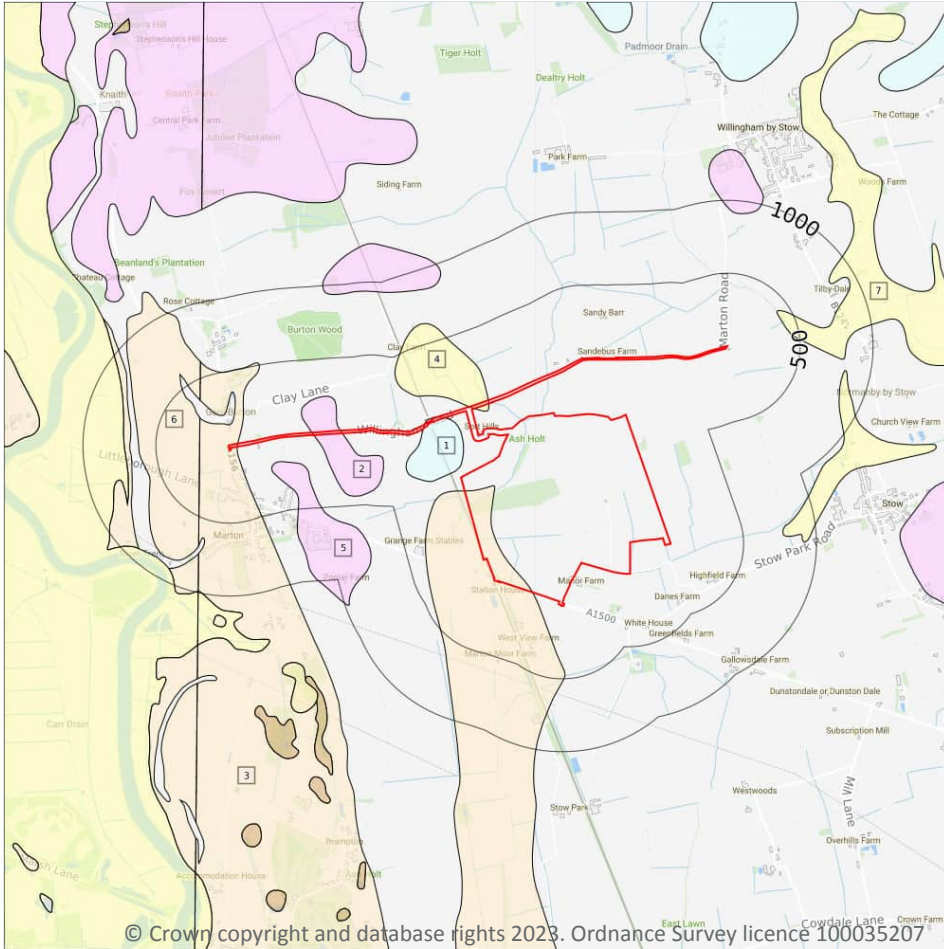
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 87**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW102_market_rasen_v4
2	200m W	No coverage	Full	Full	No coverage	EW101_east_retford_v4

This data is sourced from the British Geological Survey.



## Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)  
Please see table for more details.

### 15.4 Superficial geology (50k)

Records within 500m

7

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

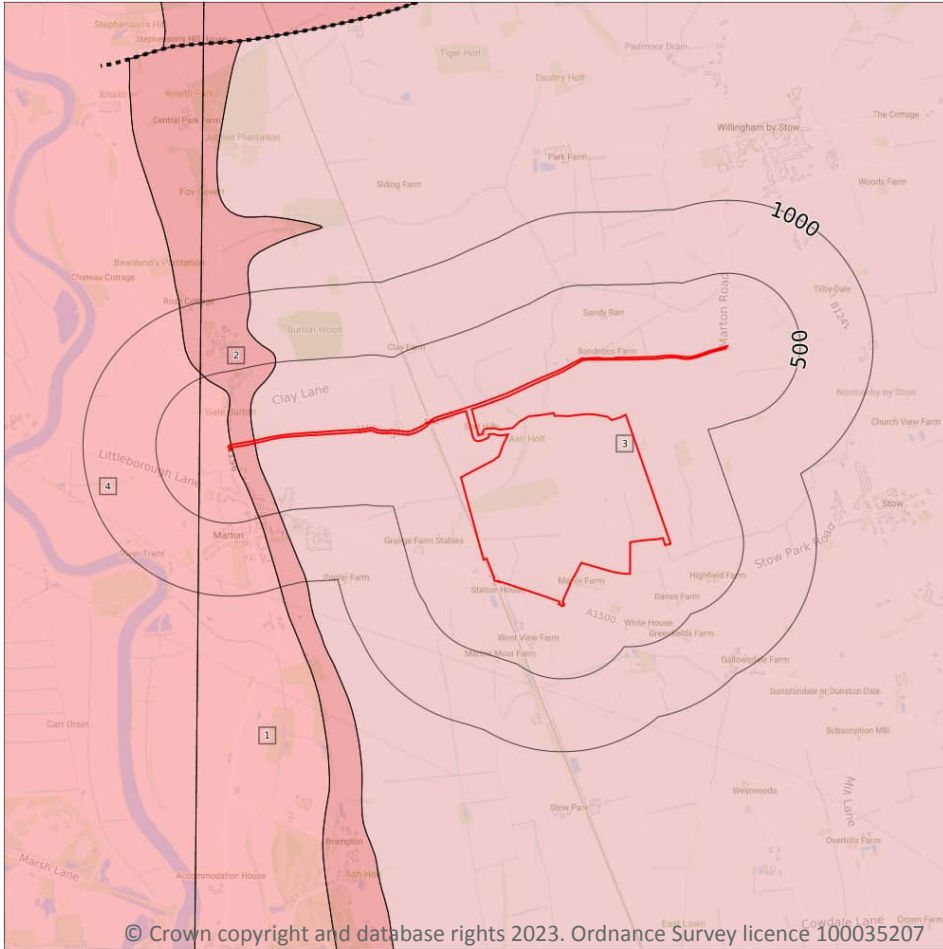
Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 89**

ID	Location	LEX Code	Description	Rock description
1	On site	TILMP-DMTN	TILL, MID PLEISTOCENE	DIAMICTON
2	On site	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
3	On site	HPSG-XSV	HOLME PIERREPONT SAND AND GRAVEL MEMBER	SAND AND GRAVEL





## Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- ..... Bedrock faults and other linear features (50k)
- Bedrock geology (50k)  
Please see table for more details.

### 15.8 Bedrock geology (50k)

Records within 500m

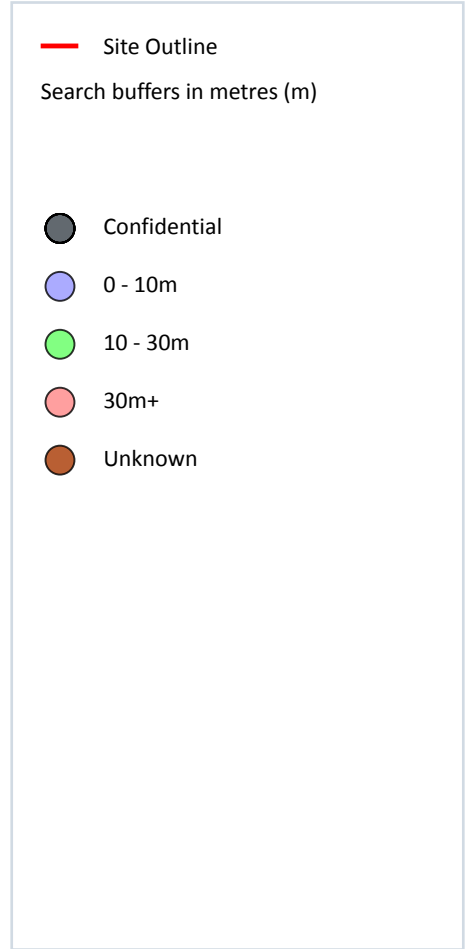
4

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

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 92**

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	MERCIA MUDSTONE GROUP - MUDSTONE	-
2	On site	PNG-MDST	PENARTH GROUP - MUDSTONE	RHAETIAN
3	On site	SMD-MDLM	SCUNTHORPE MUDSTONE FORMATION - MUDSTONE AND LIMESTONE, INTERBEDDED	RHAETIAN

## 16 Boreholes



### 16.1 BGS Boreholes

#### Records within 250m

1

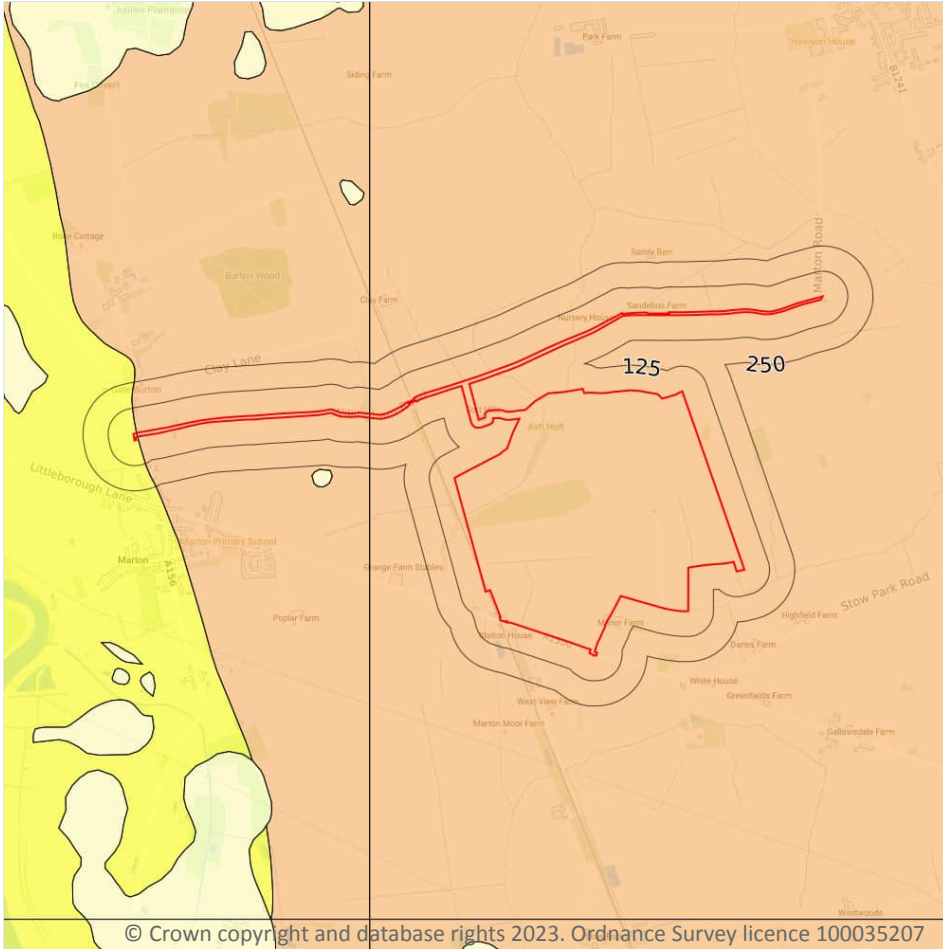
The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several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

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

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	186m W	483857 382191	NEW POLICE HOUSE MARTON	30.48	N	<a href="#">244162</a>

*This data is sourced from the British Geological Survey.*

## 17 Natural ground subsidence - Shrink swell clays



— Site Outline  
Search buffers in metres (m)

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

### 17.1 Shrink swell clays

Records within 50m

2

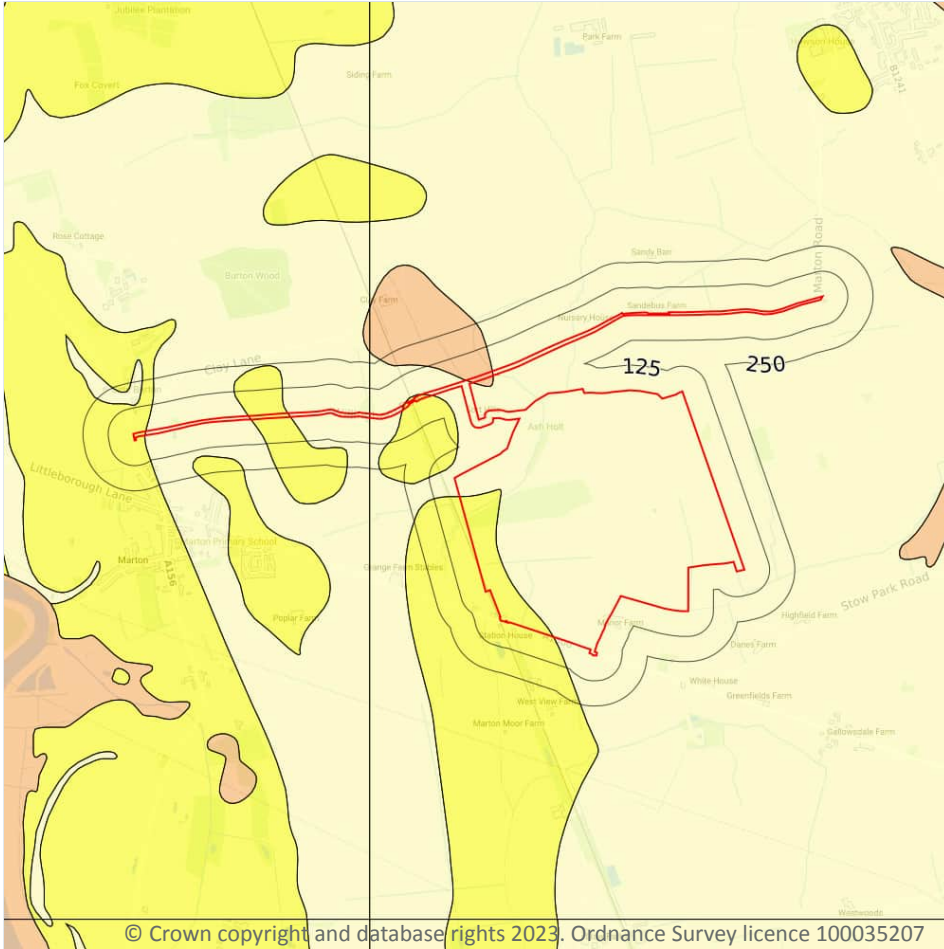
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 95**

Location	Hazard rating	Details
On site	Very low	Ground conditions predominantly low plasticity.
On site	Low	Ground conditions predominantly medium plasticity.

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Running sands



— Site Outline  
Search buffers in metres (m)

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

### 17.2 Running sands

Records within 50m

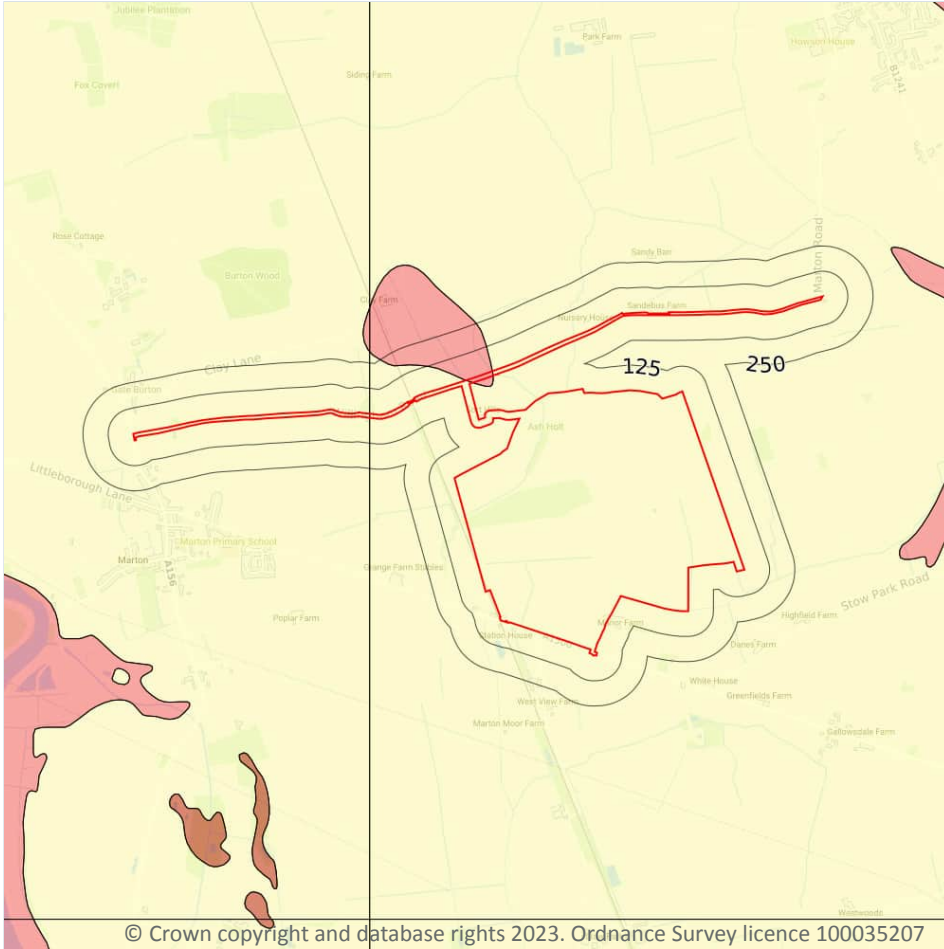
3

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

Features are displayed on the Natural ground subsidence - Running sands map on **page 96**

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

## Natural ground subsidence - Compressible deposits



— Site Outline  
Search buffers in metres (m)

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

### 17.3 Compressible deposits

Records within 50m

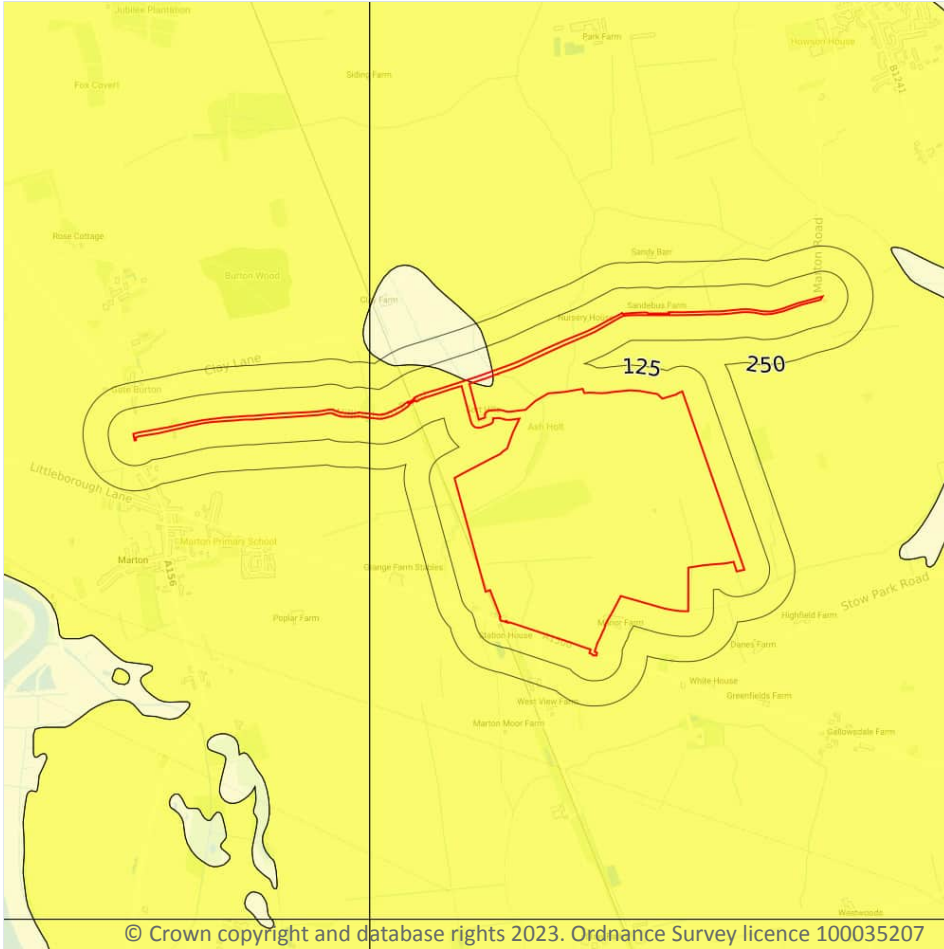
2

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 98**

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

## Natural ground subsidence - Collapsible deposits



— Site Outline  
Search buffers in metres (m)

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

### 17.4 Collapsible deposits

Records within 50m

2

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

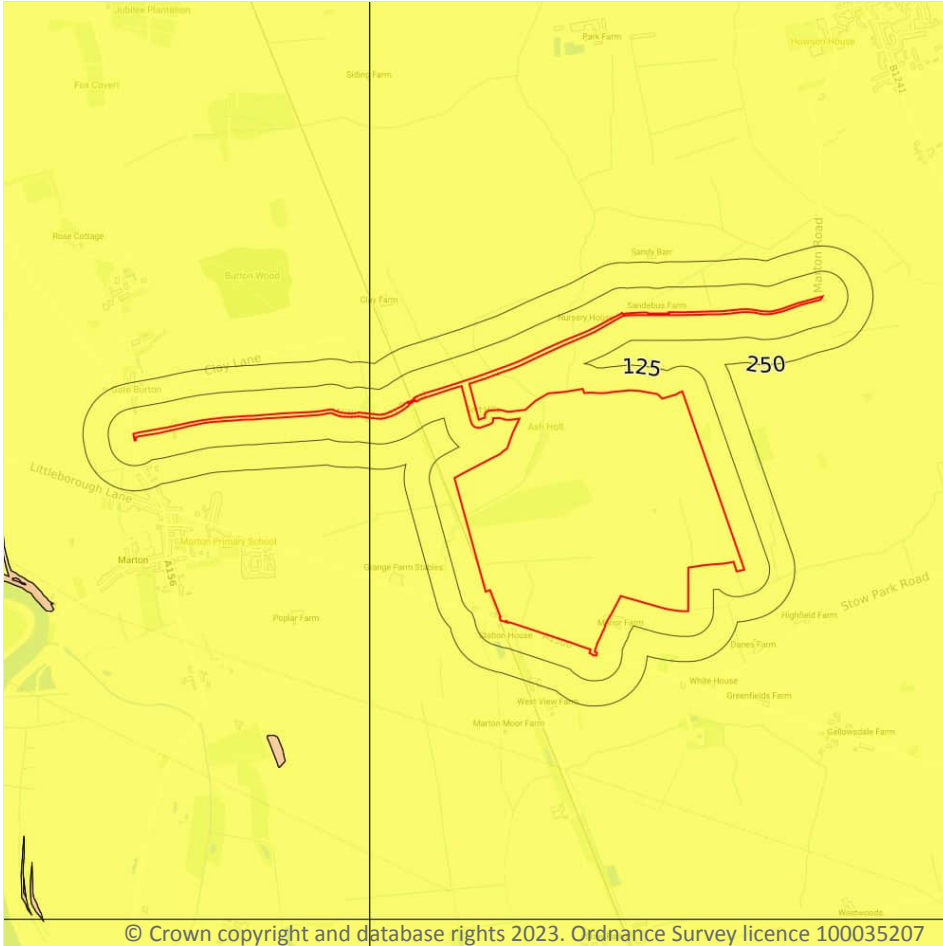
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 100**

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

*This data is sourced from the British Geological Survey.*



## Natural ground subsidence - Landslides



— Site Outline  
Search buffers in metres (m)

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

### 17.5 Landslides

Records within 50m

1

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

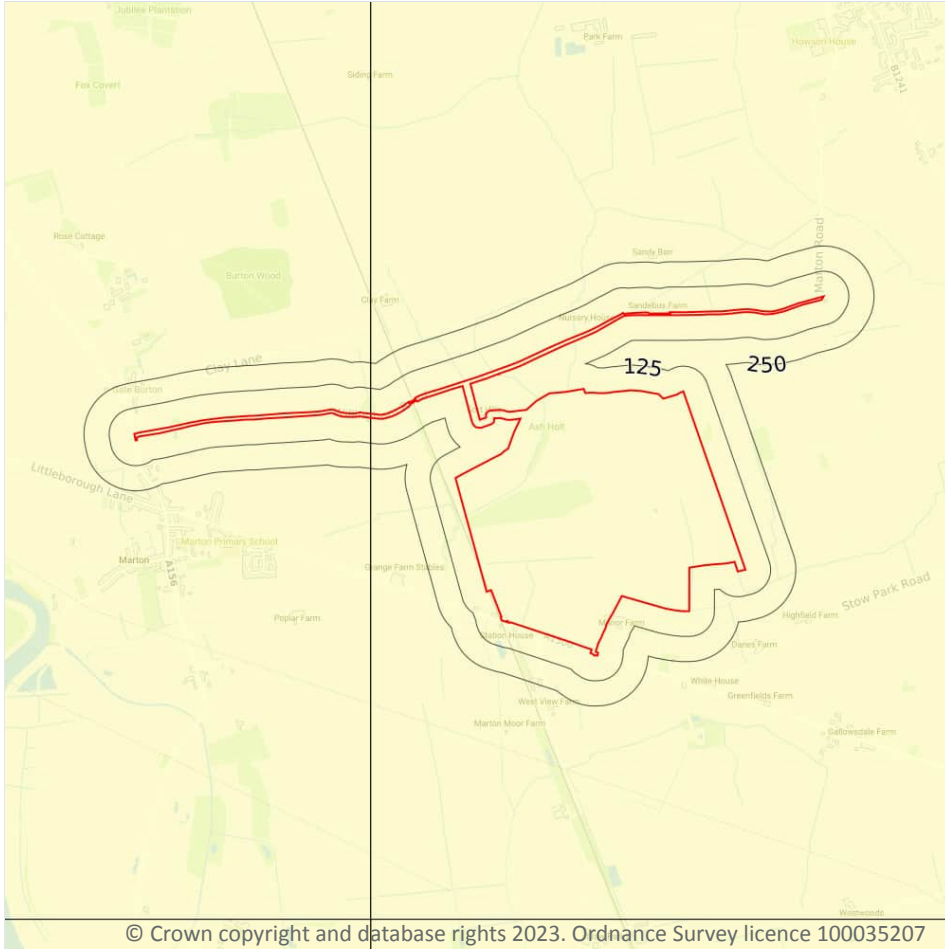
Features are displayed on the Natural ground subsidence - Landslides map on **page 101**

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

*This data is sourced from the British Geological Survey.*



## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

Records within 50m

1

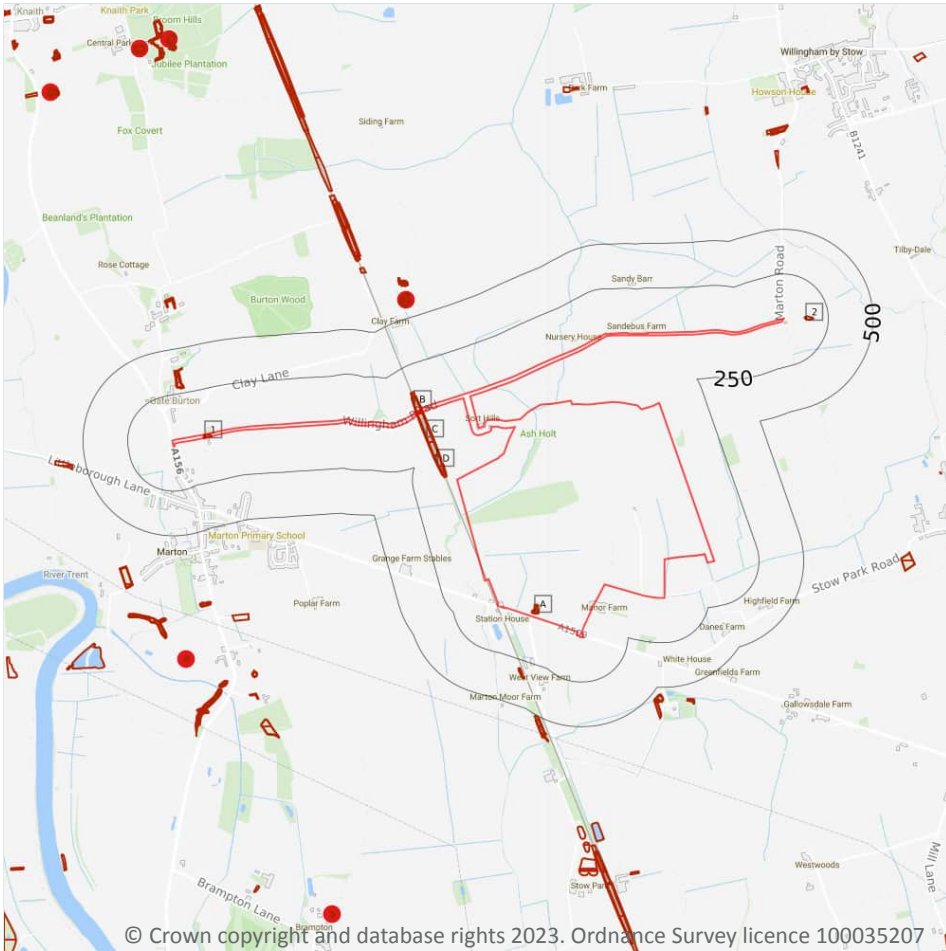
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 102**

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



## 18 Mining, ground workings and natural cavities



### 18.1 Natural cavities

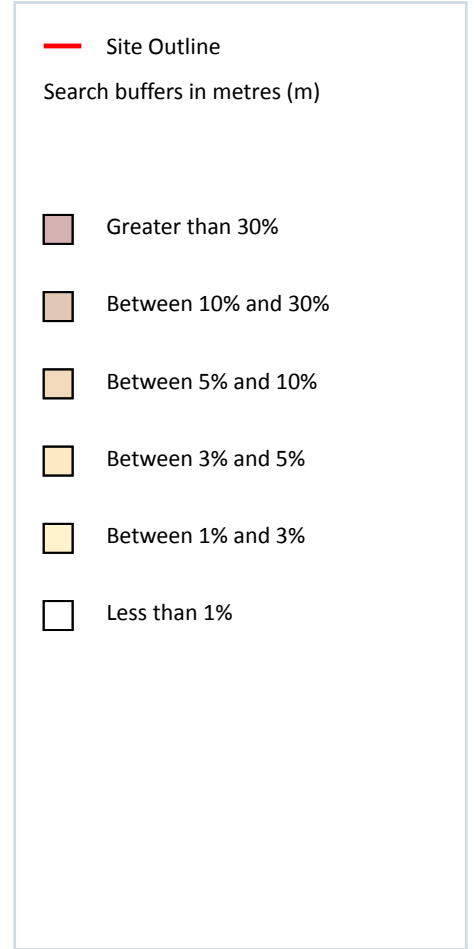
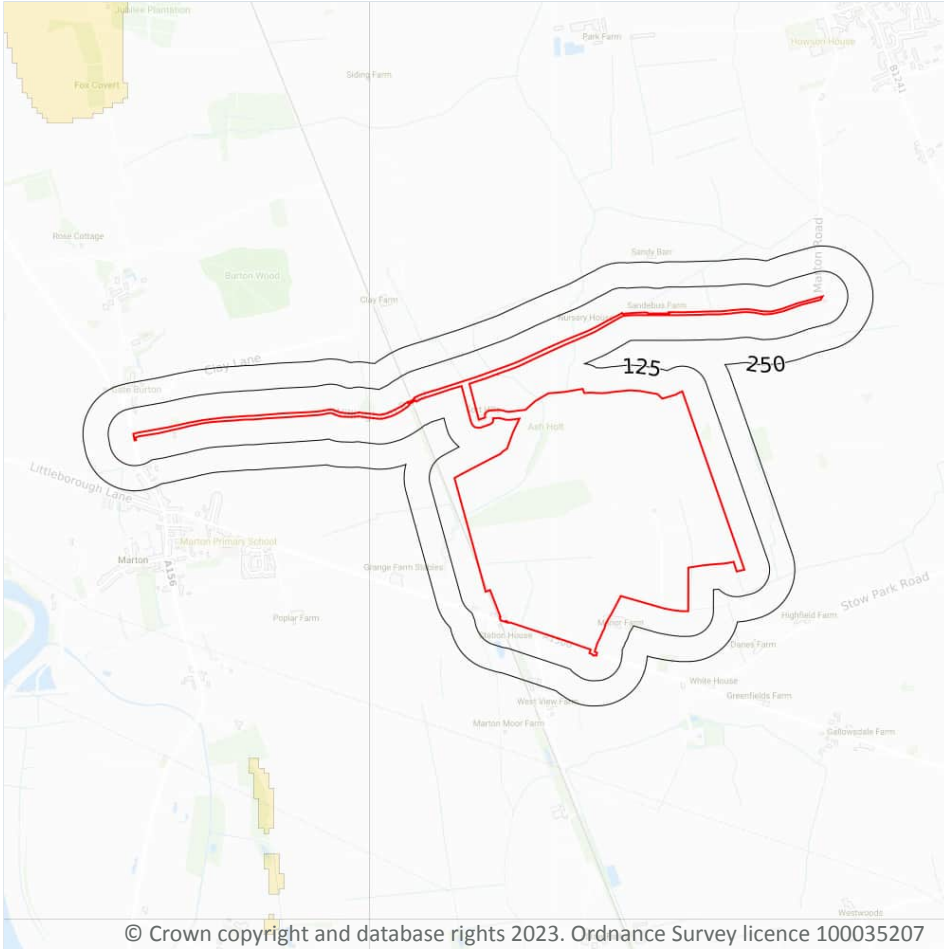
Records within 500m

0

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

*This data is sourced from Stantec UK Ltd.*

## 19 Radon



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### 19.1 Radon

#### Records on site

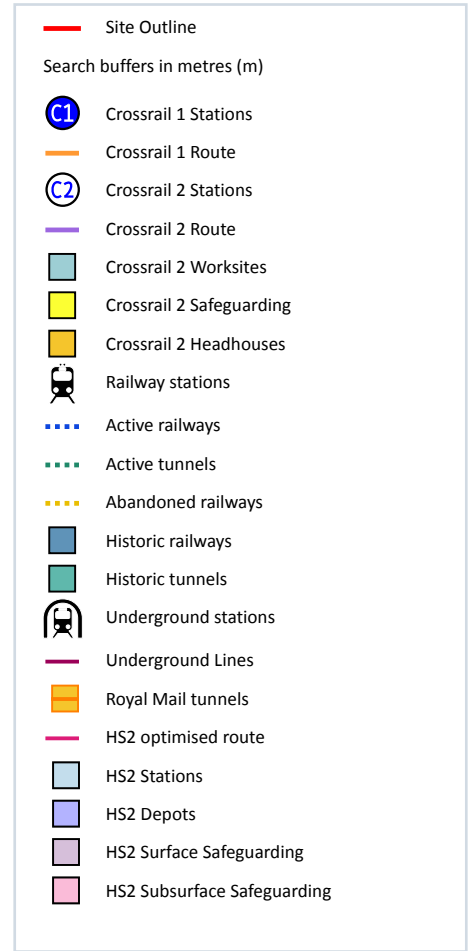
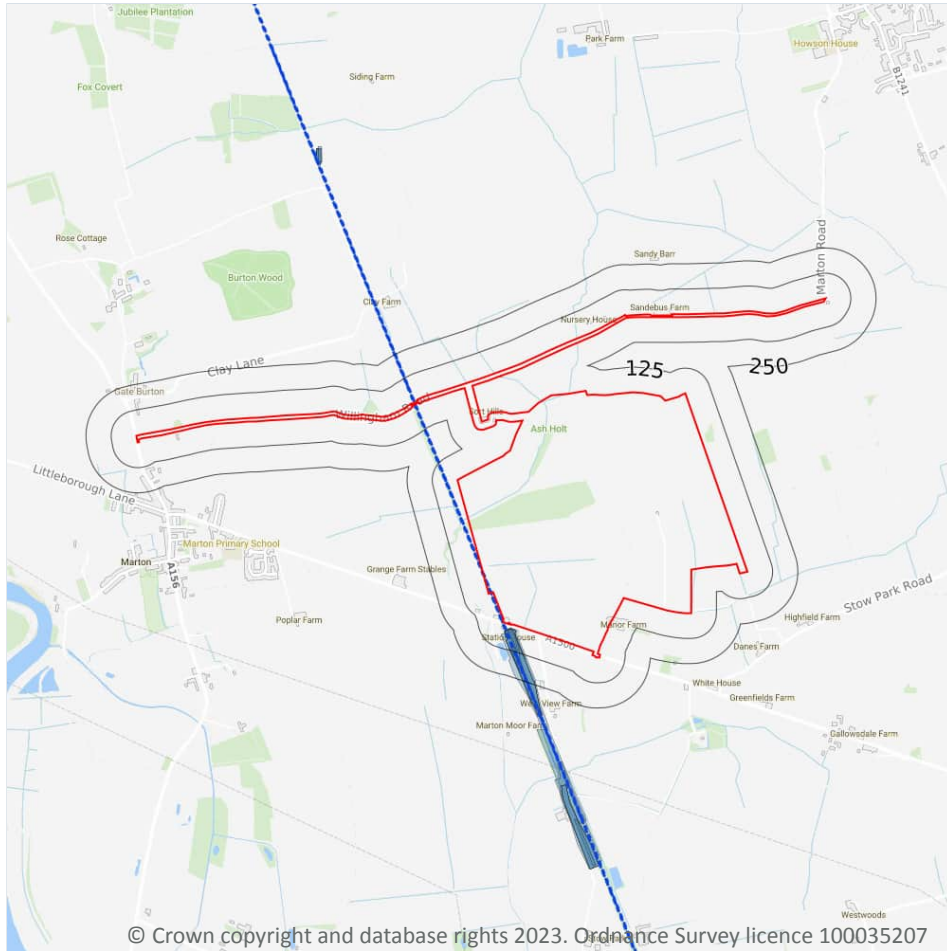
1

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

Features are displayed on the Radon map on **page 108**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None

## 21 Railway infrastructure and projects



### 21.1 Underground railways (London)

Records within 250m

0

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

*This data is sourced from publicly available information by Groundsure.*

### 21.2 Underground railways (Non-London)

Records within 250m

0

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

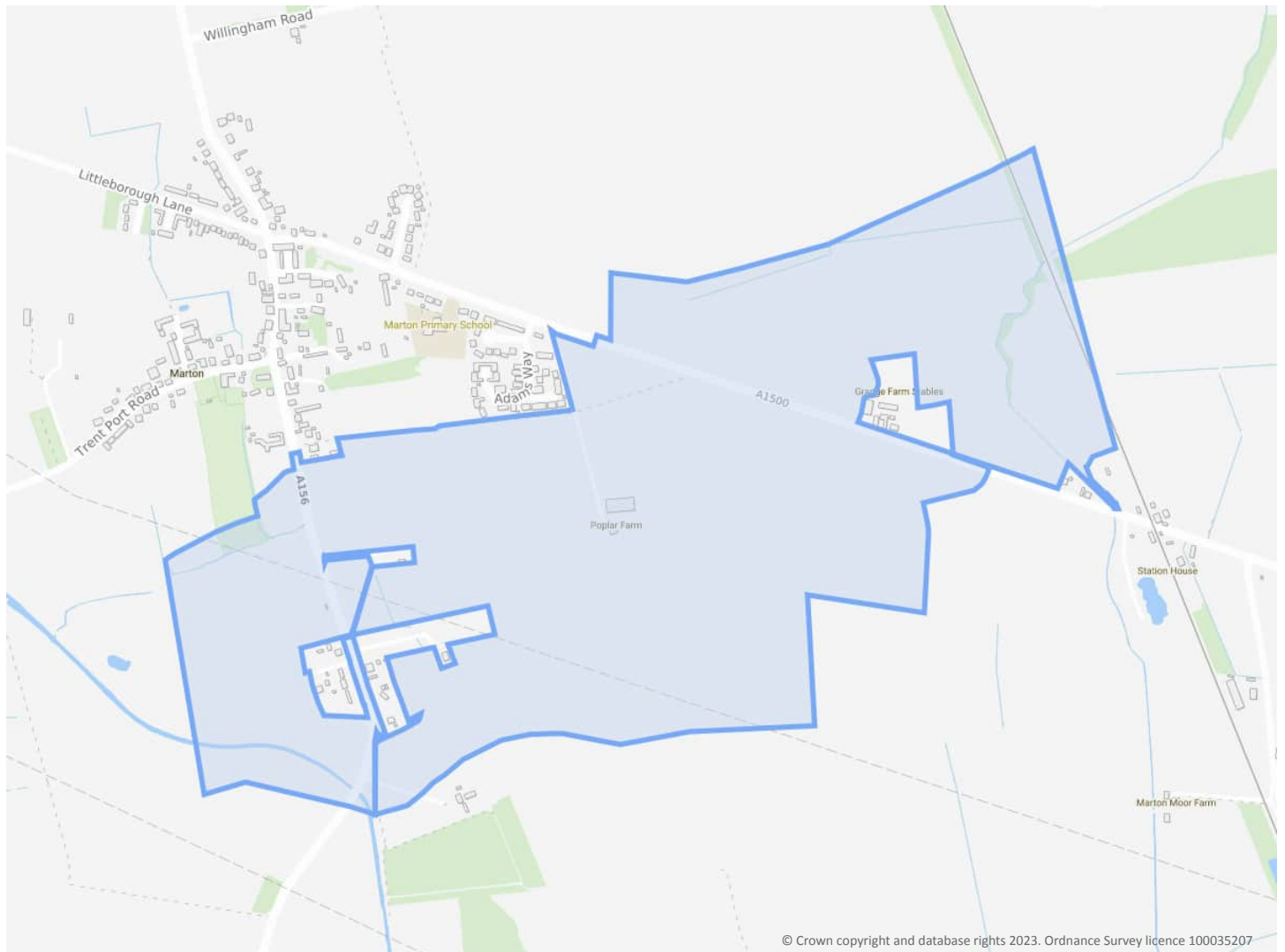
## Tillbridge cable run area

### Order Details

**Date:** 13/02/2023  
**Your ref:** ref 60677969  
**Our Ref:** GSIP-2023-13376-12945\_6

### Site Details

**Location:** 484591 381435  
**Area:** 110.14 ha  
**Authority:** [West Lindsey District Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

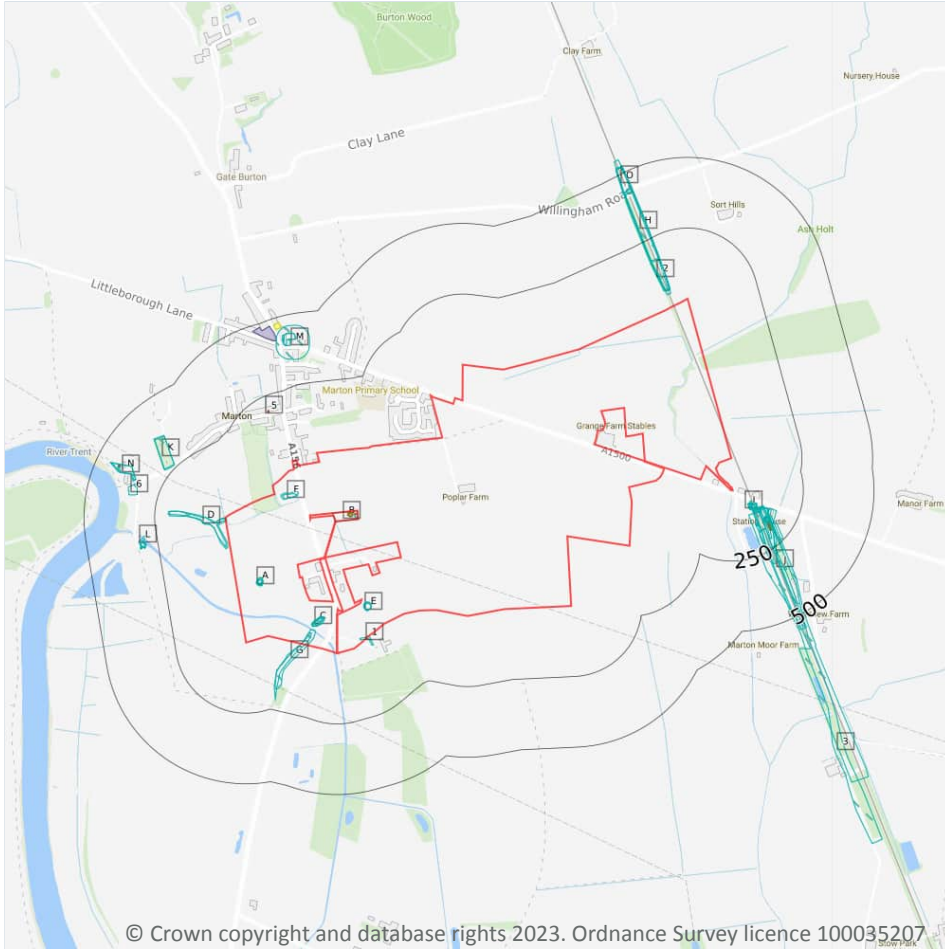
N/A: >10ha

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000

# 1 Past land use



**Site Outline**

Search buffers in metres (m)

- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical petrol stations
- Historical garages

## 1.1 Historical industrial land uses

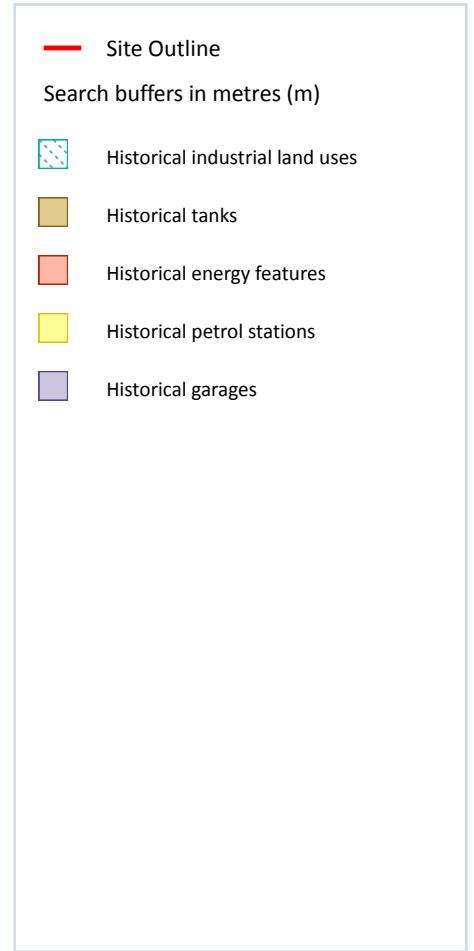
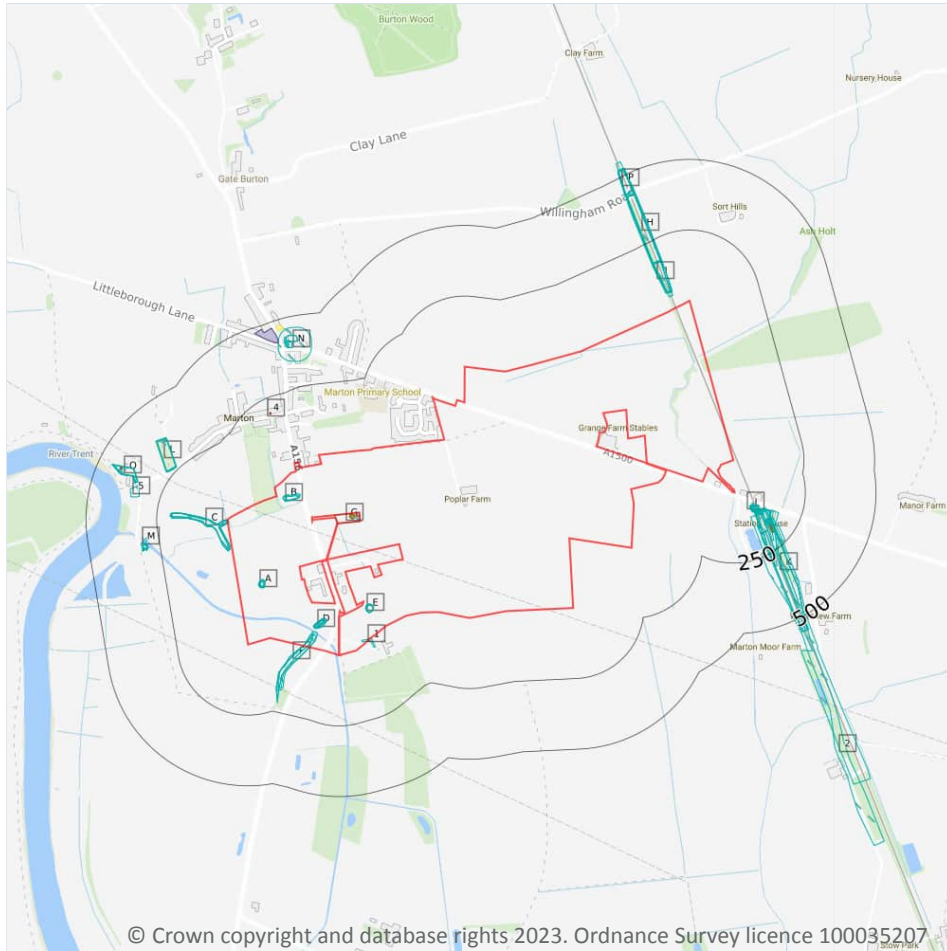
**Records within 500m** **76**

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

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

ID	Location	Land use	Dates present	Group ID
1	On site	Unspecified Ground Workings	1916	1566697

## 2 Past land use - un-grouped



### 2.1 Historical industrial land uses

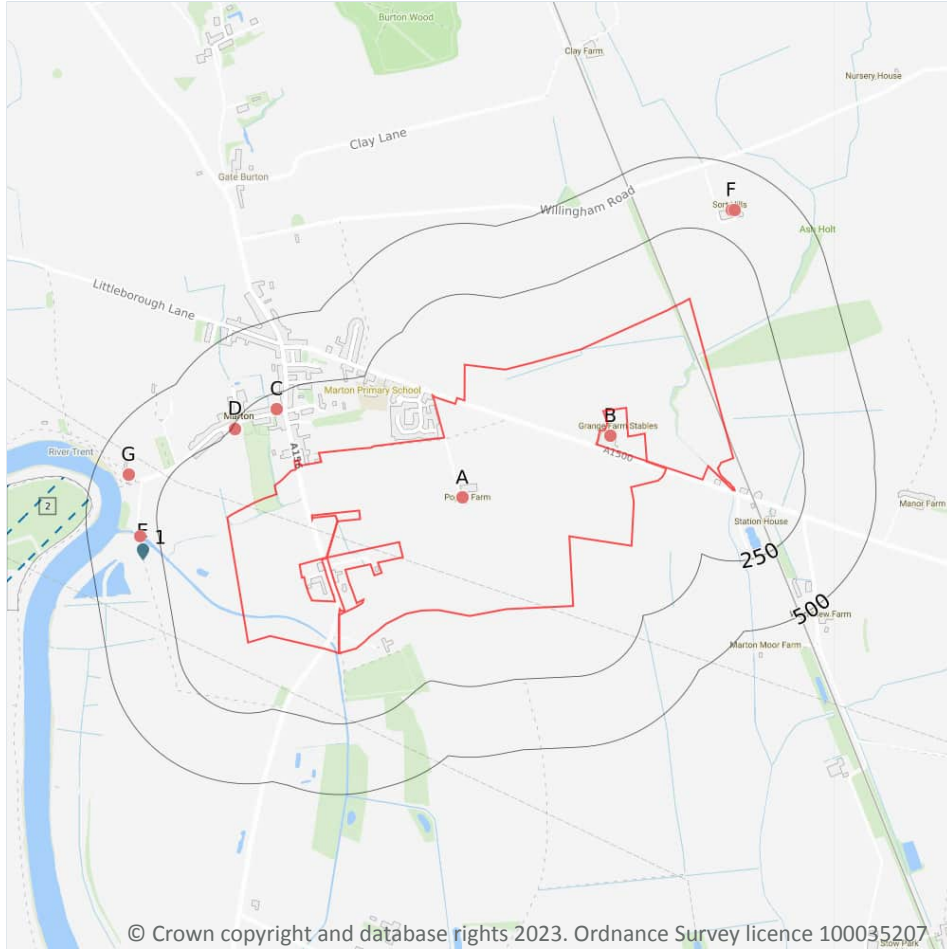
**Records within 500m** **111**

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

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

ID	Location	Land Use	Date	Group ID
1	On site	Unspecified Ground Workings	1916	1566697
A	On site	Unspecified Pit	1947	1670374
A	On site	Unspecified Pit	1916	1670374

### 3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Active or recent landfill
- Licensed waste sites
- Waste exemptions

#### 3.1 Active or recent landfill

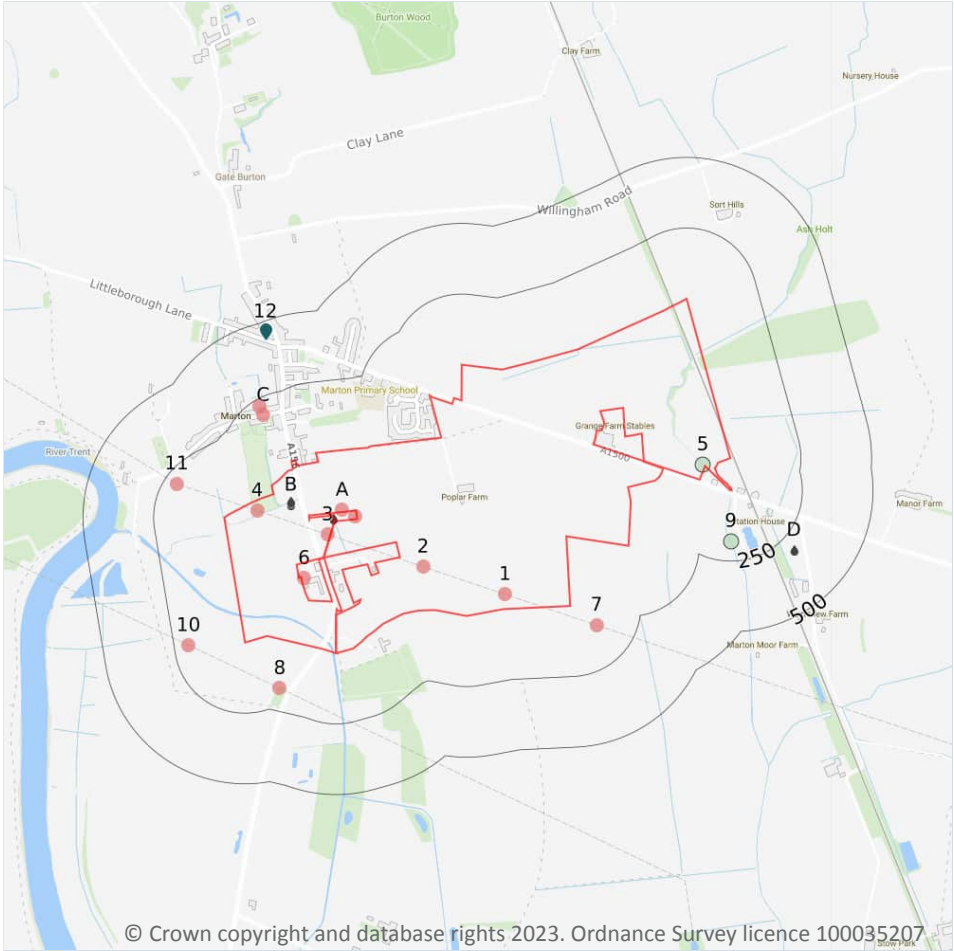
**Records within 500m** **1**

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation. Features are displayed on the Waste and landfill map on **page 26**

ID	Location	Details
2	482m W	<p>Operator: British Waterways Board                      Site Address: Land/premises At, Trent Valley Way, West Bank Of River Trent, Opposite Marton, Nottinghamshire, DN21</p> <p>WML Number: 43111                      EPR Reference: BRI005                      Landfill type: A06: Landfill taking other wastes                      Status: Issued                      IPPC Reference: -                      EPR Number: EA/EPR/AP3297FZ/A001</p>

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

## 4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- ◆ Licensed pollutant release (Part A(2)/B)
- ◆ Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

### 4.1 Recent industrial land uses

**Records within 250m** **13**

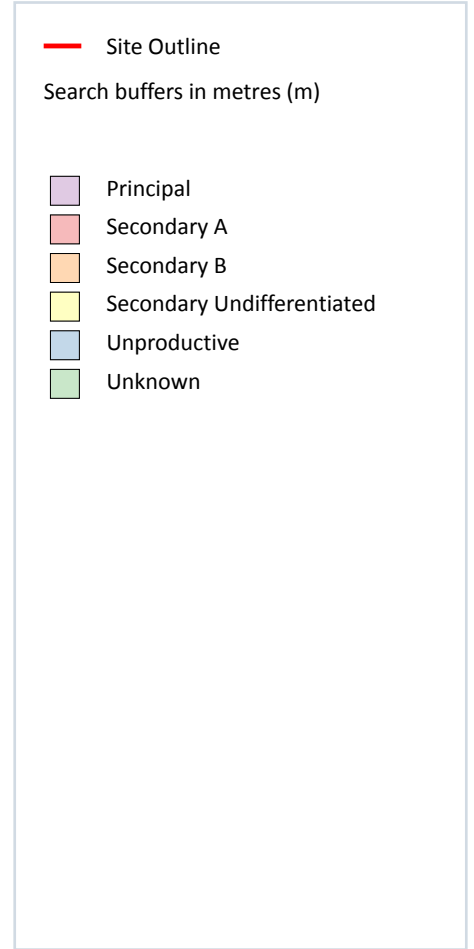
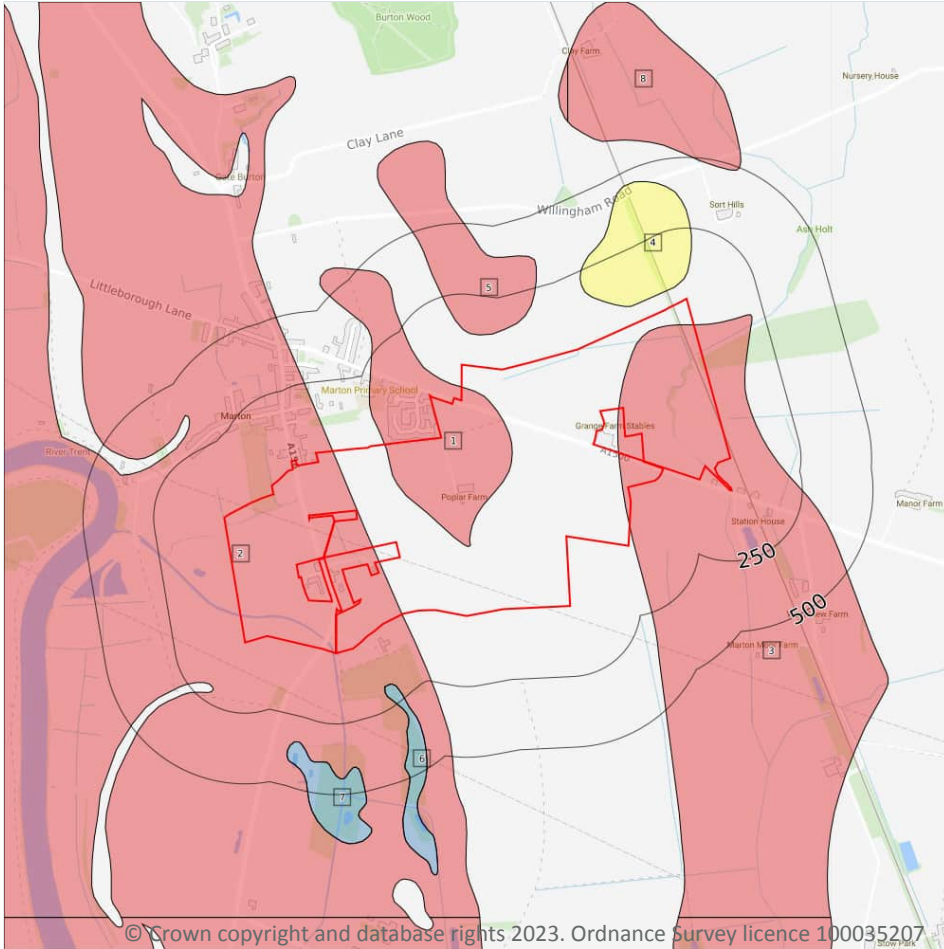
Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 35**

ID	Location	Company	Address	Activity	Category
1	On site	Pylon	Lincolnshire, DN21	Electrical Features	Infrastructure and Facilities
2	On site	Pylon	Lincolnshire, DN21	Electrical Features	Infrastructure and Facilities
3	On site	Pylon	Lincolnshire, DN21	Electrical Features	Infrastructure and Facilities



## 5 Hydrogeology - Superficial aquifer



### 5.1 Superficial aquifer

Records within 500m

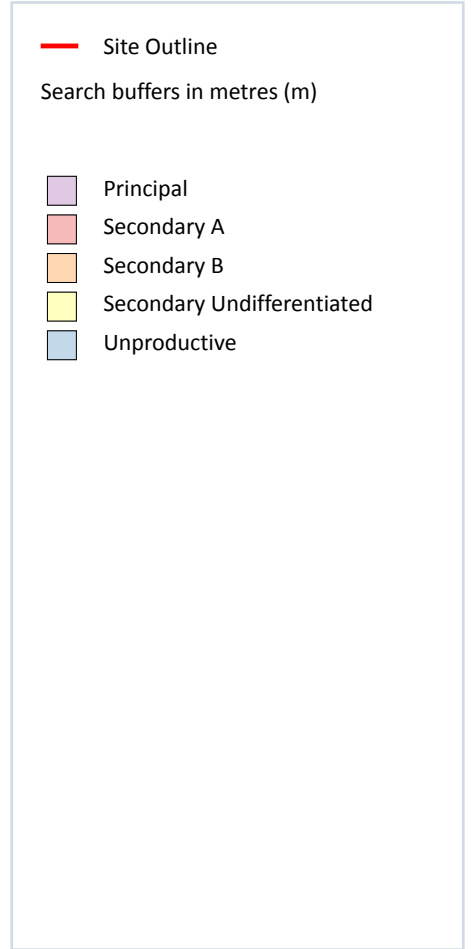
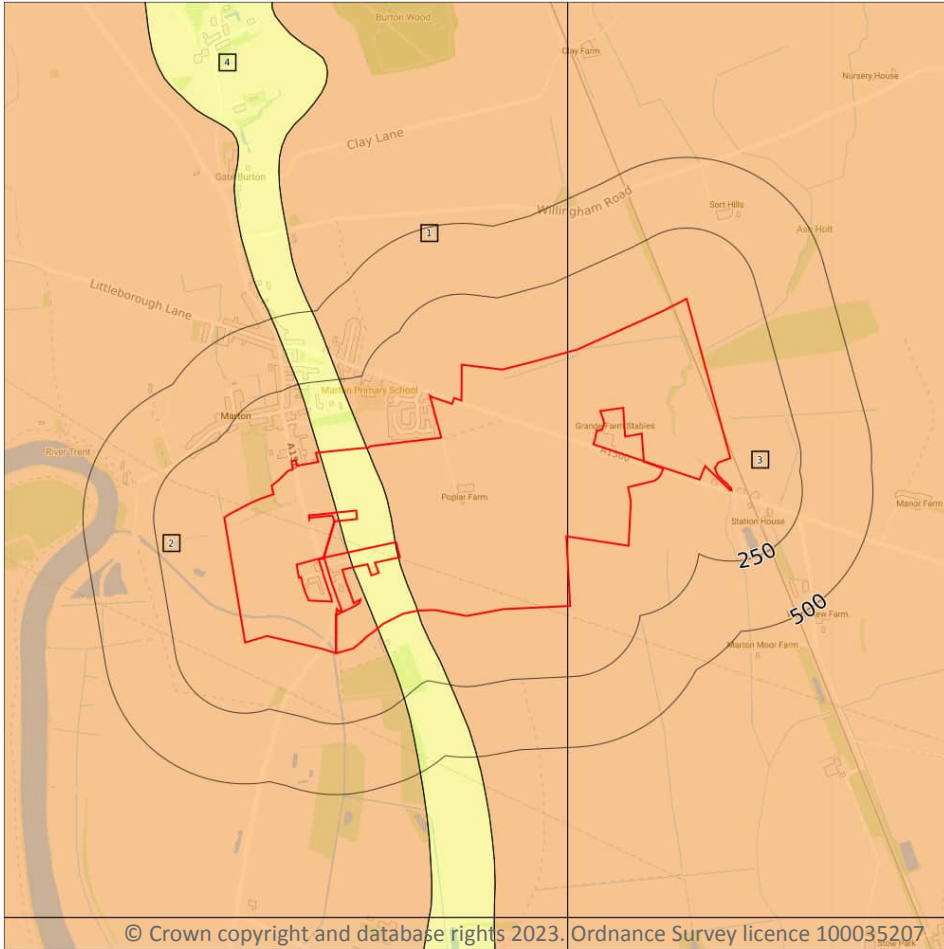
8

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 43**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	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

## Bedrock aquifer



### 5.2 Bedrock aquifer

Records within 500m

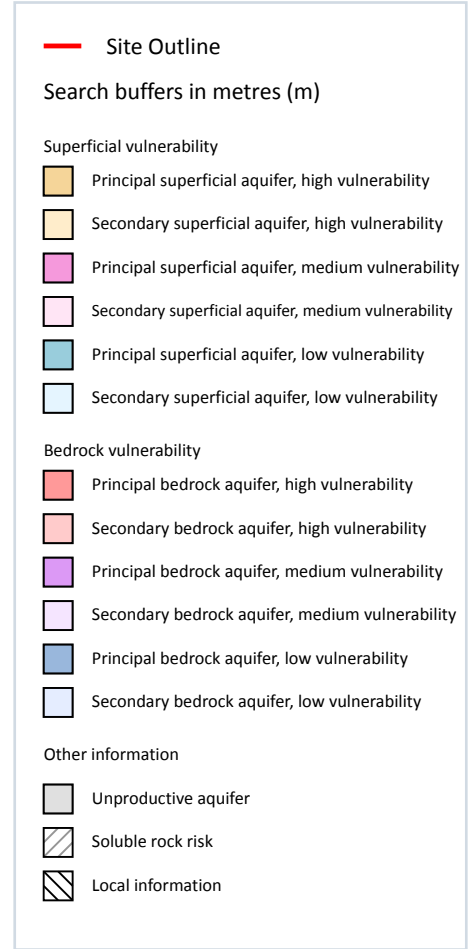
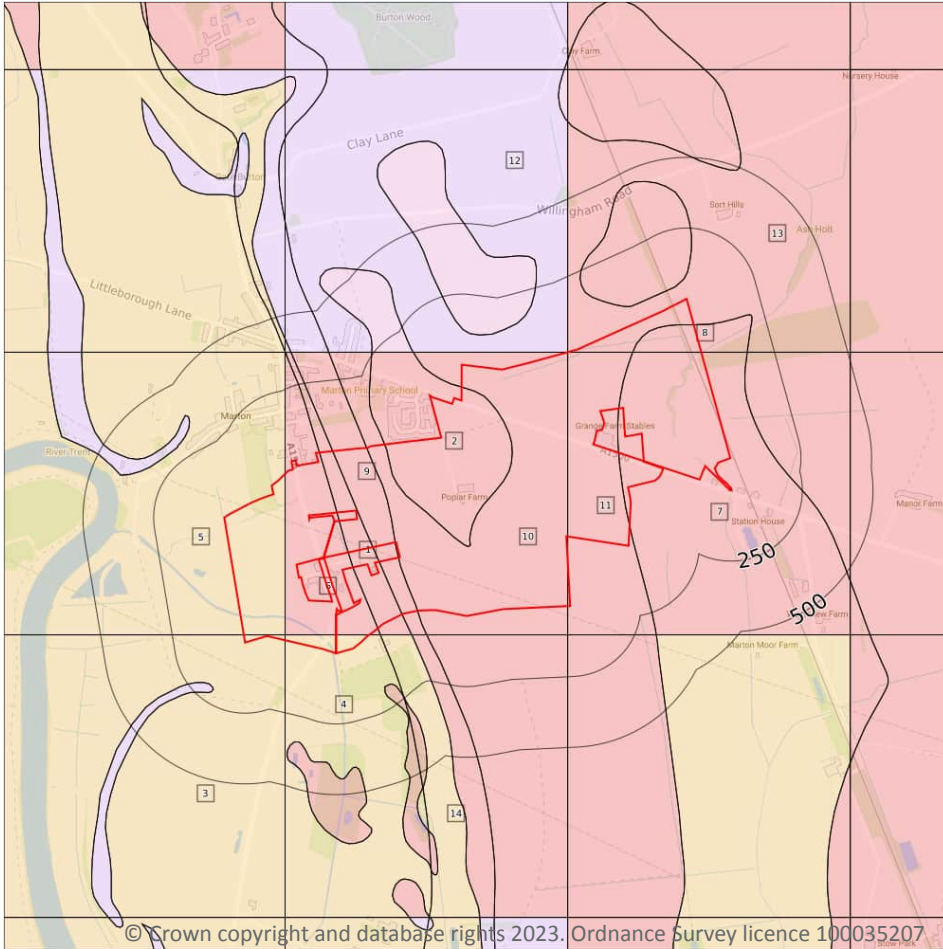
4

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 45**

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

## Groundwater vulnerability



### 5.3 Groundwater vulnerability

Records within 50m

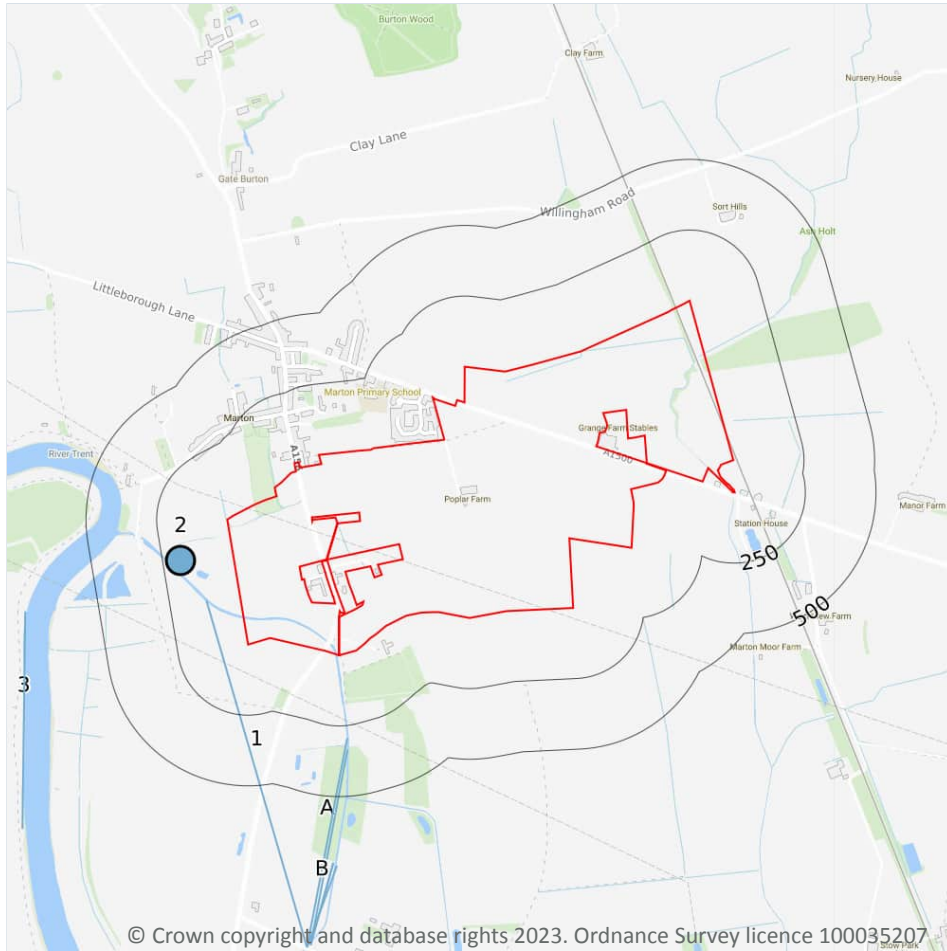
14

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

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

Features are displayed on the Groundwater vulnerability map on **page 47**

## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

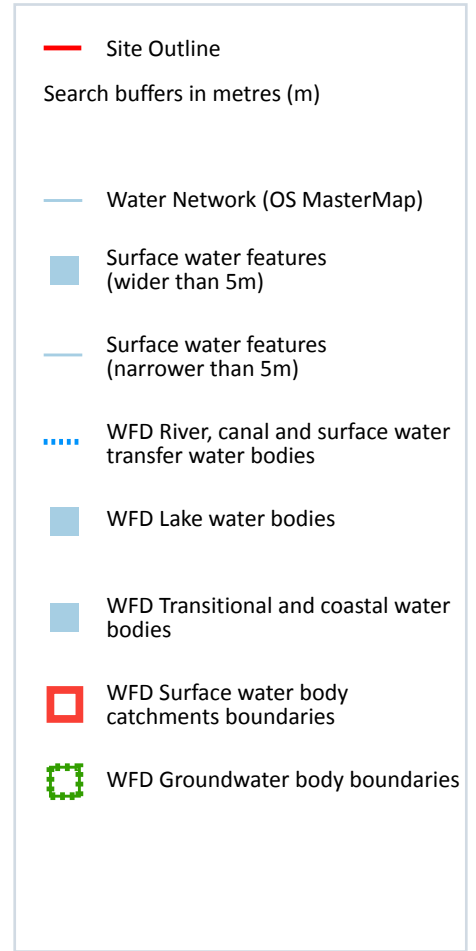
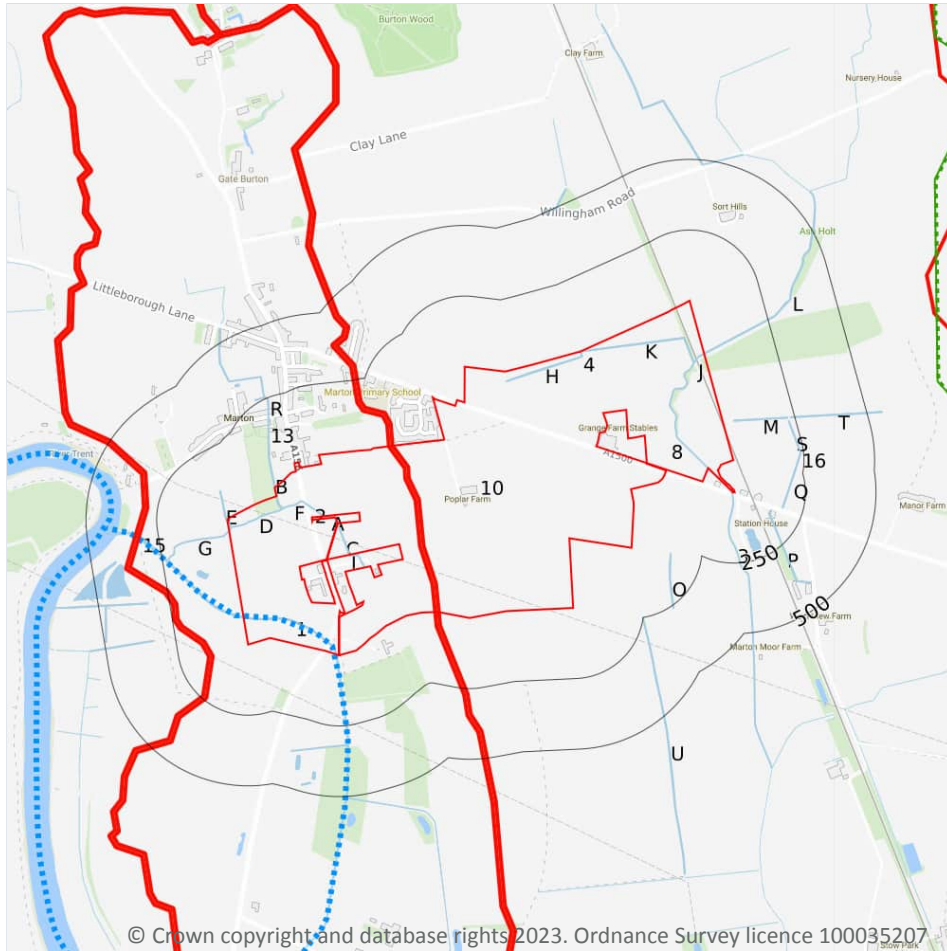
Records within 2000m

4

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 51**

## 6 Hydrology



### 6.1 Water Network (OS MasterMap)

Records within 250m

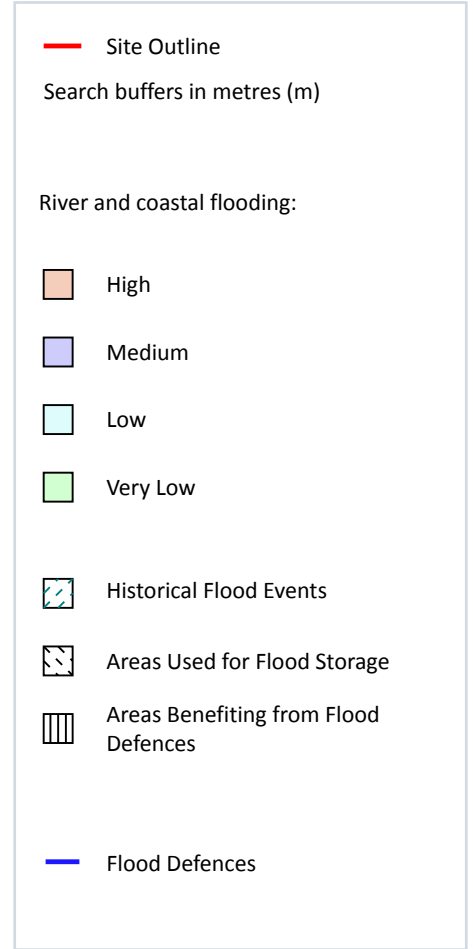
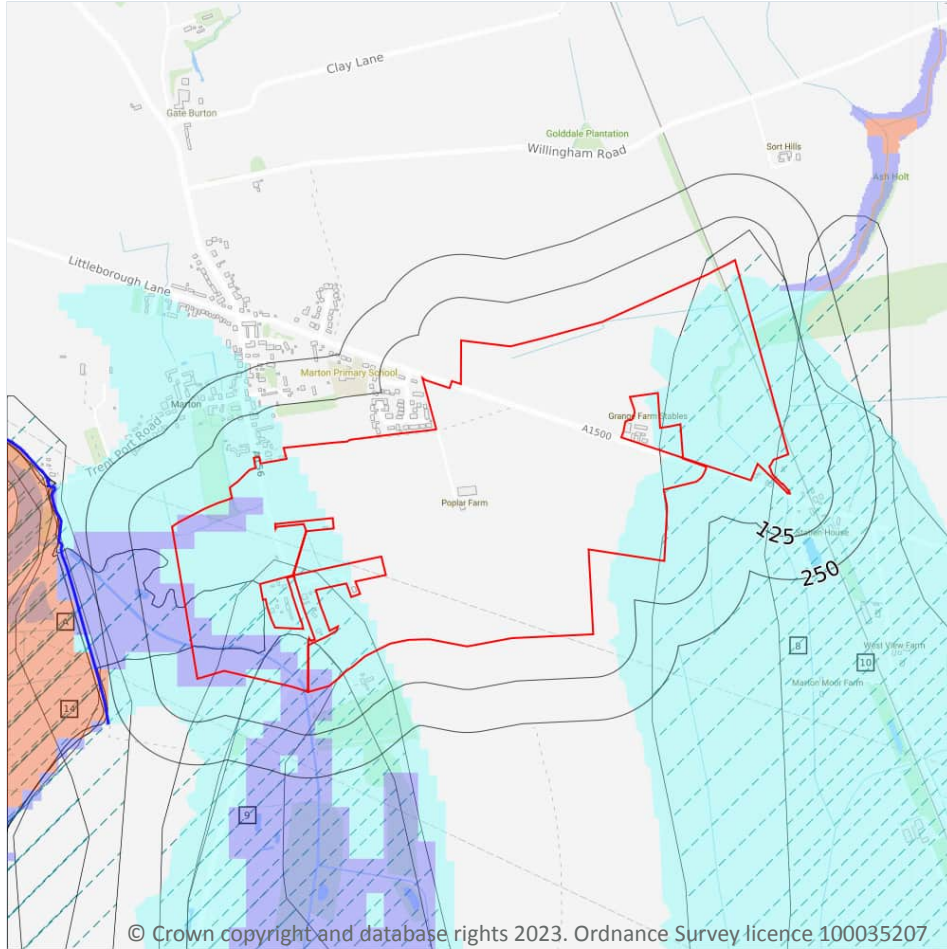
36

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

Features are displayed on the Hydrology map on **page 57**

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

## 7 River and coastal flooding



### 7.1 Risk of flooding from rivers and the sea

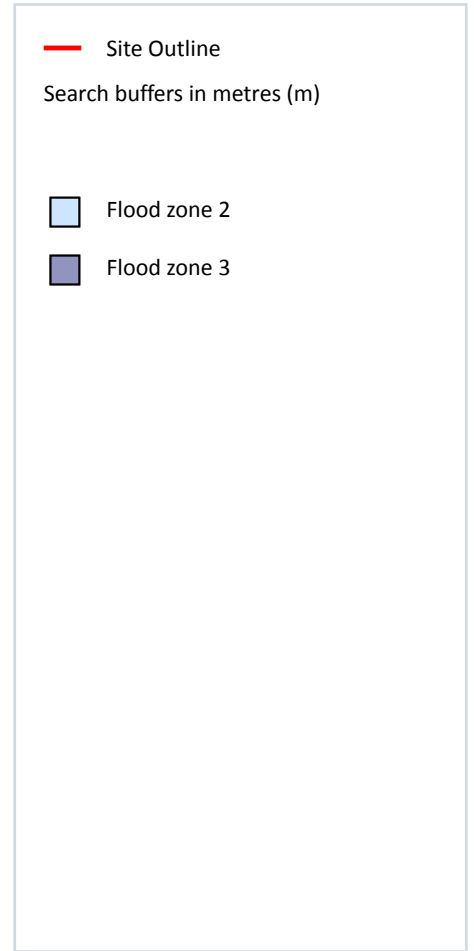
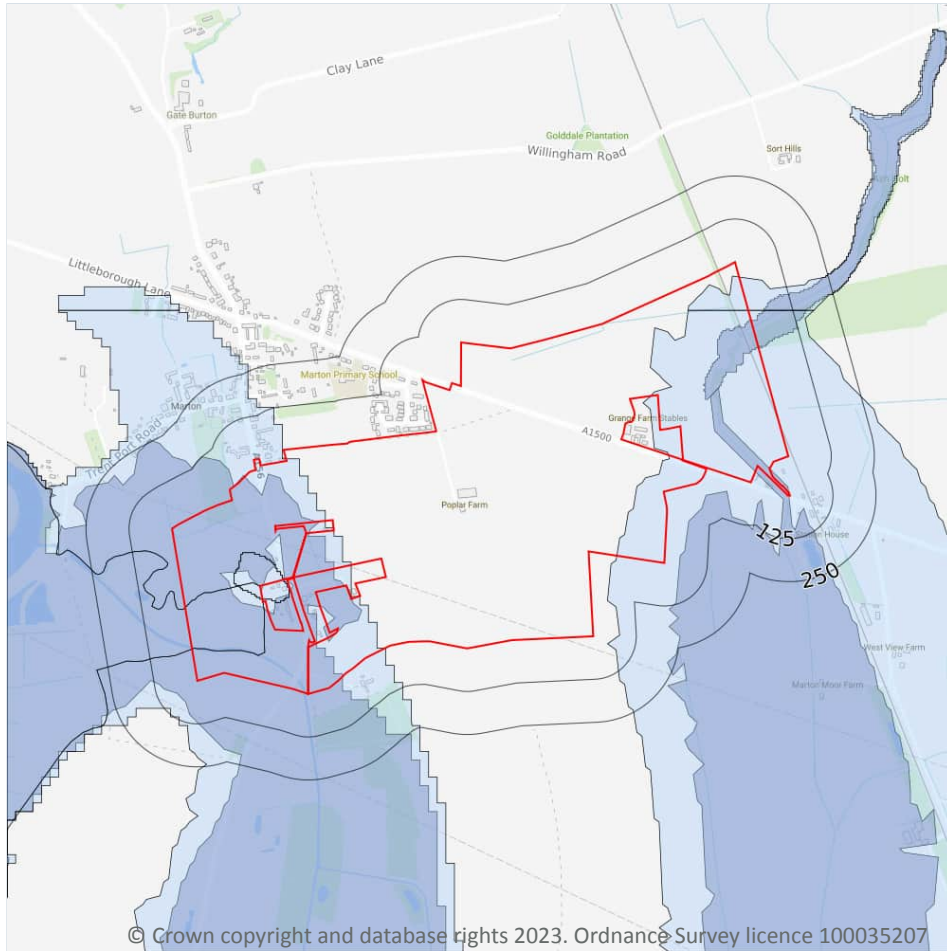
Records within 50m

7

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

Features are displayed on the River and coastal flooding map on **page 63**

## River and coastal flooding - Flood Zones



### 7.6 Flood Zone 2

Records within 50m

1

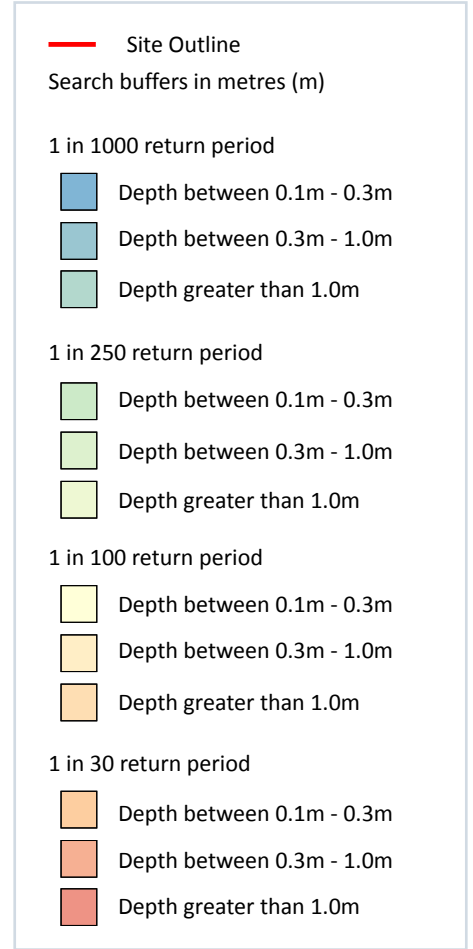
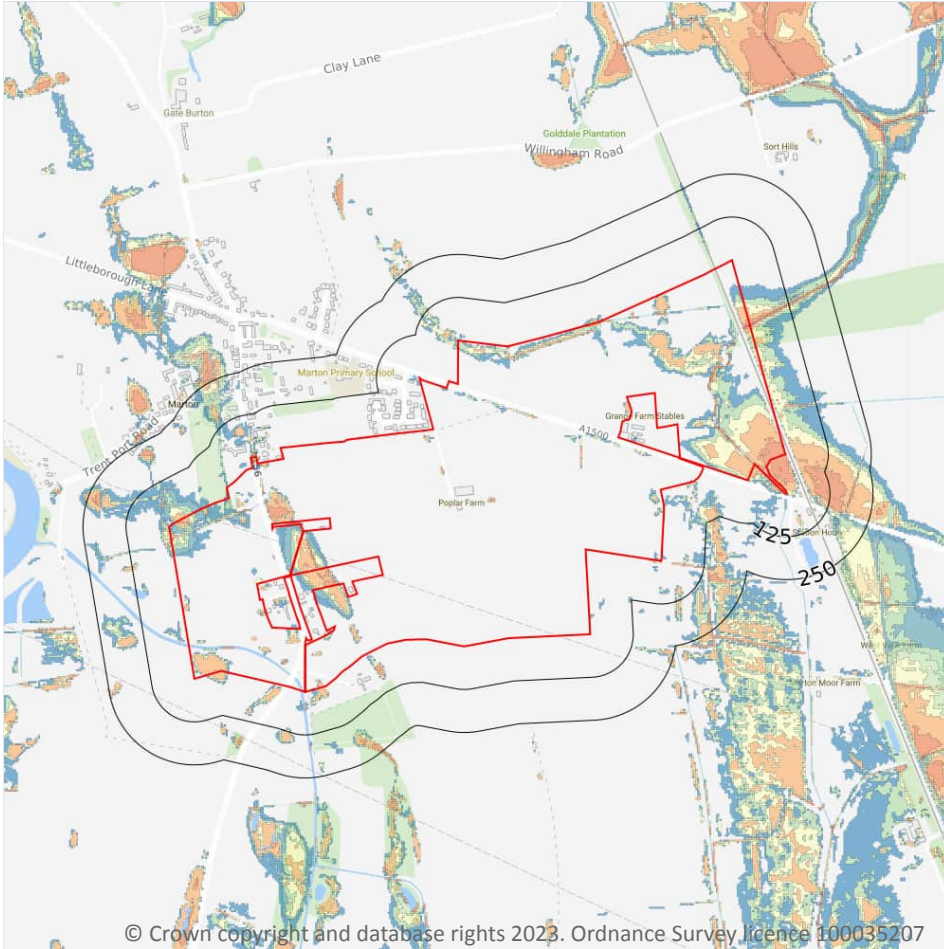
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 63**

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

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

## 8 Surface water flooding



### 8.1 Surface water flooding

**Highest risk on site**

**1 in 30 year, Greater than 1.0m**

**Highest risk within 50m**

**1 in 30 year, Greater than 1.0m**

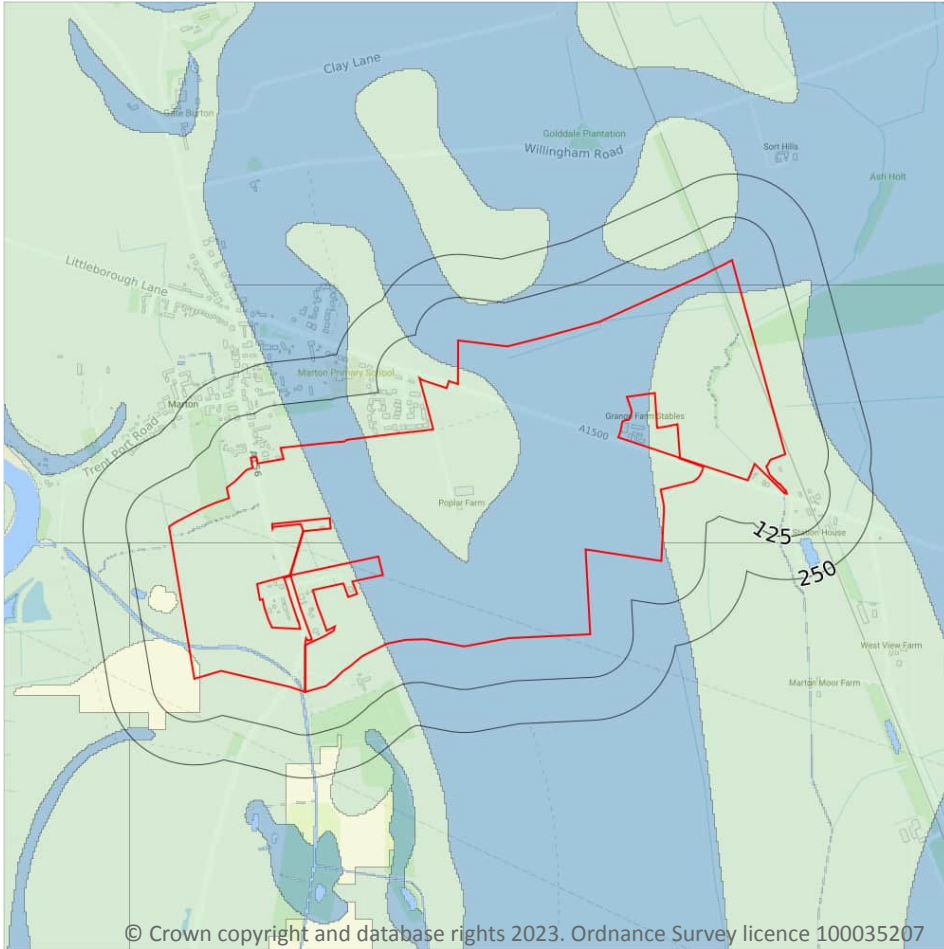
Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year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

Features are displayed on the Surface water flooding map on **page 68**

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



## 9 Groundwater flooding



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### 9.1 Groundwater flooding

**Highest risk on site**

**Moderate**

**Highest risk within 50m**

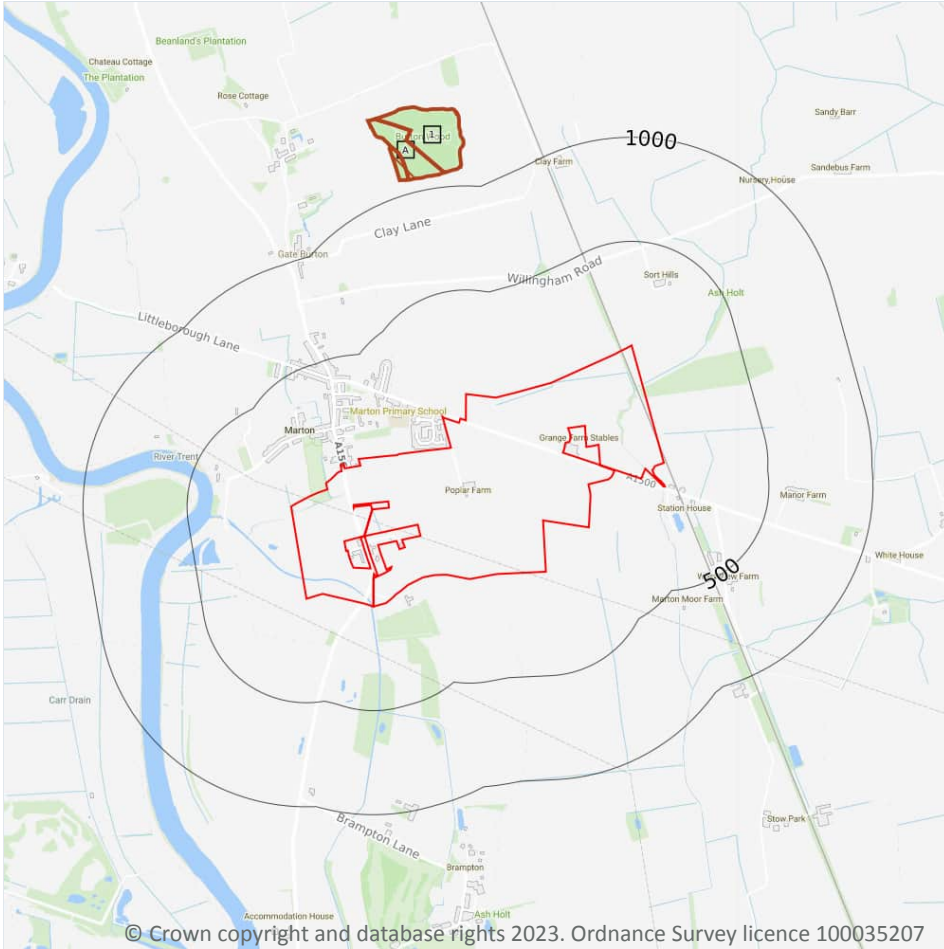
**Moderate**

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

Features are displayed on the Groundwater flooding map on **page 70**

*This data is sourced from Ambiental Risk Analytics.*

## 10 Environmental designations



### 10.1 Sites of Special Scientific Interest (SSSI)

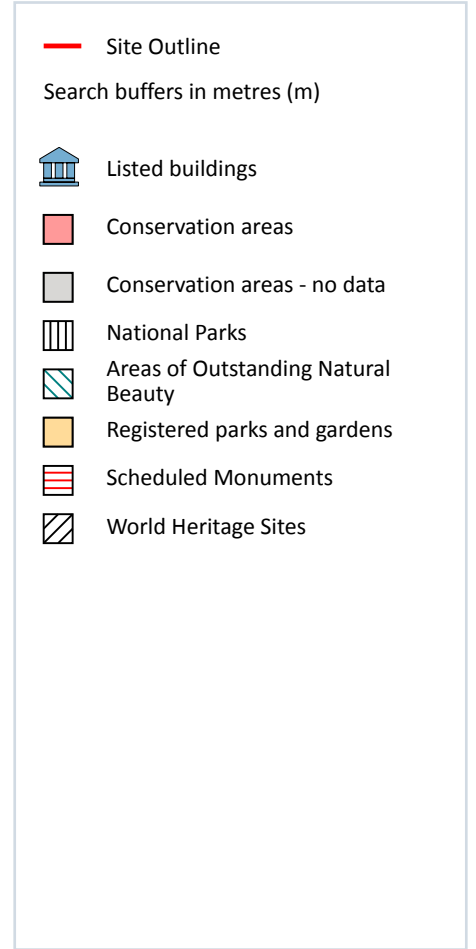
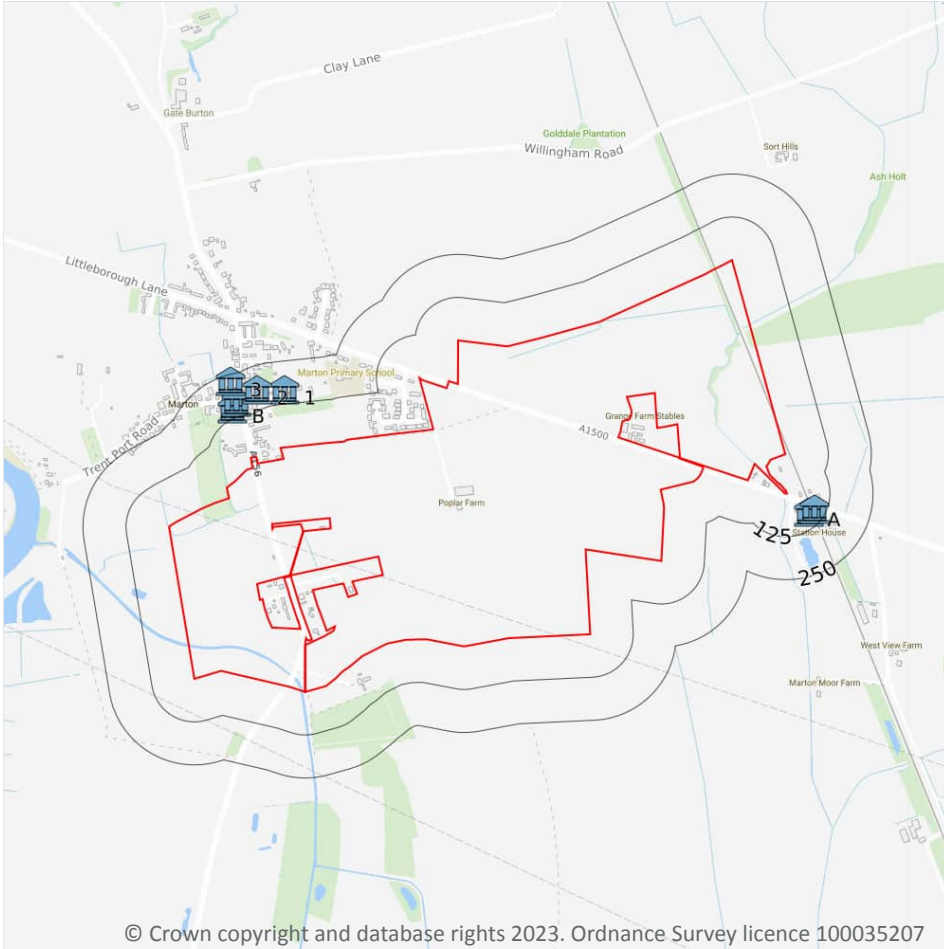
**Records within 2000m**

**0**

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

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

## 11 Visual and cultural designations



### 11.1 World Heritage Sites

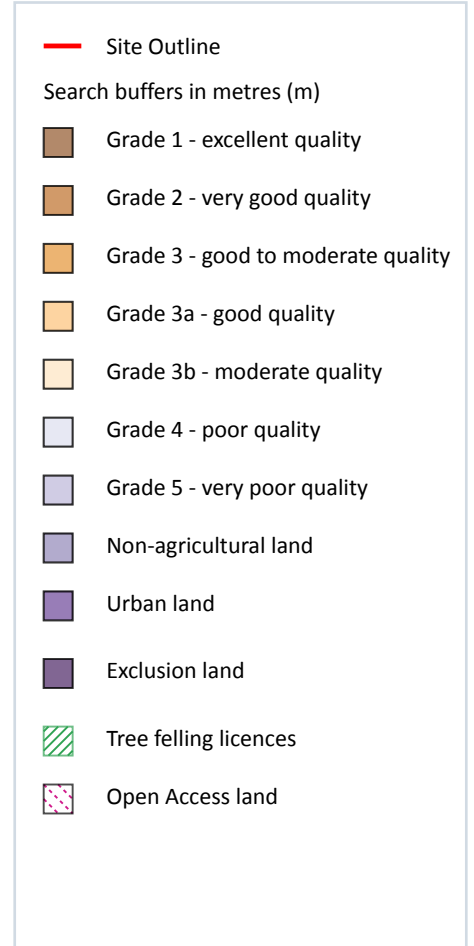
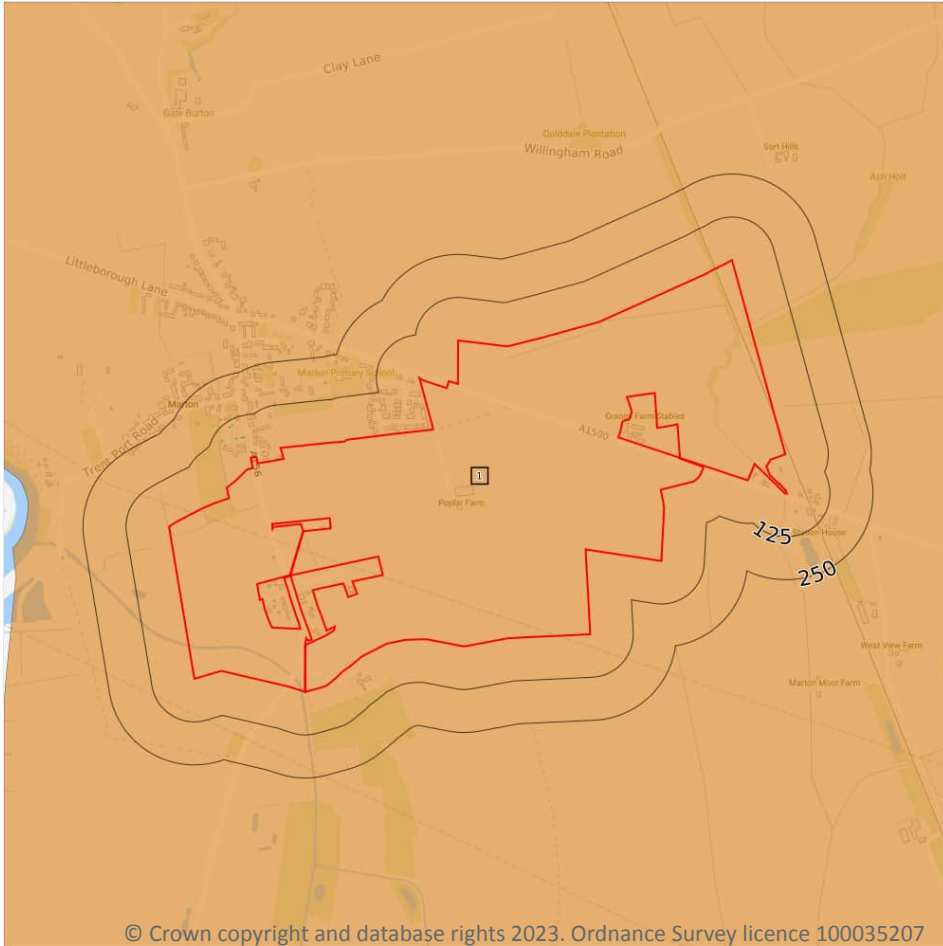
Records within 250m

0

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

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

## 12 Agricultural designations



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### 12.1 Agricultural Land Classification

Records within 250m

1

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

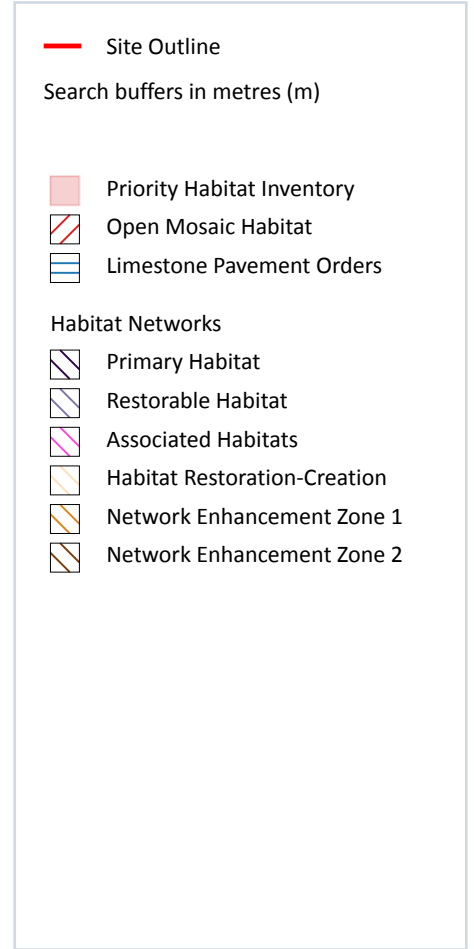
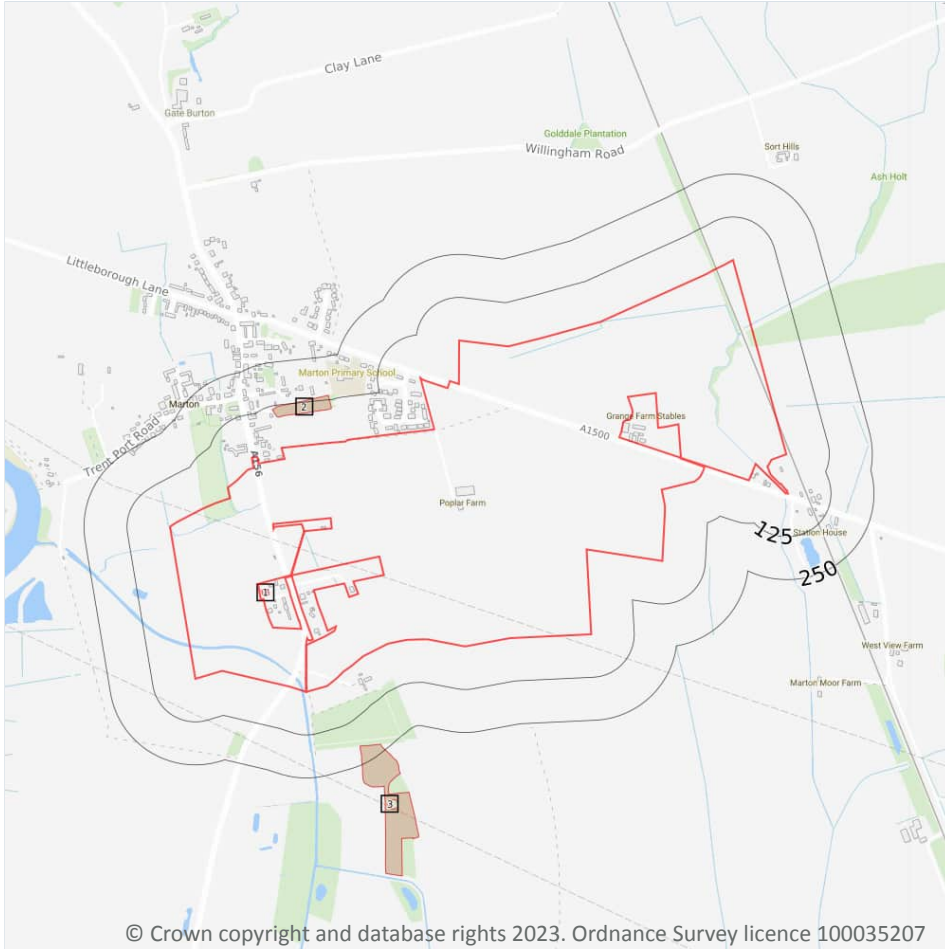
Features are displayed on the Agricultural designations map on **page 81**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

This data is sourced from Natural England.



## 13 Habitat designations



### 13.1 Priority Habitat Inventory

Records within 250m

3

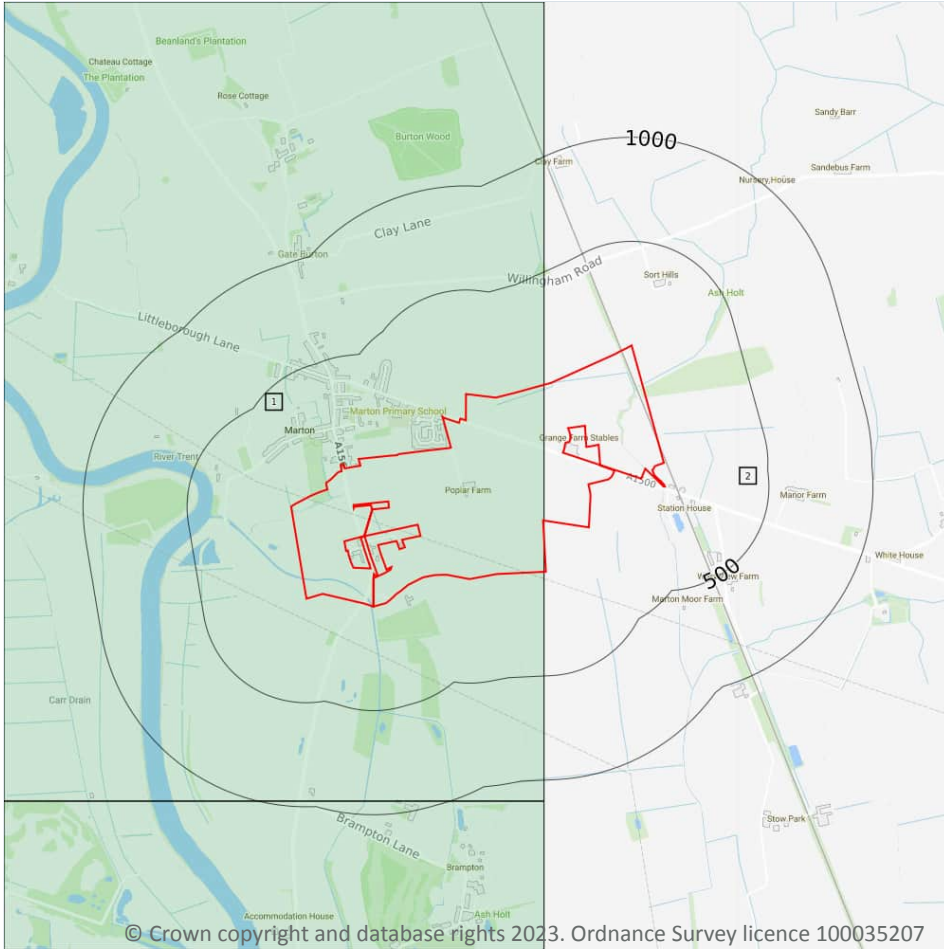
Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 84**

ID	Location	Main Habitat	Other habitats
1	7m SW	Traditional orchard	Overruled by Traditional Orchards HAP Inventory dataset
2	90m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	199m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

*This data is sourced from Natural England.*

## 14 Geology 1:10,000 scale - Availability



— Site Outline  
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

### 14.1 10k Availability

Records within 500m

2

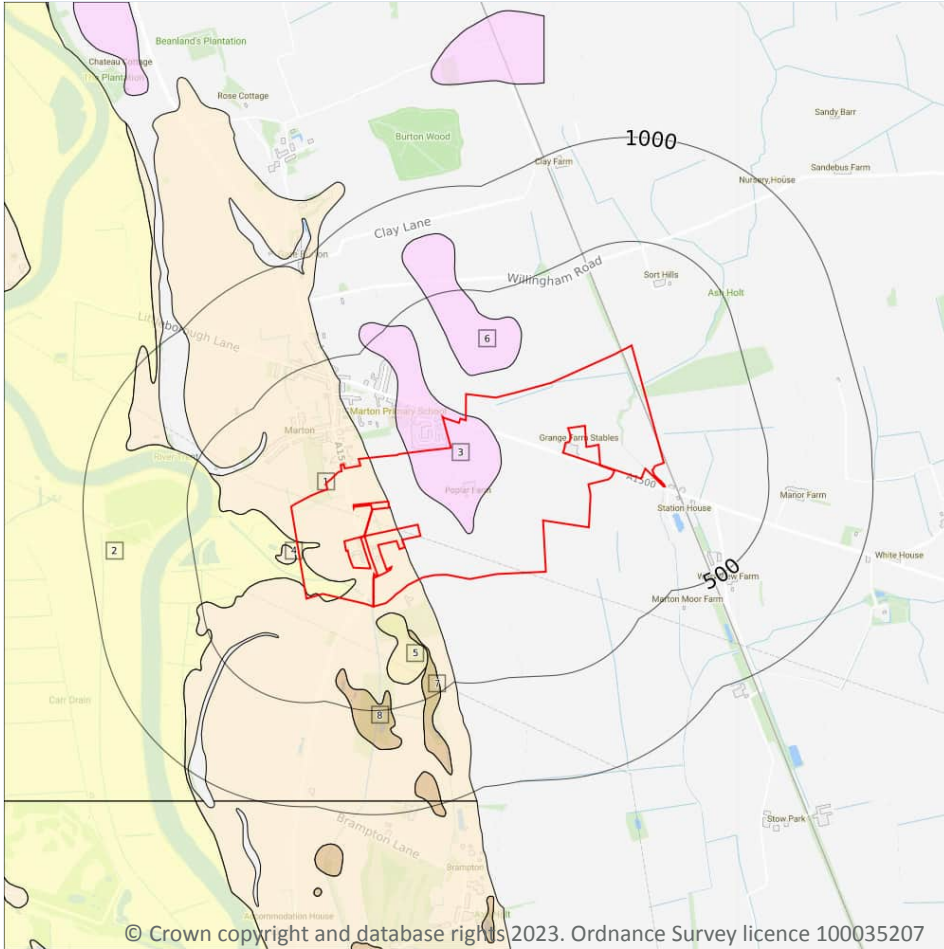
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 86**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	SK88SW
2	On site	No coverage	No coverage	No coverage	No coverage	NoCov

*This data is sourced from the British Geological Survey.*

## Geology 1:10,000 scale - Superficial



**— Site Outline**

Search buffers in metres (m)

**▣ Landslip (10k)**

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

### 14.3 Superficial geology (10k)

**Records within 500m**

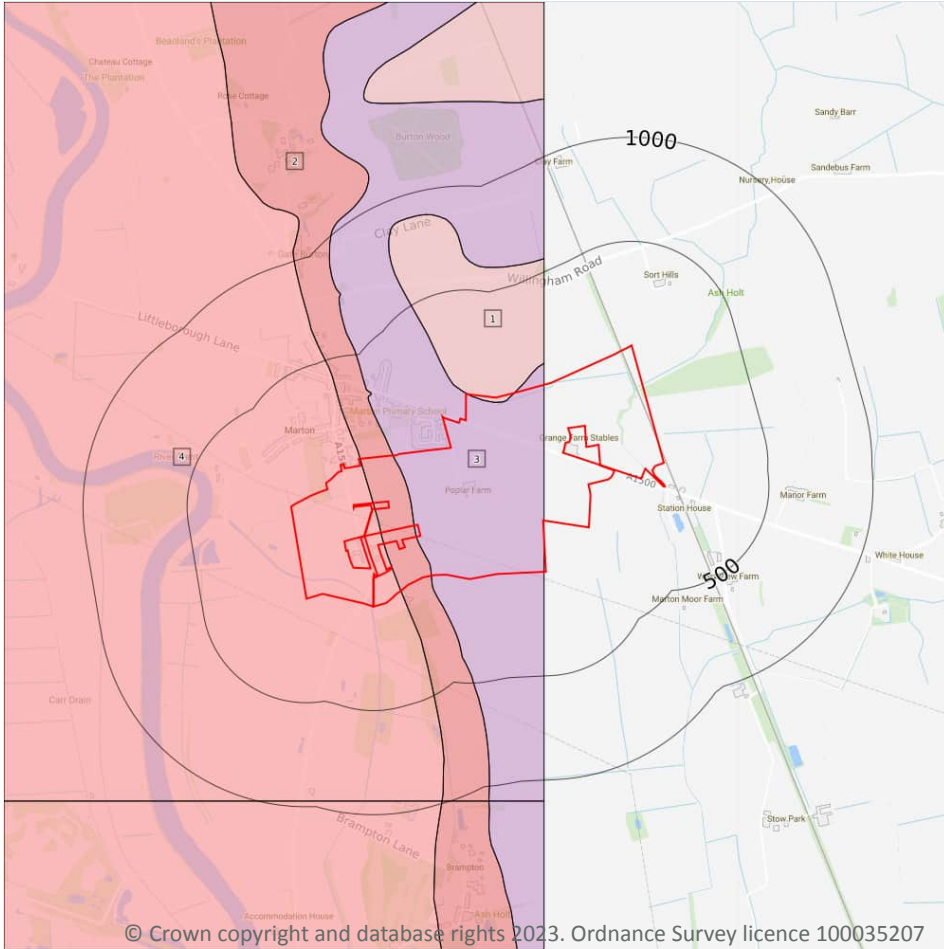
**8**

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

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 88**

ID	Location	LEX Code	Description	Rock description
1	On site	HPSG-XSV	Holme Pierrepont Sand And Gravel Member - Sand And Gravel	Sand And Gravel
2	On site	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
3	On site	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel

## Geology 1:10,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (10k)
- Bedrock geology (10k)  
Please see table for more details.

### 14.5 Bedrock geology (10k)

Records within 500m

4

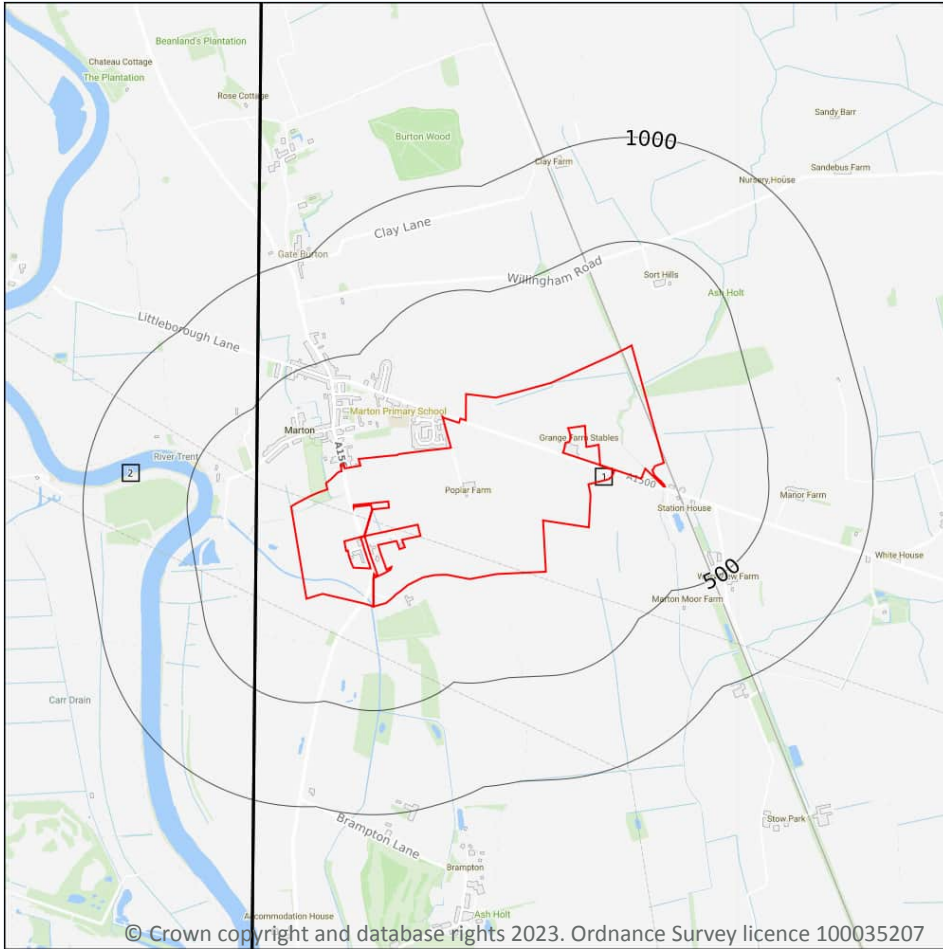
Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 90**

ID	Location	LEX Code	Description	Rock age
1	On site	SMD-MDLM	Scunthorpe Mudstone Formation - Mudstone And Limestone, Interbedded	Sinemurian Age - Rhaetian Age
2	On site	PNG-MDST	Penarth Group - Mudstone	Rhaetian Age
3	On site	SMD-LMST	Scunthorpe Mudstone Formation - Limestone	Sinemurian Age - Rhaetian Age



## 15 Geology 1:50,000 scale - Availability



- Site Outline
- Search buffers in metres (m)
- Geological map tile

### 15.1 50k Availability

Records within 500m

2

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

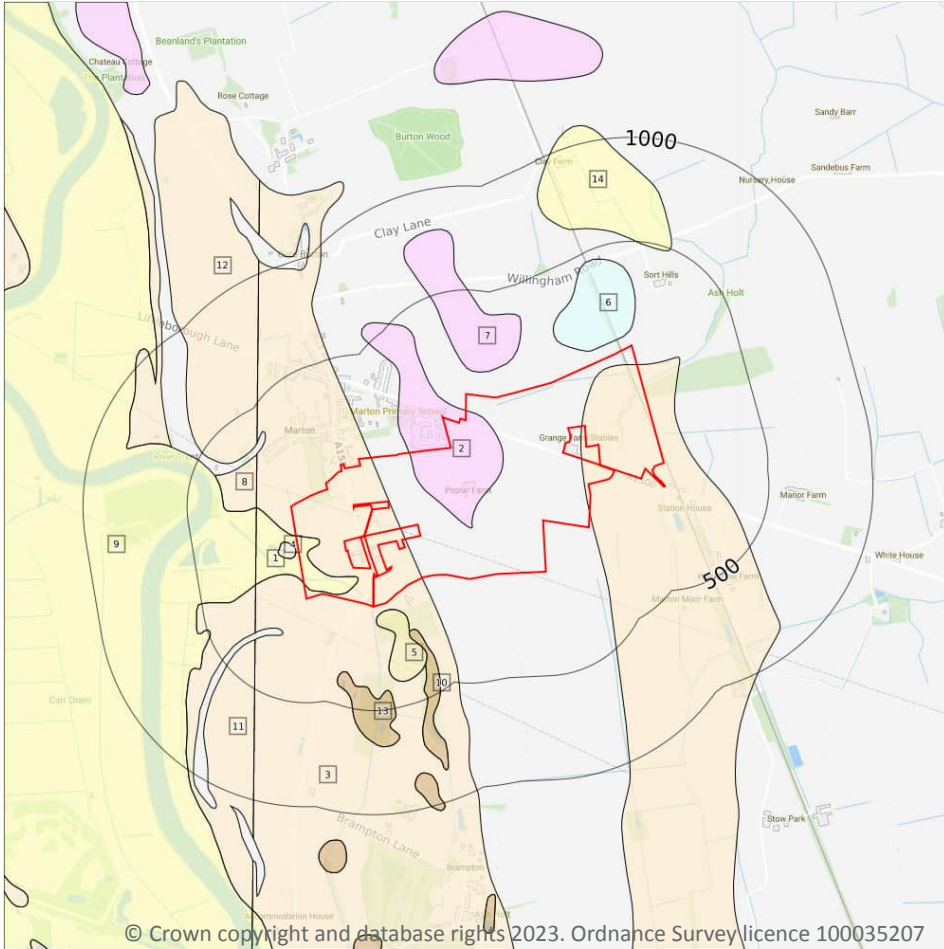
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 92**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW102_market_rasen_v4
2	167m W	No coverage	Full	Full	No coverage	EW101_east_retford_v4

*This data is sourced from the British Geological Survey.*



## Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)  
Please see table for more details.

### 15.4 Superficial geology (50k)

Records within 500m

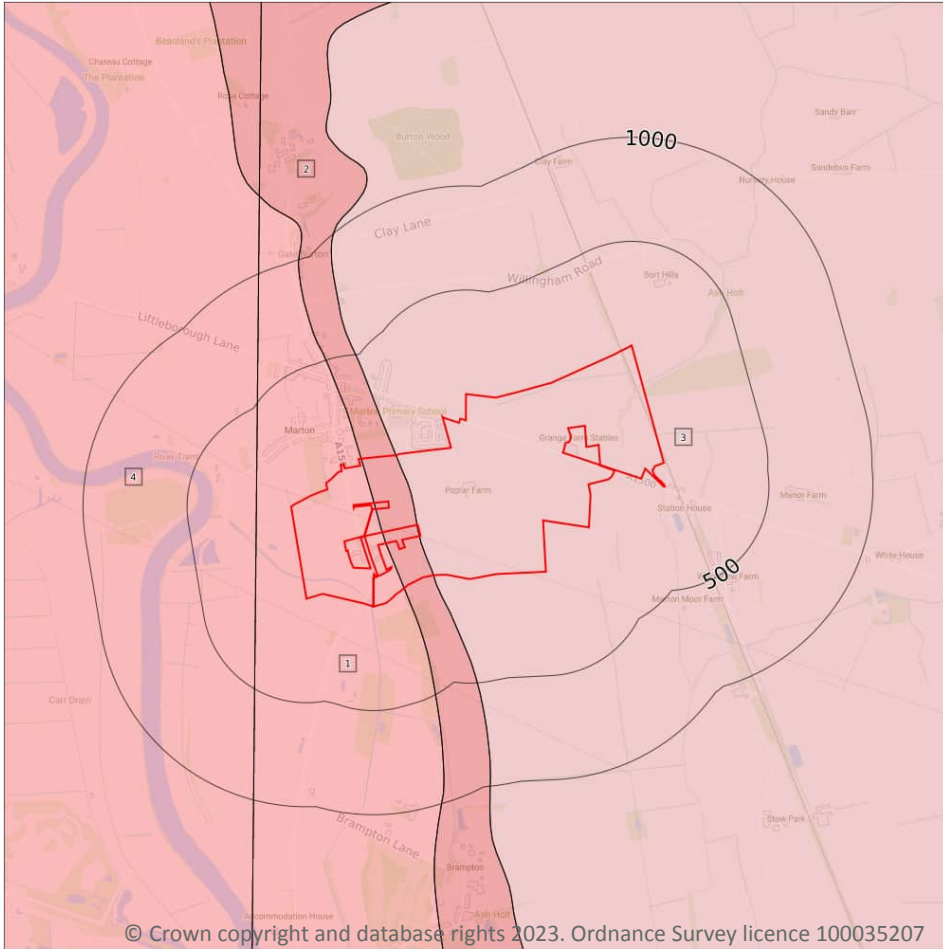
14

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 94**

ID	Location	LEX Code	Description	Rock description
1	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
2	On site	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
3	On site	HPSG-XSV	HOLME PIERREPONT SAND AND GRAVEL MEMBER	SAND AND GRAVEL
4	12m W	HPSG-XSV	HOLME PIERREPONT SAND AND GRAVEL MEMBER	SAND AND GRAVEL

## Geology 1:50,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

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

### 15.8 Bedrock geology (50k)

Records within 500m

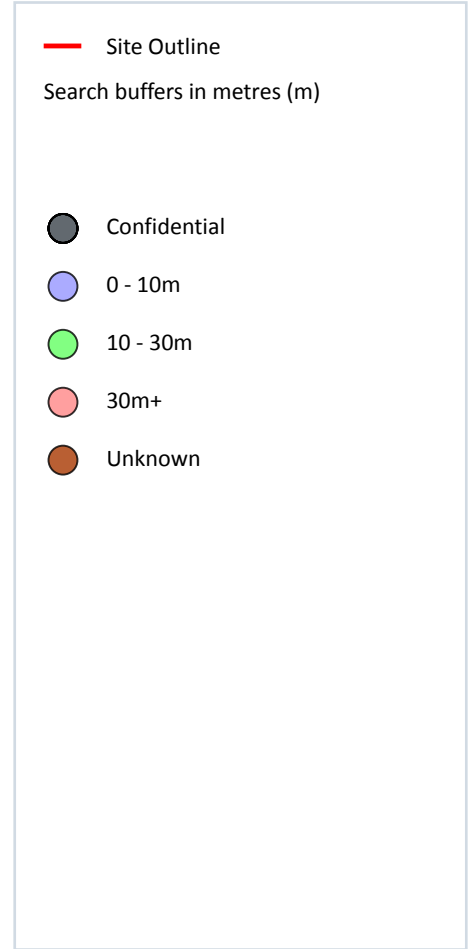
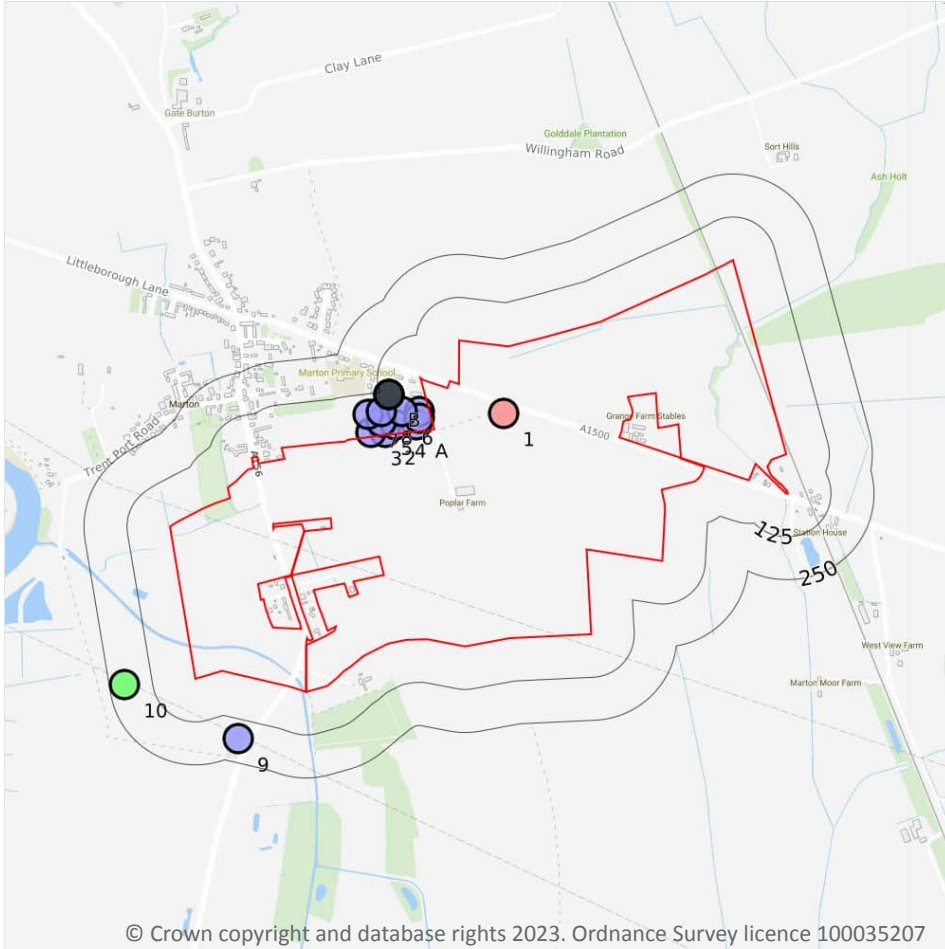
4

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

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 97**

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	MERCIA MUDSTONE GROUP - MUDSTONE	-
2	On site	PNG-MDST	PENARTH GROUP - MUDSTONE	RHAETIAN
3	On site	SMD-MDLM	SCUNTHORPE MUDSTONE FORMATION - MUDSTONE AND LIMESTONE, INTERBEDDED	RHAETIAN

## 16 Boreholes



### 16.1 BGS Boreholes

Records within 250m

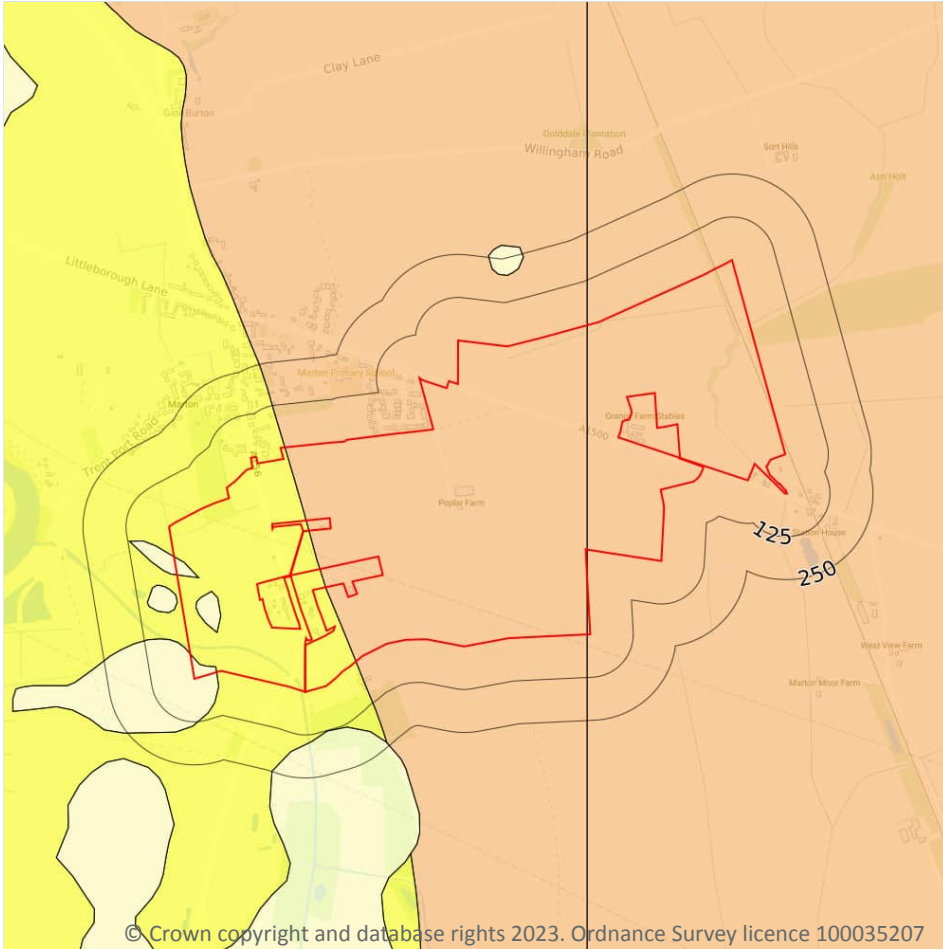
16

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

Features are displayed on the Boreholes map on **page 99**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	484755 381744	MARTON	1372.47	N	<a href="#">244202</a>
2	9m NW	484410 381690	SPAFFORD CLOSE MARTON LINCS TP 1	3.1	N	<a href="#">15940034</a>
3	14m NW	484370 381690	SPAFFORD CLOSE MARTON LINCS TP 2	2.2	N	<a href="#">15940036</a>

## 17 Natural ground subsidence - Shrink swell clays



### 17.1 Shrink swell clays

Records within 50m

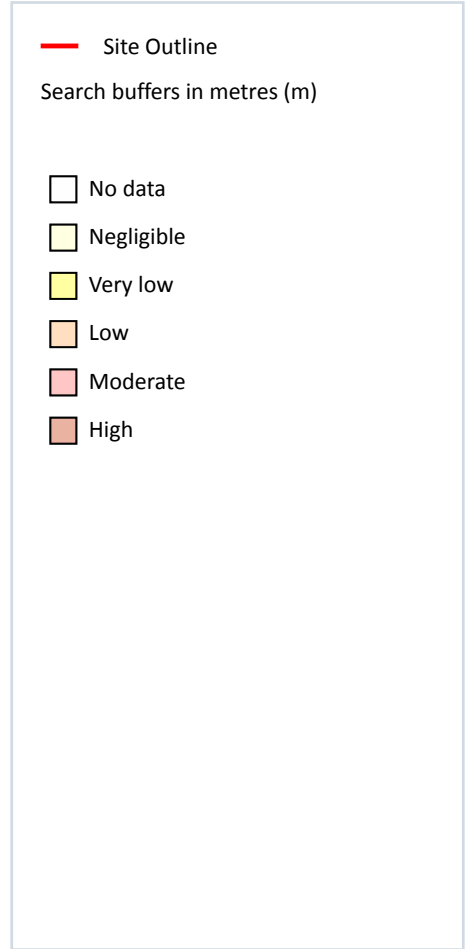
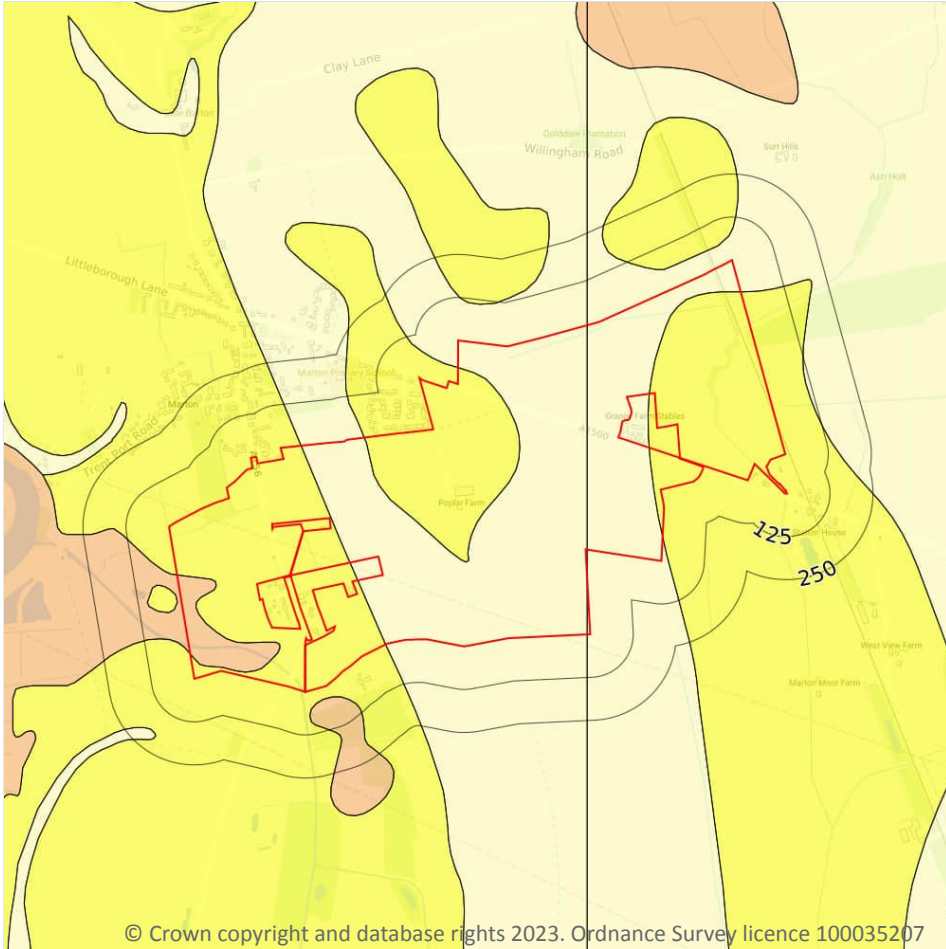
4

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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 101**

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

## Natural ground subsidence - Running sands



### 17.2 Running sands

Records within 50m

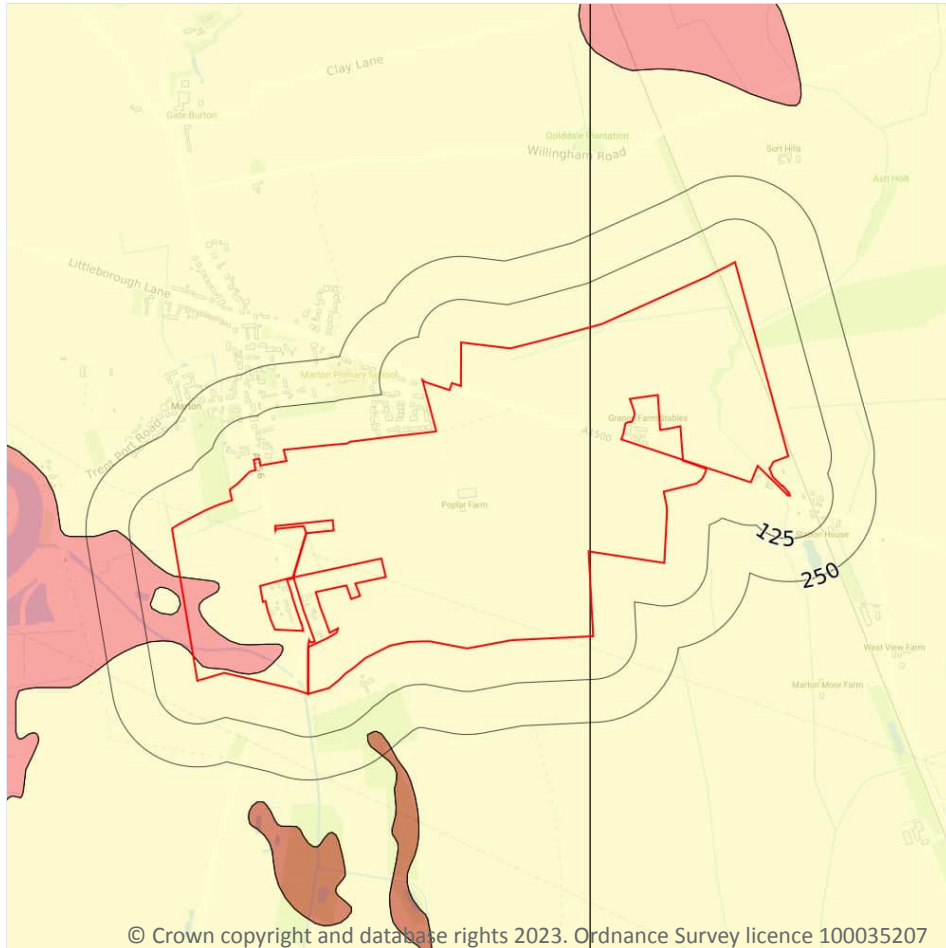
5

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

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

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

## Natural ground subsidence - Compressible deposits



— Site Outline  
Search buffers in metres (m)

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

### 17.3 Compressible deposits

Records within 50m

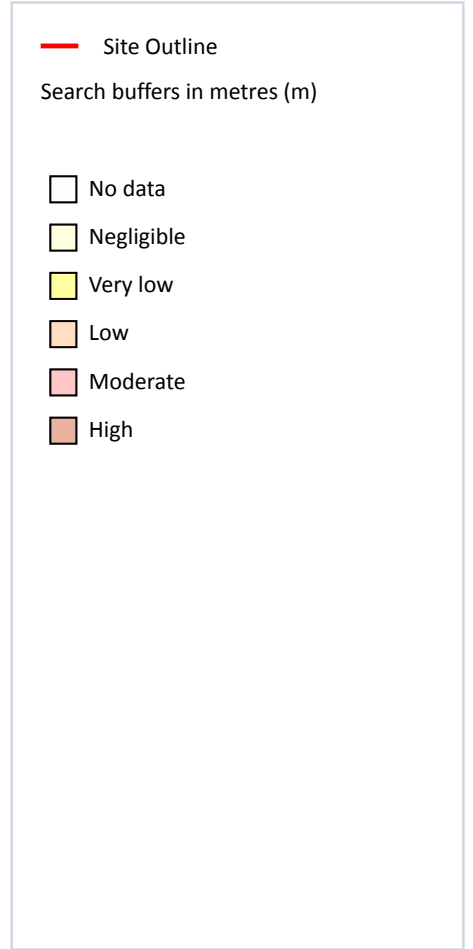
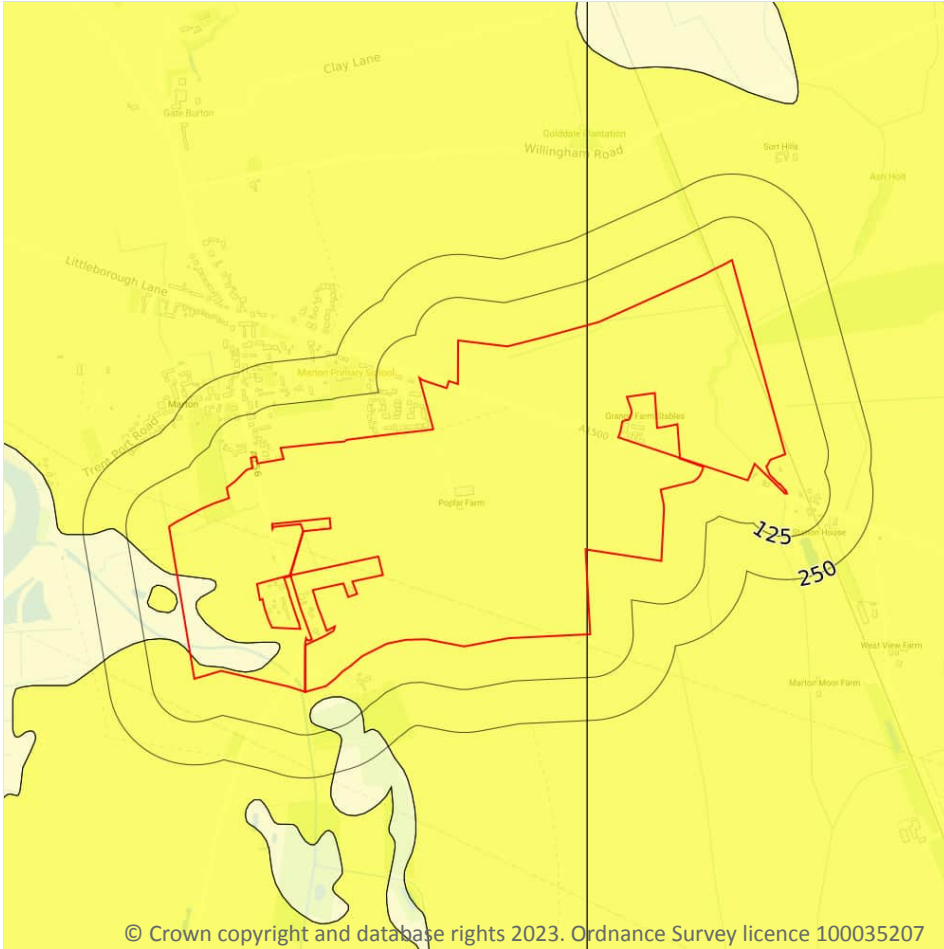
3

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 105**

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

## Natural ground subsidence - Collapsible deposits



### 17.4 Collapsible deposits

Records within 50m

4

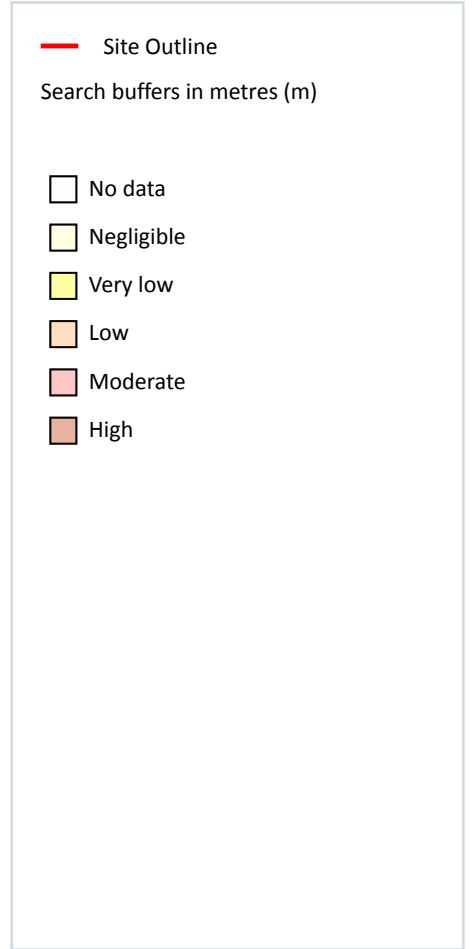
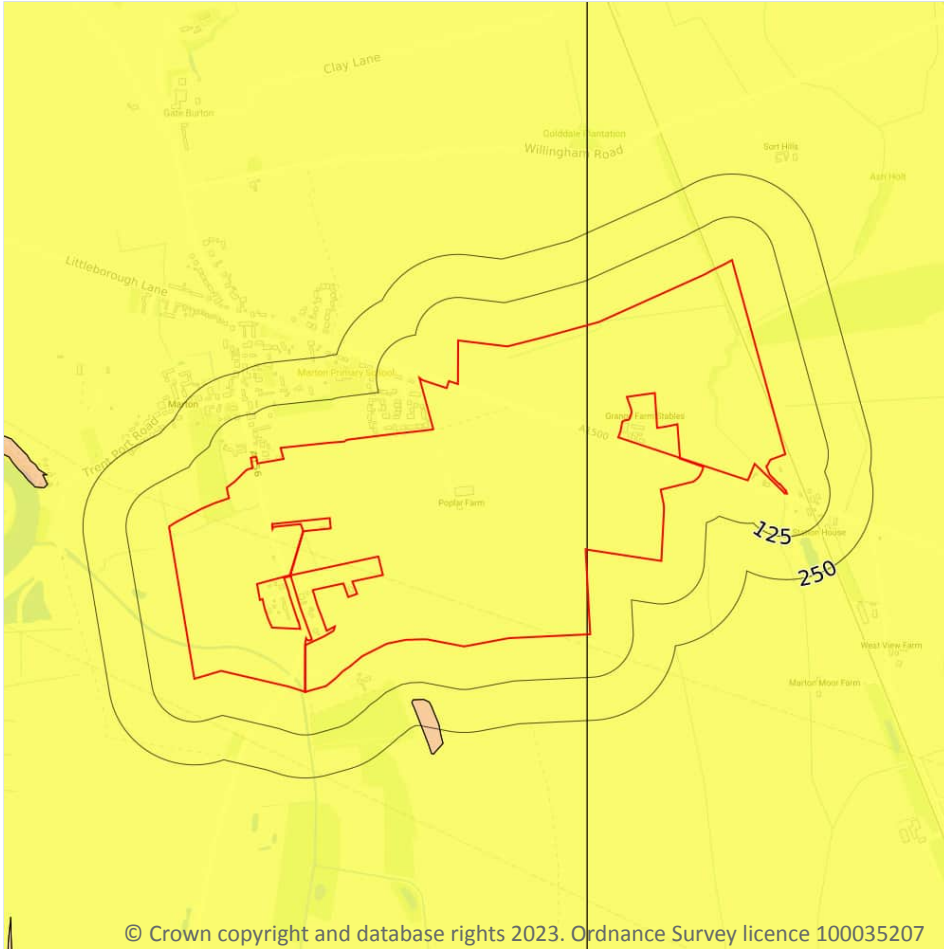
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 107**

Location	Hazard rating	Details
On site	Negligible	Deposits with potential to collapse when loaded and saturated are believed not to be present.
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
12m W	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.



## Natural ground subsidence - Landslides



### 17.5 Landslides

Records within 50m

1

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

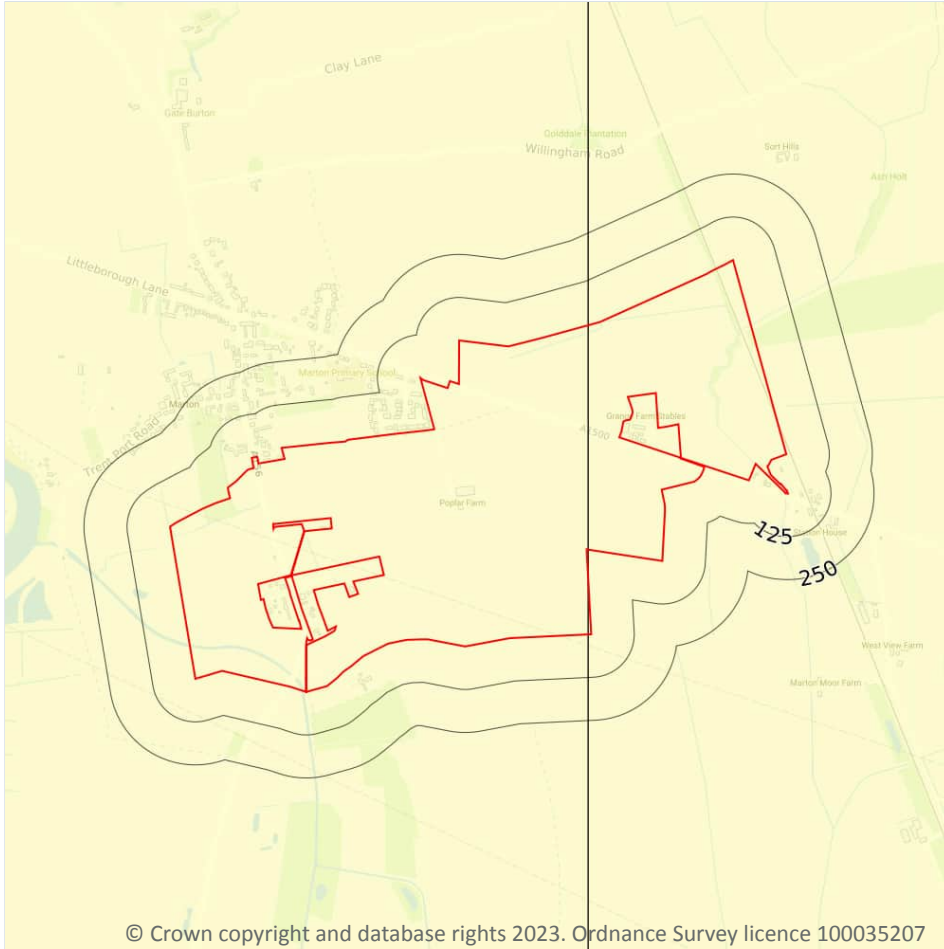
Features are displayed on the Natural ground subsidence - Landslides map on **page 109**

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

*This data is sourced from the British Geological Survey.*



## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

Records within 50m

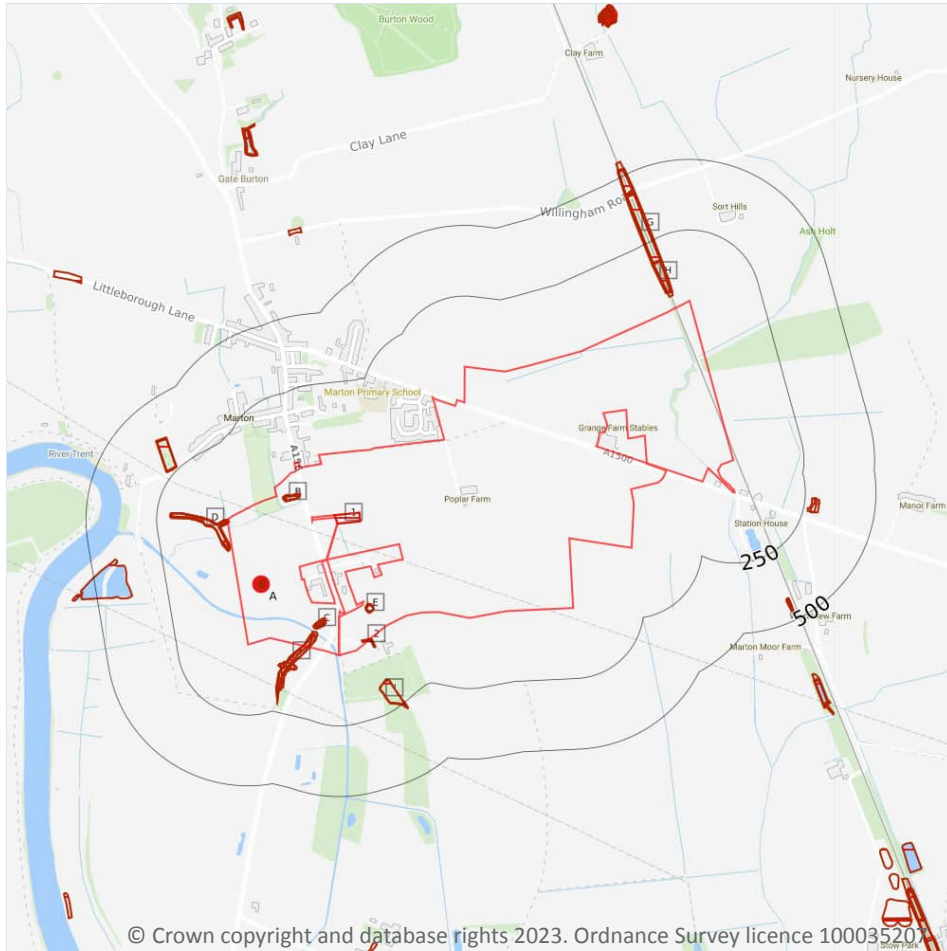
1

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

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 110**

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

## 18 Mining, ground workings and natural cavities



### 18.1 Natural cavities

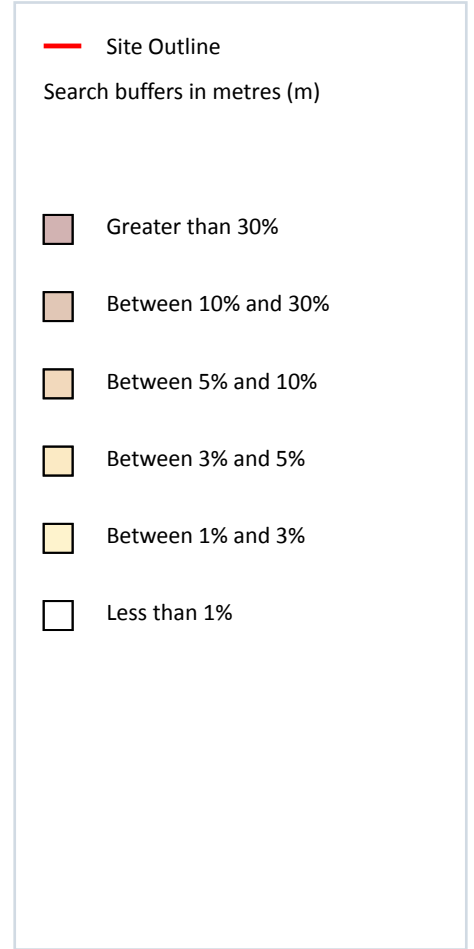
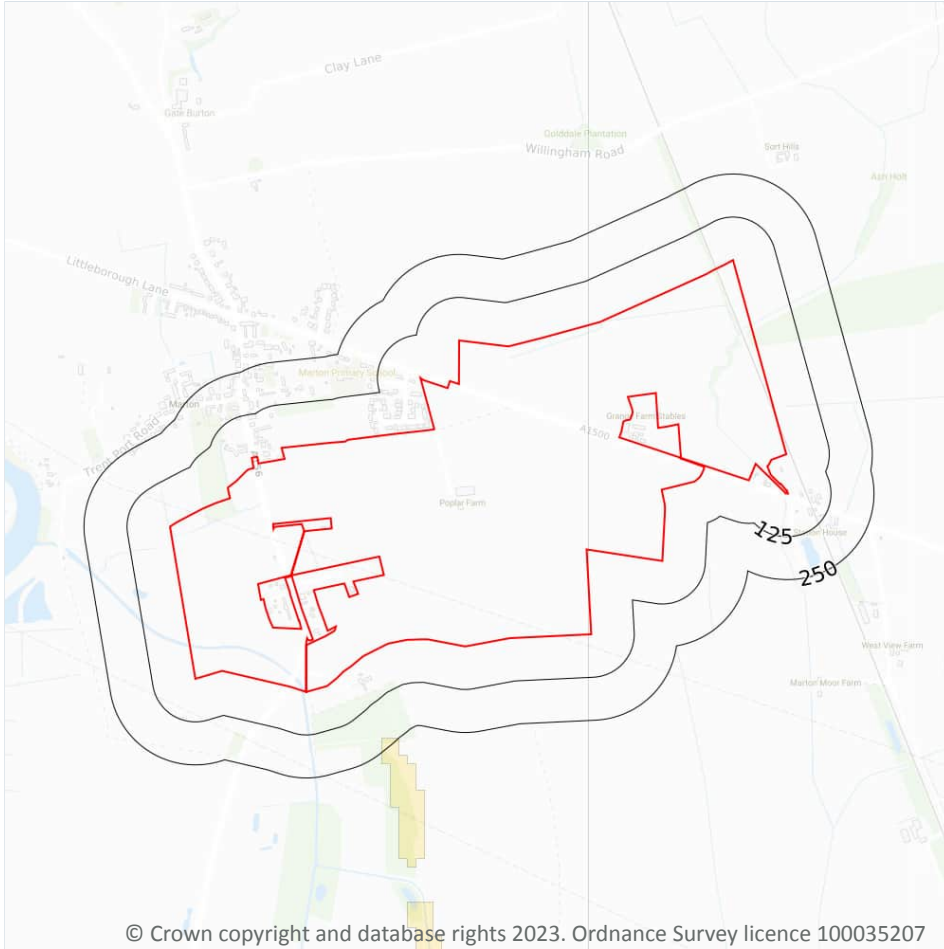
Records within 500m

0

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

*This data is sourced from Stantec UK Ltd.*

## 19 Radon



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### 19.1 Radon

#### Records on site

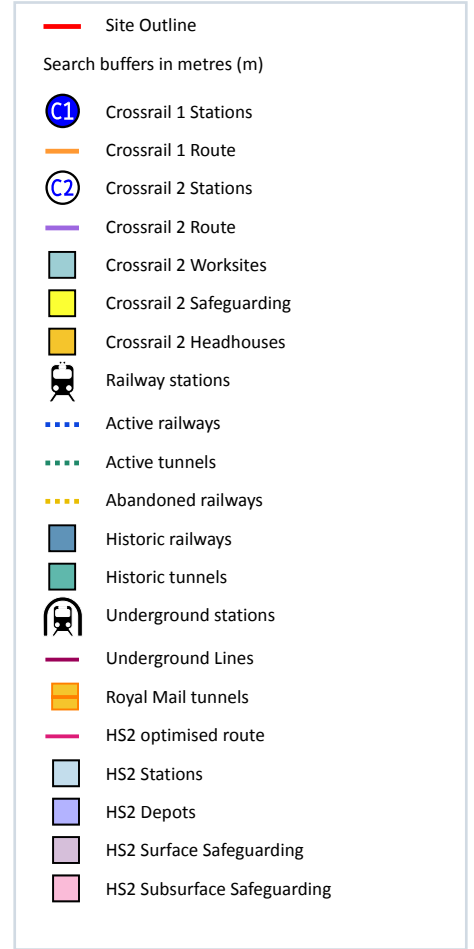
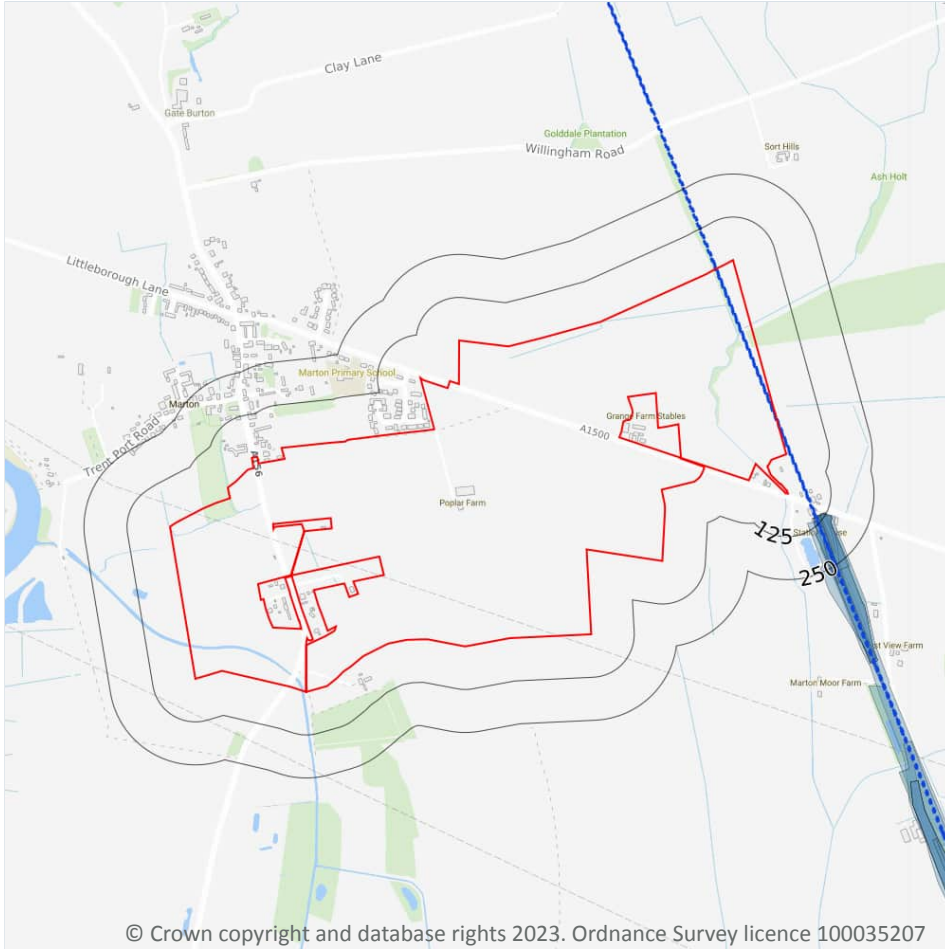
1

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

Features are displayed on the Radon map on **page 118**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None

## 21 Railway infrastructure and projects



### 21.1 Underground railways (London)

Records within 250m

0

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

*This data is sourced from publicly available information by Groundsure.*

### 21.2 Underground railways (Non-London)

Records within 250m

0

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

## Tillbridge cable run area

### Order Details

**Date:** 14/02/2023  
**Your ref:** ref 60677969  
**Our Ref:** GSIP-2023-13376-12945\_7

### Site Details

**Location:** 483191 381026  
**Area:** 109.73 ha  
**Authority:** [West Lindsey District Council](#), [Bassetlaw District Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

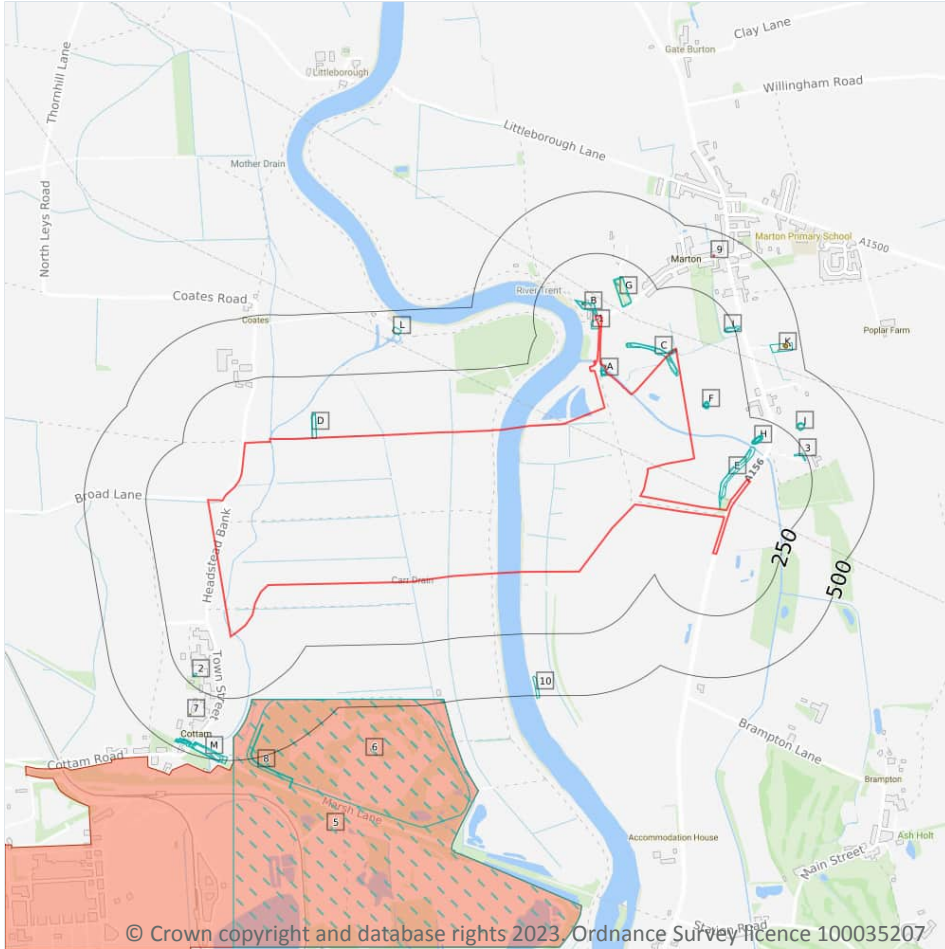
N/A: >10ha

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)




08444 159 000

# 1 Past land use



**— Site Outline**

**Search buffers in metres (m)**

-  Historical industrial land uses
-  Historical tanks
-  Historical energy features

## 1.1 Historical industrial land uses

**Records within 500m**

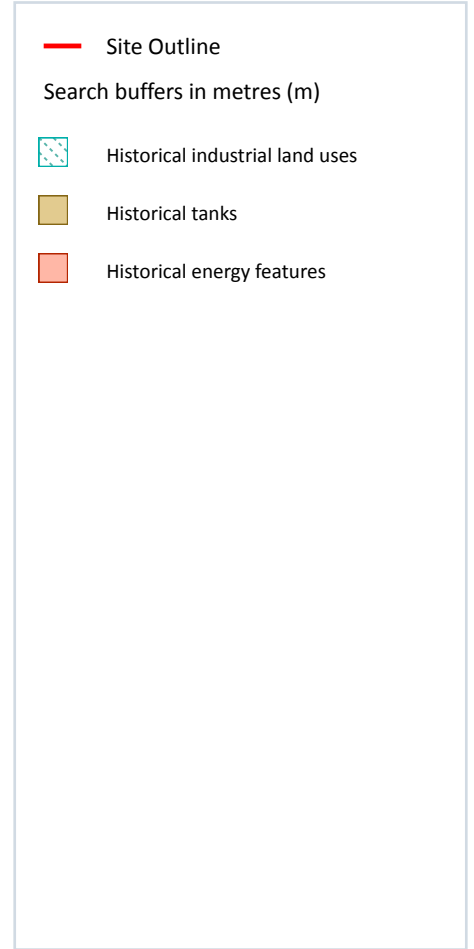
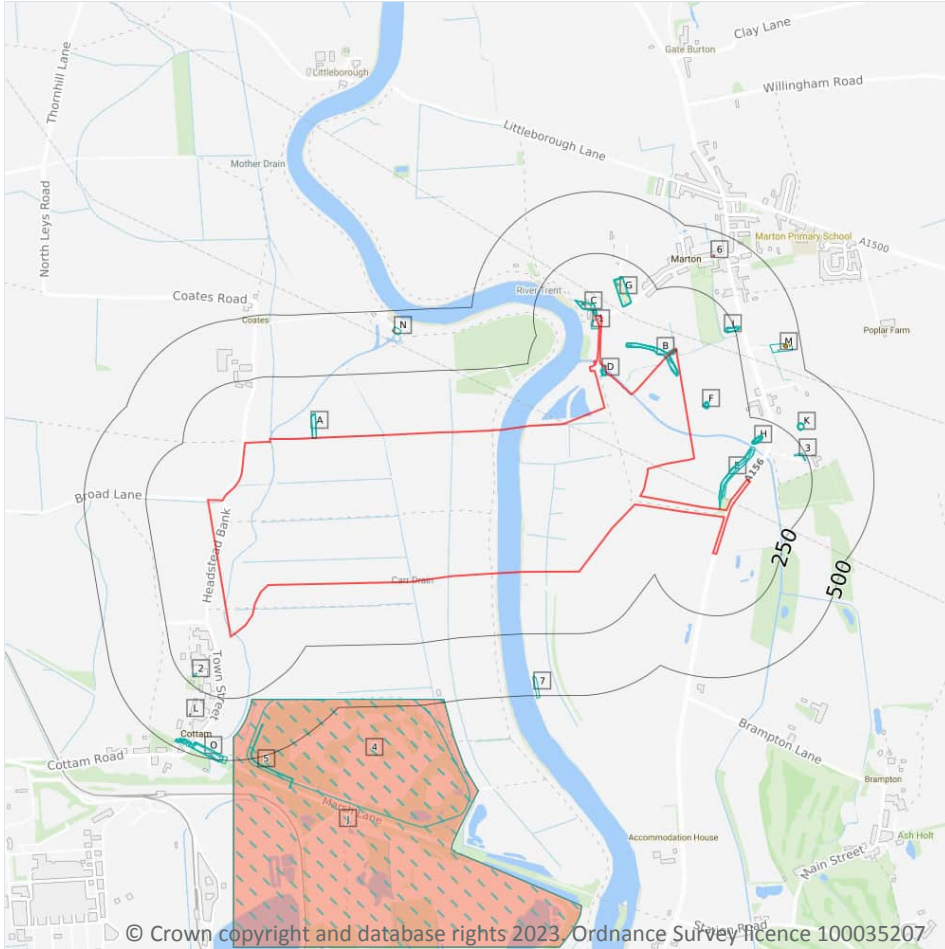
**53**

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

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

ID	Location	Land use	Dates present	Group ID
1	On site	Malthouse	1885	1583928

## 2 Past land use - un-grouped



### 2.1 Historical industrial land uses

Records within 500m

81

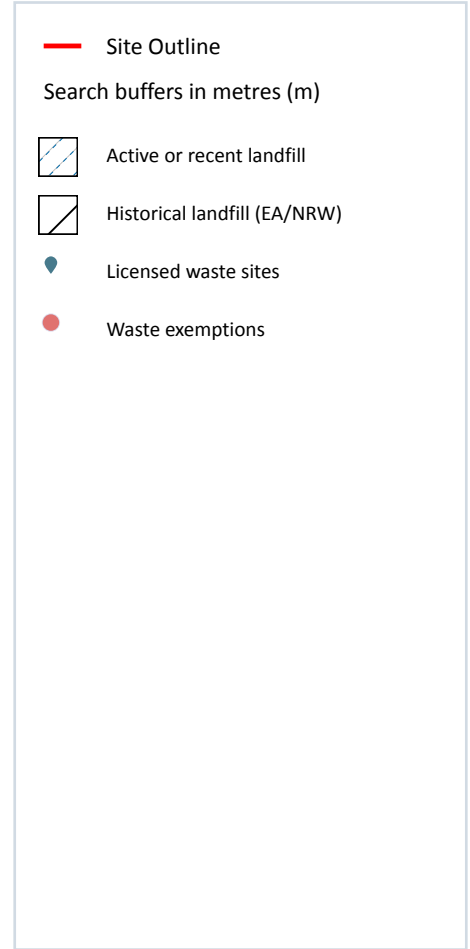
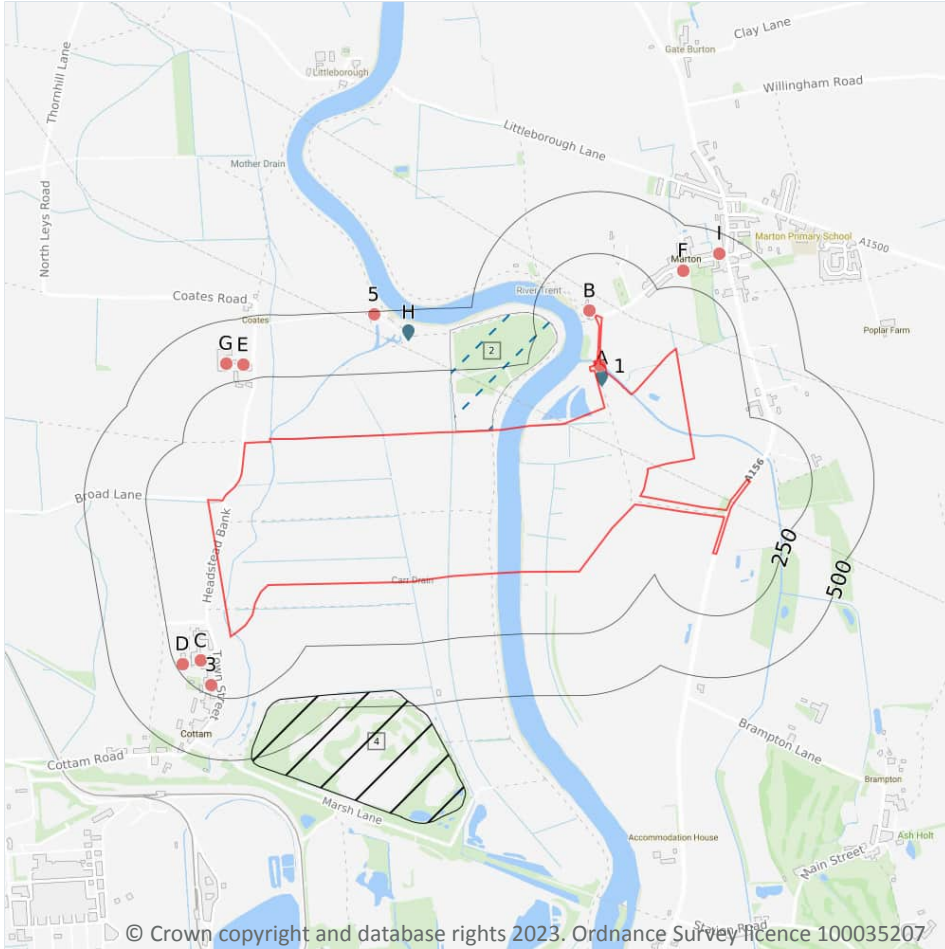
Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group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

Features are displayed on the Past land use - un-grouped map on **page 18**

ID	Location	Land Use	Date	Group ID
1	On site	Malthouse	1885	1583928
A	On site	Unspecified Heap	1916	1700547
A	On site	Unspecified Heap	1900	1665630



### 3 Waste and landfill



#### 3.1 Active or recent landfill

Records within 500m

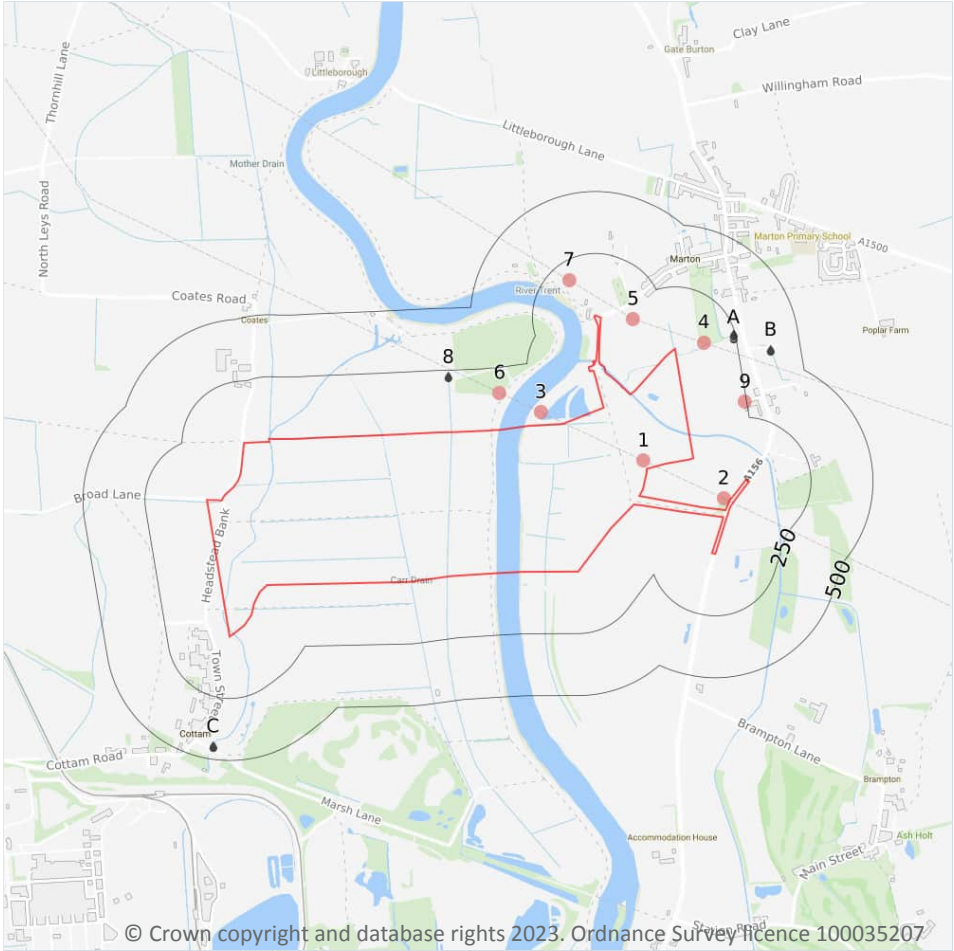
1

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation. Features are displayed on the Waste and landfill map on **page 24**

ID	Location	Details
2	1m NE	Operator: British Waterways Board Site Address: Land/premises At, Trent Valley Way, West Bank Of River Trent, Opposite Marton, Nottinghamshire, DN21 WML Number: 43111 EPR Reference: BRI005 Landfill type: A06: Landfill taking other wastes Status: Issued IPPC Reference: - EPR Number: EA/EPR/AP3297FZ/A001

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

## 4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Licensed Discharges to controlled waters

### 4.1 Recent industrial land uses

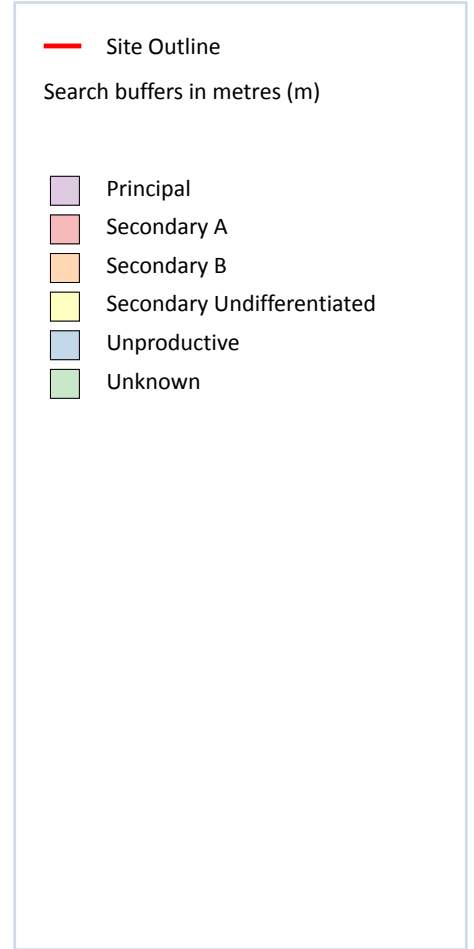
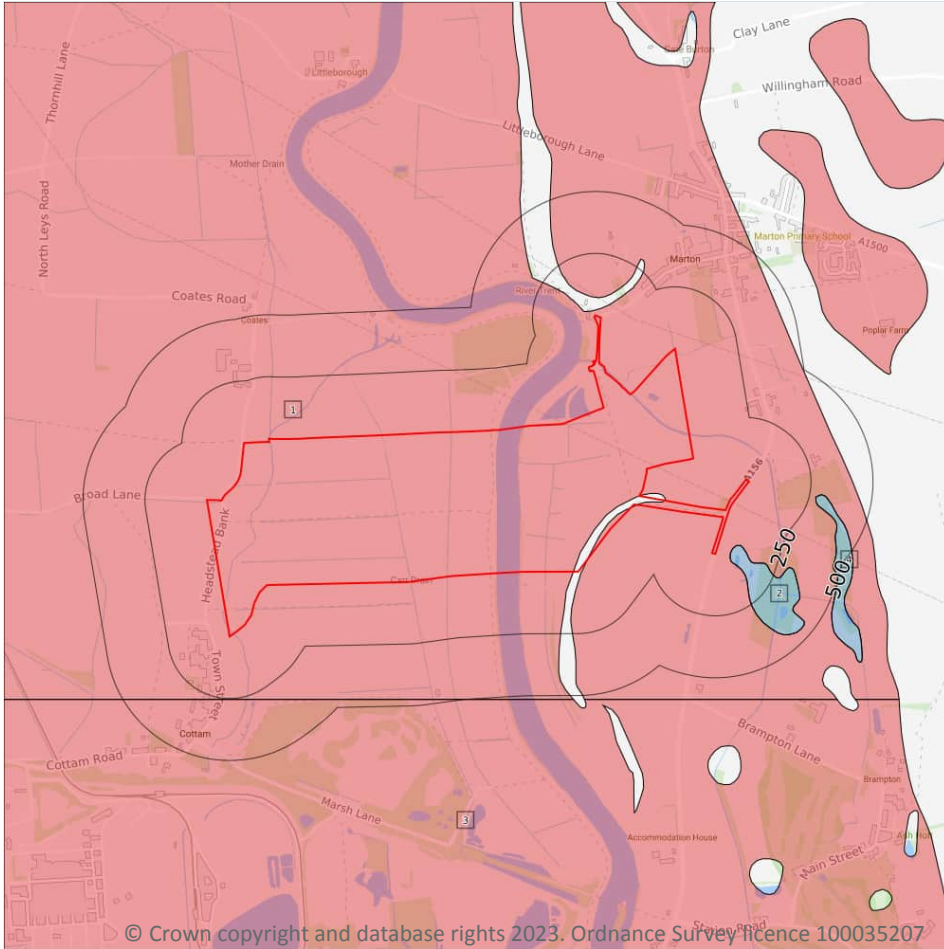
**Records within 250m** **8**

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 35**

ID	Location	Company	Address	Activity	Category
1	On site	Pylon	Lincolnshire, DN21	Electrical Features	Infrastructure and Facilities
2	26m E	Pylon	Lincolnshire, DN21	Electrical Features	Infrastructure and Facilities
3	52m NE	Pylon	Lincolnshire, DN21	Electrical Features	Infrastructure and Facilities

## 5 Hydrogeology - Superficial aquifer



### 5.1 Superficial aquifer

Records within 500m

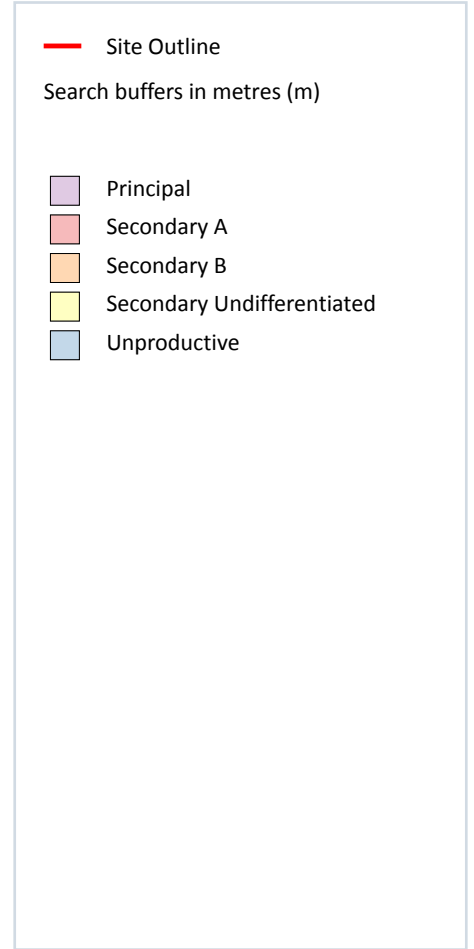
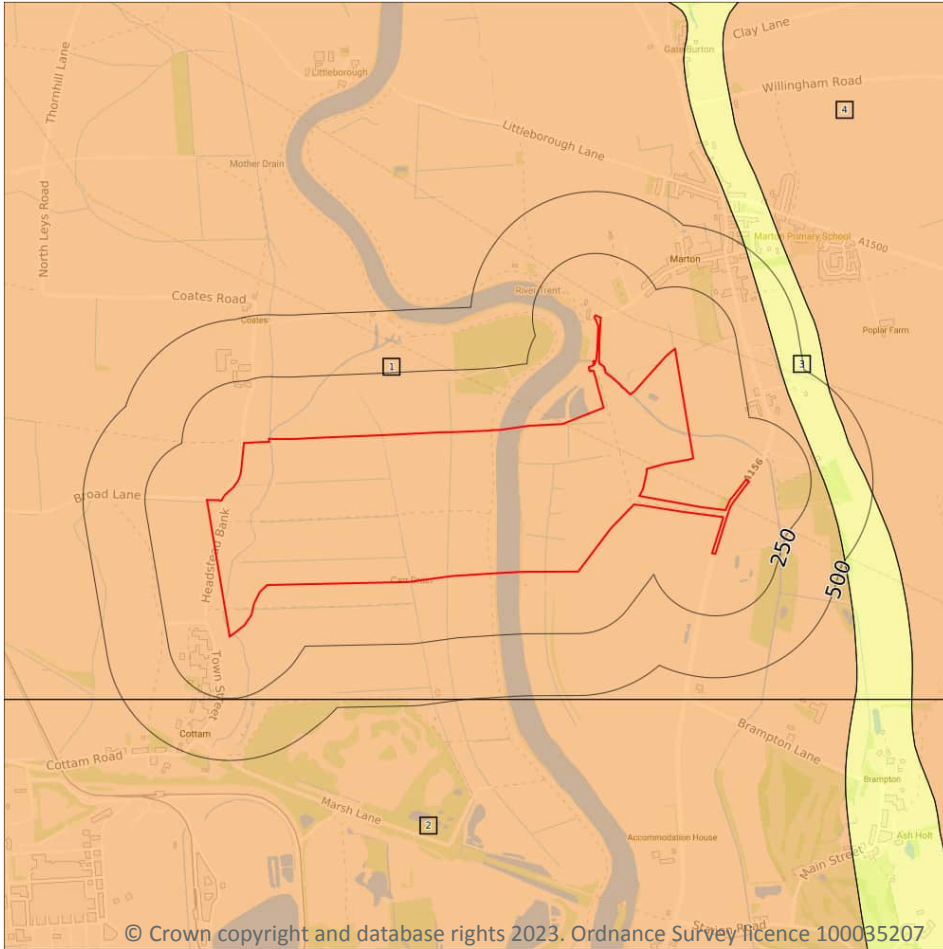
4

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 43**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	57m E	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

## Bedrock aquifer



### 5.2 Bedrock aquifer

Records within 500m

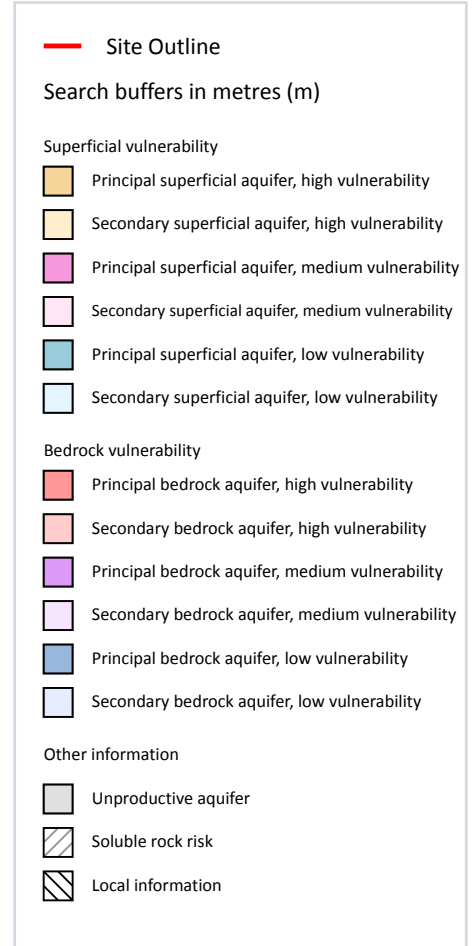
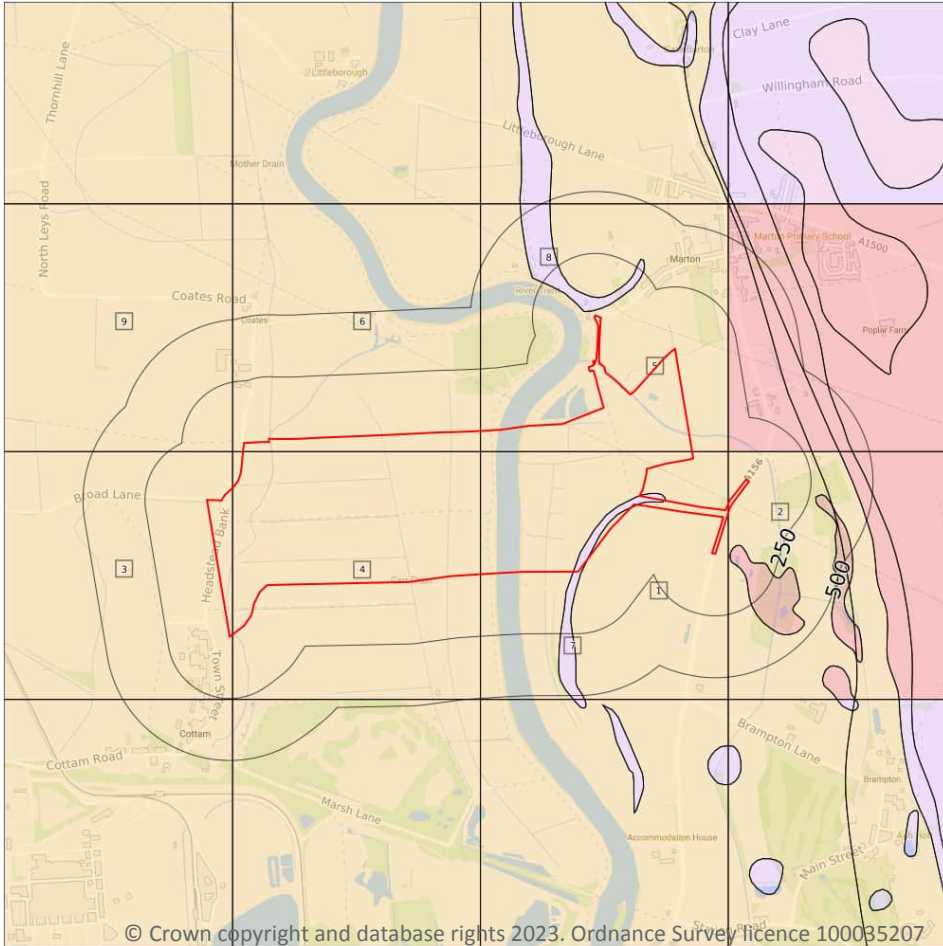
4

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 45**

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	254m SW	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

## Groundwater vulnerability



### 5.3 Groundwater vulnerability

Records within 50m

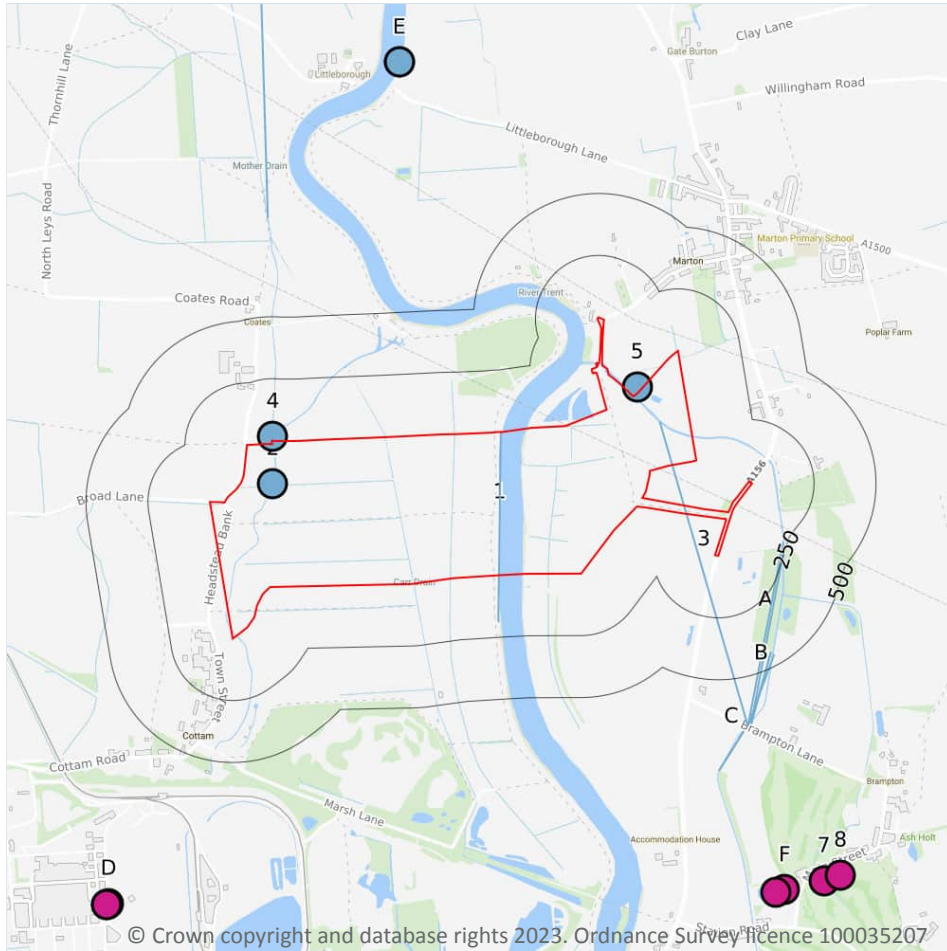
9

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

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

Features are displayed on the Groundwater vulnerability map on **page 47**

## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

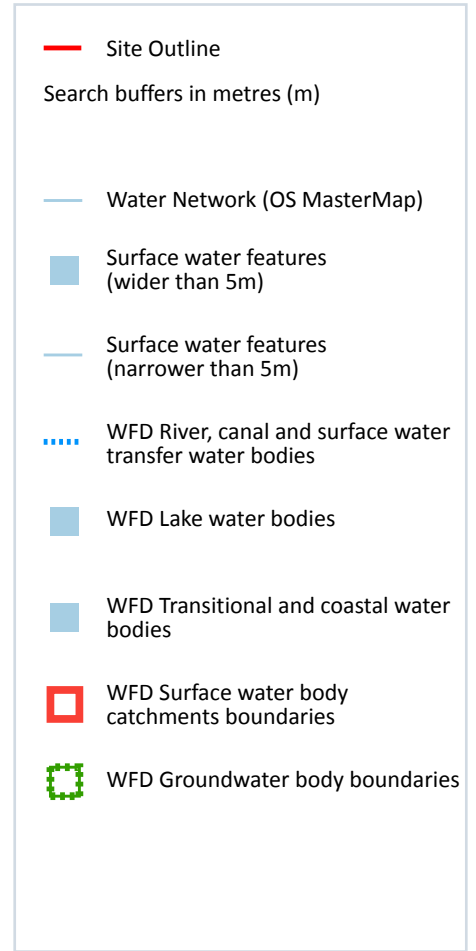
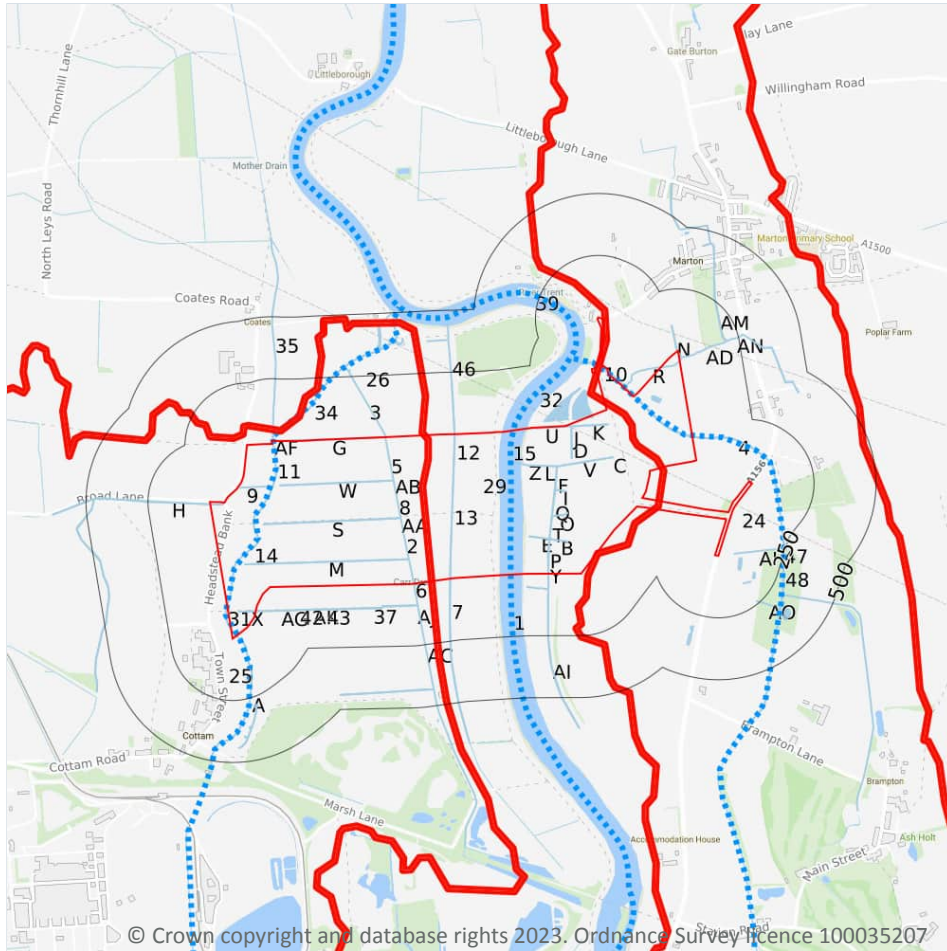
Records within 2000m

8

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 50**

## 6 Hydrology



### 6.1 Water Network (OS MasterMap)

Records within 250m

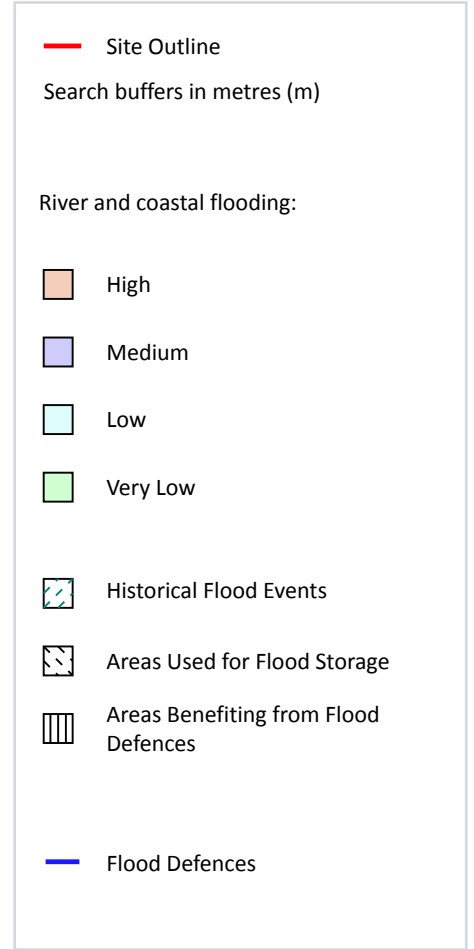
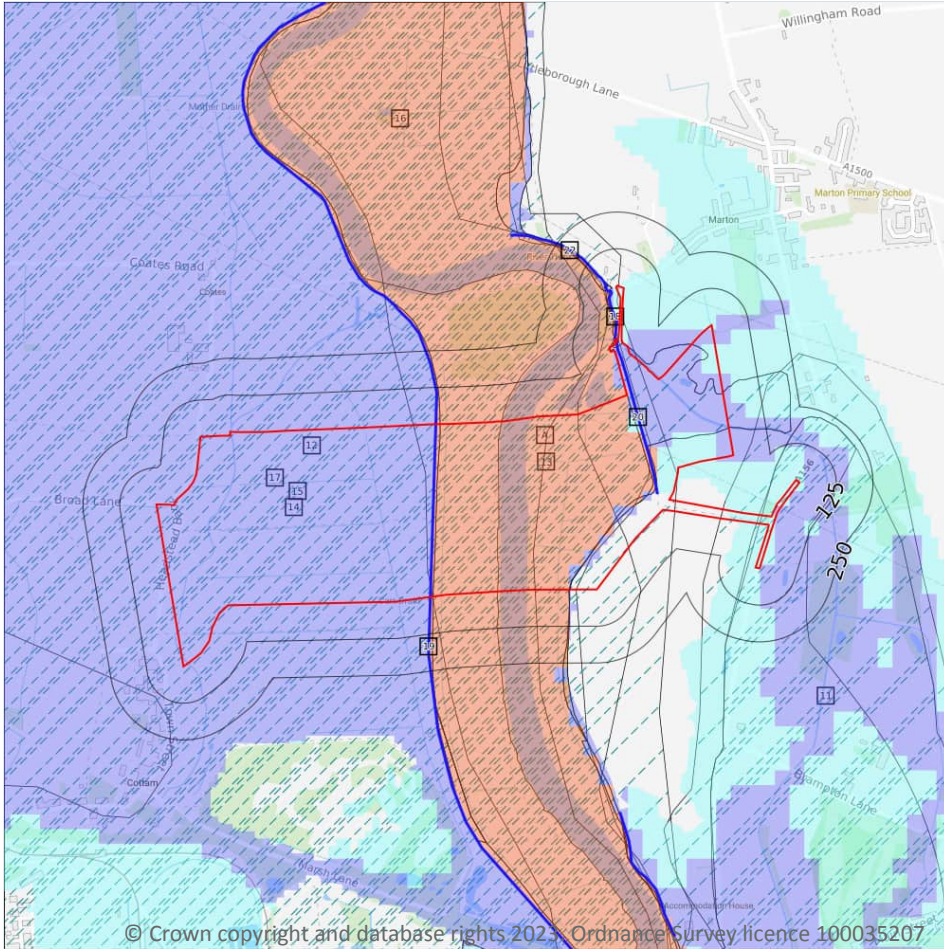
80

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

Features are displayed on the Hydrology map on **page 57**

ID	Location	Type of water feature	Ground level	Permanence	Name
1	On site	Tidal river or stream.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Trent

## 7 River and coastal flooding



### 7.1 Risk of flooding from rivers and the sea

#### Records within 50m

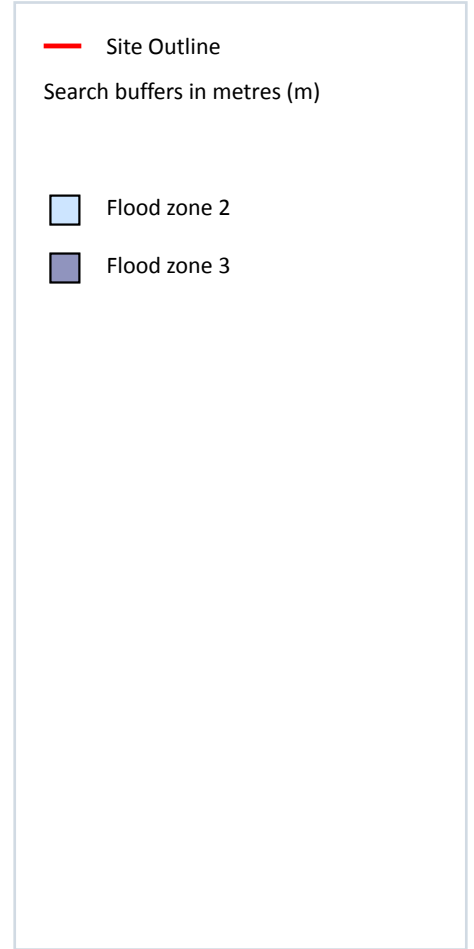
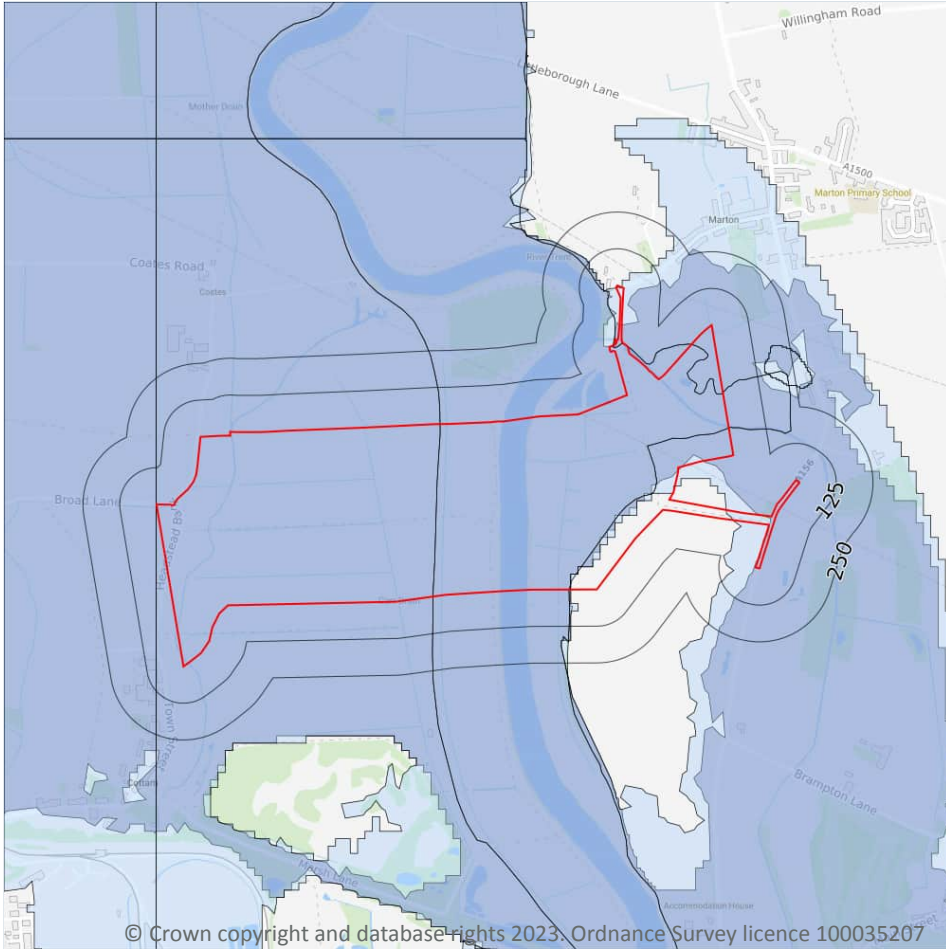
11

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

Features are displayed on the River and coastal flooding map on **page 66**



## River and coastal flooding - Flood Zones



### 7.6 Flood Zone 2

Records within 50m

1

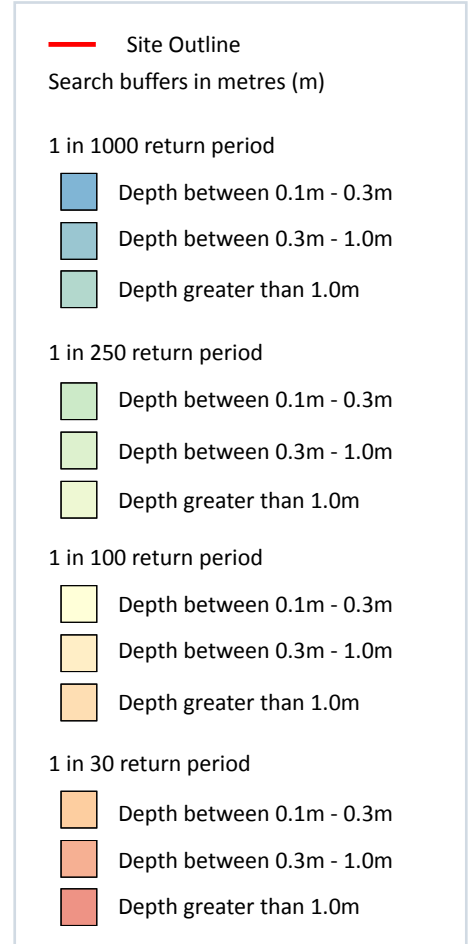
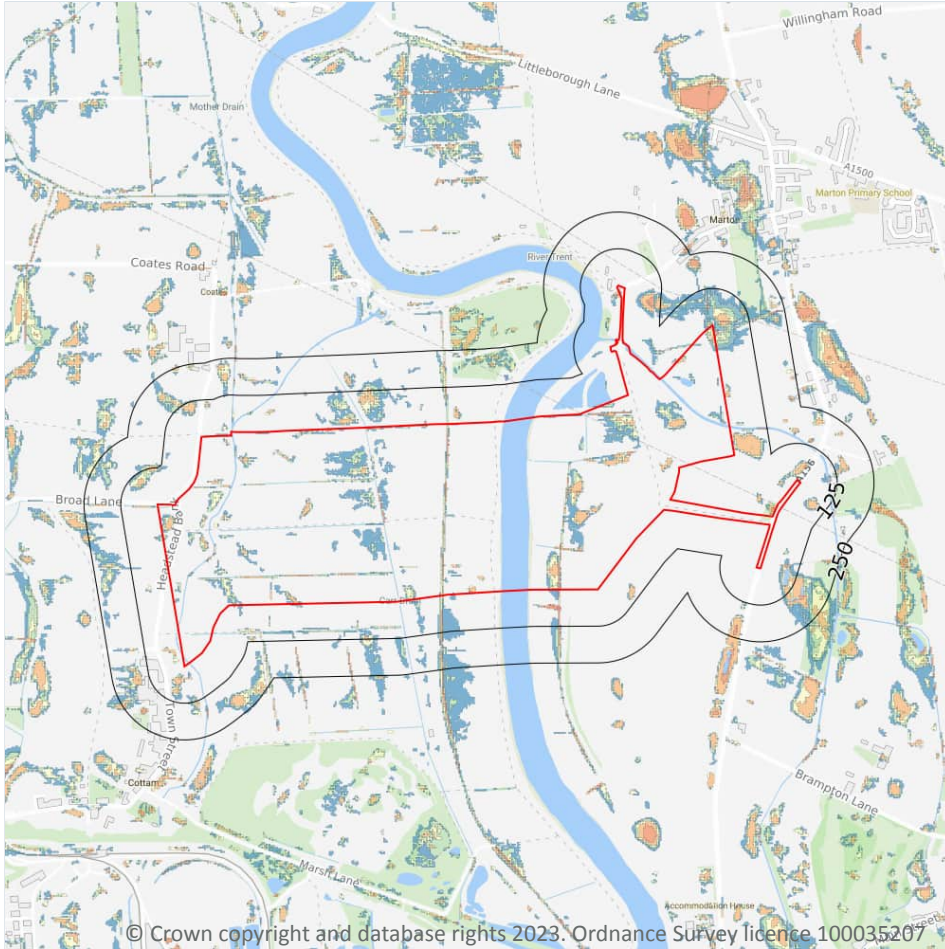
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 66**

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

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

## 8 Surface water flooding



### 8.1 Surface water flooding

**Highest risk on site**

**1 in 30 year, 0.3m - 1.0m**

**Highest risk within 50m**

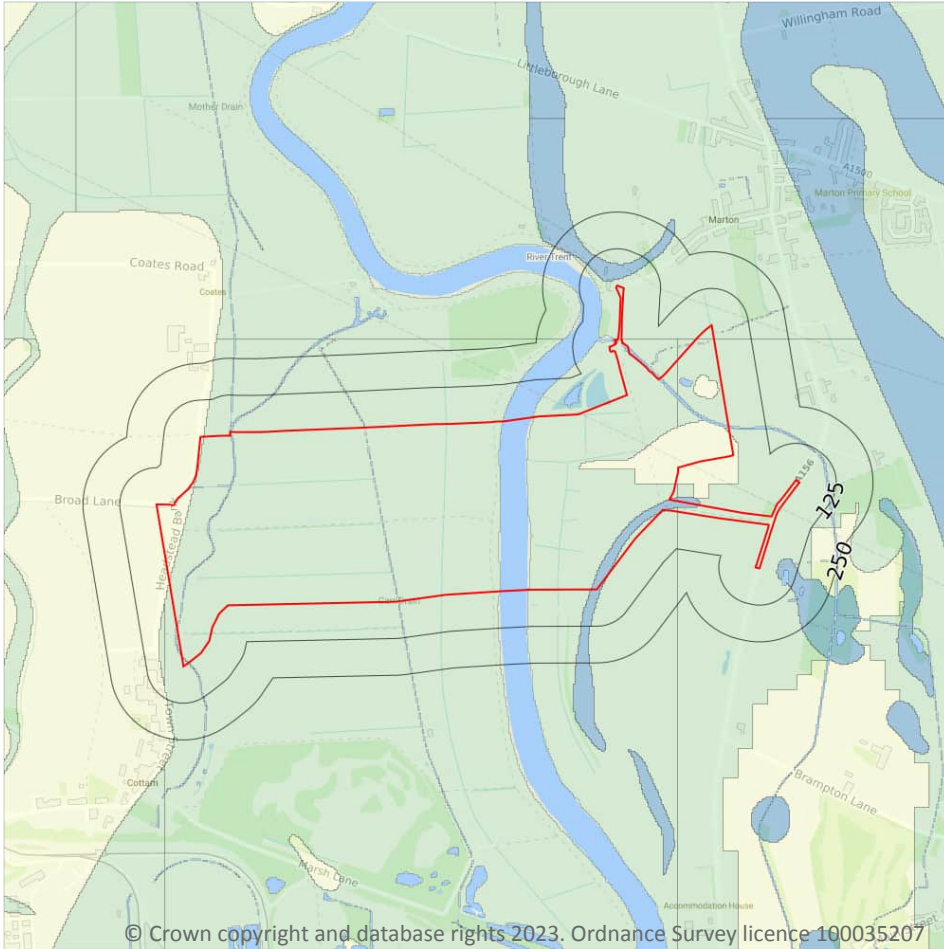
**1 in 30 year, Greater than 1.0m**

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

Features are displayed on the Surface water flooding map on **page 71**

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

## 9 Groundwater flooding



### 9.1 Groundwater flooding

**Highest risk on site**

**Moderate**

**Highest risk within 50m**

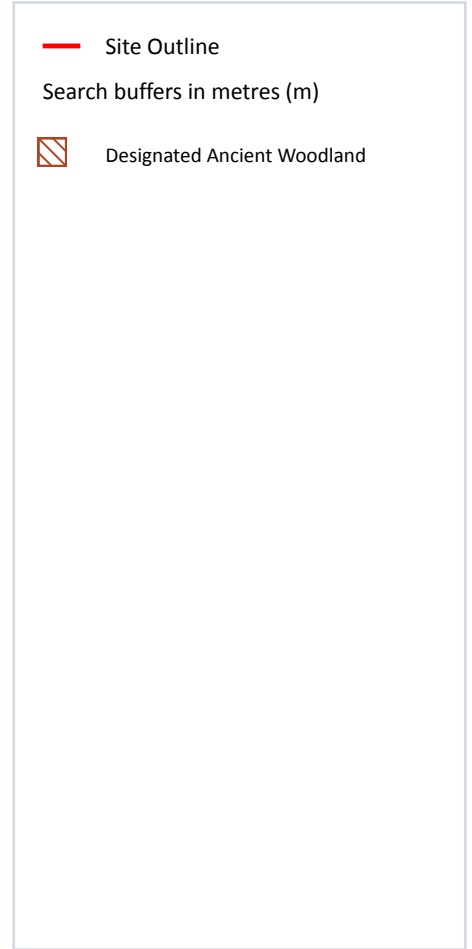
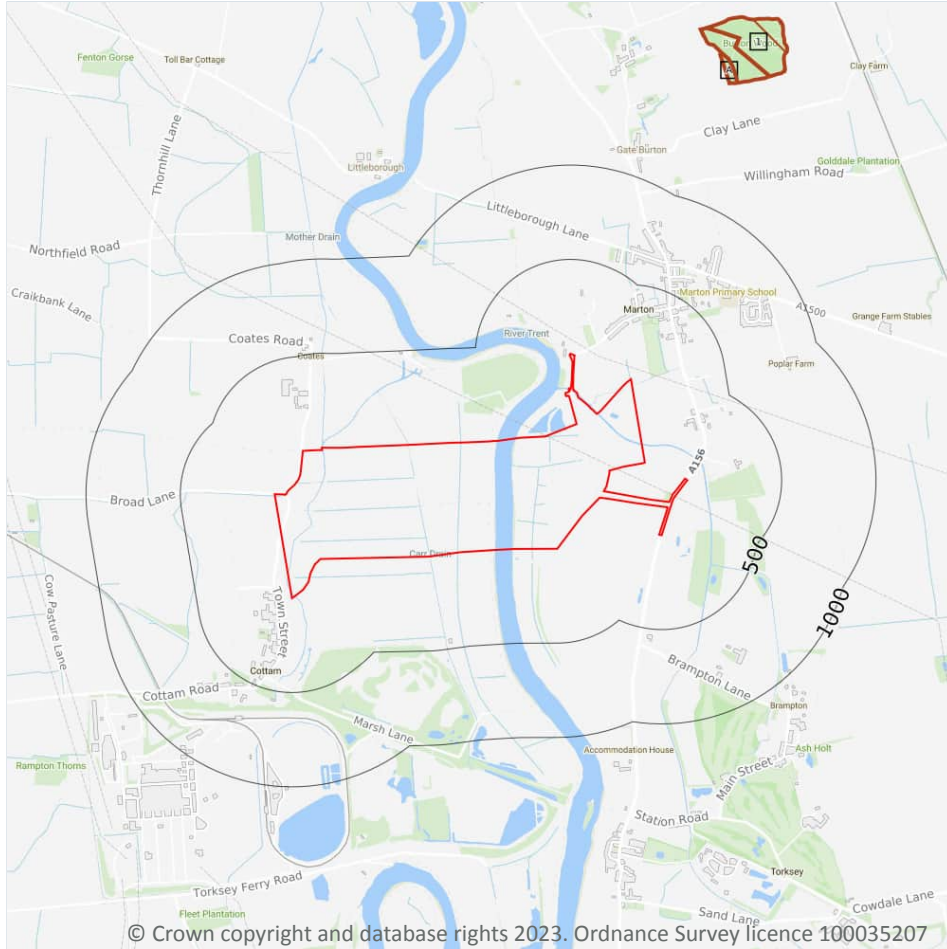
**Moderate**

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

Features are displayed on the Groundwater flooding map on **page 73**

*This data is sourced from Ambiantal Risk Analytics.*

## 10 Environmental designations



### 10.1 Sites of Special Scientific Interest (SSSI)

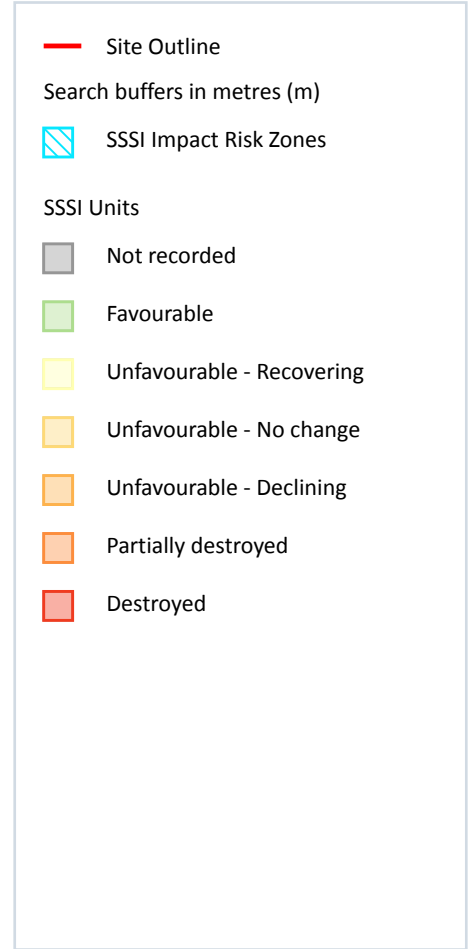
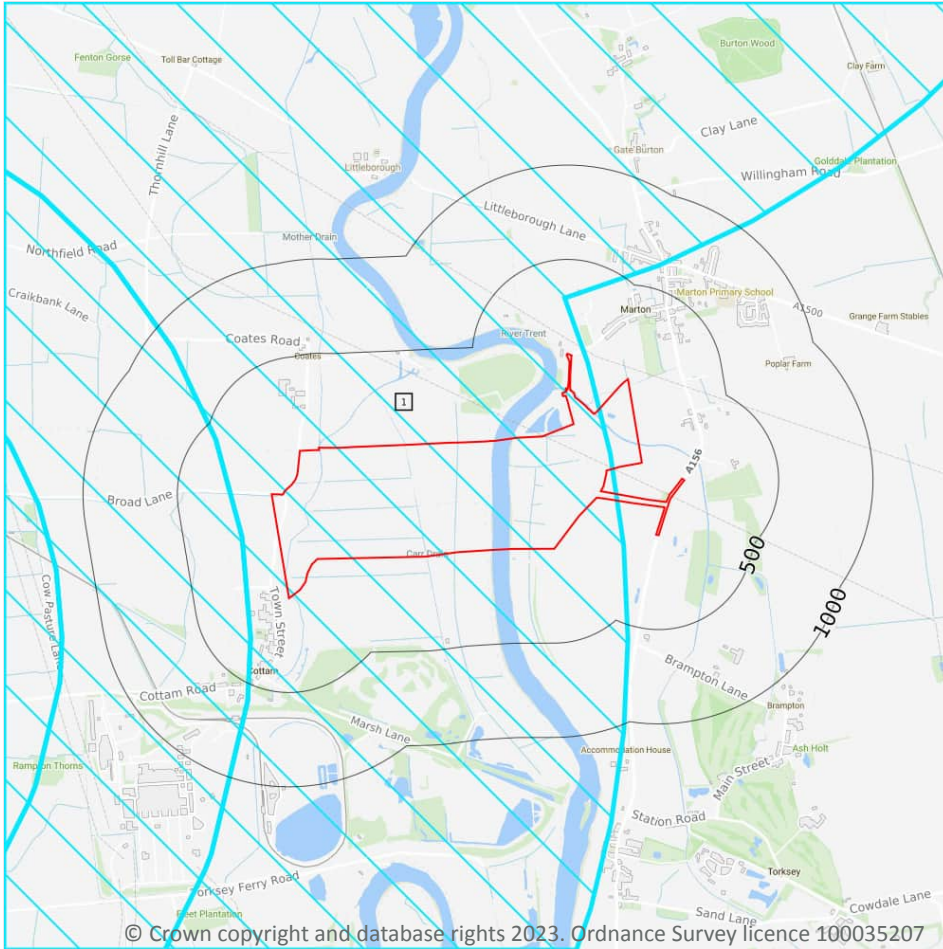
Records within 2000m

0

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

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

## SSSI Impact Zones and Units



### 10.17 SSSI Impact Risk Zones

#### Records on site

1

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

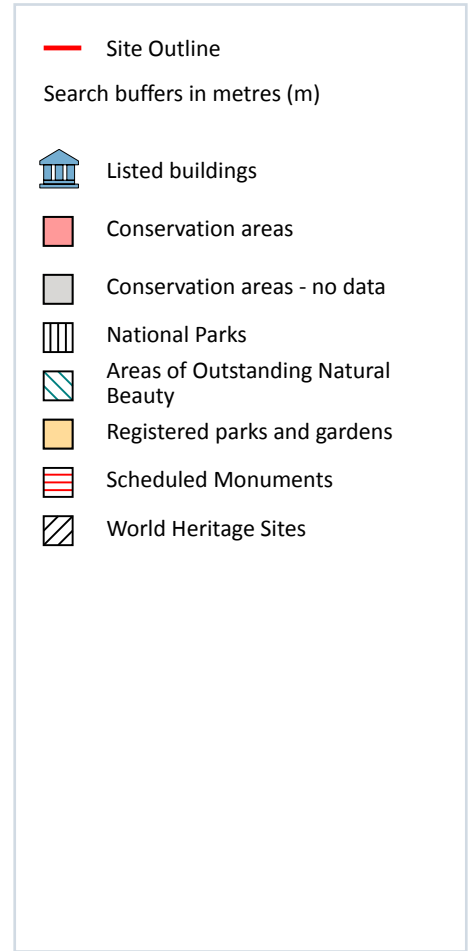
Features are displayed on the SSSI Impact Zones and Units map on **page 80**

ID	Location	Type of developments requiring consultation
1	On site	<b>Infrastructure - Airports, helipads and other aviation proposals.</b> <b>Air pollution - Livestock &amp; poultry units with floorspace &gt; 500m<sup>2</sup>, slurry lagoons &amp; digestate stores &gt; 750m<sup>2</sup>, manure stores &gt; 3500t.</b>

*This data is sourced from Natural England.*



## 11 Visual and cultural designations



### 11.1 World Heritage Sites

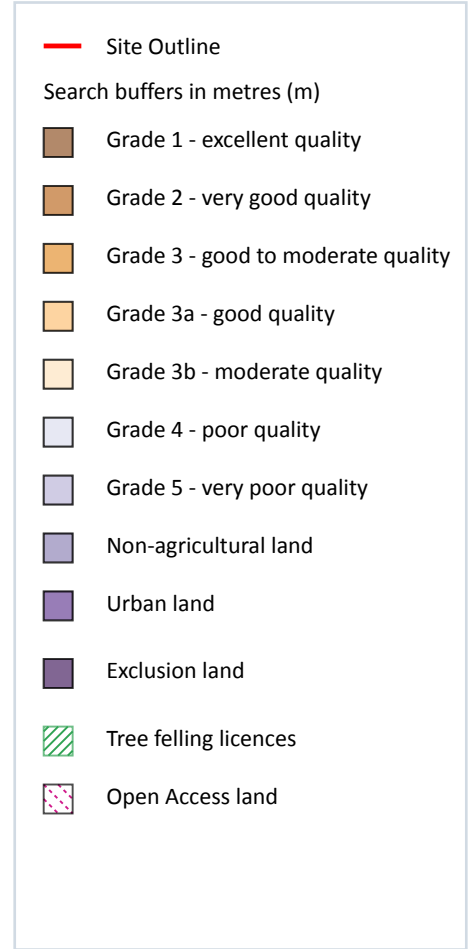
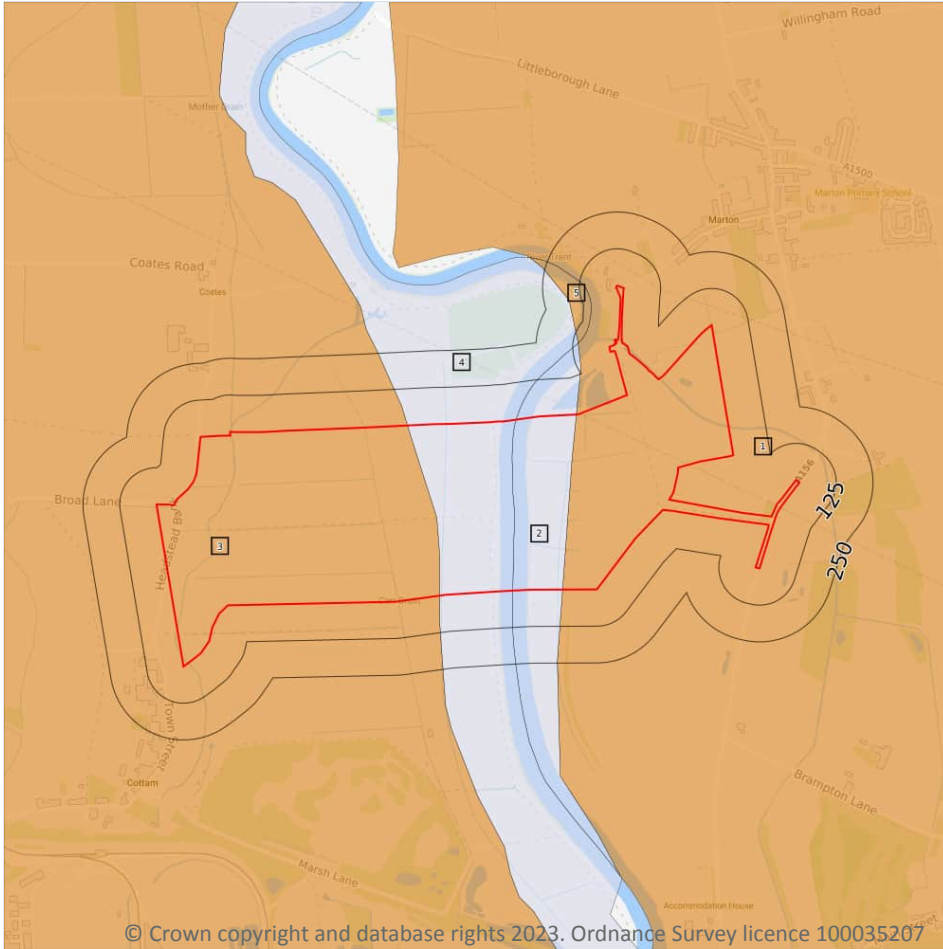
**Records within 250m**

**0**

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

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

## 12 Agricultural designations



### 12.1 Agricultural Land Classification

Records within 250m

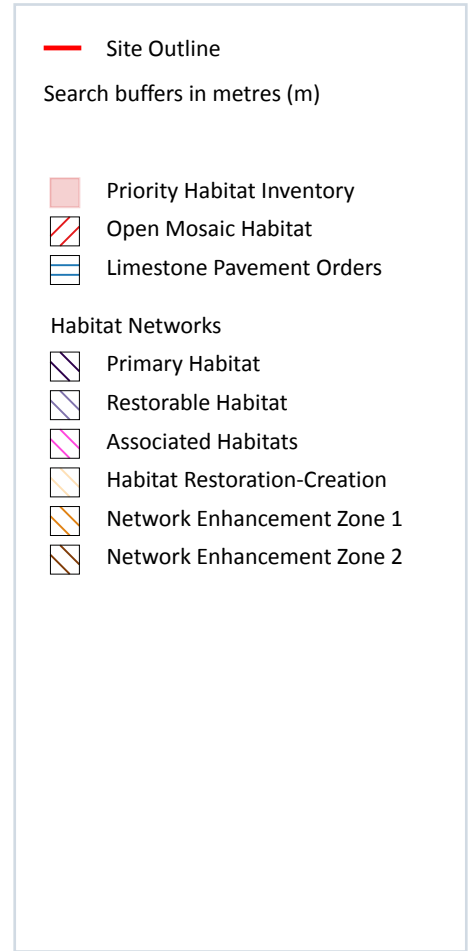
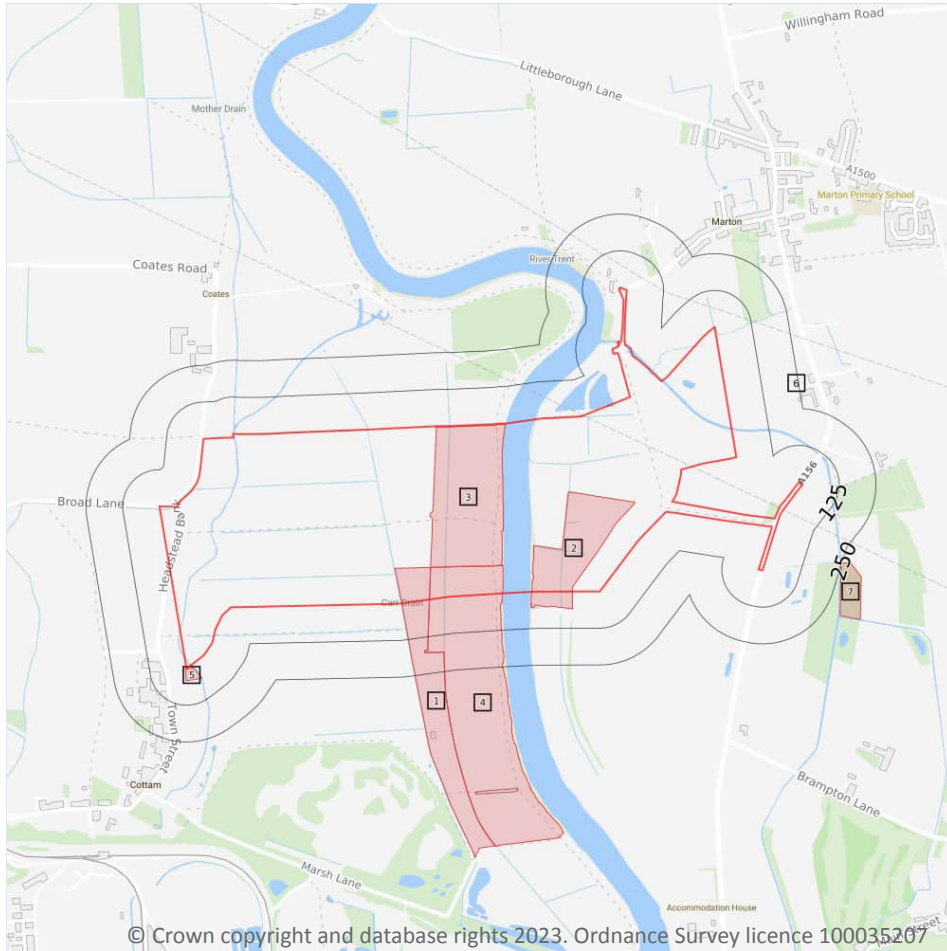
5

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

Features are displayed on the Agricultural designations map on **page 85**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

## 13 Habitat designations



### 13.1 Priority Habitat Inventory

Records within 250m

7

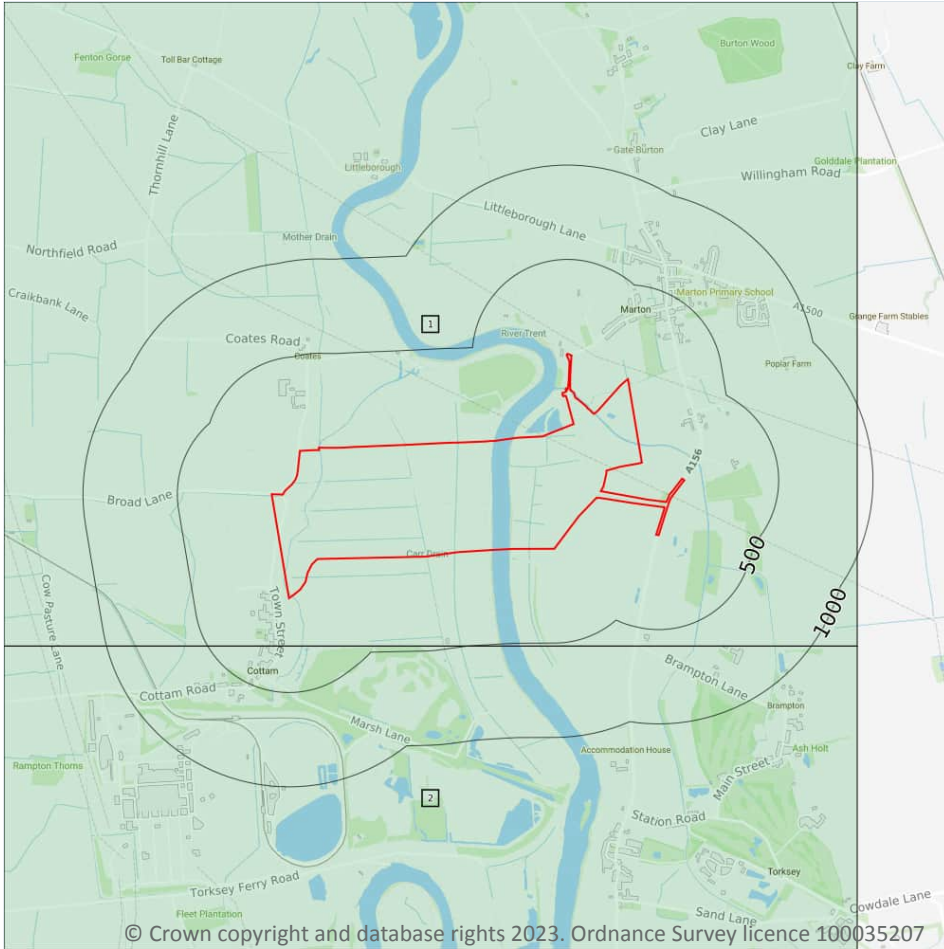
Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 88**

ID	Location	Main Habitat	Other habitats
1	On site	Coastal and floodplain grazing marsh	Main habitat: CFPGM (INV > 50%)
2	On site	Coastal and floodplain grazing marsh	Main habitat: CFPGM (INV > 50%)
3	On site	Coastal and floodplain grazing marsh	Main habitat: CFPGM (INV > 50%)
4	On site	Coastal and floodplain grazing marsh	Main habitat: CFPGM (INV > 50%)



## 14 Geology 1:10,000 scale - Availability



**Site Outline**

Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

### 14.1 10k Availability

Records within 500m

2

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

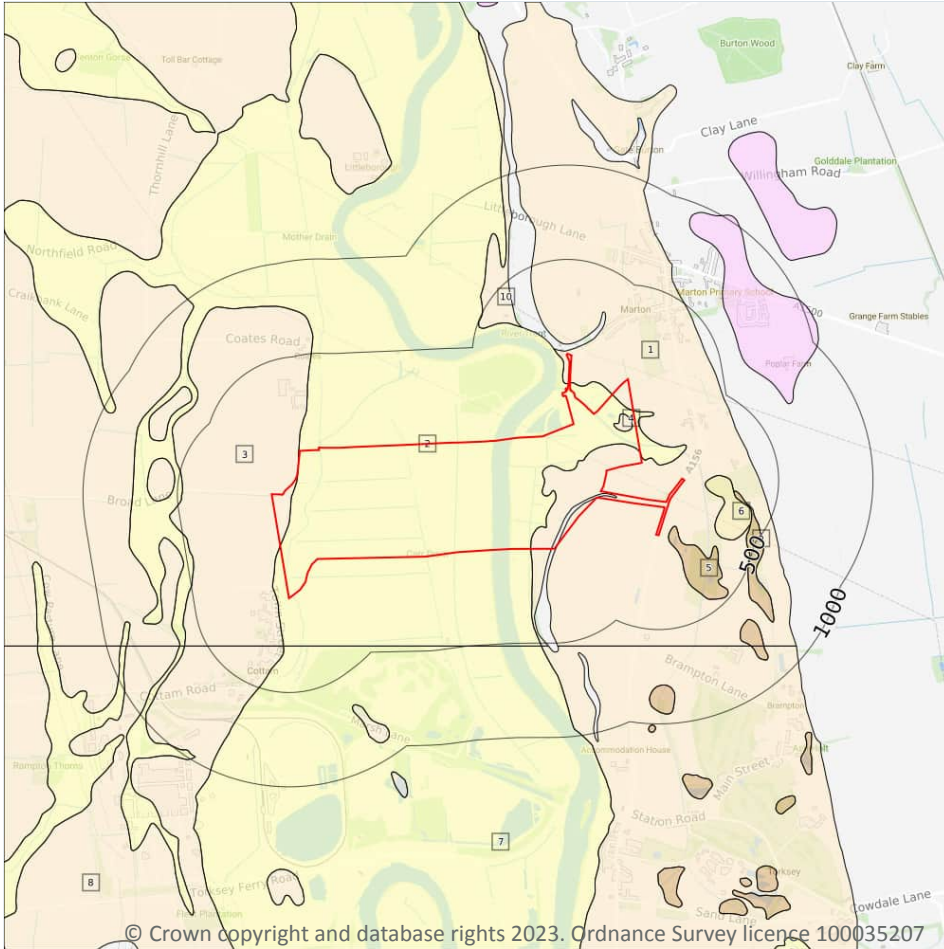
Features are displayed on the Geology 1:10,000 scale - Availability map on **page 90**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	SK88SW
2	254m SW	No coverage	Full	Full	No coverage	SK87NW

This data is sourced from the British Geological Survey.



## Geology 1:10,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (10k)
- Superficial geology (10k)  
Please see table for more details.

### 14.3 Superficial geology (10k)

Records within 500m

10

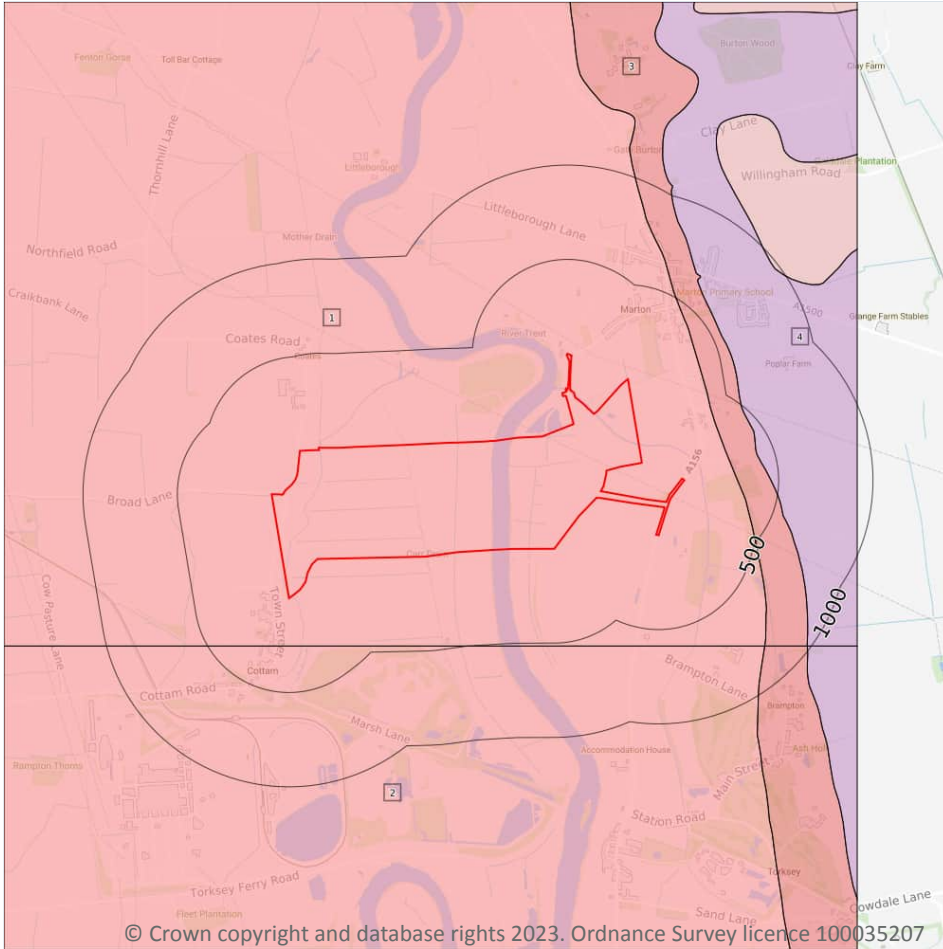
Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 92**

ID	Location	LEX Code	Description	Rock description
1	On site	HPSG-XSV	Holme Pierrepont Sand And Gravel Member - Sand And Gravel	Sand And Gravel
2	On site	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
3	On site	HPSG-XSV	Holme Pierrepont Sand And Gravel Member - Sand And Gravel	Sand And Gravel



## Geology 1:10,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (10k)
- Bedrock geology (10k)  
Please see table for more details.

### 14.5 Bedrock geology (10k)

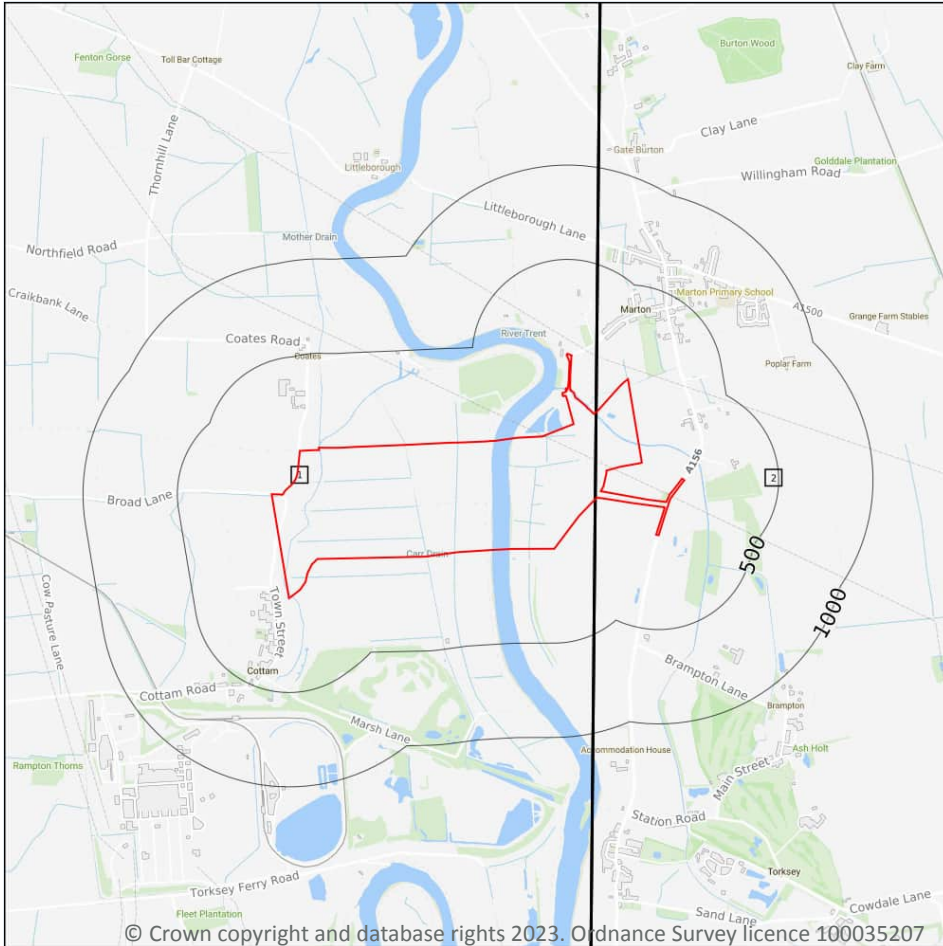
**Records within 500m** **4**

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

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 94**

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
2	254m SW	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
3	261m E	PNG-MDST	Penarth Group - Mudstone	Rhaetian Age

## 15 Geology 1:50,000 scale - Availability



- Site Outline
- Search buffers in metres (m)
- Geological map tile

### 15.1 50k Availability

Records within 500m

2

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

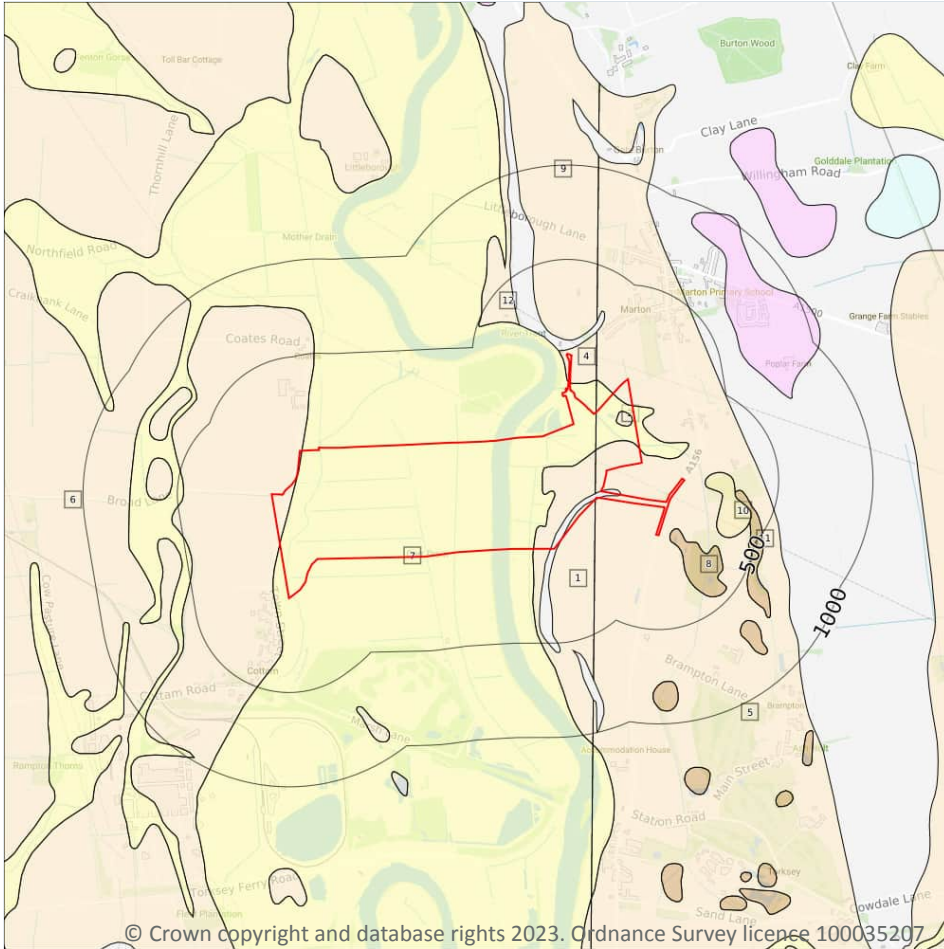
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 96**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW101_east_retford_v4
2	On site	No coverage	Full	Full	No coverage	EW102_market_rasen_v4

*This data is sourced from the British Geological Survey.*



## Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)  
Please see table for more details.

### 15.4 Superficial geology (50k)

Records within 500m

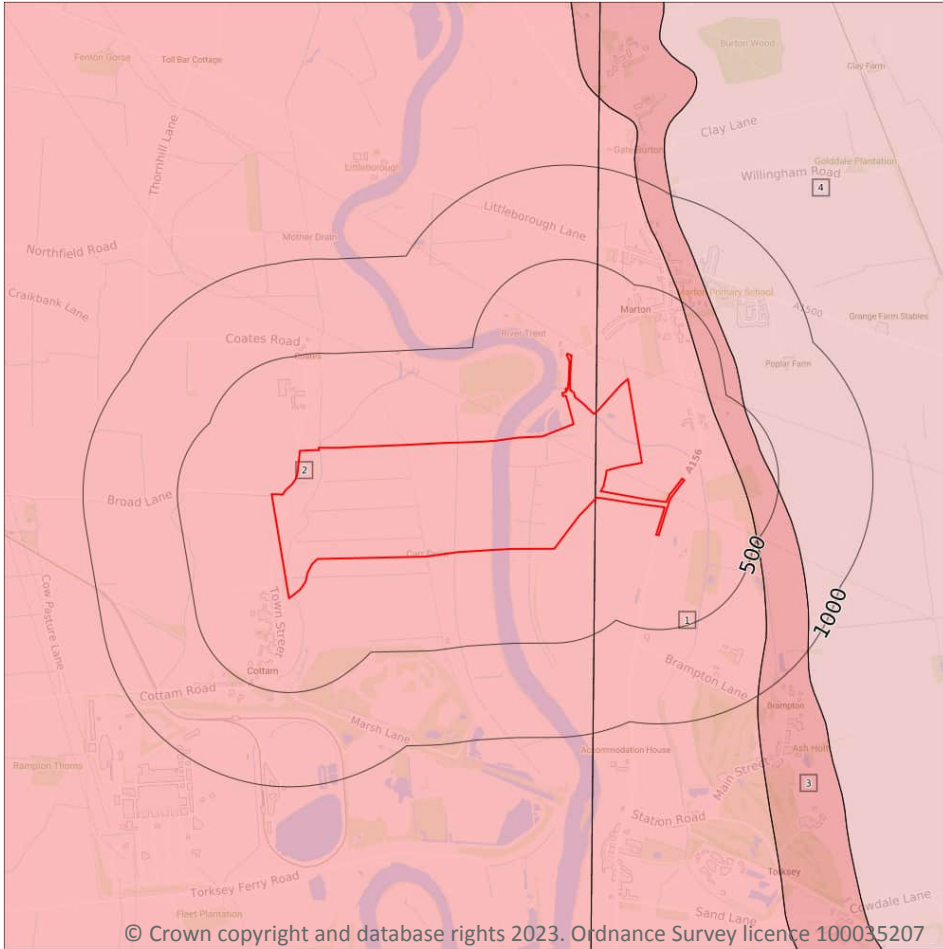
12

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 98**

ID	Location	LEX Code	Description	Rock description
1	On site	HPSG-XSV	HOLME PIERREPONT SAND AND GRAVEL MEMBER	SAND AND GRAVEL
2	On site	HPSG-XSV	HOLME PIERREPONT SAND AND GRAVEL MEMBER	SAND AND GRAVEL
3	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
4	On site	HPSG-XSV	HOLME PIERREPONT SAND AND GRAVEL MEMBER	SAND AND GRAVEL

## Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- ..... Bedrock faults and other linear features (50k)
- Bedrock geology (50k)  
Please see table for more details.

### 15.8 Bedrock geology (50k)

Records within 500m

4

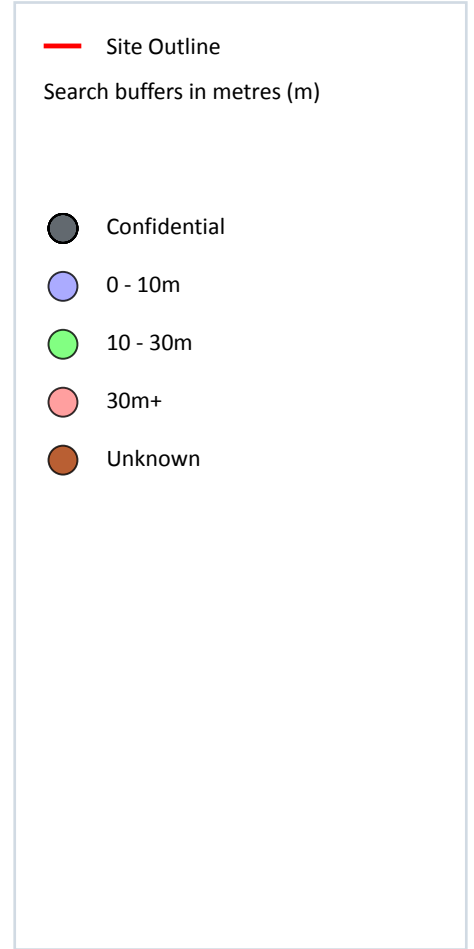
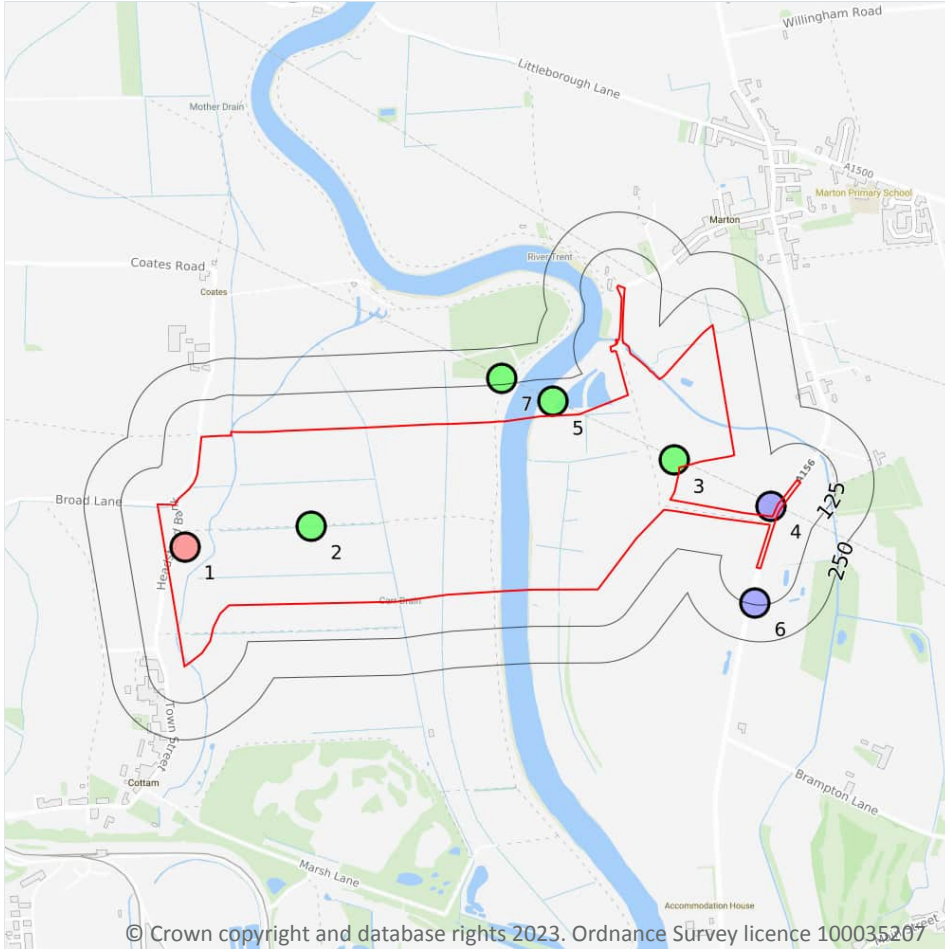
Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 101**

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	MERCIA MUDSTONE GROUP - MUDSTONE	-
2	On site	MMG-MDST	MERCIA MUDSTONE GROUP - MUDSTONE	-
3	280m E	PNG-MDST	PENARTH GROUP - MUDSTONE	RHAETIAN



## 16 Boreholes



### 16.1 BGS Boreholes

Records within 250m

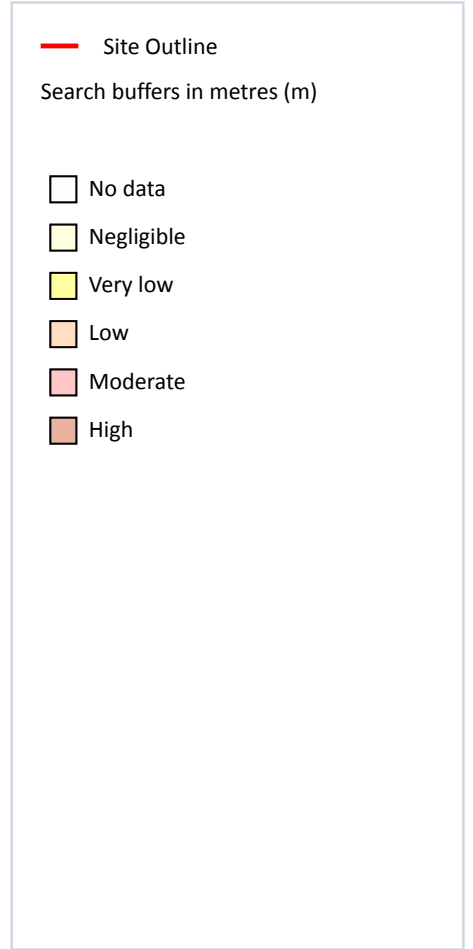
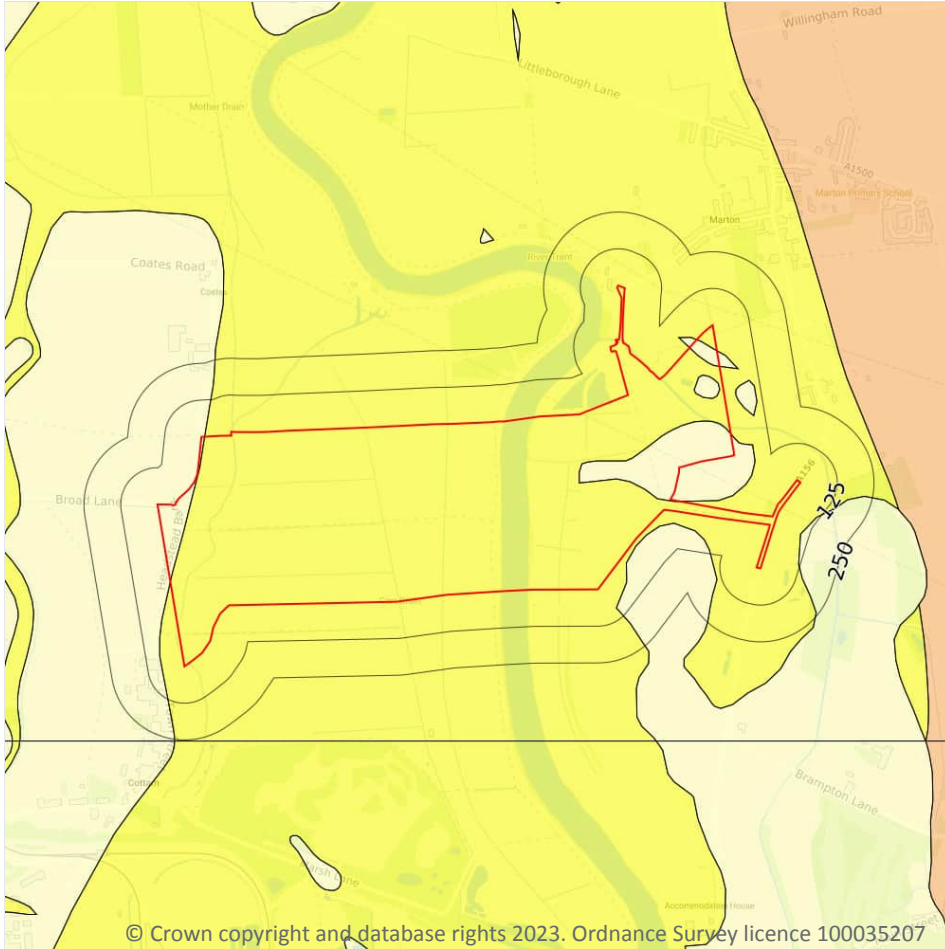
7

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

Features are displayed on the Boreholes map on **page 103**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	481989 380661	HEADSTEAD BANK	1200.53	N	<a href="#">244205</a>
2	On site	482420 380730	CARR DRAIN COTTAM	13.0	N	<a href="#">244169</a>
3	On site	483653 380957	WESTBURTON/WALTHAM CROSS 612	12.19	N	<a href="#">244187</a>

## 17 Natural ground subsidence - Shrink swell clays



### 17.1 Shrink swell clays

Records within 50m

4

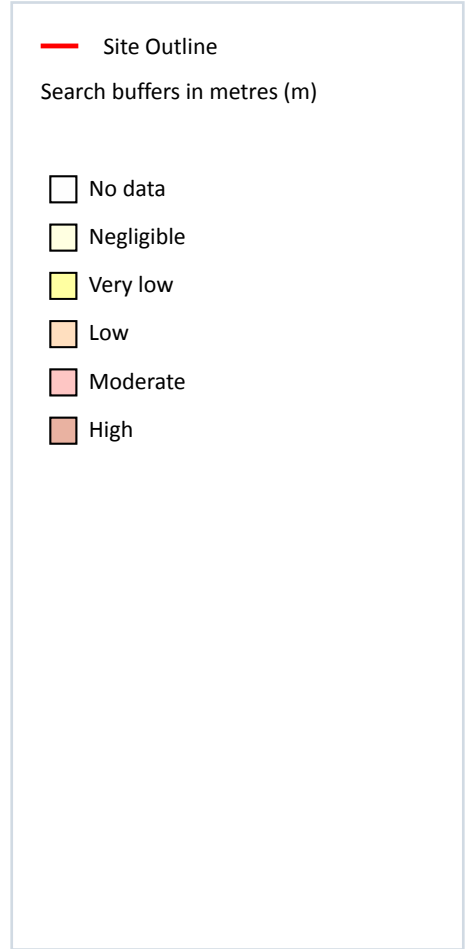
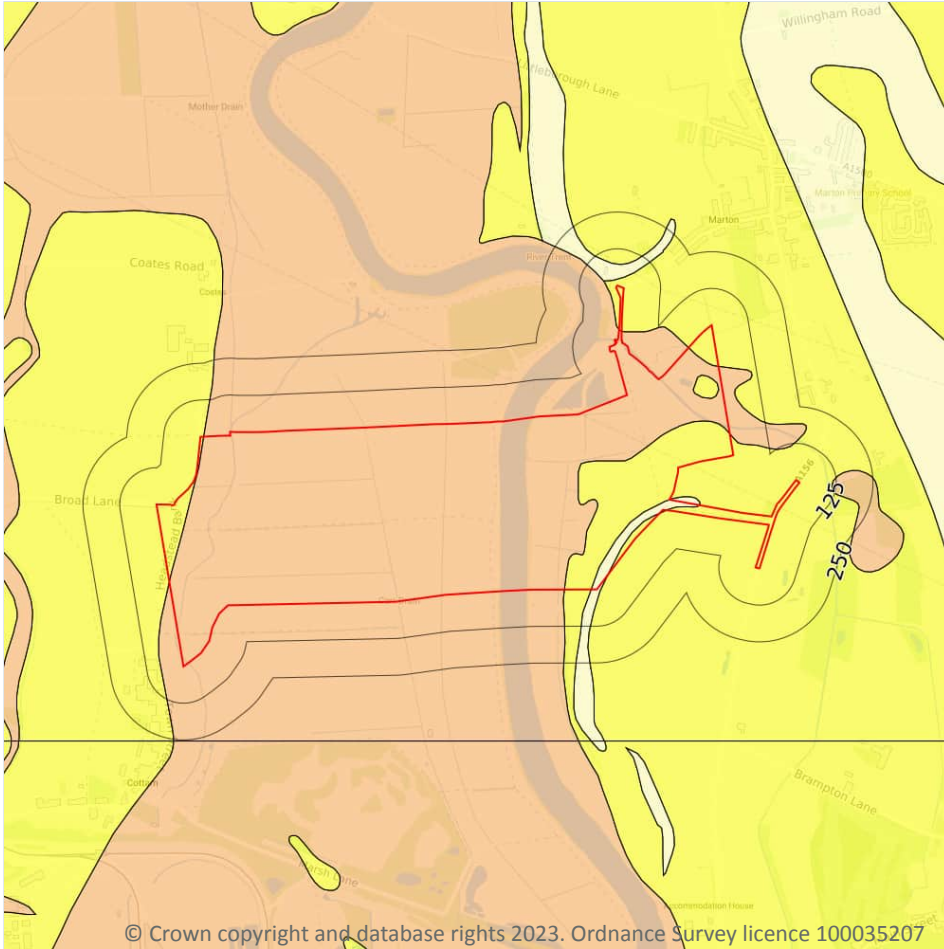
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 105**

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.
15m E	Negligible	Ground conditions predominantly non-plastic.



## Natural ground subsidence - Running sands



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### 17.2 Running sands

#### Records within 50m

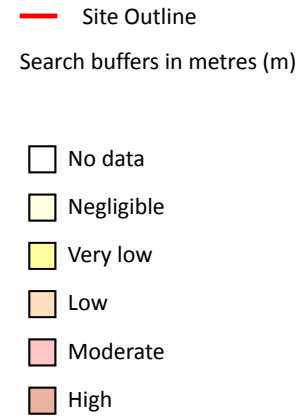
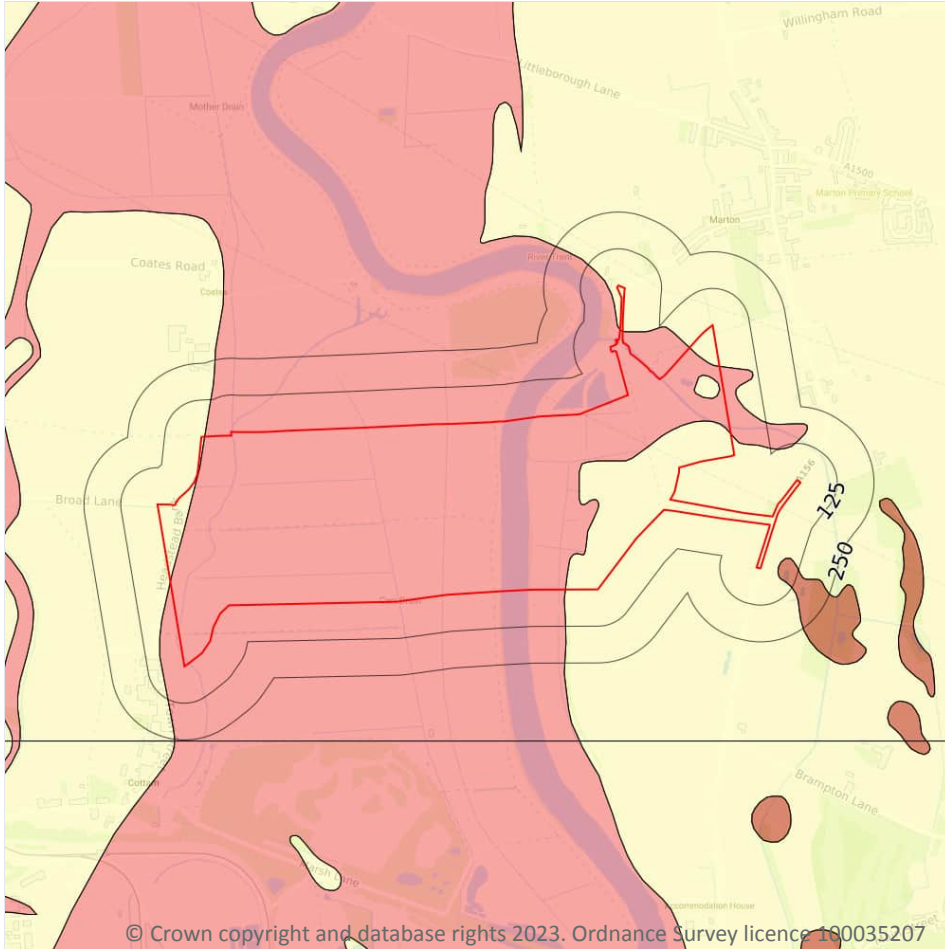
4

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

Features are displayed on the Natural ground subsidence - Running sands map on **page 107**

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

## Natural ground subsidence - Compressible deposits



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### 17.3 Compressible deposits

#### Records within 50m

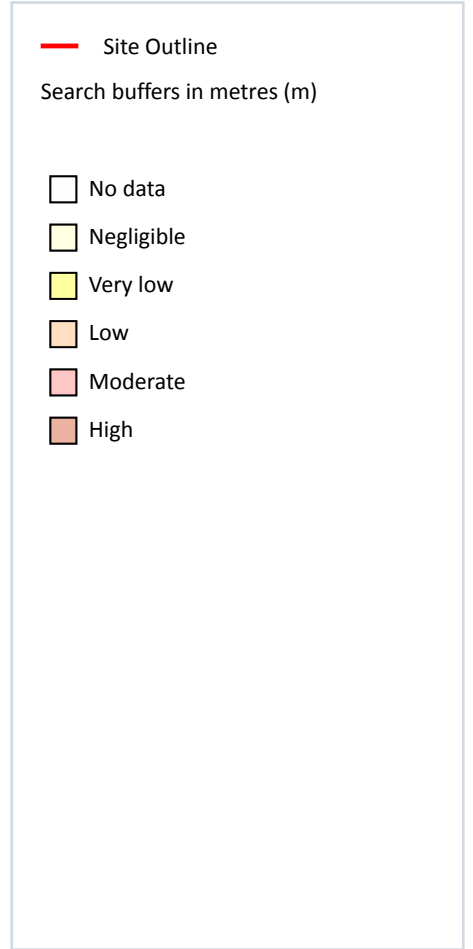
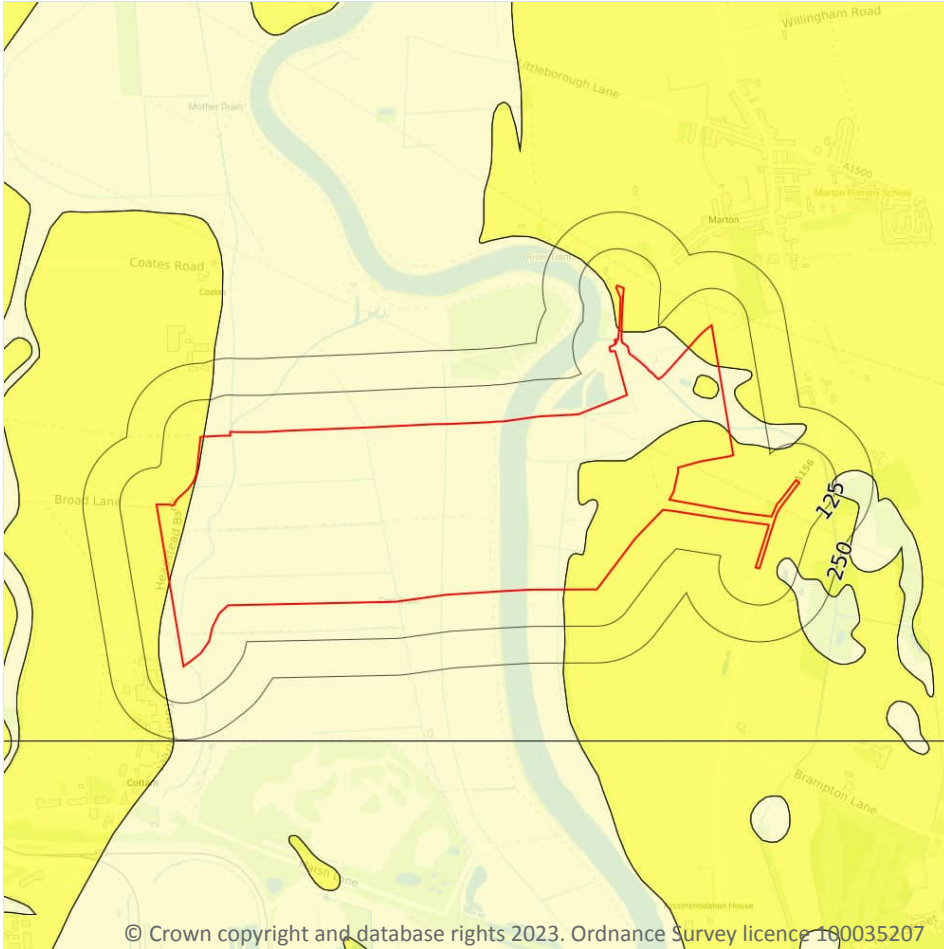
2

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 109**

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

## Natural ground subsidence - Collapsible deposits



### 17.4 Collapsible deposits

Records within 50m

2

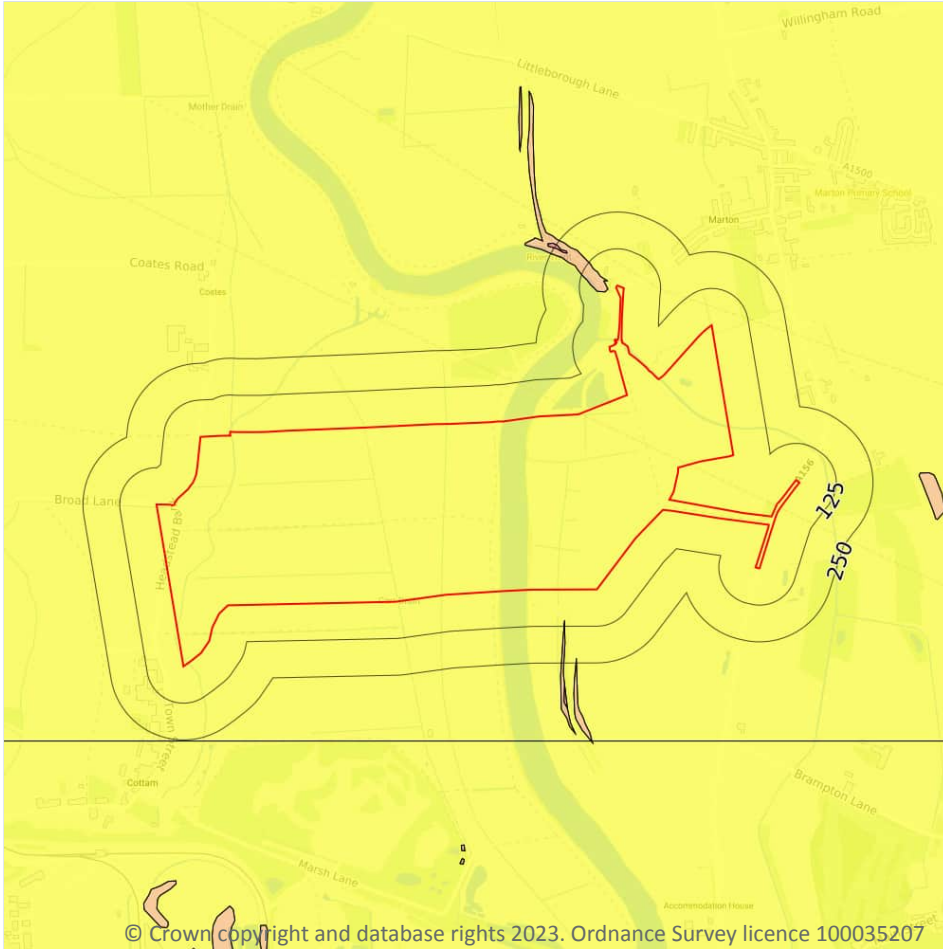
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 111**

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

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Landslides



— Site Outline  
Search buffers in metres (m)

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

### 17.5 Landslides

Records within 50m

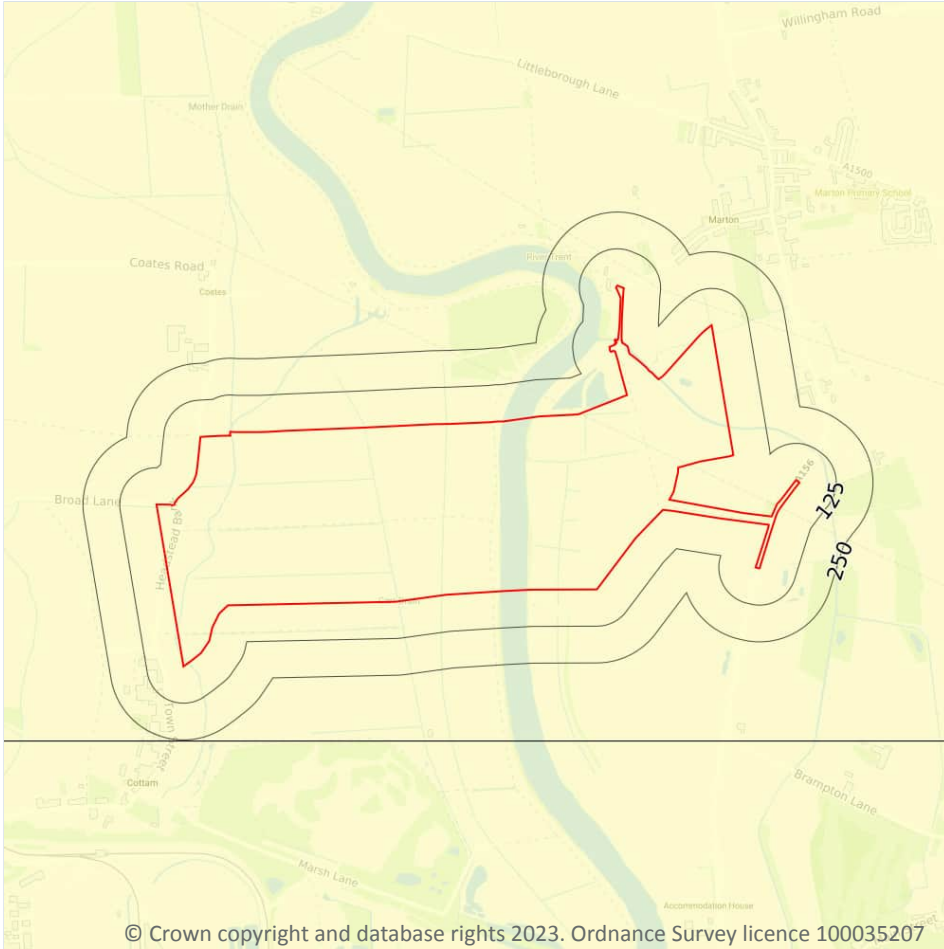
2

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

Features are displayed on the Natural ground subsidence - Landslides map on **page 112**

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

## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

Records within 50m

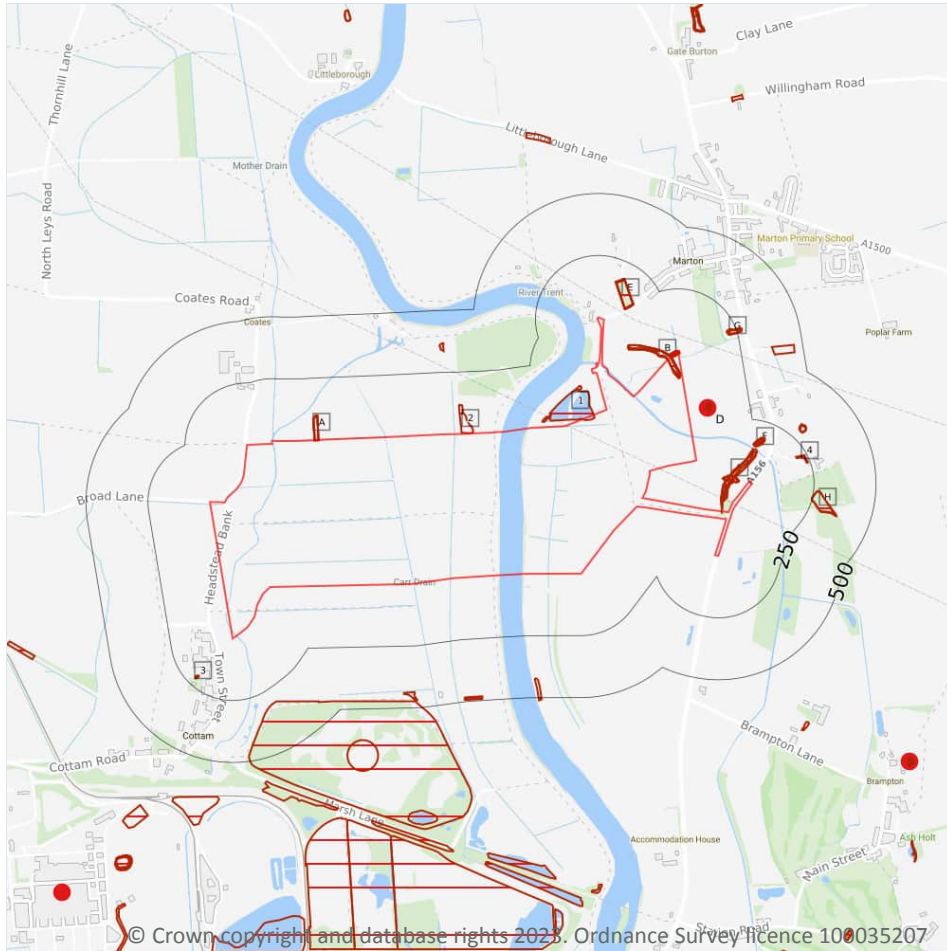
1

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

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 114**

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

## 18 Mining, ground workings and natural cavities



### 18.1 Natural cavities

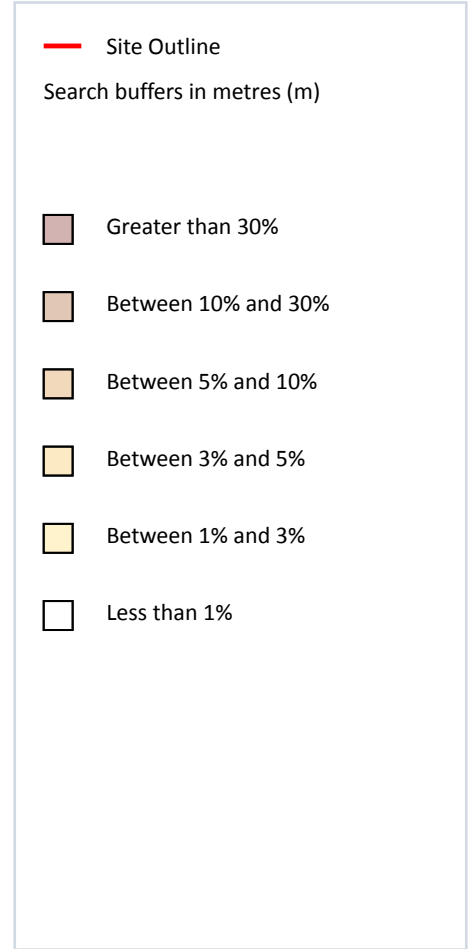
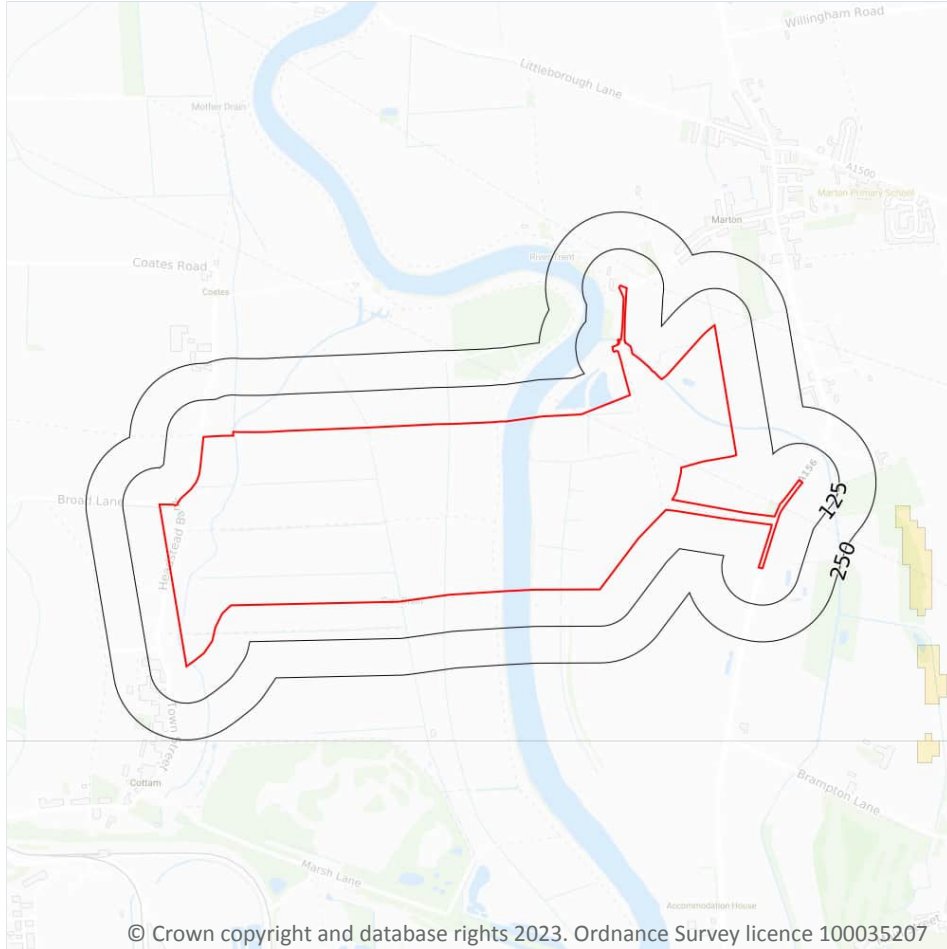
Records within 500m

0

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

*This data is sourced from Stantec UK Ltd.*

## 19 Radon



### 19.1 Radon

#### Records on site

1

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

Features are displayed on the Radon map on **page 122**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None

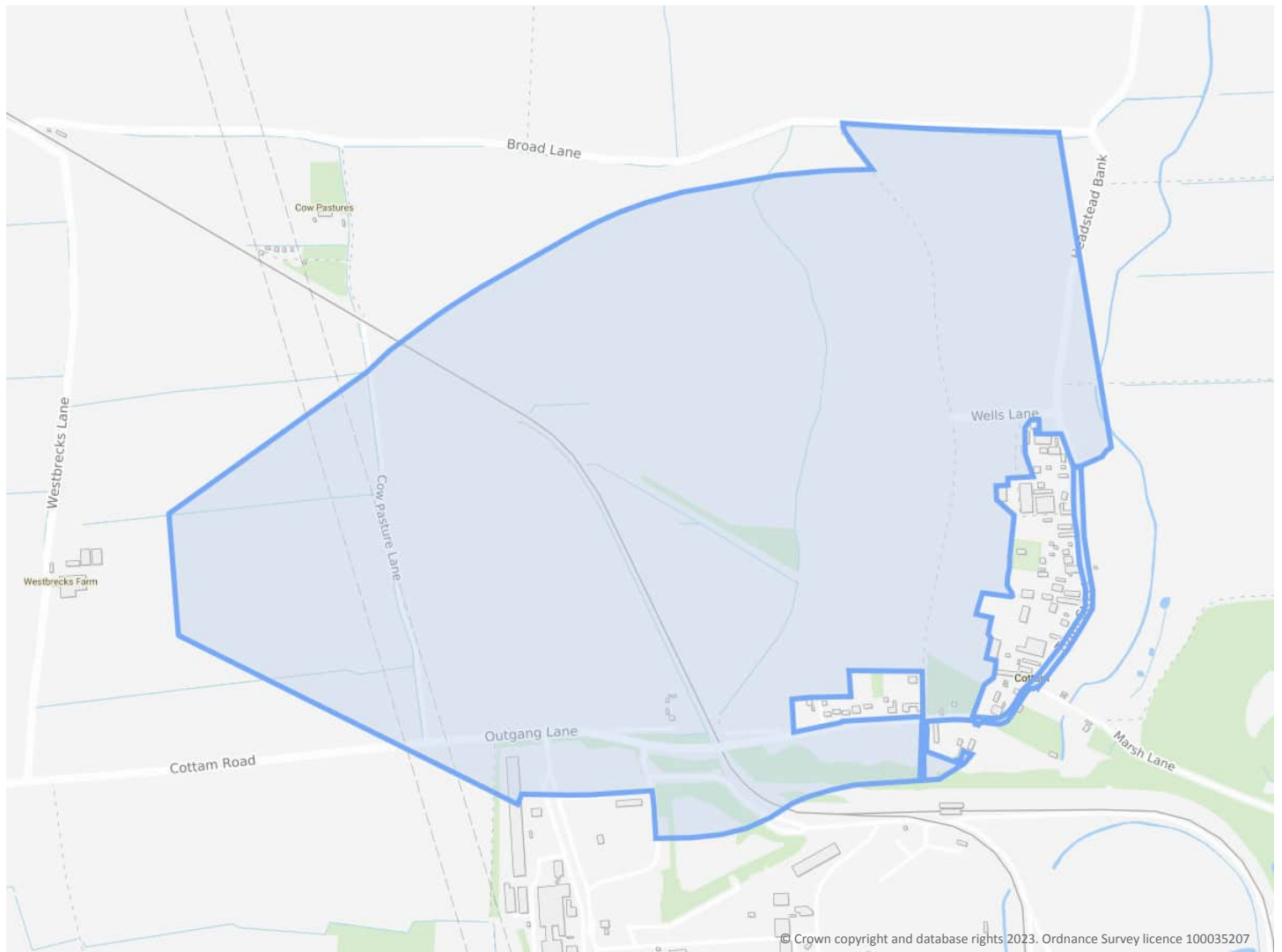
## Tillbridge cable run area

### Order Details

**Date:** 13/02/2023  
**Your ref:** ref 60677969  
**Our Ref:** GSIP-2023-13376-12945\_8

### Site Details

**Location:** 481643 380025  
**Area:** 133.14 ha  
**Authority:** [Bassetlaw District Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

N/A: >10ha

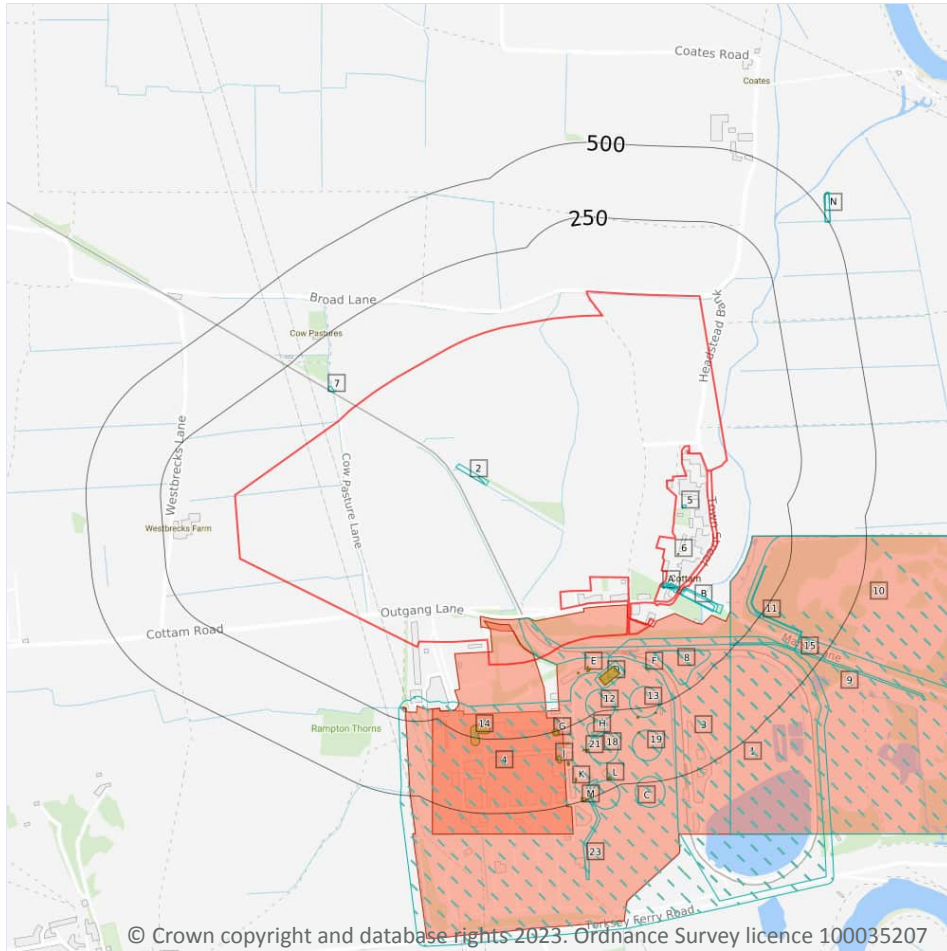
Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000



# 1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features

## 1.1 Historical industrial land uses

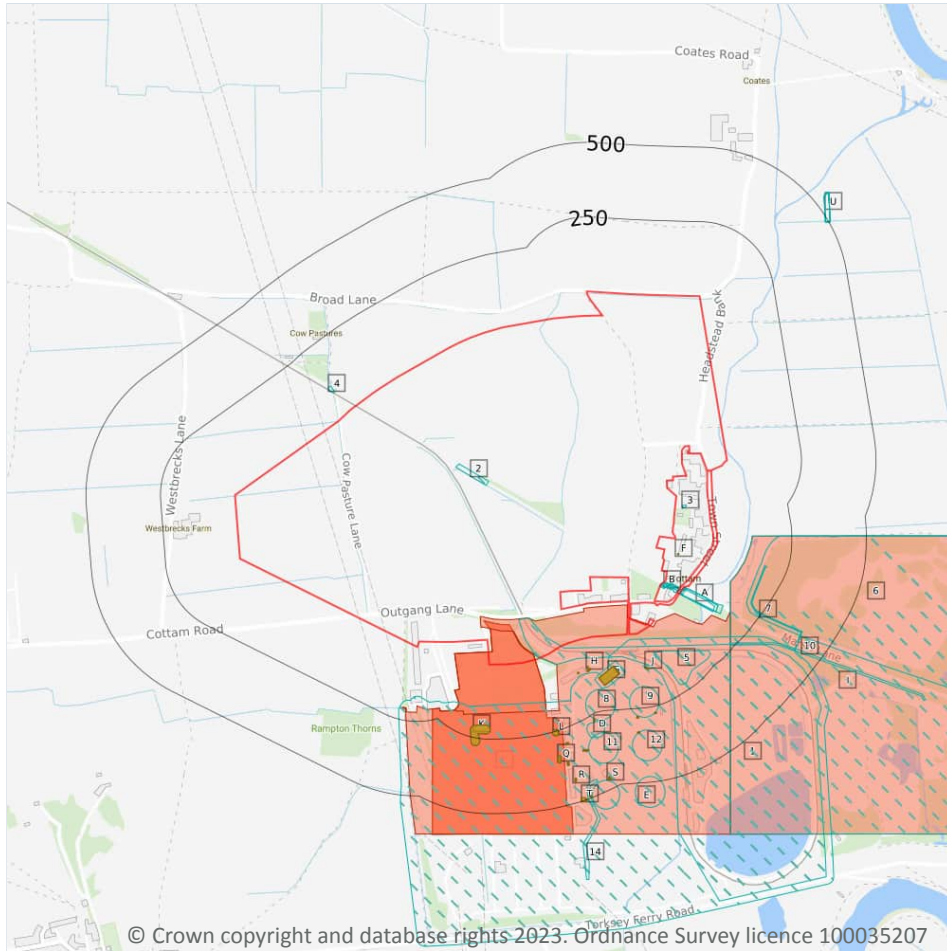
**Records within 500m** **35**

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

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

ID	Location	Land use	Dates present	Group ID
1	On site	Railway Sidings	1978	1560966

## 2 Past land use - un-grouped



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features

### 2.1 Historical industrial land uses

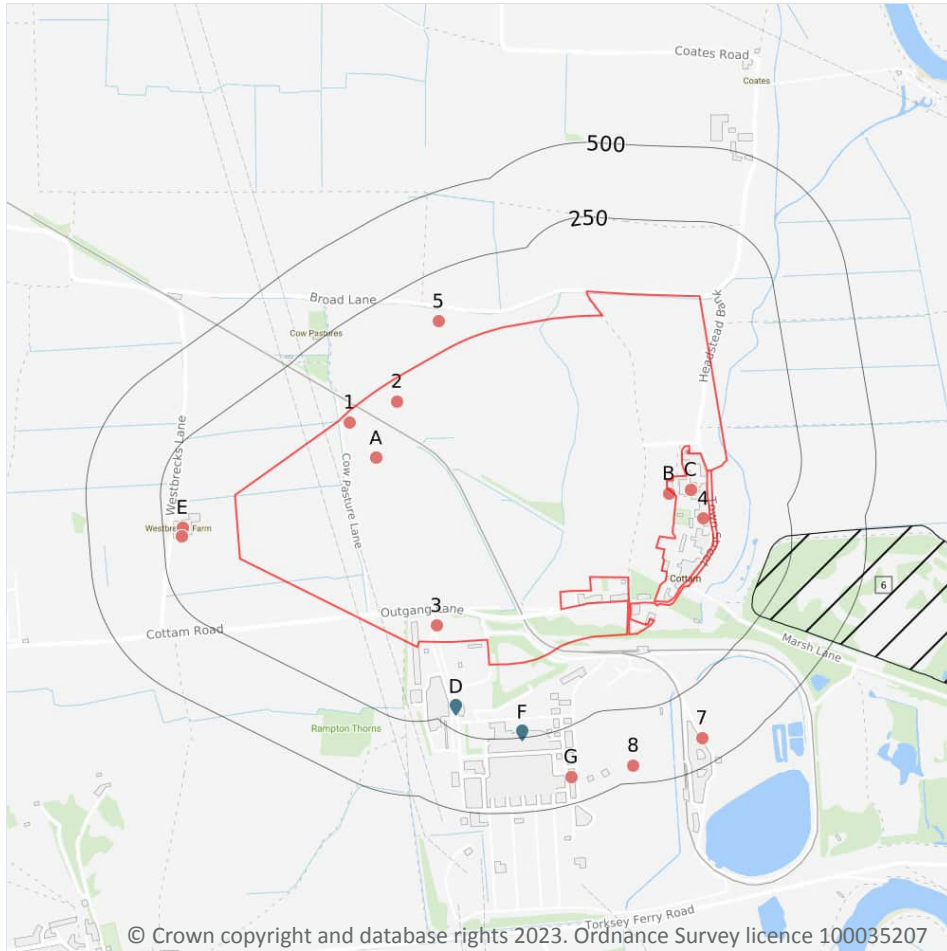
**Records within 500m** **42**

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

Features are displayed on the Past land use - un-grouped map on **page 18**

ID	Location	Land Use	Date	Group ID
1	On site	Railway Sidings	1978	1560966
2	On site	Cuttings	1885	1562143
A	On site	Railway Sidings	1947	1741513

## 3 Waste and landfill



### 3.1 Active or recent landfill

Records within 500m

0

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

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

### 3.2 Historical landfill (BGS records)

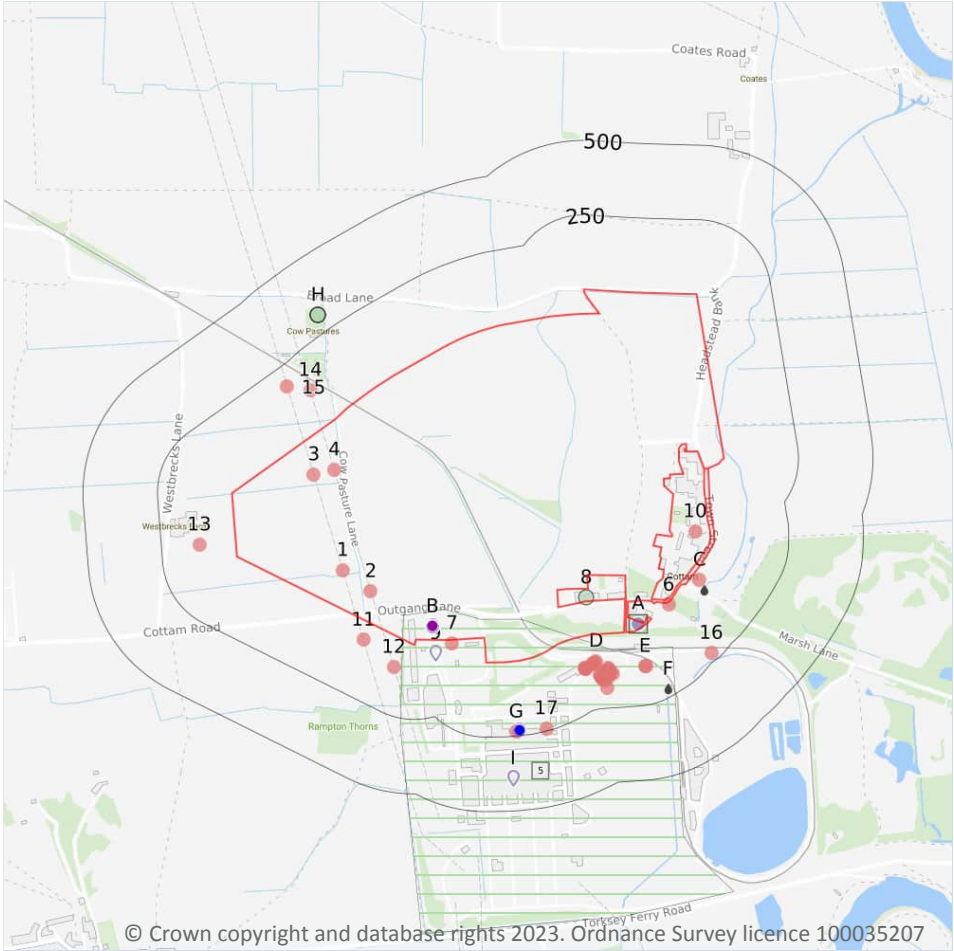
Records within 500m

0

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

*This data is sourced from the British Geological Survey.*

## 4 Current industrial land use



### 4.1 Recent industrial land uses

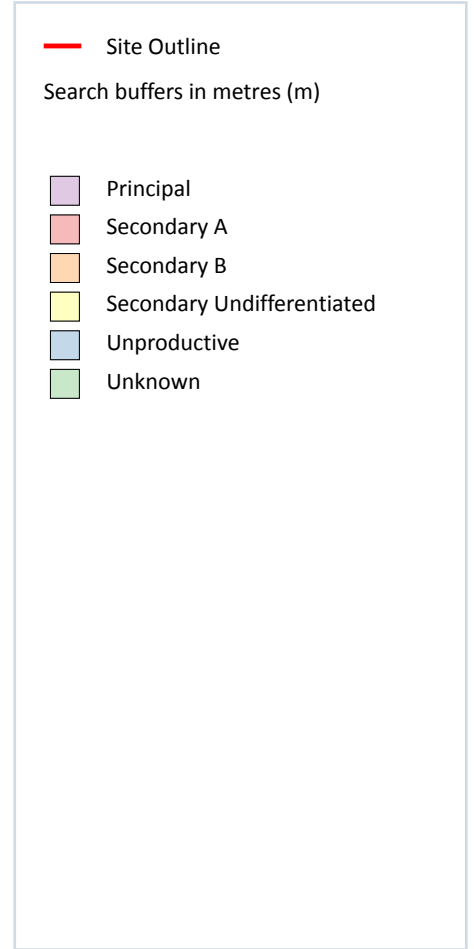
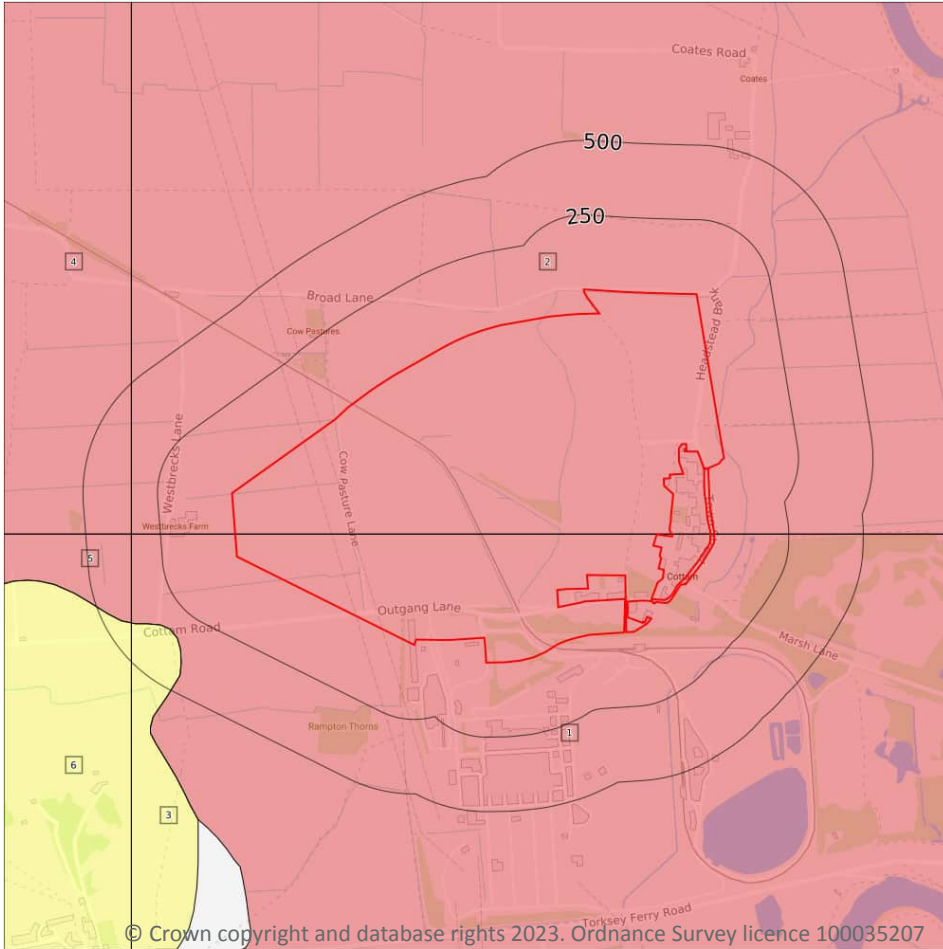
**Records within 250m** **43**

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 32**

ID	Location	Company	Address	Activity	Category
1	On site	Pylon	Nottinghamshire, DN22	Electrical Features	Infrastructure and Facilities
2	On site	Pylon	Nottinghamshire, DN22	Electrical Features	Infrastructure and Facilities
3	On site	Pylon	Nottinghamshire, DN22	Electrical Features	Infrastructure and Facilities

## 5 Hydrogeology - Superficial aquifer



### 5.1 Superficial aquifer

Records within 500m

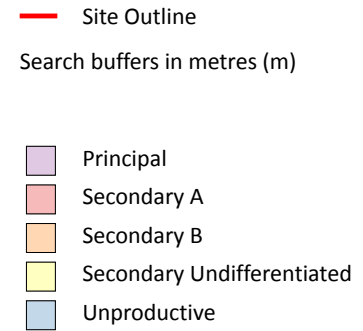
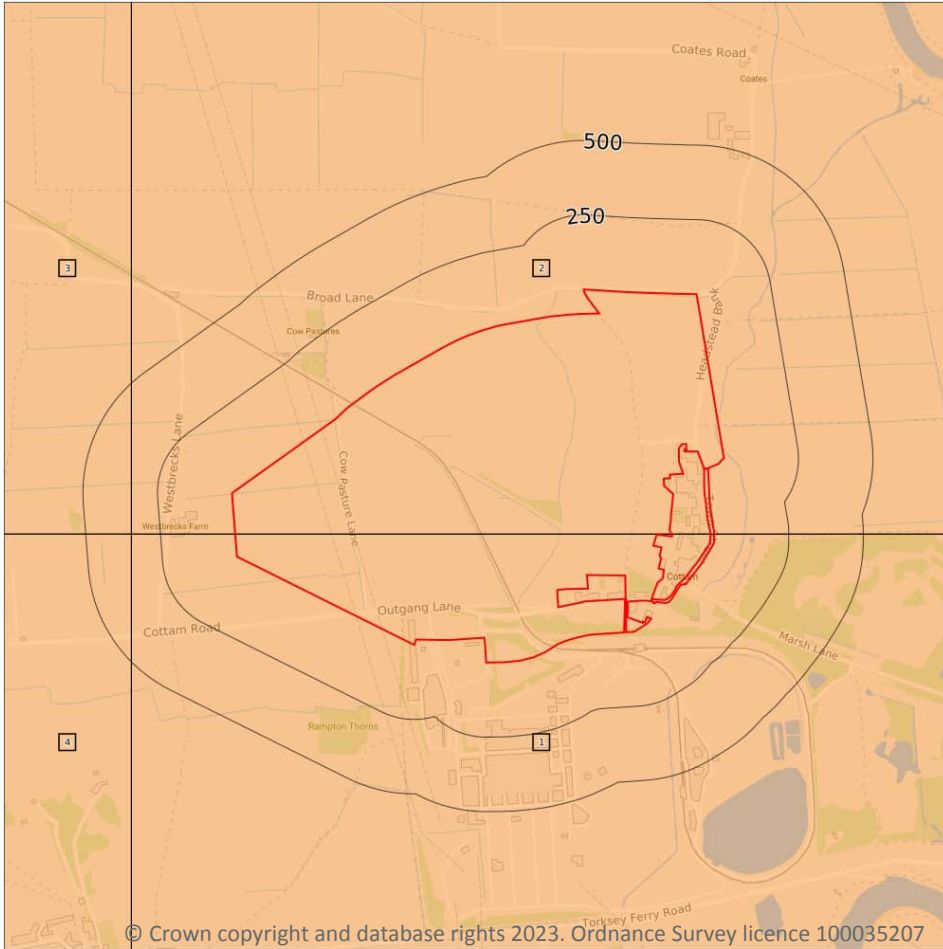
6

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 68**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	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

## Bedrock aquifer



### 5.2 Bedrock aquifer

Records within 500m

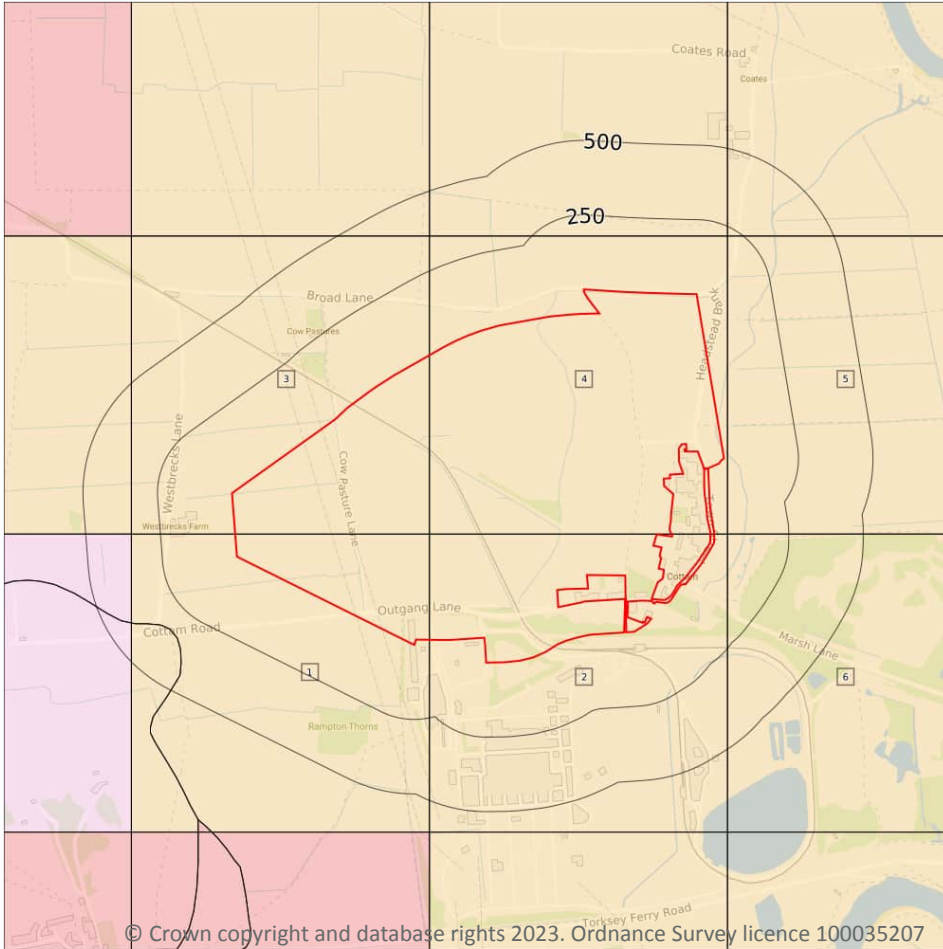
4

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 70**

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

## Groundwater vulnerability



### 5.3 Groundwater vulnerability

Records within 50m

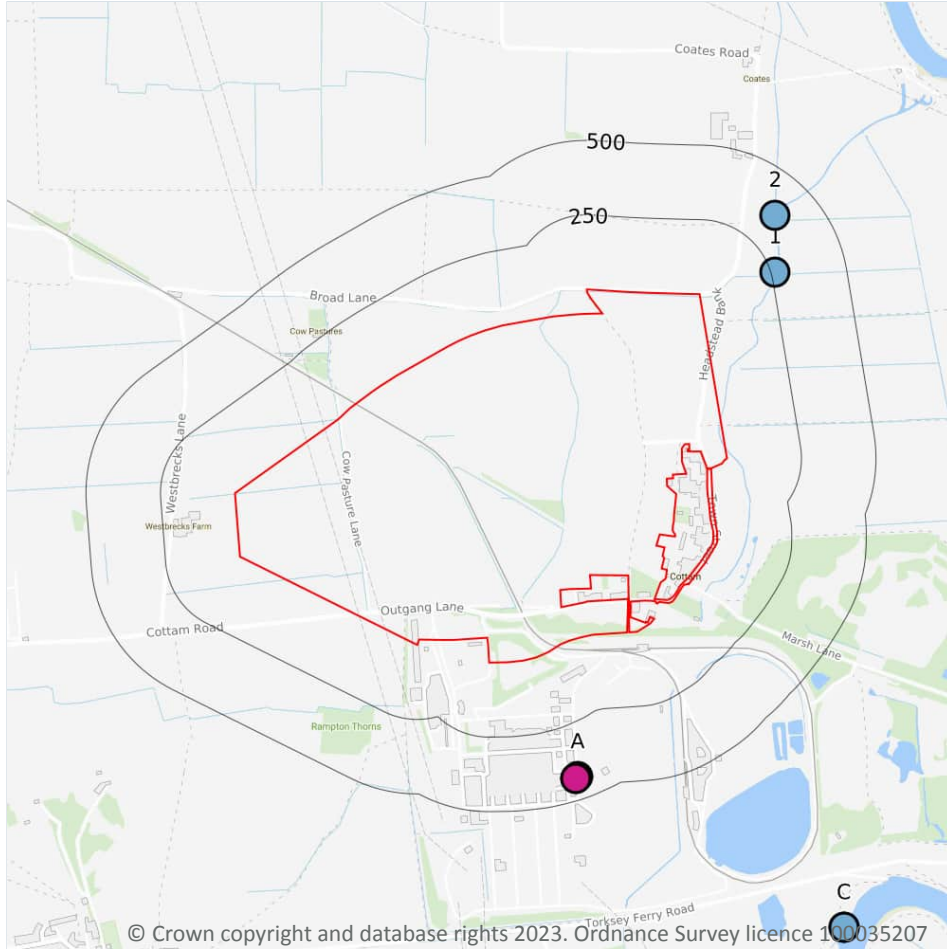
6

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

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

Features are displayed on the Groundwater vulnerability map on **page 72**

## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

Records within 2000m

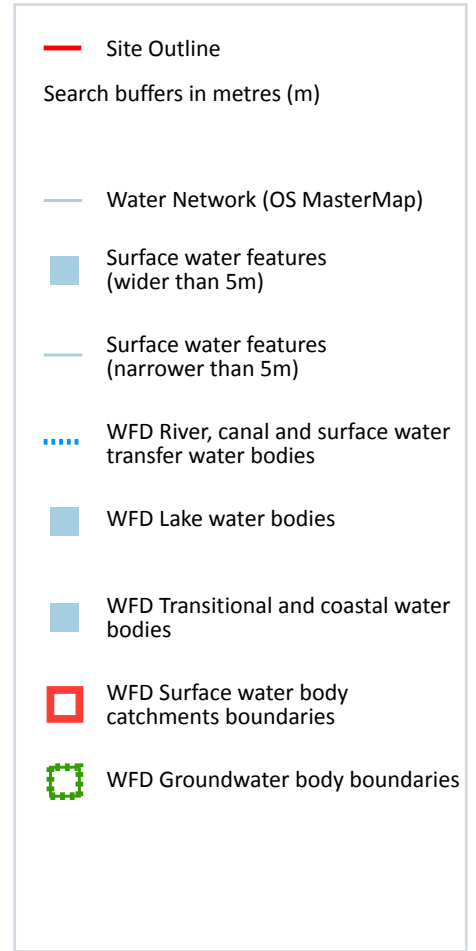
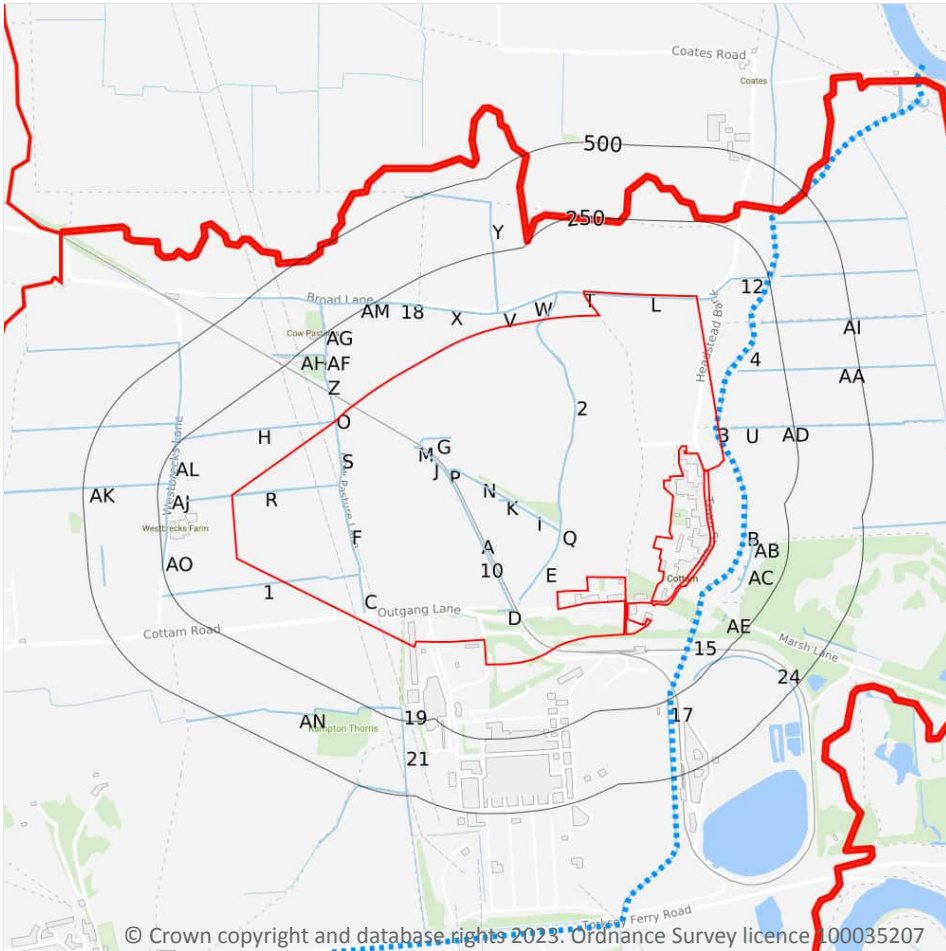
4

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 75**



## 6 Hydrology



### 6.1 Water Network (OS MasterMap)

**Records within 250m** **67**

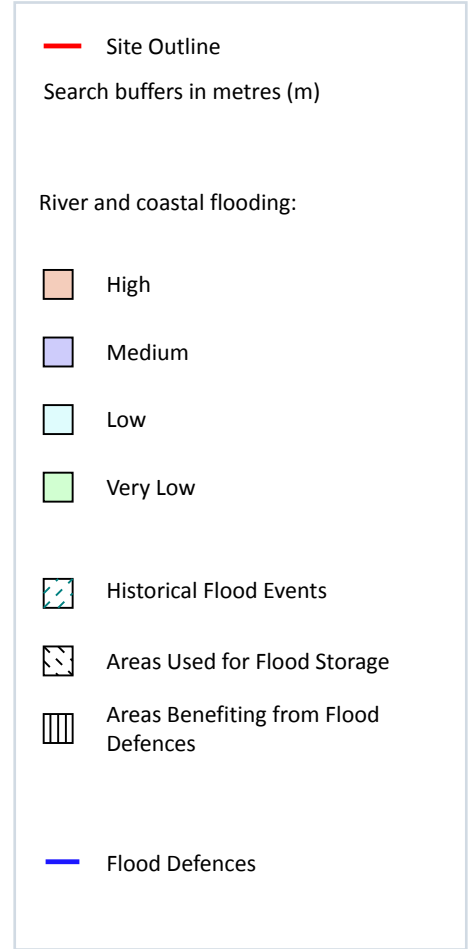
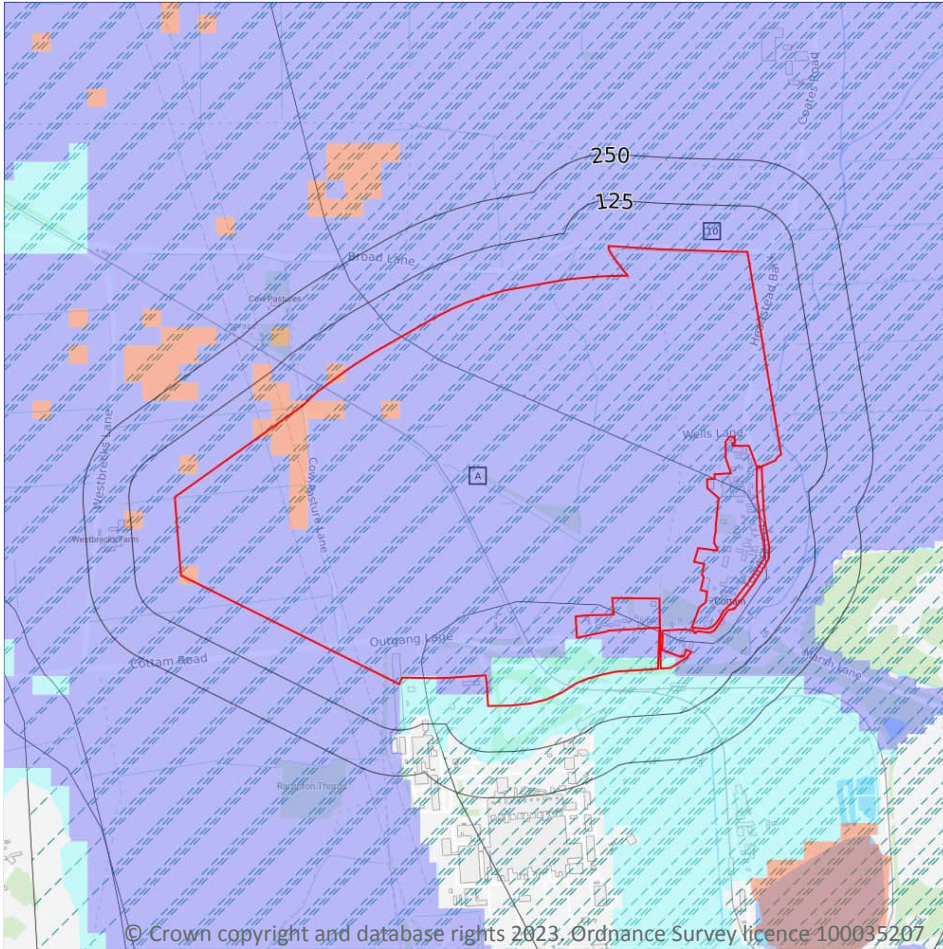
Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 80**

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



## 7 River and coastal flooding



### 7.1 Risk of flooding from rivers and the sea

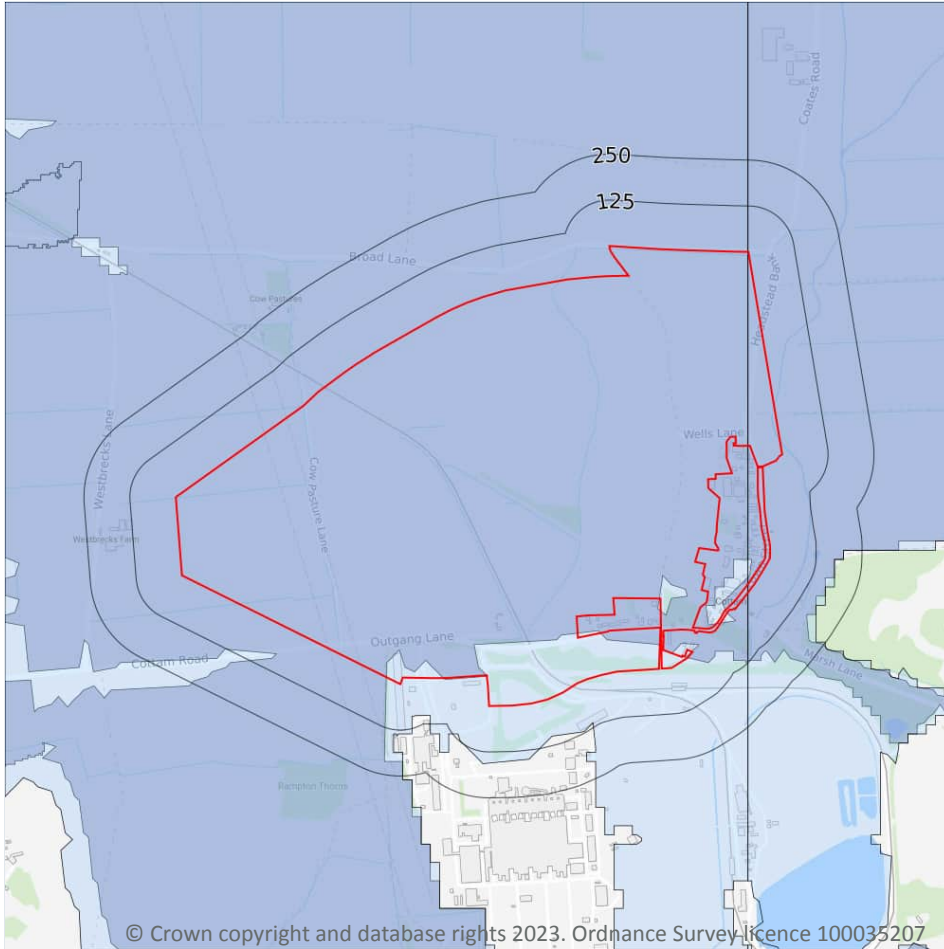
Records within 50m

10

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

Features are displayed on the River and coastal flooding map on **page 88**

## River and coastal flooding - Flood Zones



— Site Outline

Search buffers in metres (m)

□ Flood zone 2

■ Flood zone 3

### 7.6 Flood Zone 2

Records within 50m

1

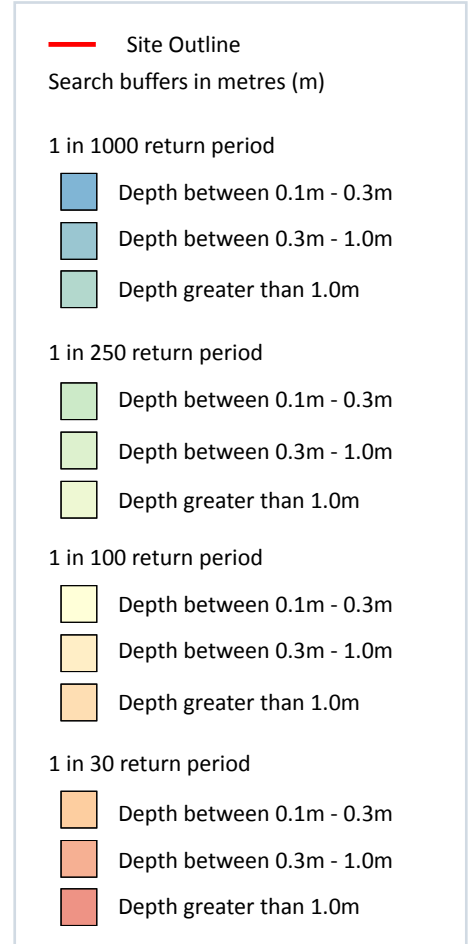
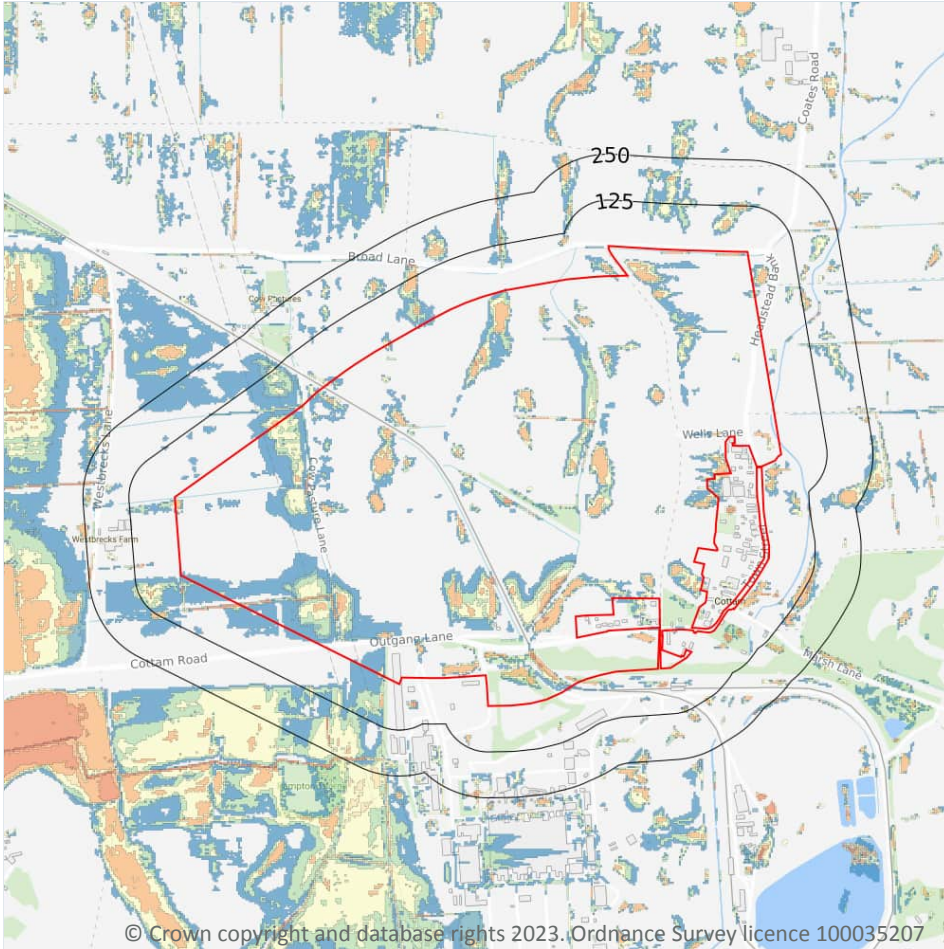
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 88**

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

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

## 8 Surface water flooding



### 8.1 Surface water flooding

**Highest risk on site**

**1 in 30 year, 0.3m - 1.0m**

**Highest risk within 50m**

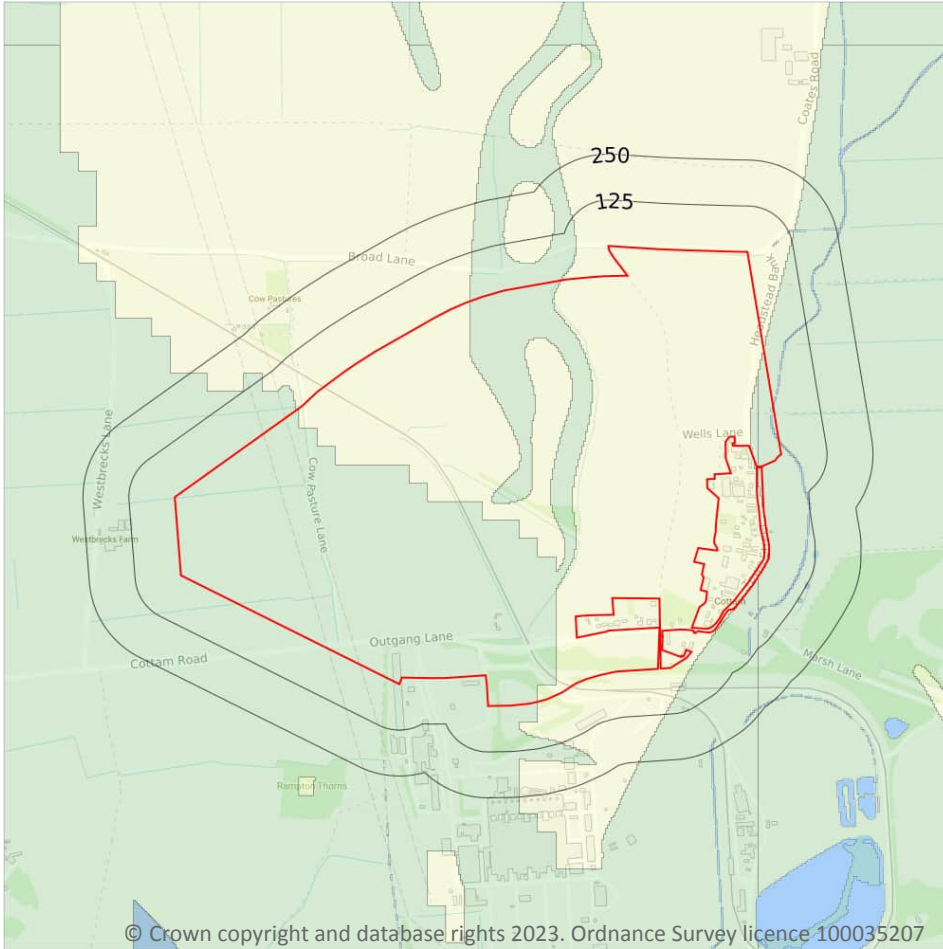
**1 in 30 year, 0.3m - 1.0m**

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

Features are displayed on the Surface water flooding map on **page 93**

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

## 9 Groundwater flooding



### 9.1 Groundwater flooding

**Highest risk on site**

**Moderate**

**Highest risk within 50m**

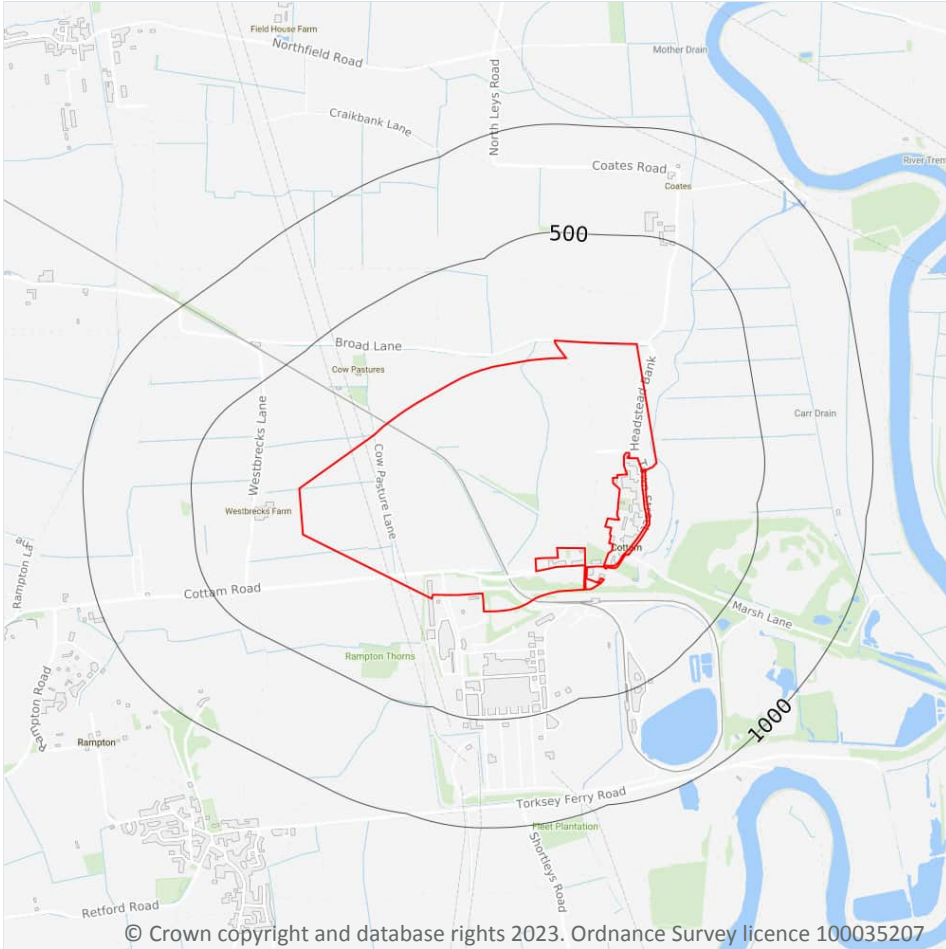
**Moderate**

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

Features are displayed on the Groundwater flooding map on **page 95**

*This data is sourced from Ambiantal Risk Analytics.*

## 10 Environmental designations



**— Site Outline**

Search buffers in metres (m)

**▨ Sites of Special Scientific Interest (SSSI)**

### 10.1 Sites of Special Scientific Interest (SSSI)

**Records within 2000m**

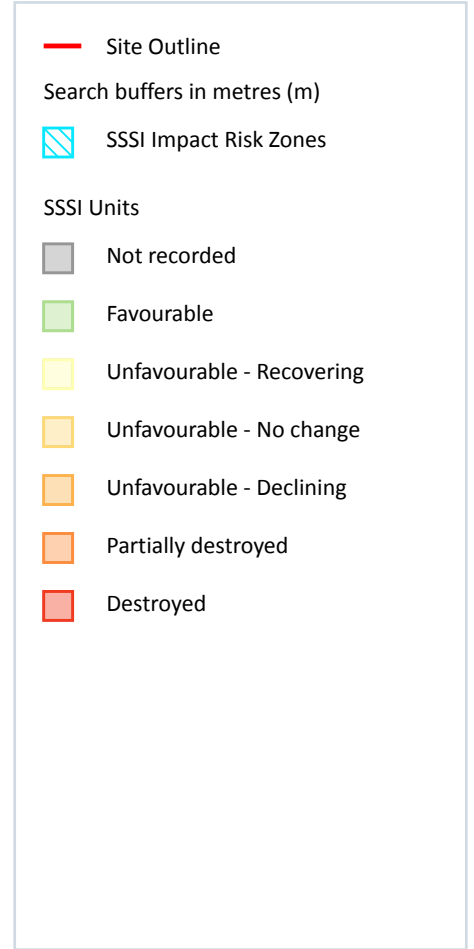
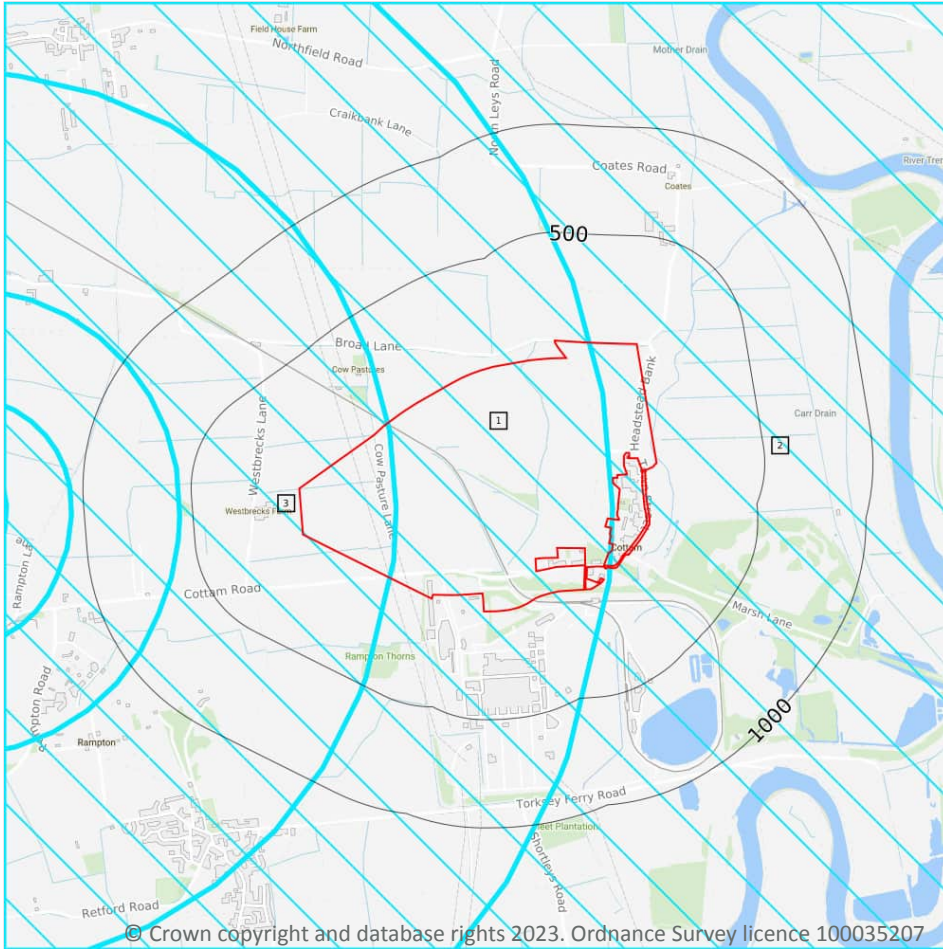
**1**

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

Features are displayed on the Environmental designations map on **page 96**

ID	Location	Name	Data source
-	1558m W	Ashton's Meadow	Natural England

## SSSI Impact Zones and Units



### 10.17 SSSI Impact Risk Zones

#### Records on site

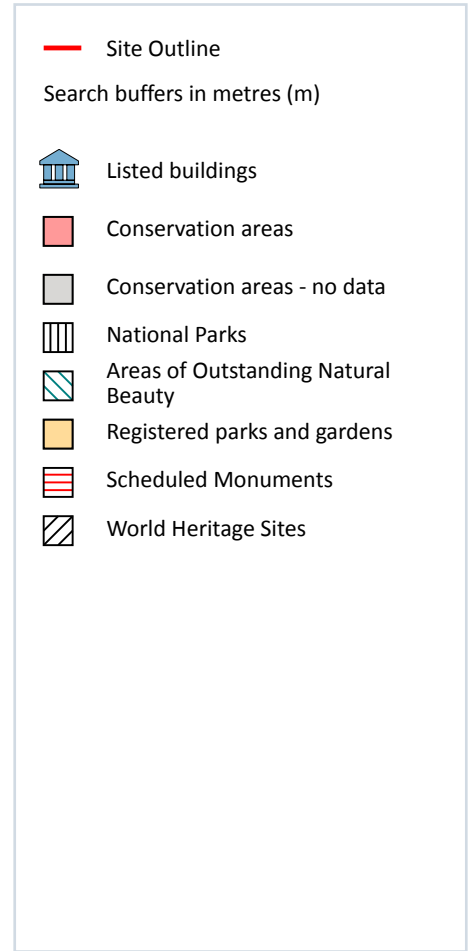
3

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

Features are displayed on the SSSI Impact Zones and Units map on **page 101**

ID	Location	Type of developments requiring consultation
1	On site	<p><b>Infrastructure - Airports, helipads and other aviation proposals.</b></p> <p><b>Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil &amp; gas exploration/extraction.</b></p> <p><b>Air pollution - Livestock &amp; poultry units with floorspace &gt; 500m<sup>2</sup>, slurry lagoons &amp; digestate stores &gt; 750m<sup>2</sup>, manure stores &gt; 3500t.</b></p>

## 11 Visual and cultural designations



### 11.1 World Heritage Sites

Records within 250m

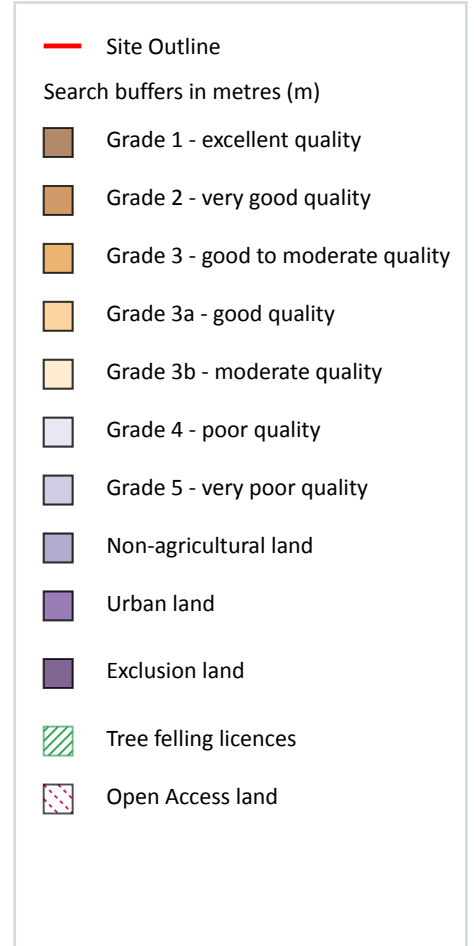
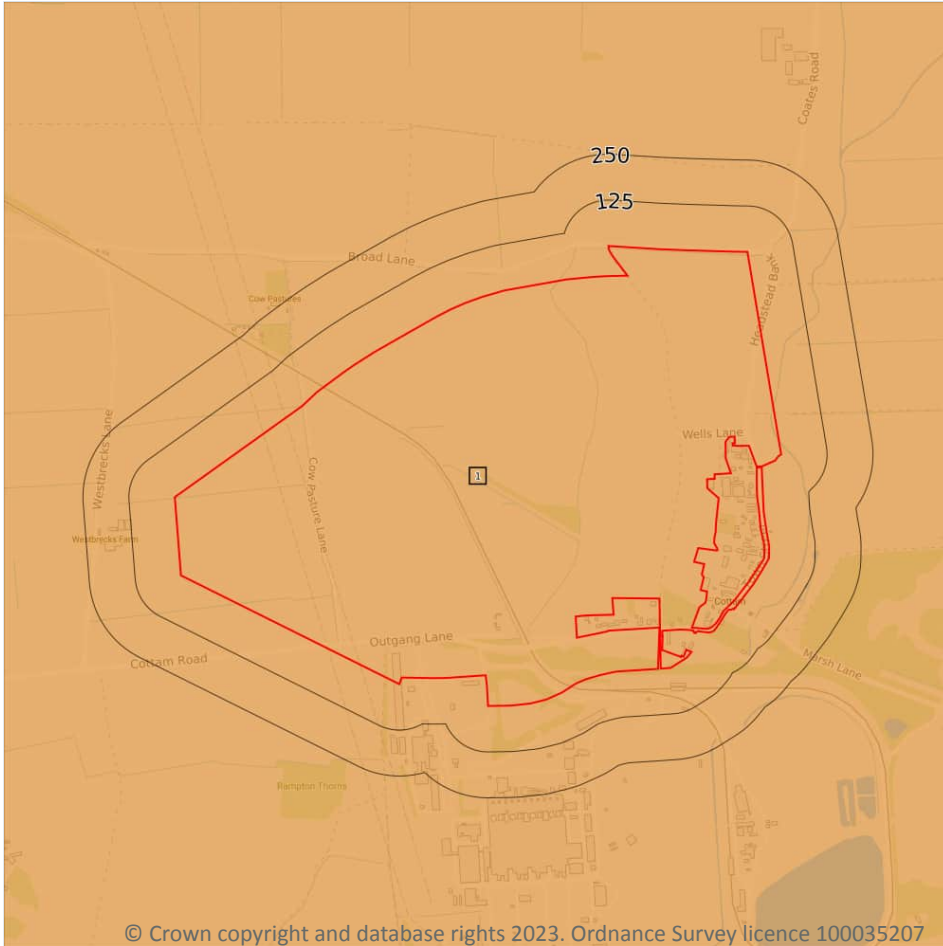
0

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

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



## 12 Agricultural designations



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### 12.1 Agricultural Land Classification

Records within 250m

1

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

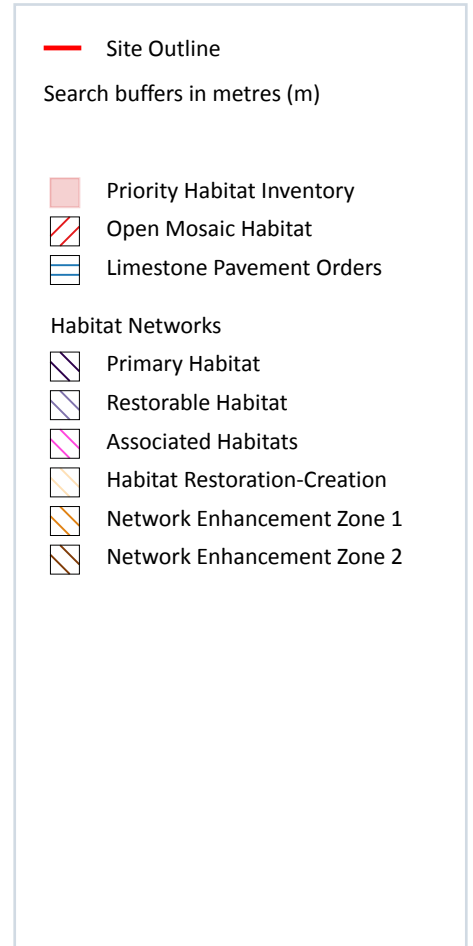
Features are displayed on the Agricultural designations map on **page 106**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

This data is sourced from Natural England.



## 13 Habitat designations



### 13.1 Priority Habitat Inventory

Records within 250m

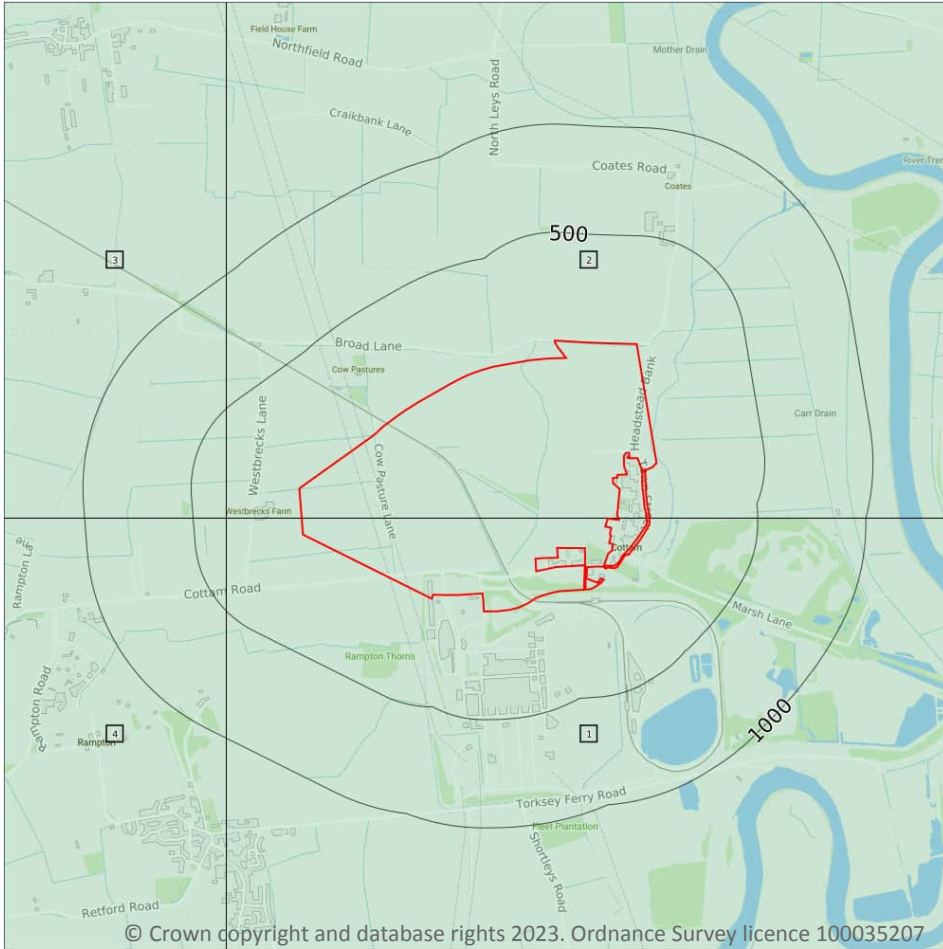
8

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

Features are displayed on the Habitat designations map on **page 108**

ID	Location	Main Habitat	Other habitats
1	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

## 14 Geology 1:10,000 scale - Availability



— Site Outline  
 Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

### 14.1 10k Availability

Records within 500m

4

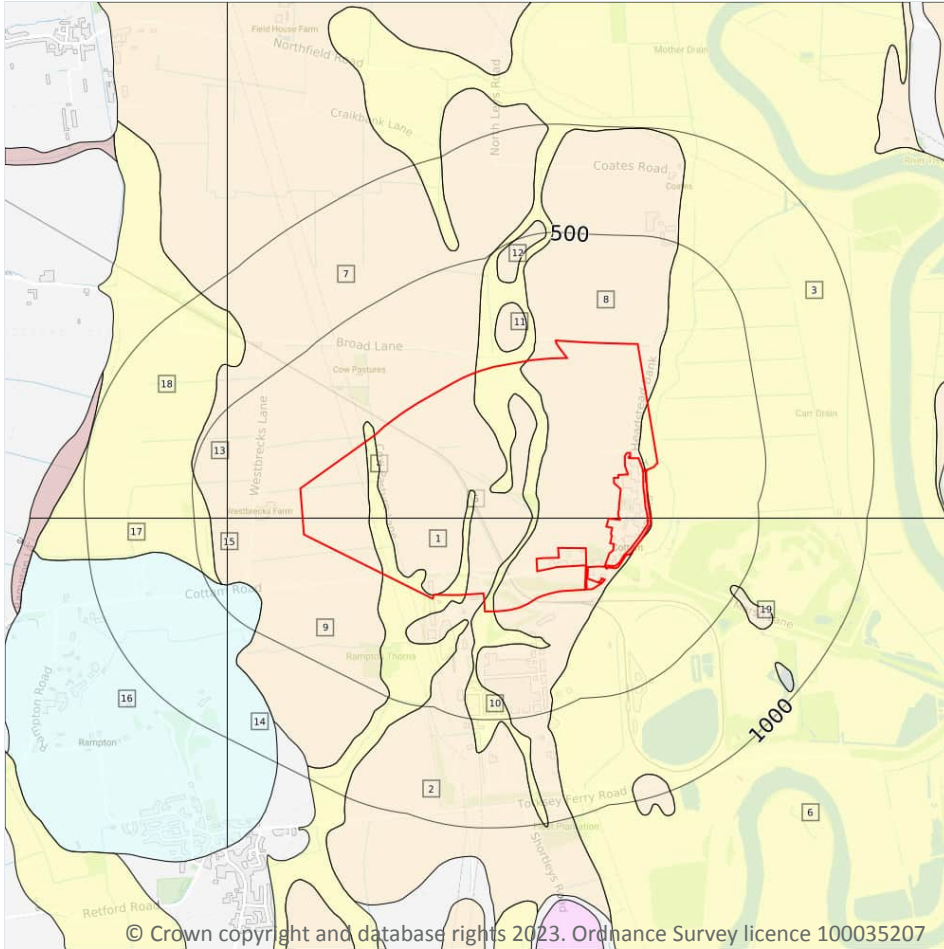
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 110**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	SK87NW
2	On site	No coverage	Full	Full	No coverage	SK88SW
3	338m W	No coverage	Full	Full	No coverage	SK78SE
4	347m W	No coverage	Full	Full	No coverage	SK77NE



## Geology 1:10,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (10k)
- Superficial geology (10k)  
Please see table for more details.

### 14.3 Superficial geology (10k)

Records within 500m

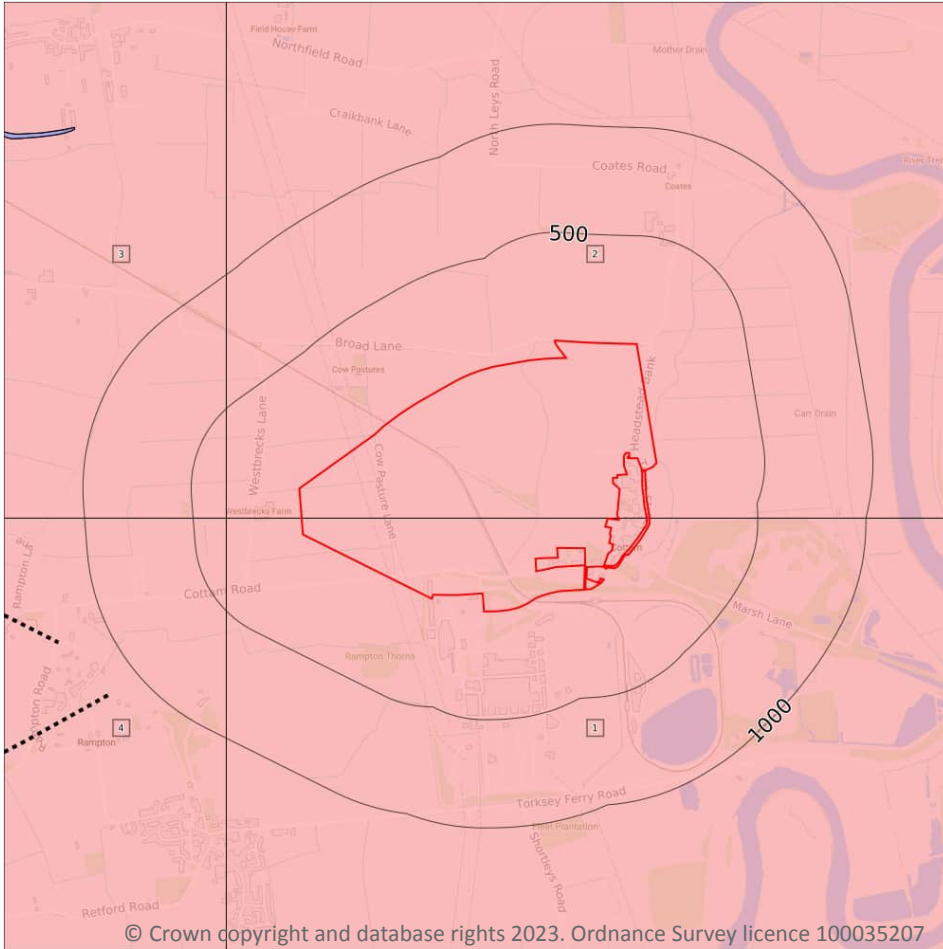
19

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

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 113**

ID	Location	LEX Code	Description	Rock description
1	On site	HPSG-XSV	Holme Pierrepont Sand And Gravel Member - Sand And Gravel	Sand And Gravel
2	On site	HPSG-XSV	Holme Pierrepont Sand And Gravel Member - Sand And Gravel	Sand And Gravel
3	On site	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel

## Geology 1:10,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (10k)
- Bedrock geology (10k)  
Please see table for more details.

### 14.5 Bedrock geology (10k)

Records within 500m

4

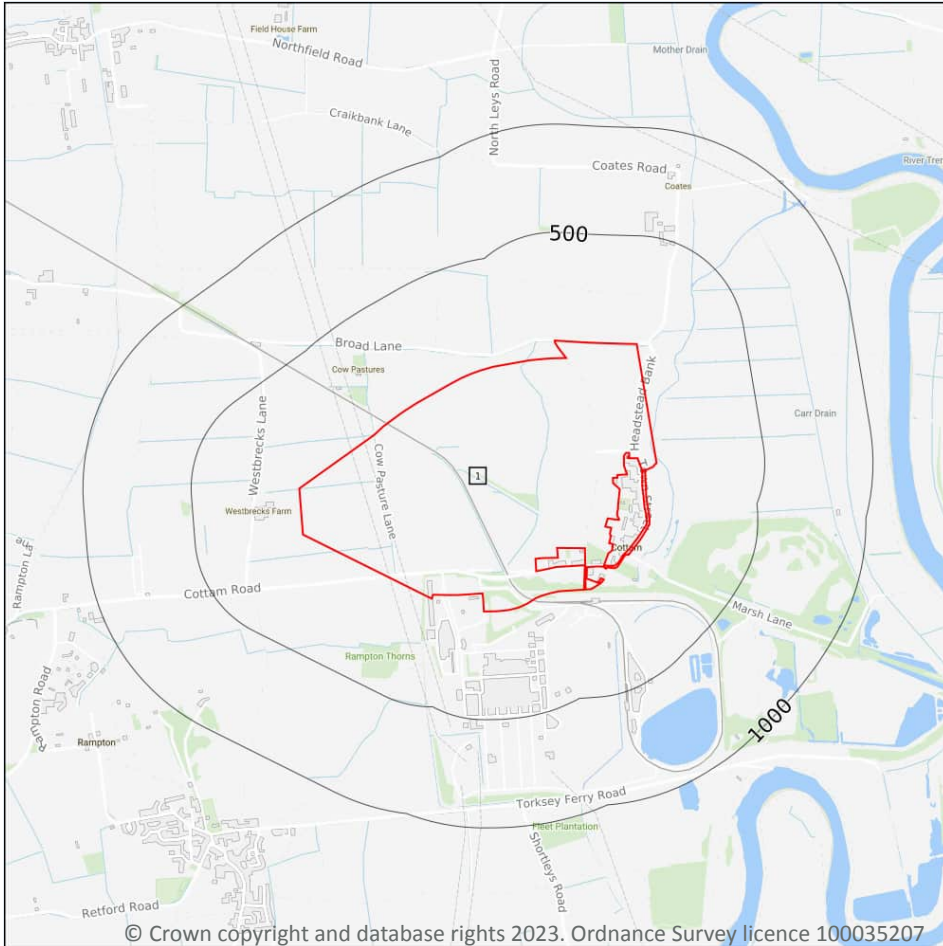
Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 115**

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
2	On site	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
3	338m W	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch



## 15 Geology 1:50,000 scale - Availability



— Site Outline  
Search buffers in metres (m)

□ Geological map tile

### 15.1 50k Availability

Records within 500m

1

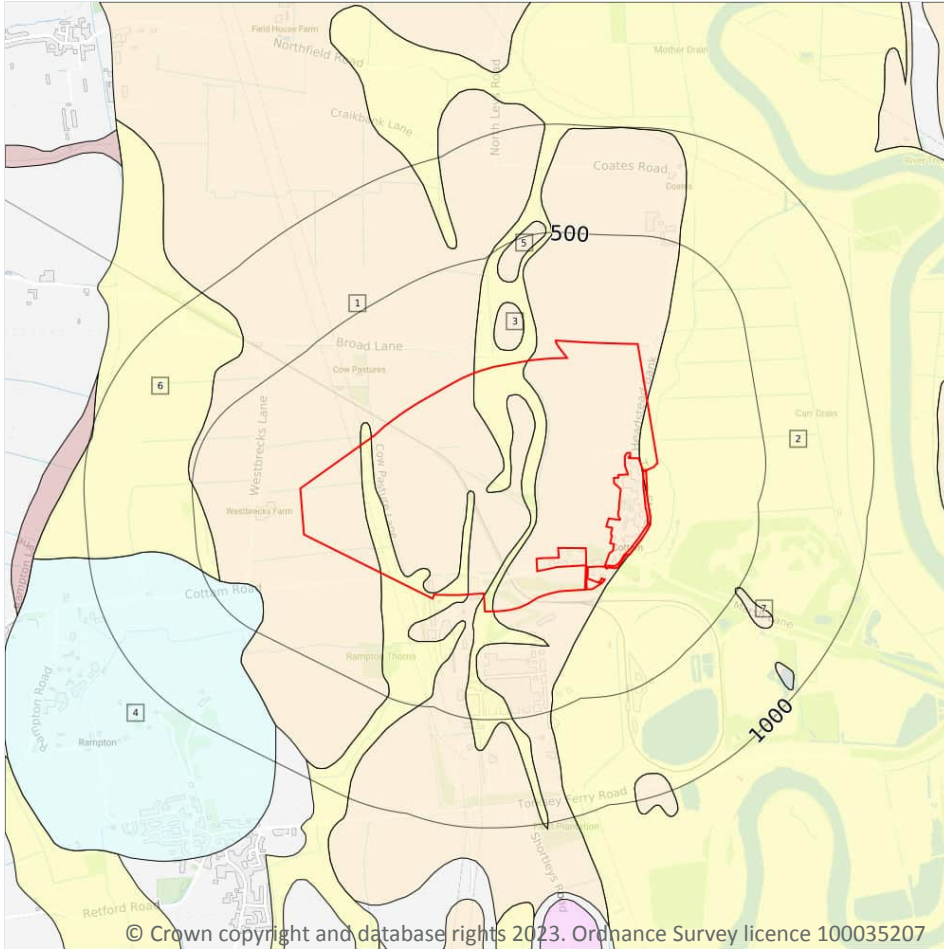
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 117**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW101_east_retford_v4

*This data is sourced from the British Geological Survey.*

## Geology 1:50,000 scale - Superficial



— Site Outline

Search buffers in metres (m)

▣ Landslip (50k)

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

### 15.4 Superficial geology (50k)

Records within 500m

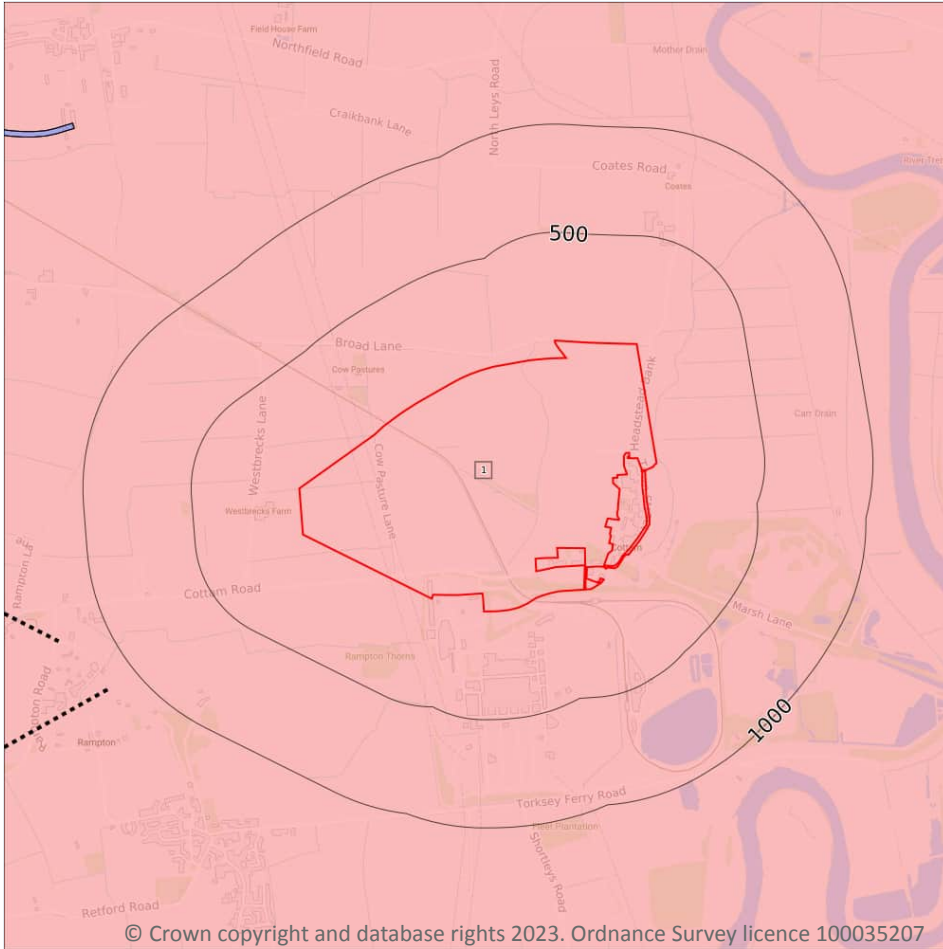
7

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 119**

ID	Location	LEX Code	Description	Rock description
1	On site	HPSG-XSV	HOLME PIERREPONT SAND AND GRAVEL MEMBER	SAND AND GRAVEL
2	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
3	61m N	HPSG-XSV	HOLME PIERREPONT SAND AND GRAVEL MEMBER	SAND AND GRAVEL

## Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (50k)
- Bedrock geology (50k)
- Please see table for more details.

### 15.8 Bedrock geology (50k)

Records within 500m

1

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

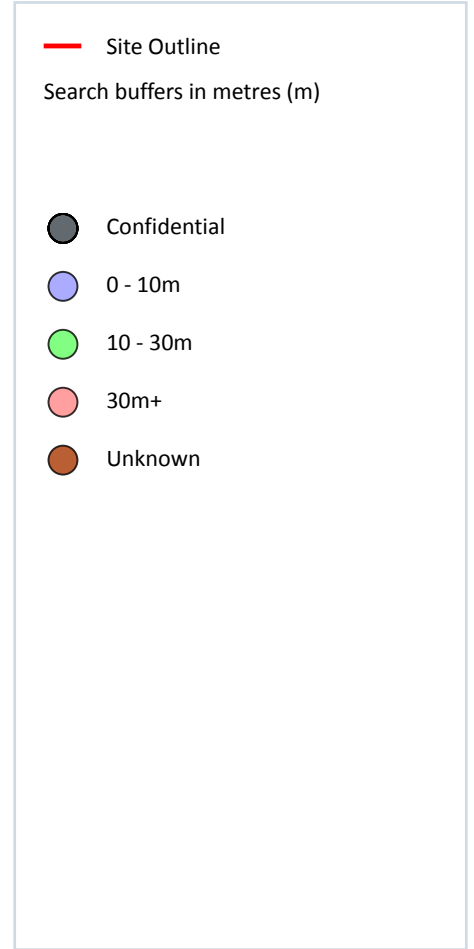
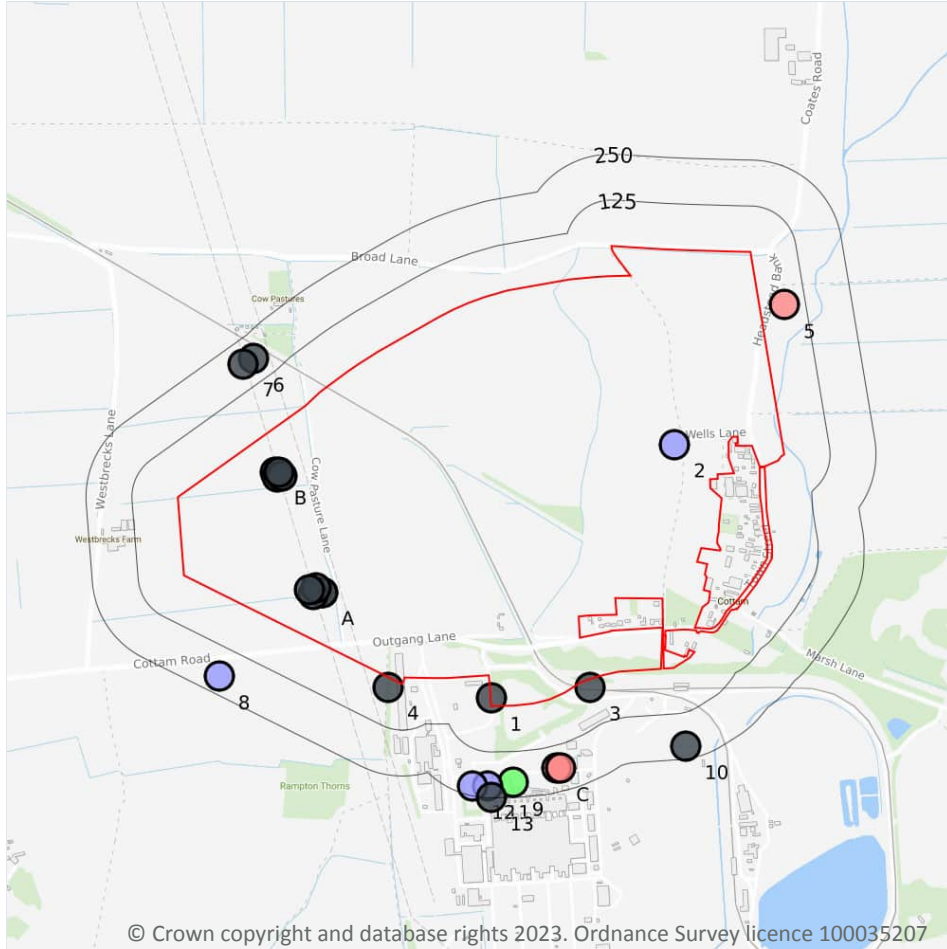
Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 122**

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	MERCIA MUDSTONE GROUP - MUDSTONE	-

*This data is sourced from the British Geological Survey.*



## 16 Boreholes



### 16.1 BGS Boreholes

Records within 250m

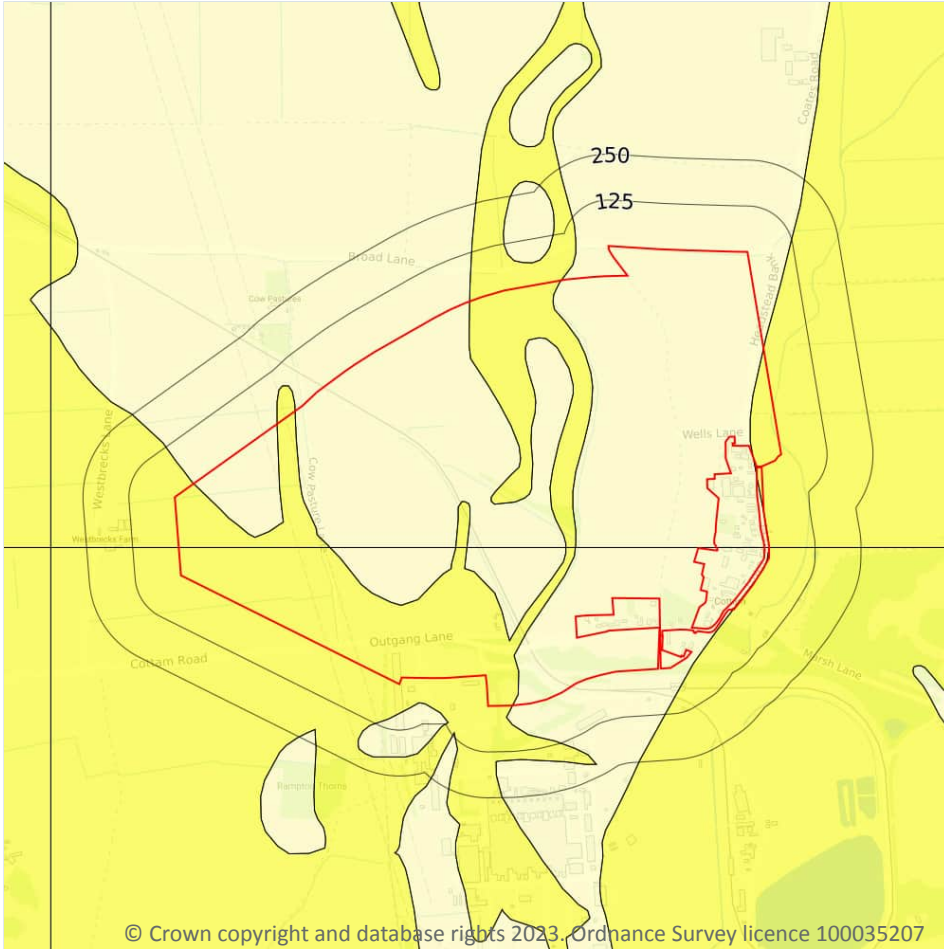
24

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

Features are displayed on the Boreholes map on **page 124**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	481190 379590	COTTAM POWER STATION 14A	-	Y	N/A
2	On site	481690 380280	COTTAM	8.0	N	<a href="#">244178</a>

## 17 Natural ground subsidence - Shrink swell clays



— Site Outline  
Search buffers in metres (m)

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

### 17.1 Shrink swell clays

Records within 50m

2

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

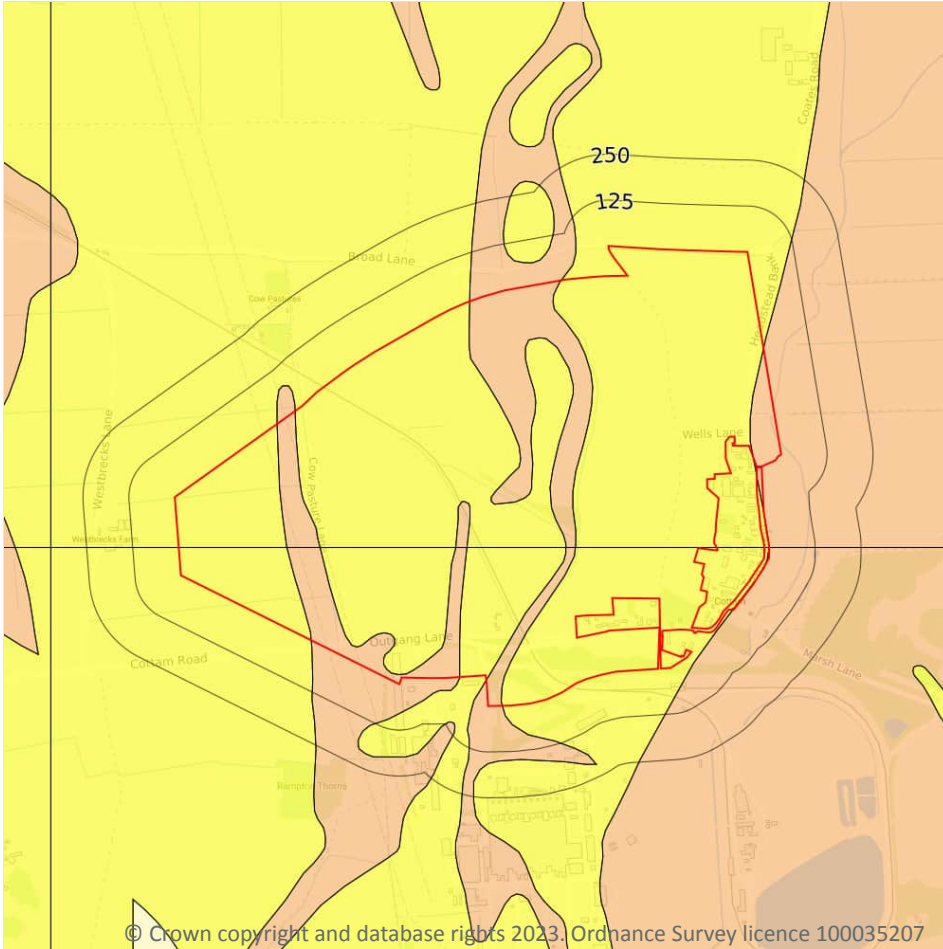
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 127**

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.

*This data is sourced from the British Geological Survey.*



## Natural ground subsidence - Running sands



### 17.2 Running sands

Records within 50m

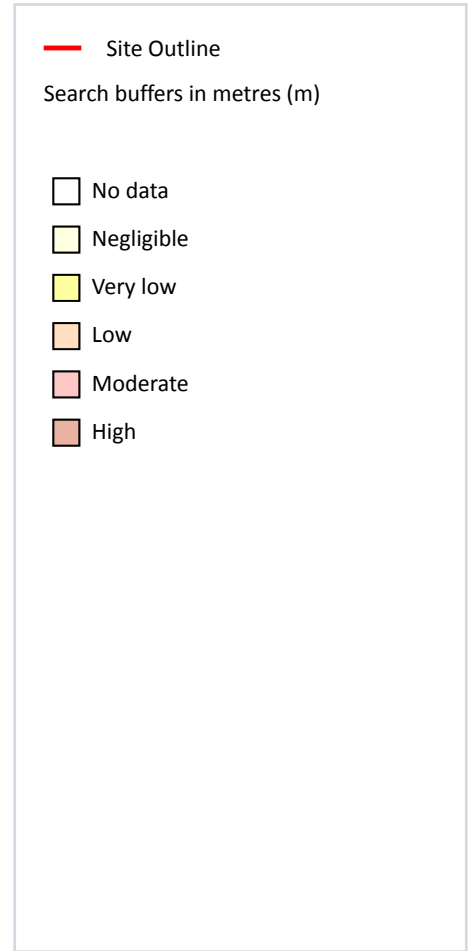
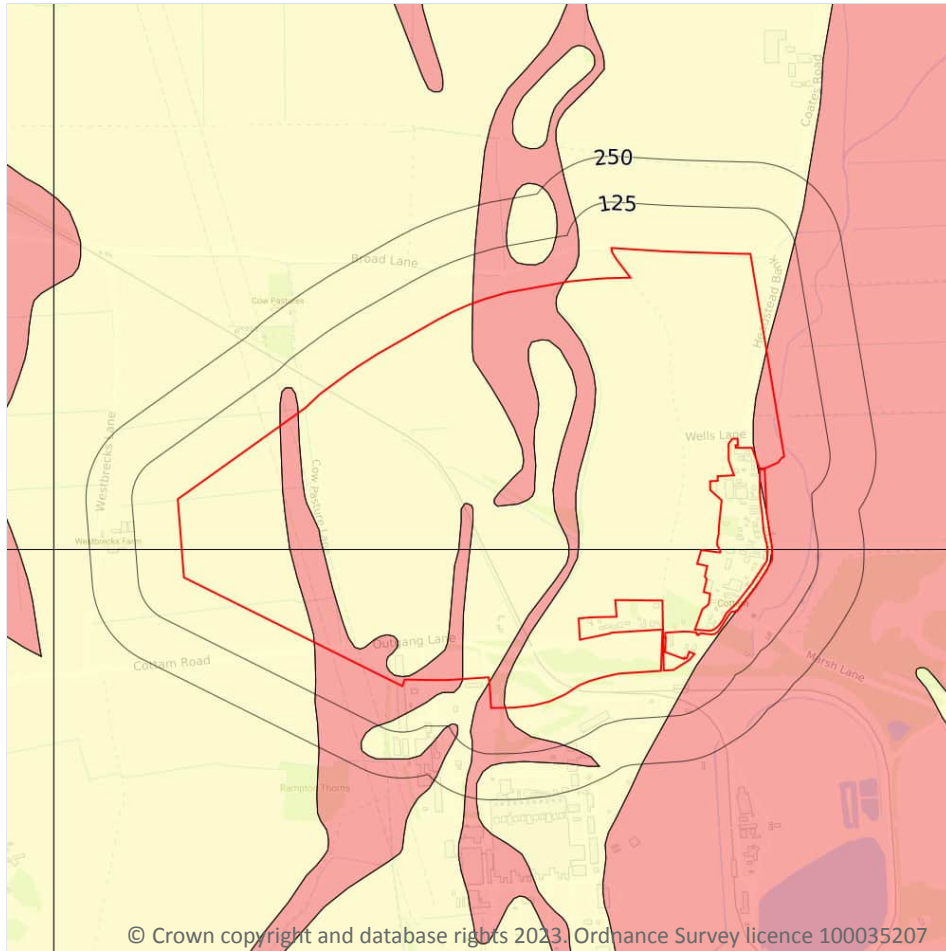
2

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

Features are displayed on the Natural ground subsidence - Running sands map on **page 128**

Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

## Natural ground subsidence - Compressible deposits



### 17.3 Compressible deposits

Records within 50m

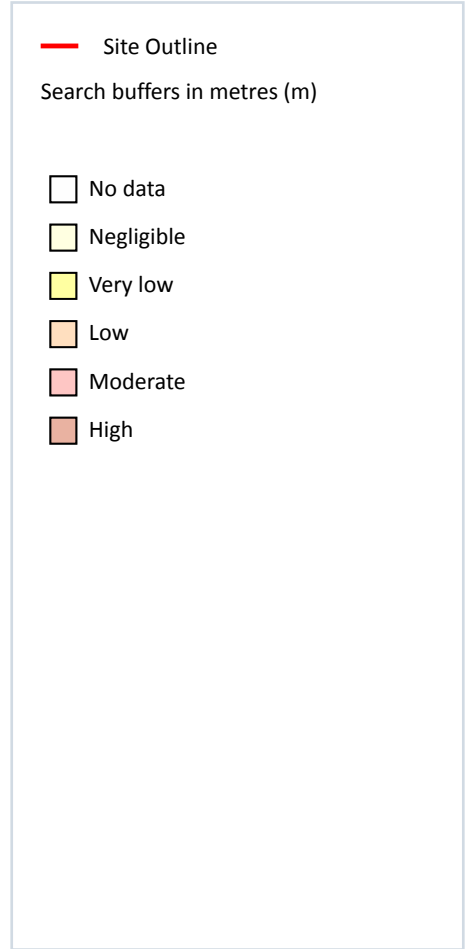
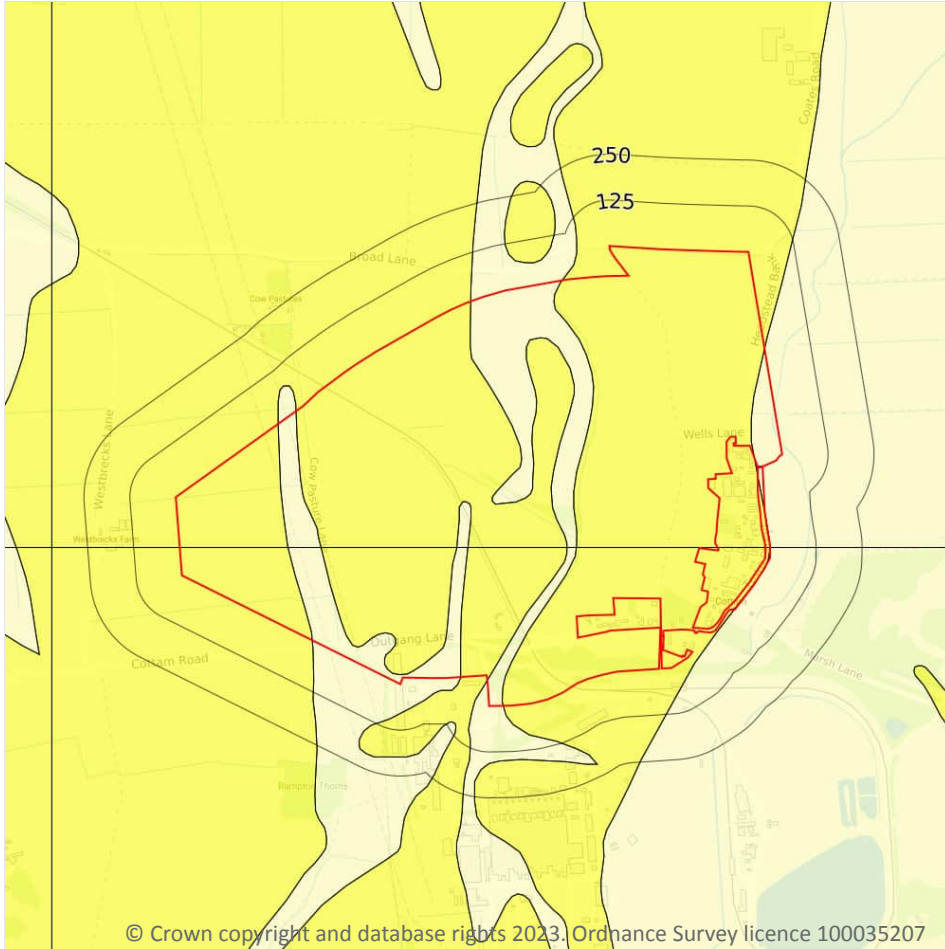
2

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 130**

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

## Natural ground subsidence - Collapsible deposits



### 17.4 Collapsible deposits

Records within 50m

2

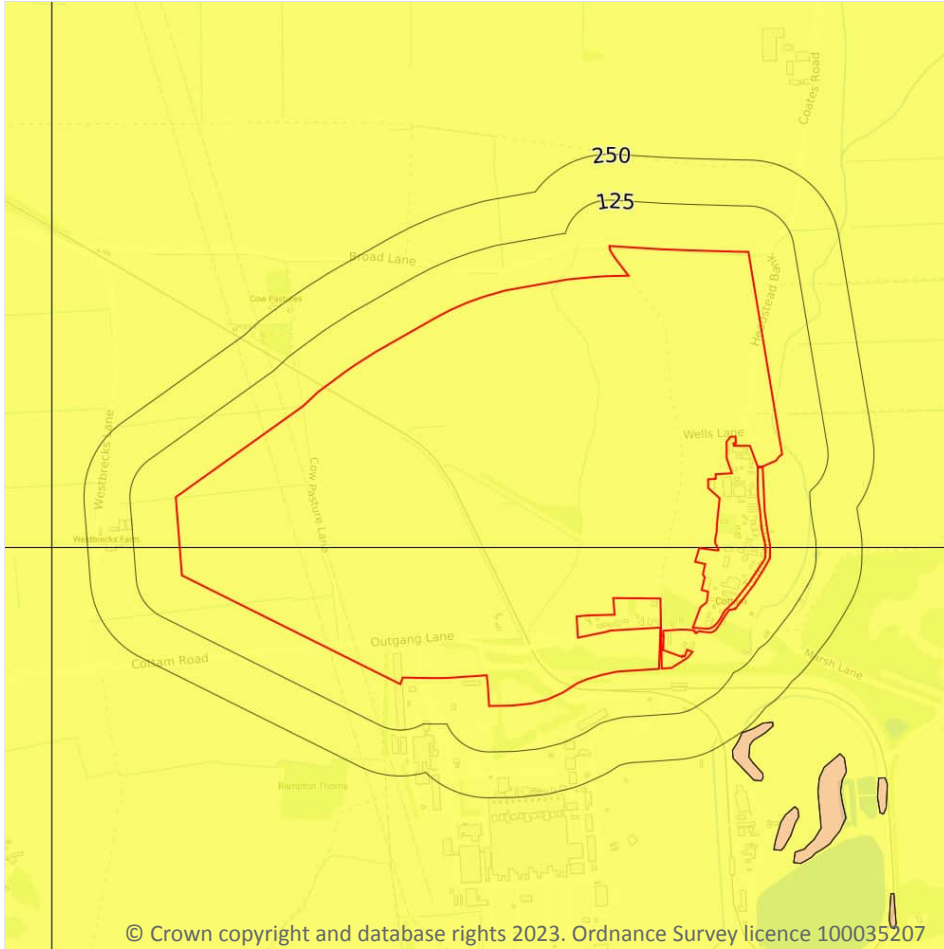
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 132**

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

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Landslides



— Site Outline  
Search buffers in metres (m)

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

### 17.5 Landslides

Records within 50m

1

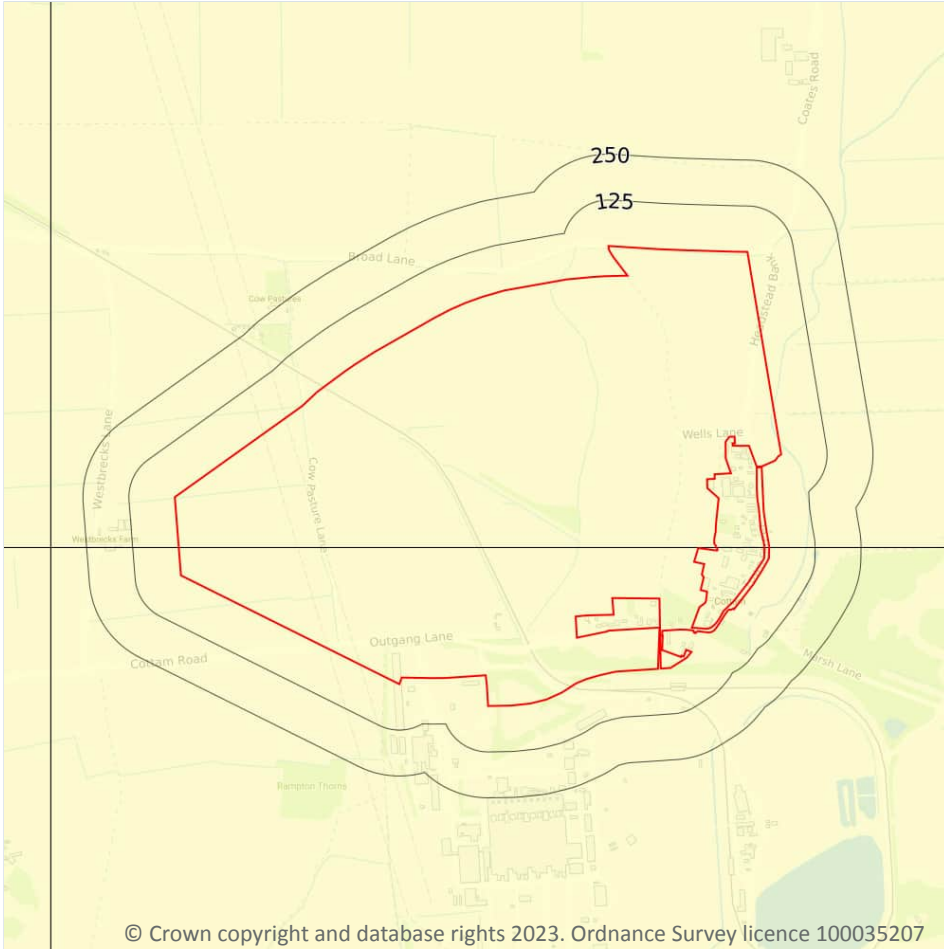
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 133**

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

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

Records within 50m

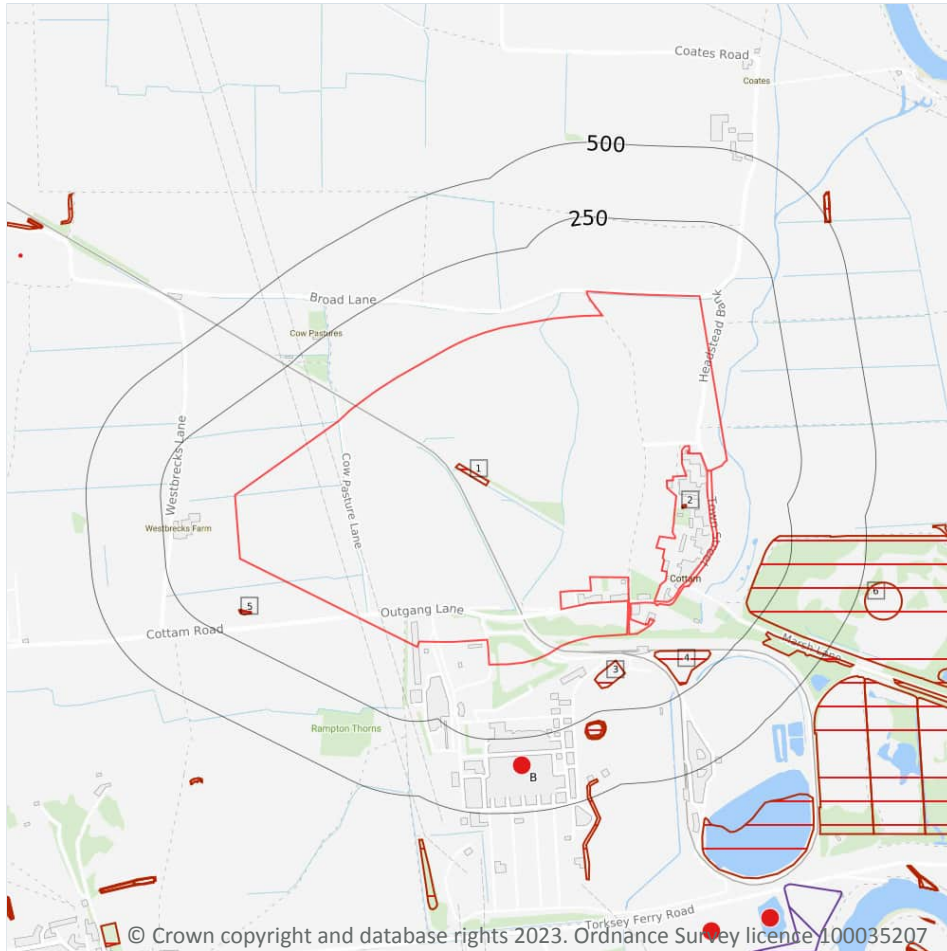
1

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

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 134**

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

## 18 Mining, ground workings and natural cavities



### 18.1 Natural cavities

Records within 500m

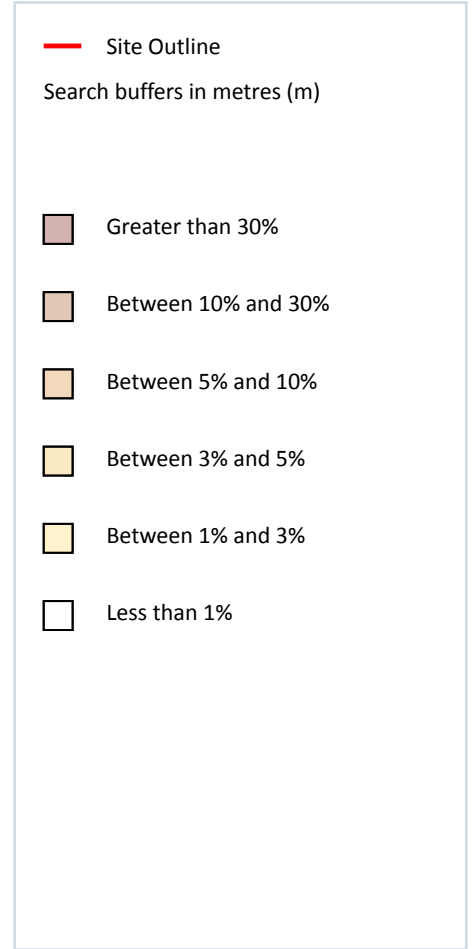
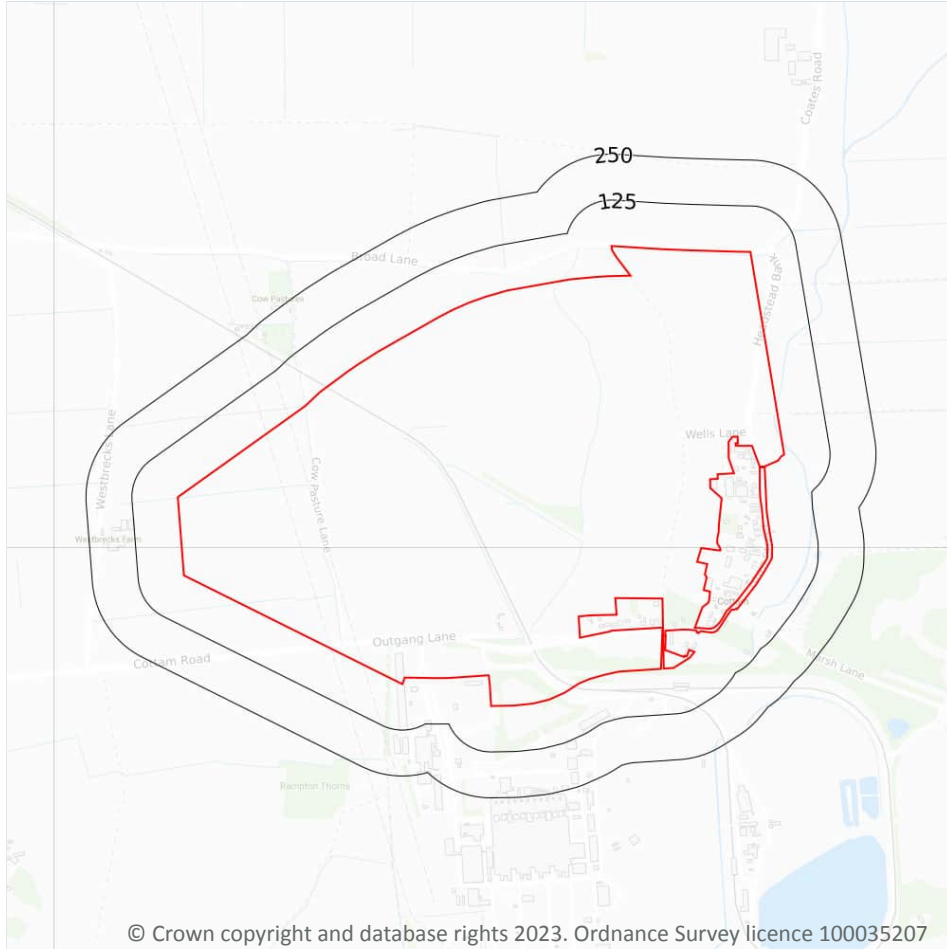
0

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

*This data is sourced from Stantec UK Ltd.*



## 19 Radon



### 19.1 Radon

#### Records on site

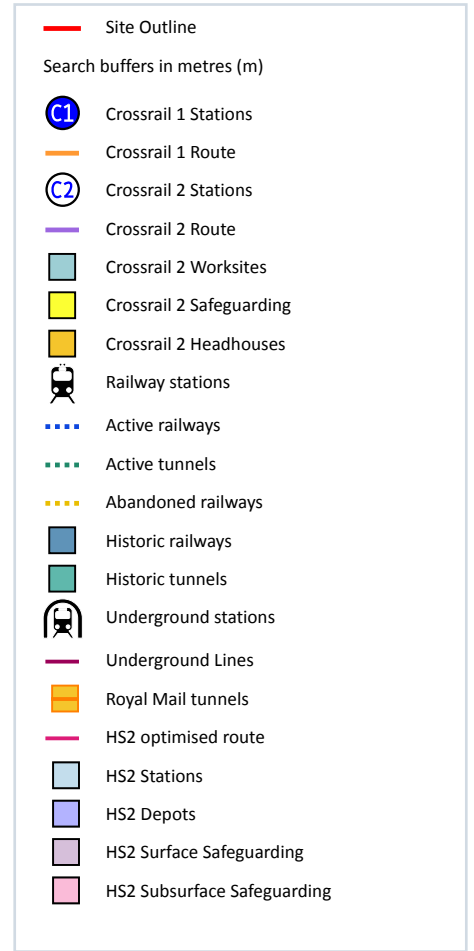
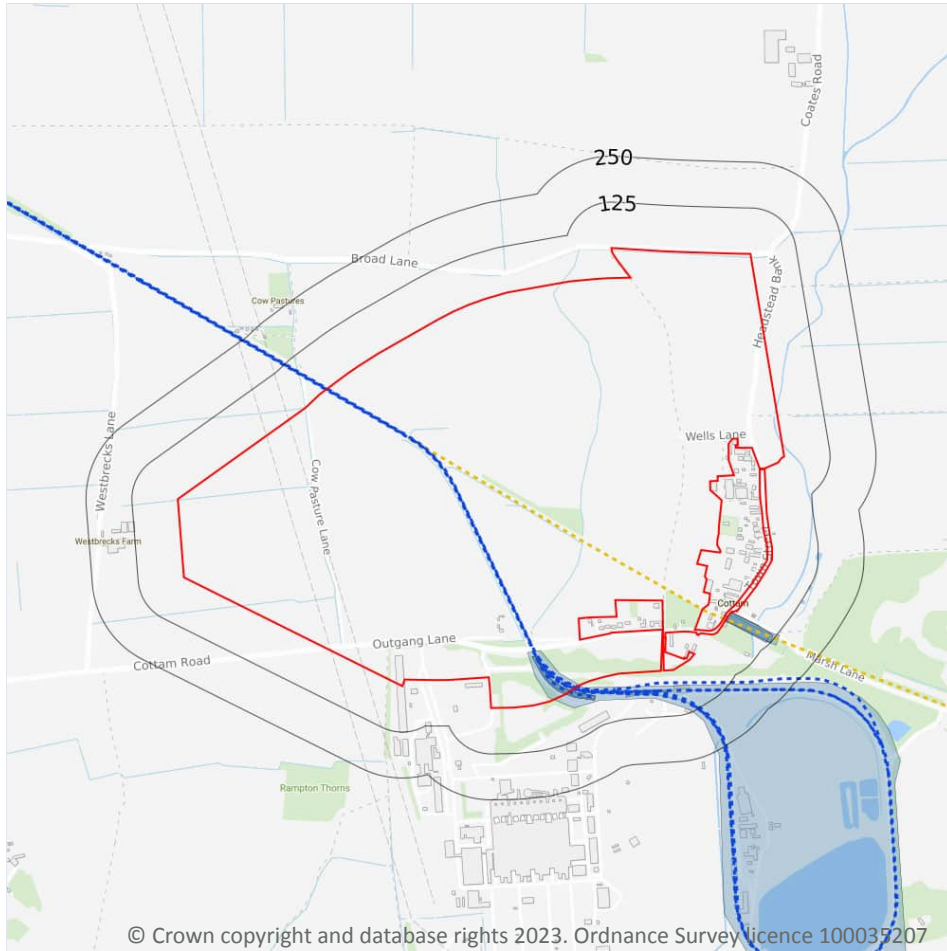
1

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

Features are displayed on the Radon map on **page 141**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None

## 21 Railway infrastructure and projects



### 21.1 Underground railways (London)

Records within 250m

0

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

*This data is sourced from publicly available information by Groundsure.*

### 21.2 Underground railways (Non-London)

Records within 250m

0

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

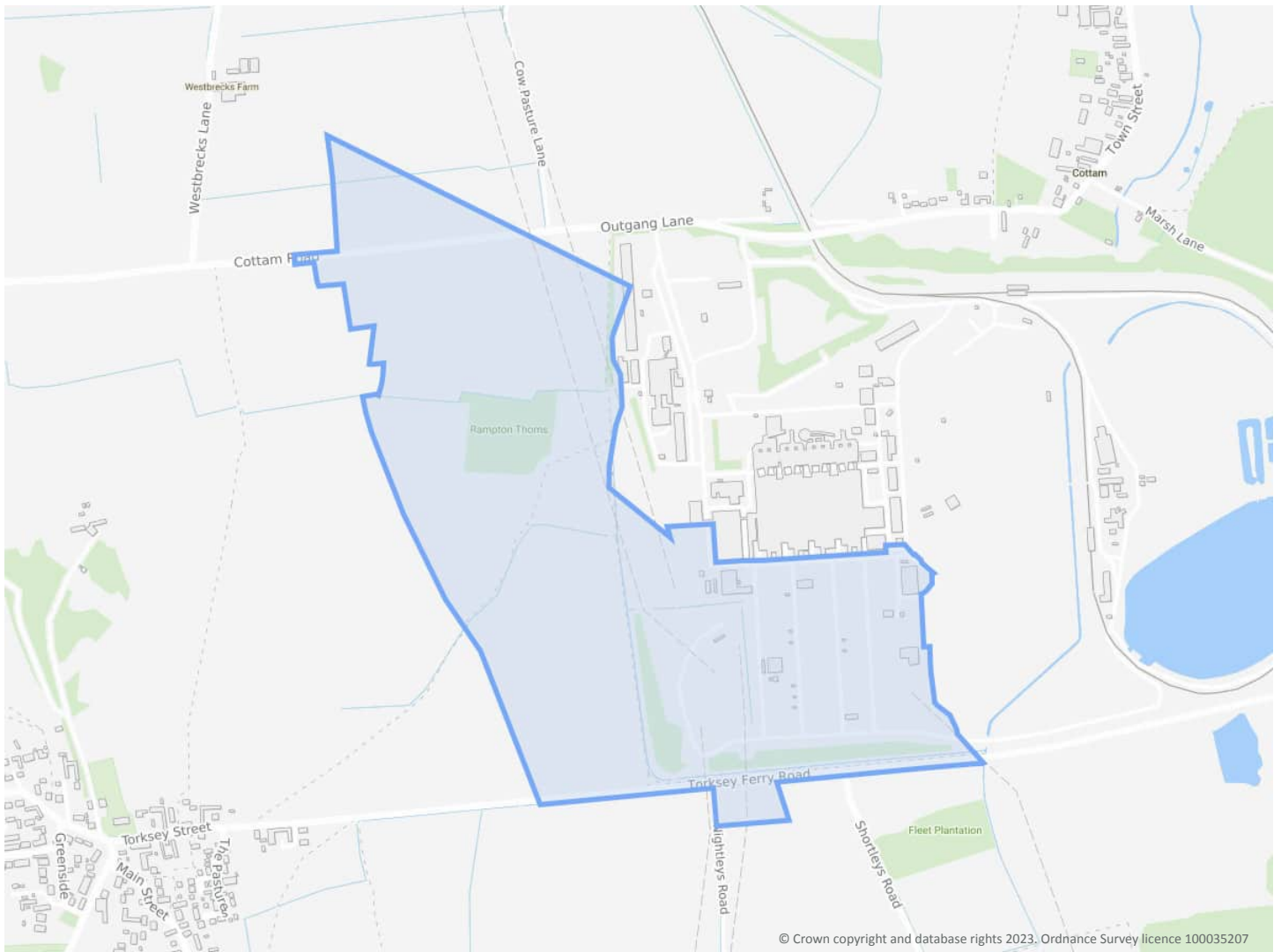
## Tillbridge cable run area

### Order Details

**Date:** 13/02/2023  
**Your ref:** ref 60677969  
**Our Ref:** GSIP-2023-13376-12945\_9

### Site Details

**Location:** 480998 379194  
**Area:** 75.78 ha  
**Authority:** [Bassetlaw District Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

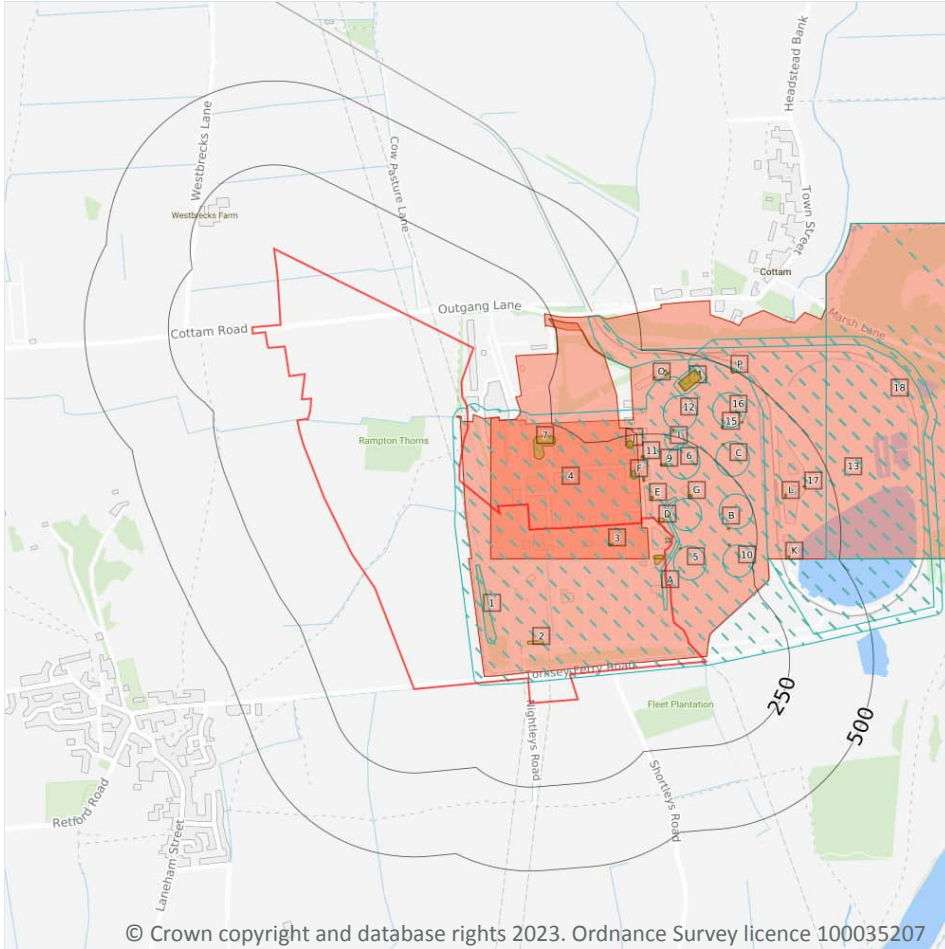
N/A: >10ha

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000

# 1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features

## 1.1 Historical industrial land uses

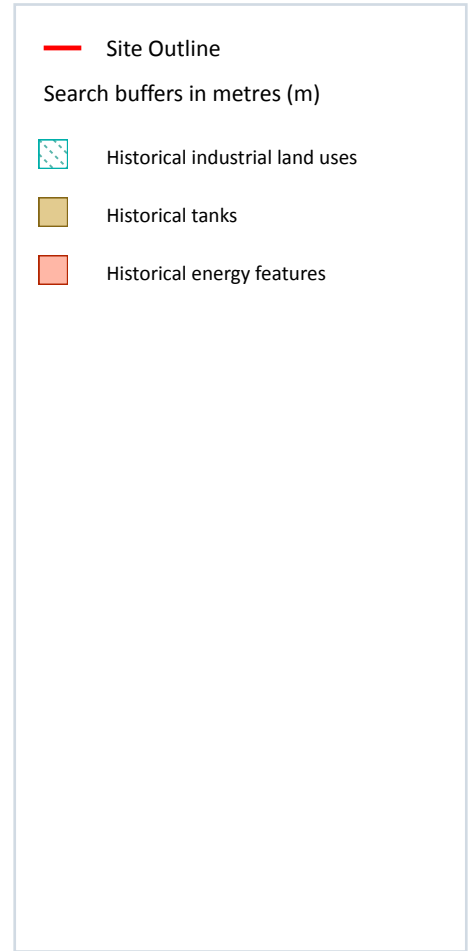
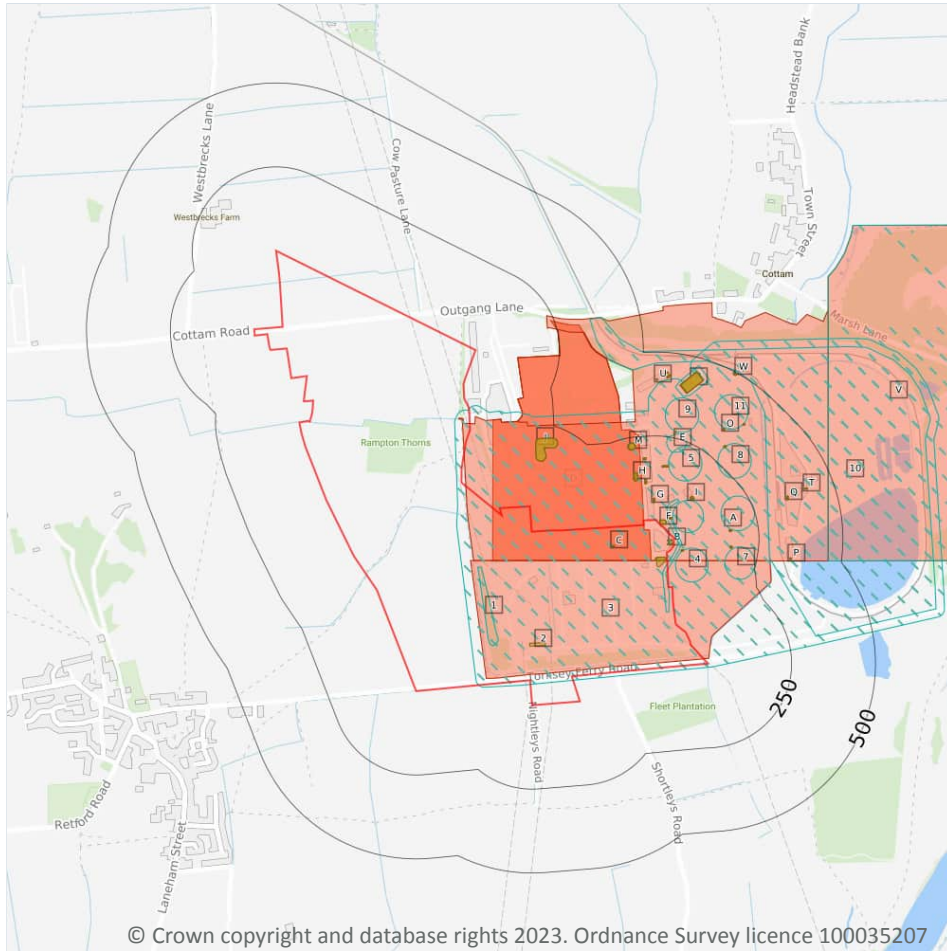
**Records within 500m** **20**

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

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

ID	Location	Land use	Dates present	Group ID
1	On site	Unspecified Heap	1978	1569853

## 2 Past land use - un-grouped



### 2.1 Historical industrial land uses

Records within 500m

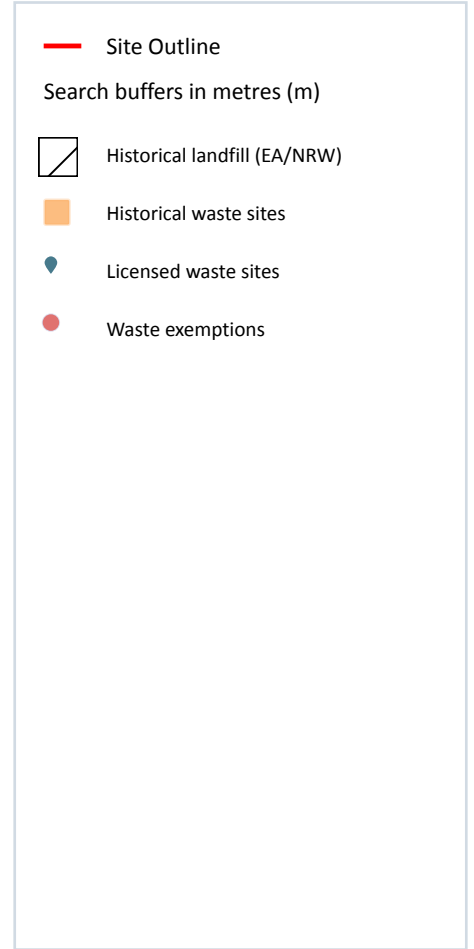
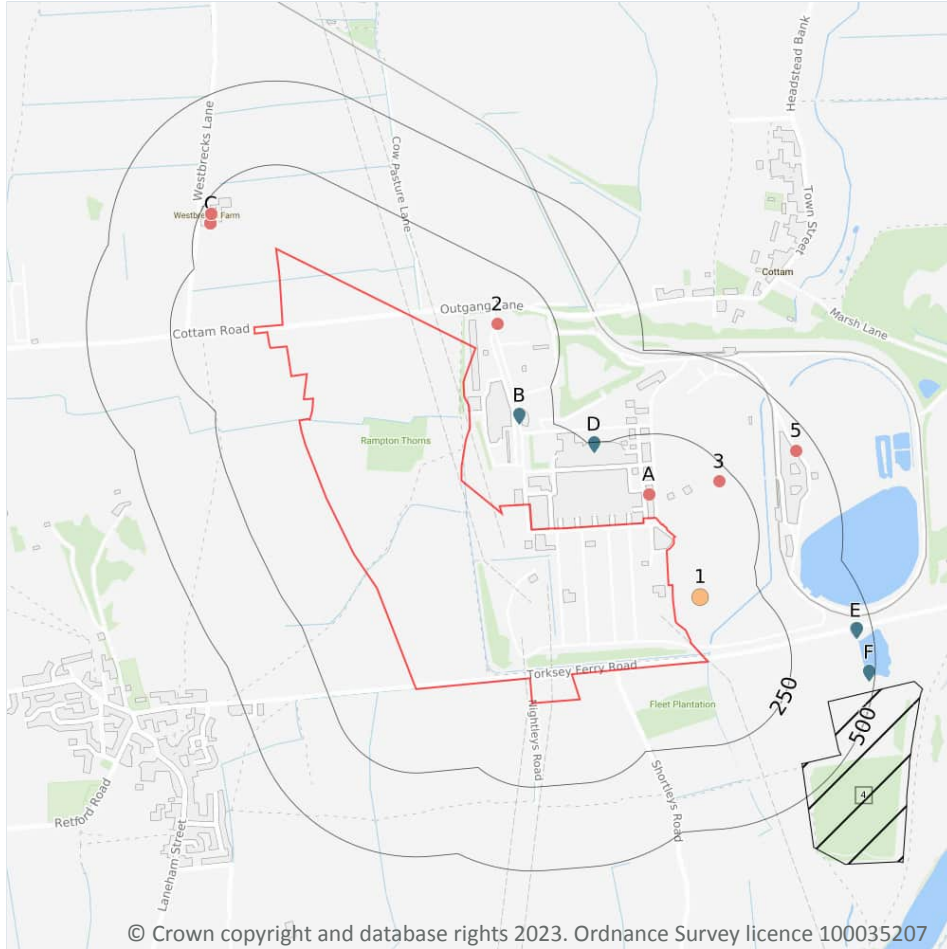
20

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

Features are displayed on the Past land use - un-grouped map on **page 18**

ID	Location	Land Use	Date	Group ID
1	On site	Unspecified Heap	1978	1569853
A	On site	Power Station	1978	1750405
B	On site	Chimney	1978	1606130

## 3 Waste and landfill



### 3.1 Active or recent landfill

Records within 500m

0

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

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

### 3.2 Historical landfill (BGS records)

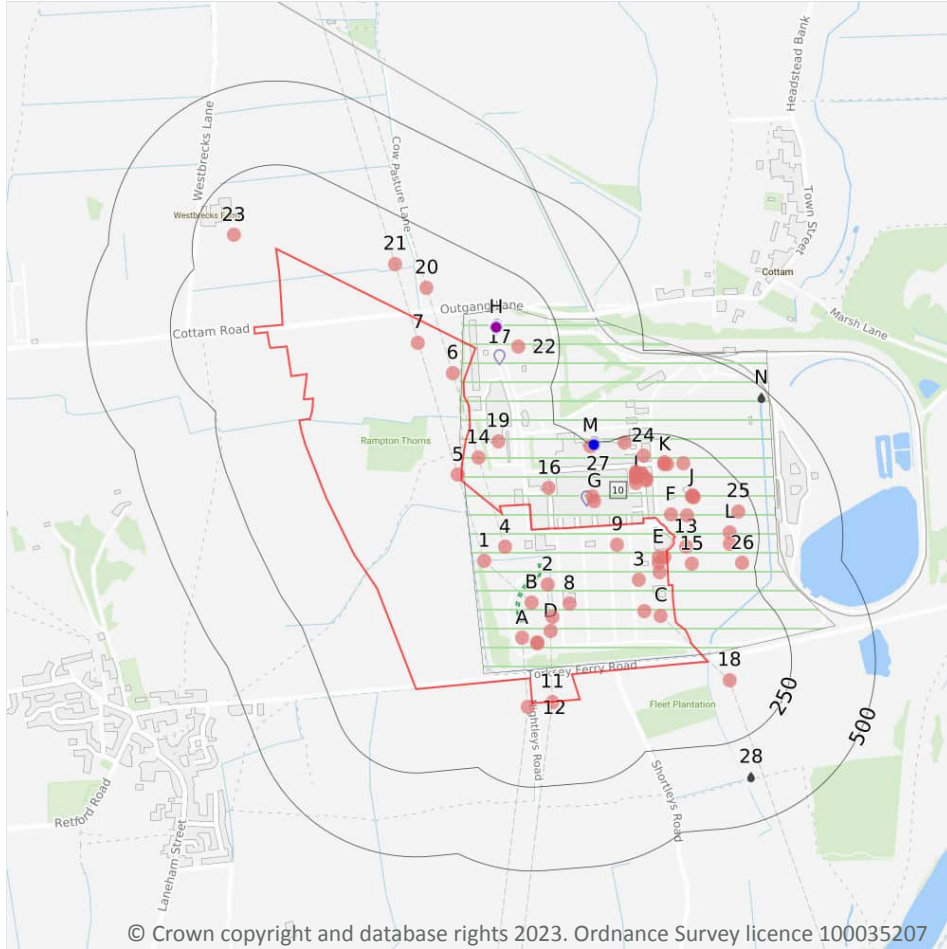
Records within 500m

0

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

*This data is sourced from the British Geological Survey.*

## 4 Current industrial land use



### 4.1 Recent industrial land uses

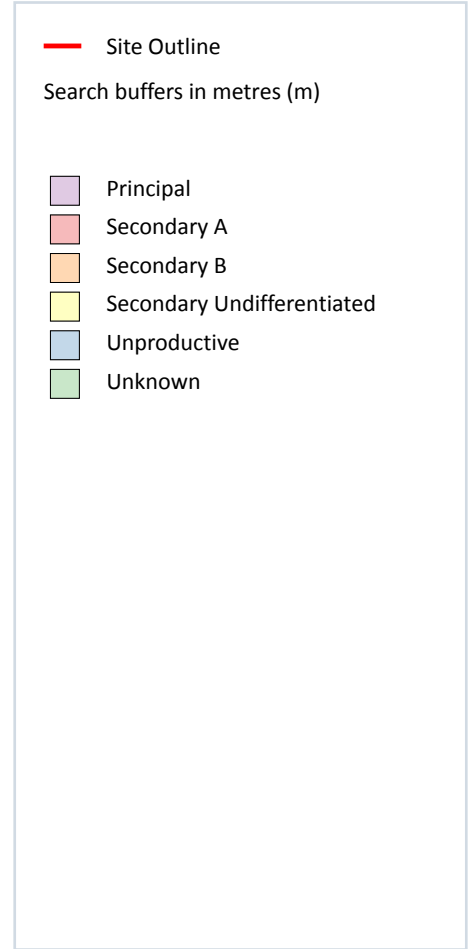
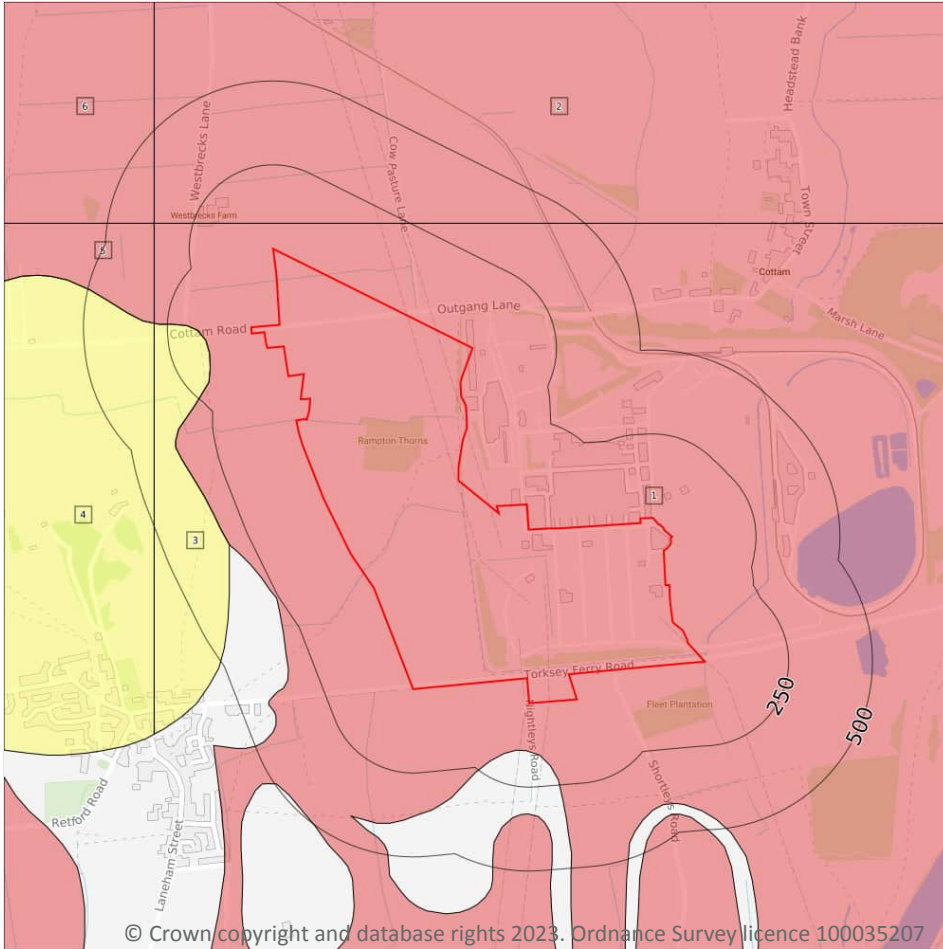
**Records within 250m** **60**

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 32**

ID	Location	Company	Address	Activity	Category
1	On site	Pylon	Nottinghamshire, DN22	Electrical Features	Infrastructure and Facilities
2	On site	Pylon	Nottinghamshire, DN22	Electrical Features	Infrastructure and Facilities
3	On site	Pylon	Nottinghamshire, DN22	Electrical Features	Infrastructure and Facilities

## 5 Hydrogeology - Superficial aquifer



### 5.1 Superficial aquifer

Records within 500m

6

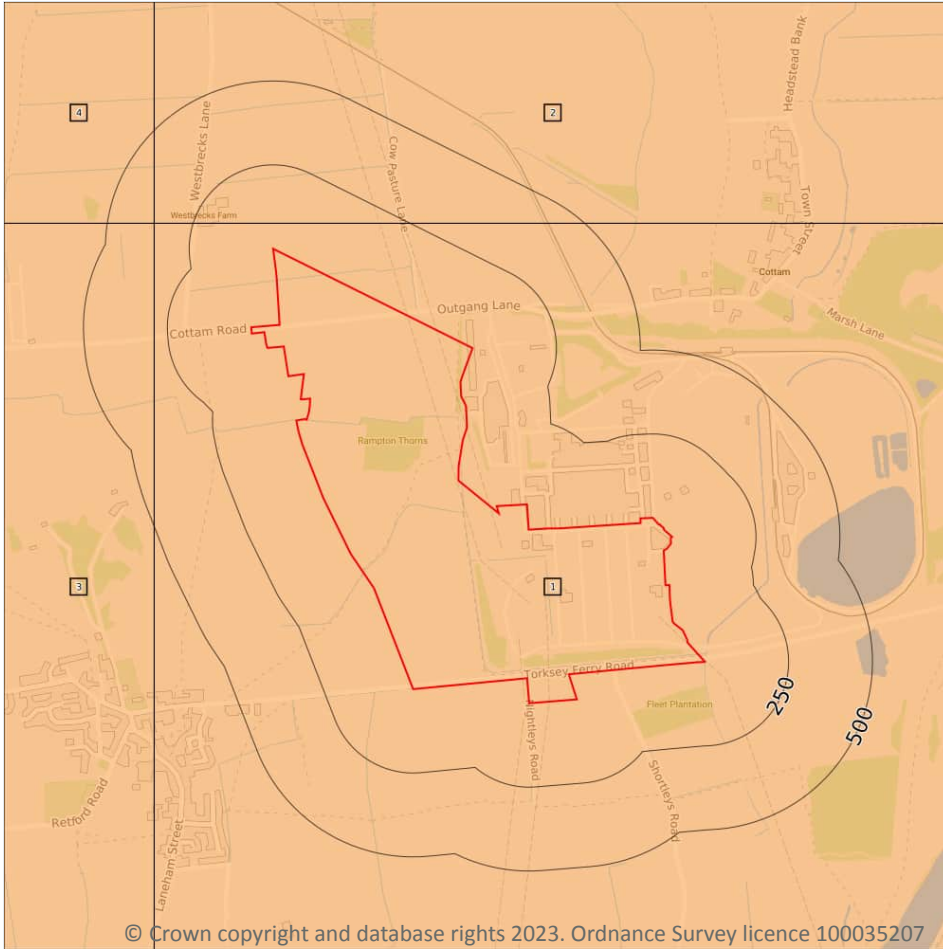
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 64**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	76m NW	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



## Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

### 5.2 Bedrock aquifer

Records within 500m

4

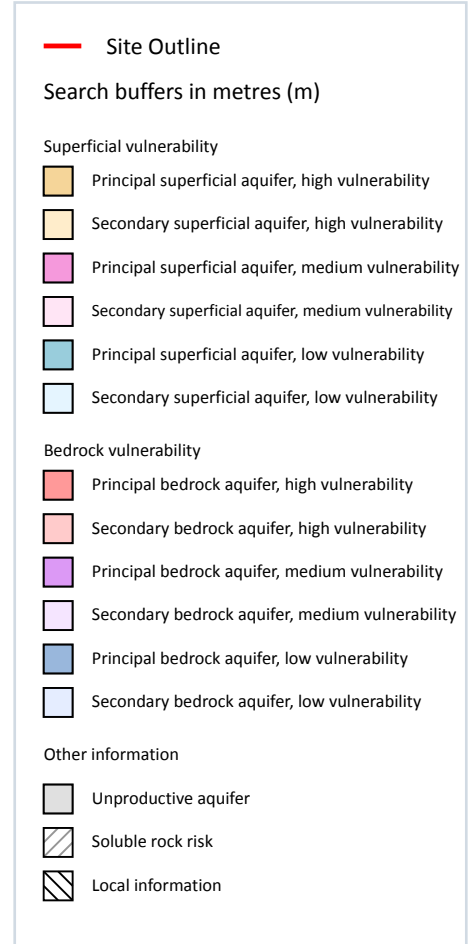
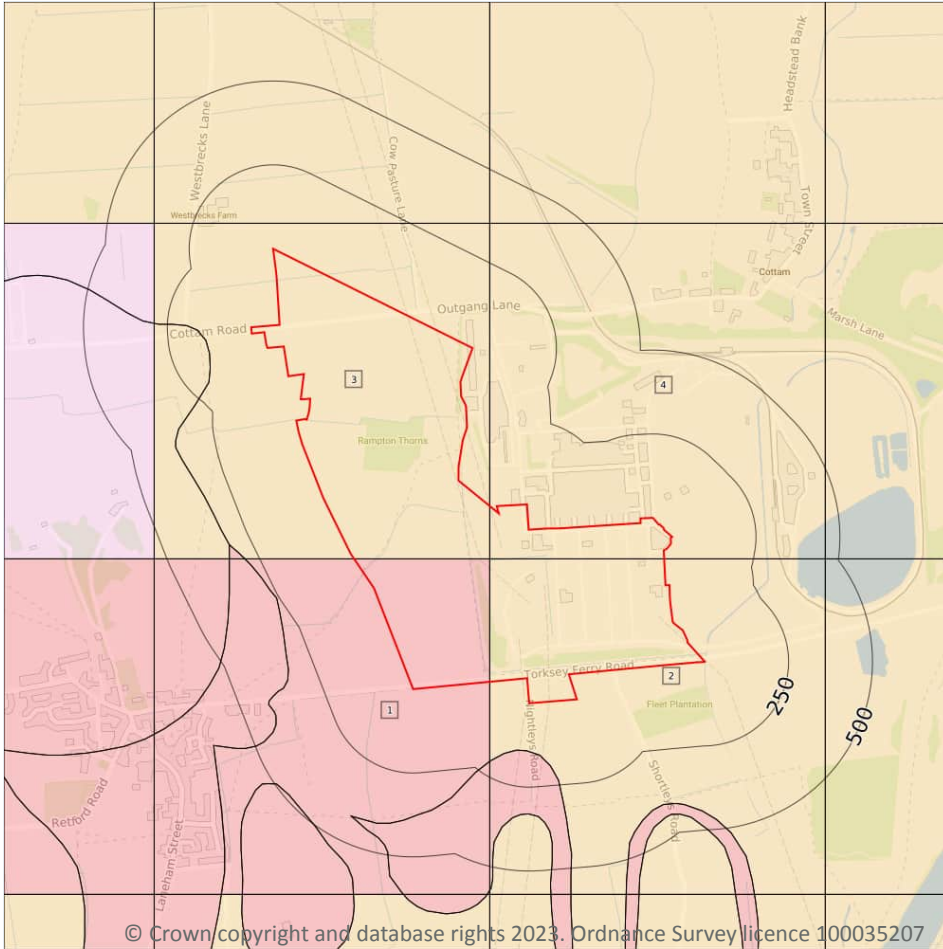
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 66**

ID	Location	Designation	Description
1	On site	Secondary B	<b>Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers</b>
2	76m NW	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers



## Groundwater vulnerability



### 5.3 Groundwater vulnerability

Records within 50m

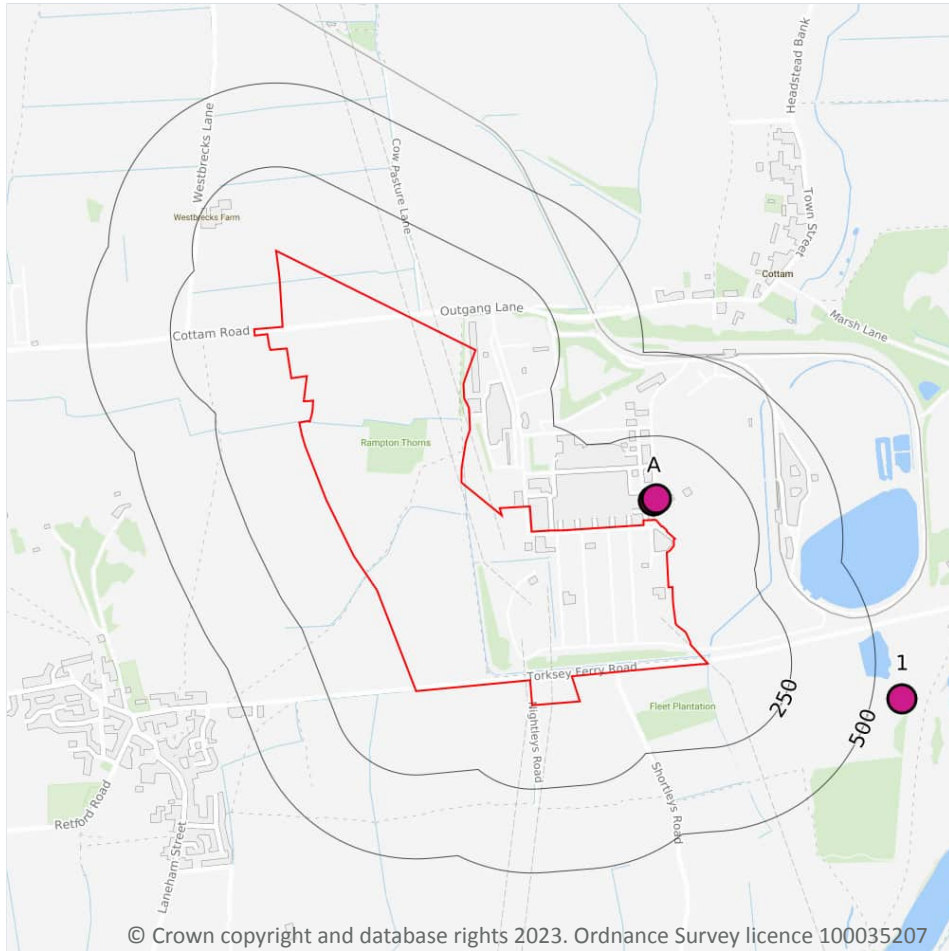
4

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

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

Features are displayed on the Groundwater vulnerability map on **page 68**

## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

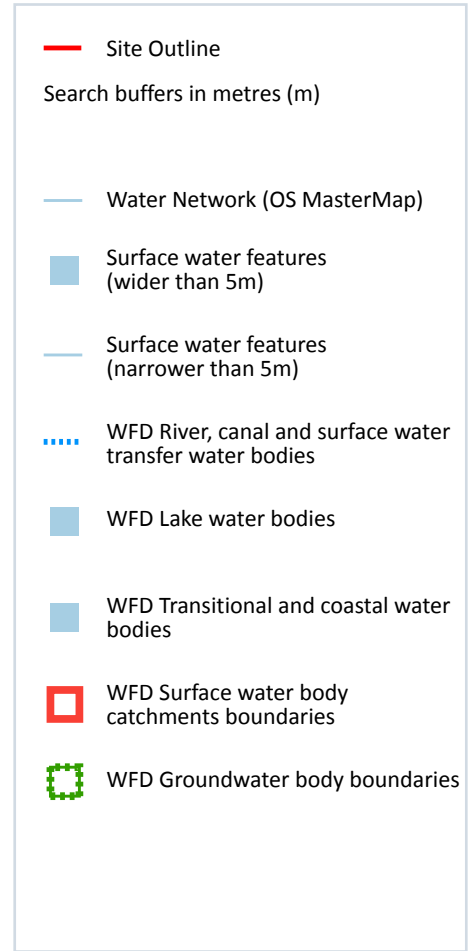
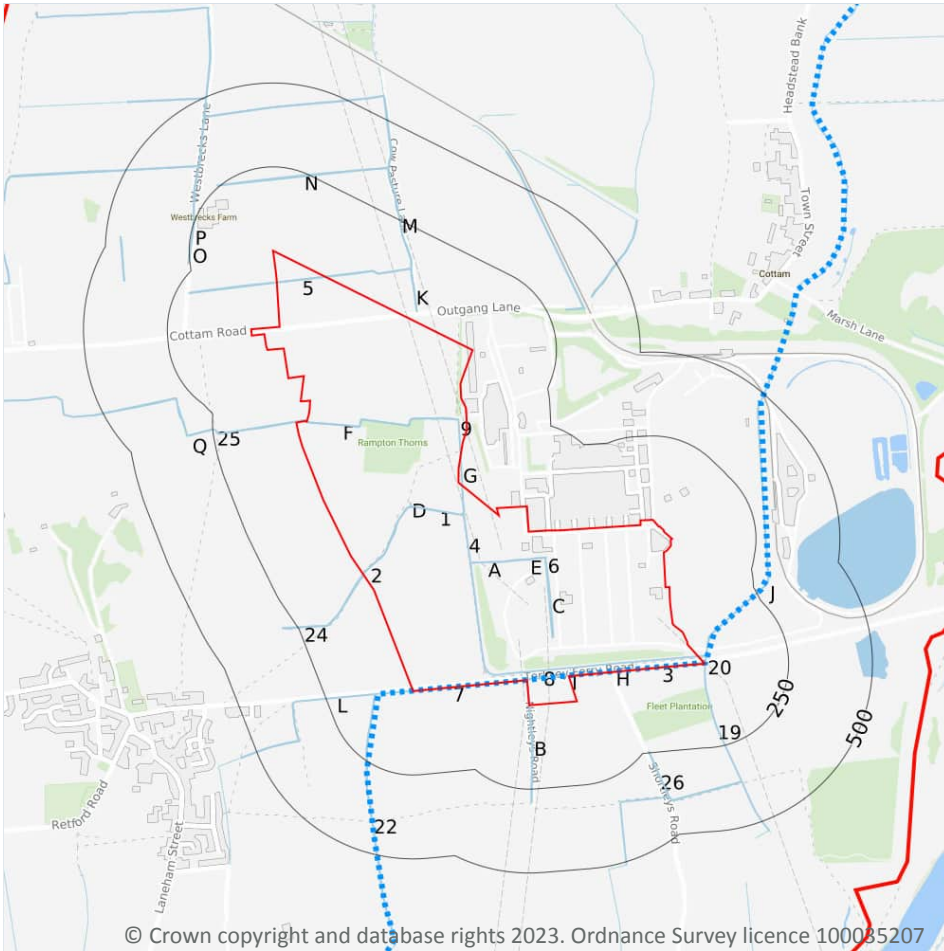
Records within 2000m

4

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 71**

## 6 Hydrology



### 6.1 Water Network (OS MasterMap)

Records within 250m

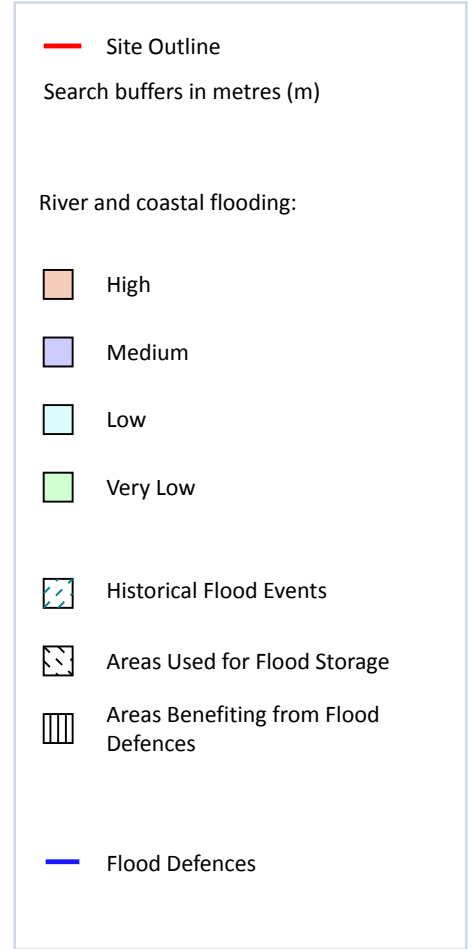
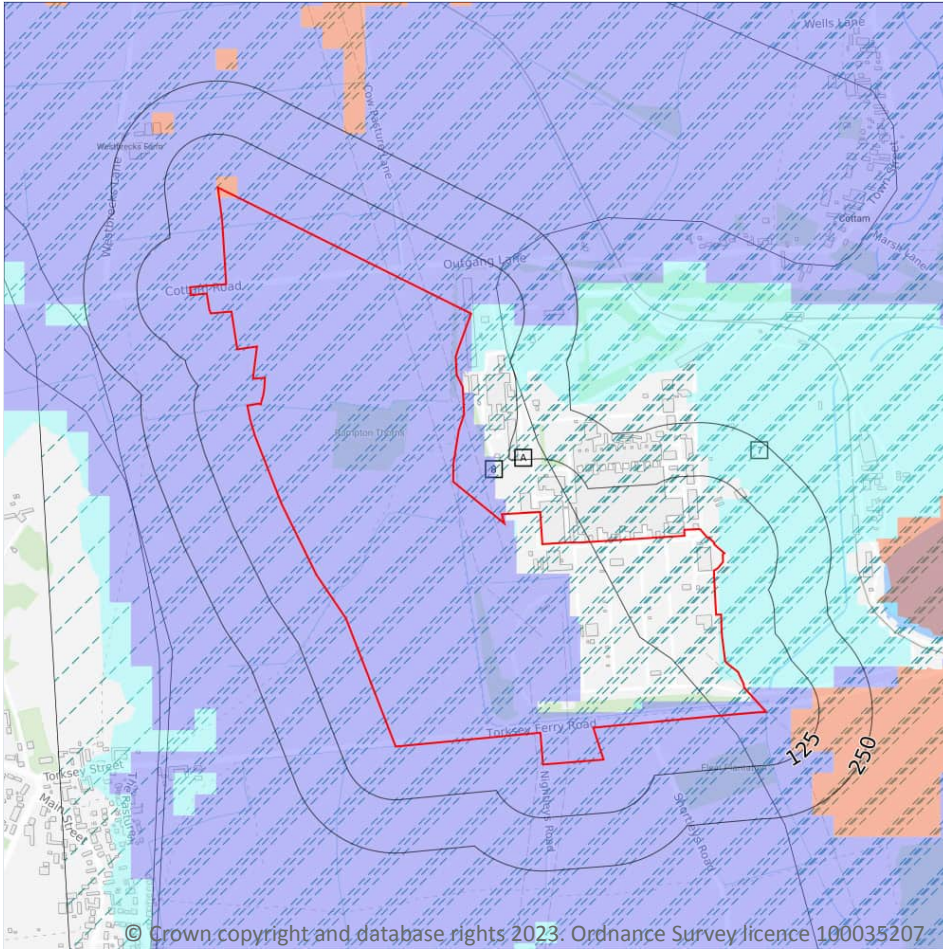
35

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

Features are displayed on the Hydrology map on **page 76**

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

## 7 River and coastal flooding



### 7.1 Risk of flooding from rivers and the sea

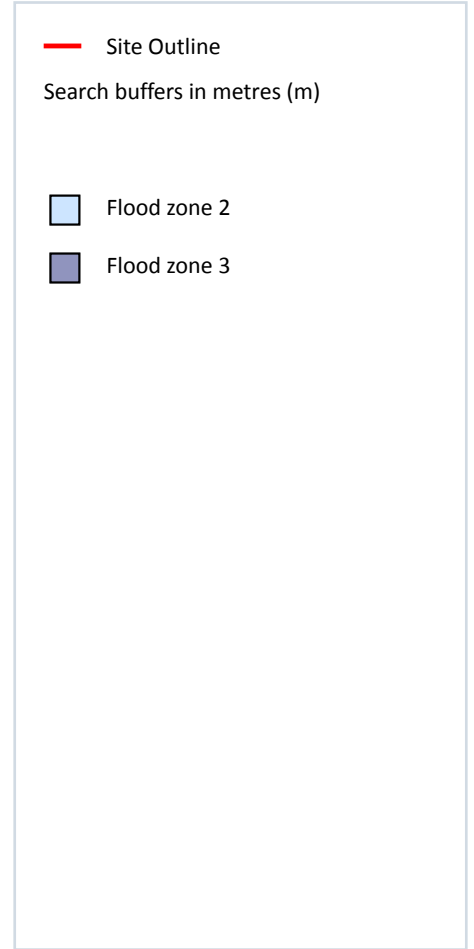
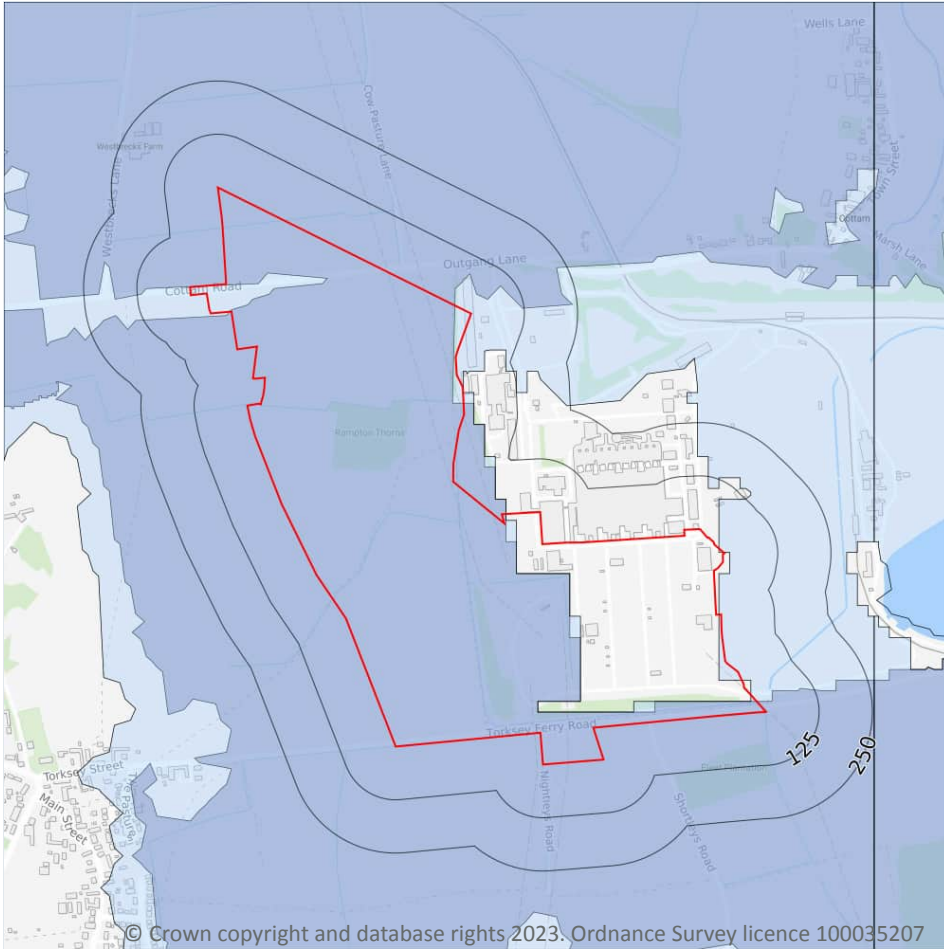
Records within 50m

6

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

Features are displayed on the River and coastal flooding map on **page 82**

## River and coastal flooding - Flood Zones



### 7.6 Flood Zone 2

Records within 50m

1

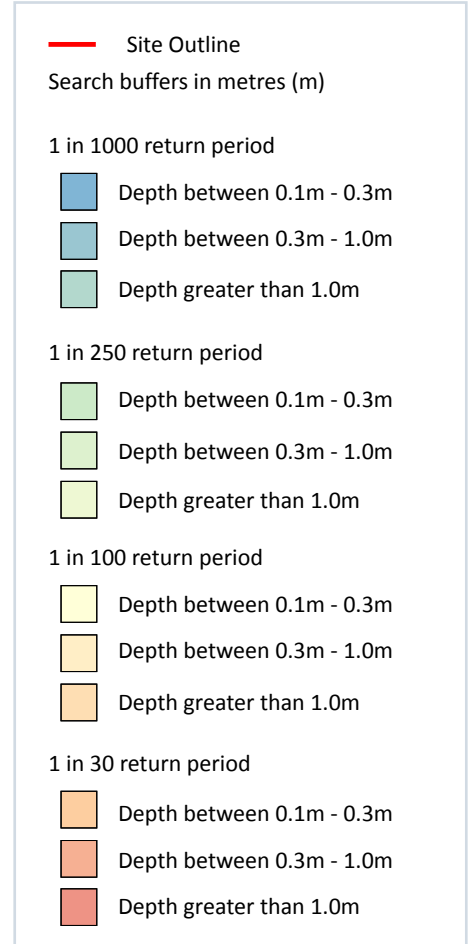
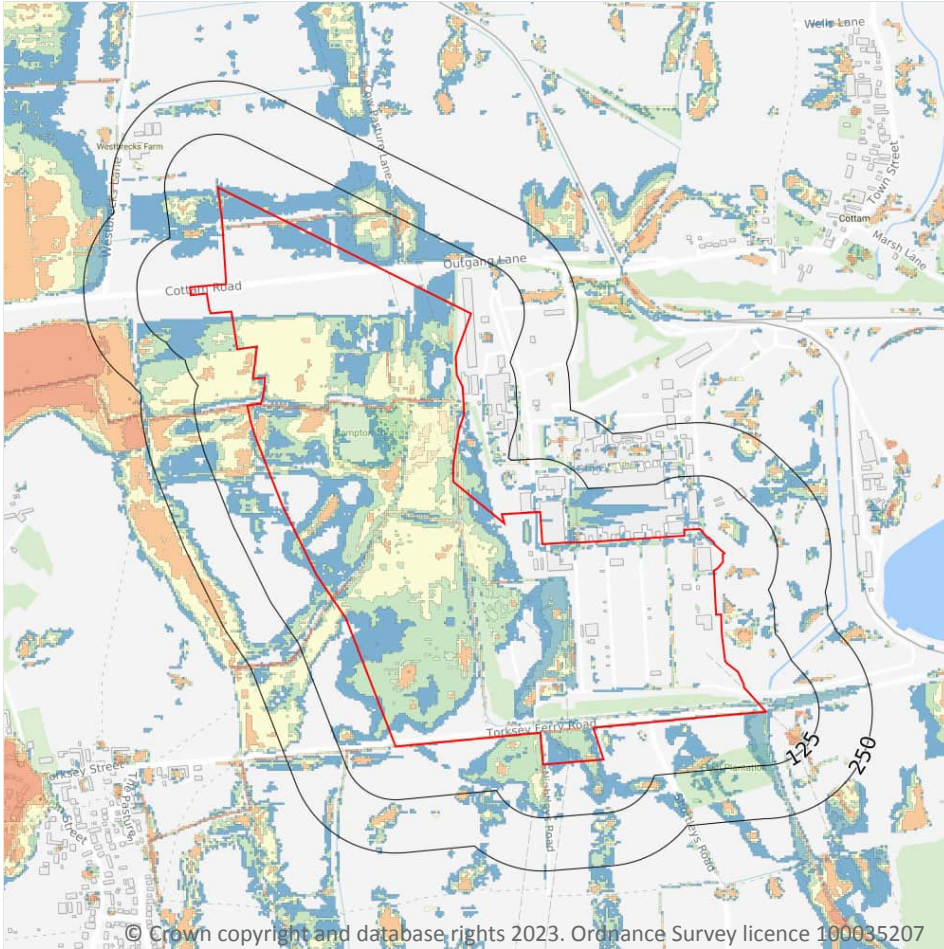
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 82**

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

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

## 8 Surface water flooding



### 8.1 Surface water flooding

**Highest risk on site**

**1 in 30 year, Greater than 1.0m**

**Highest risk within 50m**

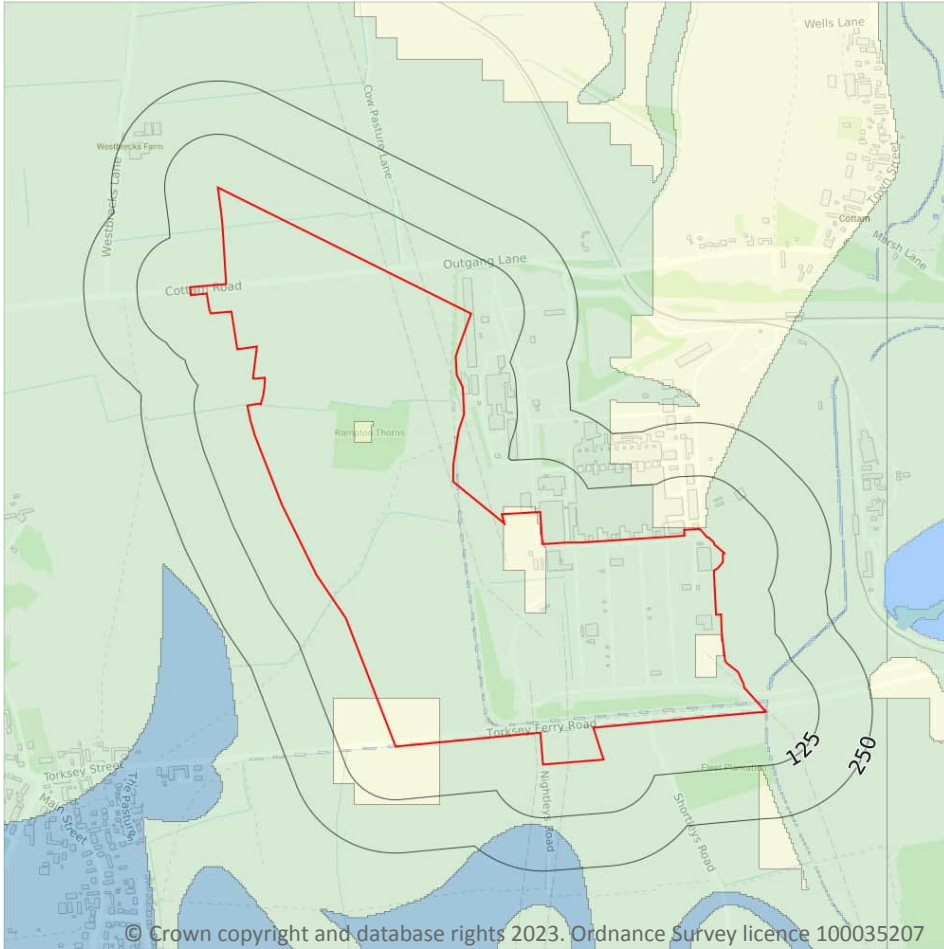
**1 in 30 year, Greater than 1.0m**

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

Features are displayed on the Surface water flooding map on **page 87**

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

## 9 Groundwater flooding



### 9.1 Groundwater flooding

Highest risk on site	Moderate
Highest risk within 50m	Moderate

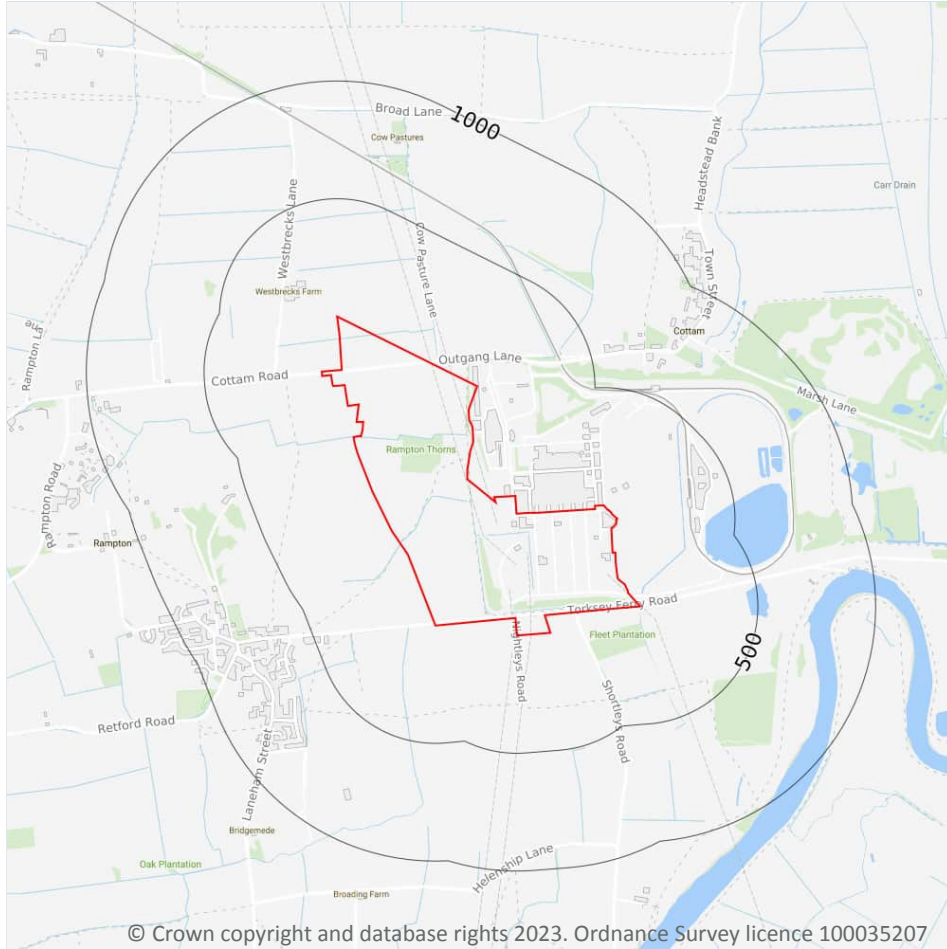
Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks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

Features are displayed on the Groundwater flooding map on **page 89**

*This data is sourced from Ambiantal Risk Analytics.*



## 10 Environmental designations



**— Site Outline**

Search buffers in metres (m)

Sites of Special Scientific Interest (SSSI)

### 10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

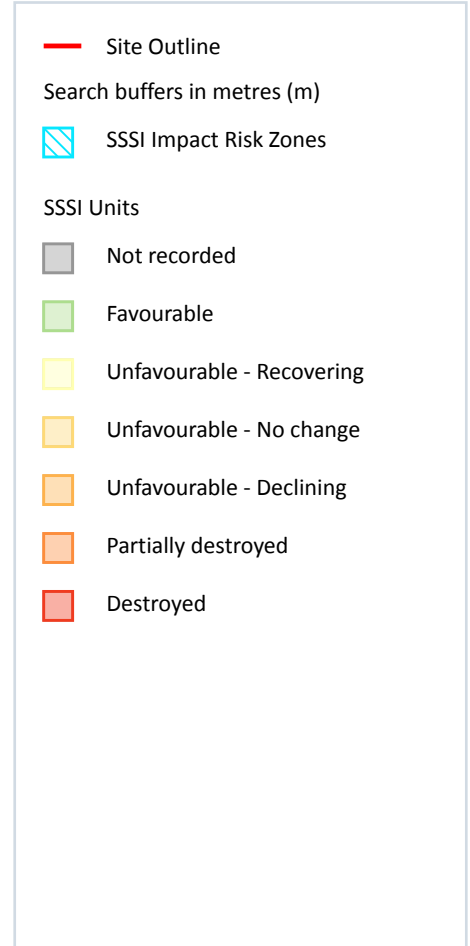
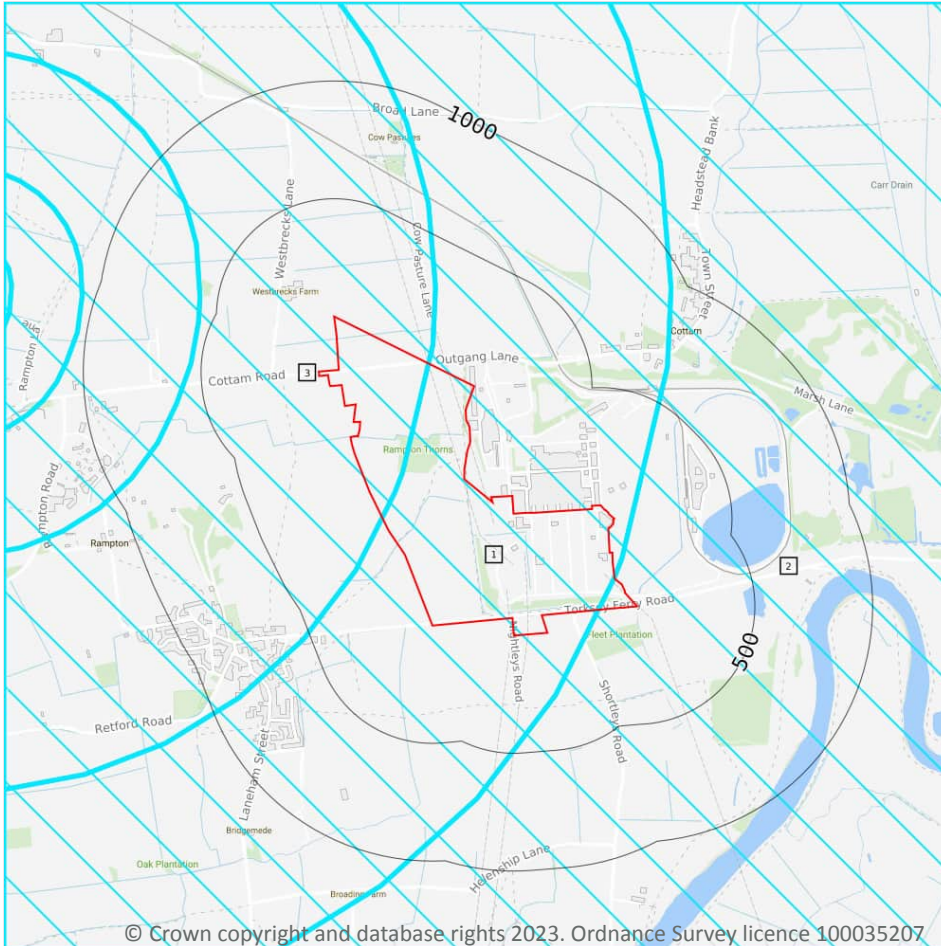
1

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

Features are displayed on the Environmental designations map on **page 90**

ID	Location	Name	Data source
-	1540m W	Ashton's Meadow	Natural England

## SSSI Impact Zones and Units



### 10.17 SSSI Impact Risk Zones

#### Records on site

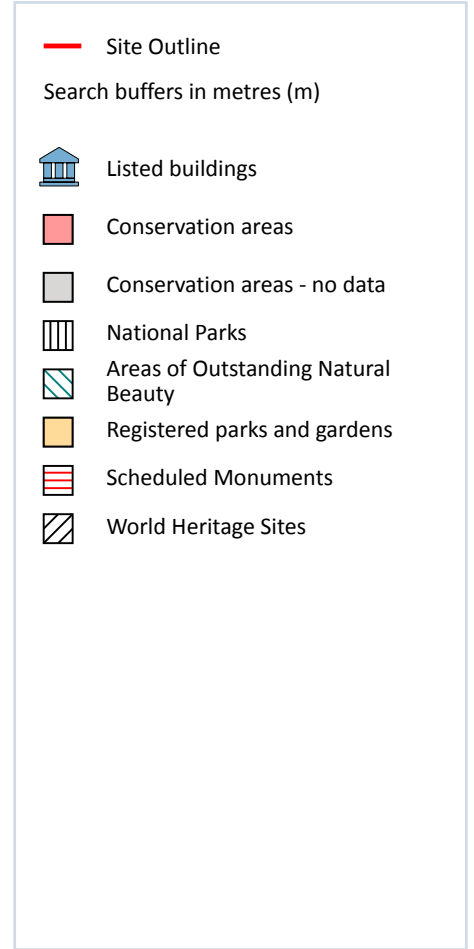
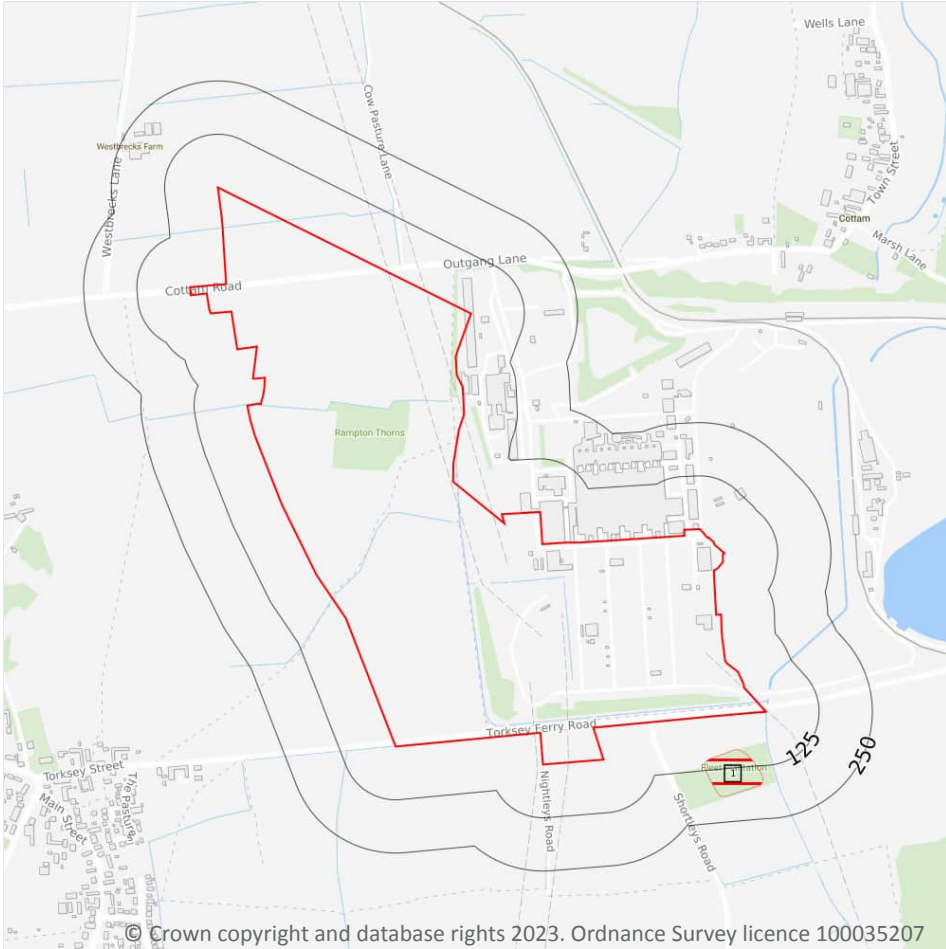
3

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

Features are displayed on the SSSI Impact Zones and Units map on **page 95**

ID	Location	Type of developments requiring consultation
1	On site	<p><b>Infrastructure - Airports, helipads and other aviation proposals.</b></p> <p><b>Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil &amp; gas exploration/extraction.</b></p> <p><b>Air pollution - Livestock &amp; poultry units with floorspace &gt; 500m<sup>2</sup>, slurry lagoons &amp; digestate stores &gt; 750m<sup>2</sup>, manure stores &gt; 3500t.</b></p>

## 11 Visual and cultural designations



### 11.1 World Heritage Sites

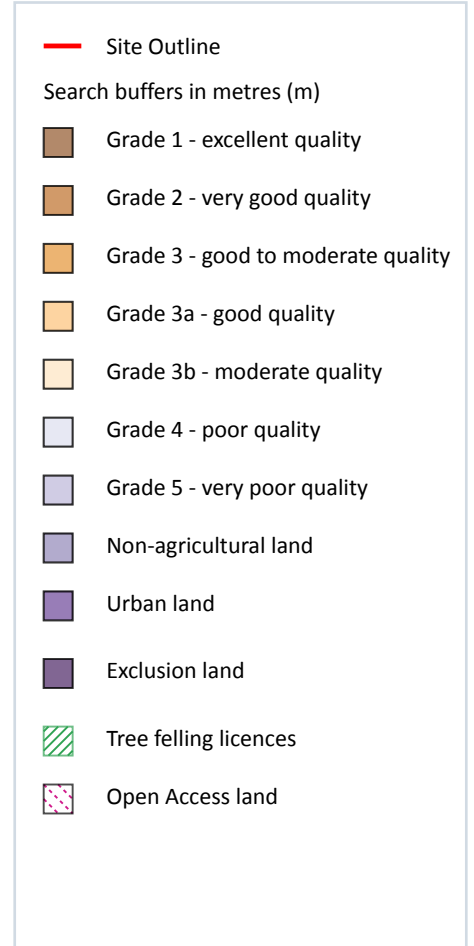
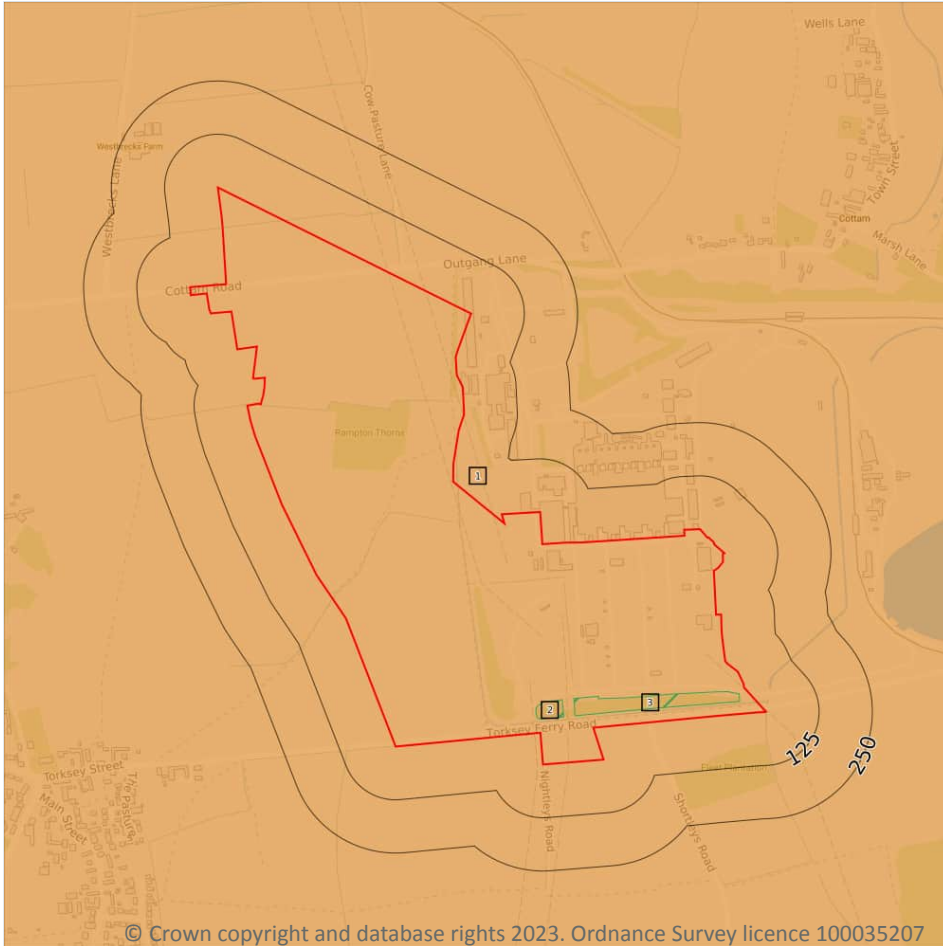
Records within 250m

0

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

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

## 12 Agricultural designations



### 12.1 Agricultural Land Classification

**Records within 250m** **1**

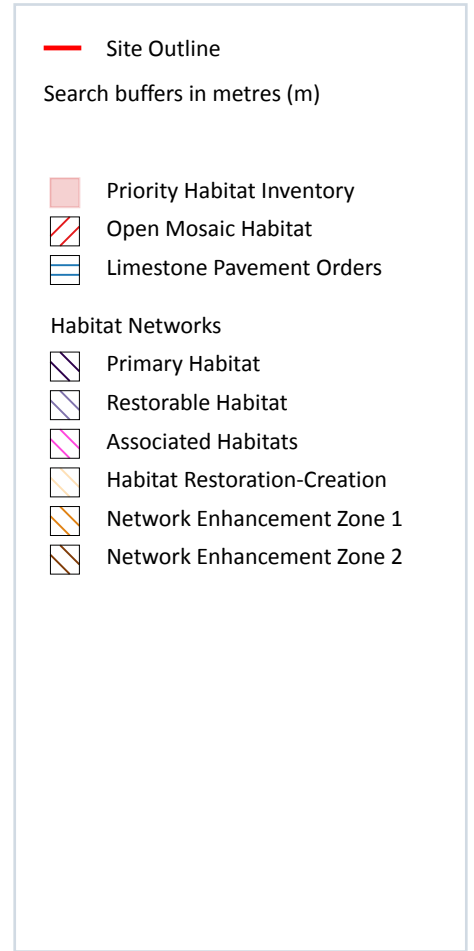
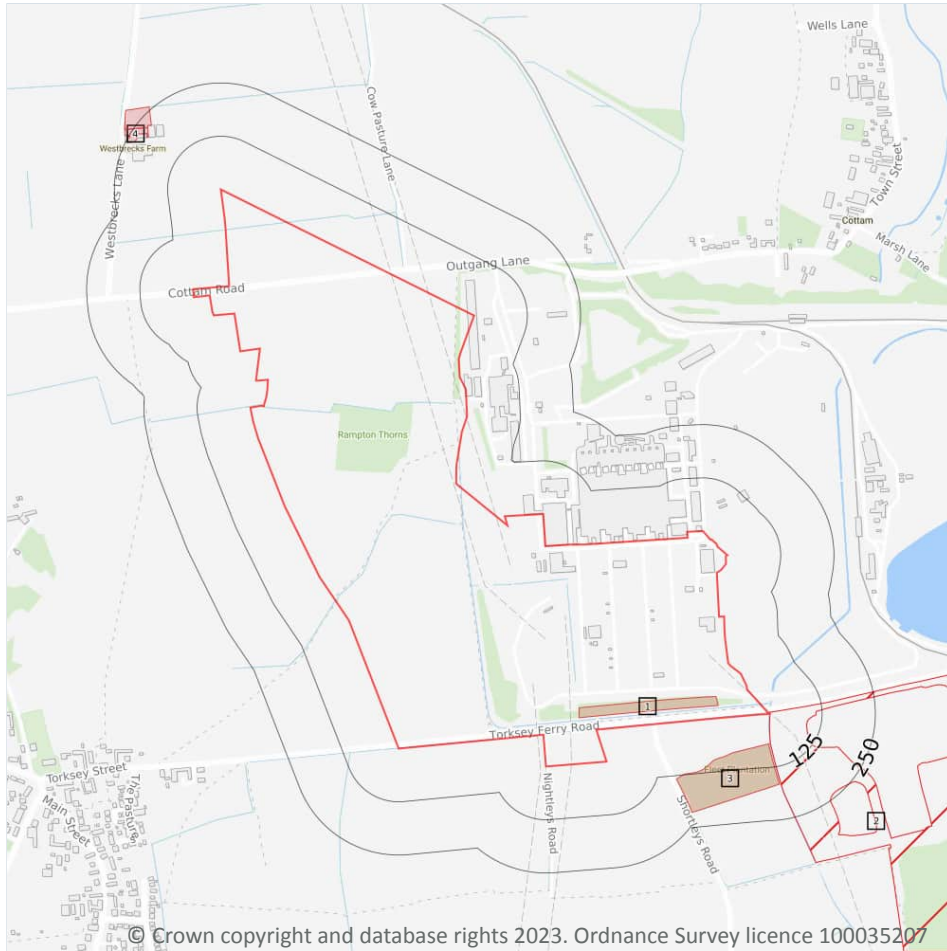
Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 100**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

*This data is sourced from Natural England.*

## 13 Habitat designations



### 13.1 Priority Habitat Inventory

Records within 250m

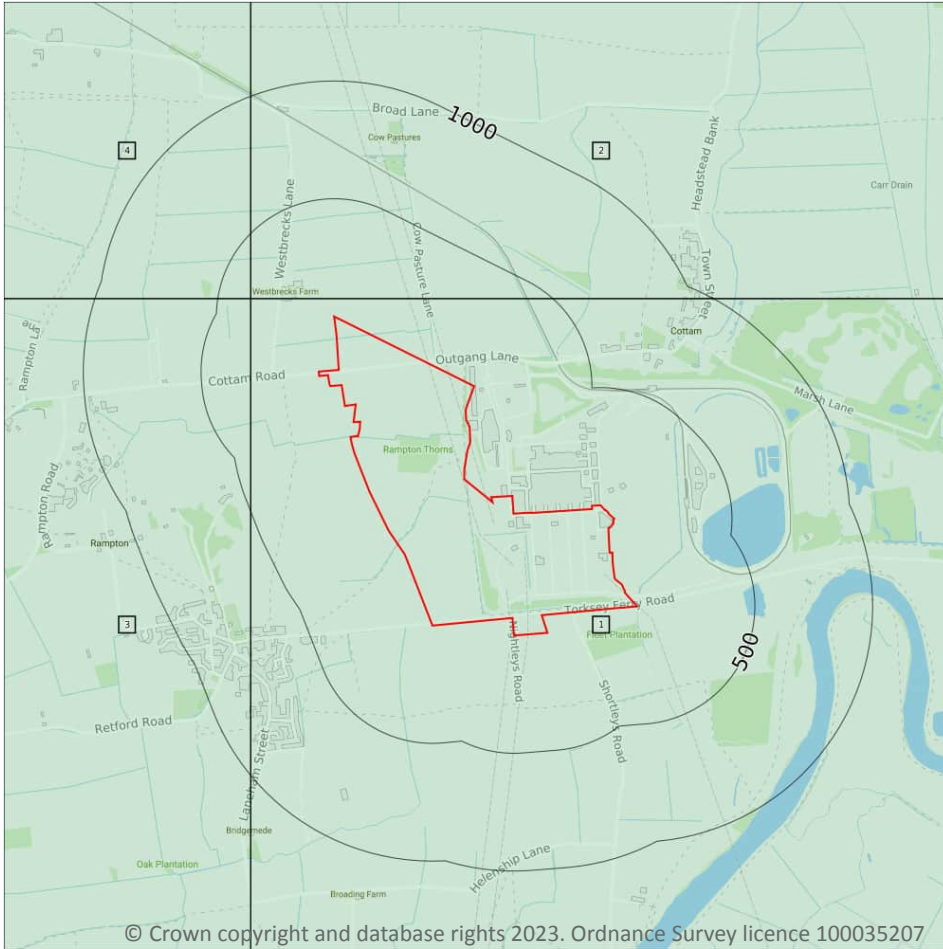
4

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

Features are displayed on the Habitat designations map on **page 103**

ID	Location	Main Habitat	Other habitats
1	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	70m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	210m NW	Traditional orchard	Main habitat: TORCH (INV > 50%)
5	222m NW	Traditional orchard	Overruled by Traditional Orchards HAP Inventory dataset

## 14 Geology 1:10,000 scale - Availability



— Site Outline  
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

### 14.1 10k Availability

Records within 500m

4

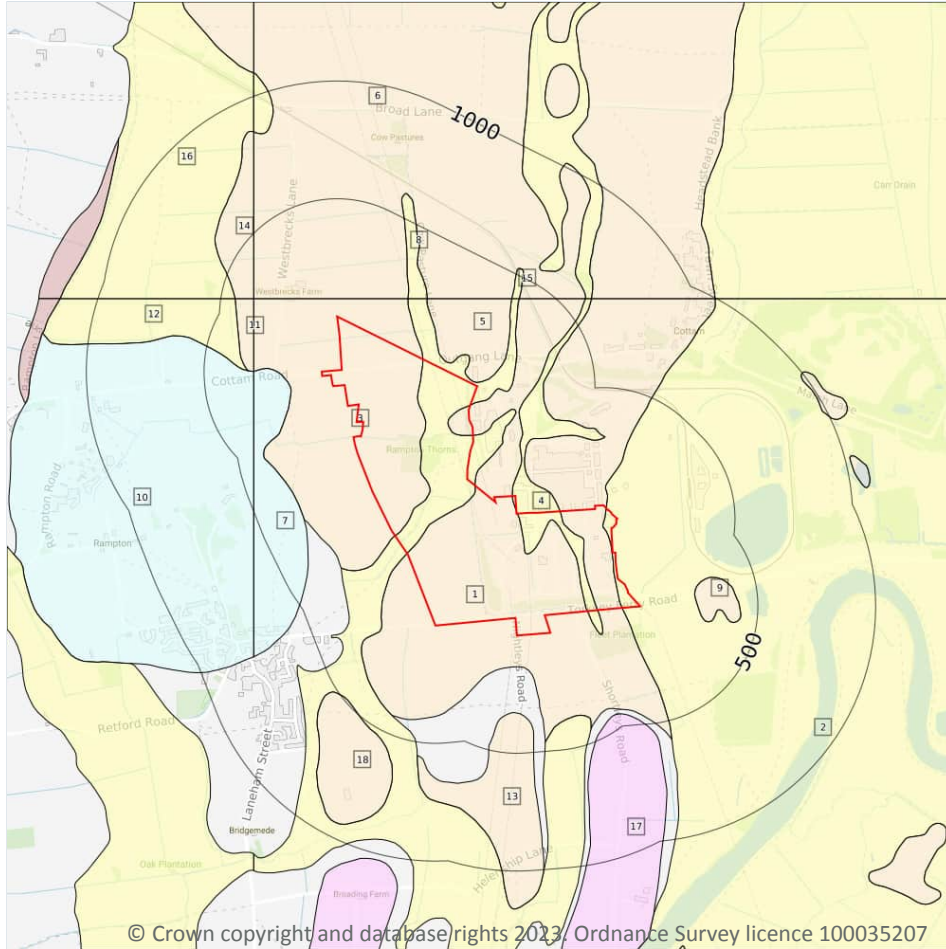
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 105**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	SK87NW
2	76m NW	No coverage	Full	Full	No coverage	SK88SW
3	289m NW	No coverage	Full	Full	No coverage	SK77NE
4	362m NW	No coverage	Full	Full	No coverage	SK78SE



## Geology 1:10,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (10k)
- Superficial geology (10k)  
Please see table for more details.

### 14.3 Superficial geology (10k)

Records within 500m

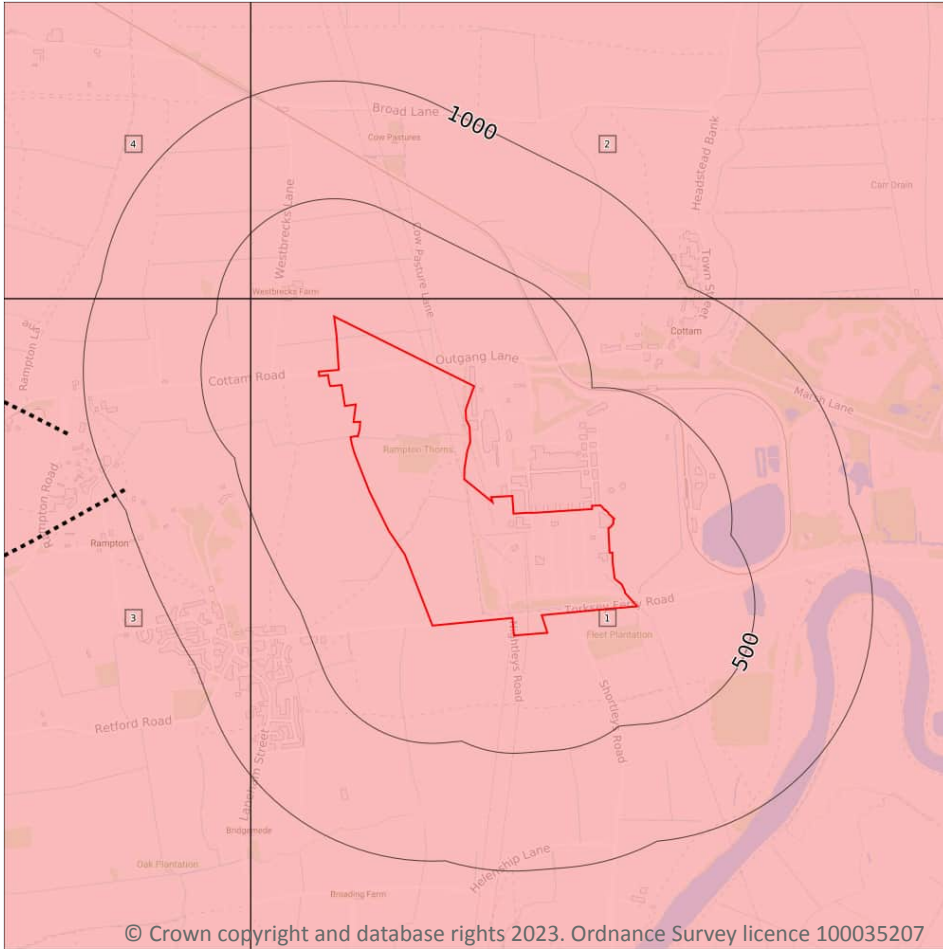
18

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

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 108**

ID	Location	LEX Code	Description	Rock description
1	On site	HPSG-XSV	Holme Pierrepont Sand And Gravel Member - Sand And Gravel	Sand And Gravel
2	On site	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
3	On site	HPSG-XSV	Holme Pierrepont Sand And Gravel Member - Sand And Gravel	Sand And Gravel

## Geology 1:10,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- ..... Bedrock faults and other linear features (10k)
- Bedrock geology (10k)  
Please see table for more details.

### 14.5 Bedrock geology (10k)

Records within 500m

4

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

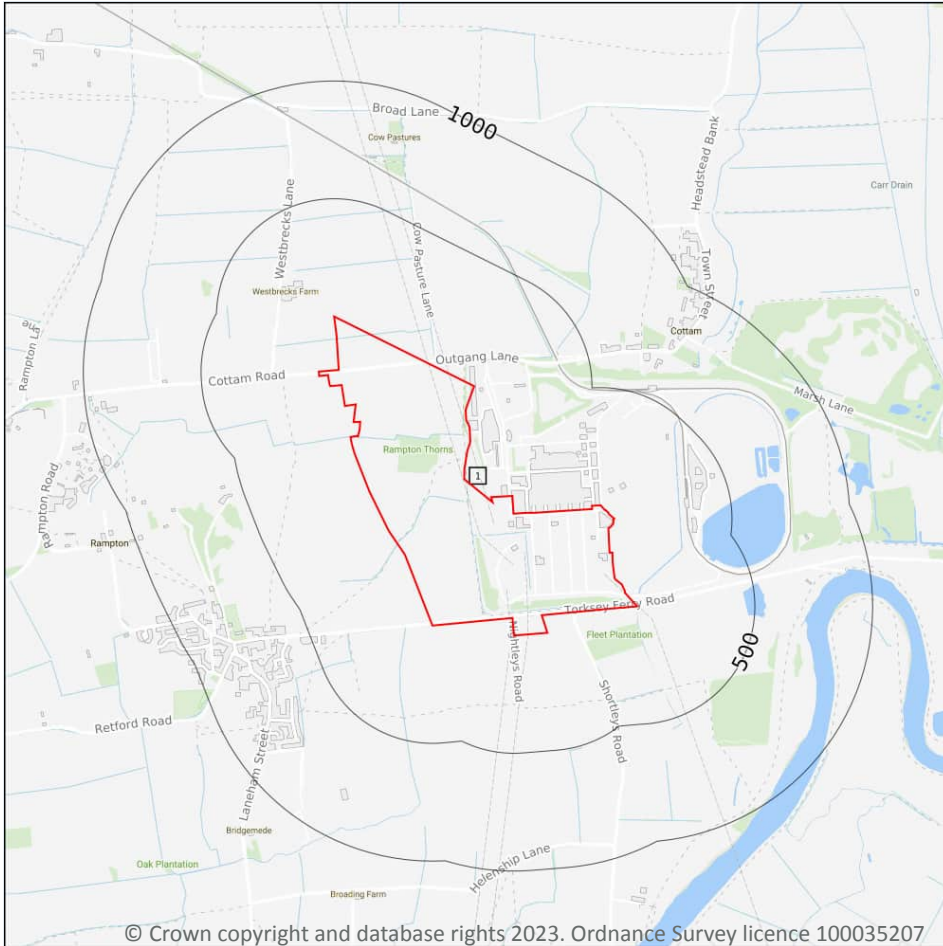
Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 110**

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
2	76m NW	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
3	289m NW	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch





## 15 Geology 1:50,000 scale - Availability



— Site Outline  
Search buffers in metres (m)

□ Geological map tile

### 15.1 50k Availability

Records within 500m

1

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

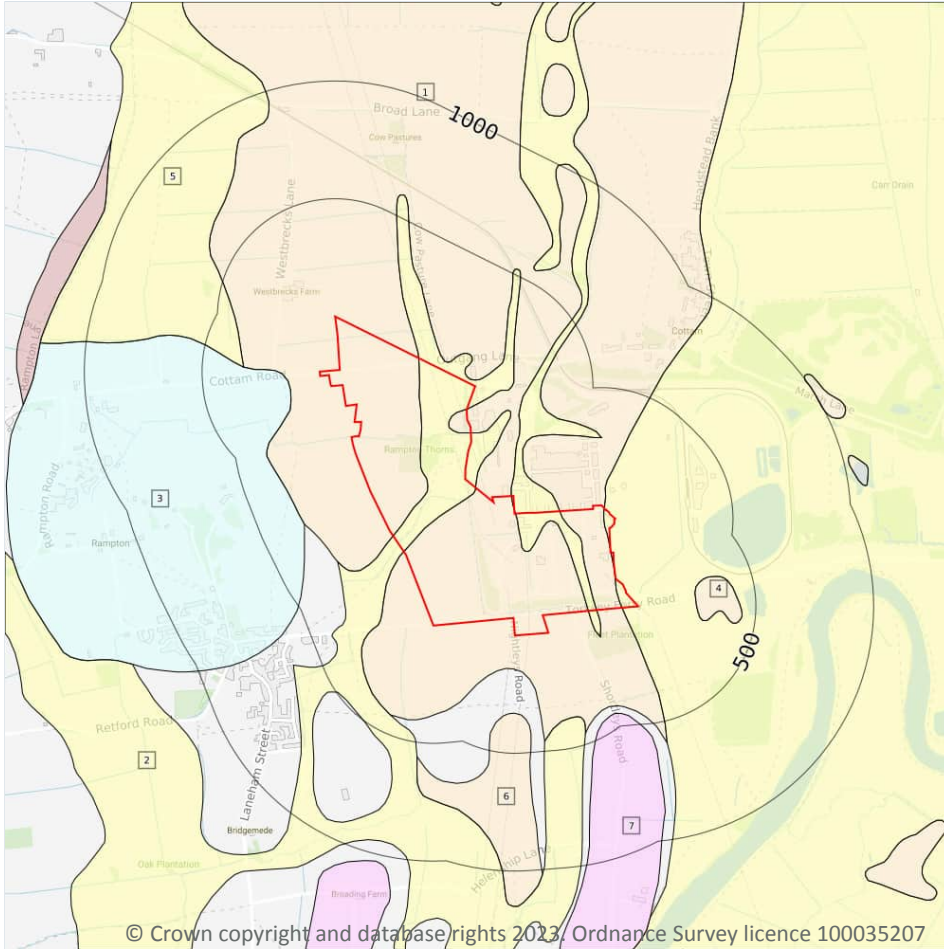
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 112**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW101_east_retford_v4

*This data is sourced from the British Geological Survey.*



## Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)  
Please see table for more details.

### 15.4 Superficial geology (50k)

Records within 500m

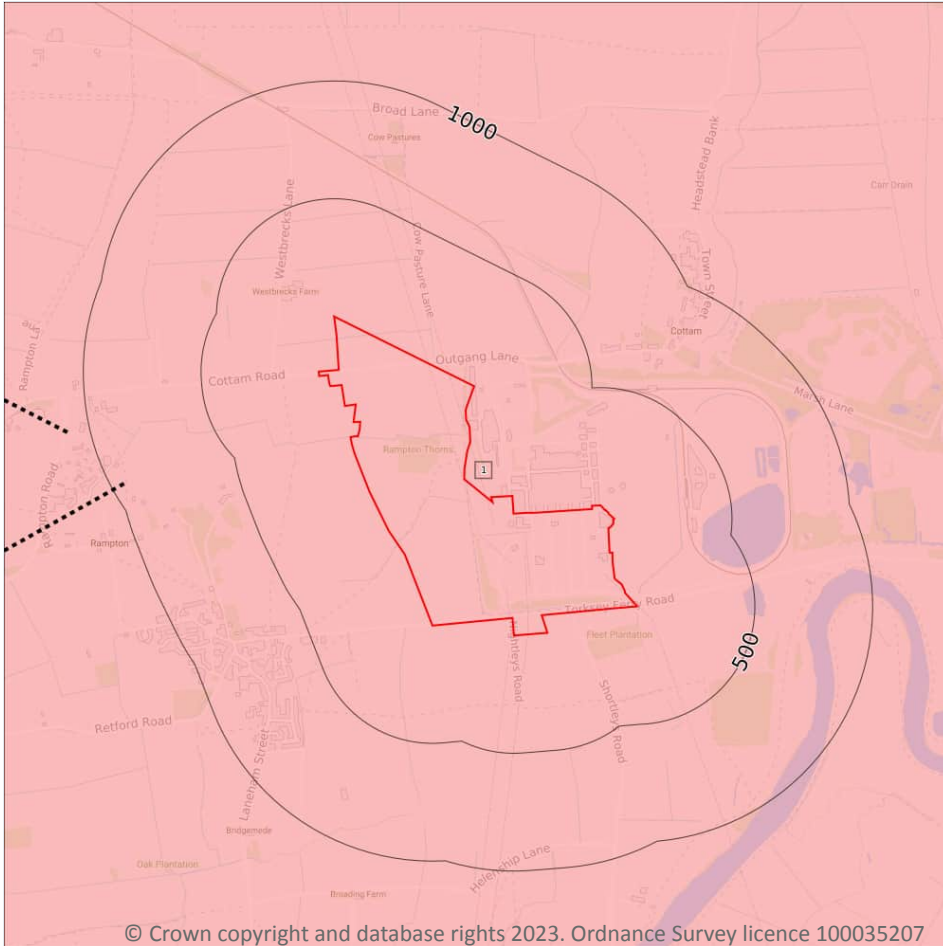
7

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 114**

ID	Location	LEX Code	Description	Rock description
1	On site	HPSG-XSV	HOLME PIERREPONT SAND AND GRAVEL MEMBER	SAND AND GRAVEL
2	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
3	137m NW	TILMP-DMTN	TILL, MID PLEISTOCENE	DIAMICTON

## Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (50k)
- Bedrock geology (50k)  
Please see table for more details.

### 15.8 Bedrock geology (50k)

Records within 500m

1

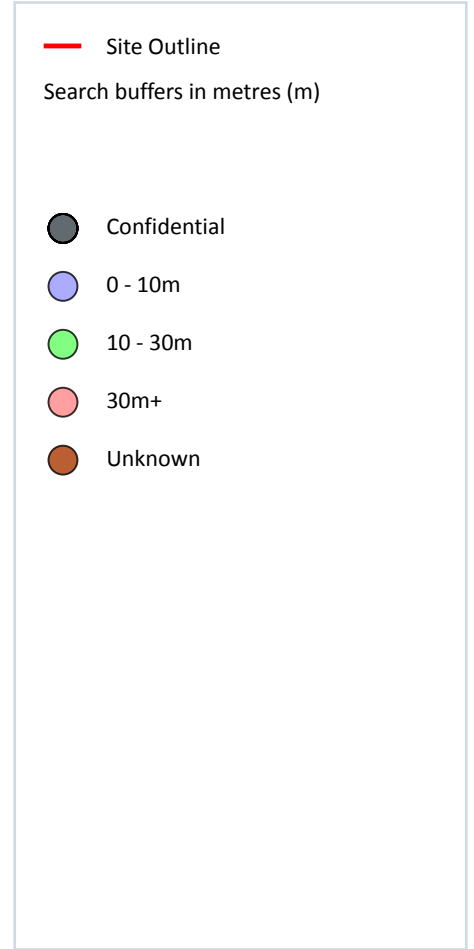
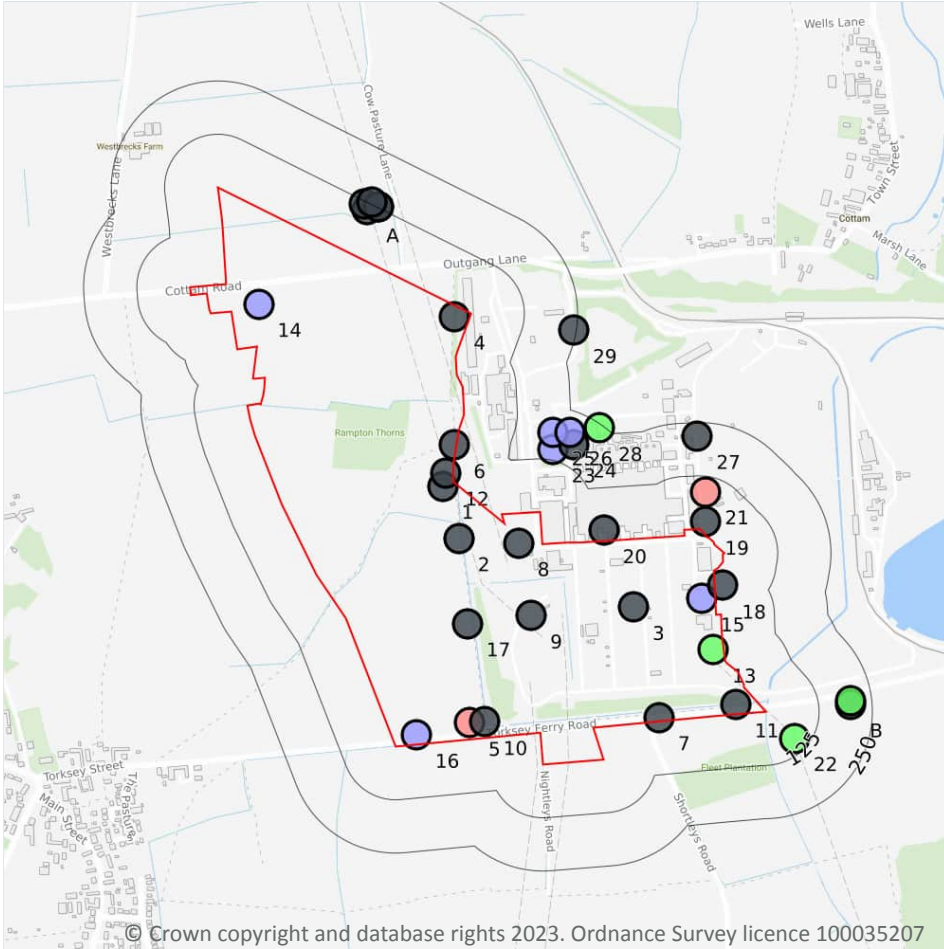
Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 117**

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	MERCIA MUDSTONE GROUP - MUDSTONE	-

*This data is sourced from the British Geological Survey.*

## 16 Boreholes



### 16.1 BGS Boreholes

Records within 250m

36

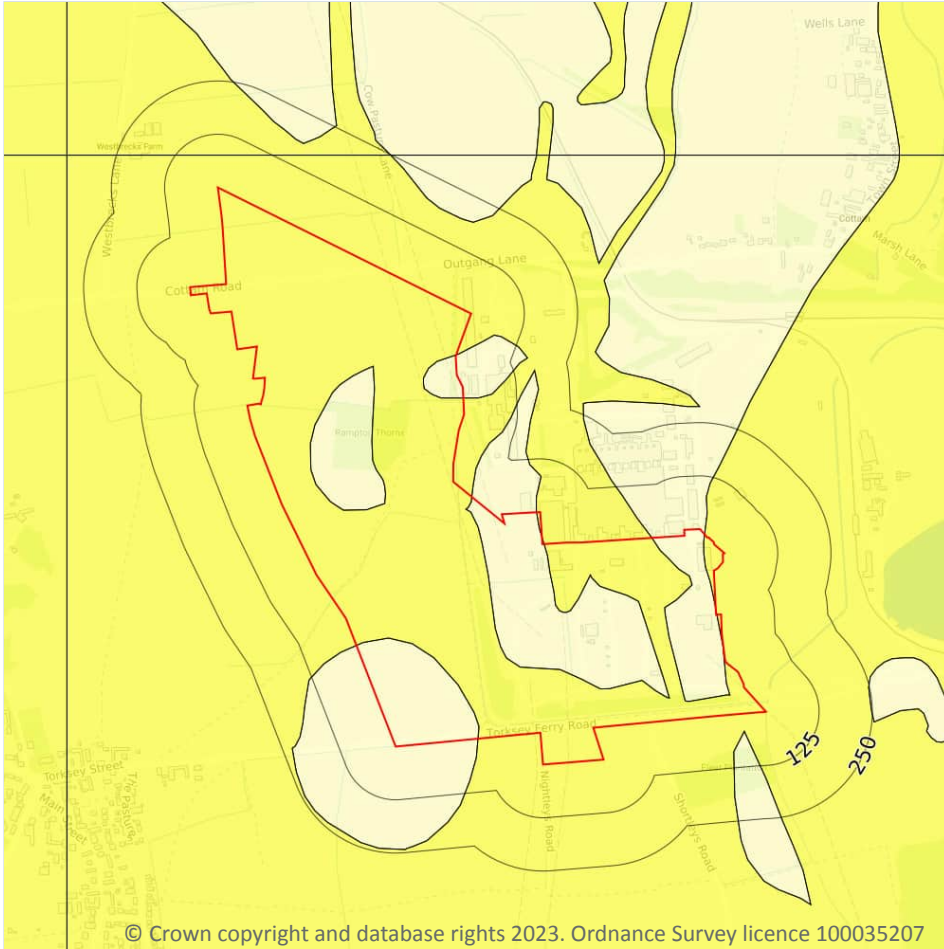
The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several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

Features are displayed on the Boreholes map on **page 119**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	480882 379223	National Grid 400kV Overhead Upgrade Programme - IP3 Stage - Tower Foundations, High Marnham to West	-	Y	N/A
2	On site	480920 379100	COTTAM POWER STATION 4A	-	Y	N/A



## 17 Natural ground subsidence - Shrink swell clays



— Site Outline  
Search buffers in metres (m)

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

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### 17.1 Shrink swell clays

Records within 50m

3

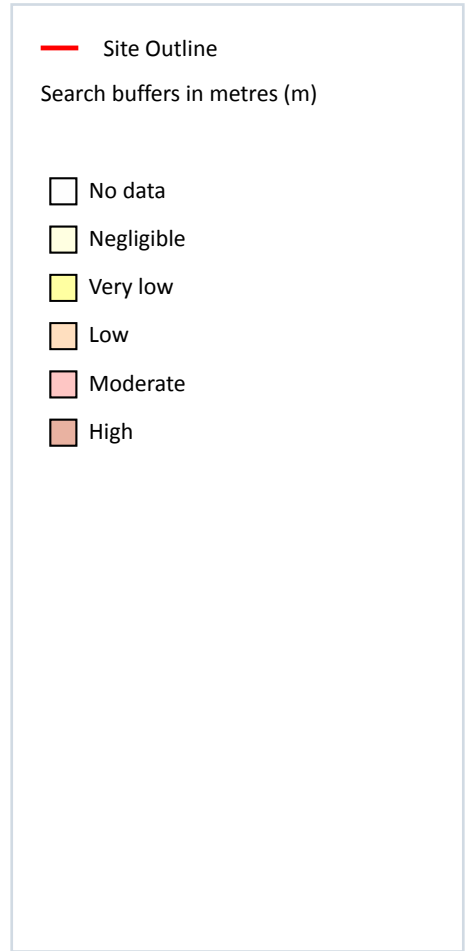
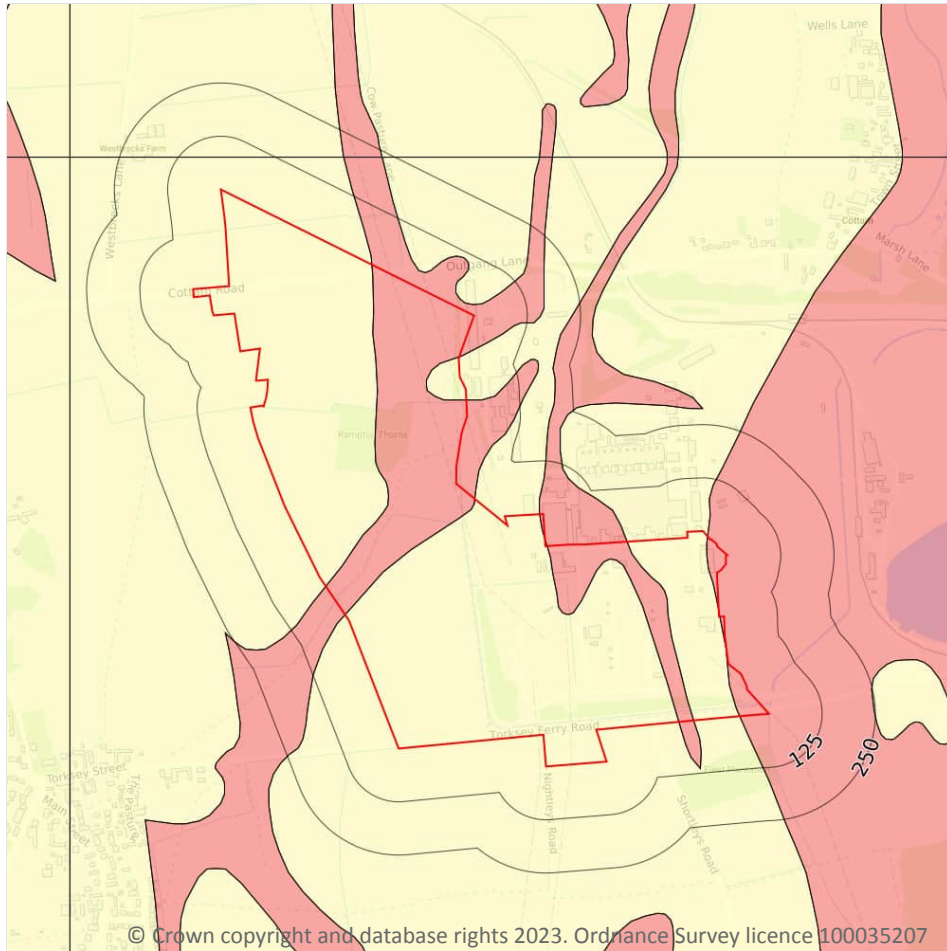
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 122**

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.
42m SE	Negligible	Ground conditions predominantly non-plastic.



## Natural ground subsidence - Compressible deposits



### 17.3 Compressible deposits

Records within 50m

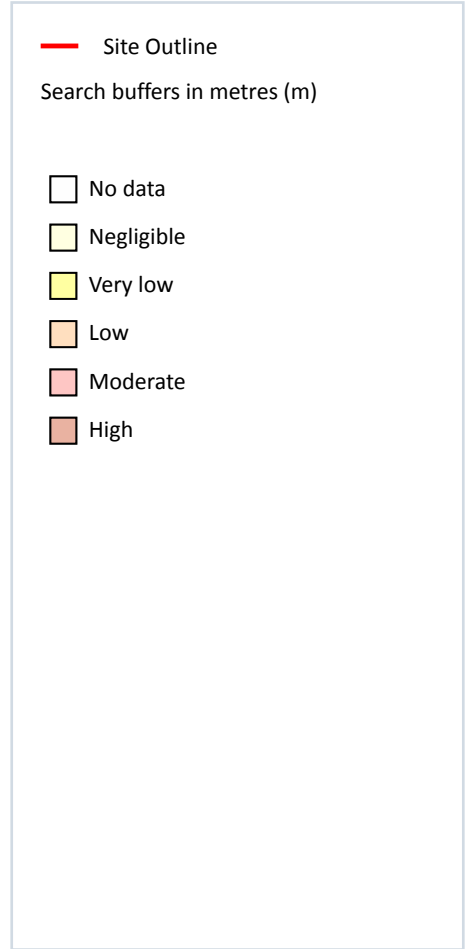
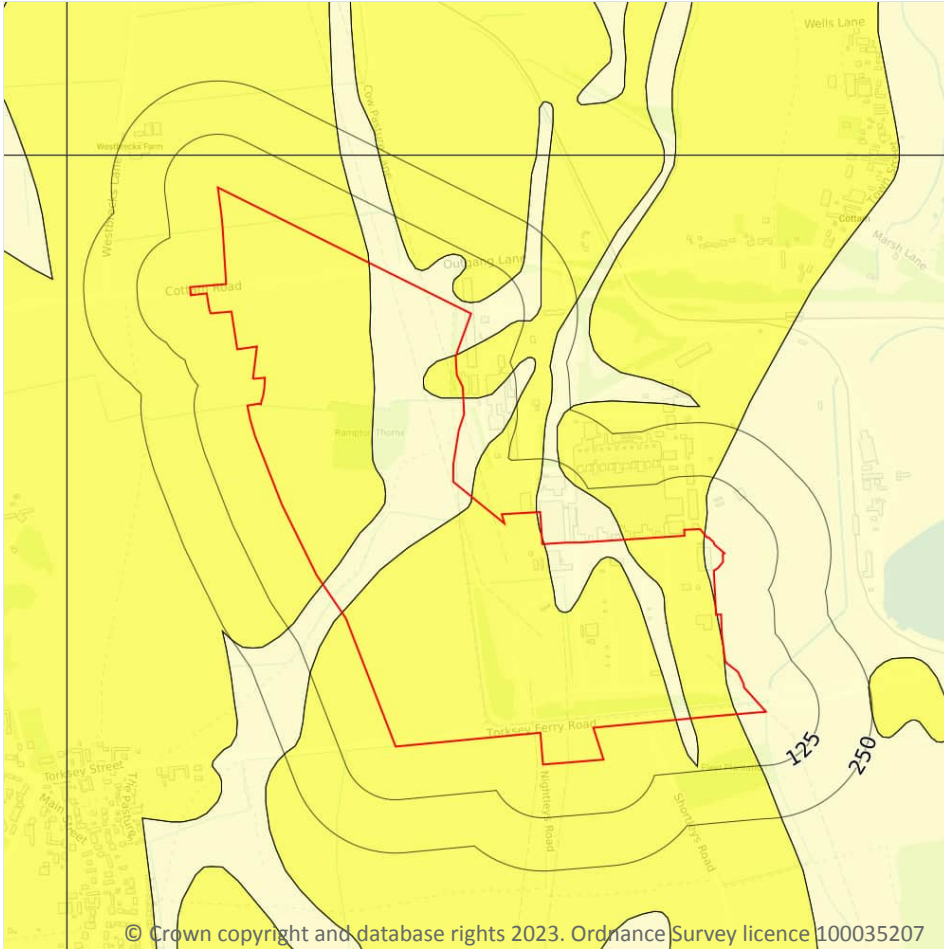
3

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 126**

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

## Natural ground subsidence - Collapsible deposits



### 17.4 Collapsible deposits

Records within 50m

3

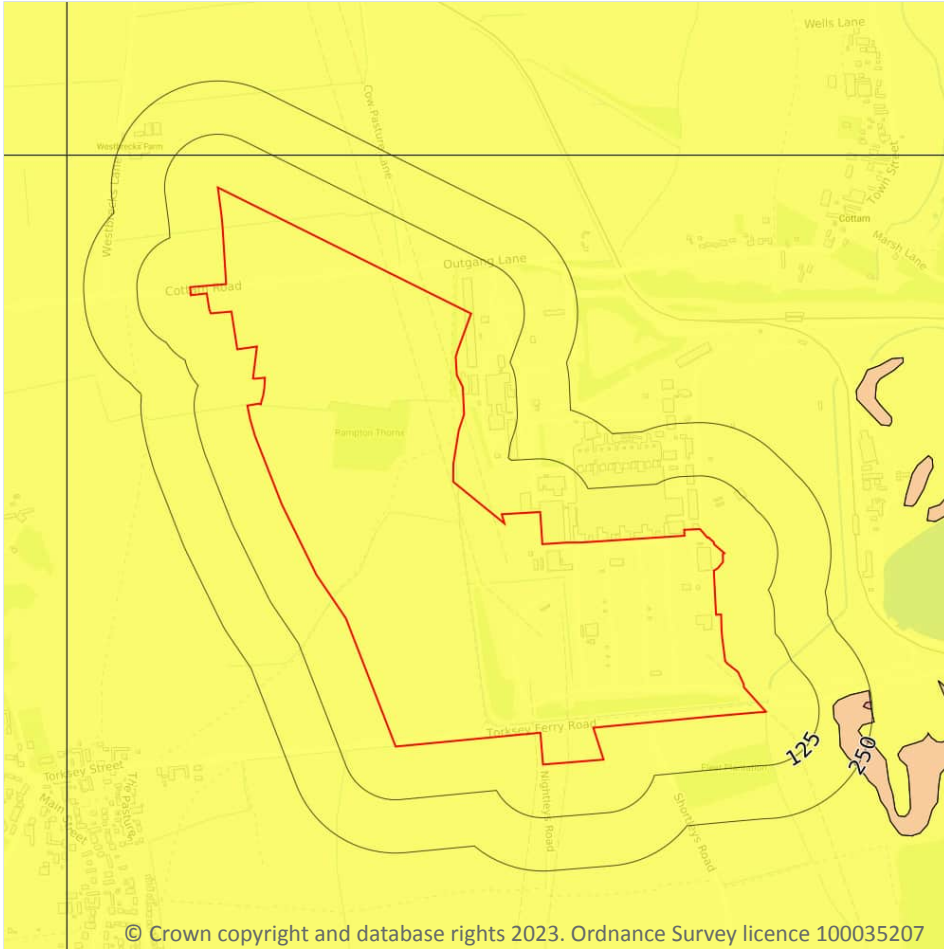
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 128**

Location	Hazard rating	Details
On site	Negligible	Deposits with potential to collapse when loaded and saturated are believed not to be present.
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
17m N	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.



## Natural ground subsidence - Landslides



### 17.5 Landslides

Records within 50m

1

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

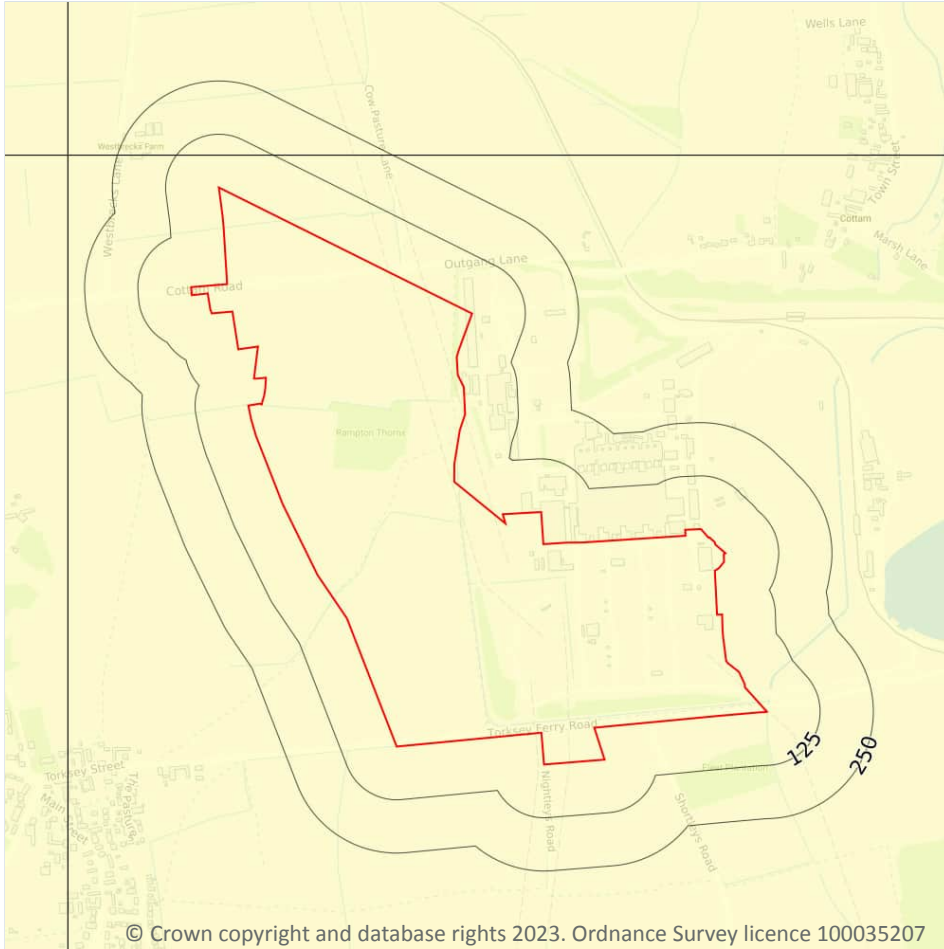
Features are displayed on the Natural ground subsidence - Landslides map on **page 130**

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

*This data is sourced from the British Geological Survey.*



## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

Records within 50m

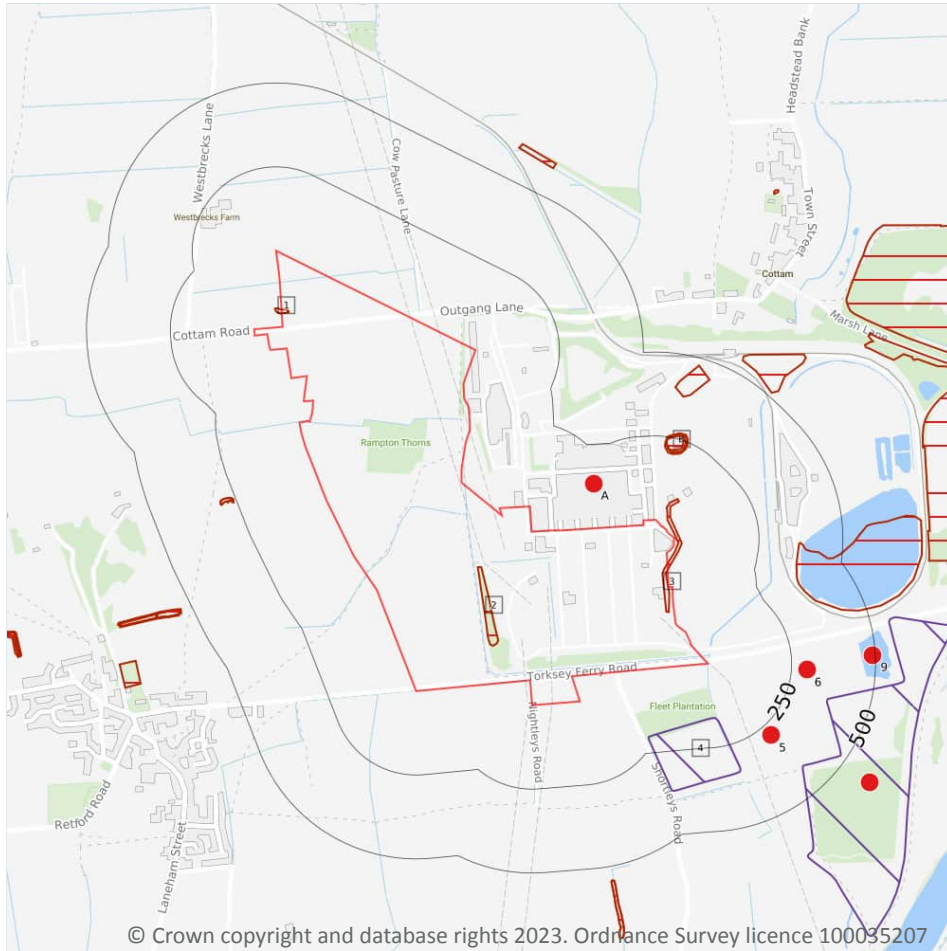
1

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

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 131**

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

## 18 Mining, ground workings and natural cavities



### 18.1 Natural cavities

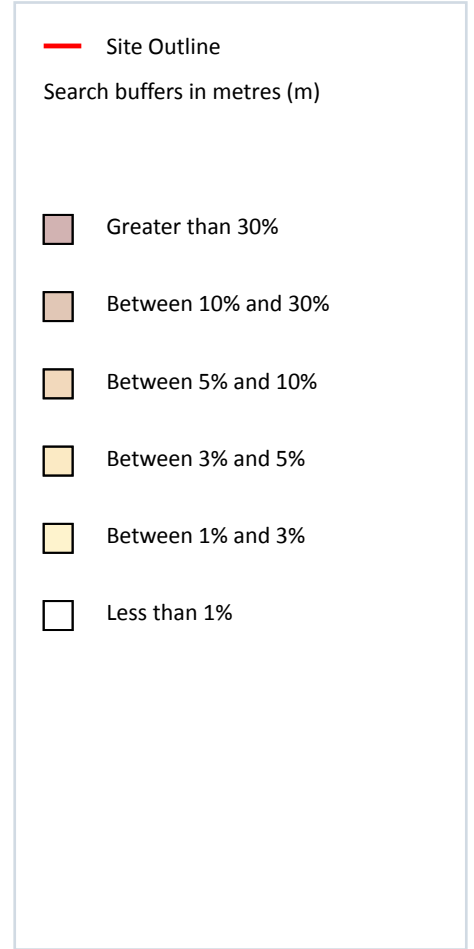
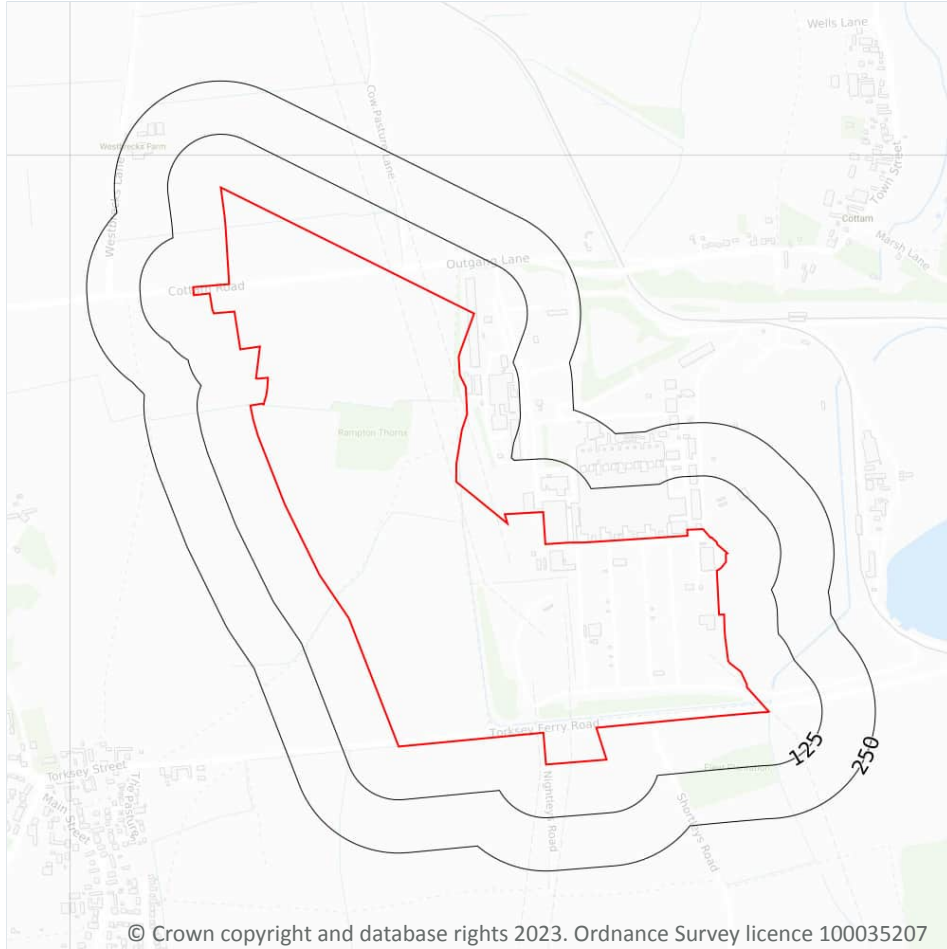
Records within 500m

0

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

*This data is sourced from Stantec UK Ltd.*

## 19 Radon



### 19.1 Radon

#### Records on site

1

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

Features are displayed on the Radon map on **page 139**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None

## **Appendix C Exploratory Boreholes Records**

SK 88 SW 21

8376 8187

Marston

Block D

Surface level (+7.9 m) +26 ft

Water level not recorded

November 1971

Overburden 0.4 m (1.5 ft)

Mineral 1.7 m (5.5 ft)

Waste 0.3 m (1.0 ft)

Bedrock 1.6 m+ (5.0 ft+)

		Thickness		Depth	
		m	(ft)	m	(ft)
	Topsoil	0.4	(1.5)	0.5	(1.5)
Glacial Sand and Gravel	'Clayey' sand Sand: medium, subangular to well rounded quartz with coal specks Fines: brown silt	1.7	(5.5)	2.1	(7.0)
7Boulder clay	Clay, reddish brown and grey; with iron staining and a little fine grained quartz and flint gravel	0.3	(1.0)	2.4	(8.0)
Keuper Marl	Mudstone, greenish grey, hard, with thin bands of green sandstone	1.6+	(5.0+)	4.0	(13.0)

	%	mm	%	Depth below surface (m)	Percentage		
					Fines	Sand	Gravel
Gravel	1	+ 16	1	0.4 - 1.4	13	86	1
		- 16 + 4	trace	1.4 - 2.1	14	86	trace
Sand	86	- 4 + 1	1				
		- 1 + 1/4	64				
		- 1/4 + 1/16	21				
Fines	13	- 1/16	13				

Institute of Geological Sciences  
RECORD OF SHAFT OR BOREHOLE

6-in or 1:10 000 Map Registration No.

SK 88 S.W. /21

National Grid Reference

SK 8376 8187

1-in or 1:50 000  
New Series Map No.

Enter 'C' if  
Confidential

C

Name and Number of Shaft or Borehole .

TV 88 36

For whom made IGS

Town or Village Marton County Lincs

Exact site (reference to a fixed point on 1-in or 1:50 000 Map):

Purpose for which made sand and gravel survey

Ground level at shaft relative to O.D. \_\_\_\_\_ m. If not ground level give O.D. of beginning of shaft bore \_\_\_\_\_ m.

Made by Foraky Ltd

Date of sinking 4.11.71

" finished 4.11.71

Information from

Examined by John H Lovell

Specimen Numbers and Additional Notes

TV 88	36/1	0.4 - 1.4 m
	36/2	1.4 - 2.1 m
	36/3	2.1 - 2.4 m
	36/4	2.4 - 4.0 m clay sample

Geological Classification	Description of Strata	Thickness metres	Depth metres
	<u>Topsoil</u> ; Dark, very sandy	0.40 1'4"	0.40 1'4"
	<u>Sand</u> ; medium with fine, well rounded, mainly quartz some more angular rock fragment. Some brown silt		
	One quartz pebble, 5x4x3 cms, well rounded apheroidal	3'3 1/2" 1.00	4'7 1/2" 1.40
	<u>Sand</u> ; medium with fine and some coarse, well rounded quartz and rock fragments, no gravel, some greyish brown silt, becomes rather clayey towards 2.1 m	2'3 1/2" 0.70	6'11" 2.10
	<u>Clay</u> ; Reddish brown and grey, laminated, some ochreous sandy pockets, iron stains, some medium well rounded flint, quartz and sandstone gravel. large blocks of angular green/white sandstone at base	1'0" 0.30	7'11" 2.40





**Job Number:** 24686      **Site:** Orchard Farm, Willingham-by-Stow      **Trial Pit:** TP1      **Sheet 1 of 1**

**Remarks:**  
 Surface: Water logged, Muddy, Slurry Puddled. Groundwater encountered at 1.2m as point seepage.

**Location:** See Plan      **Orientation:** NW - SE      **Dimensions:** Length: 2.00m  
 Width: 1.40m  
 Depth: 1.60m

**Client:** Amcliffe Homes Limited      **Face Logged:** SW

**Excavation Method:** Back Acter      **Logged By:** FP      **Log Scale:** 2.50 m/page      **Ground Level:** - m AOD

Date (2003)	Depth of Casing (m)	Depth of Water (m)	Sample/Test		Change of Strata			Description of Strata	Penetration Test Result	Atterberg Limits				Density		Shear Strength		Chemical		Other Tests	
			No	Type	Depth (m)	Legend	Depth below GL (m)			Reduced Level m AOD (m)	Thickness of Stratum (m)	NMC %	LL %	PL %	PI %	CBR %	Bulk mg/m <sup>3</sup>	Dry Mg/m <sup>3</sup>	Cu kPa		ϕu°
13/01			001	B	0.50-1.00		0.45	0.45													
			002	W	1.20		1.15	1.15													
							1.60														

**Scale:** Disturbed Samples U100 105mm Diameter      **Undisturbed Samples:** U38 U100

**Symbols:** PT Penetration Tests      **Type of Shear Test:** V Shear Vane Cu Undrained Cohesive Strength  
 W Water Sample      SB Shear Box ϕu° Internal Friction Angle  
 D Small Bag      M Macintosh Probe Blow Count      TX Triaxial (Undrained)  
 S Large Bag      P Probe CBR  
 T Tin J Jar      (i) Other Tests Undertaken

**Groundwater:** ⚡ Struck ⚡ Rose to

**Notes:** Geology: Refer to appendix at end of logs.  
 (i): Other Tests Undertaken, For Results Refer To Appendix

**LINCS LAB**  
 Telephone (01522) 530355



British Geological Survey

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British Geological Survey

47

48

61

New 20' access & culvert.  
Install two 10' field gates.

New 12' access road to site

Install culvert.

7862  
JMCAH  
16/2/62  
Notified 13/10/61.

Stock proof post & wire fence.

Two 10' field gates

OWNERS- Messrs G R W and J A Gagg,  
Lower Dabdhill Farm,  
Misterton,  
Doncaster,  
Yorks.

OCCUPIER- G F Gagg and Sons LTD.,  
Lower Dabdhill Farm,  
Misterton,  
Doncaster,  
Yorks.

66

70

64

2

3

B P EXPLORATION Co. Ltd.

SP. 589

Scale 1/2500

J.A.G.

REPRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE SANCTION OF THE CONTROLLER OF H.M. STATIONERY OFFICE.

CROWN COPYRIGHT RESERVED.

TEST AREA GLENTWORTH  
 COUNTY LINCS.  
 R.T.E. 91.4 ft. above OD.

WELL N<sup>o</sup>. 4.  
 LICENCE 25.  
 LAT. 53° 22' 55.3" N  
 LONG. 00° 37' 28.4" W

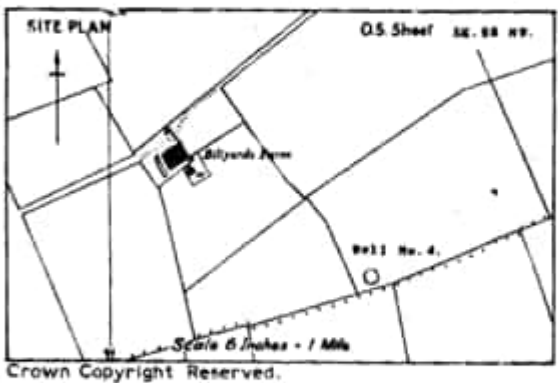
SK 98NW/4

HISTORY

Drilling commenced 1 FEB. 1962  
 Drilling completed 1 MARCH 1962  
 Rig 126 Jackrite T32  
 Power Paxman Diesel.

ORIGINAL VERSION : 14-3-62

BORINGS DEPT  
 7862  
 JMAH  
 26/3/62  
 Notified 13/10/61.



LEGEND

- Shale - Clay-Mudstone etc.
- Silt
- Sandy silt
- Thin beds of sand shale - No lense
- Sandstone pebbly sandstone
- Conglomerate Breccia
- Coal
- Fireclay
- Ironstone nodules
- Chert and Flint
- Limestone
- Dolomite
- Calcareous in part
- Anhydrite and Gypsum
- Salt
- Igneous

GEOLOGICAL FORMATION	DEPTH IN FEET	LOG	DETAILS OF FORMATION	OIL GAS WATER CON. S.M.F.	CASING	REMARKS
PLEISTOCENE AND RECENT.	35'		Clay, grey-brown, with scattered pebbles (brick red siltst. off white int., etc. (some pink).			
LIAS	40'		Calc. siltst. med. grey. Siltst. med. grey. sl. calc. clayey locally pyritous. Calc. siltst. med. grey inc. pyritous; some calcite veins. Silty Lat. med. grey w. rounded & sub-rounded ferrug. particles (? siltst.) and slim calcite veins. Silty Lat. med. grey w. thin beds white Lat; occ. calcite veins. Silty Lat. and calc. siltst. med. grey, loc. pyritous, some calcite veins. Silty Lat. med. to dk. grey, loc. pyritous, loc. w. shell fragments, occ. thin beds crinoidal Lat. Silty Lat. and calc. siltst. med-dk. grey inc. pyritous. Thin bed white microcralline Lat. Silty Lat. med. -dk. grey w. interbedded white microcralline Lat w. small solitary corals locally. Calc. mudst. orange-grey w. interbedded med grey pyritous mudst. Occ. lt. grey w. f. s. w. pyrite blut. v. well cemented (calcite). Shale dk. grey-black. Mudst. & silty mudst. lt. grey sl. greenish w. scattered dk. min. dolomitic; loc. grades to siltst. sl. gypsiferous. Silty mudst. brick red, occ. lt. grey-green and dolomitic. Gypsiferous as above.			
TRIASSIC	445'					
PERMIAN	455'					
	490'					
	500'					
	530'					
	612'					

Deviation 1'  
 11 1/2" casing surface to 308ft.

fuller edge  
 Gyp. siltst.  
 50'  
 Gyp. siltst. (siltst.)  
 (G. siltst.)  
 612'

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TEST AREA GLENTWORTH  
 COUNTY LINCS.  
 R.T.E. 91.4 ft. above OD.

WELL No. 4.  
 LICENCE 25.  
 LAT. 53° 22' 55.3" N  
 LONG. 00° 37' 28.4" W

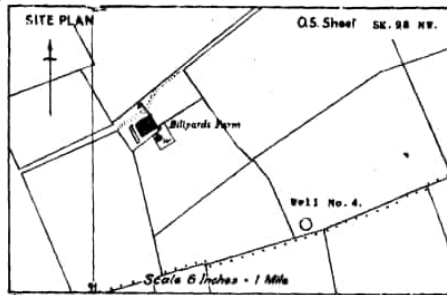
SK 98NW/4

HISTORY

Drilling commenced 1 FEB. 1962  
 Drilling completed 1 MARCH 1962  
 Rig 126 Jackknife T32  
 Power Faxman Diesel.

ORIGINAL VERSION: 14-3-62

ROBINGS DEPT  
 7862  
 JMCAH  
 26/3/62  
 Northwell 13/10/61.

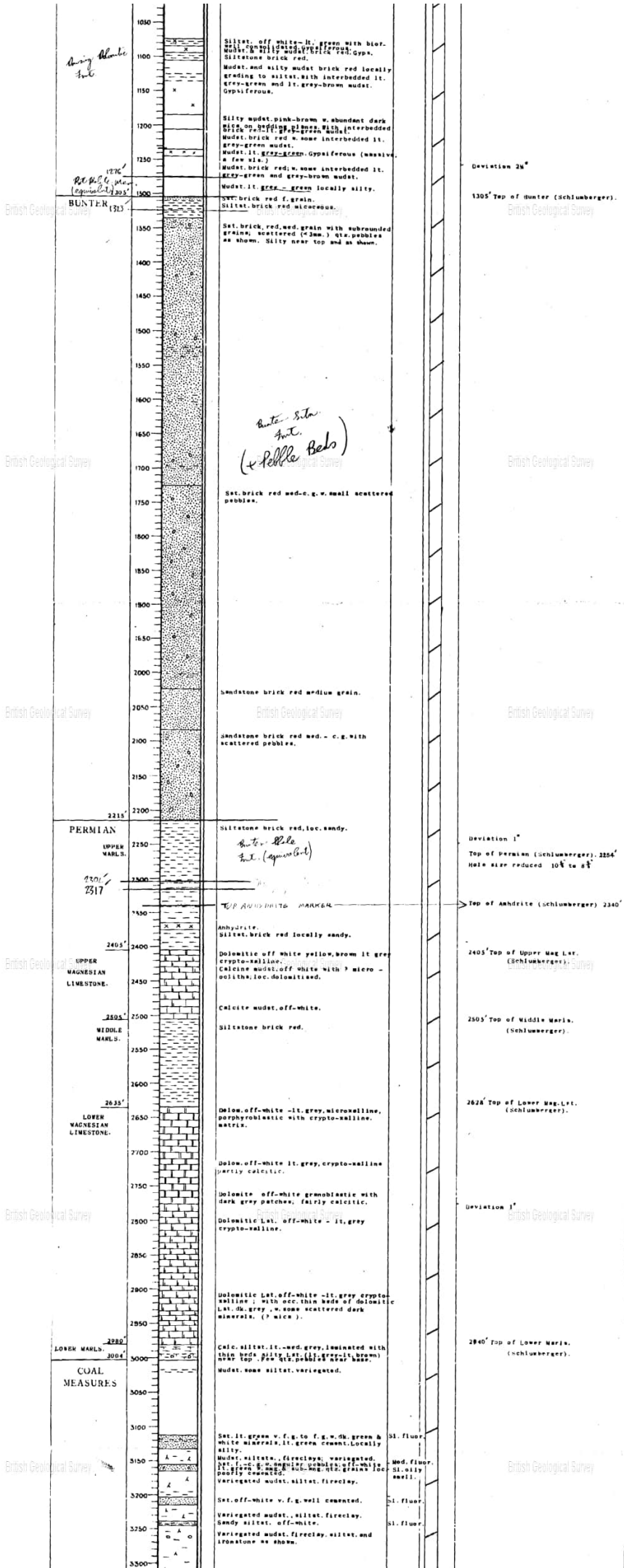


LEGEND

- Shale - Clay - Mudstone Etc.
- Coal
- Calcareous in part
- Silt
- Fireclay
- Anhydrite and Gypsum
- Sandy silt
- Ironstone nodules
- Silt
- Thin beds silt sand shale - No lines
- Chert and Flint
- Igneous
- Sandstone pebbly sandstone
- Limestone
- Dolomite
- Conglomerate Breccia

GEOLOGICAL FORMATION	DEPTH IN FEET	LOG	DETAILS OF FORMATION	OIL GAS WATER COAL SEAMS	CASING	REMARKS
PLEISTOCENE AND RECENT	55'	o o o o	Clay, grey-brown, with scattered pebbles (brick red siltst. off white lat., etc. (some pink).			
LIAS	50' 100' 150' 200' 250' 300' 350' 400'	o o	Calc. siltst. med. grey. Siltst. med. grey. sl. calc. clayey locally pyritous. Calc. siltst. med. grey loc. pyritous; some calcite veins. Silty Lst. med. grey w. rounded & sub-rounded ferrug. particles (? oolite), and clean calcite veins. Silty Lst. med. grey w. thin beds white Lst; occ. calcite veins. Silty Lst. and calc. siltst. med. grey, loc. pyritous, some calcite veins. Silty Lst. med. to dk. grey, loc. pyritous, loc. w. shell fragments. Occ. thin beds crinoidal Lst. Silty Lst. and calc. siltst., med-dk. grey loc. pyritous. Thin bed white microalgal Lst.			
KRAETIC	405'		Silty Lst. med.-dk. grey w. interbedded white microalgal Lst w. small solitary corals locally.			
AEUPER	445' 455'	x	Calc. mudst. orange-grey w. interbedded med grey pyritous mudst. Sst. lt. grey v. f. g. w. pyrite blot. v. well developed (Calcite) Shales dk. grey-black.			
	490' 500' 530'	x x x	Mudst. & silty mudst. lt. grey sl. greenish - scattered loc. min. dolomitic; loc. grades to siltst. Sl. gypsiferous. Silty mudst. brick red, occ. lt. grey-green and dolomitic. Gypsiferous as shown.			
	550' 600'	x W.S. x x x H.S. x	Mudst. brick red w. interbedded lt. green mudst. Mudst. lt. grey-green, dolomitic, calc. w. some interbedded brick-red mudst. Notably gypsiferous.			
	650' 700'	x x x x	Mudst. brick red; w. interbedded grey-green and dk. grey mudst. in lower part. Silty mudst. (loc. sandy), lt. green often with brick red patches. With interbedded brick red silty mudst. Gypsiferous.			
	750' 800'	x x	Siltst. brick red; w. interbedded brick red and lt. green mudst. and silty mudst. Gypsiferous. Mudst. brick red; with interbedded lt. green and dk. grey mudst. and brick red siltstone. Gypsiferous.			
	850' 900'	x P.S. -	Mudst. lt. green loc. sandy dolomitic; w. interbedded brick red mudst. and med. grey calc. siltstone.			
	950' 1000' 1050'	x x x	Mudst. brick red; with interbedded lt. green and off white mudst. Gypsiferous. Siltst. off white - lt. green with blot.			

Deviation 1'  
 1 1/2" casing surface to 306ft.



*Avery Marls*

1270'  
1300'  
BUNTER (321')

Siltst. off white - lt. green with blor. wh. cement. Locally brick red. Gyps. Siltstone brick red.

Mudst. and silty mudst. brick red locally grading to siltst. with interbedded lt. grey-green and lt. grey-brown mudst. Gypsiferous.

Silty mudst. pink-brown w. abundant dark fine op. bedding. Siltst. with interbedded mudst. brick red w. some interbedded lt. grey-green mudst.

Mudst. lt. grey-green. Gypsiferous (massive, a few sh.)

Mudst. brick red. w. some interbedded lt. grey-green and grey-brown mudst.

Mudst. lt. grey - green locally silty.

Siltst. brick red f. grain.

Siltst. brick red micaceous.

Silt. brick red med. grain with subrounded grains; scattered (<math>2-3\text{mm}</math>) qtz. pebbles as shown. Silty near top and at shown.

Silt. brick red med-c. g. w. small scattered pebbles.

Sandstone brick red med. grain.

Sandstone brick red med. - c. g. with scattered pebbles.

Siltstone brick red, loc. sandy.

Anhydrite. Siltst. brick red locally sandy.

Dolomitic off white yellow, brown lt grey crypto-saline. Calcine mudst. off white with ? micro - oolites; loc. dolomitized.

Calcite mudst. off-white.

Siltstone brick red.

Dolom. off-white - lt. grey, micro-saline, porphyroblastic with crypto-saline matrix.

Dolom. off-white lt. grey, crypto-saline partly calcitic.

Dolomite off-white granoblastic with dark grey patches, fairly calcitic.

Dolomitic Lst. off-white - lt. grey crypto-saline.

Dolomitic Lst. off-white - lt. grey crypto-saline.

Dolomitic Lst. off-white - lt. grey crypto-saline.

Calc. siltst. lt. med. grey, laminated with thin beds silty Lst. (lt. grey - lt. brown) near top. Few qtz. pebbles near base.

Mudst. some siltst. variegated.

Silt. lt. green v. f. g. to f. g. w. dk. green & white minerals. lt. green cement. Locally silty.

Mudst. siltst. (fireclay); variegated. It. green & brown. Locally off-white. Silty toward top. Few qtz. pebbles near base.

Mudst. some siltst. variegated.

Silt. off-white v. f. g. well cemented.

Variegated mudst., siltst. fireclay. Silty floor.

Sandy siltst. off-white. Silty floor.

Variegated mudst. fireclay, siltst. and ironstone as shown.

Deviation 2 1/2"

1305' Top of Hunter (Schlumberger).

Deviation 1"

Top of Permian (Schlumberger). 2254'

Note size reduced 10% to 4 1/2"

Top of Anhydrite (Schlumberger) 2340'

2405' Top of Upper Mag Lst. (Schlumberger).

2505' Top of Middle Marls. (Schlumberger).

2628' Top of Lower Mag. Lst. (Schlumberger).

Deviation 1"

2840' Top of Lower Marls. (Schlumberger).

31. floor

31. floor

31. floor

Mod. floor

Mod. floor

31. floor

31. floor

31. floor

31. floor

31. floor

31. floor

31. floor

31. floor

31. floor

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British Geological Survey

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British Geological Survey

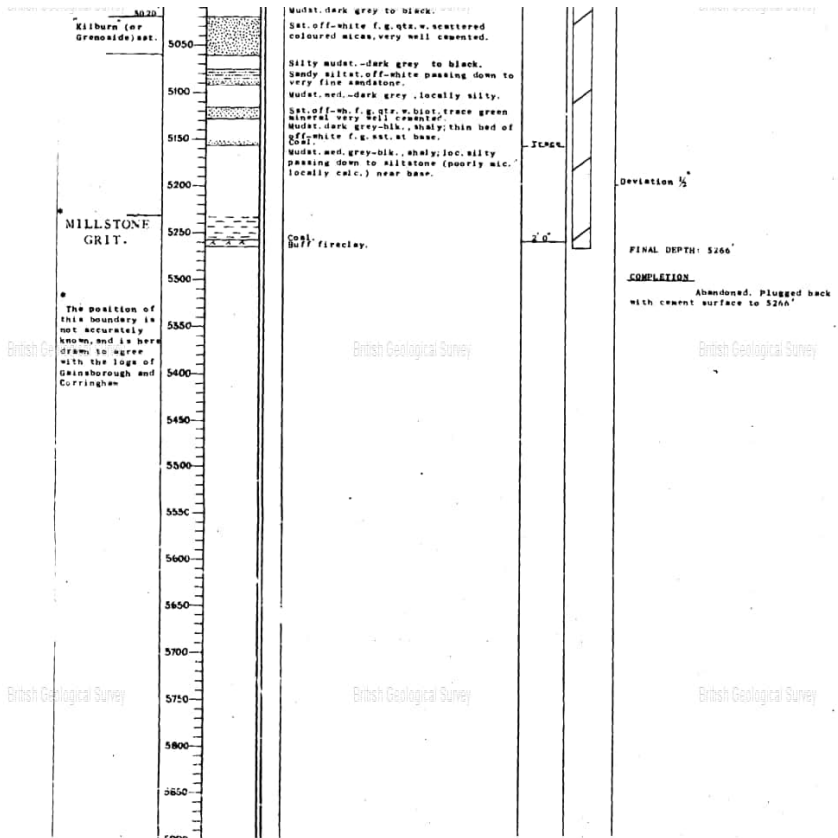
British Geological Survey

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British Geological Survey

British Geological Survey





## Appendix D Zetica UXO Map



# UNEXPLODED BOMB RISK MAP



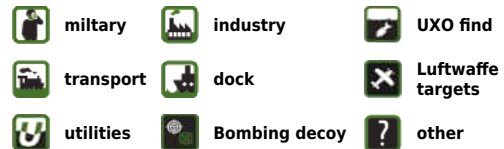
## SITE LOCATION

Location: DN21 5JY,  
Map Centre: 487388,384470



## LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.



### How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment\* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment\* is necessary.

### What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

**Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.**

### If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

### If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website:

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

\*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

## **Appendix E Pre-Desk Study Assessment from Zetica (for the Principal Site)**

## Pre-Desk Study Assessment

<b>Site:</b>	Tillbridge Solar Farm, Hemswell, Lincolnshire
<b>Client:</b>	AECOM
<b>Contact:</b>	Maria Vigano
<b>Date:</b>	4 <sup>th</sup> August 2022
<b>Pre-WWI Military Activity on or Affecting the Site</b>	None identified.
<b>WWI Military Activity on or Affecting the Site</b>	Harpwell Airfield opened in 1916, on land adjacent to the Site, as a Home Defence Landing Group (HDLG). By the end of WWI, the airfield expanded and became a night flying training ground for the Royal Air Force (RAF).
<b>WWI Strategic Targets (within 5km of Site)</b>	The following strategic targets were located in the vicinity of the Site: <ul style="list-style-type: none"> <li>■ Transport infrastructure and public utilities.</li> <li>■ Royal Flying Corps (RFC) Harpswell.</li> <li>■ Military barracks, camps, and training areas.</li> </ul>
<b>WWI Bombing</b>	None identified on the Site.
<b>Interwar Military Activity on or Affecting the Site</b>	RAF Harpswell closed in 1919. The airfield was reopened in January 1937 as RAF Hemswell and was used as a bomber airfield.
<b>WWII Military Activity on or Affecting the Site</b>	No. 61 and No. 144 bomber squadrons were the first units stationed at the airfield flying Hadley Page Hampden medium bombers. No. 300 and No. 300 were the next units stationed at the airfield flying Vickers Wellington bomber aircraft from July 1941.  Readily available records have been found indicating that 1No. British bomber aircraft crashed on the Site.
<b>WWII Strategic Targets (within 5km of Site)</b>	The following strategic targets were located in the vicinity of the Site: <ul style="list-style-type: none"> <li>■ Transport infrastructure and public utilities.</li> <li>■ RAF Hemswell.</li> <li>■ Military barracks, camps, and training areas.</li> <li>■ Anti-Aircraft (AA) and anti-invasion defences.</li> </ul>
<b>WWII Bombing Decoys (within 5km of Site)</b>	None.
<b>WWII Bombing</b>	During WWII the Site was located in the Rural District (RD) of Gainsborough, which officially recorded 102No. High Explosive (HE) bombs with a bombing density of 1.3 bombs per 405 hectares (ha).  No readily available records have been found to indicate that the Site was bombed.
<b>Post-WWII Military Activity on or Affecting the Site</b>	Post-WWII, RAF Hemswell continued to be a bomber airfield until the late 1950s.  In 1958, RAF Hemswell gained the responsibility as one of the main headquarters in Britain for the Douglas Thor nuclear missile.  RAF Hemswell closed in 1967 and was passed the Care and Maintenance. The Military Gliding School continued until 1974 when the RAF officially left the airfield.

Recommendation	It is recommended that a detailed desk study is commissioned to assess, and potentially zone, the Unexploded Ordnance (UXO) hazard level on the Site.
Further information	<p>For information about Zetica’s detailed UXO desk studies and other UXO services, please visit our website: <a href="http://www.zeticauxo.com">www.zeticauxo.com</a>.</p> <p>Details and downloadable resources covering the most common sources of UXO hazard affecting sites in the UK can be found <a href="#">here</a>.</p> <p>If you have any further queries, please don’t hesitate to get in contact with us at <a href="mailto:uxo@zetica.com">uxo@zetica.com</a> or 01993 886 682.</p>
<p>This summary is based on a cursory review of readily available records. Caution is advised if you plan to action work based on this summary.</p>	
<p>It should be noted that where a potentially significant source of UXO hazard has been identified on the Site, the requirement for a detailed desk study and risk assessment has been confirmed and no further research will be undertaken at this stage. It is possible that further in-depth research as part of a detailed UXO desk study and risk assessment may identify other potential sources of UXO hazard on the Site.</p>	

