A1813
Phase 1
Geo-Environmental Report

Land adjacent to Chestnut Terrace, Sutton Bridge, Spalding, PE12 9SX

AGS Ground Solutions Ltd

For

Lincoln Jack Ltd
C/O Alan Brown Development Services Ltd
Boscarnon Farmhouse, St Keverne, Cornwall
TR12 6NU

September 2018
Report Number: A1816

AGS Ground Solutions Ltd
4 Bond Street, Redruth, Cornwall TR15 2QB

DOCUMENT CONTROL

Client	Lincoln Jack Ltd
Project Title	Sutton Bridge
Document Title	Phase 1 Geo-Environmental Report
Document No.	A1816

Date	Revision	Changes	Author	Review	Approved
24/09/2018	0		CS	PF	

CONTENTS

Page

1. INTRODUCTION I
2. SITE LOCATION AND LAYOUT II
3. SITE HISTORY III
4. ENVIRONMENTAL SETTING V
   - 4.1 GEOLOGY V
   - 4.2 GROUNDWATER V
   - 4.3 SURFACE WATER V
   - 4.4 MINING VI
   - 4.5 RADON VI
   - 4.6 OTHER GEOLOGICAL INFORMATION VI
     - 4.6.1 Artificial / Made Ground vi
     - 4.6.2 Geological faults vi
     - 4.6.3 Surface & Underground Workings vi
     - 4.6.4 Mining, extraction & natural cavities vi
     - 4.6.5 Natural Subsidence vii
   - 4.7 OTHER ENVIRONMENTAL INFORMATION VIII
     - 4.7.1 Historical Industrial Land Use viii
     - 4.7.2 Environment ix
     - 4.7.3 Waste ix
     - 4.7.4 Current Industrial Land Use ix
     - 4.7.5 Water x
     - 4.7.6 Flooding x
     - 4.7.7 Protected Locations - Environmentally Sensitive Receptorsx
5. CONCEPTUAL SITE MODEL XI
   - 5.1 CONTAMINANT SOURCES XII
   - 5.2 PATHWAYS XII
   - 5.3 RECEPTORS XII
   - 5.4 POLLUTANT LINKAGES XIII
   - 5.5 DISCUSSION XIV
6. LAND STABILITY ASSESSMENT XV
   - 6.1 UNDERGROUND CAVITIES XV
   - 6.2 UNSTABLE SLOPES XV
   - 6.3 GROUND COMPRESSION / SHRINK / SWELL XV
7. CONCLUSIONS AND RECOMMENDATIONS XVII
   - 7.1 RECOMMENDATIONS XVII

APPENDICES:

1. Site Photographs

2. Historical Maps
3. Geological Report
4. Environmental Report

1. INTRODUCTION

AGS Ground Solutions Ltd (AGS) were commissioned by Alan Brown Development Services (The Architect) on behalf of Lincoln Jack Ltd (The Client) to undertake a Phase 1 geo-environmental site investigation on a site known as Land adjacent to Chestnut Terrance, and Land adjacent to Withington Street, Sutton Bridge, Lincolnshire.

It is understood that it is planned to purchase a large plot of land, with outline planning permission on two areas of the site, to construct 18 new residential dwellings, with associated garages, amenity space and access roads.

The aim of the investigation was to examine site conditions, and to identify any potential risks of ground contamination resulting from historical and contemporary site usage, and to make recommendations in accordance with these findings. In addition, an assessment of ground stability was also made.

2. SITE LOCATION AND LAYOUT

The site was located at Sutton Bridge, Lincolnshire and was centred approximately on Ordnance Survey Grid Reference TF 471 217.

A walkover survey was undertaken on the 26th September 2018.

A photographic record of the site walkover survey and siteworks are presented in Appendix 1.

Access to the site was via Granville Terrace, that lead to a farm track to the west of the site. Access on foot was possible from St Matthews Drive, to the east of the site and also from Chestnut Terrace and Withington Street to the south of the site.

At the time of the walkover survey the site was irregular in shape, and oriented approximately north-west to south-east on the long axis.

For the purposes of the study, the sit was split into three areas. Area A was a square plot at the end of Withington Street, upon which it was planned to construct 9 dwellings. Are a B was an L-shaped plot to the north and east of Chestnut Terrace, upon which it was planned to construct 9 dwellings. Area C was a long rectangular area occupying the remainder of the site. We are not aware of any plans to develop area C at the present time.

At the time of the survey, the site was overgrown with long grass, nettles and scrub. Some fly-tipped waste was found on site, predominately domestic waste (food wrappers / containers, plastic bags, soil, bricks, old trampoline etc). The fly-tipped material was concentrated around the end of Withington Street and the end of Chestnut Terrace, close to the areas of pedestrian access.

Geomorphologically, the site was generally level, however the ground was rutted and uneven, particularly in area C.

The following features surrounded the site:

- **To the north**; the site was bound by a ploughed farm fields, with trackways bordering the edges. Further farm fields were found beyond.
- **To the south**; the site boundary was boarded by multiple roads and residential dwellings. Bridge road and additional residential dwellings were found beyond.
- **To the east**; the site boundary was boarded by a trackway that led onto allotment gardens. Farm land and residential dwellings was found beyond.
- **To the west**; the site was bound by a trackway with farmland and residential dwellings found beyond.

3. SITE HISTORY

A map search was carried out for the site and extracts of the following Ordnance Survey maps were obtained covering the period between 1887 and 2014. Maps marked (*) are obtained from Russian Military Mapping, not Ordnance Survey.

These are presented in Appendix 2 and the relevant historic details are summarised as follows:

Period	Scale	Observations
1887	1:10,560	The site is shown to be a rural area, dominated by fields. A road named Prospect Road runs immediately to the south of the site in a SSW – NNE orientation. There are no structures on site, with the nearest structures being residential properties, directly to the south-west of site, and a row or properties and businesses running in a WNW – ESE orientation, approximately 150 m away. These are named Nene Lodge, Lindum Terrace, and the Holmes. In addition, three buildings are shown immediately to the north of the north west corner of the site.
1888	1:2,500	Additional residential dwellings to the south and south-west and roads of Granville Terrace and Withington Street of site are shown.
1889	1:2,500	A pump is approximately 150 m south-east of the site.
1903	1:10,560	Area B is dominated by trees. An additional property named Allenby's Chase is approximately 250 m south-east, and Anchor Inn is approximately 150 m south-west of the site.
1904	1:2,500	An additional property named Young's Row is approximately 50 m west of the site. The road running WNW – ESE orientation is now known as Bridge Road.
1929 - 1931	1:10,560	Multiple allotment gardens are surrounding the site, with one directly east of the site, one approximately 150 m south-east, one approximately 50 m WSW and west, and another approximately 250 m north-west of the site.
1938	1:10,560	No significant changes.
1958	1:10,560	No significant changes.
1965	1:2,500	The area south-east of site, adjacent to the east of Nene Lodge is now known as Westmere County Junior School. Sewage works are directly south of site, in the north-east corner of the school, and another is approximately 100 m north-west. A sewage pump station is approximately 100 m

		south-east of the site. Three new properties directly WSW of the site are known as The Haven, Davlin, and Cariton House.
1971	1:2,500	A coal yard is approximately 50 m west of the site, and a garage is approximately 120 m south-west of the site.
1974	1:10,000	Tracks run around the boundaries of the fields to the north, north-west and north-east of the fields, north of the site. A nursey is approximately 250 m west of the site. A drain is approximately 250 m north-west of the site.
1984	1:2,500	No significant changes.
1987 - 1990	1:2,500	No significant changes.
1990 – 1995	1:2,500	A drain is approximately 100 m NWN of the site. The school is now known as Sutton Bridge Westmere County Primary School. An additional property to the south of the site is known as Prospect Lodge. An electrical sub station is approximately 100 m south-east of the site, situated on Anne Road.
1991	1:10,000	Additional drains are approximately 250 m north of the site. Additional allotment gardens are NEN approximately 150 m away.
1992	1:2,500	No significant changes.
2002	1:10,000	No significant changes.
2010	1:10,000	No significant changes.
2014	1:10,000	No significant changes.

4. ENVIRONMENTAL SETTING

4.1 GEOLOGY

Reference to the British Geological Survey 1:50,000 scale geological map of the area shows the site as being underlain by Superficial deposits, identified as Tidal Flat Deposits – Clay and Silt (TFD). This is shown to be underlain by The Ampthill Clay Formation - Mudstone (AMC).

The British Geological survey provides the following geological descriptions. Contains British Geological Survey materials © NERC 2018:

Tidal Flat Deposits – Clay and Silt (TFD)

Description: Tidal Flat Deposits - Clay And Silt. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by shorelines (U).

Setting: shorelines (U). These sedimentary deposits are shallow-marine in origin. They are detrital, generally coarse-grained forming beaches and bars in a coastal setting.

Ampthill Clay Formation – Mudstone (AMC)

Description: Ampthill Clay Formation - Mudstone. Sedimentary Bedrock formed approximately 157 to 164 million years ago in the Jurassic Period. Local environment previously dominated by shallow seas.

Setting: shallow seas. These sedimentary rocks are shallow-marine in origin. They are detrital, ranging from coarse- to fine-grained (locally with some carbonate content) forming interbedded sequences.

4.2 GROUNDWATER

Reference to the British Geological Survey's Aquifer within Superficial Deposits, indicated that the superficial strata underlying the site are classified as a Unproductive.

Reference to the British Geological Survey's Aquifer within Bedrock Deposits, indicated that the strata underlying the site are classified as Unproductive. "These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

The site is not shown as being in a source protection zone.

4.3 SURFACE WATER

The nearest recorded surface water feature shown on the Ordnance Survey MasterMap Water Network is an inland river 56m to the north.

4.4 MINING

The site is not situated in an area where underground mining is likely to have taken place. Therefore, no mining search has been requested.

4.5 RADON

Reference to the British Geological Society (BGS) National Geoscience Information Service indicated that less than one percent (< 1 %) of homes within the area, which includes the site, have radon concentrations above the action level of 200Bq/m3.

Based upon the advice of the BGS National Geoscience Information Service, no radon protection measures are required in the construction of new dwellings or extensions.

4.6 OTHER GEOLOGICAL INFORMATION

Reference was made to the geological database Groundsure, extracts from which are provided in Appendix 3. Relevant entries in this database, relating to the sites geological stability is summarised as follows:

4.6.1 Artificial / Made Ground

Reference to the British Geological Survey (BGS) 1:10,000 and 1:50,000 plans for the area, indicates that there is no Artificial Ground / Made Ground (MGR) on the site.

4.6.2 Geological faults

Reference to the Geological Database, Groundsure indicates that there are no recorded faults within 250 m of the site.

4.6.3 Surface & Underground Workings

Surface Workings

There were four surface workings identified on within 250 m of the site.

- 1 x Sewage works
- 3 x Ponds

Underground Workings

No underground workings were identified on the site.

4.6.4 Mining, extraction & natural cavities

Historical Mining

No historical mining areas were identified within 250 m of the site.

Coal Mining

No coal mining was identified within 250 m of the site.

Johnson, Poole & Bloomer

No Johnson, Poole & Bloomer mining sites were identified within 250 m of the site.

Non-Coal Mining Cavities

No non-coal mining features were identified on site.

Natural Cavities

No natural cavities were identified within 250 m of the site.

Brine Extraction

No brine extraction sites were identified within 250 m of the site.

Gypsum Extraction

No gypsum extraction sites were identified within 250 m of the site.

Clay Mining

No clay mining sites were identified within 250 m of the site.

4.6.5 Natural Subsidence

Shrink / Swell

The site is identified as being at low risk of shrink swell subsidence.

Landslips

The site is identified as being at very low risk from landslip subsidence.

Ground Solution

The site is identified as being at negligible risk from ground solution subsidence.

Compressible Ground

The site is identified as being at moderate risk from compressible ground subsidence.

Collapsible Ground

The site is identified as being at negligible risk from collapsible ground subsidence.

Running Sands

The site is identified as being at moderate risk from running sands subsidence.

4.7 OTHER ENVIRONMENTAL INFORMATION

Reference was made to the environmental database Groundsure, extracts from which are provided in Appendix 4. Relevant entries in this database, relating to the sites environmental sensitivity is summarised as follows:

4.7.1 Historical Industrial Land Use

Potentially Contaminative Land Use

There were five potentially contaminative land uses shown on site or found within 250 m of the site.

- 2 x Unspecified Tanks
- 1 x Sewage Works
- 2 x Unspecified Pump

Historical Tank Database

There were eight historical tanks identified within 250 m of the site.

- 2 x Tanks
- 6 x Unspecified Tanks

Historical Energy Features

There were five historical energy features identified within 250 m of the site.

- 5 x Electricity Substation

Petrol and Fuel

No historical petrol stations or fuel sites were listed within 250 m of the site.

Historical Garage and Motor Vehicle Repair

There were three historical vehicle or motor repair sites identified 250 m of the site.

- 3 x Garage

Potentially Infilled Land

There were three potentially infilled features identified within 250 m of the site.

- 1 x Sewage Works
- 2 x Ponds

4.7.2 Environment

Environmental Permits

There were no environmental permits listed within 250 m of the site.

Discharge Consents

There was one licensed discharge consent shown within 250 m of the site.

- 1 x Unspecified affluent

Dangerous or Hazardous Sites

No recorded COMAH & NIHHS sites were listed within 250 m of the site.

Pollution Incidents

There were no pollution incidents recorded within 250 m of the site.

Contaminated Land

There was one site listed as contaminated land under part II A of the Environmental Protection Act, 1990.

- 1 x Historical Permit, Type B, Petrol Vapour Recovery

4.7.3 Waste

Landfill

There were no historical landfill sites listed within 250 m of the site.

There were no registered landfill sites listed within 250 m of the site.

There were no landfill records from historical mapping within 250 m of the site.

Waste

There were no licensed waste management facilities listed within 250 m of the site.

There were no waste transfer sites listed within 250 m of the site.

4.7.4 Current Industrial Land Use

Industrial Land Use

There were four potentially contaminative industrial site listed within 250 m of the site.

- 2 x Electrical Features
- 1 x Vehicle Breakdown and Recovery Services

- 1 x Sports and Leisure Equipment Repair

Petrol and Fuel

There was one petrol station or fuel site was listed within 250 m of the site.

- 1 x Obsolete, Unbranded Feature

4.7.5 Water

Abstraction Licenses

There were one water abstraction licenses listed within 1000 m of the site.

- 1 x Well 254 m South of the site. Direct Source, Ground Water Source and Supply. Details, General Farming & Domestic. Name, Hayes. Status, 1 x Historical.

4.7.6 Flooding

Flooding from Rivers and the Sea

The risk of flooding from rivers and the sea on the site is considered to be very low.

Groundwater Flooding

The site is not within 50 m of a British Geological Survey groundwater susceptibility area.

4.7.7 Protected Locations - Environmentally Sensitive Receptors

There was no Nitrate Vulnerable Zone (DEFRA) shown as Existing on site.

The site is not situated within 250 m of any other environmentally sensitive receptors, except those referred to in chapters 4.2 and 4.3.

5. CONCEPTUAL SITE MODEL

This conceptual site model has been undertaken with due regard to the advice relating to groundwater as provided in the Environment Agency's "Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources", the advice provided in the Contaminated Land (England) Regulations 2000, and the associated statutory guidance. The guidance defines contaminated land as any land that is in such a condition that by reason of substances in, on or under the land:

- significant harm is being caused or there is a significant possibility of such harm being caused; or
- pollution of controlled water is being, or is likely to be caused.

This definition is based on the principles of risk assessment defined as a combination of the probability (or frequency) of occurrence of a defined hazard and the magnitude (including the seriousness) of the consequences. Central to the risk assessment process is the concept of pollutant linkage that is a linkage between a contaminant and a receptor by means of a pathway.

Statutory definitions relating to pollution linkage.	
Contaminant	"a substance which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters."
Receptor	"a living organism, a group of living organisms, and ecological system or a piece of property" which meets given criteria. "controlled waters which are, or could be, polluted by a contaminant".
Pathway	"one or more routes or means by, or through, which a receptor: • is being exposed to, or affected by, a contaminant, or • could be so exposed or affected".

The relationship between these components is discussed below in order to identify the existence of any source-pathway-receptor linkage on the site, and hence the potential risks associated with any contamination.

5.1 CONTAMINANT SOURCES

There were several potential contamination sources identified in chapters 2 – 4. These are summarised below.

- Sewage works
- Electrical substation
- Ponds
- Unspecified tanks
- Unspecified pump
- Tanks
- Unspecified tanks
- Electricity substation
- Garage
- Coal yard
- Fly tipped waste
- Allotment gardens

5.2 PATHWAYS

The following potential contaminant pathways may therefore exist on the site:

- Indoor ingestion of soil dust.
- Inhalation of indoor dust and vapour.
- Contact with indoor dust.
- Vapours from the ground.
- Soil tracked indoors by people.
- Dermal contact with contaminated soil.
- Outdoor ingestion of soil.
- Outdoor inhalation of dust and vapour.
- Wind erosion and lifting of soil dust.
- Surface water runoff with suspended soil.
- Wind deposition to surface water.
- Migration through soil.
- Migration into groundwater.
- Migration of surface water.
- Contact of building foundations and buried services with contaminated soil.

5.3 RECEPTORS

Potential receptors/targets at the site and in the area in which the site is located include:

- Future occupants
- Site construction workers
- Groundwater resources
- Trees / Plants
- Underground services in and around the site
- Allotment gardens
- Buried structures

5.4 POLLUTANT LINKAGES

Source	Contaminant	Receptor	Pathway	Severity	Likelihood	Risk	Justification
Farm Land	Pesticides Herbicides Vermicides	Residents Construction Workers	Ingestion / inhalation of dust / soil / vapour	Moderate	Low	Low / Moderate	The area is not currently used for farming, and has not been for some time. It is likely that any pesticide residues will have broken down.
		Groundwater	Migration into groundwater	Mild	Medium	Low/ Moderate	Groundwater is likely to be shallow on the site, however, the use of pesticides / herbicides is likely to be low, given that the site has not been used for farming for some time.
Fly tipped waste	Unknown contaminants	Groundwater Residents Plants Site Workers	Ingestion / inhalation of dust / soil / vapour / migration into groundwater	Moderate	Low	Low/ Moderate	The fly tipped waste was minimal in quantity, however, has the potential to contain unknown contaminants.
Coal yard & garage	PAH & TPH	Groundwater Residents Servicing Staff Plants Site Workers	Ingestion / inhalation of dust / soil / vapour / migration into groundwater	Moderate	Low	Low / Moderate	Given the distance from the site, the risks posed by the coal yard and garage on the site are low.
Sewage Works / Pump Station / Potential chemical storage /	Inhalation of vapor, dermal contact, migration into water systems,	Residents Site Workers Plants Groundwater	Ingestion / inhalation of dust / soil / vapour / migration into	Mild	Low	Low / Moderate	The risks are considered to be low given the type of site and its distance from

hydrocarbon waste	direct ingestion, uptake by plants, permeation into water pipes.		groundwater				the site.
Electricity Substations / Historical Energy Features - PCBs	Inhalation of vapour, dermal contact, risk of explosion in enclosed space, migration into watercourses	Groundwater Residents Plants Site Workers		Moderate	Low	Low / Moderate	PCBs were historically used as lubricants within electricity substations. Given the size of the stations and distance from site, these are unlikely to have any significant and adverse effect.

5.5 DISCUSSION

The site is situated in a rural location and as such the site has not been witness to any considerable industrial or commercial activity.

The area around the site is a mixture of medium density residential land and farm land with few contaminative features.

A low / moderate risk exists from a number of sources, however, no particular areas of concern have been identified.

Given the size of the site, and the number of dwellings proposed, it would be prudent to carry out screening for a range of possible contaminants which may be present due to the sites history.

If, during construction, any potentially contaminated ground is encountered, as denoted by discolouration, man-made material, odour, etc, work should stop until the risk posed by the extent of the contamination and the risk posed can be established.

6. LAND STABILITY ASSESSMENT

This risk assessment has been undertaken with due regard to the advice relating to ground instability as provided in the National Planning Policy Framework (NPPF) Planning Practice Guidance (PPG) ID:45 for "Land Stability".

This Land Stability Assessment has been designed to consider the following risks:

1. The effects of underground cavities; these may be of natural origin or due to mining or to civil engineering works;

2. Unstable slopes; these may be natural, in both coastal and inland situations; or manmade, whether excavated, as in quarries or cuttings, or constructed, as in tips and embankments.

3. Ground compression; this may be of natural origin due to peat, alluvial, estuarine or marine soils; or due to human activities, e.g. made ground, landfill or restored opencast mines; and ground subject to movement due to shrinking and swelling clays.

While in all cases instability may arise whether or not there is any development on the surface, it is important to recognise that the development itself or the intensification of development may be the triggering factor, which initiates instability problems.

The risks posed by each type of unstable ground are discussed based upon the proposed redevelopment of the site for residential structures and associated infrastructure.

6.1 UNDERGROUND CAVITIES

The desk-top study identified that the site was unlikely to be affected by historic mining features.

The geology of the area is not susceptible to solution features.

Therefore, the risks posed by underground cavities is considered to be low.

6.2 UNSTABLE SLOPES

The site was situated on level ground.

The site was identified as being at very low risk from landslip subsidence.

The risks posed by unstable slopes are therefore considered to be low.

6.3 GROUND COMPRESSION / SHRINK / SWELL

The geology of the site is identified as being at moderate risk of shrink / swell subsidence.

The geology of the site is identified as being at negligible risk of compressible ground subsidence.

The superficial deposits beneath the site have been identified as Marine Beach Deposits, which may contain significant quantities of clay / silt, which may be subject to volume change depending upon moisture content. In addition, the groundwater may be subject to tidal action, given the proximity of the tidal River Nene to the east of the site.

We would therefore suggest that the risks from compressible ground should be considered moderate, and further work should be carried out to establish the magnitude of any compressibility.

7. CONCLUSIONS AND RECOMMENDATIONS

Based on the data assessment, the following conclusions and recommendations have been drawn up in respect to Land adjacent to Chestnut Terrance, and Land adjacent to Withington Street, Sutton Bridge, Lincolnshire.

- Several potential contamination sources were identified on or within 250 m of the site.
- All risks were identified as low or low / moderate risk.
- The risks posed by sub surface voids were considered to be low.
- The risks posed by unstable slopes were considered to be low.
- The risks posed by compressible ground on the site were considered to be moderate.

7.1 RECOMMENDATIONS

Given the size of the site, it is recommended that the topsoil and subsoil beneath the site are sampled for the presence of a basic suite of contaminants.

This work should involve the excavation of a number of shallow trial pits / boreholes across the site to enable soil samples to be taken for laboratory analysis.

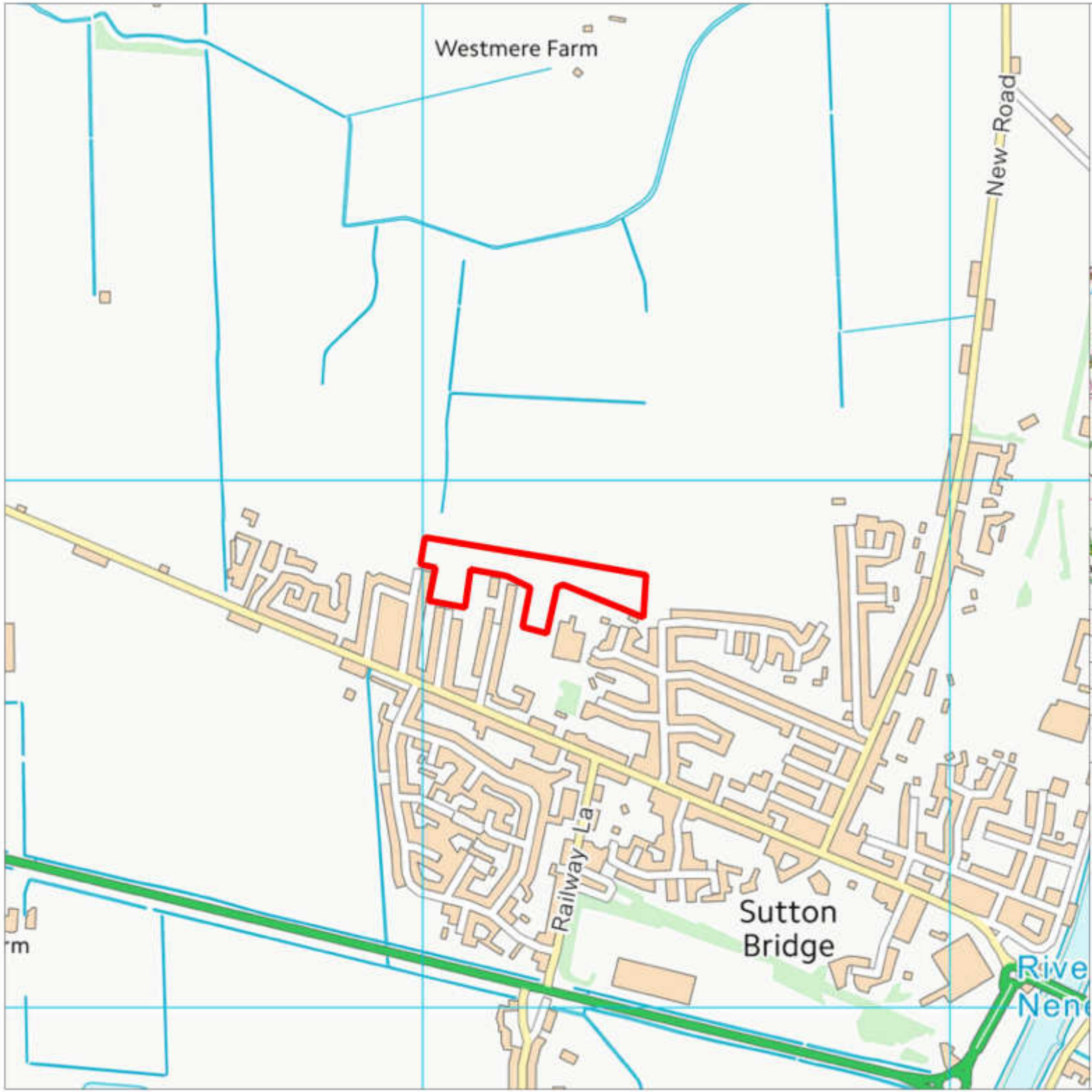
Samples should be tested for (as a minimum) the presence of toxic metals, pH, sulphate, Phenol, PAH and TPH.

Should any unexpected ground contamination is encountered, that work should stop until the extents and risks posed by the contamination can be identified.

It is recommended that a geotechnical site investigation be carried out, to establish the risks posed by compressible ground beneath the proposed buildings and roads. The investigation should also provide a ground bearing pressure for the design of building foundations.

APPENDICES:

1. Site Photographs
2. Historical Maps
3. Geological Report
4. Environmental Report



AGS Ground Solutions Ltd

www.agsgroundsolutions.com
01209 202 409

Project	Sutton Bridge
Project Number	A1816
Location	Spalding, Lincolnshire
Client	Lincoln Jack Ltd / Alan Brown Development Services Ltd
Drawing Title	Site Location Plan

Drawing Number	Revision	Date	Approximate Scale
A1816-01	1	03/10/2018	1:10000 @ A4

Key

Site Boundary

0 100 200 300 400 500 m

N

Contains OS data © Crown copyright and database right (2018)

Appendix 1

Site Photographs

Photograph 1 – General view of south-eastern boundary of the site, facing south.

Photograph 2 – General view of features to the west of the site, showing a ploughed farm field.

Photograph 3 – View of farmland and trackway to the north of the site.

Photograph 4 – View of the site facing south-east, this highlights portion A of the investigation.

Photograph 5 – Northern boundary of the site, facing south-east.

Photograph 6 – View of end of Withington Street facing towards the site.

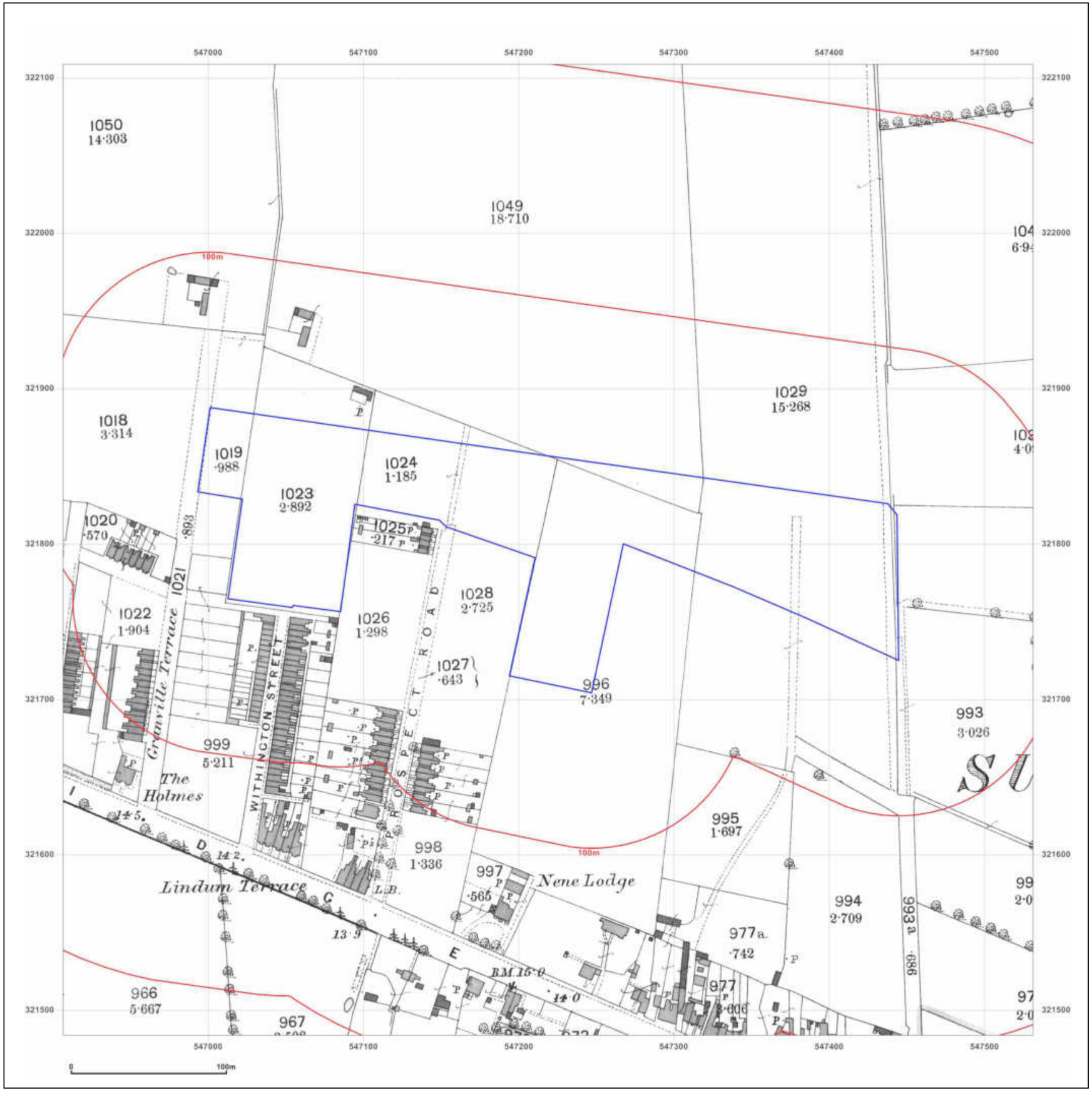
Photograph 7 – View of the end of Chestnut Terrace facing towards the site.

Photograph 8 – Western half of the site.

Photograph 9 – Eastern half of the site.

Appendix 2

Historical Maps



Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: County Series

Map date: **1888**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1888
Revised 1888
Edition N/A
Copyright N/A
Levelled N/A

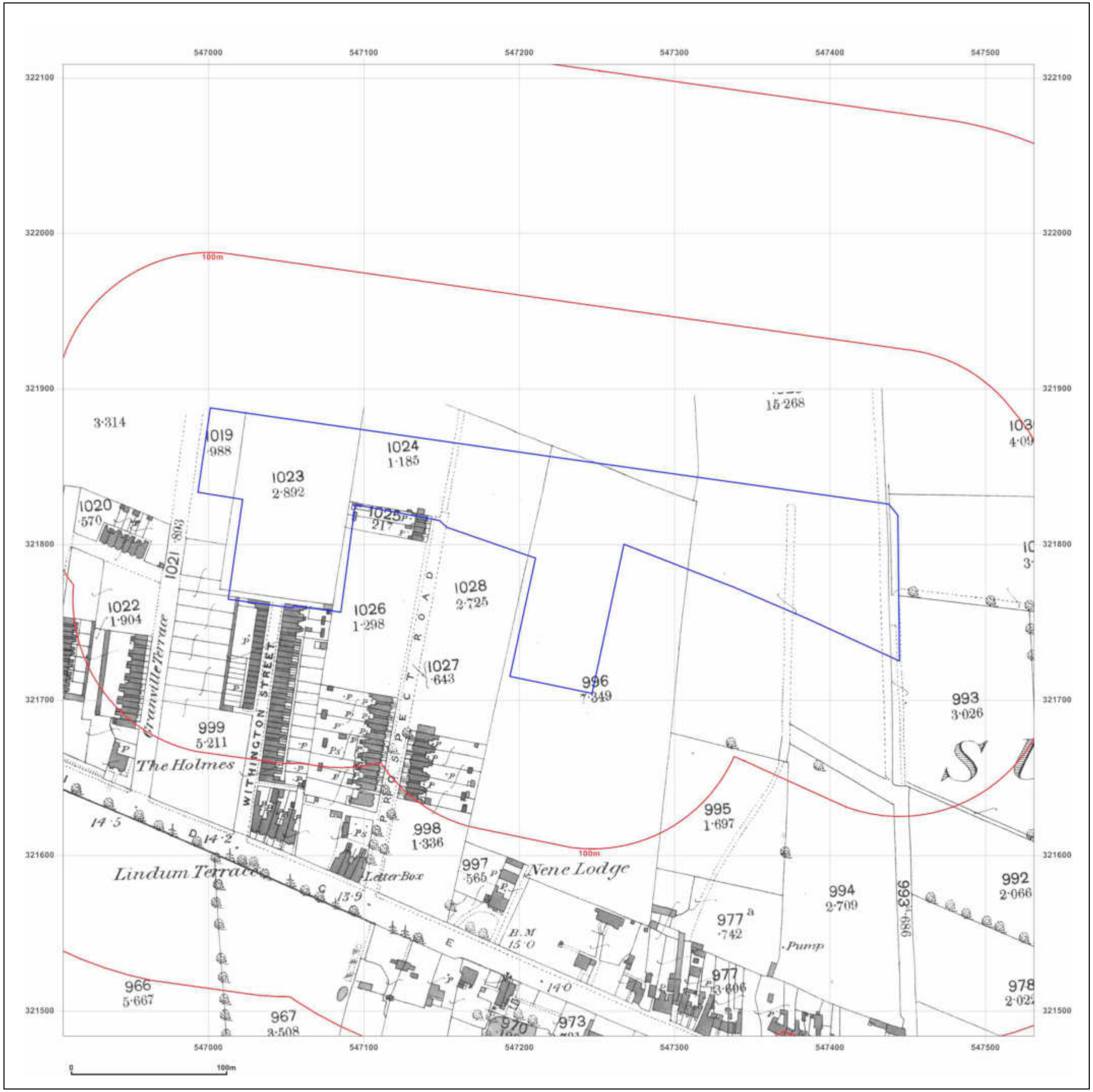
Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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



Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: County Series

Map date: **1889**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A

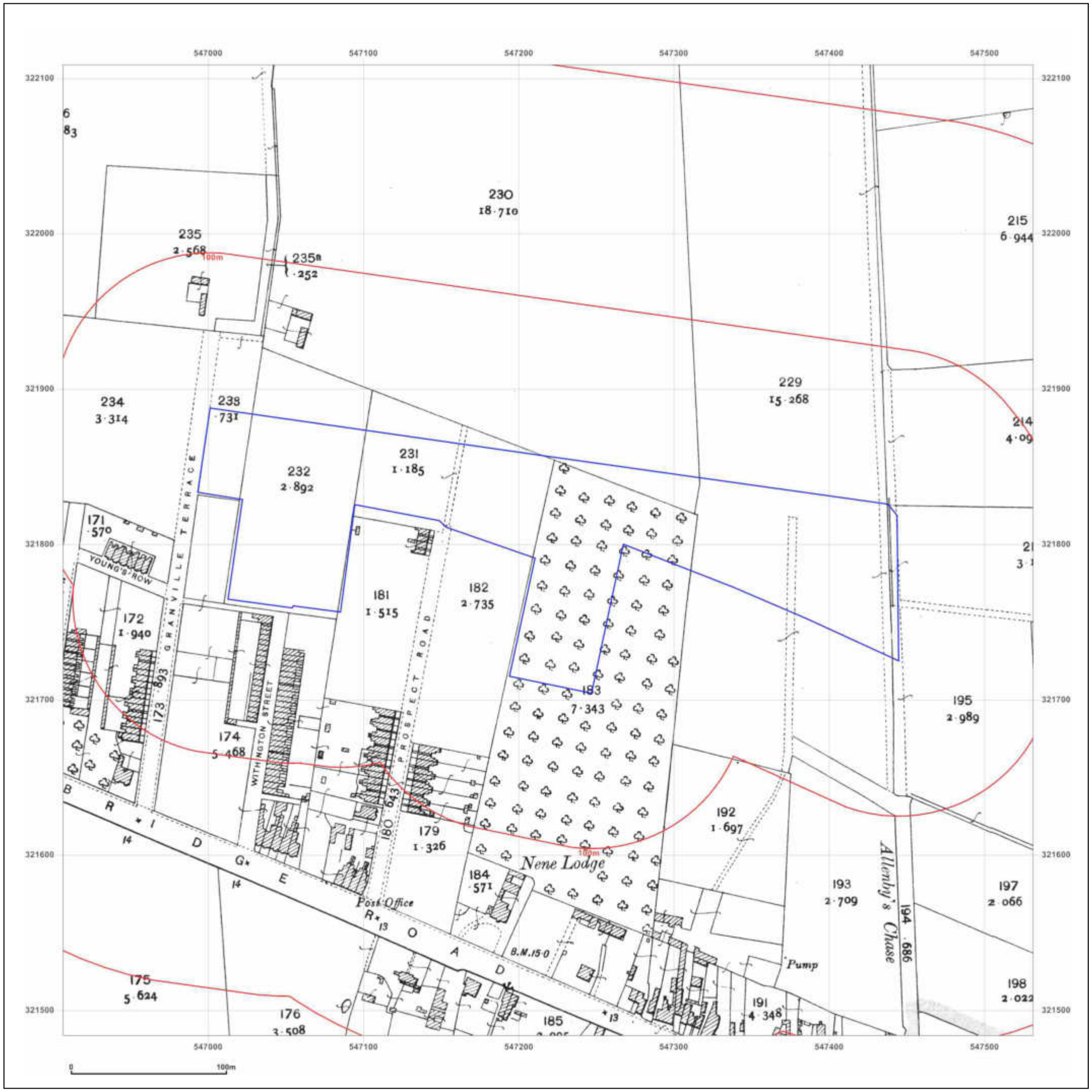
Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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



Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: County Series

Map date: **1904**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

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

Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

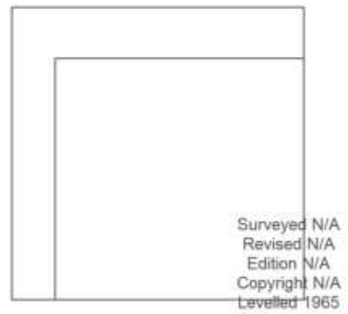
Map Name: National Grid

Map date: **1965**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: National Grid

Map date: **1971**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1971
Revised 1971
Edition N/A
Copyright 1972
Levelled 1964

Surveyed 1971
Revised 1971
Edition N/A
Copyright 1972
Levelled 1965

Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: National Grid

Map date: **1984**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1965
Revised 1984
Edition N/A
Copyright 1984
Levelled 1965

Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT TERRACE, SUTTON BRIDGE, SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

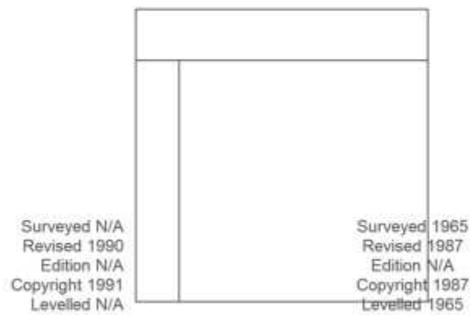
Map Name: National Grid

Map date: **1987-1990**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



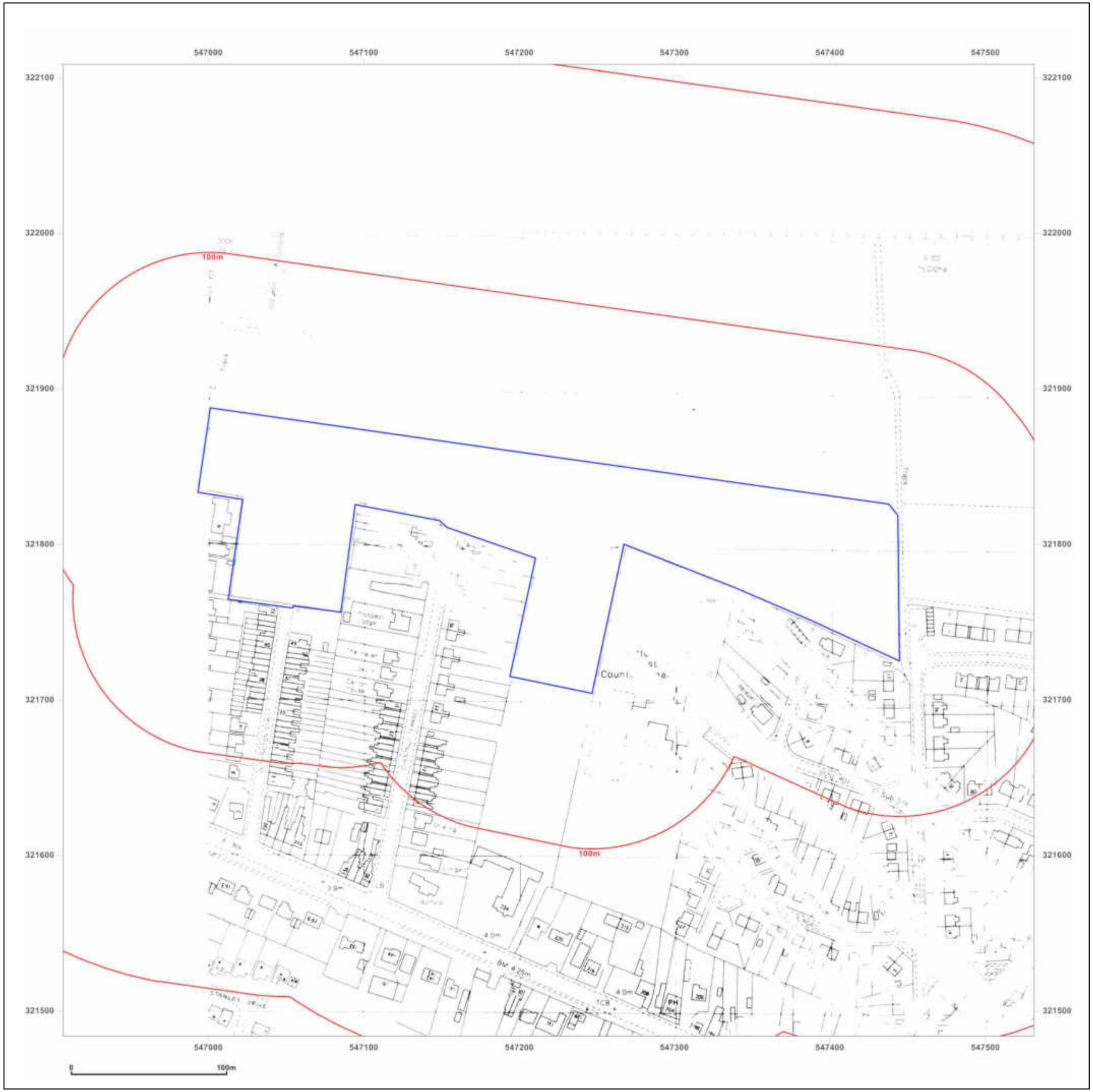
Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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



Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

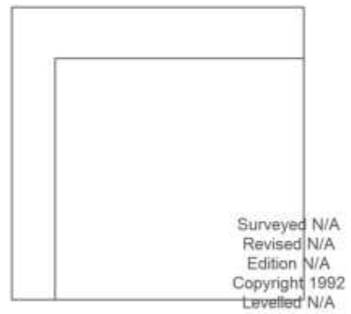
Map Name: National Grid

Map date: **1992**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

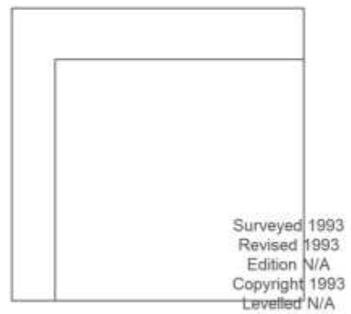
Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: National Grid

Map date: **1990-1995**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

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

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

Surveyed 1965
Revised 1990
Edition N/A
Copyright 1990
Levelled 1965

Surveyed N/A
Revised 1990
Edition N/A
Copyright 1991
Levelled N/A

Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: County Series

Map date: **1887**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1887
Revised 1887
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1887
Revised 1887
Edition N/A
Copyright N/A
Levelled N/A

Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: County Series

Map date: **1903**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1886
Revised 1903
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1886
Revised 1903
Edition N/A
Copyright N/A
Levelled N/A

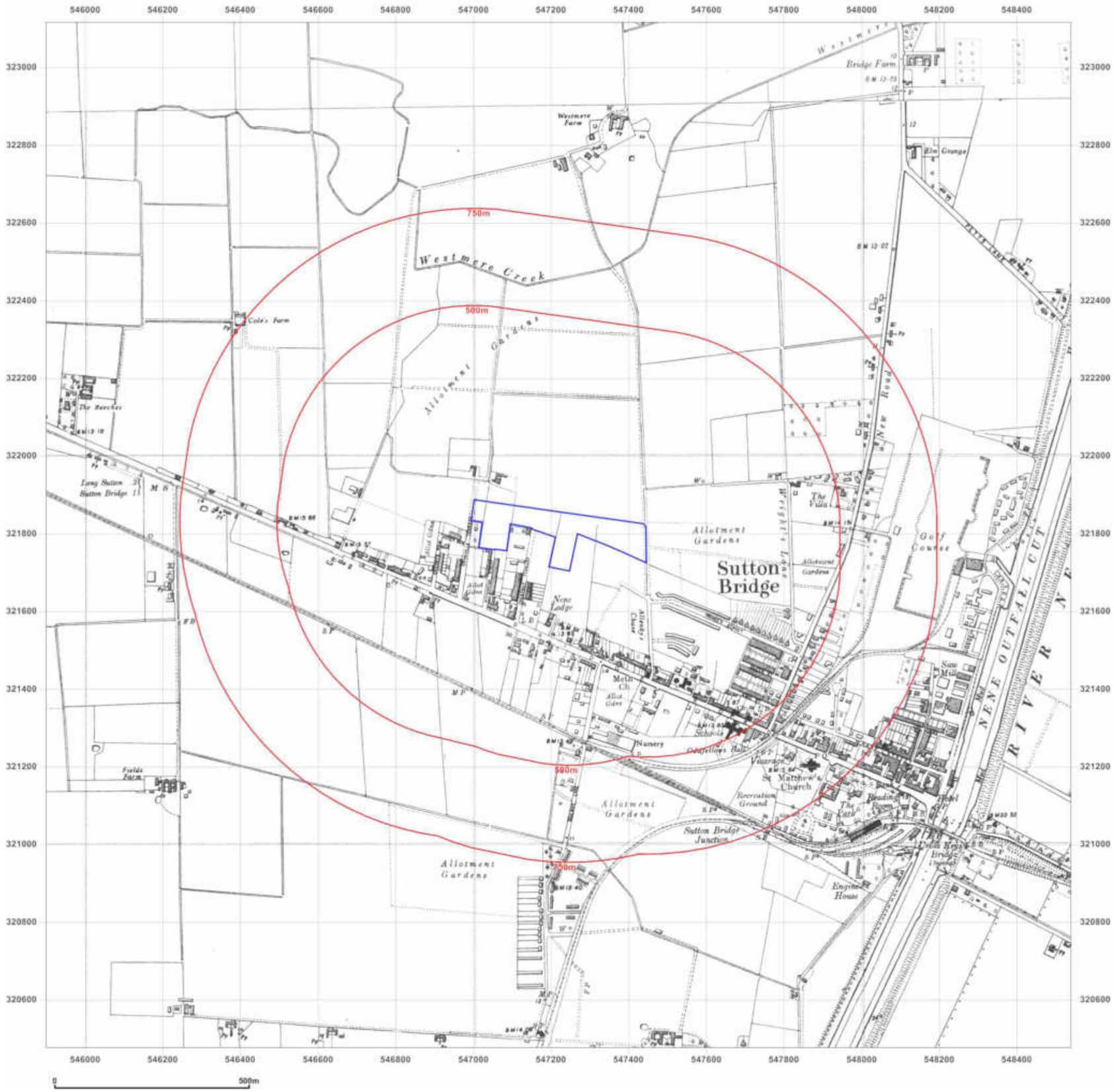
Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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



Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: County Series

Map date: **1929-1931**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1886
Revised 1931
Edition 1931
Copyright N/A
Levelled N/A

Surveyed 1886
Revised 1929
Edition N/A
Copyright N/A
Levelled N/A

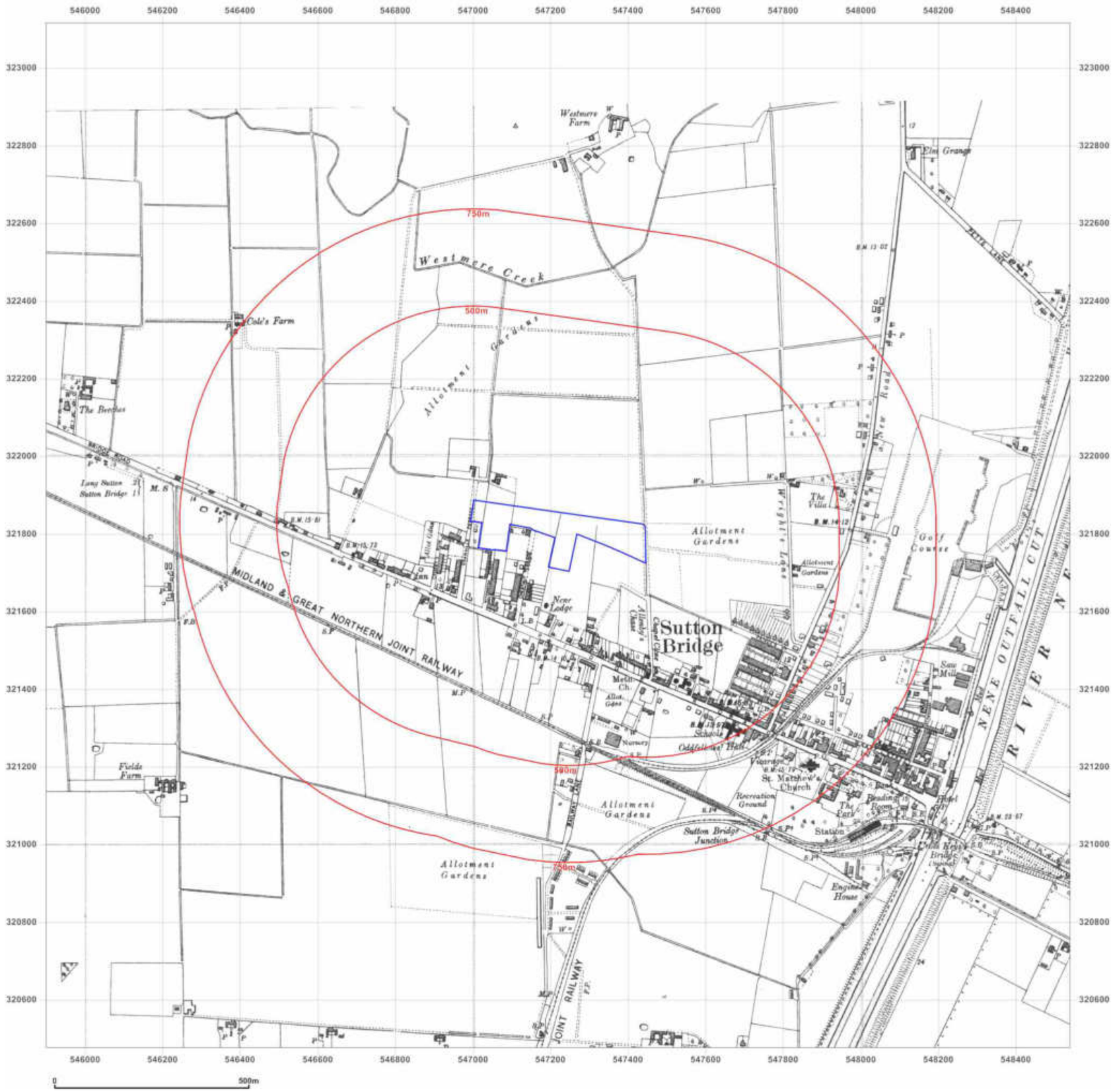
Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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



Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1886
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

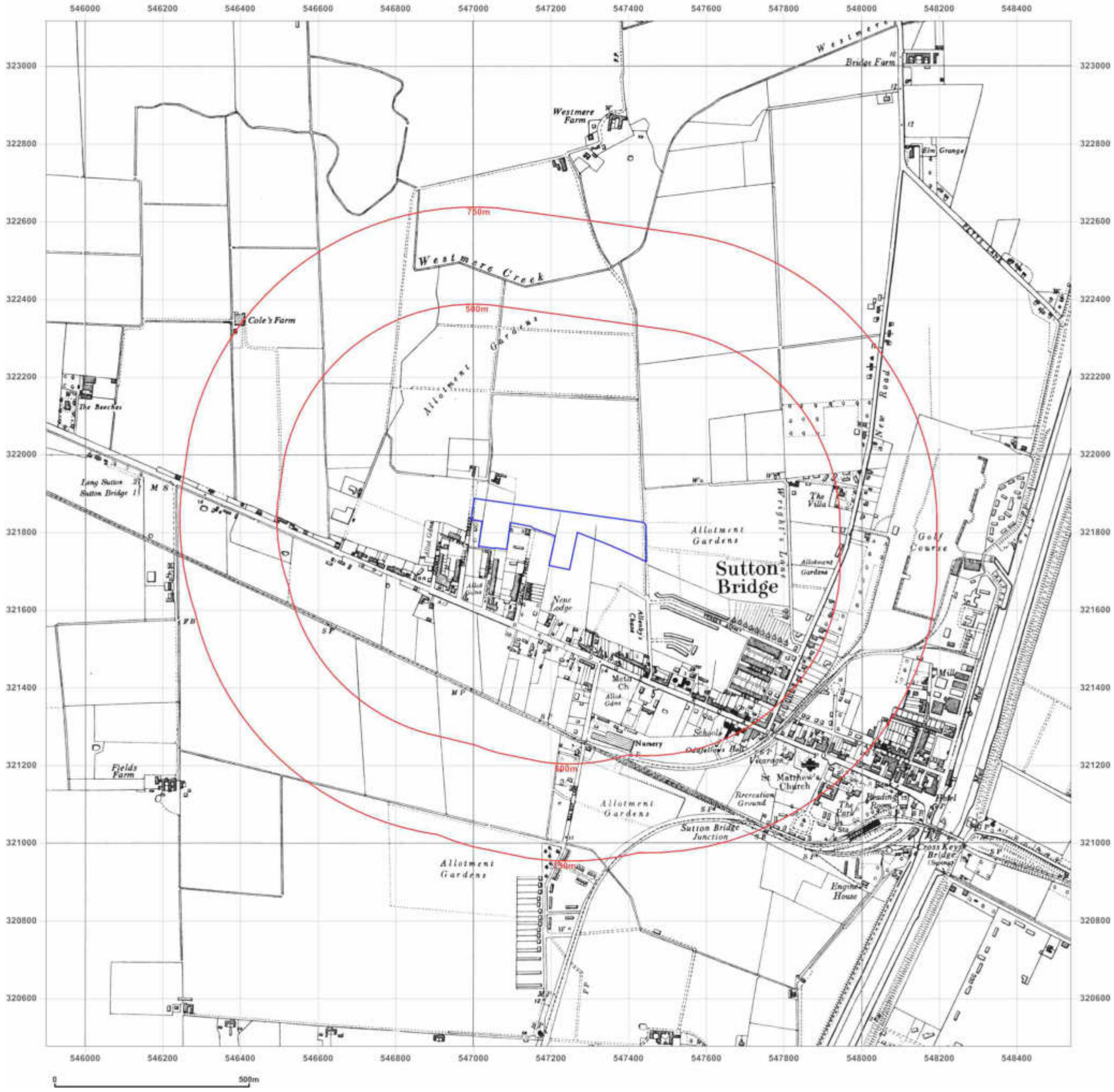
Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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



Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: Provisional

Map date: **1958**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

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

Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT TERRACE, SUTTON BRIDGE, SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: National Grid

Map date: **1974**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

Surveyed 1971
Revised 1973
Edition N/A
Copyright 1974
Levelled N/A

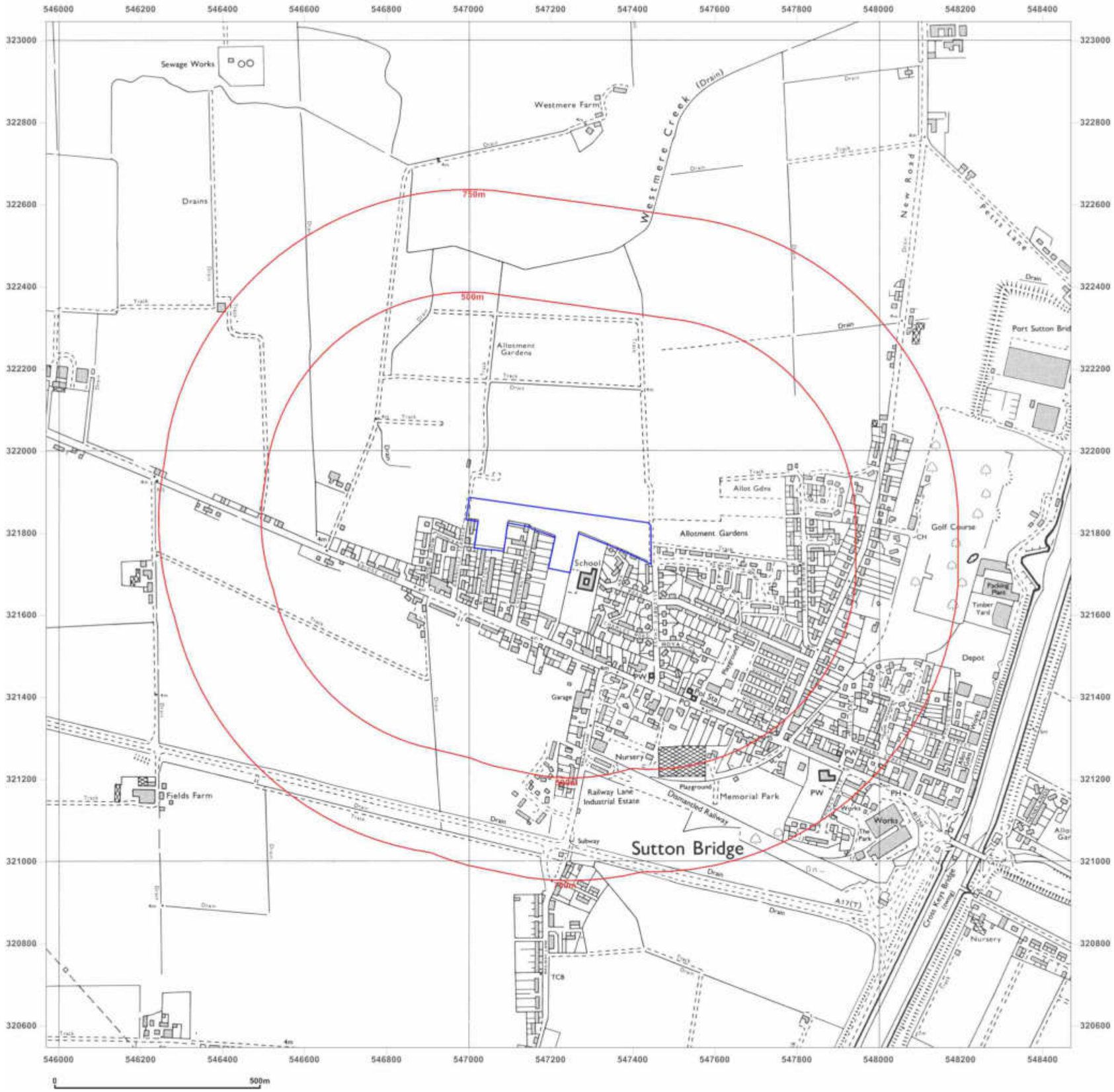
Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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



Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: National Grid

Map date: **1991**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

Surveyed 1990
Revised 1991
Edition N/A
Copyright N/A
Levelled N/A

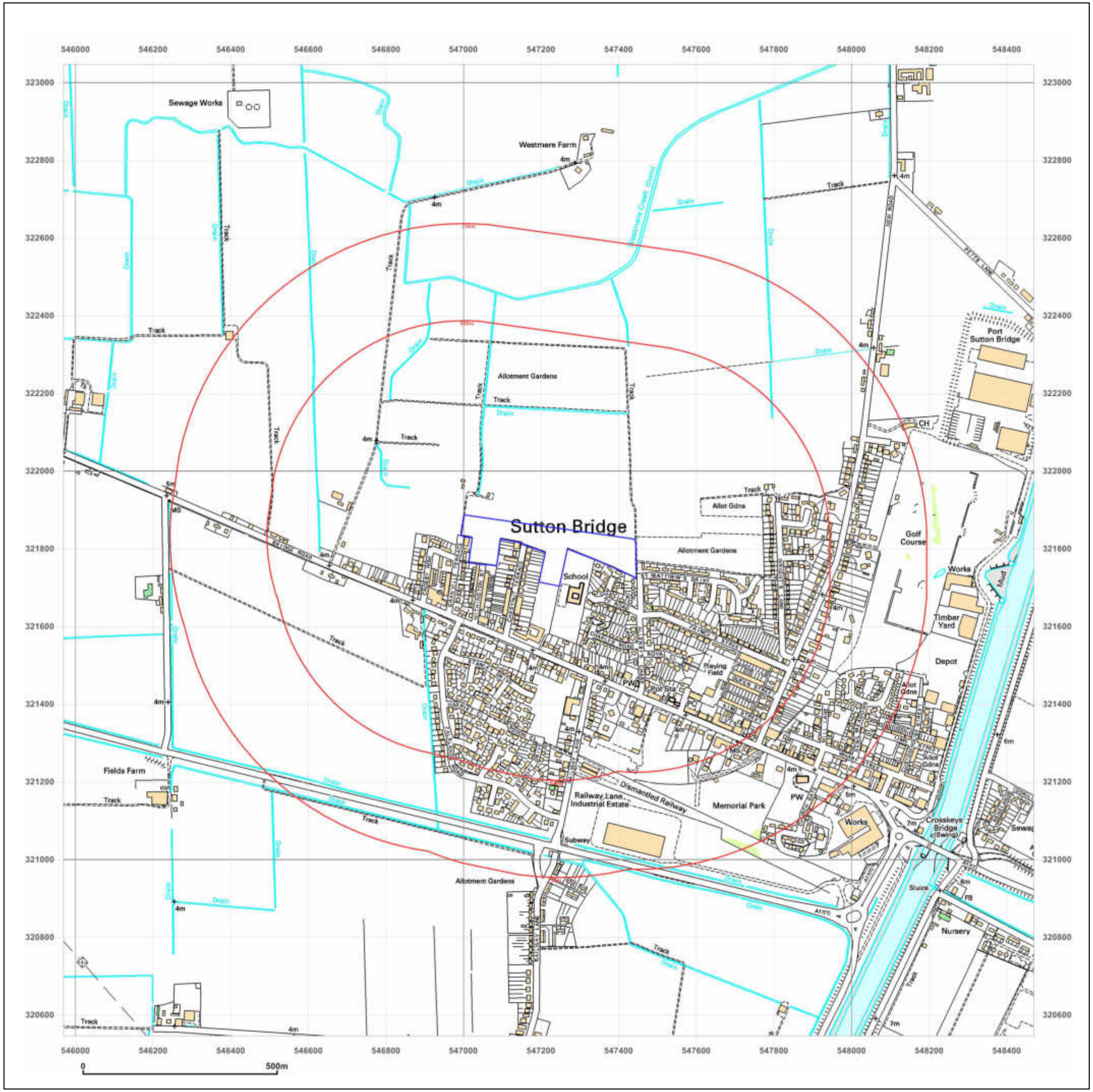
Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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



Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT
TERRACE, SUTTON BRIDGE,
SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

2002

Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT TERRACE, SUTTON BRIDGE, SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

2010

Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Groundsure INSIGHTS

Site Details:

LAND ADJ TO CHESTNUT TERRACE, SUTTON BRIDGE, SPALDING, PE12 9SX

Client Ref: A1816_-_Sutton_Bridge
Report Ref: GS-5471033
Grid Ref: 547219, 321796

Map Name: National Grid

Map date: **2014**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

2014

Powered by OS

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

© Crown copyright and database rights 2018 Ordnance Survey 100035207

Production date: 24 September 2018

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

Appendix 3

Geological Report

AGS Ground Solutions Ltd

3, Greenwith Crescent,
Truro, TR3 7LU

Groundsure Reference:	GS-5471032
Your Reference:	A1816_-_Sutton_Bridge
Report Date	24 Sep 2018
Report Delivery Method:	Email - pdf

Geo Insight

Address: LAND ADJ TO CHESTNUT TERRACE, SUTTON BRIDGE, SPALDING, PE12 9SX

Dear Sir/ Madam,

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

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

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

Geo Insight

Address:	**LAND ADJ TO CHESTNUT TERRACE, SUTTON BRIDGE, SPALDING, PE12 9SX**
Date:	**24 Sep 2018**
Reference:	**GS-5471032**
Client:	**AGS Ground Solutions Ltd**

NW N NE

W

E

SW S SE

Aerial Photograph Capture date:	06-Apr-2015
Grid Reference:	547209,321823
Site Size:	3.75ha

Contents Page

Contents Page ... 3
Overview of Findings ... 5
1:10,000 Scale Availability ... 8
Availability of 1:10,000 Scale Geology Mapping ... 9
1 Geology (1:10,000 scale) ... 10
1.1 Artificial Ground map (1:10,000 scale) ... 10
1. Geology 1:10,000 scale ... 11
1.1 Artificial Ground ... 11
1.2 Superficial Deposits and Landslips map (1:10,000 scale) ... 12
1.2 Superficial Deposits and Landslips ... 13
1.2.1 Superficial Deposits/ Drift Geology ... 13
1.2.2 Landslip ... 13
1.3 Bedrock and linear features map (1:10,000 scale) ... 14
1.3 Bedrock and linear features ... 15
1.3.1 Bedrock/ Solid Geology ... 15
1.3.2 Linear features ... 15
2 Geology 1:50,000 Scale ... 16
2.1 Artificial Ground map ... 16
2. Geology 1:50,000 scale ... 17
2.1 Artificial Ground ... 17
2.1.1 Artificial/ Made Ground ... 17
2.1.2 Permeability of Artificial Ground ... 17
2.2 Superficial Deposits and Landslips map (1:50,000 scale) ... 18
2.2 Superficial Deposits and Landslips ... 19
2.2.1 Superficial Deposits/ Drift Geology ... 19
2.2.2 Permeability of Superficial Ground ... 19
2.2.3 Landslip ... 19
2.2.4 Landslip Permeability ... 19
2.3 Bedrock and linear features map (1:50,000 scale) ... 20
2.3 Bedrock, Solid Geology & linear features ... 21
2.3.1 Bedrock/Solid Geology ... 21
2.3.2 Permeability of Bedrock Ground ... 21
2.3.3 Linear features ... 21
3 Radon Data ... 22
3.1 Radon Affected Areas ... 22
3.2 Radon Protection ... 22
4 Ground Workings map ... 23
4 Ground Workings ... 24
4.1 Historical Surface Ground Working Features derived from Historical Mapping ... 24
4.2 Historical Underground Working Features derived from Historical Mapping ... 24
4.3 Current Ground Workings ... 24
5 Mining, Extraction & Natural Cavities ... 26
5.1 Historical Mining ... 26
5.2 Coal Mining ... 26
5.3 Johnson Poole and Bloomer ... 26
5.4 Non-Coal Mining ... 26
5.5 Non-Coal Mining Cavities ... 27
5.6 Natural Cavities ... 27
5.7 Brine Extraction ... 27
5.8 Gypsum Extraction ... 27
5.9 Tin Mining ... 27
5.10 Clay Mining ... 28
6 Natural Ground Subsidence ... 29
6.1 Shrink-Swell Clay map ... 29
6.2 Landslides map ... 30
6.3 Ground Dissolution of Soluble Rocks map ... 31
6.4 Compressible Deposits map ... 32
6.5 Collapsible Deposits map ... 33
6.6 Running Sand map ... 34

6 Natural Ground Subsidence..... 35
6.1 Shrink-Swell Clays.....35
6.2 Landslides.....35
6.3 Ground Dissolution of Soluble Rocks.....36
6.4 Compressible Deposits.....36
6.5 Collapsible Deposits.....36
6.6 Running Sands.....36
7 Borehole Records..... 38
8 Estimated Background Soil Chemistry..... 39
9 Railways and Tunnels map..... 40
9 Railways and Tunnels..... 41
9.1 Tunnels 41
9.2 Historical Railway and Tunnel Features 41
9.3 Historical Railways.....42
9.4 Active Railways.....42
9.5 Railway Projects.....42

Overview of Findings

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

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

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

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

Section 2: Geology 1:50,000 Scale		
2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features	2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?	Yes
	2.3.3 Are there any records of linear features within 500m of the study site boundary?	No

Section 3: Radon

3. Radon	3.1Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
	3.2Radon Protection	No radon protective measures are necessary.

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

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

Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0

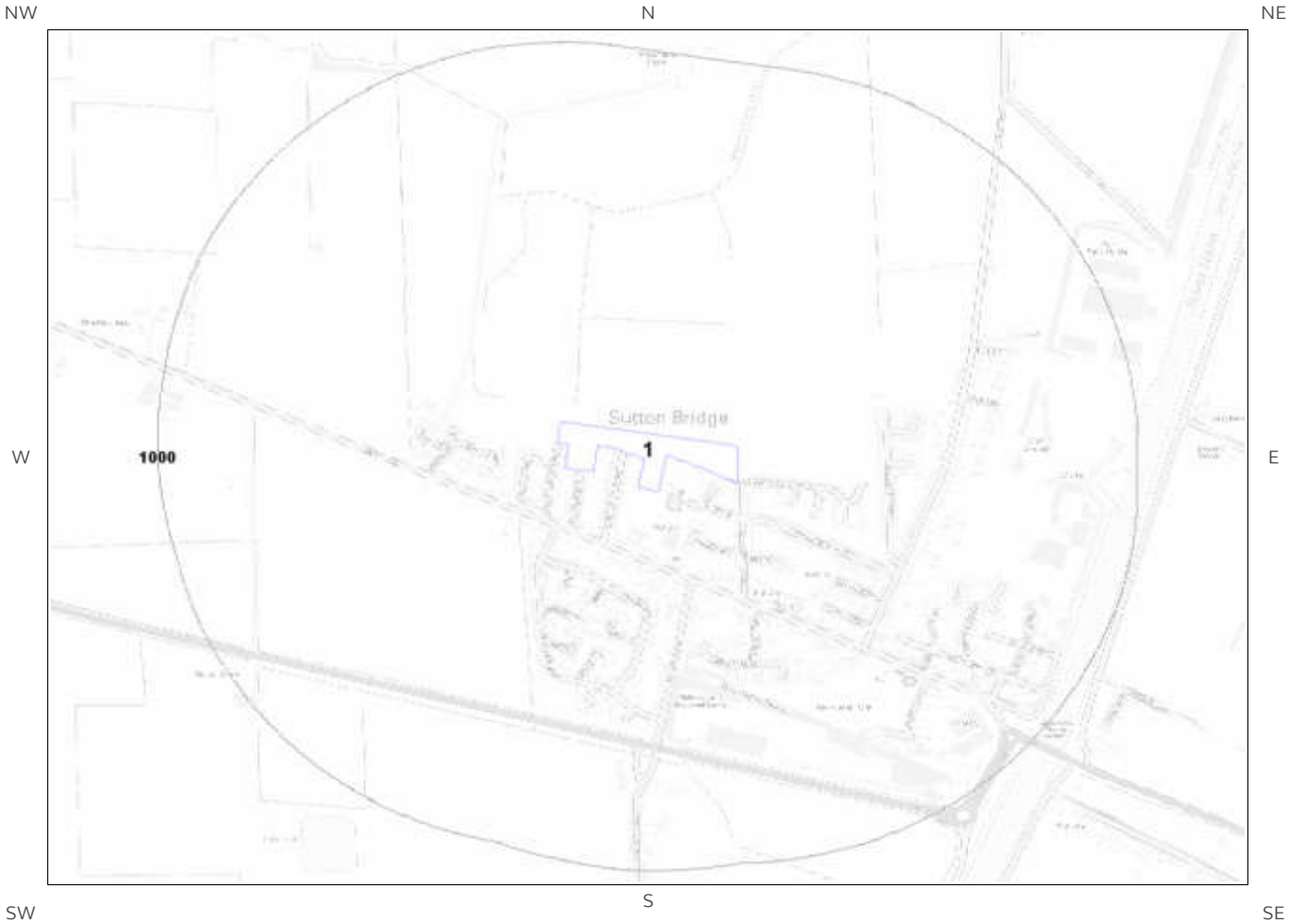
Section 6: Natural Ground Subsidence	On-site
6.1 Shrink-Swell Clay	Low
6.2 Landslides	Very Low
6.3 Ground Dissolution of Soluble Rocks	Negligible
6.4 Compressible Deposits	Moderate
6.5 Collapsible Deposits	Negligible
6.5 Running Sand	Moderate

Section 7: Borehole Records	On-site	0-50m	51-250
7 BGS Recorded Boreholes	0	0	4

Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250
8 Records of Background Soil Chemistry	2	0	0

Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500
9.1 Tunnels	0	0	0	Not Searched
9.2 Historical Railway and Tunnel Features	0	0	0	Not Searched
9.3 Historical Railways	0	0	0	Not Searched
9.4 Active Railways	0	0	0	Not Searched
9.5 Railway Projects	0	0	0	0

1:10,000 Scale Availability



1_10,000 Availability Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Availability of 1:10,000 Scale Geology Mapping

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

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	No deposits are mapped	No coverage	No coverage	No coverage

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

The definitions of coverage are as follows:

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

1 Geology (1:10,000 scale).

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

Artificial Ground Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

1. Geology 1:10,000 scale

1.1 Artificial Ground

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

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

Database searched and no data found.

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

Artificial Ground Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

500
1000
Search Buffers (m)

1.2 Superficial Deposits and Landslips

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

1.2.1 Superficial Deposits/ Drift Geology

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

Database searched and no data found.

1.2.2 Landslip

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

No

Database searched and no data found.

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

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

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

Bedrock and linear features Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

500
1000
Search Buffers (m)

1.3 Bedrock and linear features

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

1.3.1 Bedrock/ Solid Geology

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

Database searched and no data found at this scale.

1.3.2 Linear features

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

Database searched and no data found at this scale.

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

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

---

2 Geology 1:50,000 Scale

2.1 Artificial Ground map

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

Search Buffers (m)

Made Ground (undivided)

Worked Ground (undivided)

Infilled Ground

Disturbed Ground (undivided)

Landscaped Ground (undivided)

Reclaimed Ground

2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 145

2.1.1 Artificial/ Made Ground

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

Database searched and no data found.

2.1.2 Permeability of Artificial Ground

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

Database searched and no data found.

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

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

500
1000
Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

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

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TFD-XCZ	TIDAL FLAT DEPOSITS	CLAY AND SILT

2.2.2 Permeability of Superficial Ground

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

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

2.2.3 Landslip

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

Database searched and no data found.

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

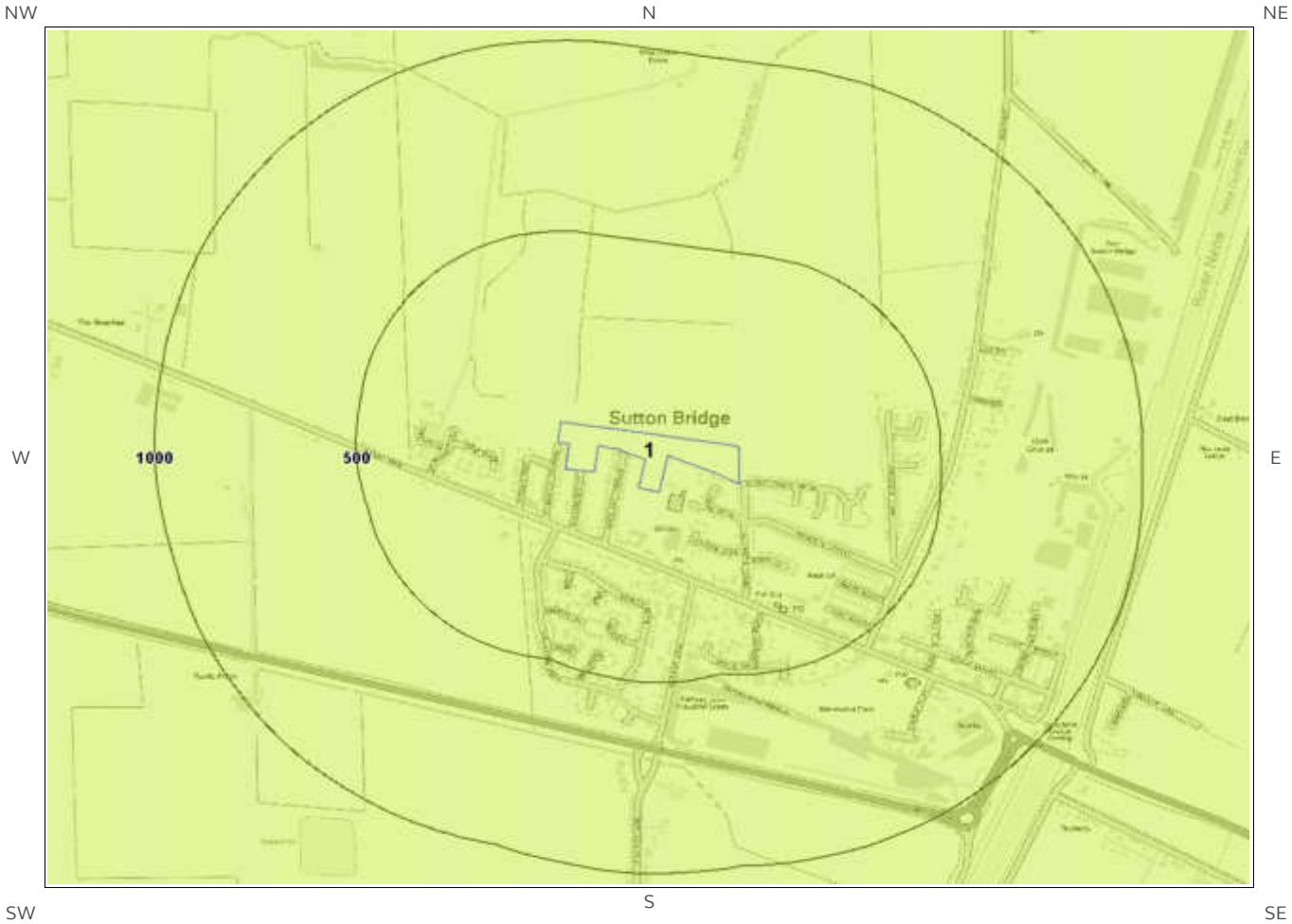
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

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

Database searched and no data found.

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



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

500
1000
Search Buffers (m)

2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 145

2.3.1 Bedrock/Solid Geology

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

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	AMC-MDST	AMPTHILL CLAY FORMATION - MUDSTONE	OXFORDIAN

2.3.2 Permeability of Bedrock Ground

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

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

2.3.3 Linear features

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

Database searched and no data found.

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

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

3 Radon Data

3.1 Radon Affected Areas

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

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

3.2 Radon Protection

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

---

4 Ground Workings map

Ground Workings Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

125
250
Search Buffers (m)

Historic Surface Ground Workings

Historic Underground Workings

Current Ground Workings

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

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

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

ID	Distance (m)	Direction	NGR	Use	Date
1	64.0	N	547453 321906	Sewage Works	1974
2A	224.0	S	547215 321456	Ponds	1887
3A	224.0	S	547208 321457	Ponds	1887
4A	224.0	S	547208 321457	Ponds	1887

4.2 Historical Underground Working Features derived from Historical Mapping

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

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

Database searched and no data found.

4.3 Current Ground Workings

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

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

Database searched and no data found.

5 Mining, Extraction & Natural Cavities map

NW N NE

W E

SW S SE

Mining, Extraction and Natural Cavities Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

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

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

Database searched and no data found.

5.2 Coal Mining

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

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

Database searched and no data found.

5.3 Johnson Poole and Bloomer

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

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

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

5.4 Non-Coal Mining

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

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

Database searched and no data found.

5.5 Non-Coal Mining Cavities

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

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

Database searched and no data found.

5.6 Natural Cavities

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

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

Database searched and no data found.

5.7 Brine Extraction

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

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

Database searched and no data found.

5.8 Gypsum Extraction

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

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

Database searched and no data found.

5.9 Tin Mining

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

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

Database searched and no data found.

5.10 Clay Mining

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

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

Database searched and no data found.

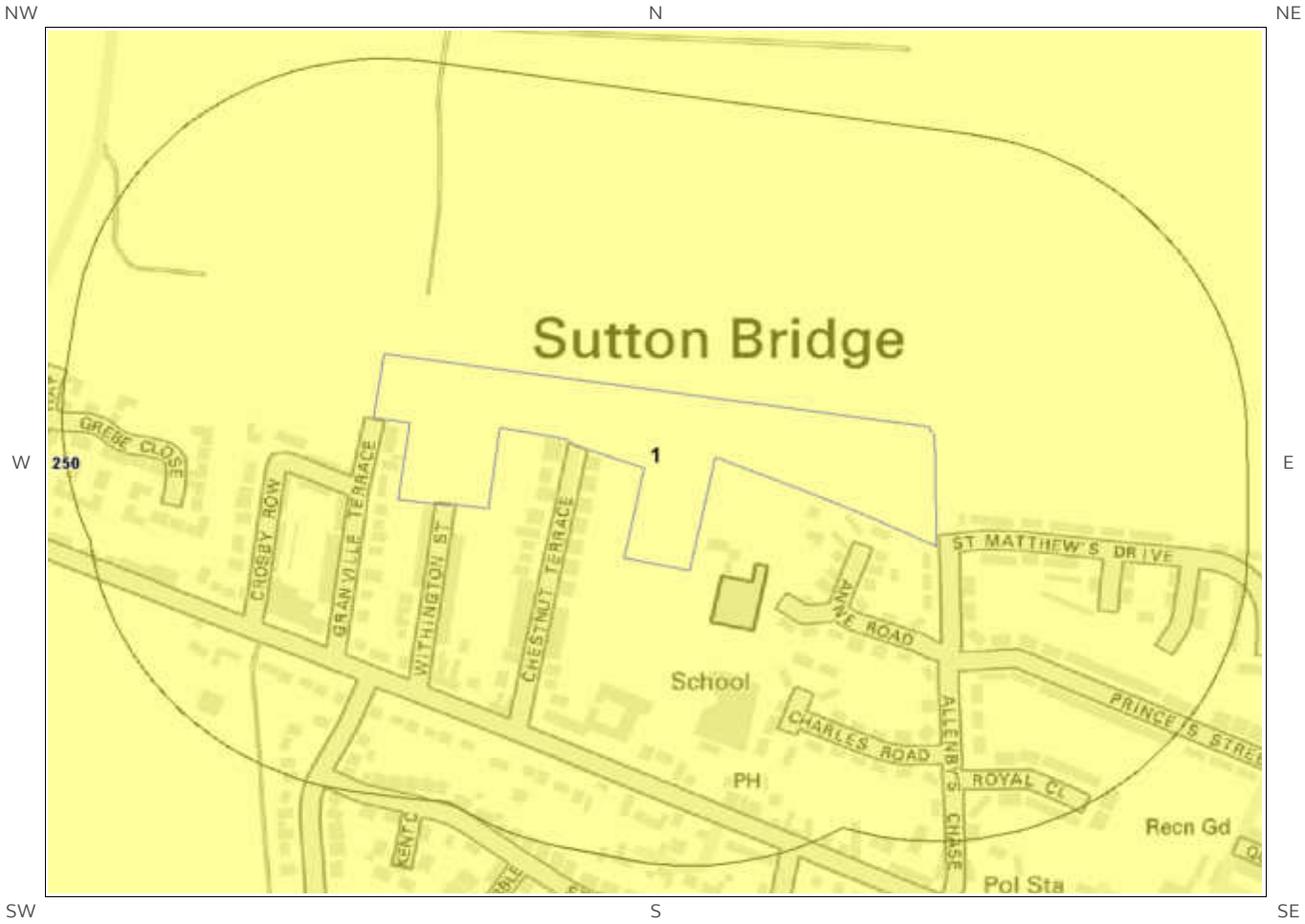
6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map

Shrink Swell Clay Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

6.2 Landslides map



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

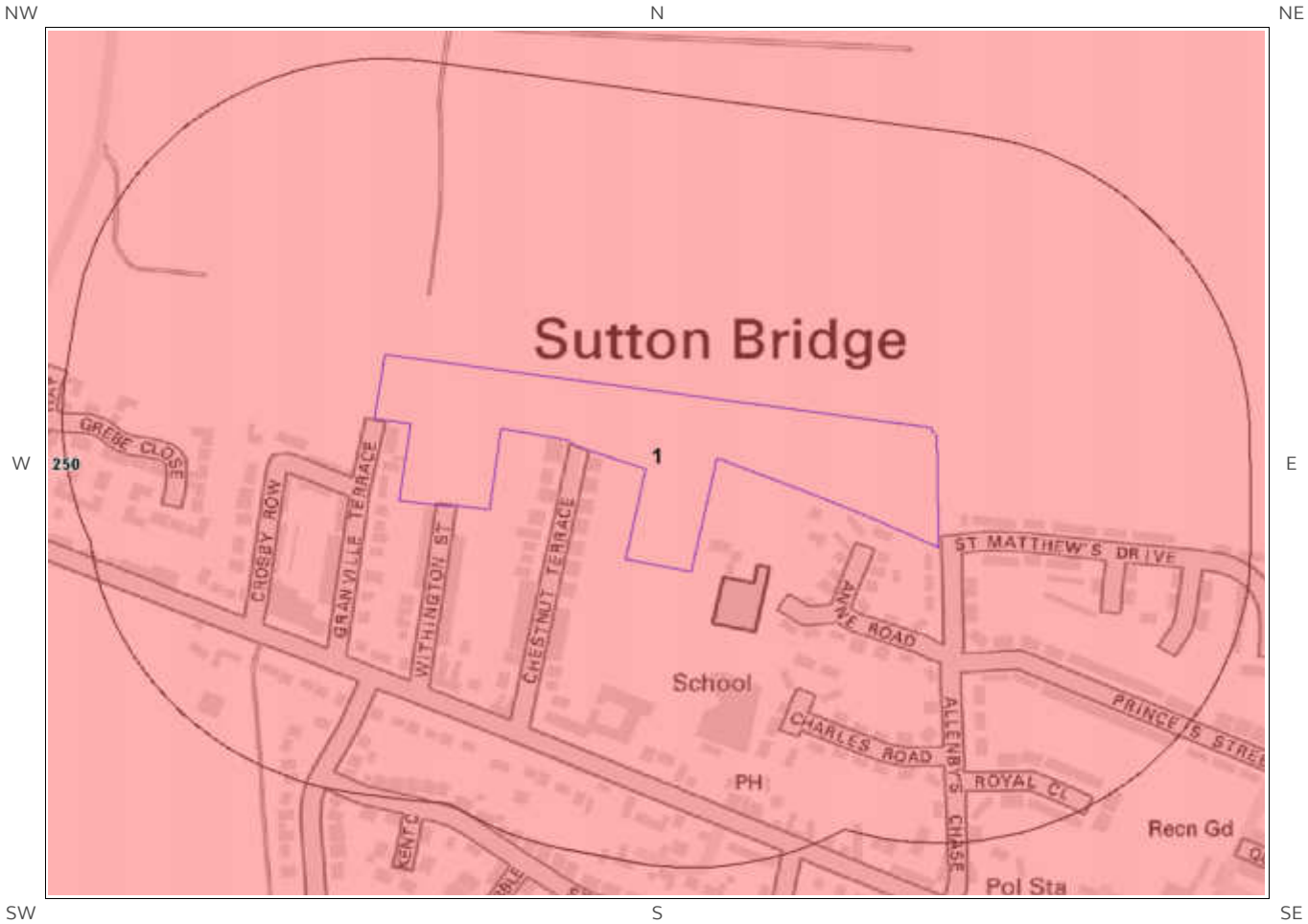
Landslides Legend

6.3 Ground Dissolution of Soluble Rocks map

Ground Dissolution Soluble Rocks Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

6.4 Compressible Deposits map



Compressible Deposits Legend

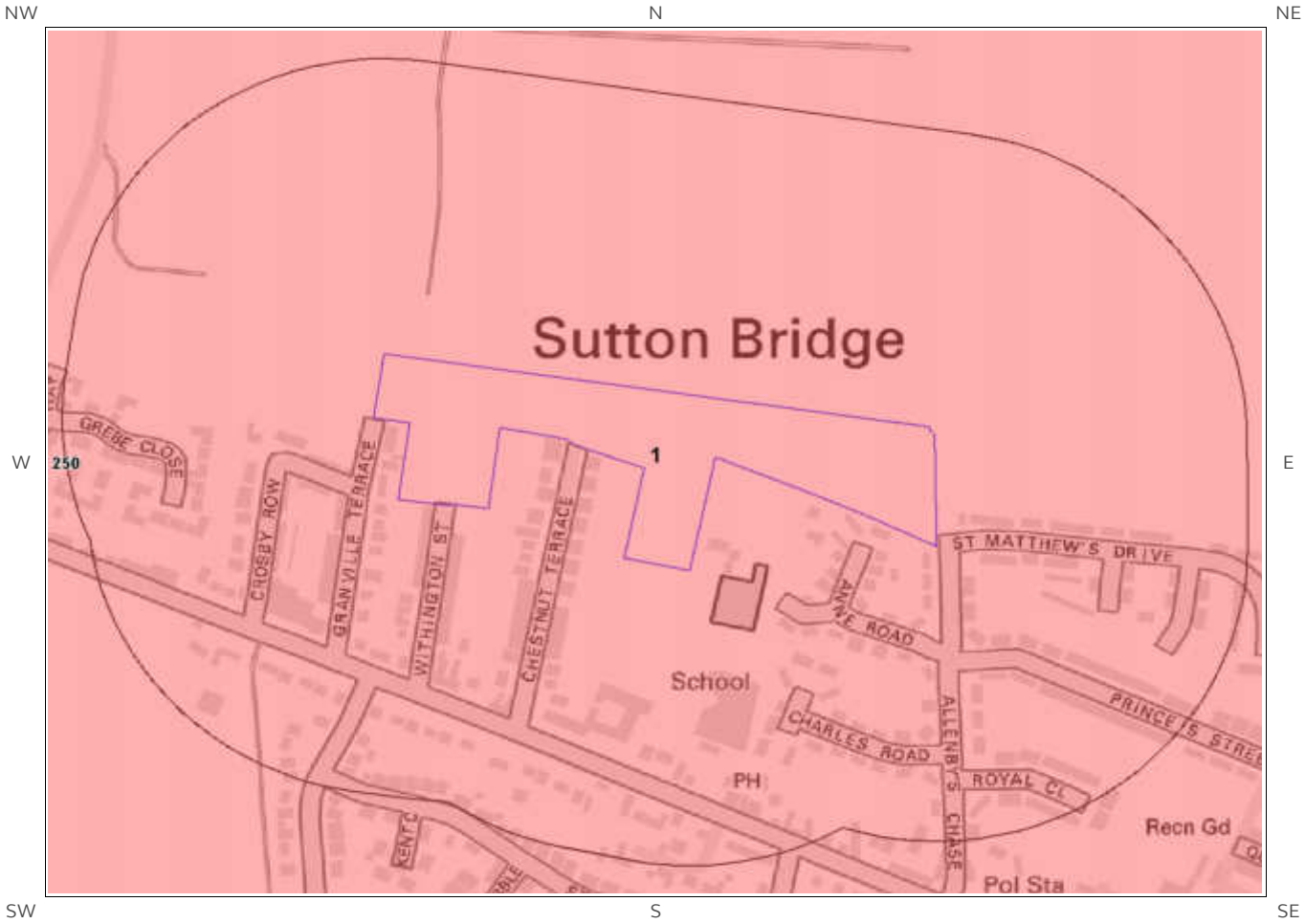
© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

6.5 Collapsible Deposits map

Collapsible Deposits Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

6.6 Running Sand map



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Running Sand Legend

6 Natural Ground Subsidence

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

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

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

6.1 Shrink-Swell Clays

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

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

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

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

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

6.3 Ground Dissolution of Soluble Rocks

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

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

6.4 Compressible Deposits

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Moderate	Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property - possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

6.5 Collapsible Deposits

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Moderate	Significant potential for running sand problems with relatively small changes in ground conditions. Avoid large amounts of water entering the ground (for example through pipe leakage or soak-aways). Do not dig (deep) holes into saturated ground near the property without technical advice. For new build - consider the consequences of soil and groundwater conditions during and after construction. For existing property - possible increase in insurance risk from running sand, for example, due to water leakage, high rainfall events or flooding.

7 Borehole Records map

Borehole Records Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

Borehole Locations

125
250
Search Buffers (m)

7 Borehole Records

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

Records of boreholes within 250m of the study site boundary: 4

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	164.0	W	546830 321820	TF42SE60	-1.0	BRIDGE ROAD SUTTON BRIDGE LINCS TPS3
2	179.0	SW	546830 321760	TF42SE56	-1.0	BRIDGE ROAD SUTTON BRIDGE LINCS TP4
3A	183.0	W	546810 321830	TF42SE59	-1.0	BRIDGE ROAD SUTTON BRIDGE LINCS TPS2
4A	184.0	W	546810 321820	TF42SE55	-1.0	BRIDGE ROAD SUTTON BRIDGE LINCS TP3

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

8 Estimated Background Soil Chemistry

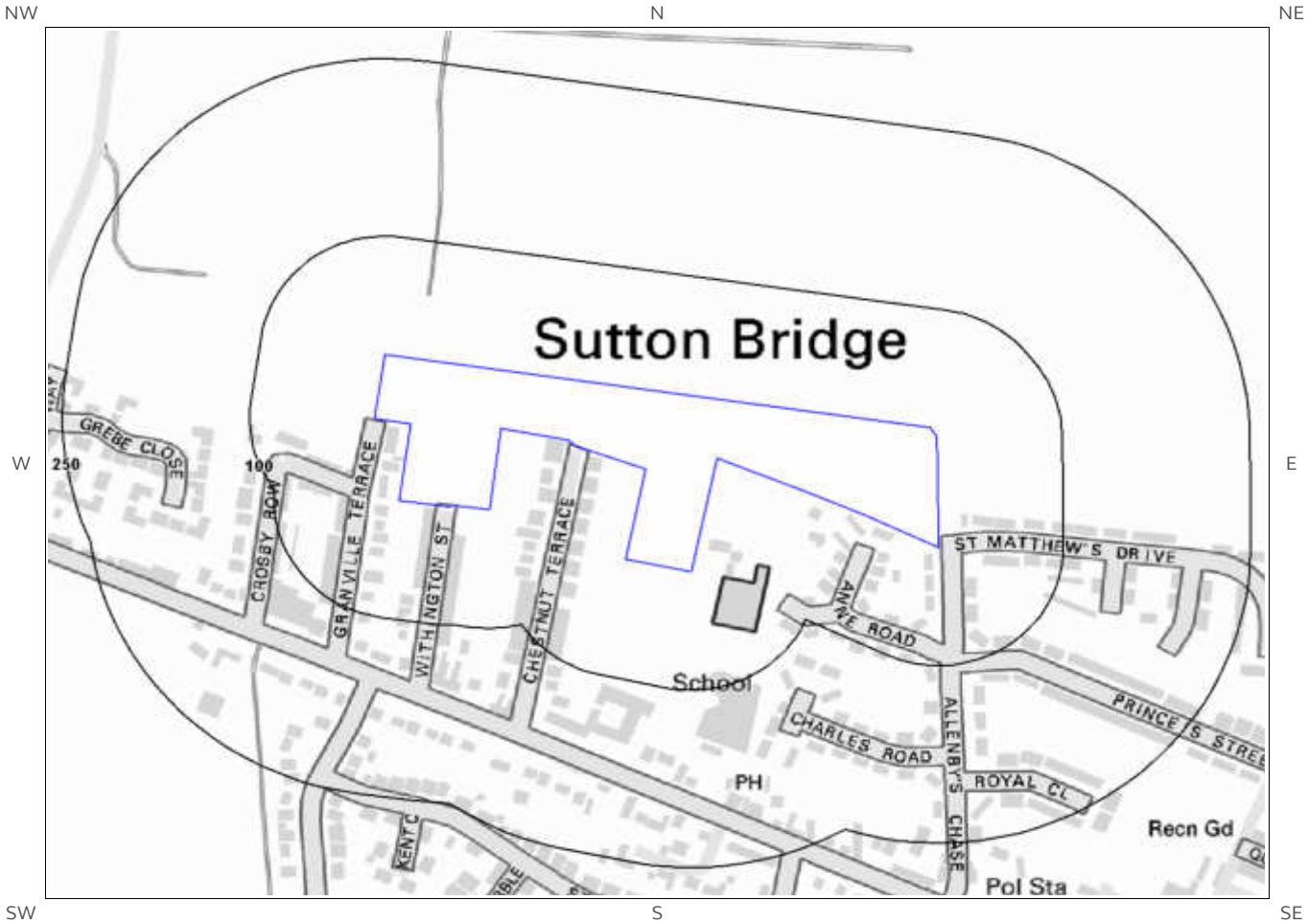
Records of background estimated soil chemistry within 250m of the study site boundary: 2

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

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

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

9 Railways and Tunnels map



Railways and Tunnels Legend

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.
© OpenStreetMapContributors

- Site Outline
- 250 / 500 Search Buffers (m)
- Underground or Partially Underground Railway / Subway System
- Railway Tunnel (OS Mapping)
- Abandoned or Dismantled Railway (OpenStreetMap)
- Railway Track (OS Mapping)
- Railway Track (OpenStreetMap)
- High Speed 2
- High Speed 2 Revised Proposed Route
- Crossrail 1
- Railway and/or Tunnel Feature from Historical Mapping

9 Railways and Tunnels

9.1 Tunnels

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

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

Database searched and no data found.

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

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

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

Database searched and no data found.

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

9.2 Historical Railway and Tunnel Features

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

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

Database searched and no data found.

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

9.3 Historical Railways

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

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

Database searched and no data found.

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

9.4 Active Railways

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

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

Database searched and no data found.

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

9.5 Railway Projects

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

Is the study site within 5km of the route of the High Speed 2 rail project?	No
Is the study site within 500m of the route of the Crossrail 1 rail project?	No

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

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

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

Contact Details

Groundsure Helpline

Telephone: 08444 159 000
info@groundsure.com

British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:**enquiries@bgs.ac.uk**
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries

British Gypsum

British Gypsum Ltd
East Leake
Loughborough
Leicestershire
LE12 6HX

The Coal Authority

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

Public Health England

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

Johnson Poole & Bloomer Limited

Harris and Pearson Building, Brettel Lane
Brierley Hill, West Midlands
DY5 3LH
Tel: +44 (0) 1384 262 000
Email:**enquiries.gs@jpb.co.uk**
Website: **www.jpb.co.uk**

Ordnance Survey

Adanac Drive, Southampton
SO16 0AS

Tel: 08456 050505
Website: http://www.ordnancesurvey.co.uk/

Getmapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444
Website:**http://www1.getmapping.com/**

Peter Brett Associates

Caversham Bridge House
Waterman Place
Reading
Berkshire RG1 8DN
Tel: +44 (0)118 950 0761 E-mail:**reading@pba.co.uk**
Website:**http://www.peterbrett.com/home**

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

Standard Terms and Conditions

Groundsure's Terms and Conditions can be viewed online at this link:
https://www.groundsure.com/terms-and-conditions-may25-2018

Appendix 4

Environmental Report

AGS Ground Solutions Ltd

3, Greenwith Crescent,
Truro, TR3 7LU

Groundsure Reference:	GS-5471031
Your Reference:	A1816_-_Sutton_Bridge
Report Date	24 Sep 2018
Report Delivery Method:	Email - pdf

Enviro Insight

Address: LAND ADJ TO CHESTNUT TERRACE, SUTTON BRIDGE, SPALDING, PE12 9SX

Dear Sir/ Madam,

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

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

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
Groundsure Enviroinsight

Enviro Insight

Address:	**LAND ADJ TO CHESTNUT TERRACE, SUTTON BRIDGE, SPALDING, PE12 9SX**
Date:	**24 Sep 2018**
Reference:	**GS-5471031**
Client:	**AGS Ground Solutions Ltd**

NW N NE

W E

SW S SE

Aerial Photograph Capture date:	06-Apr-2015
Grid Reference:	547209,321823
Site Size:	3.75ha

Report Reference: GS-5471031
Client Reference: A1816_-_Sutton_Bridge

Contents Page

Contents Page 3
Overview of Findings 6
Using this report 10
1. Historical Land Use 11
1. Historical Industrial Sites 12
1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping 12
1.2 Additional Information – Historical Tank Database 13
1.3 Additional Information – Historical Energy Features Database 13
1.4 Additional Information – Historical Petrol and Fuel Site Database 14
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database 14
1.6 Historical military sites 15
1.7 Potentially Infilled Land 15
2. Environmental Permits, Incidents and Registers Map 16
2. Environmental Permits, Incidents and Registers 17
2.1 Industrial Sites Holding Licences and/or Authorisations 17
2.1.1 Records of historic IPC Authorisations within 500m of the study site: 17
2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site: 17
2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site: 17
2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site: 17
2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: 17
2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: 18
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations: 18
2.1.8 Records of Licensed Discharge Consents within 500m of the study site: 18
2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: 18
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site: 19
2.2 Dangerous or Hazardous Sites 19
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents 19
2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site: 19
2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site: 19
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990 19
3. Landfill and Other Waste Sites Map 20
3. Landfill and Other Waste Sites 21
3.1 Landfill Sites 21
3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site: 21
3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site: 21
3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site: 21
3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site: 21
3.2 Other Waste Sites 21
3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site: 21
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site: 22
4. Current Land Use Map 23
4. Current Land Uses 24
4.1 Current Industrial Data 24
4.2 Petrol and Fuel Sites 24
4.3 National Grid High Voltage Underground Electricity Transmission Cables 25
4.4 National Grid High Pressure Gas Transmission Pipelines 25

5. Geology 26
5.1 Artificial Ground and Made Ground 26
5.2 Superficial Ground and Drift Geology 26
5.3 Bedrock and Solid Geology 26
6 Hydrogeology and Hydrology 27
6a. Aquifer Within Superficial Geology 27
6b. Aquifer Within Bedrock Geology and Abstraction Licences 28
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences 29
6d. Hydrogeology – Source Protection Zones within confined aquifer 30
6e. Hydrology – Watercourse Network and River Quality 31
6.Hydrogeology and Hydrology 32
6.1 Aquifer within Superficial Deposits 32
6.2 Aquifer within Bedrock Deposits 32
6.3 Groundwater Abstraction Licences 32
6.4 Surface Water Abstraction Licences 33
6.5 Potable Water Abstraction Licences 33
6.6 Source Protection Zones 33
6.7 Source Protection Zones within Confined Aquifer 33
6.8 Groundwater Vulnerability and Soil Leaching Potential 33
6.9 River Quality 34
6.9.1 Biological Quality: 34
6.9.2 Chemical Quality: 34
6.10 Ordnance Survey MasterMap Water Network 34
6.11 Surface Water Features 36
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea) 37
7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map 38
7 Flooding 39
7.1 River and Coastal Zone 2 Flooding 39
7.2 River and Coastal Zone 3 Flooding 40
7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating 40
7.4 Flood Defences 40
7.5 Areas benefiting from Flood Defences 41
7.6 Areas benefiting from Flood Storage 41
7.7 Groundwater Flooding Susceptibility Areas 41
7.8 Groundwater Flooding Confidence Areas 41
8. Designated Environmentally Sensitive Sites Map 42
8. Designated Environmentally Sensitive Sites 43
8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site: 43
8.2 Records of National Nature Reserves (NNR) within 2000m of the study site: 43
8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site: 43
8.4 Records of Special Protection Areas (SPA) within 2000m of the study site: 43
8.5 Records of Ramsar sites within 2000m of the study site: 43
8.6 Records of Ancient Woodland within 2000m of the study site: 44
8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site: 44
8.8 Records of World Heritage Sites within 2000m of the study site: 44
8.9 Records of Environmentally Sensitive Areas within 2000m of the study site: 44
8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site: 44
8.11 Records of National Parks (NP) within 2000m of the study site: 44
8.12 Records of Nitrate Sensitive Areas within 2000m of the study site: 44
8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site: 45

8.14 Records of Green Belt land within 2000m of the study site: 45
9. Natural Hazards Findings 46
9.1 Detailed BGS GeoSure Data 46
9.1.1 Shrink Swell 46
9.1.2 Landslides 46
9.1.3 Soluble Rocks 46
9.1.4 Compressible Ground 47
9.1.5 Collapsible Rocks 47
9.1.6 Running Sand 47
9.2 Radon 48
9.2.1 Radon Affected Areas 48
9.2.2 Radon Protection 48
10. Mining 49
10.1 Coal Mining 49
10.2 Non-Coal Mining 49
10.3 Brine Affected Areas 49
Contact Details 50
Standard Terms and Conditions 52

Overview of Findings

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

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	0	1	4	37
1.2 Additional Information – Historical Tank Database	0	4	4	10
1.3 Additional Information – Historical Energy Features Database	0	0	5	15
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	3	9
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	0	0	3	5

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	1	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	1	0	0
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	1
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

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

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	0	4	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	1	1
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

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

Section 6: Hydrogeology and Hydrology	0-500m
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	Identified
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	1	0	0
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	0	0	#250GWV#	#500GWV#	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	No	No
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	0	6	20	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	Yes	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Enviroment Agency Zone 2 floodplains within 250m of the study site	Identified
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	Identified
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Low
7.4 Flood Defences within 250m of the study site	None identified
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified
7.6 Areas used for Flood Storage within 250m of the study site	None identified
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Not Prone
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	Not Applicable

Section 8: Designated Environmentally Sensitive Sites

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

Section 8: Designated Environmentally Sensitive Sites

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

Section 9: Natural Hazards

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

Section 10: Mining

10.1 Coal mining areas within 75m of the study site	None identified
10.2 Non-Coal Mining areas within 50m of the study site boundary	None identified
10.3 Brine affected areas within 75m of the study site	None identified

Using this report

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

1. Historical Industrial Sites

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

2. Environmental Permits, Incidents and Registers

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

3. Landfills and Other Waste Sites

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

4. Current Land Uses

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

5. Geology

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

6. Hydrogeology and Hydrology

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

7. Flooding

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

8. Designated Environmentally Sensitive Sites

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

9. Natural Hazards

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

10. Mining

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

11. Contacts

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

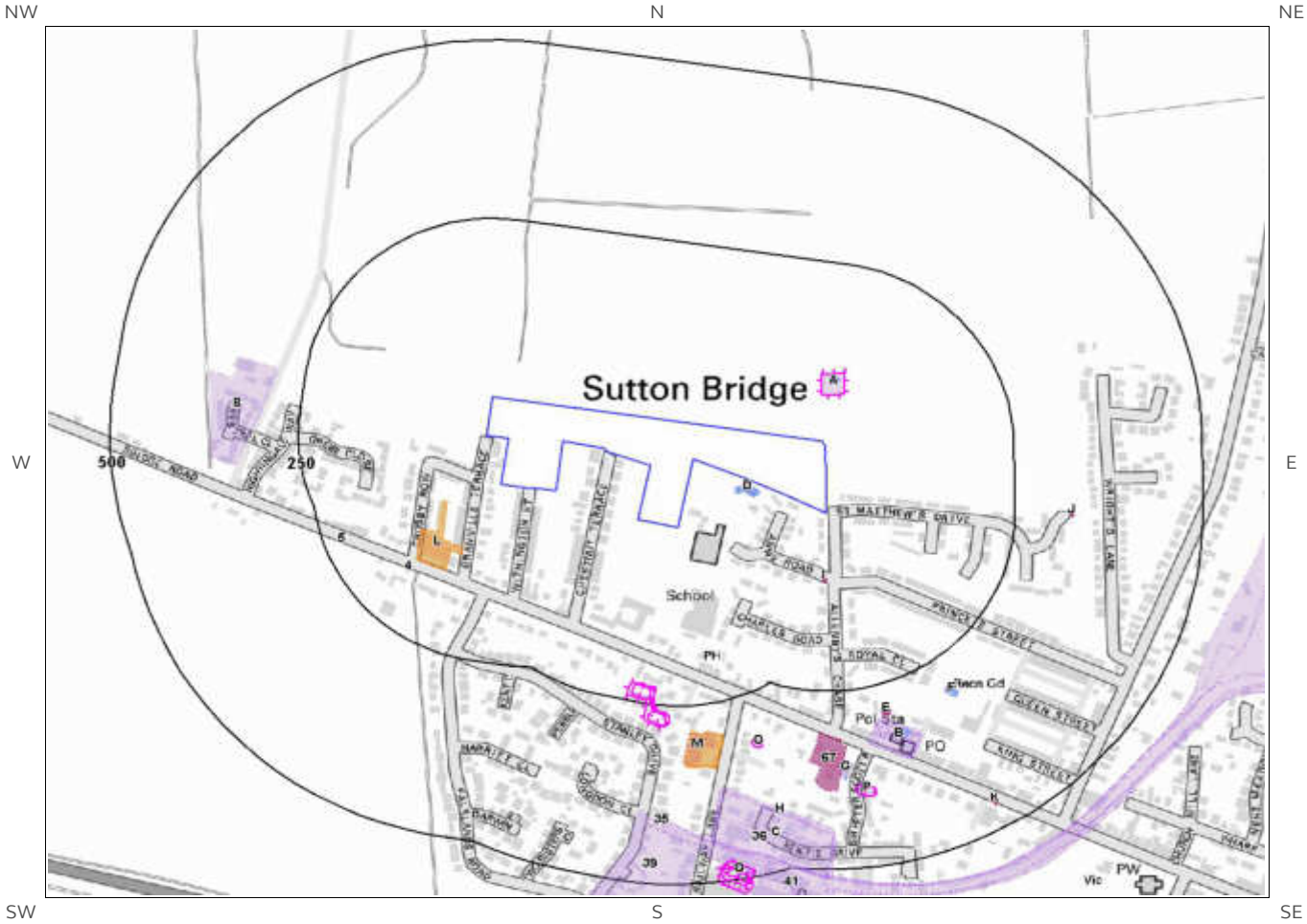
Note: Maps

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

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

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

1. Historical Land Use



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

250
500
Search Buffers (m)

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

Industrial Land Use

Potentially Infilled Land

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

Energy Features

Petrol Stations

Historical military sites

Tanks

Garages

1. Historical Industrial Sites

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

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

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 42

ID	Distance [m]	Direction	Use	Date
1D	6	SW	Unspecified Tanks	1974
2A	64	N	Sewage Works	1974
3A	82	N	Unspecified Tank	1974
4	169	SW	Unspecified Pump	1929
5	224	W	Unspecified Pump	1929
6E	281	S	Unspecified Tank	1974
7M	288	S	Garage	1991
8	288	W	Nursery	1974
9F	289	SE	Unspecified Tanks	1974
10B	295	S	Unspecified Commercial/Industrial	1929
11B	297	S	Unspecified Works	1958
12B	298	S	Gas Works	1887
13B	300	S	Gas Works	1903
14B	300	S	Gas Works	1887
15B	300	S	Unspecified Commercial/Industrial	1931
16B	307	S	Unspecified Tank	1929
17B	308	S	Unspecified Tank	1958
18B	309	S	Unspecified Tank	1931
19B	313	S	Police Station	1991
20B	313	S	Gasometer	1903
21O	314	S	Unspecified Pit	1887
22B	324	S	Unspecified Tank	1929
23B	325	S	Unspecified Tank	1931
24B	325	S	Unspecified Tank	1958
25B	328	S	Gasometer	1887
26B	328	S	Gasometer	1903
27B	328	S	Gasometer	1887
28G	350	S	Police Station	1974
29C	367	S	Nursery	1974
30C	367	S	Nursery	1991
31C	371	S	Nursery	1931
32C	373	S	Nursery	1958
33C	374	S	Nursery	1938

34P	384	S	Unspecified Pit	1887
35	399	S	Railway Sidings	1931
36	408	S	Nursery	1929
37	410	S	Railway Sidings	1903
38	411	S	Railway Sidings	1938
39	412	S	Industrial Estate	1991
40	454	S	Railway Sidings	1887
41	481	S	Railway Sidings	1958
42	483	S	Railway Sidings	1887

1.2 Additional Information – Historical Tank Database

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

Records of historical tanks within 500m of the search boundary: 18

ID	Distance (m)	Direction	Use	Date
43D	7	SW	Tanks	1971
44D	9	SW	Tanks	1965
45D	13	S	Unspecified Tank	1971
46D	15	S	Unspecified Tank	1965
47A	81	N	Unspecified Tank	1965
48A	81	N	Unspecified Tank	1984
49A	81	N	Unspecified Tank	1987
50A	83	N	Unspecified Tank	1971
51E	282	S	Gas Holder	1971
52F	293	SE	Tanks	1965
53F	294	SE	Tanks	1971
54G	308	S	Gas Works	1889
55B	319	S	Unspecified Tank	1889
56G	372	S	Unspecified Tank	1971
57H	420	S	Unspecified Tank	1965
58H	420	S	Unspecified Tank	1984
59H	420	S	Unspecified Tank	1987
60H	421	S	Unspecified Tank	1971

1.3 Additional Information – Historical Energy Features Database

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

Records of historical energy features within 500m of the search boundary: 20

ID	Distance (m)	Direction	Use	Date
61I	90	S	Electricity Substation	1992
62I	90	S	Electricity Substation	1993
63I	90	S	Electricity Substation	1991
64I	91	S	Electricity Substation	1990
65I	93	S	Electricity Substation	1996
66E	282	S	Gas Holder	1971
67	308	S	Gas Works	1889
68J	323	E	Electricity Substation	1991
69J	323	E	Electricity Substation	1993
70J	325	E	Electricity Substation	1996
71J	326	E	Electricity Substation	1990
72K	459	SE	Electricity Substation	1992
73K	459	SE	Electricity Substation	1993
74K	459	SE	Electricity Substation	1965
75K	459	SE	Electricity Substation	1984
76K	459	SE	Electricity Substation	1991
77K	459	SE	Electricity Substation	1987
78K	461	SE	Electricity Substation	1990
79K	461	SE	Electricity Substation	1971
80K	462	SE	Electricity Substation	1996

1.4 Additional Information – Historical Petrol and Fuel Site Database

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

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

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

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

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 12

ID	Distance (m)	Direction	Use	Date
81L	75	W	Garage	1990

82L	75	W	Garage	1971
83L	108	SW	Garage	1990
84M	285	S	Garage	1991
85M	285	S	Garage	1984
86M	285	S	Garage	1987
87M	285	S	Garage	1965
88M	285	S	Garage	1993
89M	285	S	Garage	1992
90M	285	S	Garage	1990
91M	285	S	Garage	1971
92M	289	S	Garage	1996

1.6 Historical military sites

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

Records of historical military sites within 500m of the search boundary: 0

Database searched and no data found.

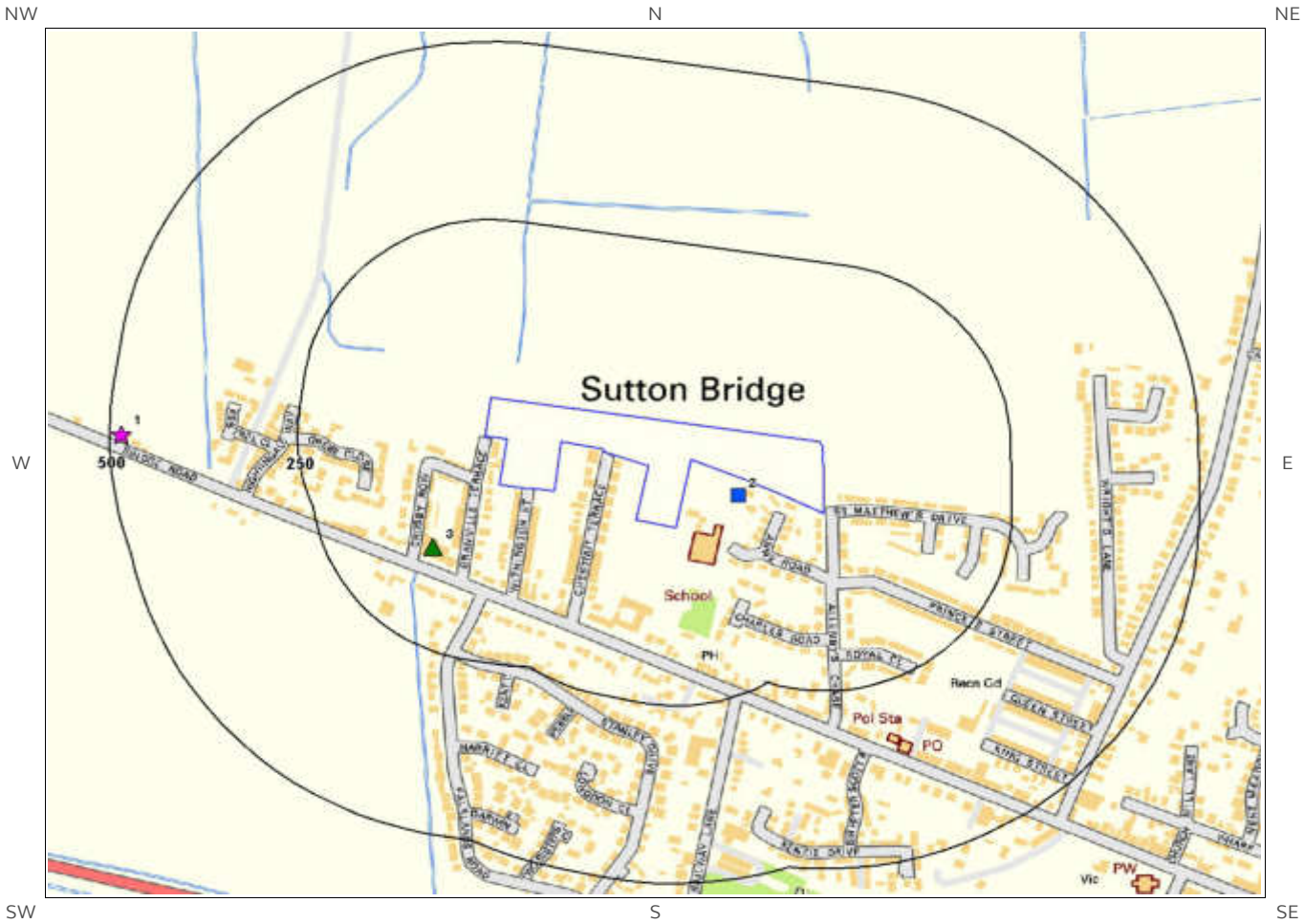
1.7 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 8

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

ID	Distance(m)	Direction	Use	Date
93A	64	N	Sewage Works	1974
94N	224	S	Ponds	1887
95N	224	S	Ponds	1887
96O	314	S	Unspecified Pit	1887
97P	384	S	Unspecified Pit	1887
98Q	472	S	Pond	1887
99Q	477	S	Pond	1887
100Q	480	S	Pond	1903

2. Environmental Permits, Incidents and Registers Map



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

Search Buffers (m)

Recorded Pollution Incident

Dangerous Substances (List 1)

Dangerous Substances (List 2)

Water Industry Referrals

Licenced Discharge Consents

Red List Discharge Consents

RAS 3 & 4 Authorisations

Part A(1) Authorised Processes and Historic IPC Authorisations

Part A(2) and Part B Authorised Processes

COMAH / NIHHS Sites

Sites Determined as Contaminated Land

Hazardous Substance Consents and Enforcements

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

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

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

1

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

ID	Distance (m)	Direction	NGR	Details	
3	127	SW	546924 321675	Address: Tears Of Sutton Bridge, 262 Bridge Road, Sutton Bridge, Spalding, PE12 9SH Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

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

1

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

ID	Distance (m)	Direction	NGR	Details	
2	24	SW	547330 321750	Address: PREMISES AT ZIMBABWE, ANNE RD, SUTTON BRIDGE, SPALDING, LINCS, PE12 9TB Effluent Type: UNSPECIFIED Permit Number: PRNLF01841 Permit Version: 1	Receiving Water: land Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 26/09/1989 Effective Date: 26-Sep-1989 Revocation Date: 15/07/1997

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

0

Database searched and no data found.

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

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

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

1

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

ID	Distance (m)	Direction	NGR	Details	
1	485	W	546508 321835	Incident Date: 14-Nov-2002 Incident Identification: 120701 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

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

0

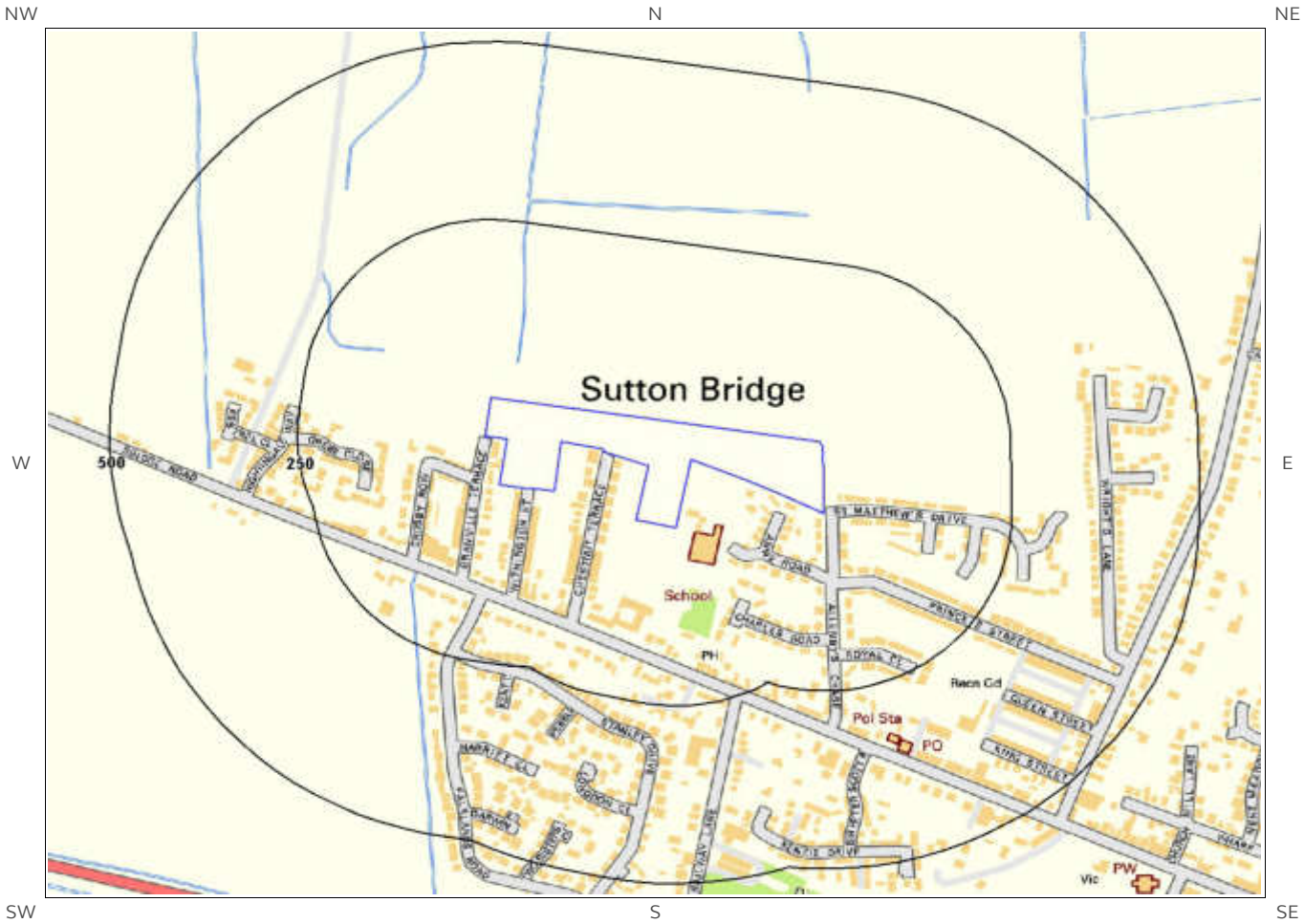
Database searched and no data found.

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

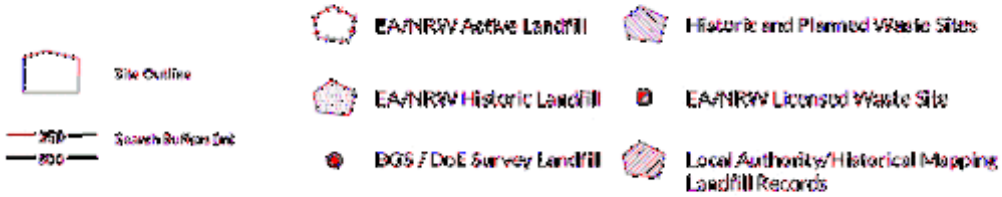
Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.



3. Landfill and Other Waste Sites

3.1 Landfill Sites

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

3.2 Other Waste Sites

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

0

Database searched and no data found.

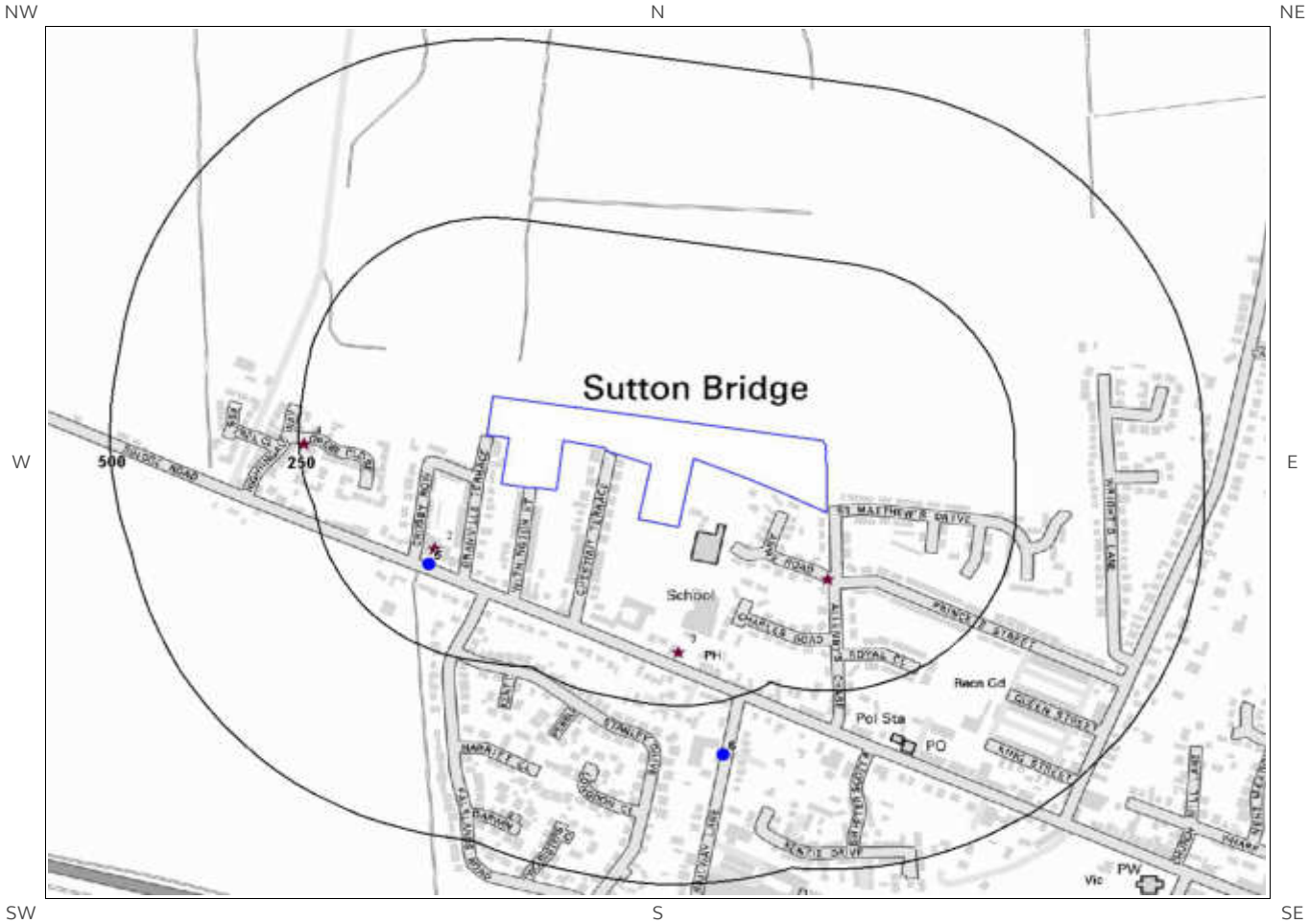
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

1

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

ID	Distance (m)	Direction	NGR	Details	
Not shown	1094	E	548478 322176	Site Address: Port Sutton Bridge, West Bank, Sutton Bridge, Nr Spalding, Lincolnshire, PE12 9QR Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CRO135 EPR reference: EA/EPR/CB3807GE/A001 Operator: C. R O Ports Sutton Bridge Limited Waste Management licence No: 402342 Annual Tonnage: 8499.0	Issue Date: 29/04/2016 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: C. R O Ports Sutton Bridge Correspondence Address: -

4. Current Land Use Map



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

Search Buffers (m)

250

500

Current Industrial Sites

Petrol & Fuel Sites

Electricity Transmission Cables

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 4

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

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	92	S	Electricity Sub Station	547445 321633	PE12	Electrical Features	Infrastructure and Facilities
2	127	SW	Tears of Sutton Bridge	546923 321675	262, Bridge Road, Sutton Bridge, Spalding, PE12 9SH	Vehicle Breakdown and Recovery Services	Personal, Consumer and Other Services
3	174	S	Mark Murphy Piano Tuner	547246 321530	216, Bridge Road, Sutton Bridge, Spalding, PE12 9SG	Sports and Leisure Equipment Repair	Repair and Servicing
4	243	W	Electricity Sub Station	546750 321822	PE12	Electrical Features	Infrastructure and Facilities

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 2

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
5	148	SW	546916 321652	UNBRANDED	262, Bridge Road, Crosby Row, Sutton Bridge, Spalding, Lincolnshire, PE12 9SH	Not Applicable	Obsolete
6	324	S	547306 321386	POWER	Railway Lane North, Sutton Bridge, Spalding, Lincolnshire, PE12 9XD	No	Open

4.3 National Grid High Voltage Underground Electricity Transmission Cables

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

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

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

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

---

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

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

5.2 Superficial Ground and Drift Geology

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

Lex Code	Description	Rock Type
TFD-XCZ	TIDAL FLAT DEPOSITS	CLAY AND SILT

5.3 Bedrock and Solid Geology

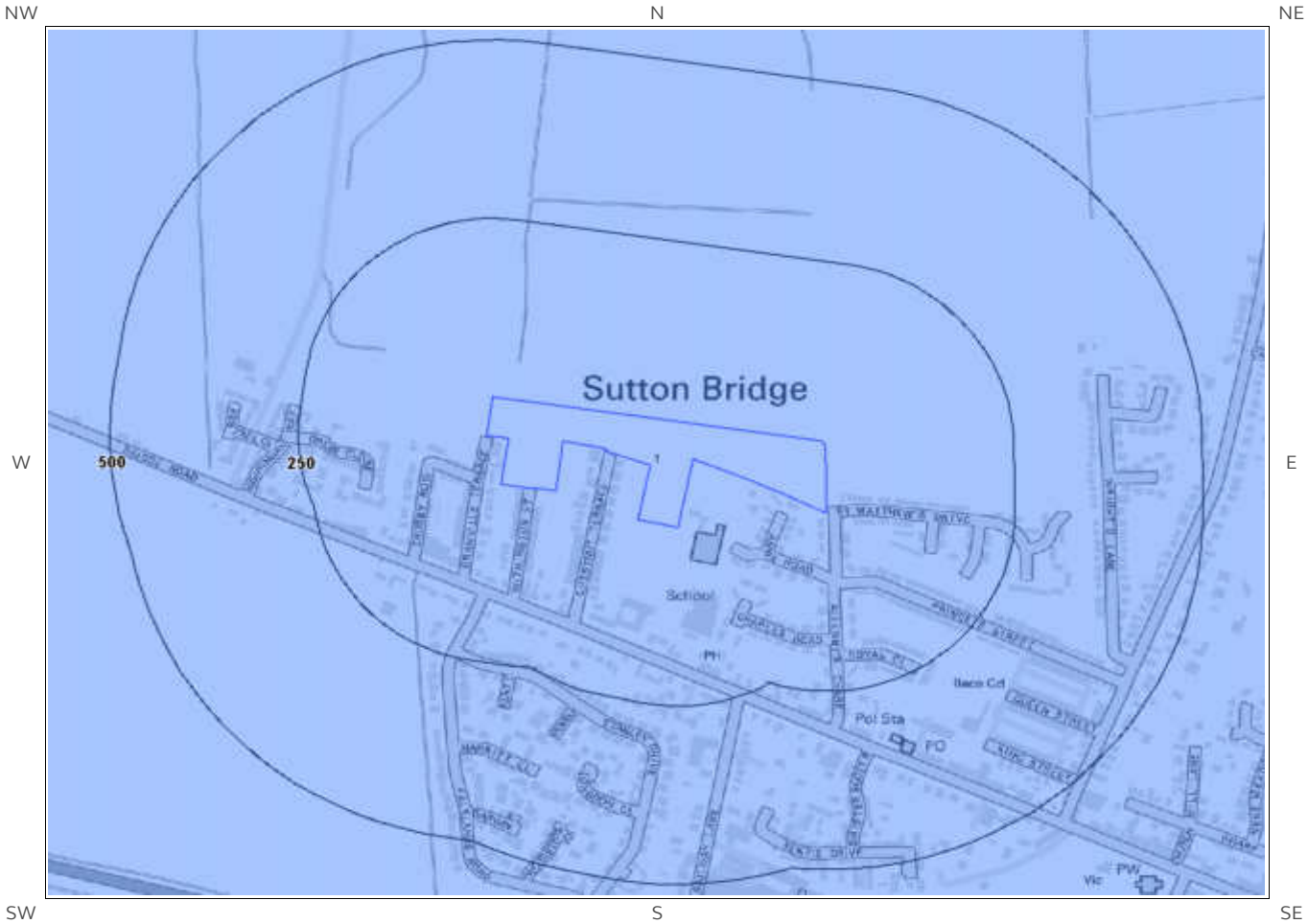
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
AMC-MDST	AMPTHILL CLAY FORMATION	MUDSTONE

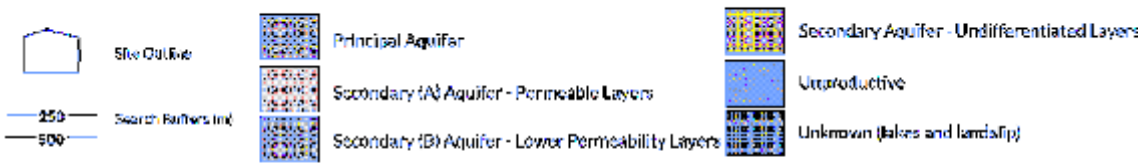
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

6a. Aquifer Within Superficial Geology

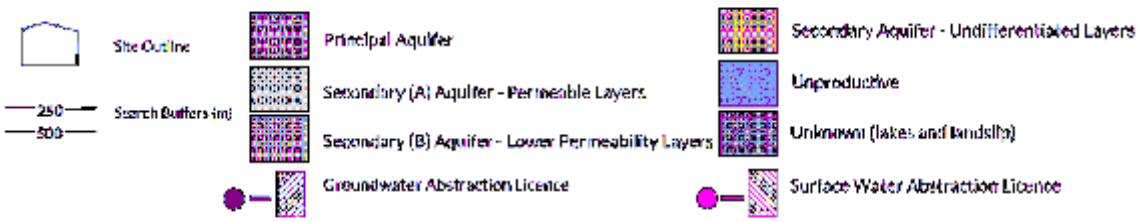


© Crown copyright and database rights 2018
Ordnance Survey licence 100035207.

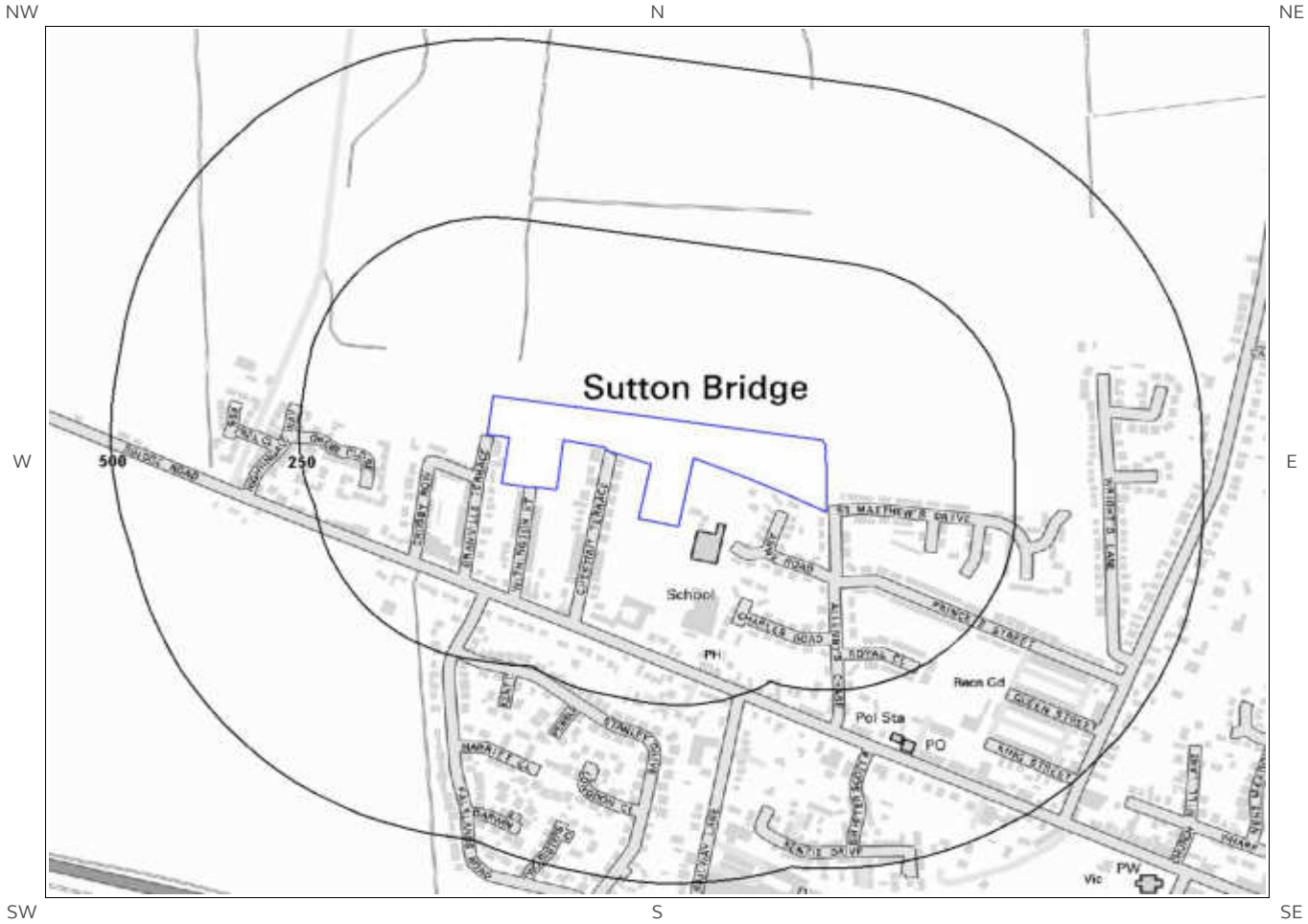


6b. Aquifer Within Bedrock Geology and Abstraction Licences

© Crown copyright and database rights 2018
Ordnance Survey licence 100035207.



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



© Crown copyright and database rights 2018
Ordnance Survey licence 100035207.

Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

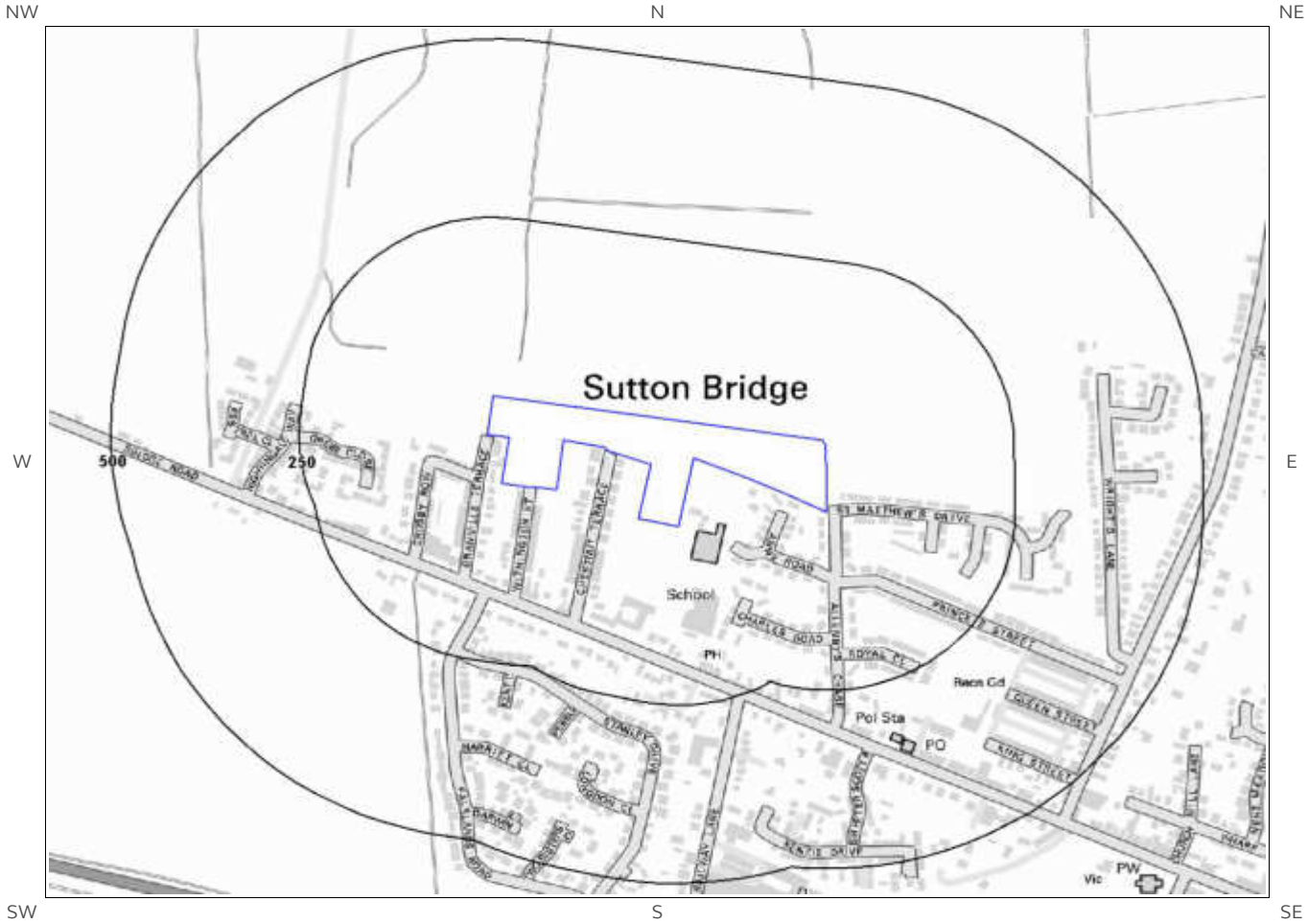
Source Protection Zone 2 - Outer Catchment

Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

6d. Hydrogeology – Source Protection Zones within confined aquifer



© Crown copyright and database rights 2018
Ordnance Survey licence 100035207.

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

Source Protection Zone 3C - Total Catchment within Confined Aquifer

Potable Water Abstraction Licence

Site Outline

250
500
Search Buffers (m)

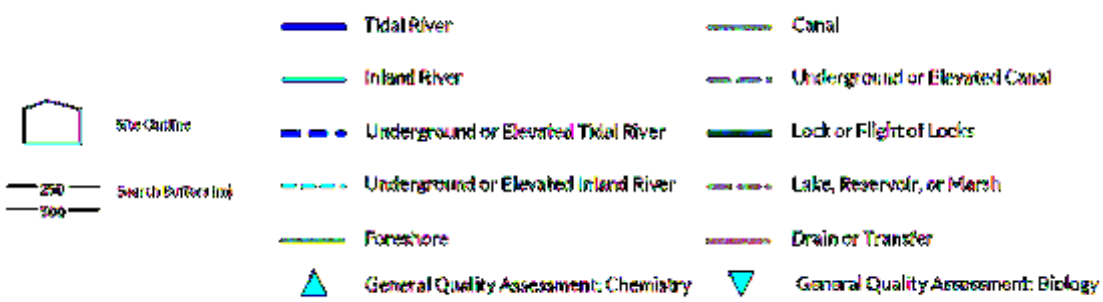
6e. Hydrology – Watercourse Network and River Quality

NW N NE

W E

SW S SE

© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.



6.Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

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

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

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

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.2 Aquifer within Bedrock Deposits

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

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

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

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site Identified

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

ID	Distance (m)	Direction	NGR	Details	
2	254	S	547250 321450	Status: Historical Licence No: 5/32/11/*G/0031 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: WELL AT BRIDGE ROAD Data Type: Point Name: HAYES	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 01/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/02/1966 Version End Date:

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site — None identified

Database searched and no data found.

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site — None identified

Database searched and no data found.

6.6 Source Protection Zones

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

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

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

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

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site — None identified

Database searched and no data found.

6.9 River Quality

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

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Ordnance Survey MasterMap Water Network

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

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

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

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
1	56 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
24	56 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
2	164 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6
25	164 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6
3	216 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				conditions) Average Width in Watercourse Section (m): 2.4
26	216 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
4	280 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
5	280 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	280 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	280 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
6	283 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.1
29	283 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.1
7	295 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.0
Not shown	295 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.0
8	352 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.7
Not shown	352 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.7
9	368 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.7

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
Not shown	368 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.7
10	442 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	442 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
11	454 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.1
Not shown	454 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.1
12	476 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
Not shown	476 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
13	488 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.7
Not shown	488 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Nene Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.7

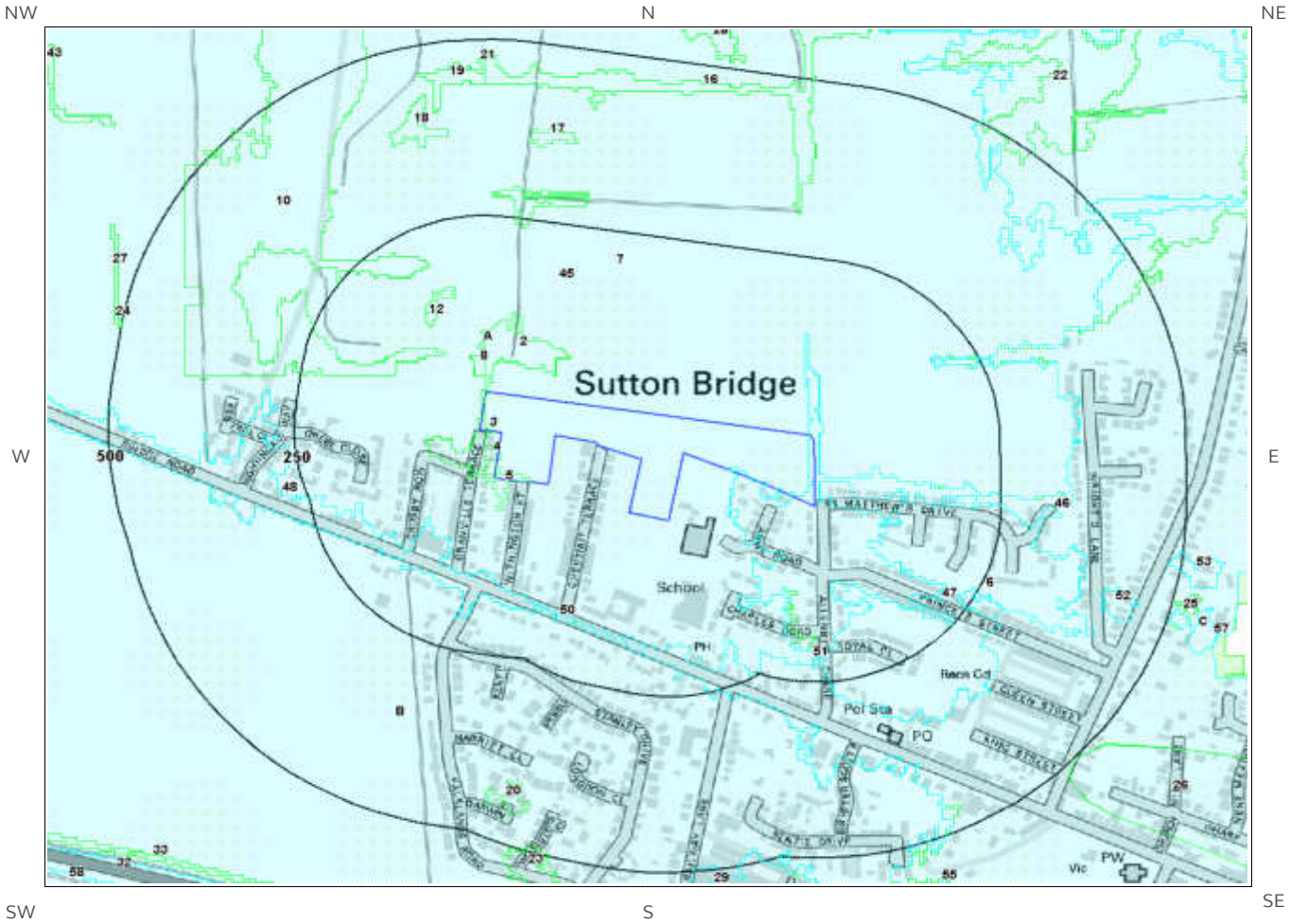
6.11 Surface Water Features

Surface water features within 250m of the study site Identified

The following surface water records are not represented on mapping:

Distance (m)	Direction
56	N
163	SW

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



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

Search Buffers (m)

Zone 2 Floodplain

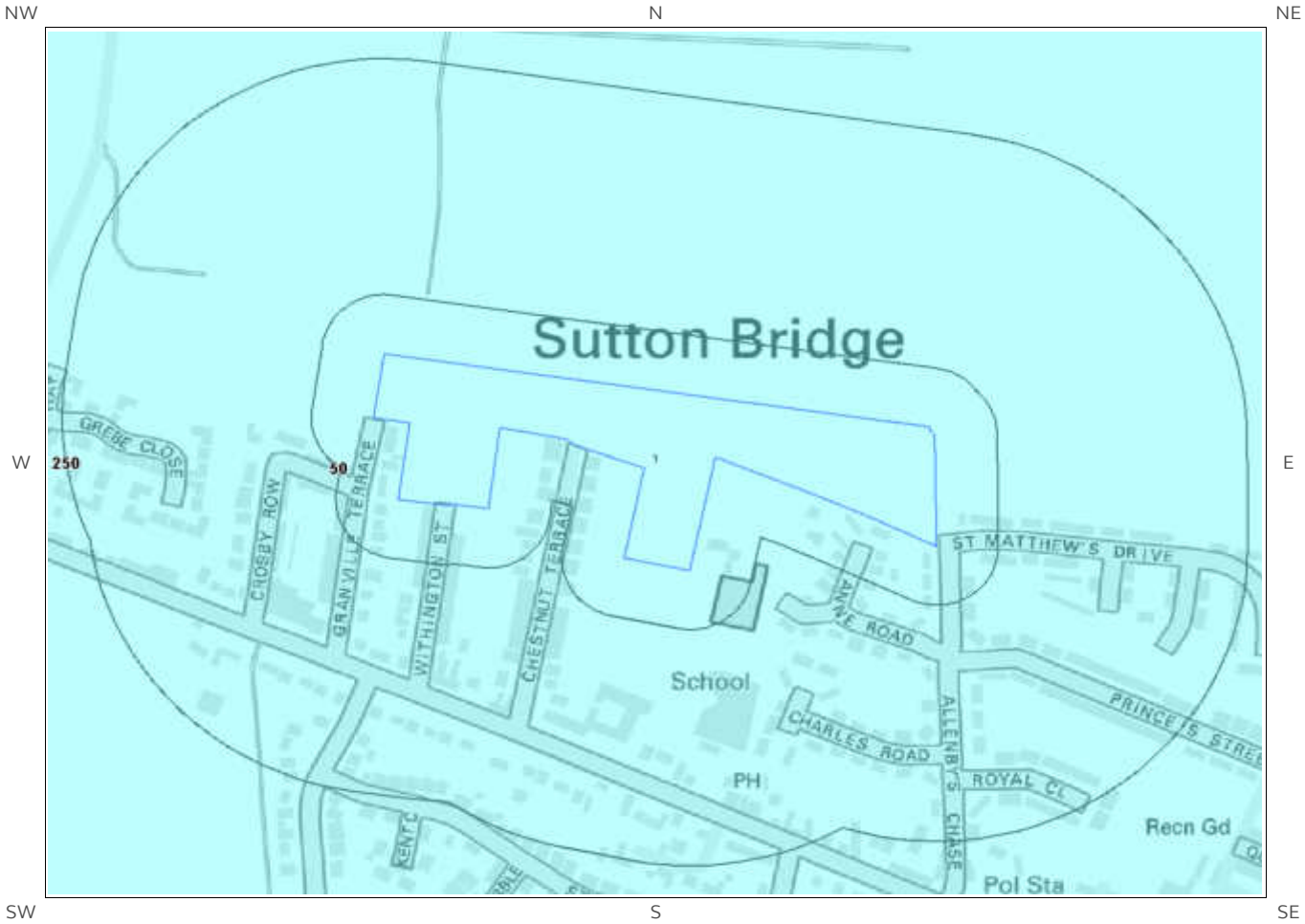
Zone 3 Floodplain

Flood Defences

Area used for Flood Storage

Area Benefiting from Flood Defences

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



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

Site Outline

Search Buffers (m)

RoFRaS Rating

Very Low

Low

Medium

High

7 Flooding

7.1 River and Coastal Zone 2 Flooding

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

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

ID	Distance (m)	Direction	Update	Type
1	0	On Site	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
2	0	On Site	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
3	0	On Site	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
4	0	On Site	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
5	0	On Site	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
6	0	On Site	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
7	0	On Site	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
8	22	N	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
9A	62	N	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
10	76	NW	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
11A	82	N	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
12	116	NW	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
13	130	NW	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
14B	158	SW	29-May-2018	Zone 2 - (Fluvial /Tidal Models)
15	237	N	29-May-2018	Zone 2 - (Fluvial /Tidal Models)

7.2 River and Coastal Zone 3 Flooding

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

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

ID	Distance (m)	Direction	Update	Type
1	0	On Site	30-May-2018	Zone 3 - (Fluvial Models)
2	0	On Site	30-May-2018	Zone 3 - (Fluvial Models)
3	6	E	30-May-2018	Zone 3 - (Fluvial Models)
4	102	SW	30-May-2018	Zone 3 - (Fluvial Models)
5	158	SW	30-May-2018	Zone 3 - (Fluvial Models)
6	167	SW	30-May-2018	Zone 3 - (Fluvial Models)
7	215	S	30-May-2018	Zone 3 - (Fluvial Models)

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

Highest risk of flooding onsite — Low

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

RoFRaS data for the study site indicates the property is in an area with a Low (greater than 1 in 1000 but less than 1 in 100) chance of flooding in any given year.

Any relevant data within 250m is represented on the RoFRaS Flood map. Data to 50m is reported in the table below.

ID	Distance (m)	Direction	RoFRas flood Risk
1	0.0	On Site	Low

7.4 Flood Defences

Flood Defences within 250m of the study site — None identified

Database searched and no data found.

7.5 Areas benefiting from Flood Defences

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

7.6 Areas benefiting from Flood Storage

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

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site — None identified

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

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions

Not Prone

The area is not considered to be prone to groundwater flooding based on rock type.

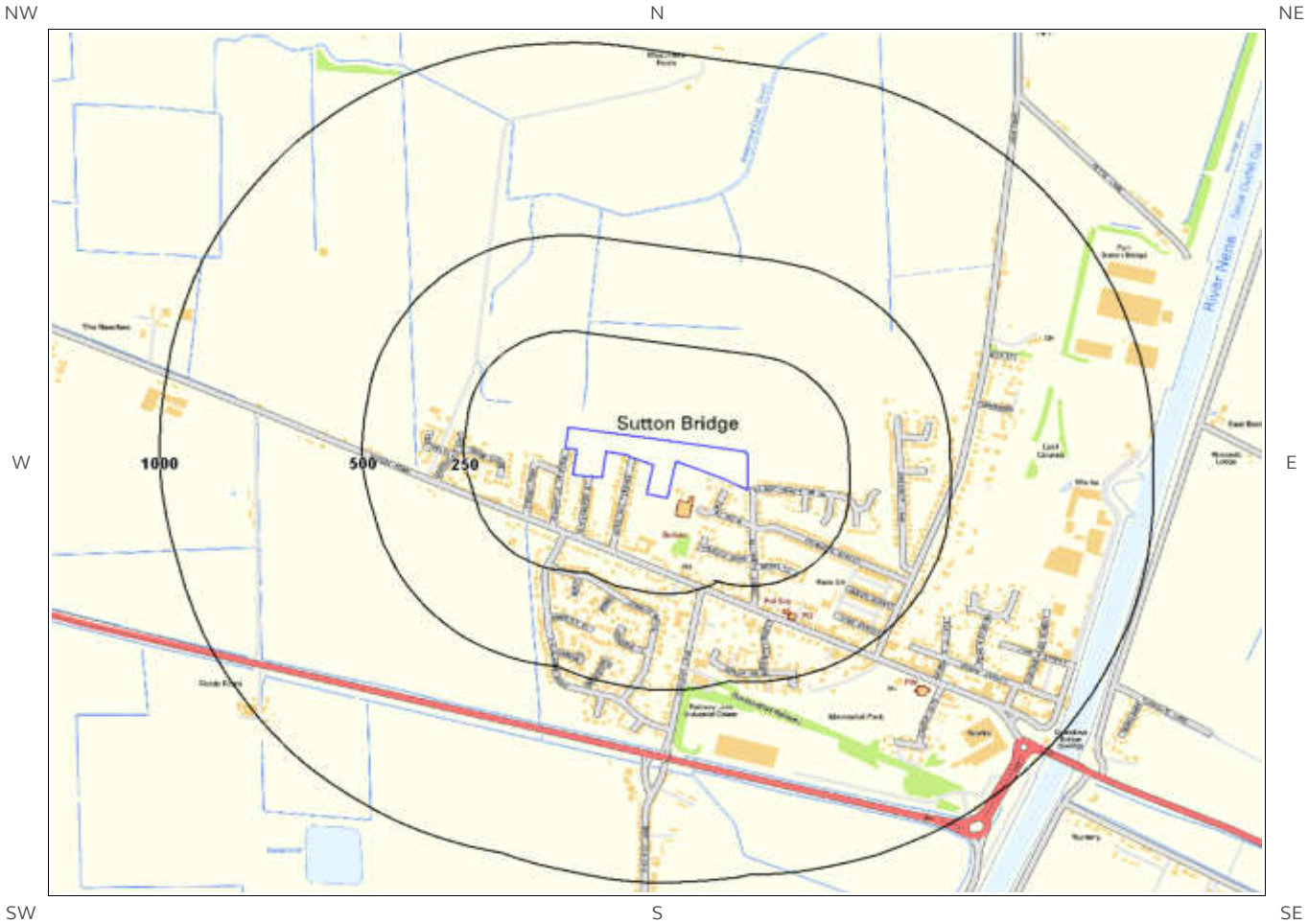
7.8 Groundwater Flooding Confidence Areas

British Geological Survey confidence rating in this result — Not Applicable

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

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

8. Designated Environmentally Sensitive Sites Map



© Crown copyright and database rights 2018.
Ordnance Survey licence 100035207.

8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site	None identified

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

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

9.1.1 Shrink Swell

Maximum Shrink-Swell*[*] hazard rating identified on the study site — Low

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

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

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site — Very Low

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

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

9.1.3 Soluble Rocks

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

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

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

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

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site — Moderate

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

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

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site — Negligible

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

Hazard
No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

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

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

Hazard
Significant potential for running sand problems with relatively small changes in ground conditions. Avoid large amounts of water entering the ground (for example through pipe leakage or soak-aways). Do not dig (deep) holes into saturated ground near the property without technical advice. For new build consider the consequences of soil and groundwater conditions during and after construction. For existing property possible increase in insurance risk from running sand, for example, due to water leakage, high rainfall events or flooding.

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

9.2 Radon

9.2.1 Radon Affected Areas

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

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

9.2.2 Radon Protection

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

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site — None identified

Database searched and no data found.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary — None identified

Database searched and no data found.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site — None identified
Guidance: No Guidance Required.

Contact Details

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

British Geological Survey Enquiries
Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

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

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

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

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

Local Authority
Authority: South Holland District Council
Phone: 01775 761 161
Web: http://www.sholland.gov.uk/
Address: Council Offices, Priory Road, Spalding, Lincolnshire, PE11

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

Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England/Natural Resources Wales who retain the Copyright and Intellectual Property Rights for the data.
PointX © Database Right/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028].
This report has been prepared in accordance with the Groundsure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

Groundsure's Terms and Conditions can be viewed online at this link:

https://www.groundsure.com/terms-and-conditions-may25-2018