






PROPOSED RESIDENTIAL DEVELOPMENT

NORTHON'S LANE/ OAKWOOD GLADE, HOLBEACH, LINCOLNSHIRE

PHASE I GEO-ENVIRONMENTAL DESK STUDY

MARCH 2019

REPORT REF: 24879/03-19/6641

Consulting Development Engineers

NORTHON'S LANE/ OAKWOOD GLADE, HOLBEACH, LINCOLNSHIRE

PHASE I GEO-ENVIRONMENTAL DESK STUDY

MARCH 2019

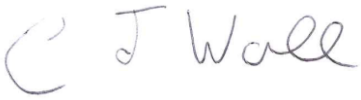
REPORT REF: 24879/03-19/6641

CLIENT: Gleeson Homes Limited (East Yorkshire)

ENGINEER: Mewies Engineering Consultants Ltd
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

Tel: 01530 264 753
Email group@m-ec.co.uk

Report Prepared By:



.....
Christopher Wall BSc(Hons) AMIEnvSc
Geo-Environmental Engineer

Report Checked and Approved by:



.....
David Torrance BSc (Hons) CGeol FGS
Associate Director Geo-Environmental

COPYRIGHT

The contents of this document must not be copied or reproduced in whole or part without the written consent of Mewies Engineering Consultants Ltd.

CONTENTS

1.0	GEO-ENVIRONMENTAL DESK STUDY	4
2.0	PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT	8
3.0	PRELIMINARY GEOTECHNICAL ASSESSMENT	11
4.0	RECOMMENDATIONS	12
5.0	REFERENCES	13

TABLES

TABLE 1: GEO-ENVIRONMENTAL DESK STUDY 4

TABLE 2: QUALITATIVE RISK ASSESSMENT – CONCEPTUAL MODEL 9

TABLE 3 PRELIMINARY GEOTECHNICAL ASSESSMENT 11

APPENDICES

A. SCOPE OF WORKS
B. SITE LOCATION PLAN
C. SITE WALKOVER NOTES AND PHOTOGRAPHIC RECORD
D. GROUNDSURE REPORT
E. HISTORICAL MAPPING
F. ENVIRONMENTAL RISK ASSESSMENT METHODOLOGY
G. NOTES ON LIMITATIONS

1.0 GEO-ENVIRONMENTAL DESK STUDY

Table 1: Geo-environmental Desk Study

Site and Setting The approximate location of the site is shown in Appendix B. A site walkover of external areas was completed by a representative of M-EC on 28th February 2019. Photographs and notes from the walkover are included in Appendix C.	
Client	Gleeson Homes Limited (East Yorkshire)
Project Setting	Proposed residential development
Site Address	PE12 7JT
Site and Surroundings	The site comprises part of a single open relatively flat lying field which had recently been ploughed at the time of the site walkover. Existing residential properties border the south and east of the site, the A17 runs along the north-eastern boundary and further open fields are shown to the north, west and south-west. Vehicular access to the site is via Northon's Lane to the south-west, Boston Road to the east and Welbourne Lane West to the north. A drainage ditch runs close to the northern site boundary adjacent to the A17 and a drainage ditch labelled as "New River" runs along the western field boundary (approximately 100m to the west of the site boundary). A shed observed to contain suspected asbestos cladding and roofing was observed to the south of the site off Northon's Lane. An area of burnt ground and a water tank were observed adjacent to this shed.

Historical Review The site history has been assessed by reviewing 1: 2,500 and 1: 10,000 scale historical Ordnance Survey maps provided by Groundsure (Appendix E). A summary of the history of the site and surroundings is provided below.	
On-site Historical Summary	The earliest mapping reviewed from 1887 and 1888 shows the site to comprise part of three open fields. A field boundary comprising trees and a drain runs from north to south and separates a larger field in the north-east with the two smaller fields in the west. This drain forms the eastern boundary of the south-western field. A separate drain runs along part of the southern site boundary and a separate field boundary comprising trees separates the north-western and south-western fields. The two western fields have been combined as of 1904 and comprise an orchard. The drain running along part of the southern site boundary is no longer shown and may have been infilled. By 1931, the drain running from north to south through the site area is no longer shown and may have been infilled. By 1950, the orchard is no longer shown in the western part of the site and the whole site is now shown as part of a single larger field. No further significant changes were observed within the site area in the subsequent mapping reviewed.
Off-site Historical Summary	The earliest mapping reviewed from 1887 and 1888 shows the surrounding area to predominantly comprise further open fields. A building with an associated pump is shown adjacent to the southern site boundary and a building labelled as "Botanic Cottage" is shown to the north of the site. A drain is shown to run along the eastern and northern field boundaries off-site, approximately 40m to the east and 50m to the north-east of the site area. By 1904, further small buildings are shown to the south of the site and the pump is no longer shown. A small pond is shown approximately 50m to the north of the site, adjacent to the junction labelled as Bailey's Grave. By 1931, the small pond to the north of the site is no longer shown and may have been backfilled. By 1938, five small residential buildings are shown directly to the west of the site fronting Boston Road. By 1968, further small buildings are shown adjacent to the southern site boundary and a "piggery" is shown close to the southern boundary of the western area. A nursery is shown approximately 60m north east of the site.

	Large-scale residential development is shown to the south of the site between 1976 and 1995. By 2010, residential development is shown to south of the western area and the "piggery" is no longer shown. The A17 is shown directly to the north of the site as of the 1992 mapping and by 1995 an electricity substation is shown approximately 20m to the south of the western area of the site.
Geo-environmental Setting A summary of the geo-environmental site setting is provided as follows. Information has been collated from the information sources noted in Appendix D.	
Geology and Hydrogeology	Information published by the BGS indicates that the site is directly underlain by superficial Tidal Flat deposits (clay and silt) overlying bedrock of the West Walton Formation – mudstone and siltstone. There is a potential for organic material within the Tidal Flat deposits. The Tidal Flat Deposits and the underlying bedrock of the West Walkton Formation are classed as Unproductive Strata. The site is not within 1km of a Groundwater Source Protection Zone. A thickness of topsoil/subsoil is anticipated based on the predominantly greenfield nature of the site. There is a potential for localised Made Ground associated with the infilled drain. BGS exploratory hole records to the east of the site indicate that the Tidal Flat deposits are likely to comprise soft to firm dark brown silt and/or loose brown sand.
Hydrology	The nearest surface water feature to the site is a ditch which runs along the northern boundary of the site adjacent to the A17. A drain labelled as "New River" runs along the western boundary of the field (approximately 100m to the west of the site). The site is within Flood Zone 3 associated with river and coastal flooding. The nearest discharge consent was located 51m north east of the site and referred to the release of sewage discharges. This was revoked in 1996.
Ground gases	Potential sources of ground gases have been identified on-site and include potential organic deposits associated with the Tidal Flat strata. The site is not located in a radon affected area as less than 1% of properties are above the action level. There are no landfill sites recorded within influencing distance of the site.

Regulatory Information A summary of pertinent information from the Groundsure Report (Appendix D) is provided below.	
Industrial Features	The nearest historical industrial site relates to the former nursery 43m north east of the site. The nearest existing industrial site refers to the electricity substation 28m south of the site. The nearest recorded tanks to the site are located 162-199m to the south of the site.
Nitrate Vulnerable Zone	The site is located within a Nitrate Vulnerable Zone relating to surface water.
UXO	A review of Zetica UXO mapping indicates that the site is at a potentially low risk of unexploded ordnance.

2.0 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

2.1 This section assesses the significance of the environmental issues that have been identified on-site or in the surrounding area in previous sections of this report by developing a preliminary Conceptual Site Model (CSM).

2.2 The objective of the CSM is to identify potential contaminant sources, pathways and receptors relating to the site and surrounding area to evaluate the potential for a pollution event to occur using a risk classification tool. The level of risk is assessed by comparing the likelihood of a pollution event to occur, versus the consequence of a pollution occurrence. The consequence is essentially a measurement of the severity of a hazard (or source) and sensitivity of the receptor (controlled waters and human health).

2.3 The risk assessment methodology detailing the classes of significance is provided in Appendix F. The risks associated with each potential pollutant/contaminant linkage are evaluated in Table 2.

Table 2: Qualitative Risk Assessment – Conceptual Model

Source	Pathway	Receptor	Consequence	Likelihood	Risk
On-site Previous and existing site use – agriculture including agricultural processes and operations and as an orchard Potential contaminants may include heavy metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons and pesticides	Direct contact, ingestion and/or inhalation of contaminated soil particulates	Ground and construction workers	Md	Lw	M/L
		Future site users	Md	Lw	M/L
		Foundations and water utility pipes	Md	Ul	L
Localised Made Ground associated with backfilled ditches Potential contaminants may include heavy metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, asbestos containing materials and ground gases including carbon dioxide and methane	Outdoor and indoor inhalation of contaminant vapours and ground gases	Future site users, ground and construction workers	Md	Ul	L
Tidal Flat deposits Potential for ground gases including carbon dioxide and methane arising from the breakdown of organic deposits	Migration of sediments via surface runoff	Drainage ditches running along the northern site boundary and 100m to the west of the site	Md	Lw	M/L

Off-site: Made Ground associated with development adjacent to the site and backfilled ponds in the surrounding area Potential contaminants may include heavy metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, asbestos containing materials and ground gases including carbon dioxide and methane Localised areas of burnt ground Potential contaminants may include polycyclic aromatic hydrocarbons	Direct contact, ingestion and/or inhalation of contaminated soil particulates	Ground and construction workers	Md	Ul	L
		Future site users	Md	Ul	L
		Water utility pipes	Mi	Ul	VL
	Migration of sediments via surface runoff and migration of contaminants via groundwater base flow	Drainage ditches running along the northern site boundary and 100m to the west of the site	Md	Ul	L

VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely

3.0 PRELIMINARY GEOTECHNICAL ASSESSMENT

Table 3 Preliminary Geotechnical Assessment

Preliminary Geotechnical Appraisal	
Made Ground	Potential for localised Made Ground associated with the backfilled ditch running across the centre of the site.
Topsoil	Subject to appropriate assessment, the topsoil may be suitable for reuse in garden or landscaped areas.
Preliminary Foundation Solution	Due to the potential for soft cohesive and/ or loose granular strata associated with the Tidal Flat Deposits, traditional shallow foundations may be unsuitable. Deepened foundations or an alternative foundation solution (such as vibro-stone column or piling) may be required.
Buried Obstructions	Buried obstructions such as land drains, if encountered, should be delineated and removed during enabling works and the voids backfilled with suitably engineered fill.
Trees	Due to the anticipated cohesive strata and the presence of mature trees (predominantly along the northern site boundary), an allowance should be made for localised deepening of foundations and incorporation of heave protection.
Earthworks	As the site is relatively flat-lying, it is considered unlikely that large-scale earthworks will be required to facilitate a suitable development platform.
pH and Sulphates	Aggressive ground conditions are not expected; however, the concrete specification should be determined by laboratory testing.
Drainage and Soakaways	Due to the anticipated cohesive nature of the underlying strata, soakaway drainage is considered unlikely to be viable.
Roads and Pavements	In-situ CBR testing should be carried out at formation level along all proposed roads. It is anticipated that very low CBR values will be recorded and the use of geo-grid and significant capping may be required, Ground stabilisation may be viable to improve the performance of the near surface materials.
Ground Stability Hazards	The site is considered to be at a moderate risk of compressible deposits, at a low risk of shrinking/swelling clays and at a moderate risk of running sand.

4.0 RECOMMENDATIONS

4.1 It is recommended that a copy of this report is submitted to the Local Planning Authority to support the ongoing promotion of the site and any future planning applications. Review of this report will enable the contaminated land or environmental health officer to review the findings and give comment as consultee to the Local Planning Officer. Future ground investigation will likely be conditioned as part of a planning permission.

4.2 Based on the findings of this report, localised remedial measures may be required to protect human health and controlled waters receptors from potential sources of contamination. However, a site-specific ground investigation is recommended to confirm these risks and to determine the geotechnical conditions for civil engineering and infrastructure works for the proposed development.

5.0 REFERENCES

5.1 This report has been prepared, where possible, with regard to the following sources of reference and guidance, supplemented with experience of similar sites.

1. British Standards Institute, (BSI), BS 8485:2015, Code of Practice for the characterization and remediation from ground gas in affected developments
2. British Standards Institute, (BSI), BS 8576:2013, Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)
3. British Standards Institute, (BSI), BS 10175:2011+A2:2017, Investigation of Contaminated Sites – Code of Practice
4. British Standards Institute, (BSI), BS5930:2015) Code of practice for ground investigations
5. British Standards Institute, (BSI), BS EN 1997-1:2004 Incorporating corrigendum February 2009, Eurocode 7 – Geotechnical Design – Part 1: General rules
6. British Standards Institute, (BSI), BS EN 1997-2:2007 Incorporating corrigendum June 2010, Eurocode 7 – Geotechnical Design – Part 2: Ground Investigation and testing
7. Building Research Establishment Special Digest 1 Third Edition. Concrete in Aggressive Ground (2005)
8. Building Research Establishment (BRE) BR211, Radon; Guidance on Protective Measures for New Buildings (2015)
9. Construction Industry Research and Information Association (CIRIA), Report 132, A Guide to Safe working on Contaminated Sites (1996)
10. Construction Industry Research and Information Association (CIRIA). 2001, C522 Contaminated land risk assessment, A guide to good practice
11. Construction Industry Research and Information Association (CIRIA). 2007, Report C665, Assessing Risk Posed by on Hazardous Ground Gases to Buildings
12. Department for Communities and Local Government (DCLG), 2012, National Planning Policy Framework
13. Department for Environment Food and Rural Affairs (DEFRA), 2012, Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance
14. Environment Agency report CLR11 'Model Procedures for the Management of Land Contamination'
15. Environment Agency 2008, Updated technical background to the CLEA model Science Report – SC050021/SR3
16. Environment Agency, 2006, Remedial Targets Methodology, Hydrogeological Risk Assessment for Land Contamination

17. Health and Safety Executive (HSE) 'Protection of workers and the general public during the Development of Contaminated Land (1991)

18. NHBC Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D Publication 66: 2008

APPENDIX A

SCOPE OF WORK

The Phase I Environmental Risk Assessment comprises a desk study review of existing information on the site combined with a site walkover and an assessment of potential environmental liabilities. A detailed description of the methodology for undertaking a Phase I Environmental Risk Assessment is in Appendix F.

No third-party liability or duty of care is extended. Third parties using information contained in this report do so at their own risk.

The main aspects are summarised below:

- Review of available historical Ordnance Survey maps of the site and surrounding areas.
- Review of published geological, hydrogeological and hydrological records to assess the environmental setting of the site and surrounding areas.
- Review of available public information and up-to-date regulatory information from regulatory authorities to identify any potentially significant environmental issues at the site and surrounding areas.
- Review of any existing information and reports relating to the site and surrounding area, including any available plans.
- Site walkover to assess the potential for environmental liabilities associated with the site and surrounding area which may impact on the development potential.
- Development of a conceptual model and risk assessment to assess potential contaminative sources, pathways and receptors on the site or surrounding properties.

Land Quality Assessment Methodology

This report has been completed to present pertinent information regarding the environmental risks and liabilities associated with the site. It has been completed to fulfil the requirements of a preliminary risk assessment in accordance with BS10175: 2011 'Investigation of Potentially Contaminated Sites Code of Practice' and CLR11 'Model Procedures for the Management of Contaminated Land'.

References to the word "contamination" in this report relate to the statutory definition of contaminated land under the Environmental Protection Act 1990: Part IIA Contaminated Land Statutory Guidance: April 2012 unless otherwise stated.

APPENDIX B

M-EC
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

SITE LOCATION PLAN

Project:	**Northon's Lane/ Oakwood Glade, Holbeach**
File Ref:	**24879**
O.S. Grid Ref:	**535330, 325584**
Postcode:	**PE12 7JT**



M-EC Ordnance Survey Licence No. 100055865

APPENDIX C



Photograph 1 – General view looking north across the site area. Photo taken from Oakwood Glade.



Photograph 2 – View looking south-east along Northon's Lane adjacent to the site area



Photograph 3 – View looking north-west along Northon's Lane adjacent to the site area. Photo shows overhead electric cables running along Northon's Lane.



Photograph 4 – View of shed adjacent to the site area and observed to contain suspected asbestos cladding and asbestos roofing.



Photograph 5 – General view looking north-east across the site area. Photo taken close to the south-western corner of the site.



Photograph 6 – Area of burnt ground observed adjacent to the suspected asbestos clad shed directly to the south of the site.



Photograph 7 – General view looking east across the southern boundary of the site. Photo taken close to the centre of the site near Cedar Drive.



Photograph 8 – View looking south along Cedar Drive, adjacent to the site area.



Photograph 9 – View looking north across site area towards line of mature trees. Photo taken adjacent to the south-eastern corner of the site.



Photograph 10 – View looking east towards site entrance connecting to Boston Road in the south-eastern corner of the site.



Photograph 11 – View looking north-east towards the A17 roundabout. Photo taken from the site entrance off Boston Road.



Photograph 12 – View looking north-west along the northern site boundary. Photo taken adjacent to the north-eastern boundary of the site.



Photograph 13 – View of drainage ditch running adjacent to the northern site boundary of the site and the A17.



Photograph 14 – View of waste material and hydrocarbon sheen on the drainage ditch to the north of the site.



Photograph 15 – View of culvert of "New River" running under Welbourne Lane West to the north of the site.



Photograph 16 – View of area of burnt ground in the west of the field.



Photograph 17 – View looking south along "New River".



Photograph 18 – View looking east across site area. Photo taken from the western field boundary.

Ref. 24879
Northon's Lane/ Oakwood Glade,
Holbeach Lincolnshire
Site Features Plan
28th February 2019
Walkover undertaken by C. Wall
Plan drawn by C. Wall
Not to scale

N



Shed observed to contain suspected asbestos roofing

Drain running to the north of the site and along the A17

Overhead electricity cable

"New River" drainage ditch running along the western field boundary

Area of burnt ground

Shed observed to contain asbestos cladding and roofing

Area of burnt ground

Overhead electricity cable

Water tank

APPENDIX D

Groundsure
LOCATION INTELLIGENCE

Mewies Engineering Consultants Ltd

The Old Chapel, STATION ROAD,
HUGGLESCOTE, LE67 2GB

Groundsure Reference:	GS-5847758
Your Reference:	8434N_-_24879
Report Date	27 Feb 2019
Report Delivery Method:	Email - pdf

Enviro Insight

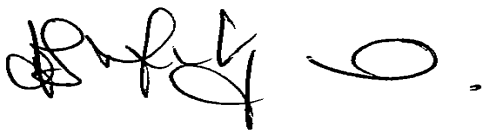
Address: BROWN BUTLIN LTD, NORTHONS LANE, HOLBEACH, SPALDING, PE12 7JS

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:	**BROWN BUTLIN LTD, NORTHONS LANE, HOLBEACH, SPALDING, PE12 7JS**
Date:	**27 Feb 2019**
Reference:	**GS-5847758**
Client:	**Mewies Engineering Consultants Ltd**

NW N NE

W E

SW S SE



Aerial Photograph Capture date:	18-Jul-2015
Grid Reference:	535330,325584
Site Size:	4.8980ha

Report Reference: GS-5847758
Client Reference: 8434N_-_24879

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....14
1.4 Additional Information – Historical Petrol and Fuel Site Database....14
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database....15
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: 20
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:....20
2.2 Dangerous or Hazardous Sites....20
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents....21
2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:....21
2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:....21
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990....21
3. Landfill and Other Waste Sites Map 22
3. Landfill and Other Waste Sites 23
3.1 Landfill Sites....23
3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site: 23
3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site: 23
3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:....24
3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:....24
3.2 Other Waste Sites....24
3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site: 24
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site: 25
4. Current Land Use Map 26
4. Current Land Uses 27
4.1 Current Industrial Data....27
4.2 Petrol and Fuel Sites....27
4.3 National Grid High Voltage Underground Electricity Transmission Cables....27
4.4 National Grid High Pressure Gas Transmission Pipelines....28

5. Geology 29
5.1 Artificial Ground and Made Ground 29
5.2 Superficial Ground and Drift Geology 29
5.3 Bedrock and Solid Geology 29
6 Hydrogeology and Hydrology 30
6a. Aquifer Within Superficial Geology 30
6b. Aquifer Within Bedrock Geology and Abstraction Licences 31
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences 32
6d. Hydrogeology – Source Protection Zones within confined aquifer 33
6e. Hydrology – Watercourse Network and River Quality 34
6.Hydrogeology and Hydrology 35
6.1 Aquifer within Superficial Deposits 35
6.2 Aquifer within Bedrock Deposits 35
6.3 Groundwater Abstraction Licences 36
6.4 Surface Water Abstraction Licences 36
6.5 Potable Water Abstraction Licences 36
6.6 Source Protection Zones 36
6.7 Source Protection Zones within Confined Aquifer 36
6.8 Groundwater Vulnerability and Soil Leaching Potential 37
6.9 River Quality 37
6.9.1 Biological Quality: 37
6.9.2 Chemical Quality: 37
6.10 Ordnance Survey MasterMap Water Network 37
6.11 Surface Water Features 45
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea) 46
7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map 47
7 Flooding 48
7.1 River and Coastal Zone 2 Flooding 48
7.2 River and Coastal Zone 3 Flooding 49
7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating 50
7.4 Flood Defences 50
7.5 Areas benefiting from Flood Defences 50
7.6 Areas benefiting from Flood Storage 51
7.7 Groundwater Flooding Susceptibility Areas 51
7.8 Groundwater Flooding Confidence Areas 51
8. Designated Environmentally Sensitive Sites Map 52
8. Designated Environmentally Sensitive Sites 53
8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site: 53
8.2 Records of National Nature Reserves (NNR) within 2000m of the study site: 53
8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site: 53
8.4 Records of Special Protection Areas (SPA) within 2000m of the study site: 53
8.5 Records of Ramsar sites within 2000m of the study site: 53
8.6 Records of Ancient Woodland within 2000m of the study site: 54
8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site: 54
8.8 Records of World Heritage Sites within 2000m of the study site: 54
8.9 Records of Environmentally Sensitive Areas within 2000m of the study site: 54
8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site: 54
8.11 Records of National Parks (NP) within 2000m of the study site: 54
8.12 Records of Nitrate Sensitive Areas within 2000m of the study site: 54
8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site: 55

8.14 Records of Green Belt land within 2000m of the study site: 55
9. Natural Hazards Findings 56
9.1 Detailed BGS GeoSure Data 56
9.1.1 Shrink Swell 56
9.1.2 Landslides 56
9.1.3 Soluble Rocks 56
9.1.4 Compressible Ground 57
9.1.5 Collapsible Rocks 57
9.1.6 Running Sand 57
9.2 Radon 58
9.2.1 Radon Affected Areas 58
9.2.2 Radon Protection 58
10. Mining 59
10.1 Coal Mining 59
10.2 Non-Coal Mining 59
10.3 Brine Affected Areas 59
Contact Details 60
Standard Terms and Conditions 62

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	0	31
1.2 Additional Information – Historical Tank Database	0	0	7	27
1.3 Additional Information – Historical Energy Features Database	0	1	10	17
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	0	1
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	0	0	0	2

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	4	12
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	0
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	2	4
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	3

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	1	5	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 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	0	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	0	0	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	8	36	46	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	Yes	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	1	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.

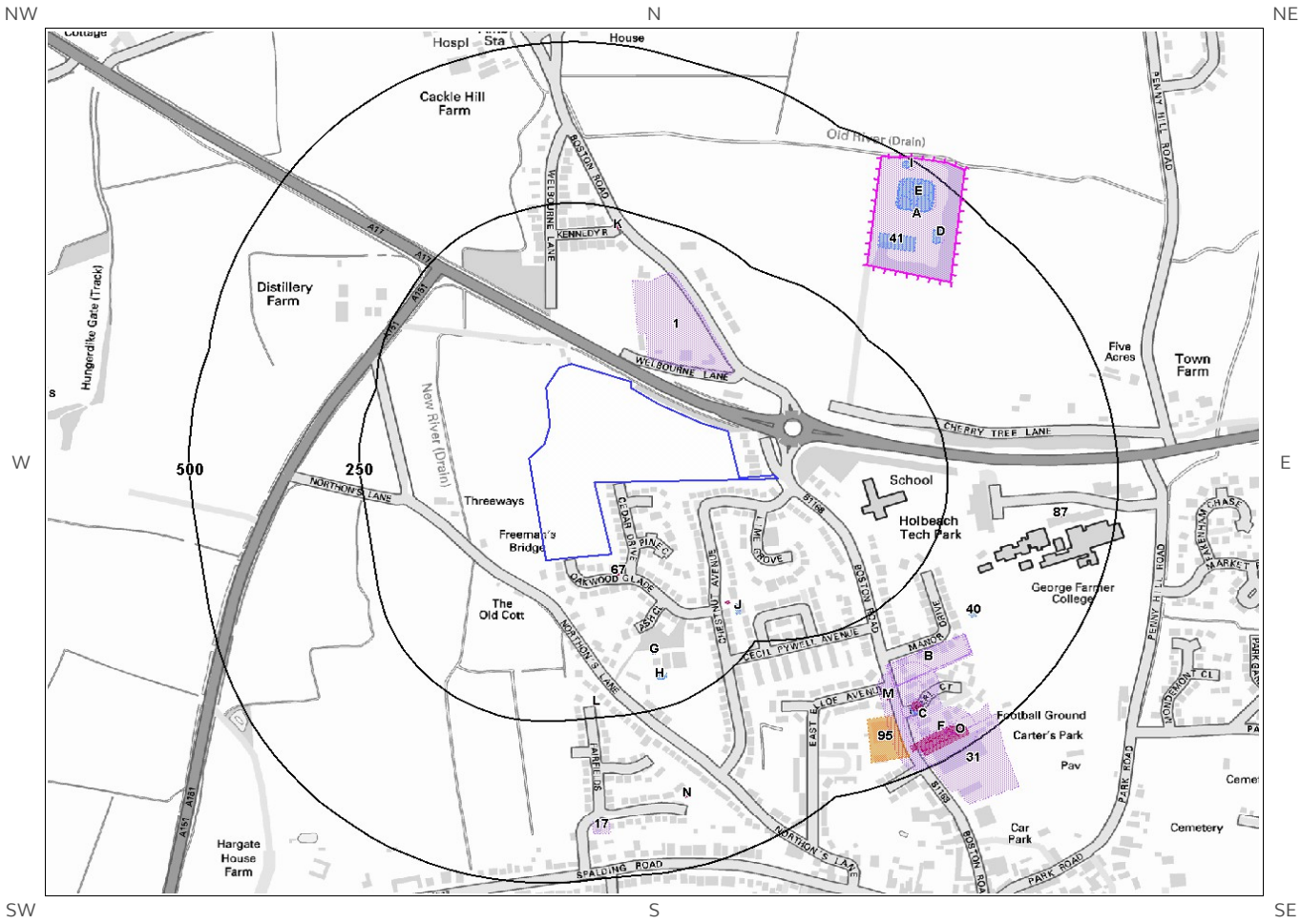
Note: Maps

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 2019.
Ordnance Survey licence 100035207.

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

Site Outline

Industrial Land Use

Potentially Infilled Land

250
500
Search Buffers (m)

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: 32

ID	Distance [m]	Direction	Use	Date
1	43	NE	Nursery	1976
2B	329	SE	Nursery	1929
3A	329	NE	Sewage Works	1976
4A	329	NE	Sewage Works	1992
5B	329	SE	Nursery	1955
6B	331	SE	Nursery	1950
7B	331	SE	Nursery	1938
8C	341	SE	Gas Works	1903
9C	366	SE	Unspecified Commercial/Industrial	1950
10C	397	SE	Unspecified Commercial/Industrial	1903
11C	397	SE	Unspecified Commercial/Industrial	1929
12C	400	SE	Unspecified Tank	1903
13C	400	SE	Unspecified Tank	1929
14C	401	SE	Unspecified Tank	1938
15C	401	SE	Unspecified Tank	1950
16C	401	SE	Gasometer	1903
17	409	S	Nursery	1970
18F	419	SE	Gas Works	1887
19D	427	NE	Unspecified Tanks	1992
20D	427	NE	Unspecified Tanks	1976
21E	432	NE	Unspecified Tanks	1992
22E	432	NE	Unspecified Tanks	1976
23F	451	SE	Gas Works	1903
24F	457	SE	Gasometers	1887
25F	458	SE	Gasometer	1903
26F	458	SE	Unspecified Tank	1929
27F	460	SE	Unspecified Tank	1938
28F	460	SE	Gasometer	1903
29F	460	SE	Unspecified Tank	1950
30F	461	SE	Gasometers	1887
31	471	SE	Unspecified Works	1976
32I	486	NE	Unspecified Tank	1992

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: 34

ID	Distance (m)	Direction	Use	Date
33G	162	S	Unspecified Tank	1904
34G	162	S	Unspecified Tank	1931
35J	191	S	Tanks	1968
36H	198	S	Tanks	1982
37H	199	S	Tanks	1968
38H	199	S	Tanks	1992
39H	199	S	Tanks	1995
40	348	SE	Tanks	1968
41	361	NE	Settling Tanks	1968
42C	399	SE	Gasholder	1968
43C	403	SE	Unspecified Tank	1904
44C	403	SE	Unspecified Tank	1931
45D	421	NE	Tanks	1995
46D	421	NE	Tanks	1992
47D	421	NE	Tanks	1992
48D	421	NE	Tanks	1982
49E	427	NE	Unspecified Tank	1982
50E	429	NE	Tanks	1995
51E	429	NE	Tanks	1968
52E	429	NE	Tanks	1992
53E	429	NE	Tanks	1992
54E	443	NE	Unspecified Tank	1982
55E	444	NE	Tanks	1995
56E	451	NE	Unspecified Tank	1982
57F	454	SE	Gas Works	1904
58F	459	SE	Gasometer	1904
59F	461	SE	Gasometer	1904
60F	461	SE	Gasometer	1931
61F	461	SE	Gas Works	1888
62E	465	NE	Unspecified Tank	1982
63F	467	SE	Gasometers	1888
64O	470	SE	Gasometers	1888
65I	484	NE	Unspecified Tank	1995
66I	485	NE	Unspecified Tank	1991

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: 28

ID	Distance (m)	Direction	Use	Date
67	28	S	Electricity Substation	1995
68J	182	SE	Electricity Substation	1992
69J	182	SE	Electricity Substation	1982
70J	183	SE	Electricity Substation	1995
71K	220	N	Electricity Substation	1995
72K	221	N	Electricity Substation	1992
73K	221	N	Electricity Substation	1982
74K	221	N	Electricity Substation	1992
75K	221	N	Electricity Substation	1968
76L	227	S	Electricity Substation	1992
77L	228	S	Electricity Substation	1995
78M	373	SE	Electricity Substation	1968
79M	373	SE	Electricity Substation	1995
80M	373	SE	Electricity Substation	1982
81M	373	SE	Electricity Substation	1992
82M	373	SE	Electricity Substation	1992
83N	389	S	Gas Governor	1992
84N	389	S	Gas Governor	1992
85N	389	S	Gas Governor	1995
86C	399	SE	Gasholder	1968
87	419	E	Electricity Substation	1982
88F	454	SE	Gas Works	1904
89F	459	SE	Gasometer	1904
90F	461	SE	Gasometer	1904
91F	461	SE	Gasometer	1931
92F	461	SE	Gas Works	1888
93F	467	SE	Gasometers	1888
94O	470	SE	Gasometers	1888

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: 1

ID	Distance (m)	Direction	Use	Date
95	395	S	Garage	1968

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.

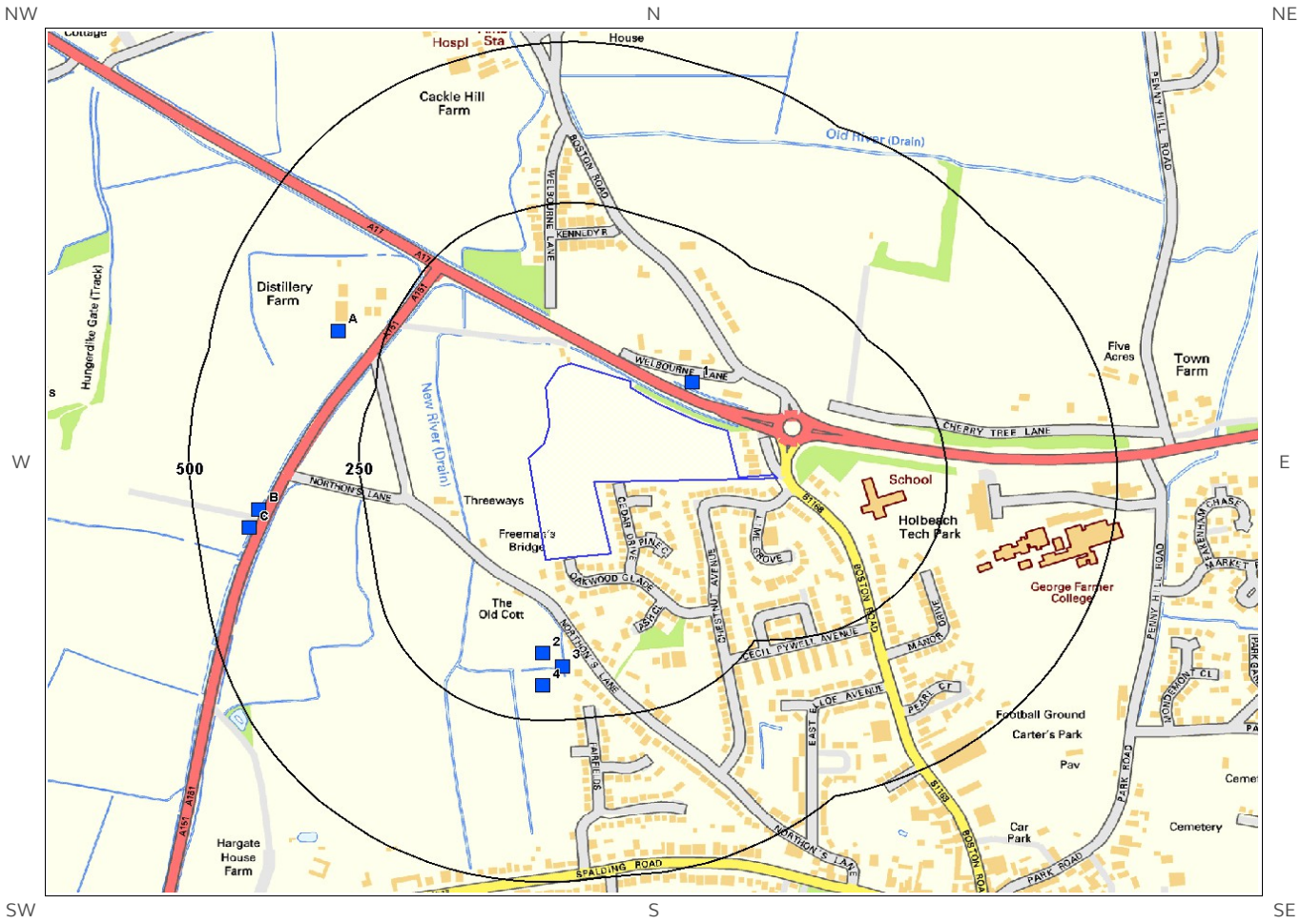
1.7 Potentially Infilled Land

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

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

ID	Distance(m)	Direction	Use	Date
96A	329	NE	Sewage Works	1992
97A	329	NE	Sewage Works	1976

2. Environmental Permits, Incidents and Registers Map



© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.

Site Outline

250
500
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:

0

Database searched and no data found.

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

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

16

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

ID	Distance (m)	Direction	NGR	Details	
1	51	NE	535420 325670	Address: THE A17 BY-PASS, WELBOURN LANE (EAST), HOLBEACH, SPALDING, LINCS Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRNLF02987 Permit Version: 1	Receiving Water: - Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 20/07/1990 Effective Date: 20-Jul-1990 Revocation Date: 01/10/1996
2	145	S	535200 325250	Address: LAMBLEYS MILL COTTAGE GARDEN, NORTHONS LANE, HOLBEACH, LINCS, PE12 7PZ Effluent Type: UNSPECIFIED Permit Number: PRNLF03154 Permit Version: 1	Receiving Water: - Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 02/08/1990 Effective Date: 02-Aug-1990 Revocation Date: 01/10/1996
3	167	S	535230 325230	Address: EATON HOUSE, NORTHONS LANE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7PZ Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRNNF12884 Permit Version: 1	Receiving Water: TRIBUTARY OF WHAPLODE RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 30/10/2002 Effective Date: 07-Oct-2002 Revocation Date: -
4	195	S	535200 325200	Address: LAMBLEYS MILL COTTAGE, NORTHONS LANE, HOLBEACH, SPALDING, LINCS, PE12 7PZ Effluent Type: UNSPECIFIED Permit Number: PRNLF03155 Permit Version: 1	Receiving Water: - Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 02/08/1990 Effective Date: 02-Aug-1990 Revocation Date: 01/10/1996
5A	318	W	534900 325750	Address: DISTILLERY FARM, OFF A151, HOLBEACH, LINCOLNSHIRE, PE12 7PY Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRNNF12520 Permit Version: 1	Receiving Water: RIVER WHAPLODE Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 20/08/2000 Effective Date: 01-Dec-2000 Revocation Date: -
6A	318	W	534900	Address: DISTILLERY FARM, OFF A151,	Receiving Water: TRIB OF RIVER

ID	Distance (m)	Direction	NGR	Details	
			325750	HOLBEACH, LINCOLNSHIRE, PE12 7PY Effluent Type: TRADE DISCHARGES - PROCESS EFFLUENT - NOT WATER COMPANY Permit Number: PRNNF18051 Permit Version: 1	WHAPLODE Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 29/03/2004 Effective Date: 04-Jan-2004 Revocation Date: -
7B	406	W	534782 325473	Address: PLOT 5 OF TRAVELER SITE, ROSE VIEW DRIVE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7LD Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD010001 Permit Version: 1	Receiving Water: TRIBUTARY TO HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -
8B	406	W	534782 325473	Address: PLOT 4 OF TRAVERLER SITE, ROSE VIEW DRIVE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7LD Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD010000 Permit Version: 1	Receiving Water: TRIBUTARY TO HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -
9B	406	W	534782 325473	Address: PLOT 3 OF TRAVERLERS SITE, ROSE VIEW DRIVE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7LD Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD009999 Permit Version: 1	Receiving Water: TRIBUTARY TO HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -
10B	406	W	534782 325473	Address: PLOT 2 OF TRAVELERS SITE, ROSE VIEW DRIVE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7LD Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD009998 Permit Version: 1	Receiving Water: TRIBUTARY OF HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -
11B	406	W	534782 325473	Address: PLOT 1 TRAVELER SITE, ROSE VIEW DRIVE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7LD Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD009997 Permit Version: 1	Receiving Water: TRIBUTARY OF HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -
12C	423	W	534769 325445	Address: PLOT10 TRAVELERS SITE, ROSE VIEW DRIVE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7LD Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD010006 Permit Version: 1	Receiving Water: TRIBUTARY OF HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -
13C	423	W	534769 325445	Address: PLOT 9 TRAVELER SITE, ROSE VIEW DRIVE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7LD Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD010005 Permit Version: 1	Receiving Water: TRIBUTARY OF HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -
14C	423	W	534769	Address: PLOT 8 OF TRAVELER SITE, ROSE	Receiving Water: TRIBUTARY TO

ID	Distance (m)	Direction	NGR	Details	
			325445	VIEW DRIVE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7LD Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD010004 Permit Version: 1	HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -
15C	423	W	534769 325445	Address: PLOT 6 PROPOSED GYPSY AND TRAVELLER, SITE OFF A151, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7PY Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD010003 Permit Version: 1	Receiving Water: TRIBUTARY TO HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -
16C	423	W	534769 325445	Address: PLOT 6 OF TRAVELERS SITE, ROSE VIEW DRIVE, HOLBEACH, SPALDING, LINCOLNSHIRE, PE12 7LD Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD010002 Permit Version: 1	Receiving Water: TRIBUTARY OF HOLBEACH RIVER Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/12/2009 Effective Date: 11-Dec-2009 Revocation Date: -

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:

0

Database searched and no data found.

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

0

Database searched and no data found.

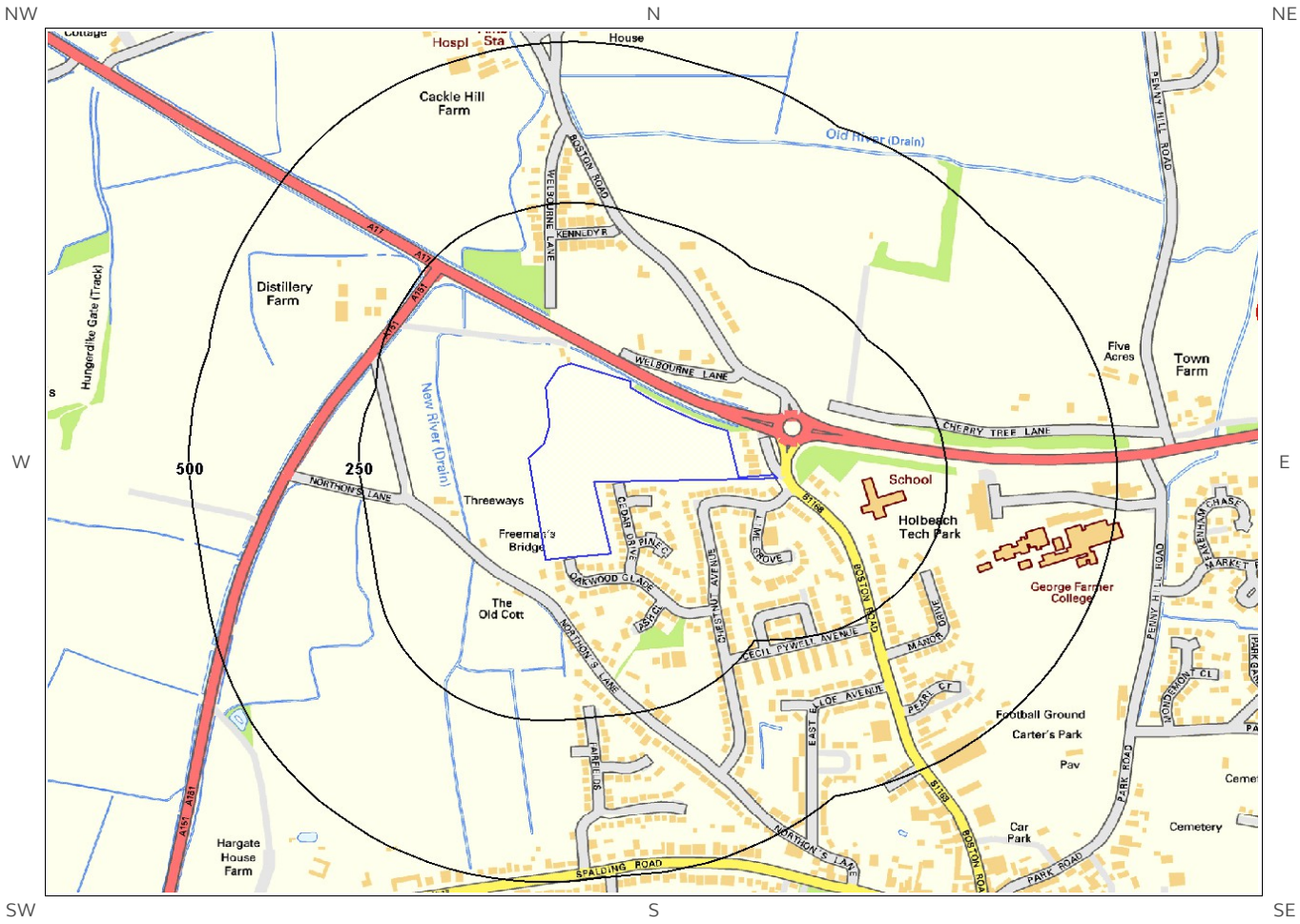
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

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 2019.
Ordnance Survey licence 100035207.

Site Outline

250 / 500 Search Buffers (m)

EA/NRW Active Landfill

EA/NRW Historic Landfill

BGS / DoE Survey Landfill

Historic and Planned Waste Sites

EA/NRW Licensed Waste Site

Local Authority/Historical Mapping Landfill Records

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:

6

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

ID	Distance (m)	Direction	NGR	Details	
1	750	E		Site Address: Battle Field, Penny Hill Road, Holbeach, Lincolnshire Waste Licence: - Site Reference: RD7-56-01/89, SH-56-01/89, 2500/5044 Waste Type: Household Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
Not shown	965	SW		Site Address: Main Road, Whaplode, Lincolnshire Waste Licence: - Site Reference: SH-49-01/89, RD7-49-01/89, 2500/5063 Waste Type: Household Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
Not shown	1028	SW		Site Address: Main Road, Whaplode, Lincolnshire Waste Licence: - Site Reference: RD7-50-01/89, SH-50-01/89, 2500/5051 Waste Type: Household Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
Not shown	1169	SE		Site Address: Barrington Gate, Holbeach, Lincolnshire Waste Licence: - Site Reference: RD7-52-01/89, SH-52-01/89, 0500/5053 Waste Type: Household Environmental Permitting Regulations	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -

ID	Distance (m)	Direction	NGR	Details	
				(Waste) Reference: -	
Not shown	1201	SE		Site Address: Allison Avenue, Holbeach, Lincolnshire Waste Licence: - Site Reference: SH-54-01/89, RD7-54-01/89, RD7-55-01/89, 2500/5263 Waste Type: Household Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
Not shown	1468	SE		Site Address: Holbeach Fen, Dam Gate, Holbeach, Lincolnshire Waste Licence: - Site Reference: RD7-53-01/89, SH-53-01/89, 2500/5036 Waste Type: Household Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -

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.

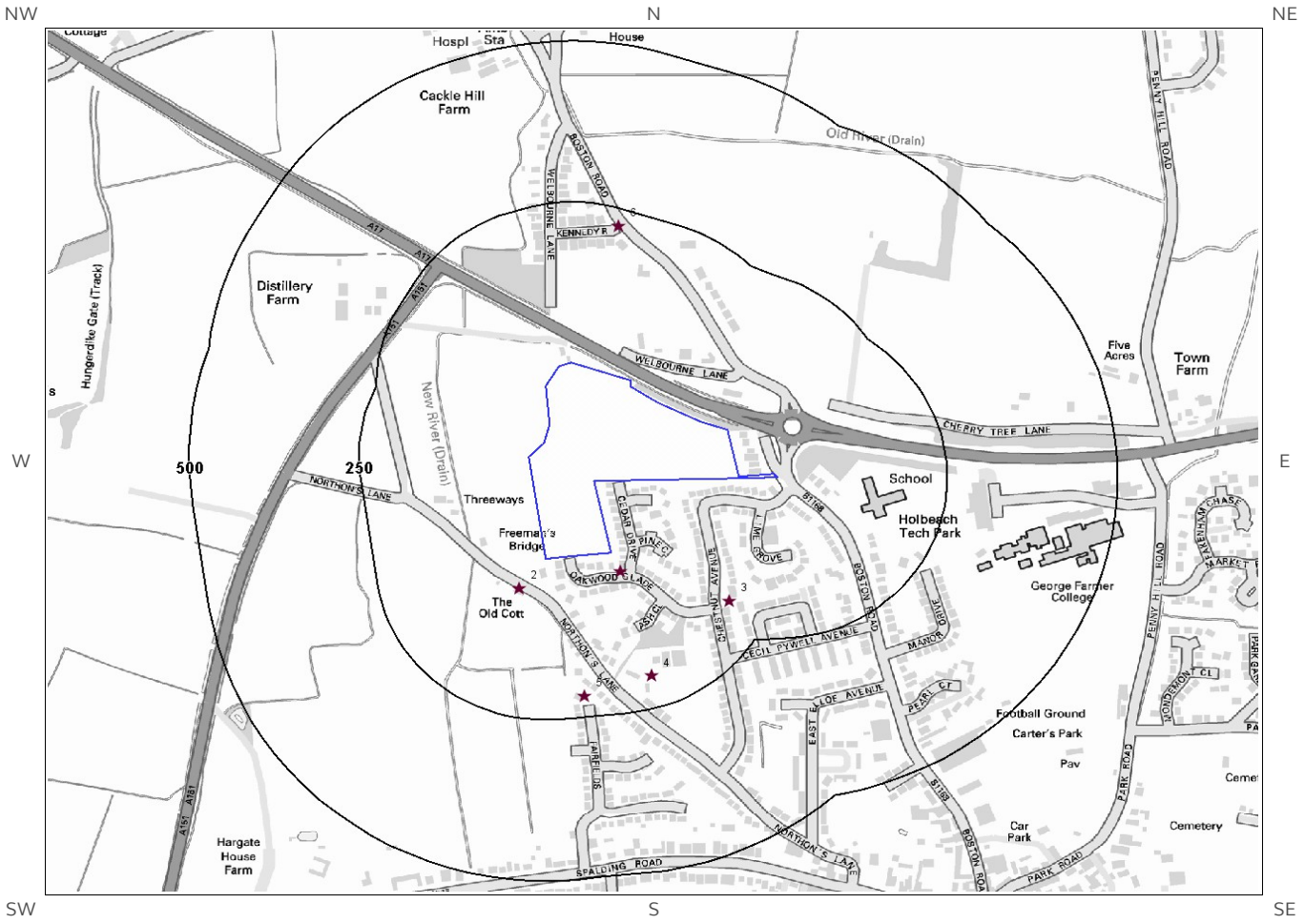
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

3

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	1341	SE	536100 324300	Site Address: Ladbrook Mr E, 5a, Fen Road, Holbeach, Lincolnshire, PE12 8QA Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LAD001 EPR reference: EA/EPR/TP3498NJ/A001 Operator: Ladbrooke Mr E Waste Management licence No: 71024 Annual Tonnage: 30000.0	Issue Date: 13/05/1992 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Eric Ladbrooke Ltd Correspondence Address: -
Not shown	1341	SE	536100 324300	Site Address: Ladbrook Mr E, 5a, Fen Road, Holbeach, Lincolnshire, PE12 8QA Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LAD001 EPR reference: - Operator: Ladbrook Mr E Waste Management licence No: 71024 Annual Tonnage: 30000.0	Issue Date: 13/05/1992 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Eric Ladbrooke Ltd Correspondence Address: Ladbrook Mr E, 5a, Fen Road, Holbeach, Lincolnshire, PE12 8QA
Not shown	1341	SE	536100 324300	Site Address: Ladbrook Mr E., 5a, Fen Road, Holbeach, Lincolnshire, PE12 8QA Type: Metal Recycling Site (mixed MRS's) Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: NMR003 EPR reference: EA/EPR/LB3135RD/V002 Operator: Nationwide Metal Recycling Ltd Waste Management licence No: 71024 Annual Tonnage: 30000.0	Issue Date: 13/05/1992 Effective Date: 26/10/2012 Modified: 05/11/2012 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Nationwide Metal Recycling Ltd Correspondence Address: -

4. Current Land Use Map



© Crown copyright and database rights 2019.
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: 6

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

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	31	SE	Electricity Sub Station	535314 325377	Lincolnshire, PE12	Electrical Features	Infrastructure and Facilities
2	59	SW	Vitro Botanics	535165 325351	The Old Cottage, Northons Lane, Spalding, Lincolnshire, PE12 7PZ	Industrial Repairs and Servicing	Repair and Servicing
3	188	SE	Electricity Sub Station	535474 325331	Lincolnshire, PE12	Electrical Features	Infrastructure and Facilities
4	199	S	Tanks	535360 325215	Lincolnshire, PE12	Tanks (Generic)	Industrial Features
5	216	S	Electricity Sub Station	535262 325184	Lincolnshire, PE12	Electrical Features	Infrastructure and Facilities
6	224	N	Electricity Sub Station	535312 325913	Lincolnshire, PE12	Electrical Features	Infrastructure and Facilities

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

4.3 National Grid High Voltage Underground Electricity Transmission Cables

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

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

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

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

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

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

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

5.2 Superficial Ground and Drift Geology

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

Lex Code	Description	Rock Type
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
WWB-MDSI	WEST WALTON FORMATION	MUDSTONE AND SILTSTONE

(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 2019
Ordnance Survey licence 100035207.

Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

6b. Aquifer Within Bedrock Geology and Abstraction Licences



© Crown copyright and database rights 2019
Ordnance Survey licence 100035207.

Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

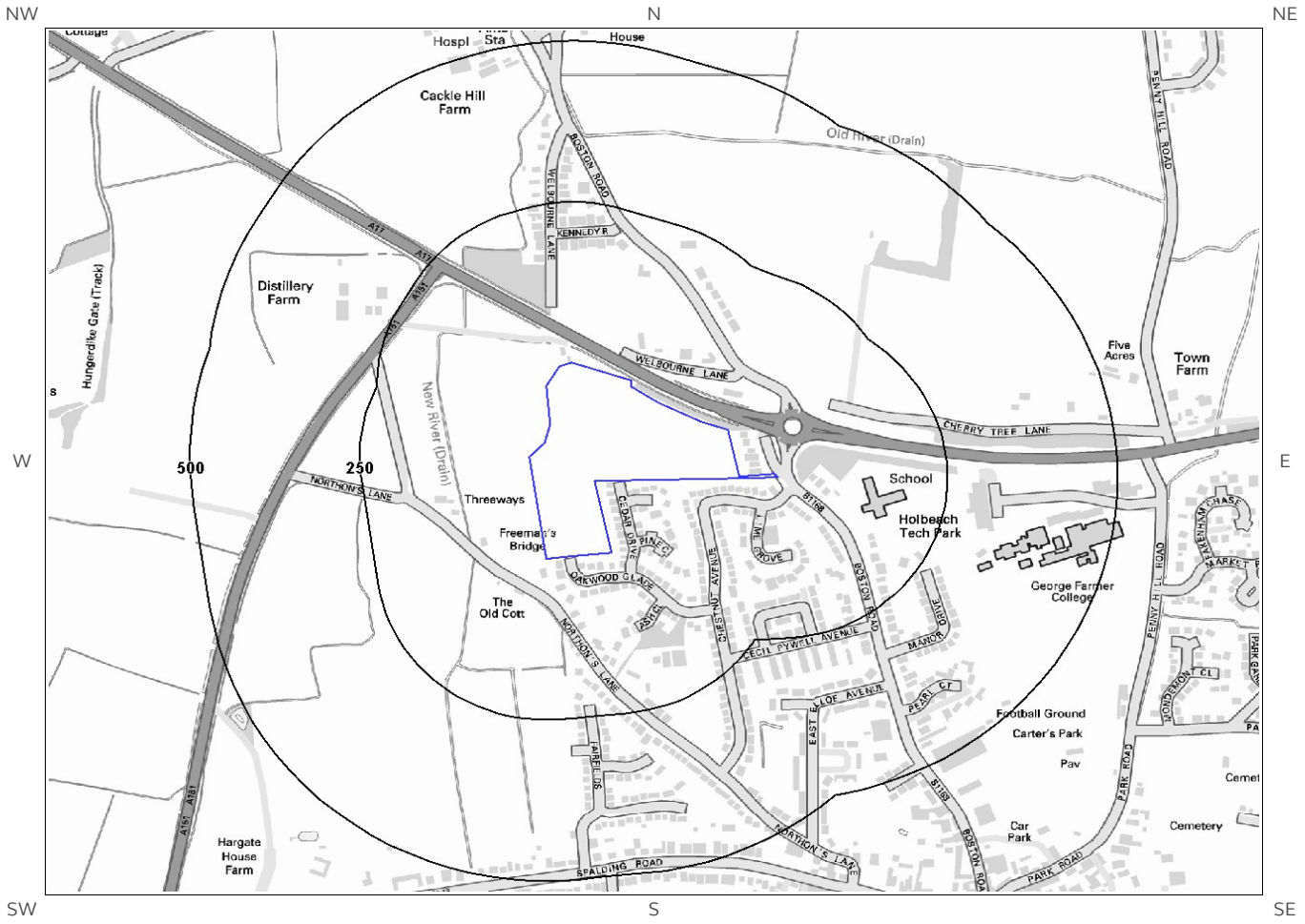
Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

Surface Water Abstraction Licence

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



© Crown copyright and database rights 2019
Ordnance Survey licence 100035207.

Site Outline

250 Search Buffers (m)
500

Source Protection Zone 1 - Inner Catchment

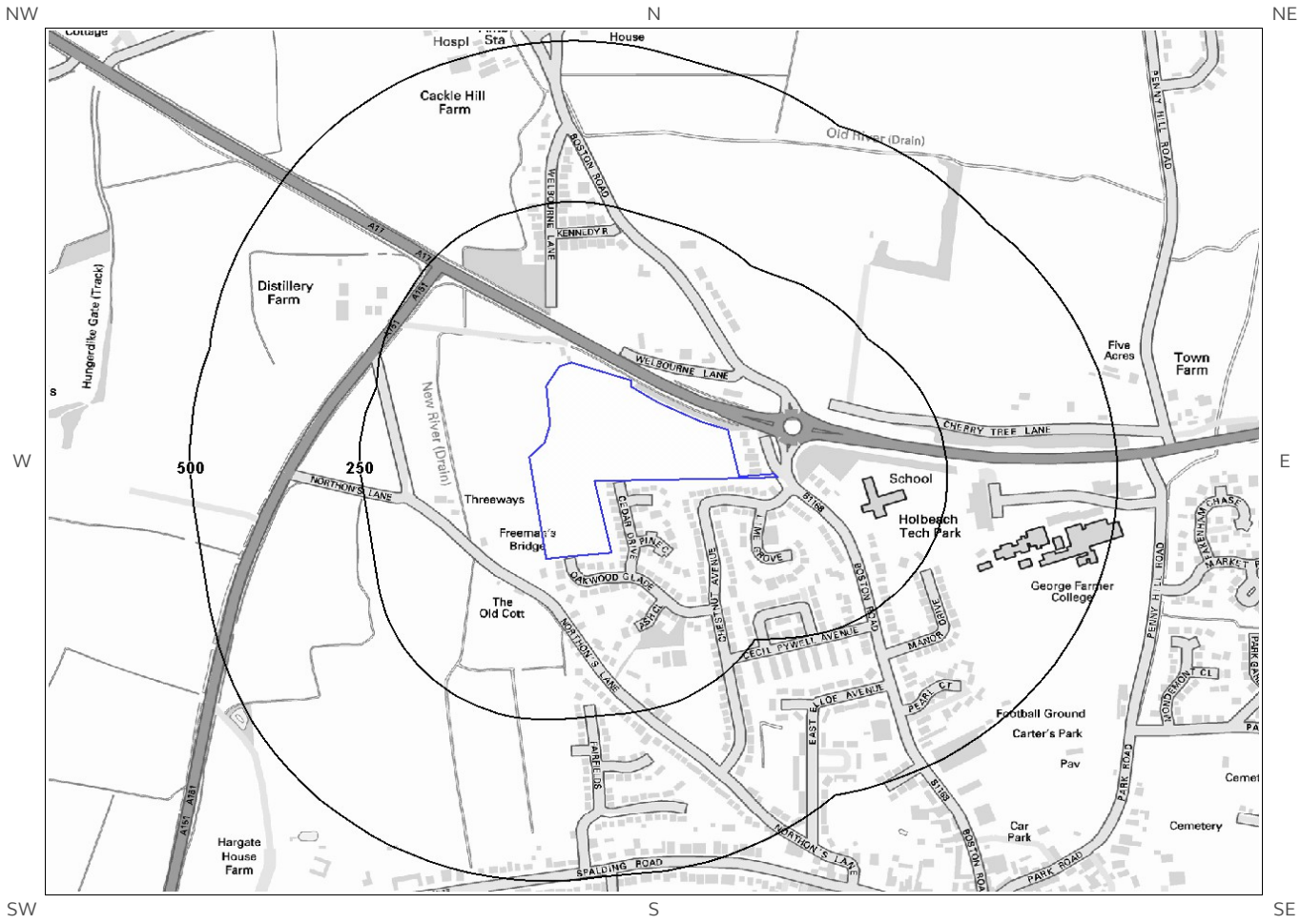
Source Protection Zone 2 - Outer Catchment

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 2019
Ordnance Survey licence 100035207.

Site Outline

250 — 500 — Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

Source Protection Zone 3C - Total Catchment within Confined Aquifer

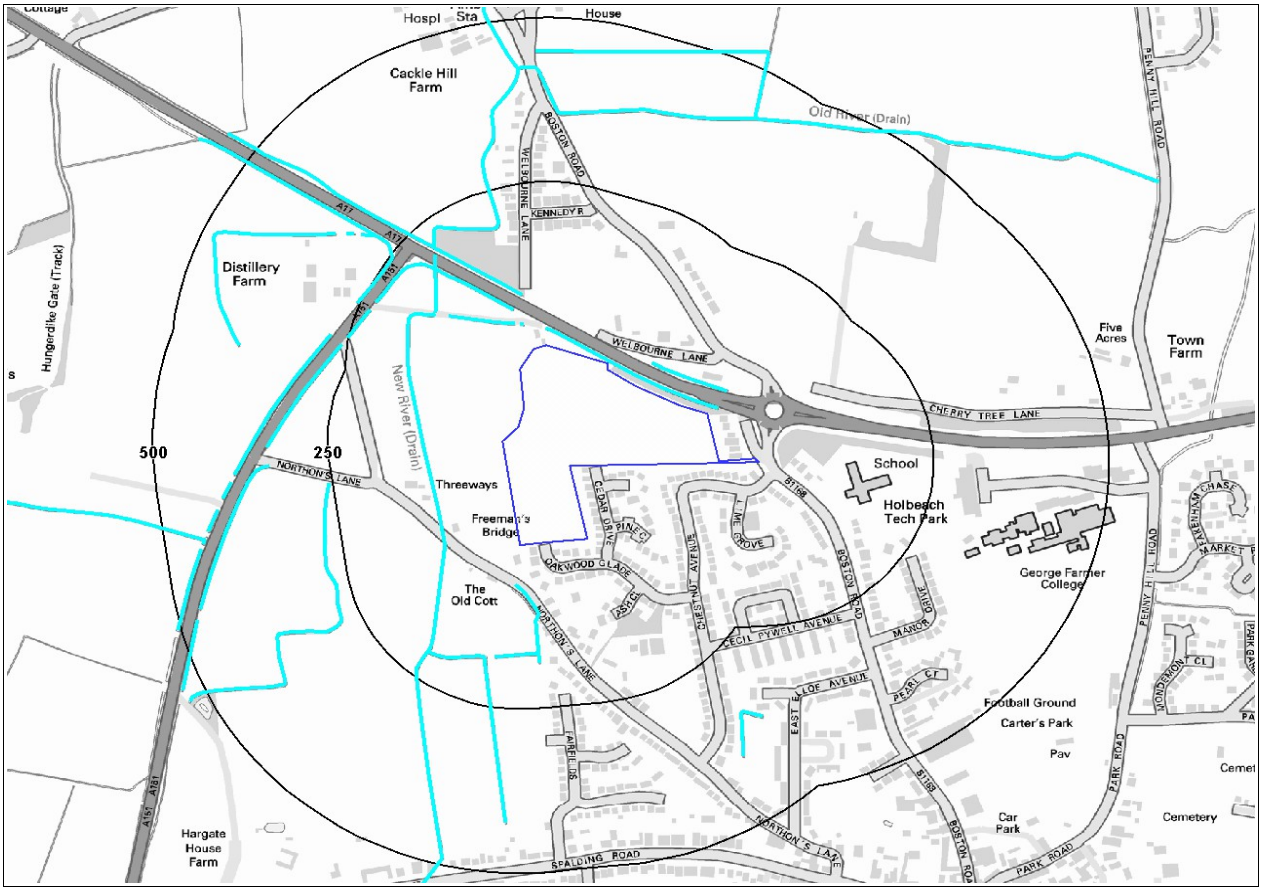
Potable Water Abstraction Licence

6e. Hydrology – Watercourse Network and River Quality

NW N NE

W E

SW S SE



© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.

Site Outline

250
500
Search Buffers (m)

Tidal River
Inland River
Underground or Elevated Tidal River
Underground or Elevated Inland River
Foreshore
General Quality Assessment: Chemistry

Canal
Underground or Elevated Canal
Lock or Flight of Locks
Lake, Reservoir, or Marsh
Drain or Transfer
General Quality Assessment: Biology

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
2	180	W	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
3	395	S	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
4	445	SW	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
2	180	W	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
3	395	S	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
4	445	SW	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	None identified

Database searched and no data found.

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	5 NE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
51	5 NE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
2	40 N	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland 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): 1.4
52	40 N	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.4
3	42 NE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
53	42 NE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
4	48 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
54	48 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
5	60 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
55	60 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
6	67 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
56	67 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
7	84 N	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.9
57	84 N	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.9
8	105 W	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
58	105 W	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
9	148 NW	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
59	148 NW	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
10	167 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
11	167 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
60	167 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
61	167 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
12	177 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
62	177 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland 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	185 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
63	185 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
14	187 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
15	187	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: Underground

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	NW			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
64	187 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
65	187 NW	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
16	192 N	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.8
66	192 N	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.8
17	207 SW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
18	207 SW	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
67	207 SW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
68	207 SW	New River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
19	210 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.5
69	210 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.5
20	233 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.3
70	233 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions)

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				Average Width in Watercourse Section (m): 2.3
21	245 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
22	245 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
71	245 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
72	245 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
23	255 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
73	255 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
24	258 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.6
74	258 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.6
25	276 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
75	276 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.5
26	285 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.4
27	285 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
76	285 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.4
77	285 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6
28	311 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.3
78	311 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.3
29	333 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.9
79	333 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.9
30	335 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.6
80	335 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.6
31	344 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.0
81	344 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.0
32	355 N	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland 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	355 N	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.1
33	393	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	W			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6
Not shown	393 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6
34	418 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland 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	418 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.7
35	425 N	Holbeach River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.8
Not shown	425 N	Holbeach River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.8
36	426 N	Holbeach River	Inland river not influenced by normal tidal action.	Catchment Area: Welland 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	426 N	Holbeach River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.1
37	429 NE	Old River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.6
38	429 NE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
Not shown	429 NE	Old River	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.6
Not shown	429 NE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
39	441 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions)

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				Average Width in Watercourse Section (m): 3.4
Not shown	441 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.4
40	444 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.8
41	444 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.2
Not shown	444 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.8
Not shown	444 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.2
42	448 N	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
Not shown	448 N	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
43	450 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 4.4
Not shown	450 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 4.4
44	474 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.2
Not shown	474 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Welland Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.2
45	491 S	New River	Inland river not influenced by normal tidal action.	Catchment Area: Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
Not shown	491 S	New River	Inland river not influenced by normal tidal action.	Catchment Area: Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

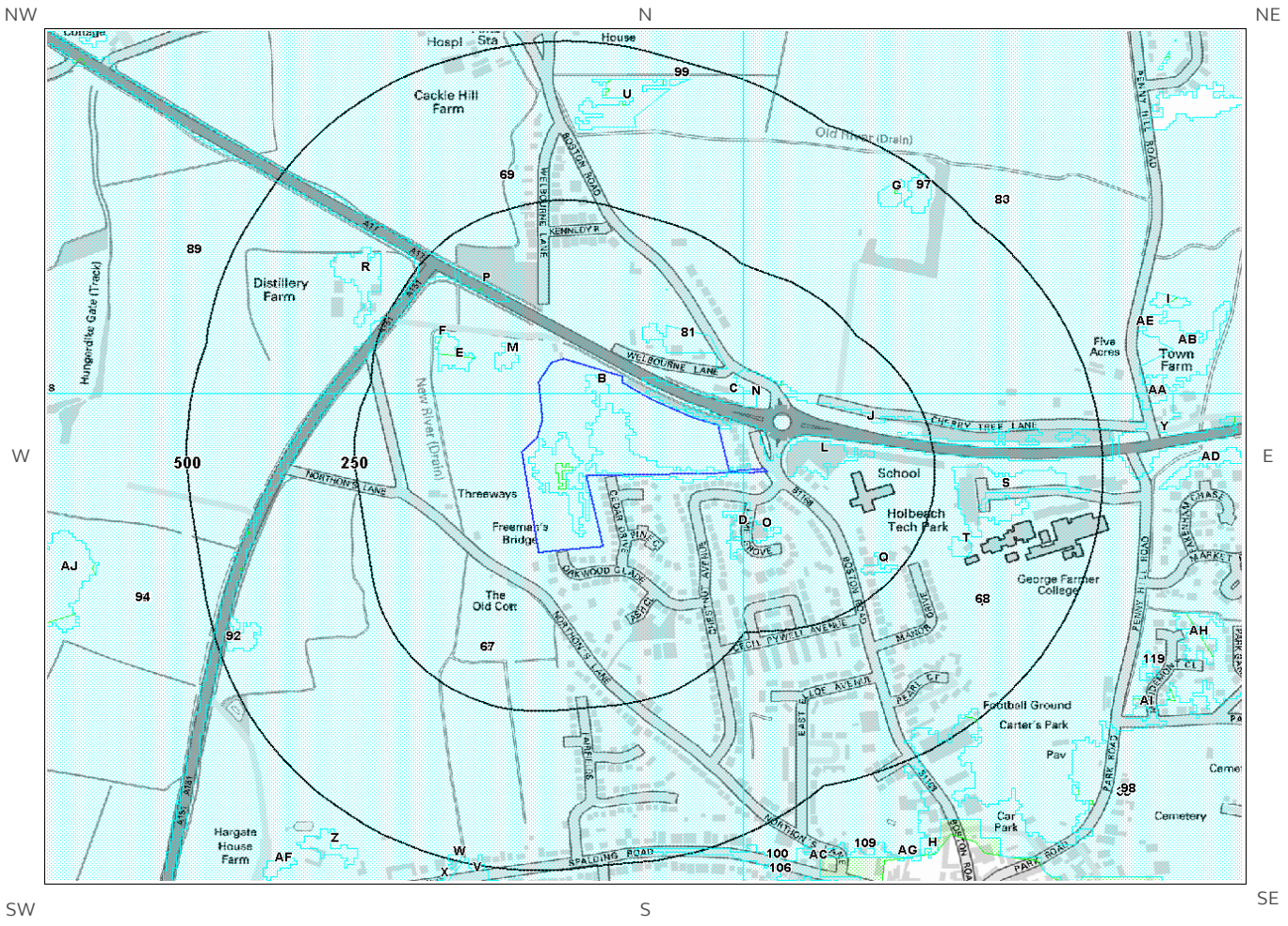
6.11 Surface Water Features

Surface water features within 250m of the study site Identified

The following surface water records are not represented on mapping:

Distance (m)	Direction
4	NE
41	NE
47	NW
60	S
67	NW
83	N
104	W
105	W
232	NW
244	NW

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



© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.

Site Outline

Search Buffers (m)

Zone 2 Floodplain

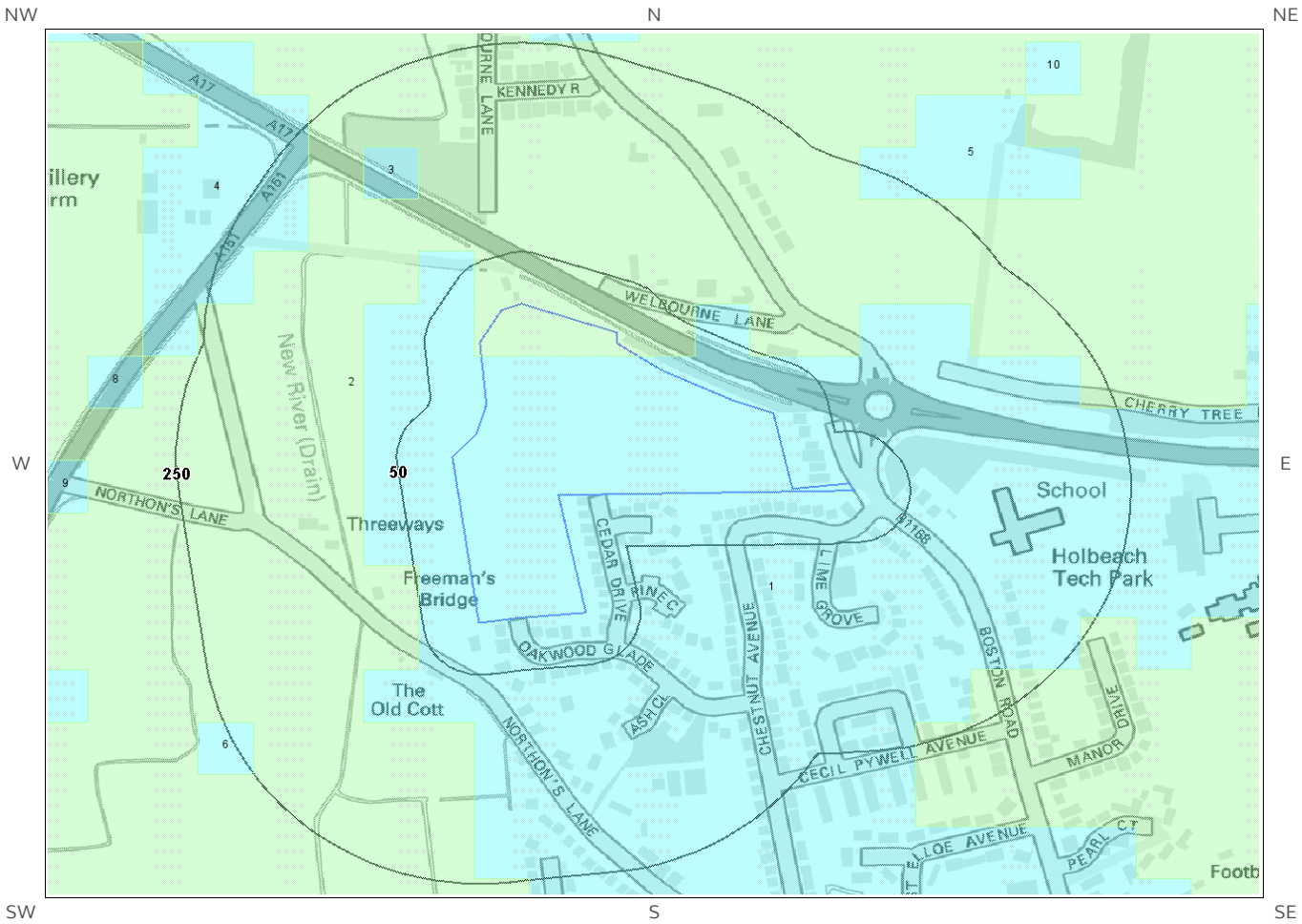
Zone 3 Floodplain

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 2019.
Ordnance Survey licence 100035207.

Site Outline

100
250
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	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
2	0	On Site	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
3B	0	On Site	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
4K	0	On Site	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
5A	0	On Site	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
6A	0	On Site	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
7A	0	On Site	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
8B	0	On Site	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
9J	0	On Site	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
10	0	On Site	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
11L	29	E	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
12C	35	N	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
13M	43	NW	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
14D	45	S	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
15N	48	NE	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
16C	63	NE	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
17O	70	S	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
18	95	NE	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
19D	100	S	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)

20E	103	W	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
21P	116	NW	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
22E	162	W	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
23F	162	W	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
24F	163	NW	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
25	192	NW	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
26Q	203	SE	21-Feb-2019	Zone 2 - (Fluvial /Tidal Models)
27	241	NW	21-Feb-2019	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	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
2	0	On Site	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
3B	0	On Site	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
4K	0	On Site	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
5A	0	On Site	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
6A	0	On Site	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
7A	0	On Site	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
8B	0	On Site	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
9J	29	E	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
10	35	N	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
11L	43	NW	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
12C	45	S	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
13M	48	NE	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
14D	63	NE	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)

15N	63	NE	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
16C	70	S	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
17O	95	NE	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
18	100	S	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
19D	103	W	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
20E	116	NW	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
21P	192	NW	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
22E	203	SE	21-Feb-2019	Zone 3 - (Fluvial /Tidal Models)
23F	241	NW	21-Feb-2019	Zone 3 - (Fluvial /Tidal 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
2	0.0	On Site	Very 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.

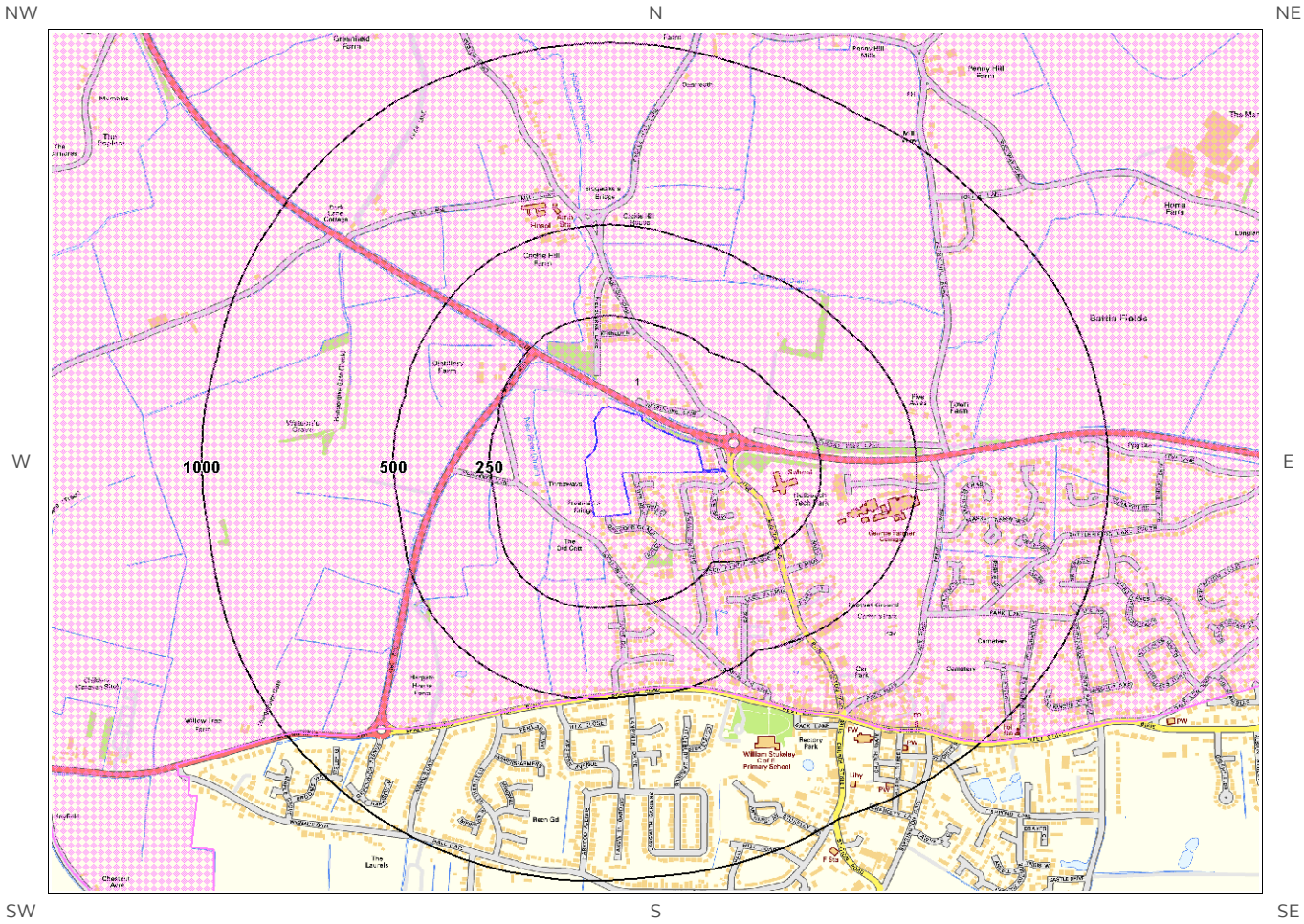
7.8 Groundwater Flooding Confidence Areas

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 2019.
Ordnance Survey licence 100035207.

Site Outline

100
250
Search Buffers (m)

AONB

National Park

SSSI

Special Protection Areas

Nitrate Vulnerable Zones

Green Belt

Environmentally Sensitive Areas

Special Areas of Conservation

World Heritage Sites

Nitrate Sensitive Areas

Ancient Woodland

National Nature Reserve

Local Nature Reserves

Ramsar Sites

8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site	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:

1

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

ID	Distance (m)	Direction	NVZ Name	Data Source
1	0	On Site	New	DEFRA

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 Guidance: No Guidance Required.	None identified

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-feb11-2019

Groundsure
LOCATION INTELLIGENCE

Mewies Engineering Consultants Ltd

The Old Chapel, STATION ROAD,
HUGGLESCOTE, LE67 2GB

Groundsure Reference:	GS-5847759
Your Reference:	8434N_-_24879
Report Date	27 Feb 2019
Report Delivery Method:	Email - pdf

Geo Insight

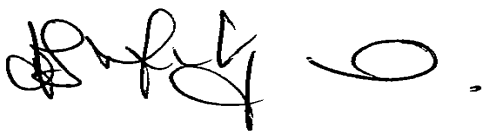
Address: BROWN BUTLIN LTD, NORTHONS LANE, HOLBEACH, SPALDING, PE12 7JS

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:	**BROWN BUTLIN LTD, NORTHONS LANE, HOLBEACH, SPALDING, PE12 7JS**
Date:	**27 Feb 2019**
Reference:	**GS-5847759**
Client:	**Mewies Engineering Consultants Ltd**

NW N NE



W E

SW S SE

Aerial Photograph Capture date:	18-Jul-2015
Grid Reference:	535330,325584
Site Size:	4.8980ha

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	0	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	0

Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250
8 Records of Background Soil Chemistry	3	1	0

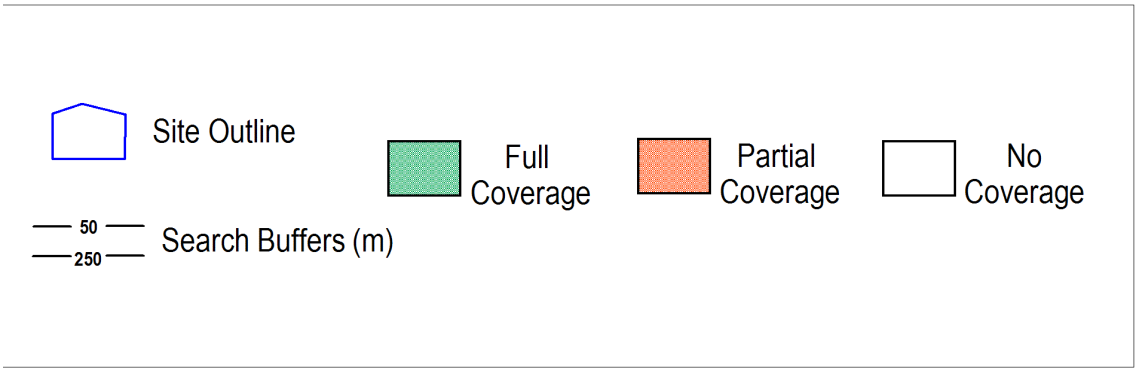
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500
9.1 Tunnels	0	0	0	Not Searched
9.2 Historical Railway and Tunnel Features	0	0	0	Not Searched
9.3 Historical Railways	0	0	0	Not Searched
9.4 Active Railways	0	0	0	Not Searched
9.5 Railway Projects	0	0	0	0

1:10,000 Scale Availability



1_10,000 Availability Legend

© Crown copyright and database rights 2019.
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

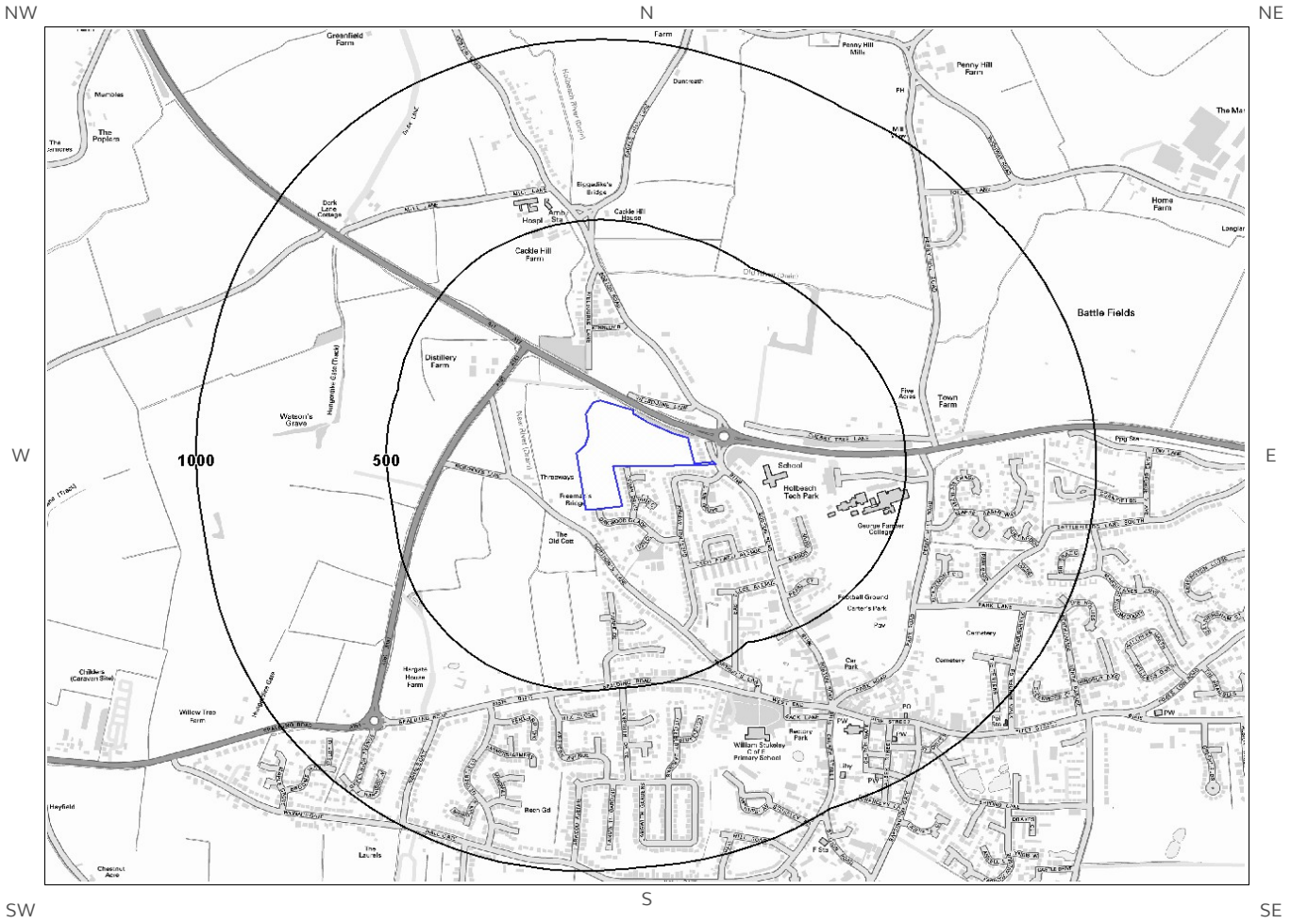
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not 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 2019.
Ordnance Survey licence 100035207.

Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Disturbed Ground (undivided)

Worked Ground (undivided)

Landscaped Ground (undivided)

Infilled Ground

Reclaimed Ground

1. Geology 1:10,000 scale

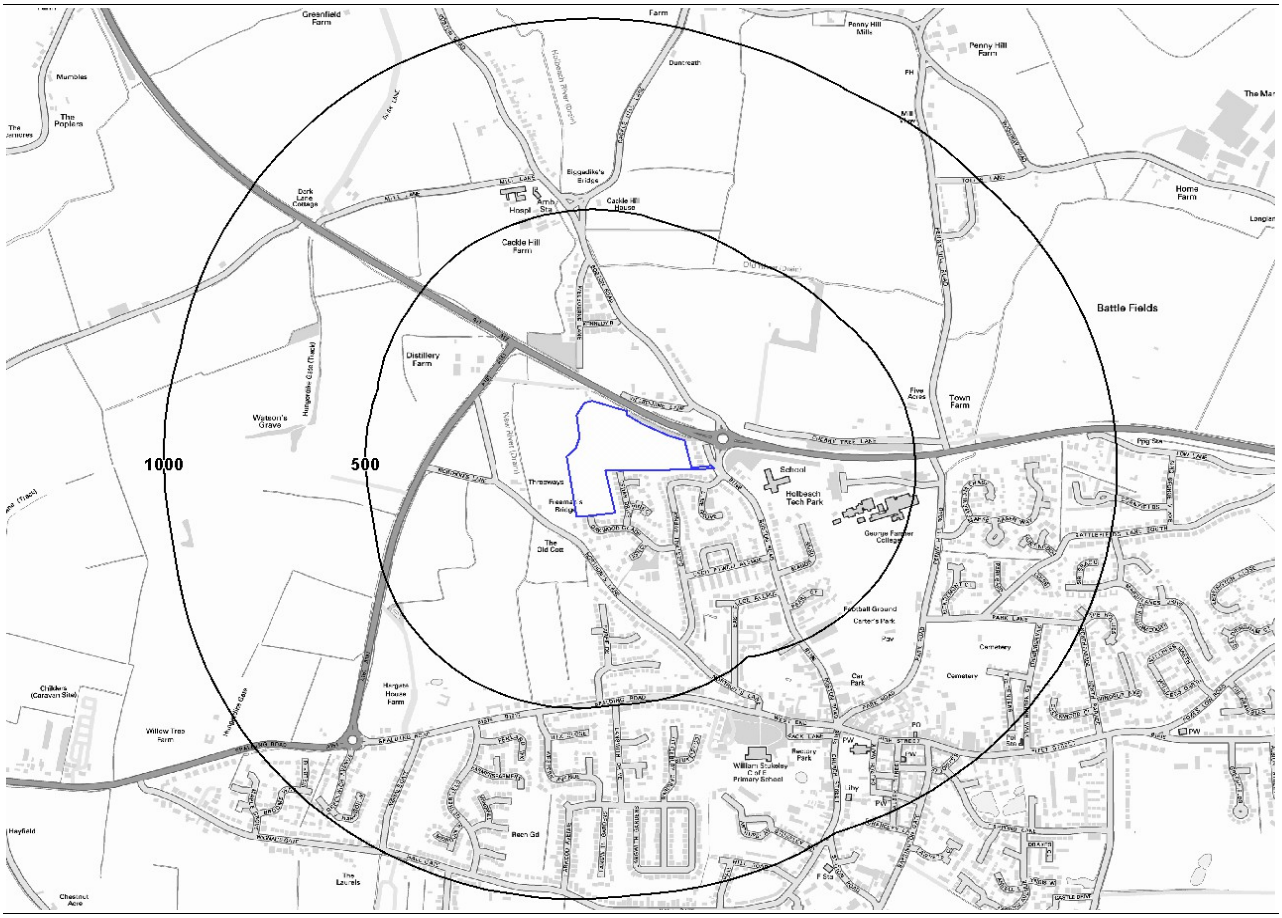
1.1 Artificial Ground

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 2019.
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.

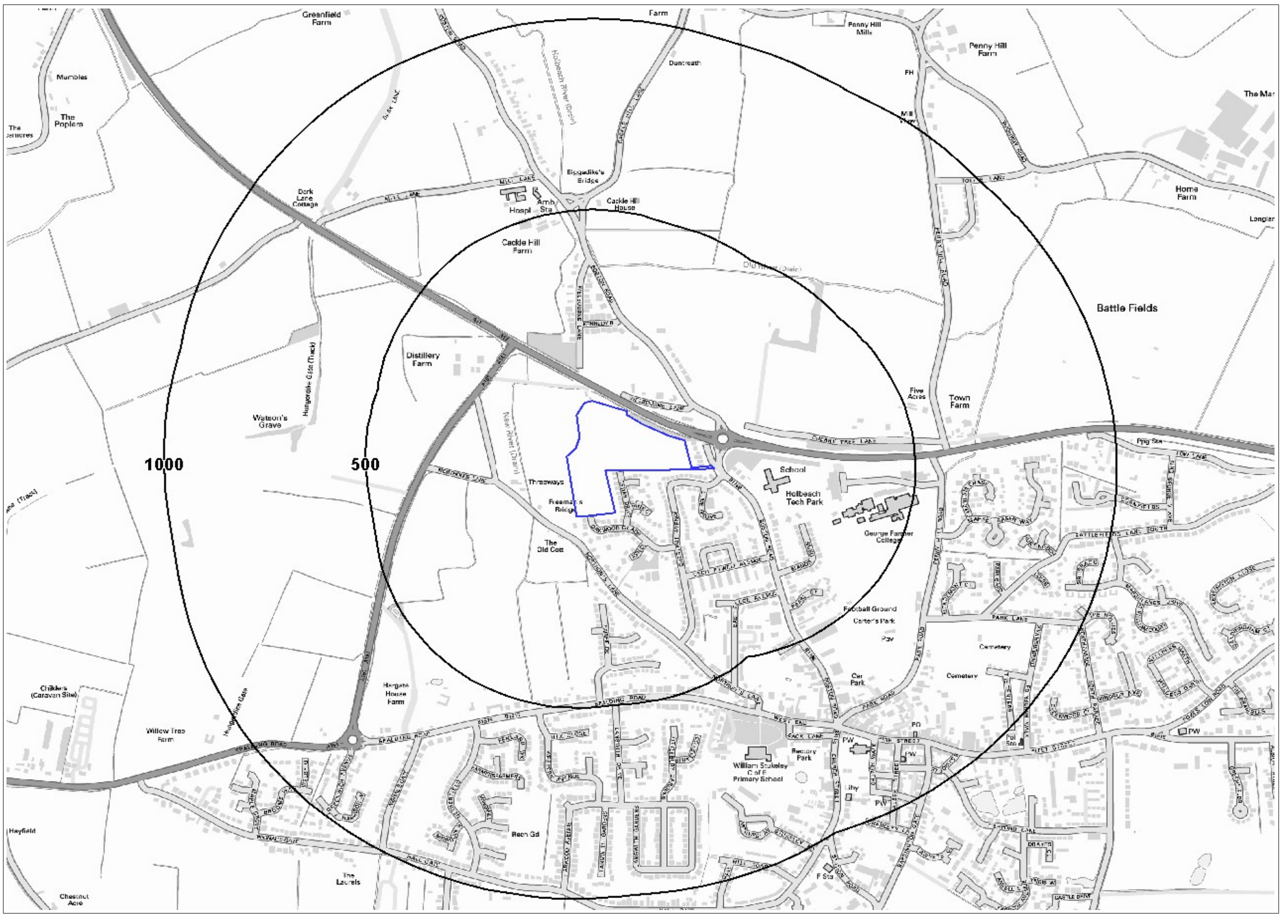
The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

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)

NW N NE

W E



SW S SE

Bedrock and linear features Legend

© Crown copyright and database rights 2019.
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.

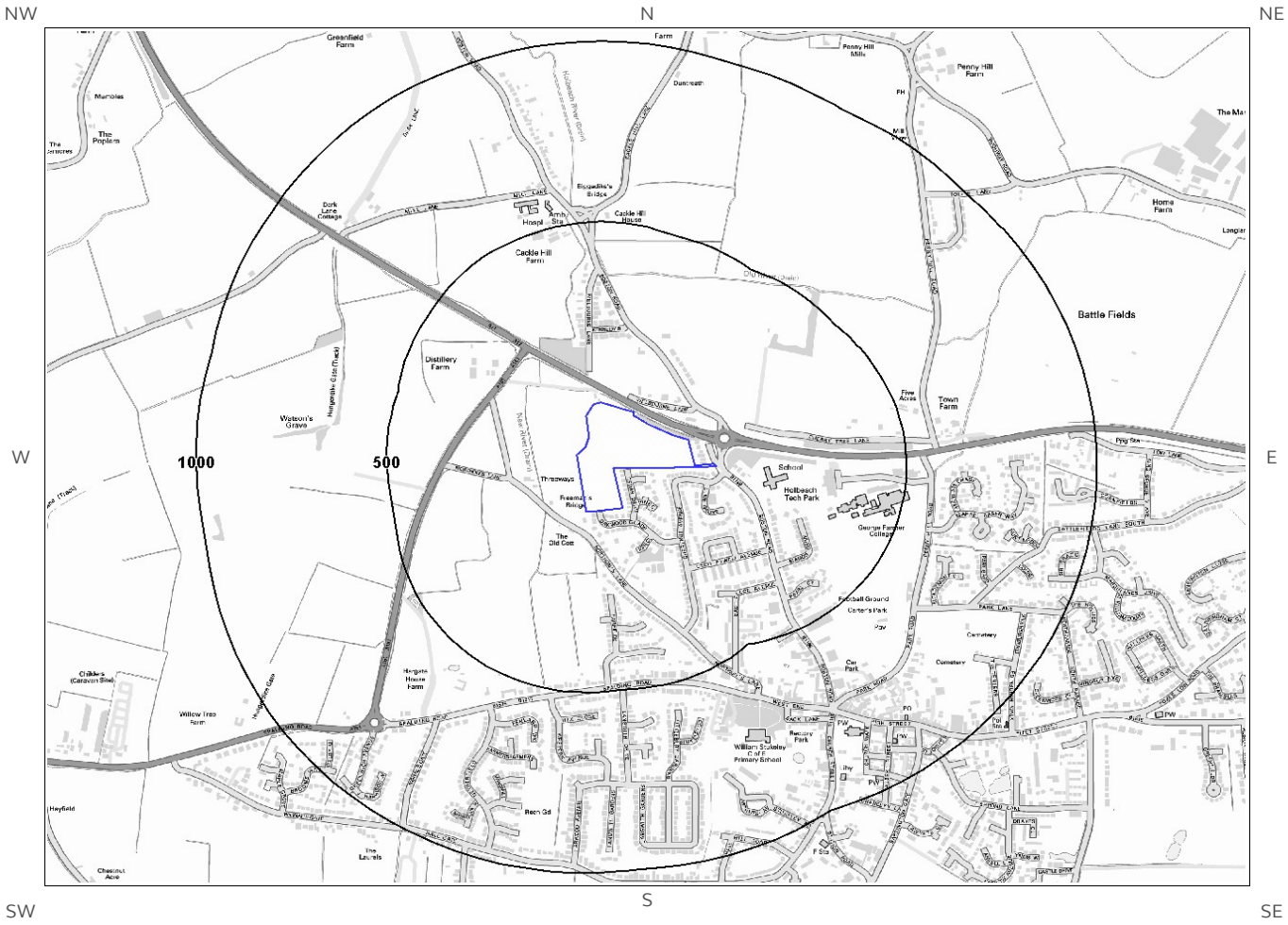
The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

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 2019.
Ordnance Survey licence 100035207.

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: 144

2.1.1 Artificial/ Made Ground

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

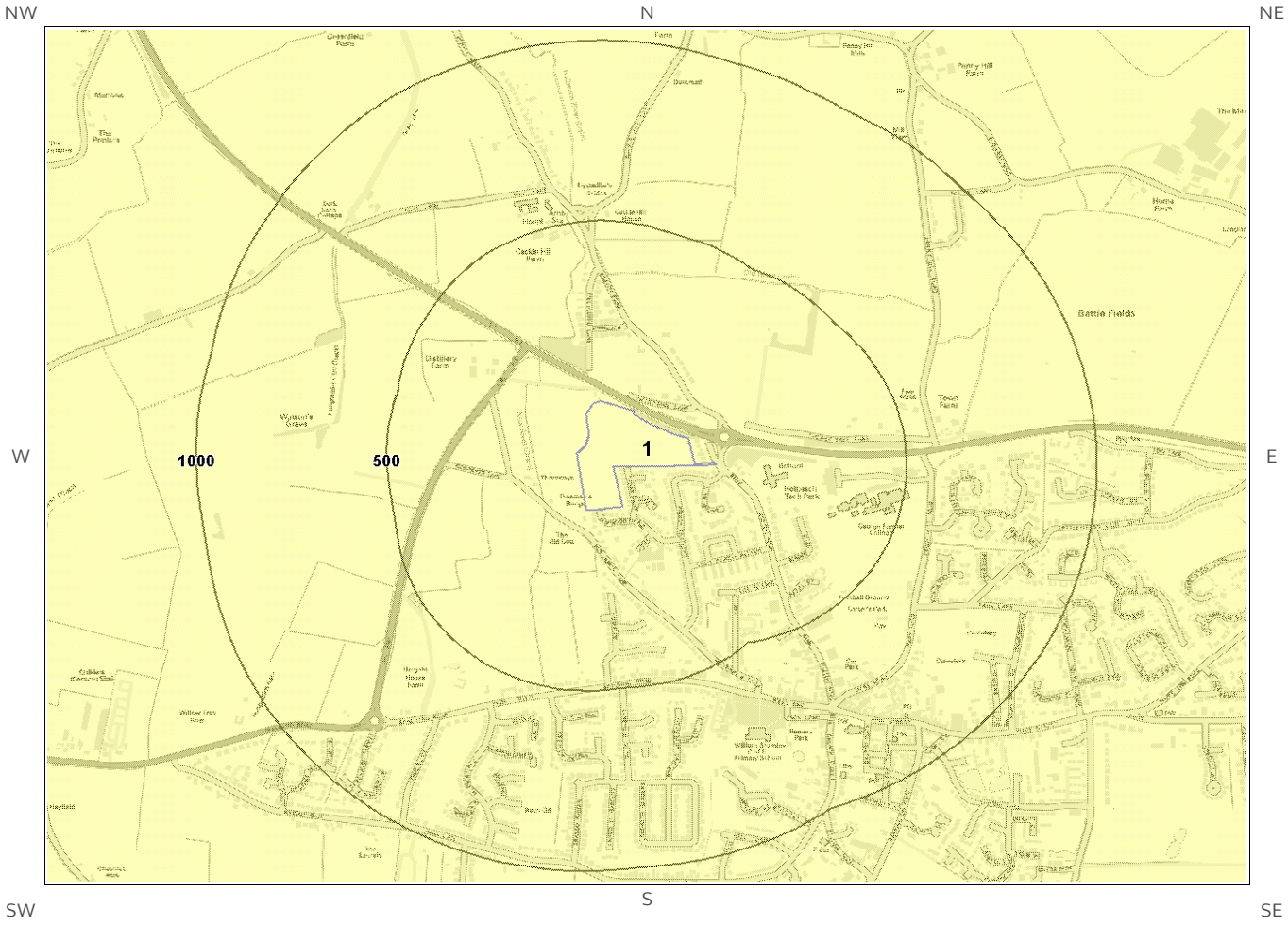
Database searched and no data found.

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 2019.
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.

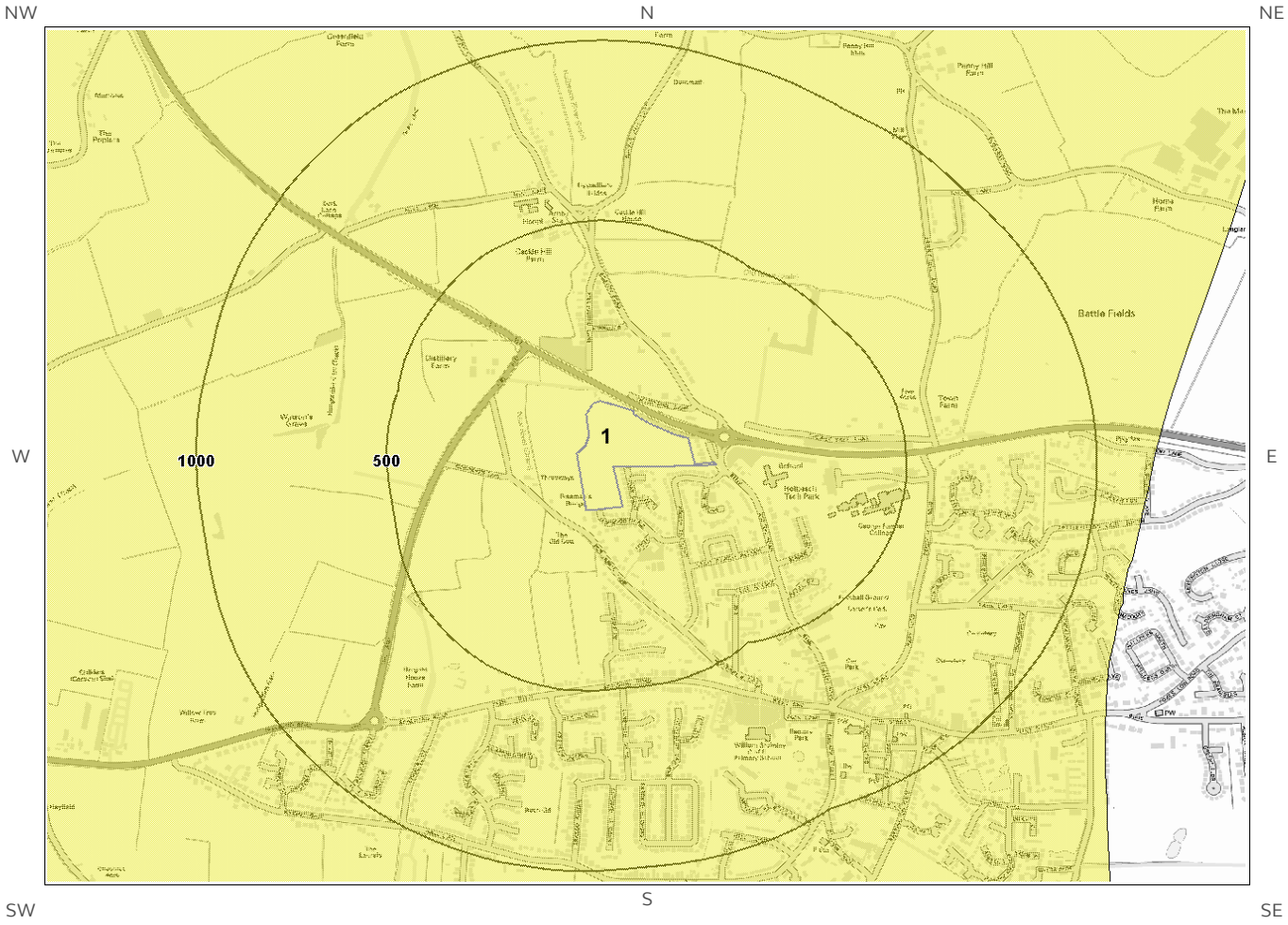
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

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 2019.
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: 144

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	WWB-MDSI	WEST WALTON FORMATION - MUDSTONE AND SILTSTONE	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.

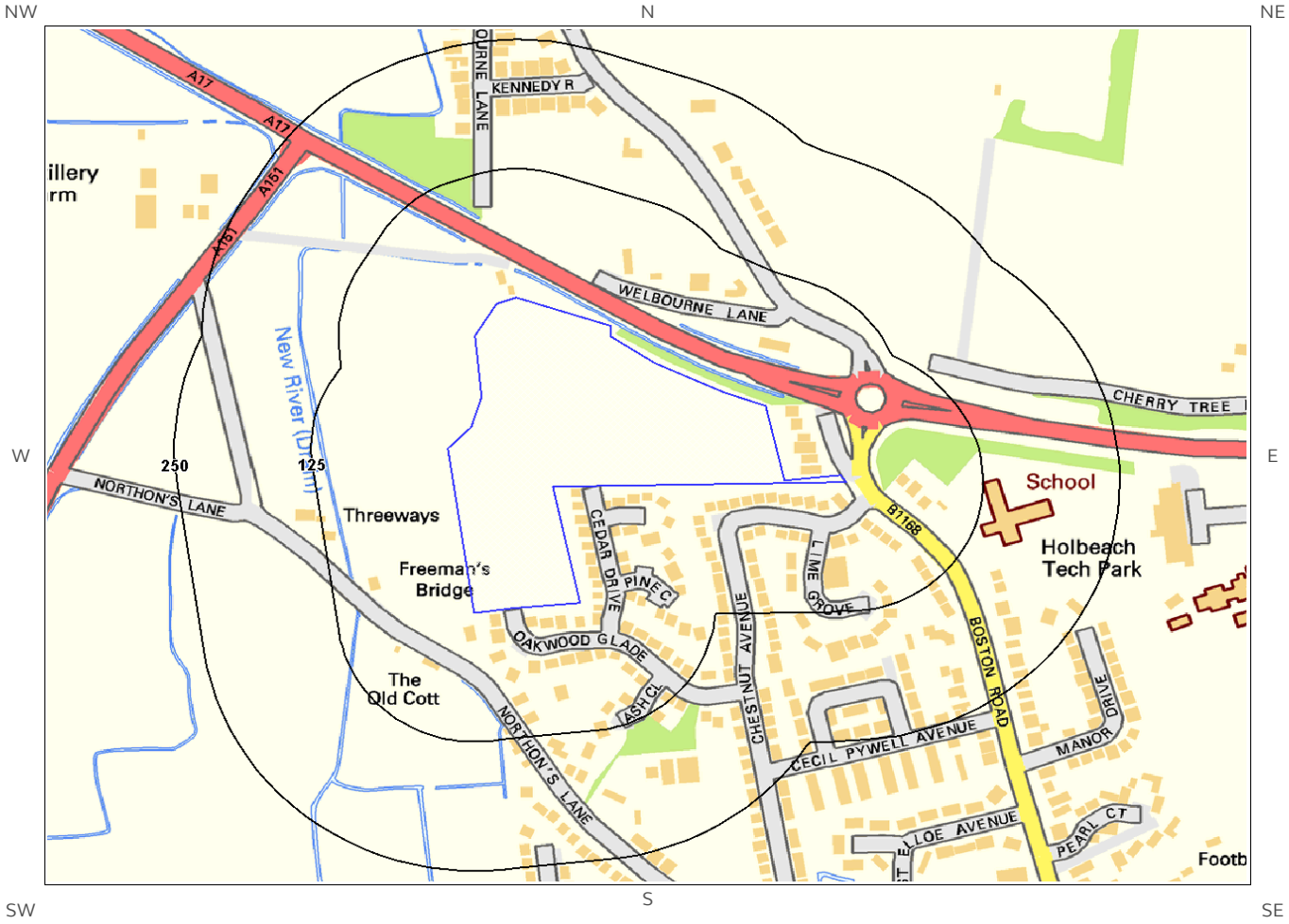
The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, 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 2019.
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? No

Database searched and no data found.

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

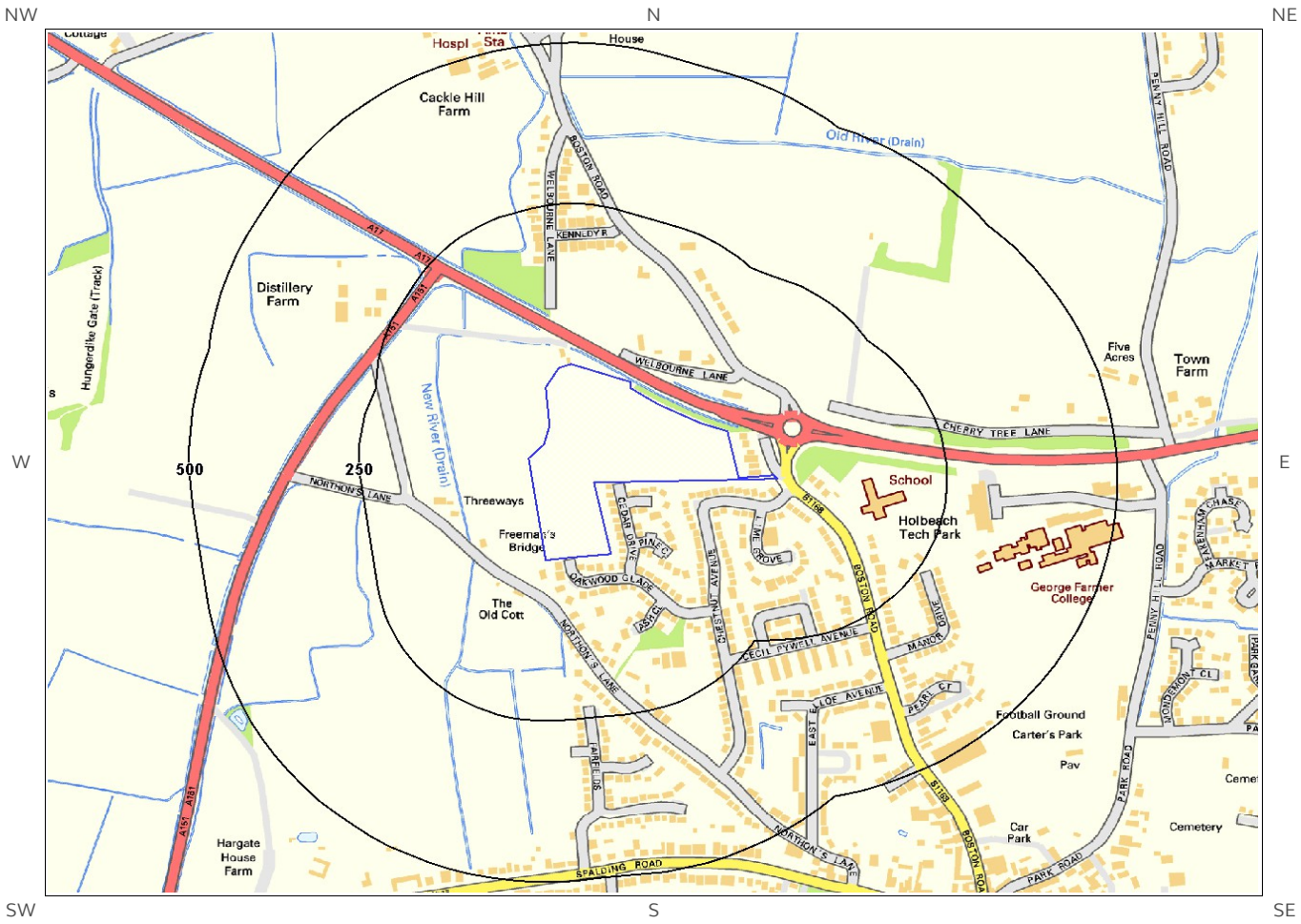
This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

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



Mining, Extraction and Natural Cavities Legend

© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.

Site Outline

Search Buffers (m)

Historical Mining

Non-Coal Mining Cavities

Natural Cavities (point data)

Natural Cavities (polygon data)

Non-Coal Mining

Highly likely

Likely

Unlikely

Highly unlikely

Rare

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 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

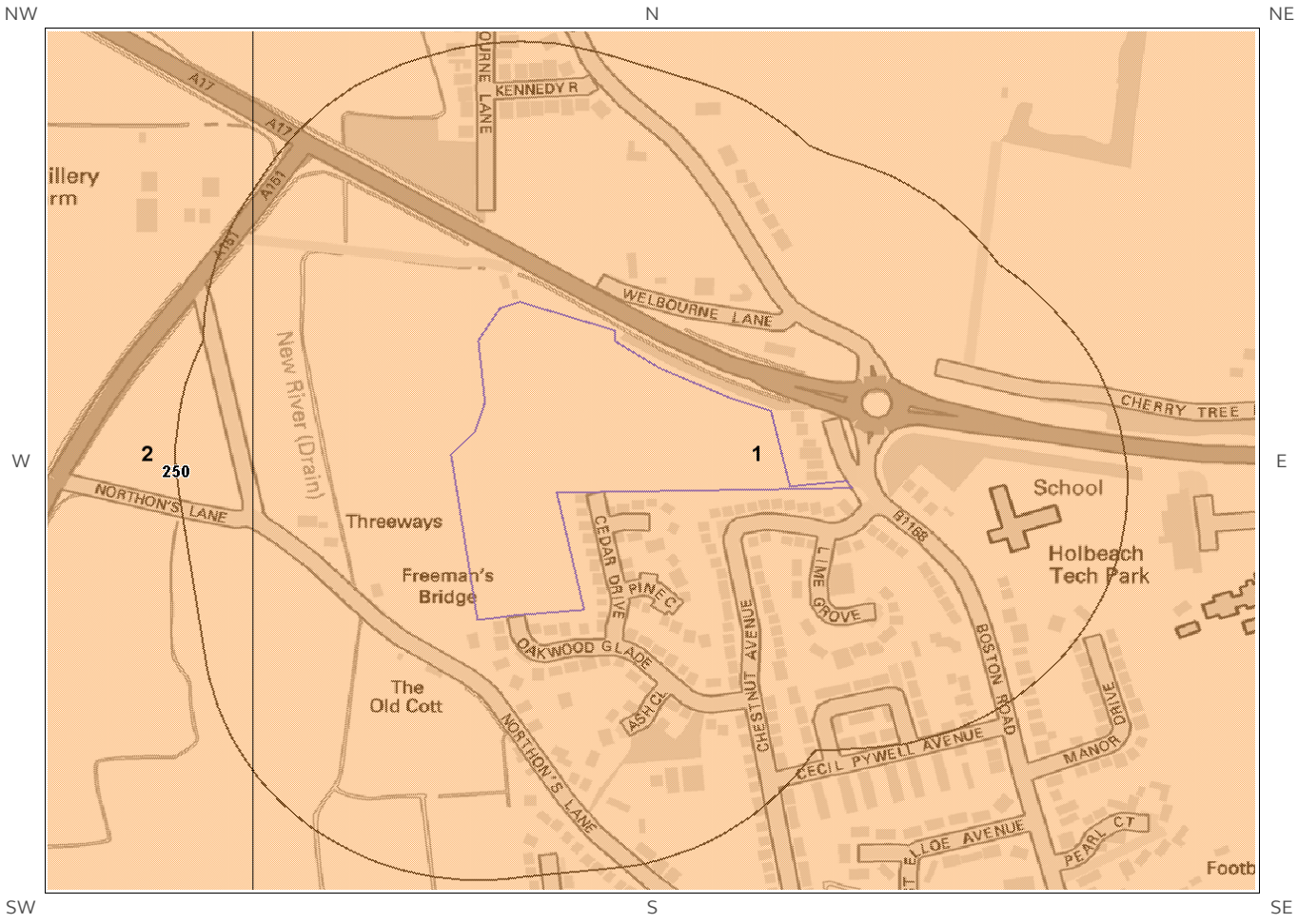
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

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

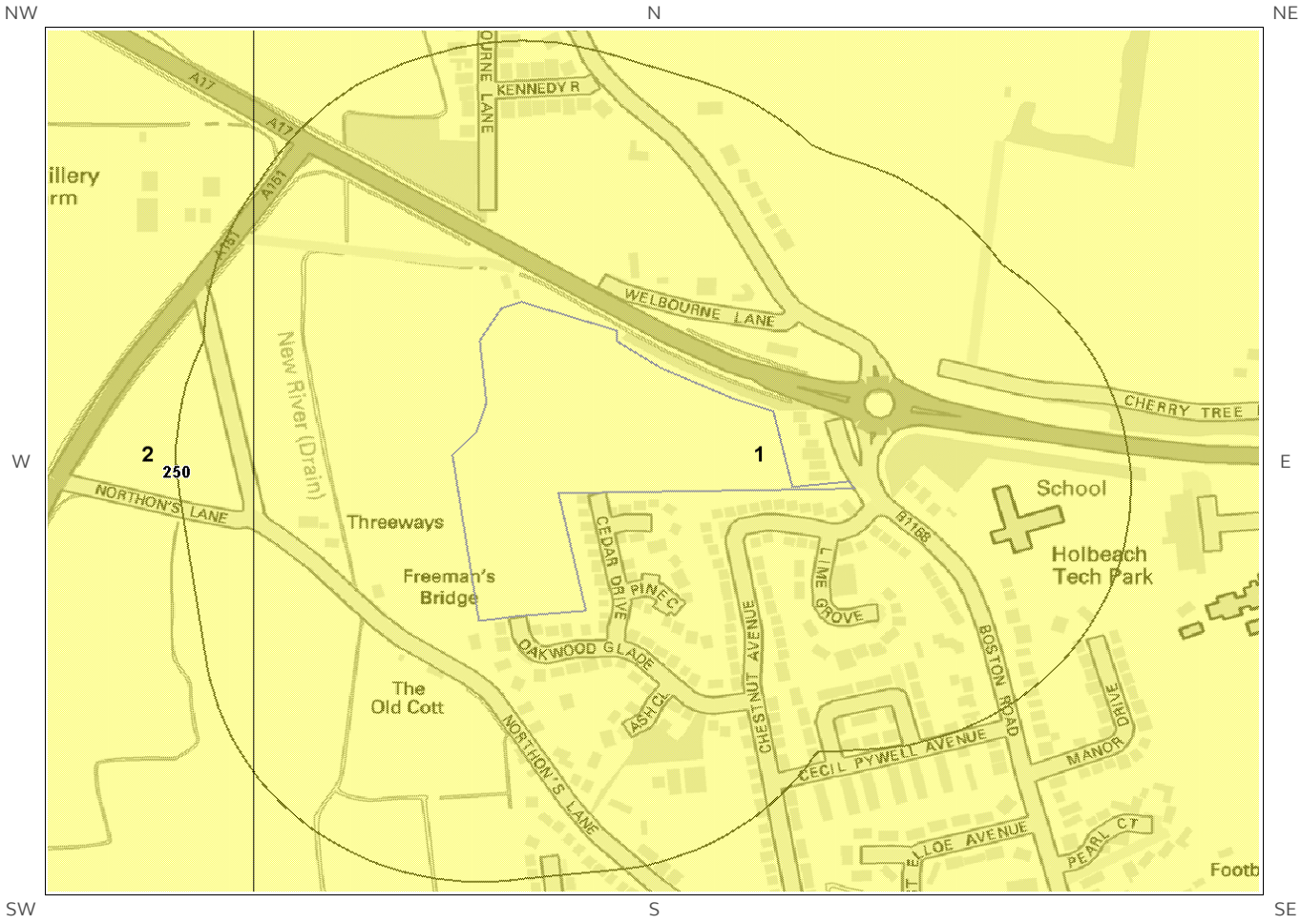


Shrink Swell Clay Legend

© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.



6.2 Landslides map

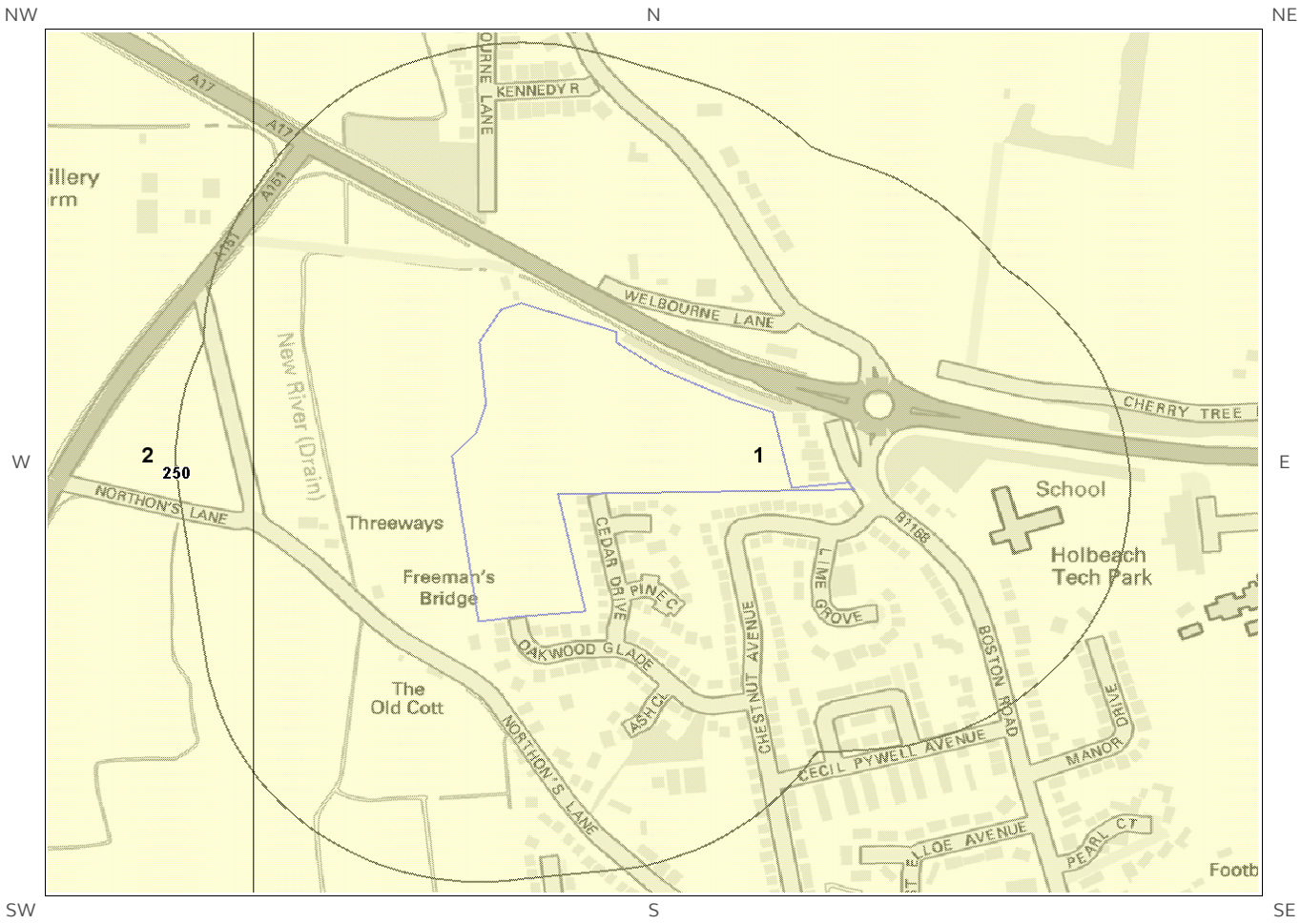


Landslides Legend

© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.



6.3 Ground Dissolution of Soluble Rocks map

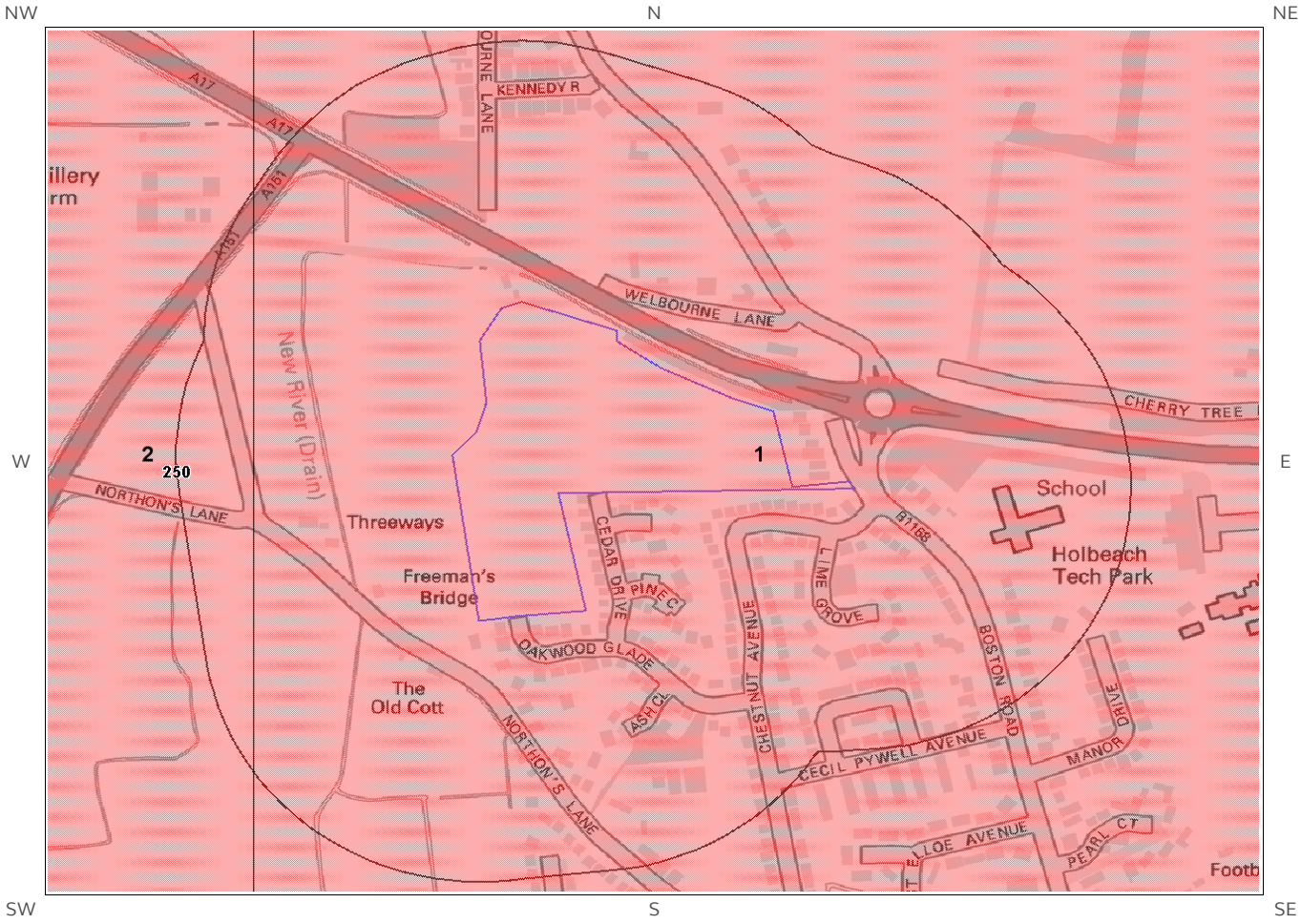


Ground Dissolution Soluble Rocks Legend

© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.



6.4 Compressible Deposits map

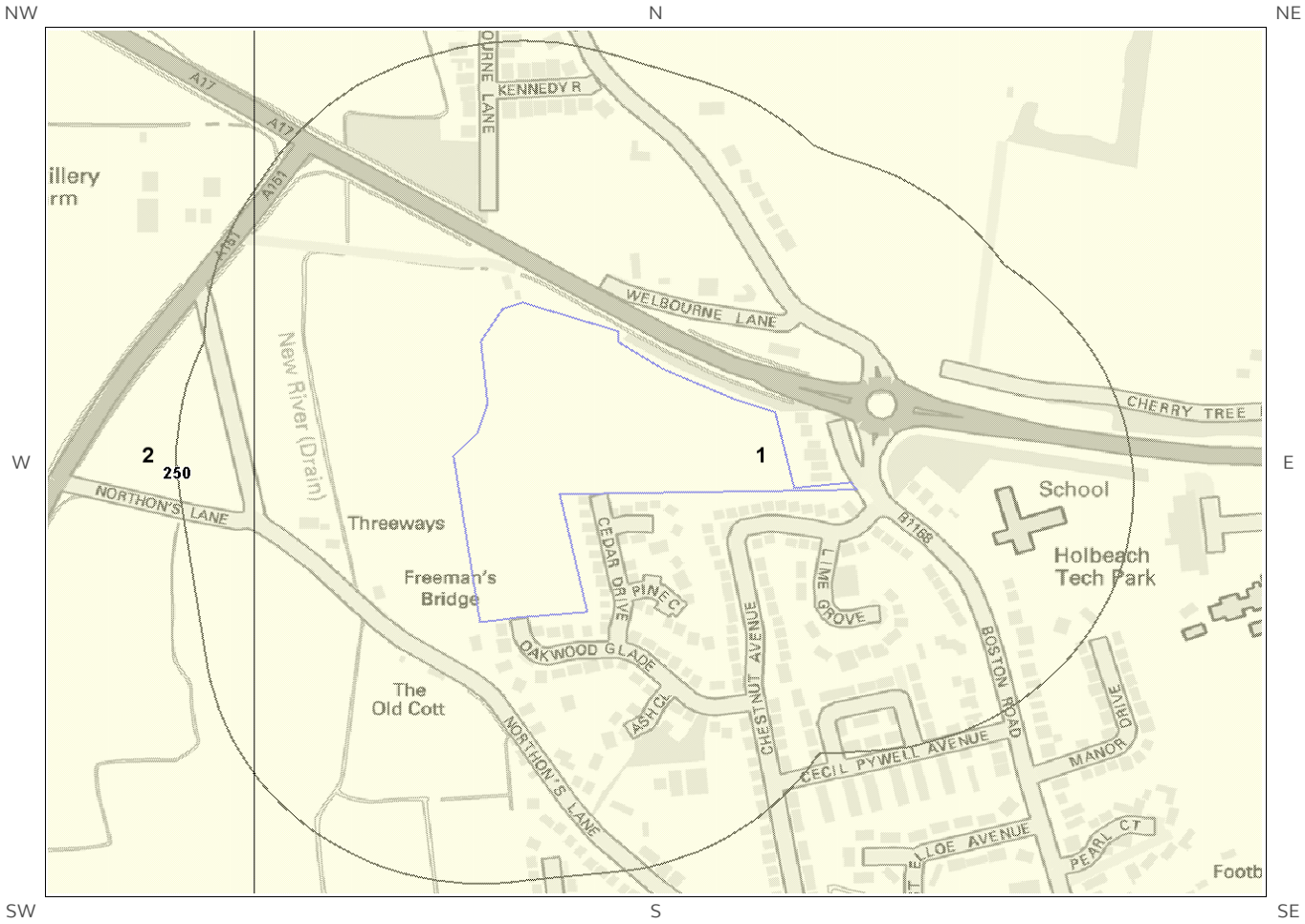


Compressible Deposits Legend

© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.



6.5 Collapsible Deposits map

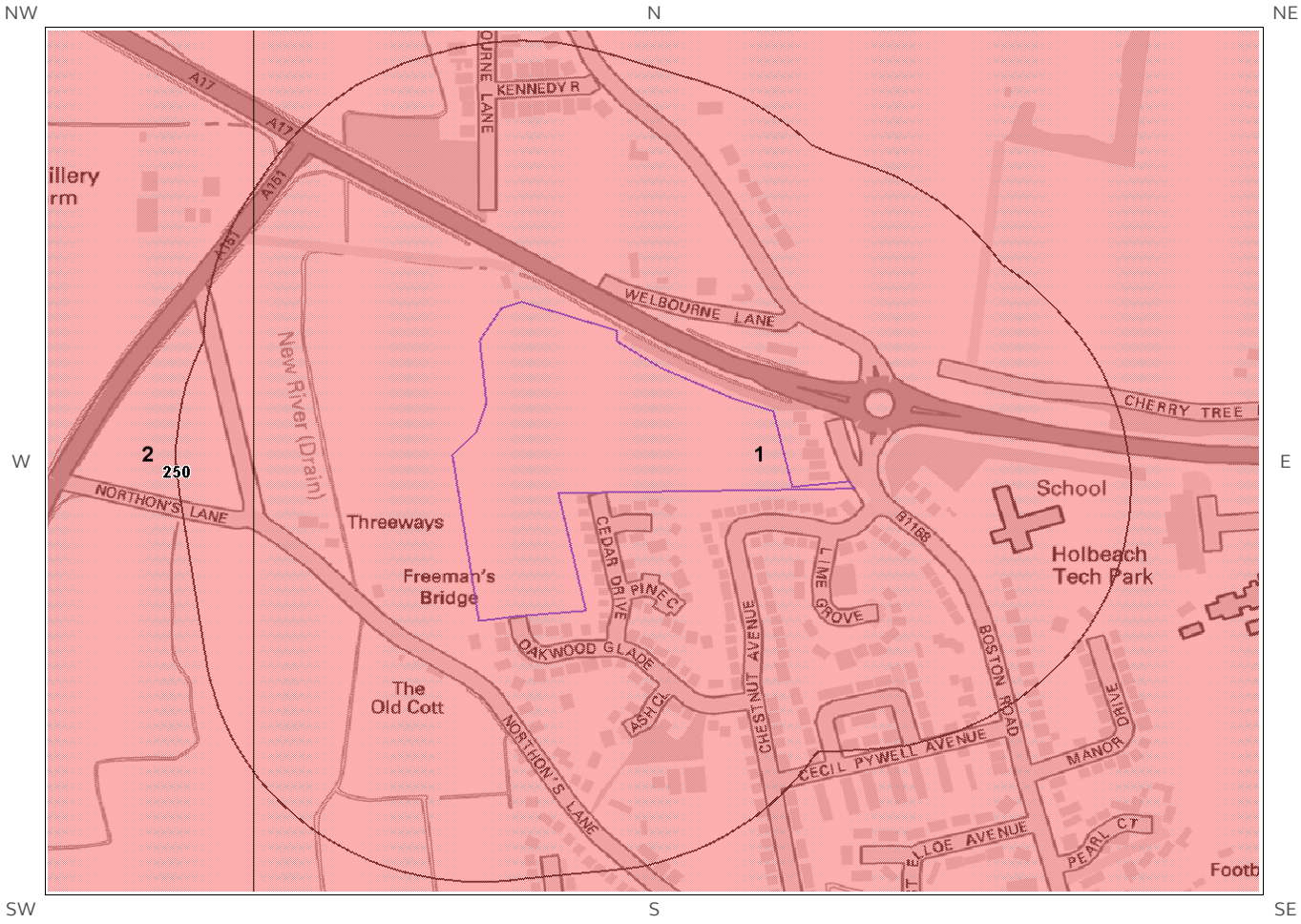


Collapsible Deposits Legend

© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.



6.6 Running Sand map



Running Sand Legend

© Crown copyright and database rights 2019.
Ordnance Survey licence 100035207.



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:

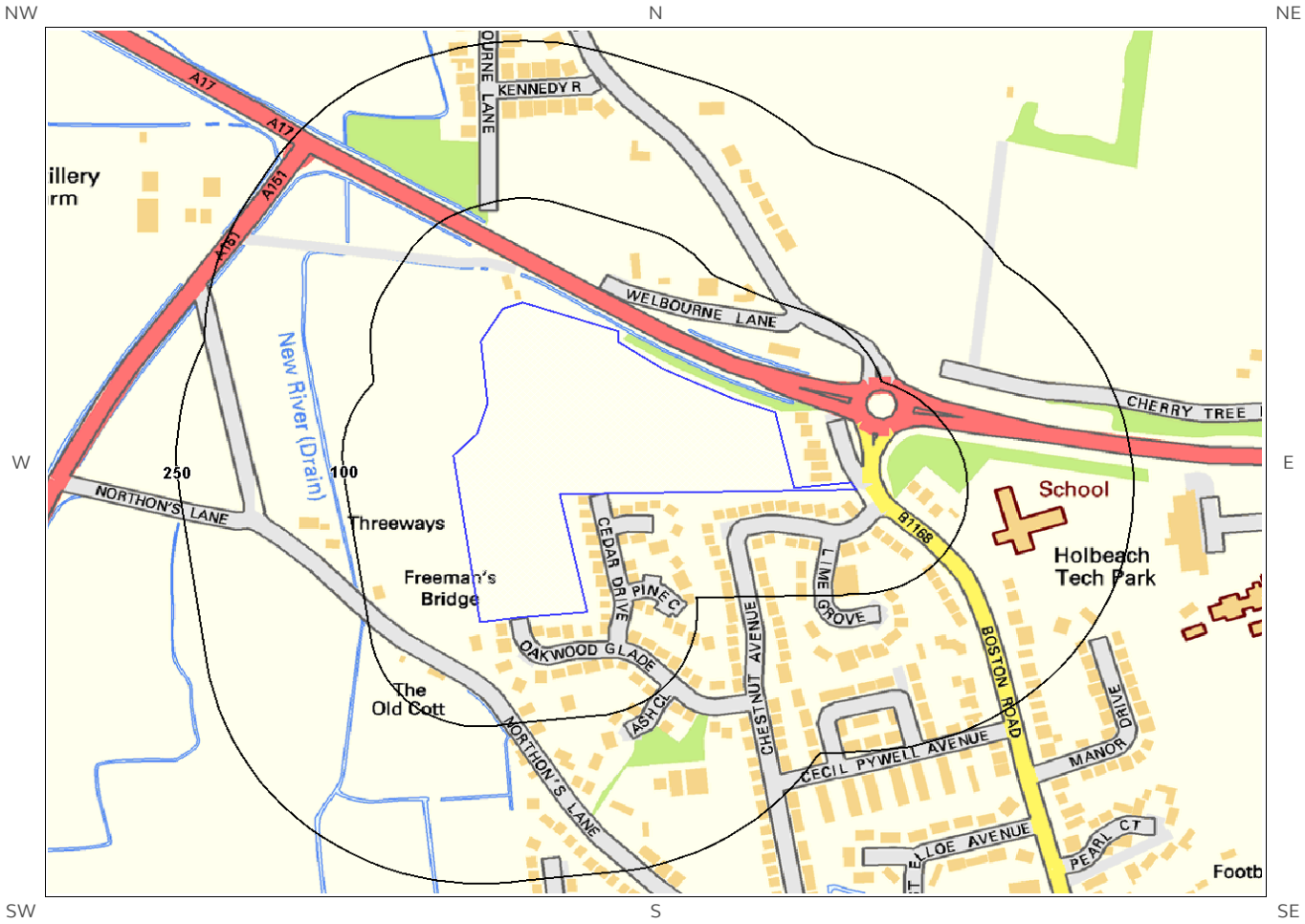
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential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

6.6 Running Sands

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

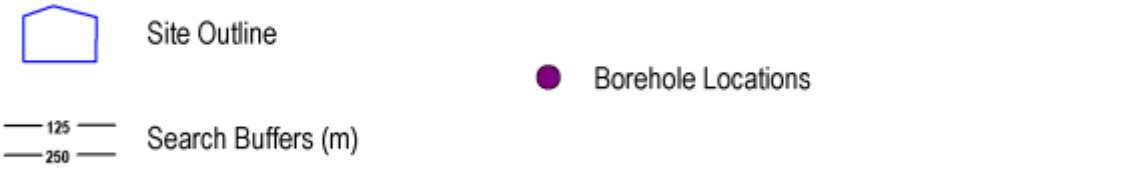
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Moderate	Significant potential for running sand problems with relatively small changes in ground conditions. Avoid large amounts of water entering the ground (for example through pipe leakage or soak-aways). Do not dig (deep) holes into saturated 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 2019.
Ordnance Survey licence 100035207.



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: 0

Database searched and no data found.

8 Estimated Background Soil Chemistry

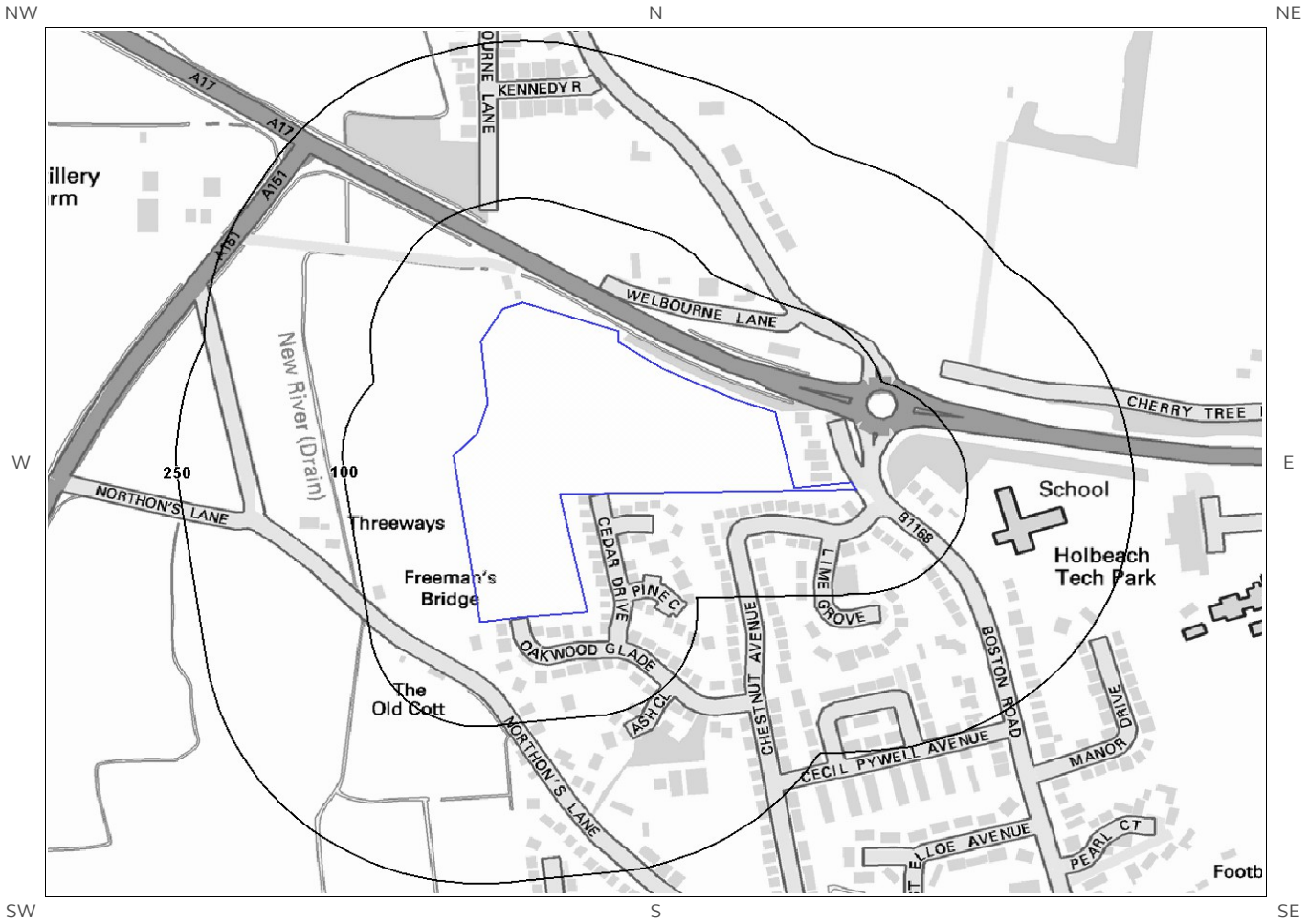
Records of background estimated soil chemistry within 250m of the study site boundary: 4

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 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
20.0	S	RuralSoil	<15 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 2019.
Ordnance Survey licence 100035207.
© OpenStreetMapContributors

- Site Outline
- Search Buffers (m) — 250 — 500
- 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-feb11-2019

APPENDIX E



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

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

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

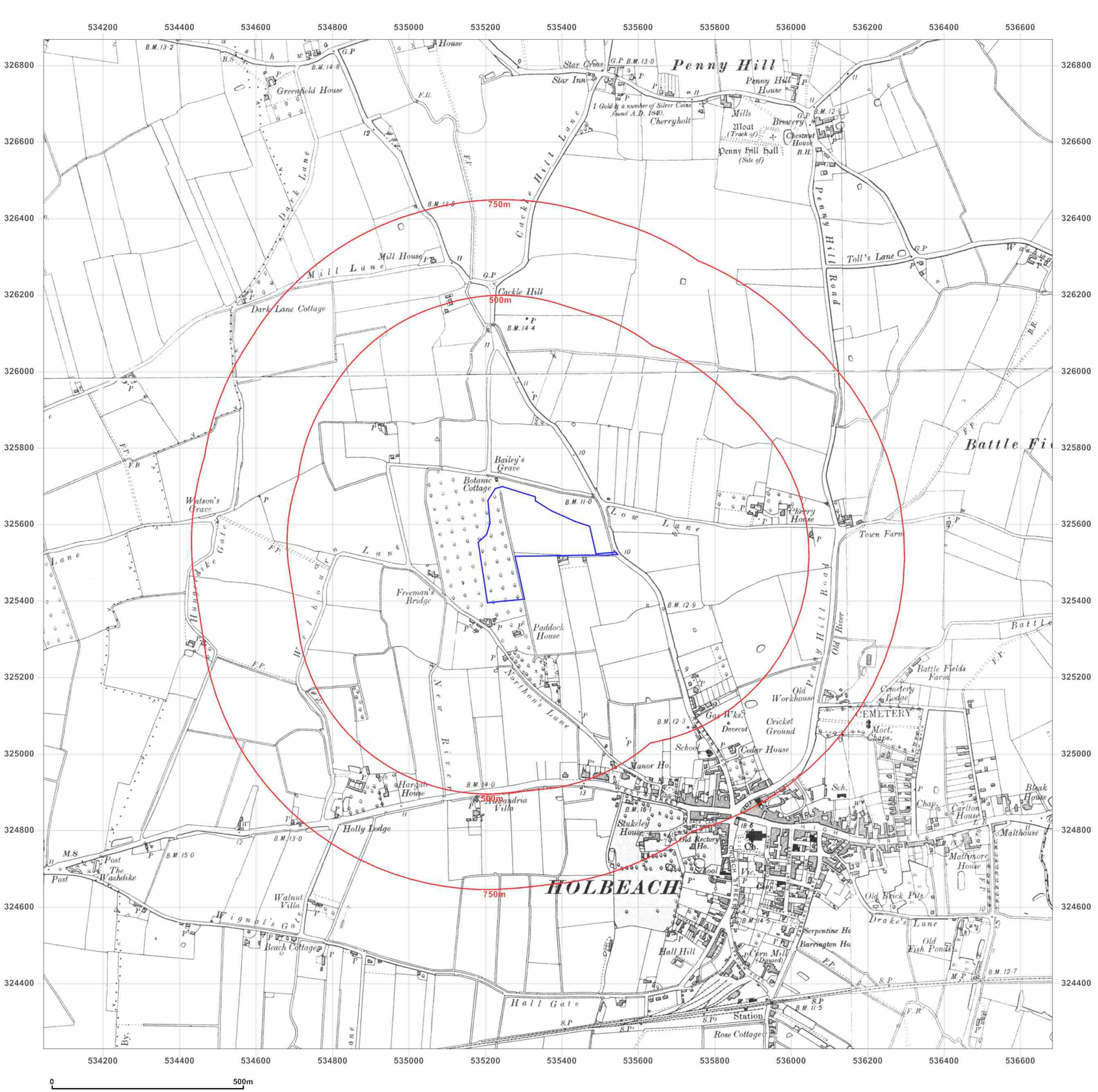
Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: County Series

Map date: **1903**

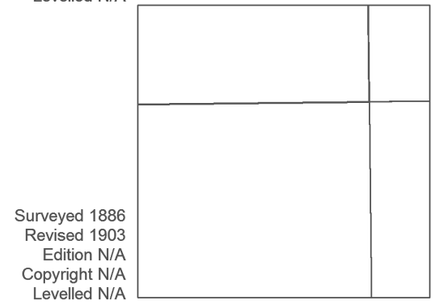
Scale: 1:10,560

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



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

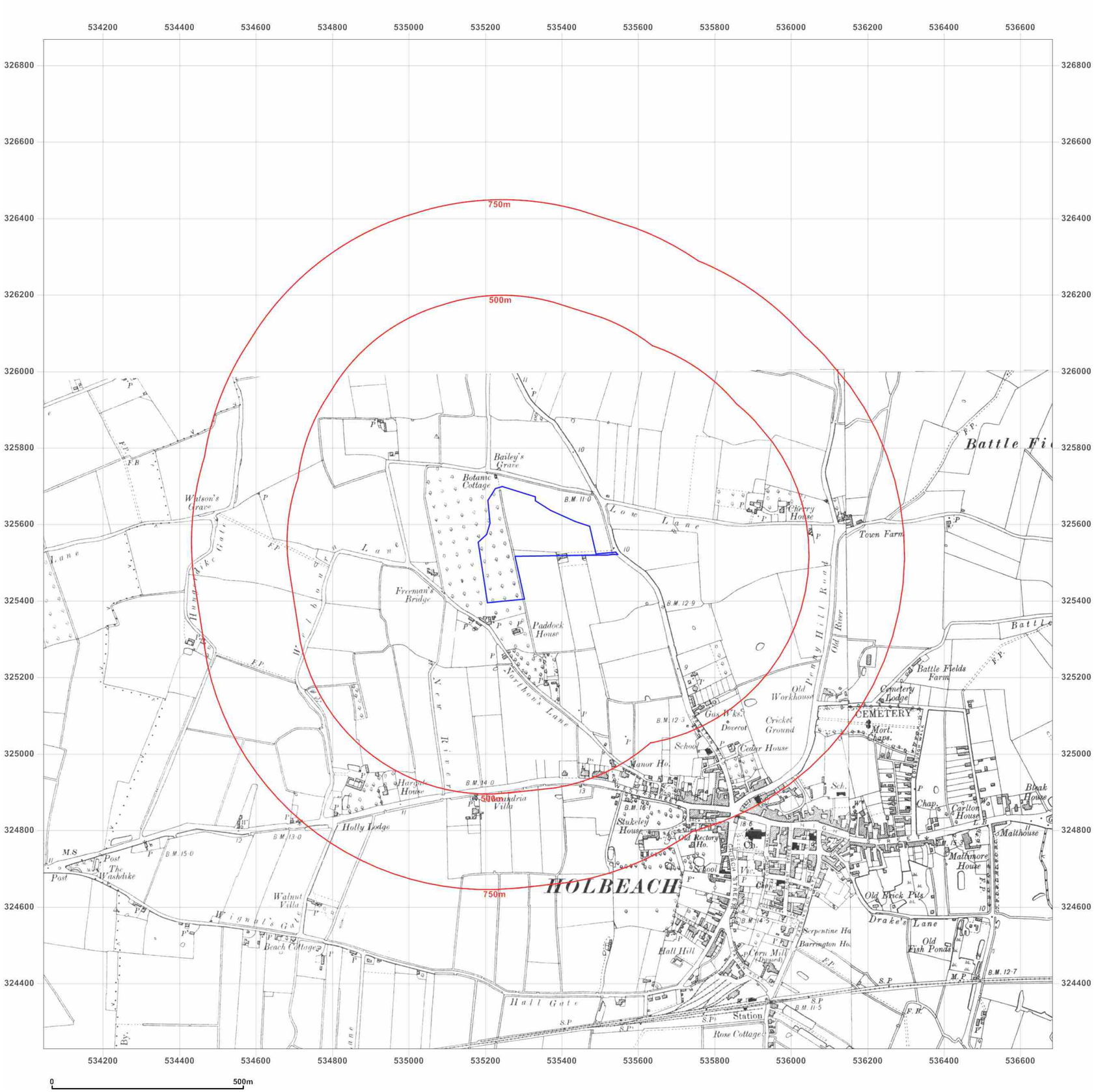
Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

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

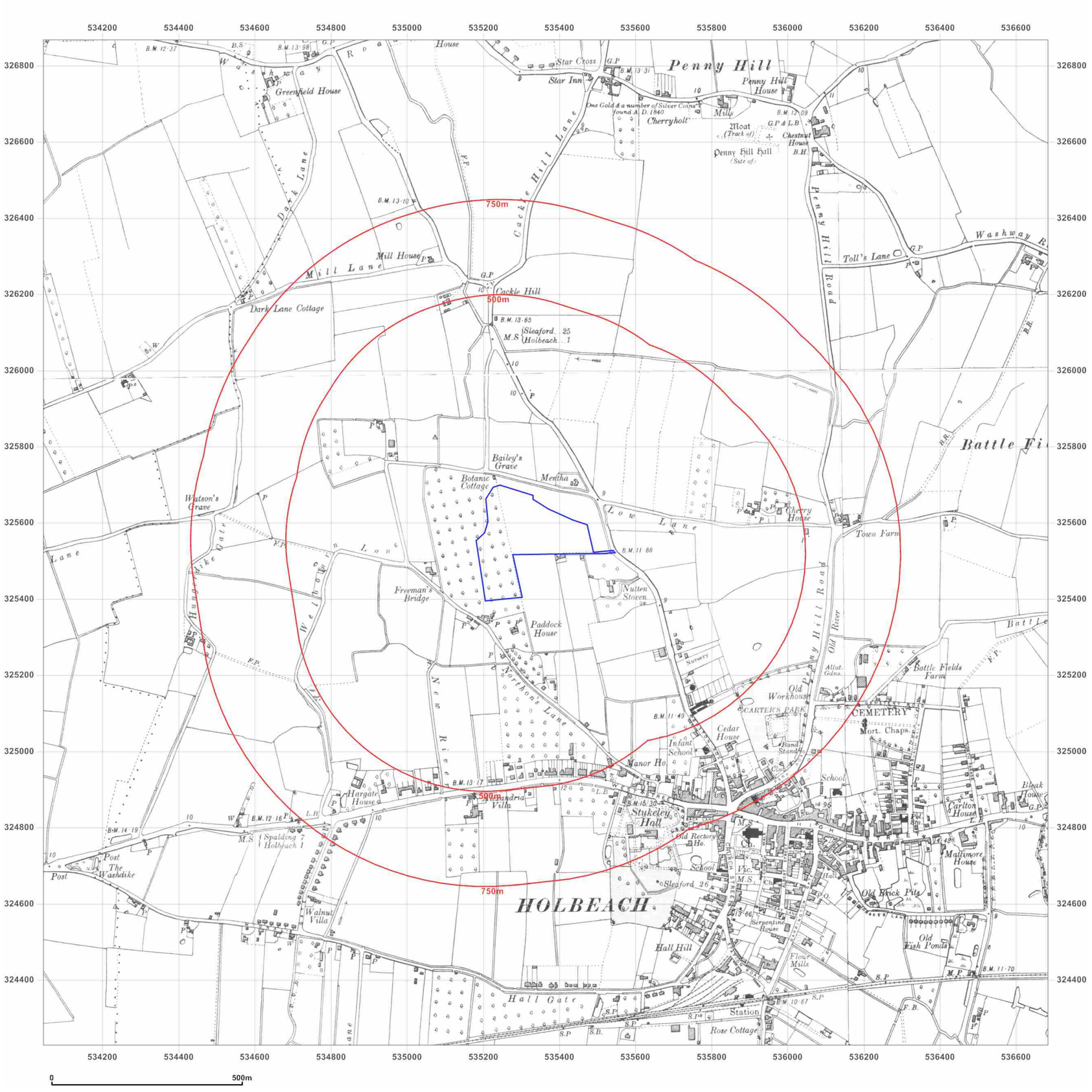
Powered by OS

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: County Series

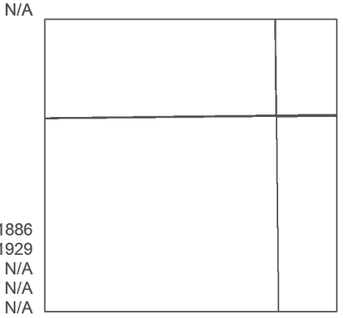
Map date: **1929**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

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



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

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

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

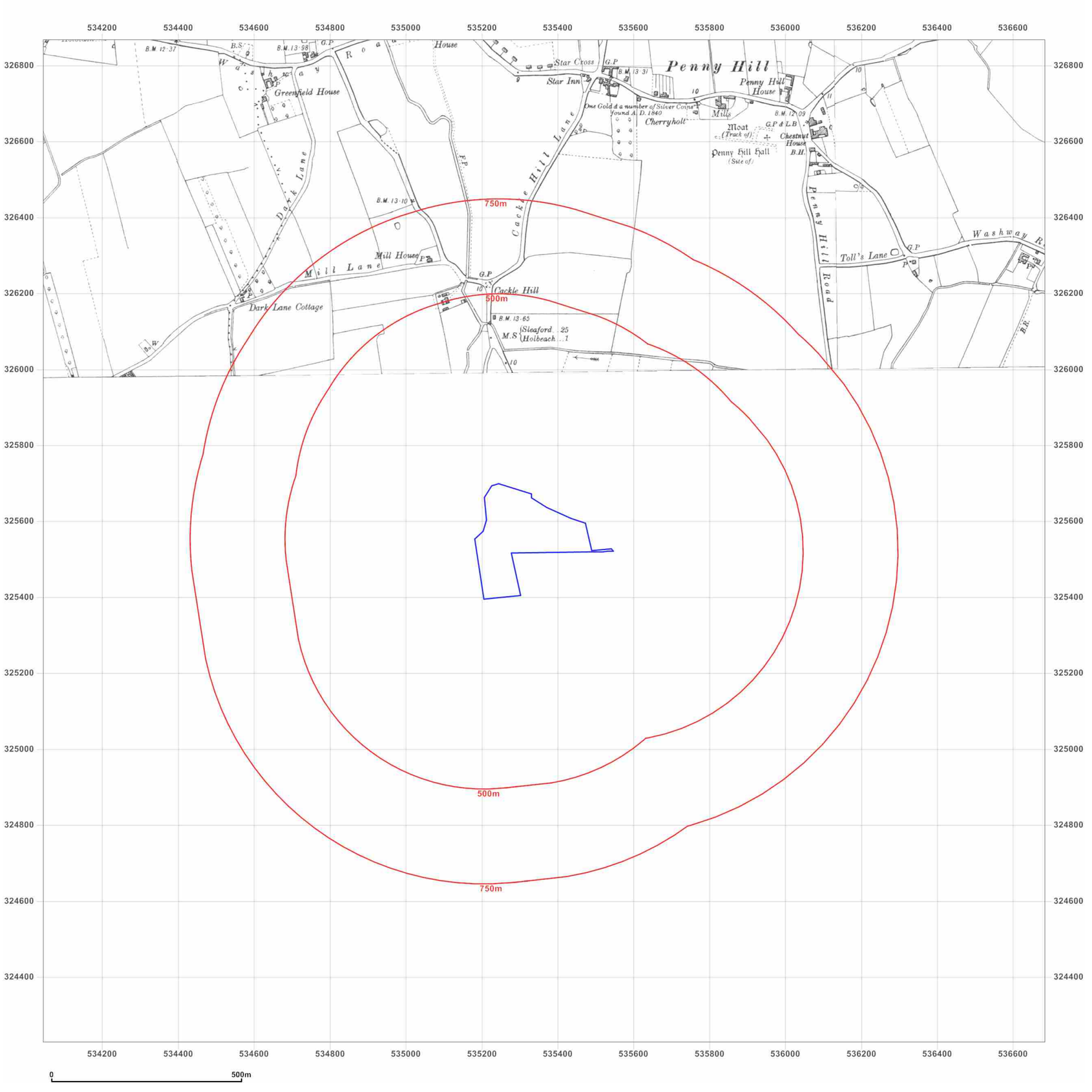
Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: County Series

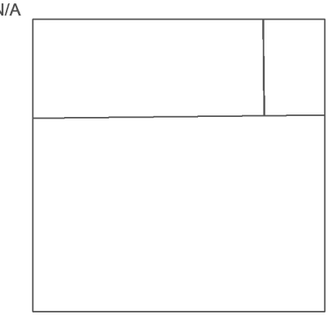
Map date: **1931**

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 1931
Edition 1931
Copyright N/A
Levelled N/A

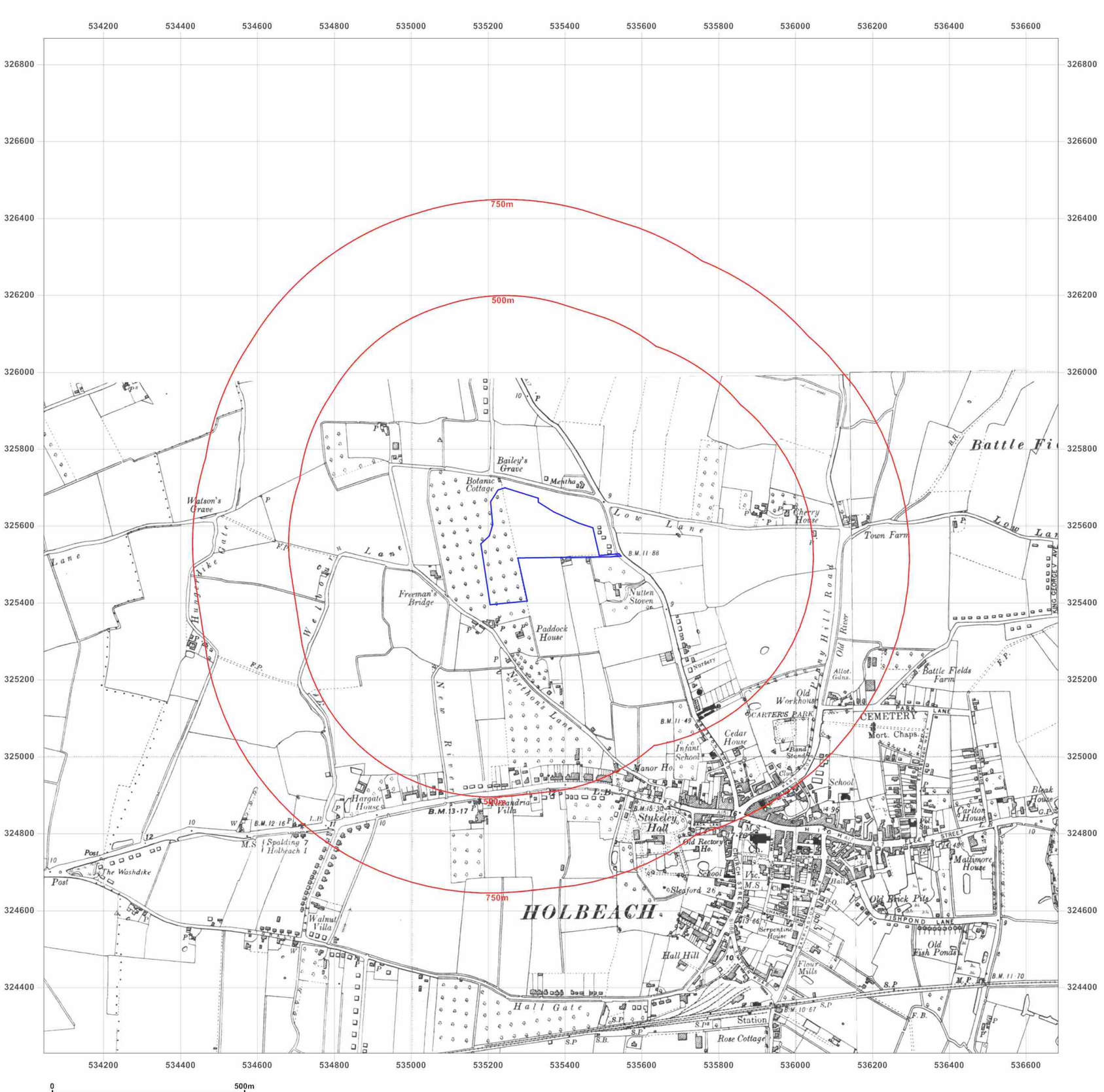
Powered by OS

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: 27 February 2019

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



Groundsure INSIGHTS

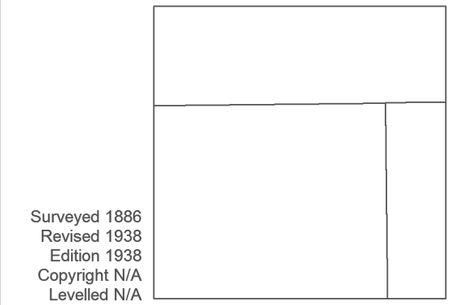
Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

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

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

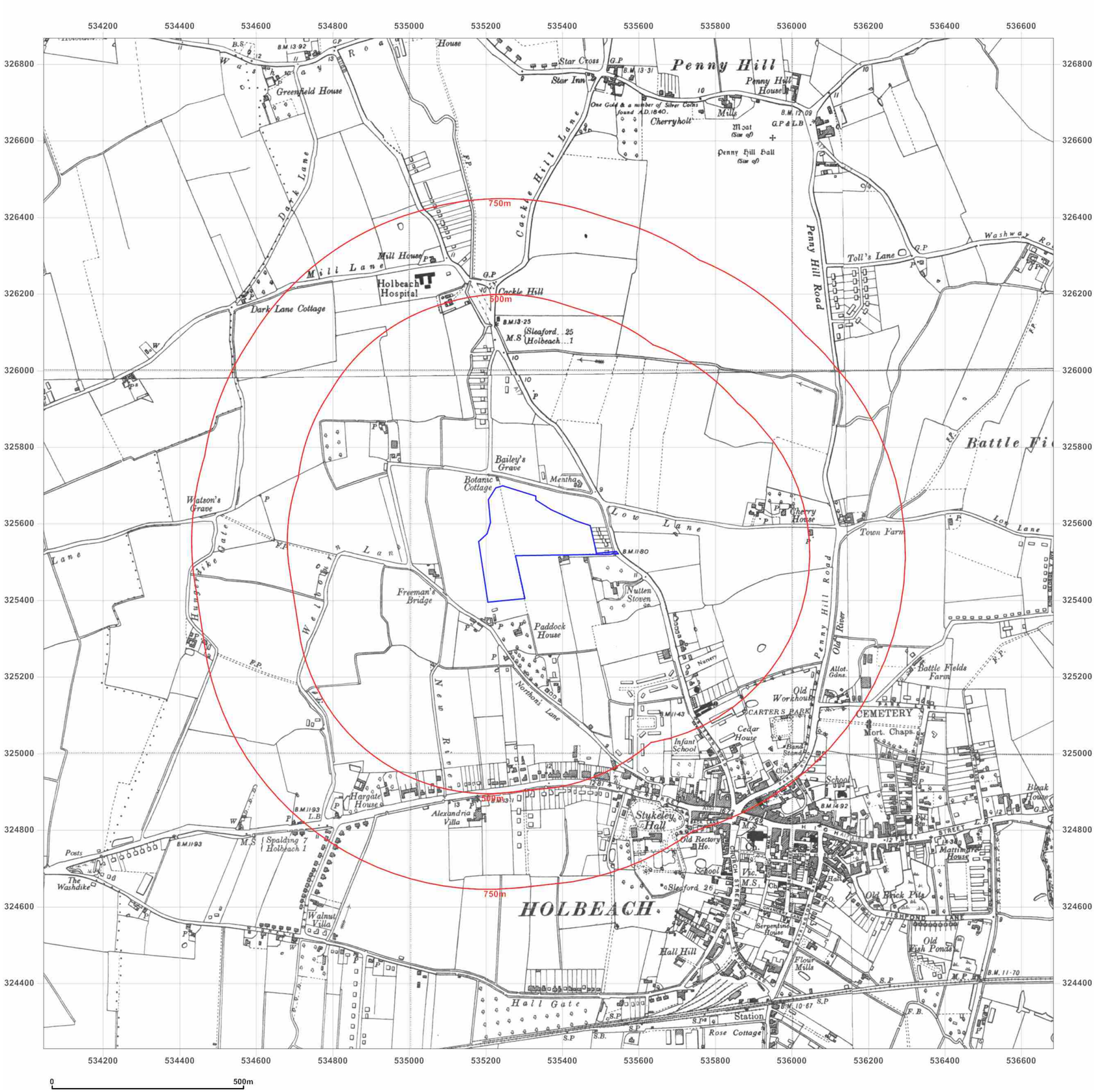
Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

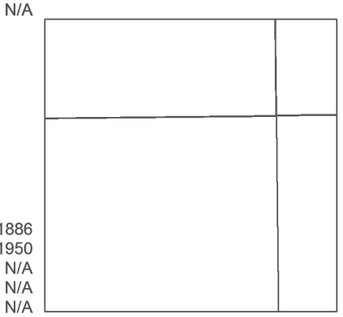
Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: County Series
Map date: **1950**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
S

Surveyed 1886
Revised 1950
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1886
Revised 1950
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1886
Revised 1950
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1886
Revised 1950
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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: Provisional

Map date: **1955-1958**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

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

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

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

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

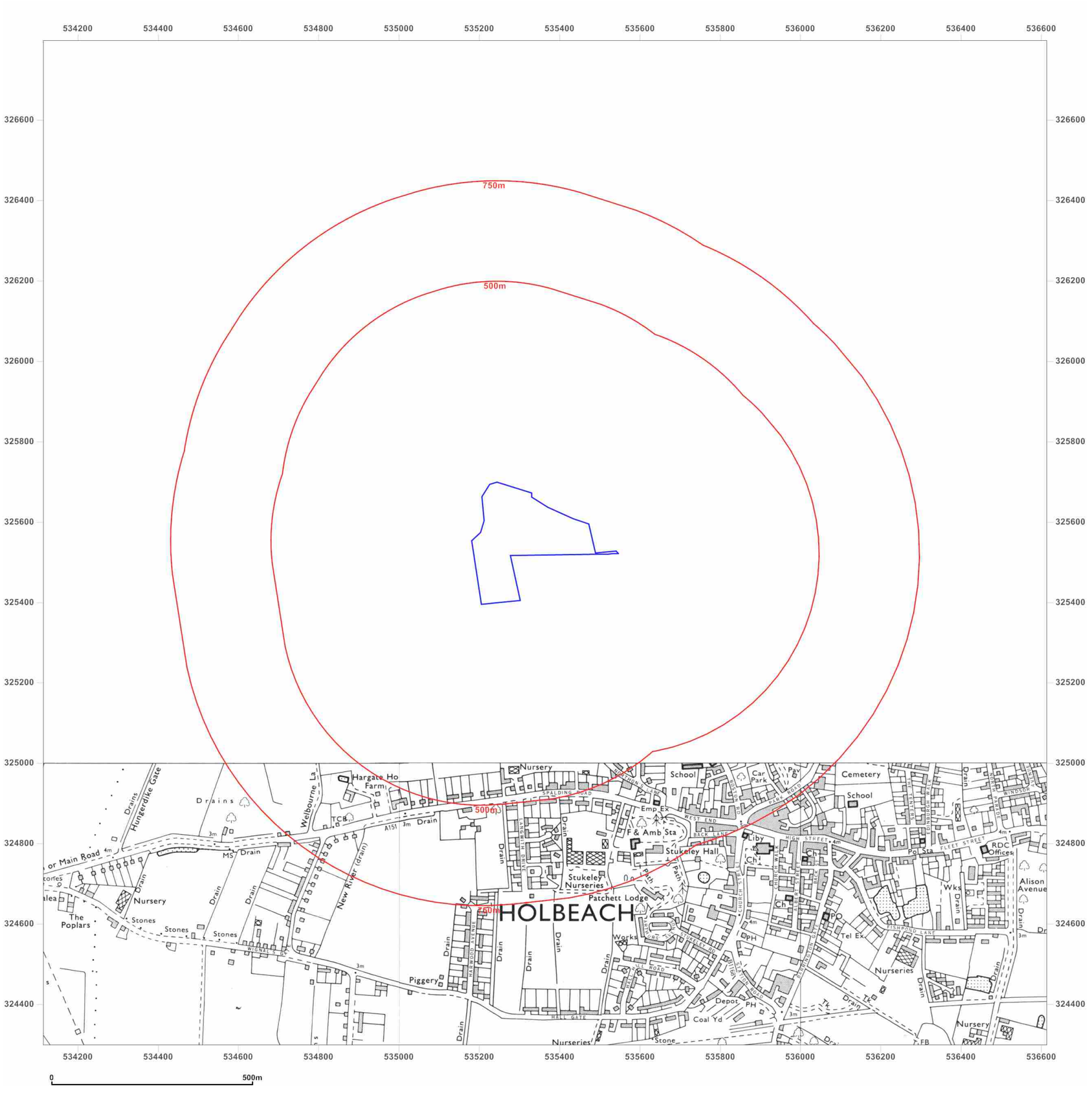
Powered by OS

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

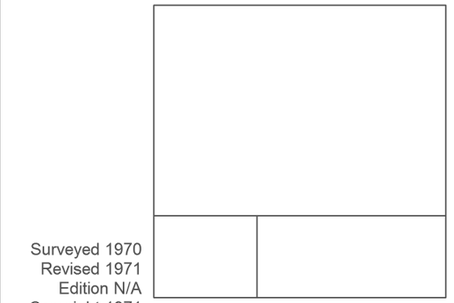
Map Name: National Grid

Map date: **1970-1971**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S



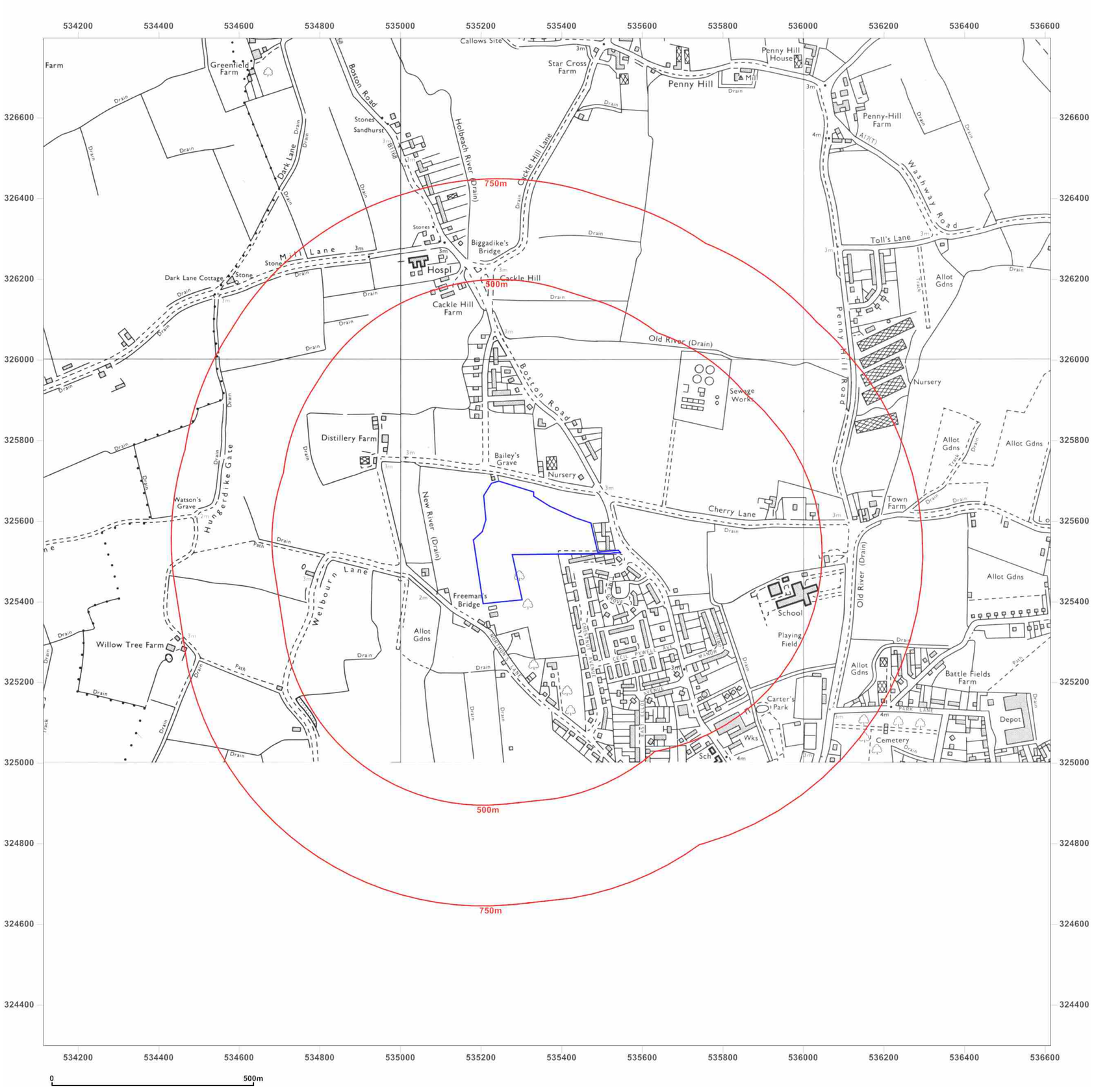
Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **1977**

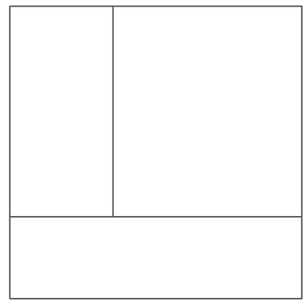
Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

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

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



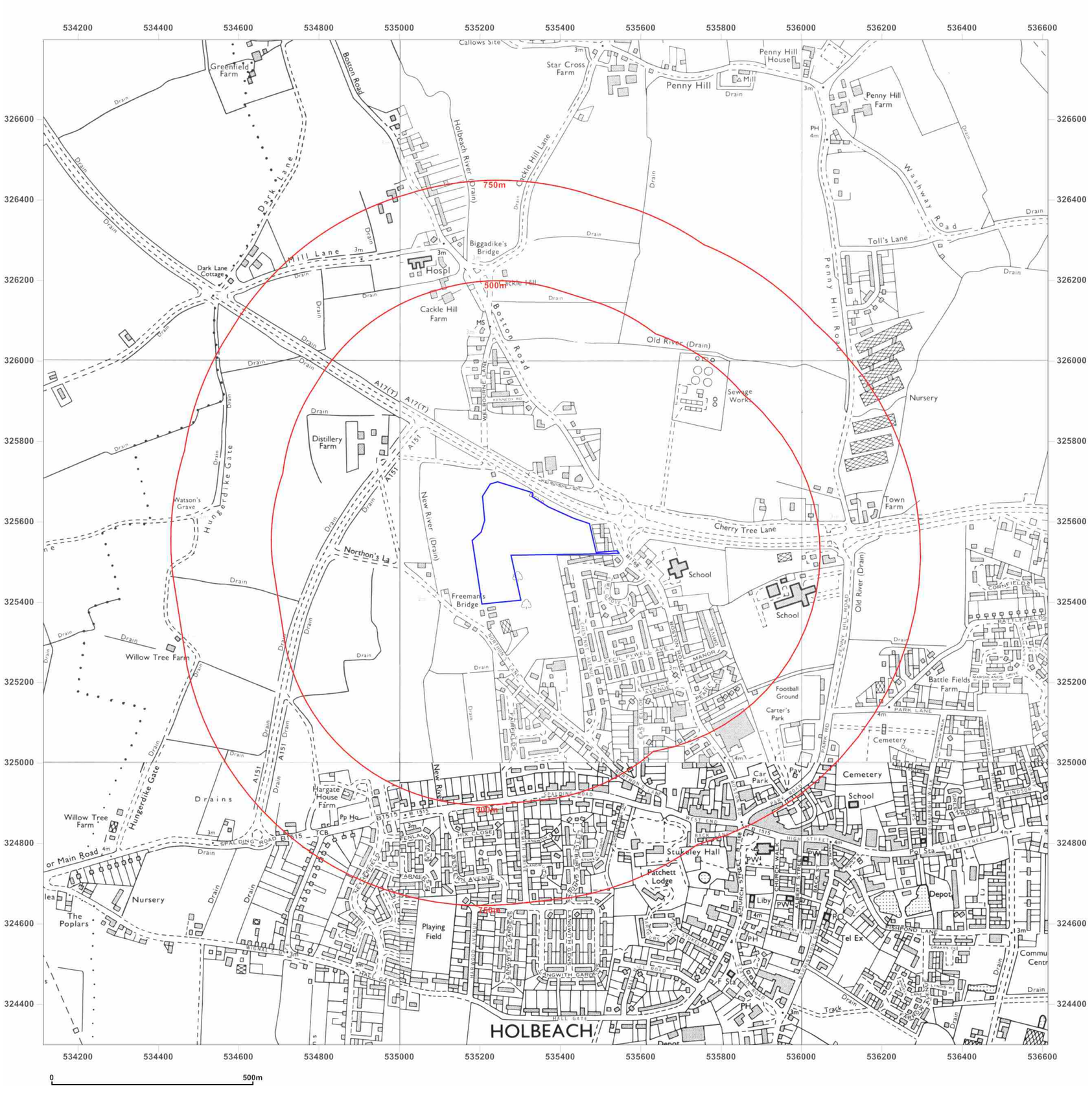
Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **1992**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

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

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

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

Surveyed 1991
Revised 1992
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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

2002

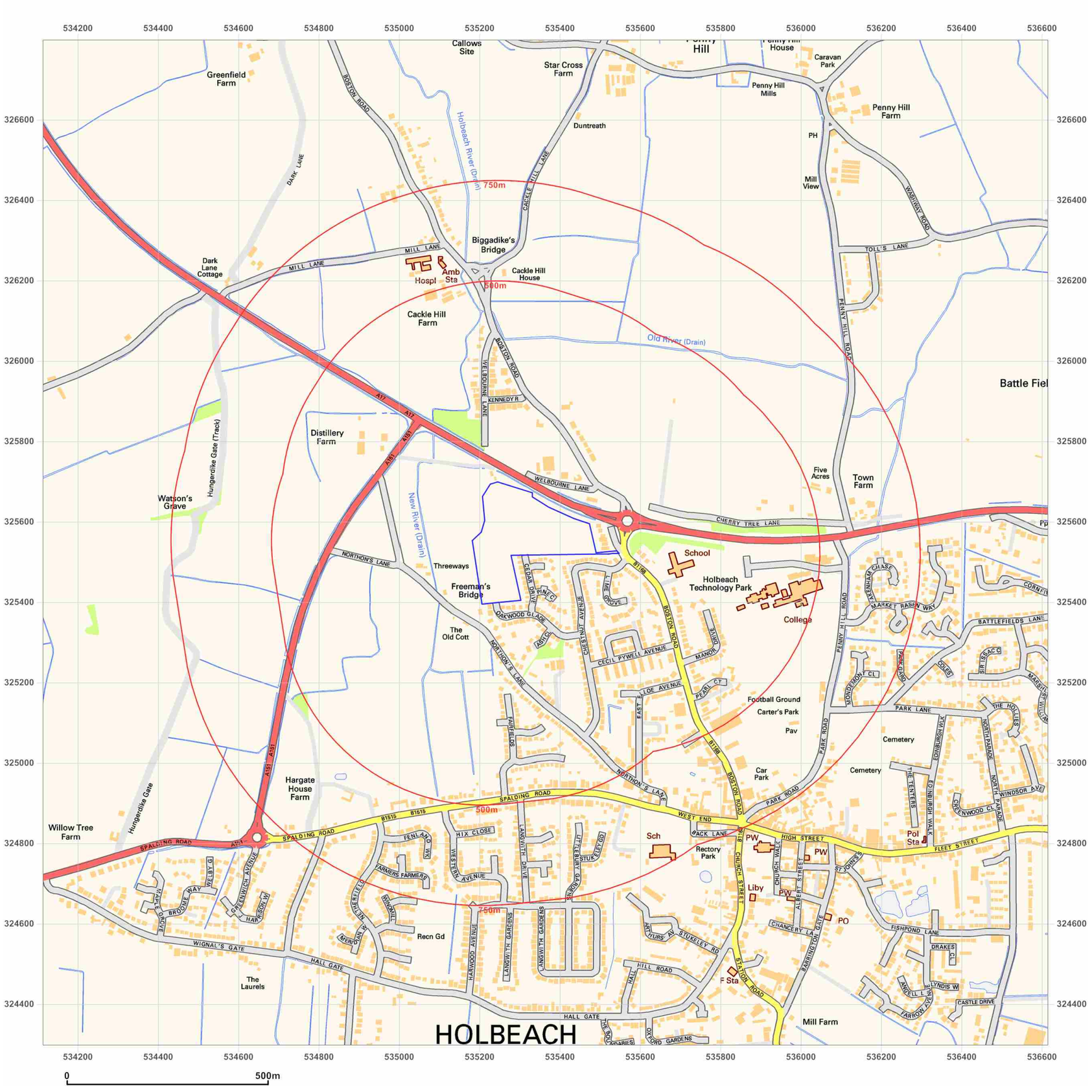
Powered by OS

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

2010

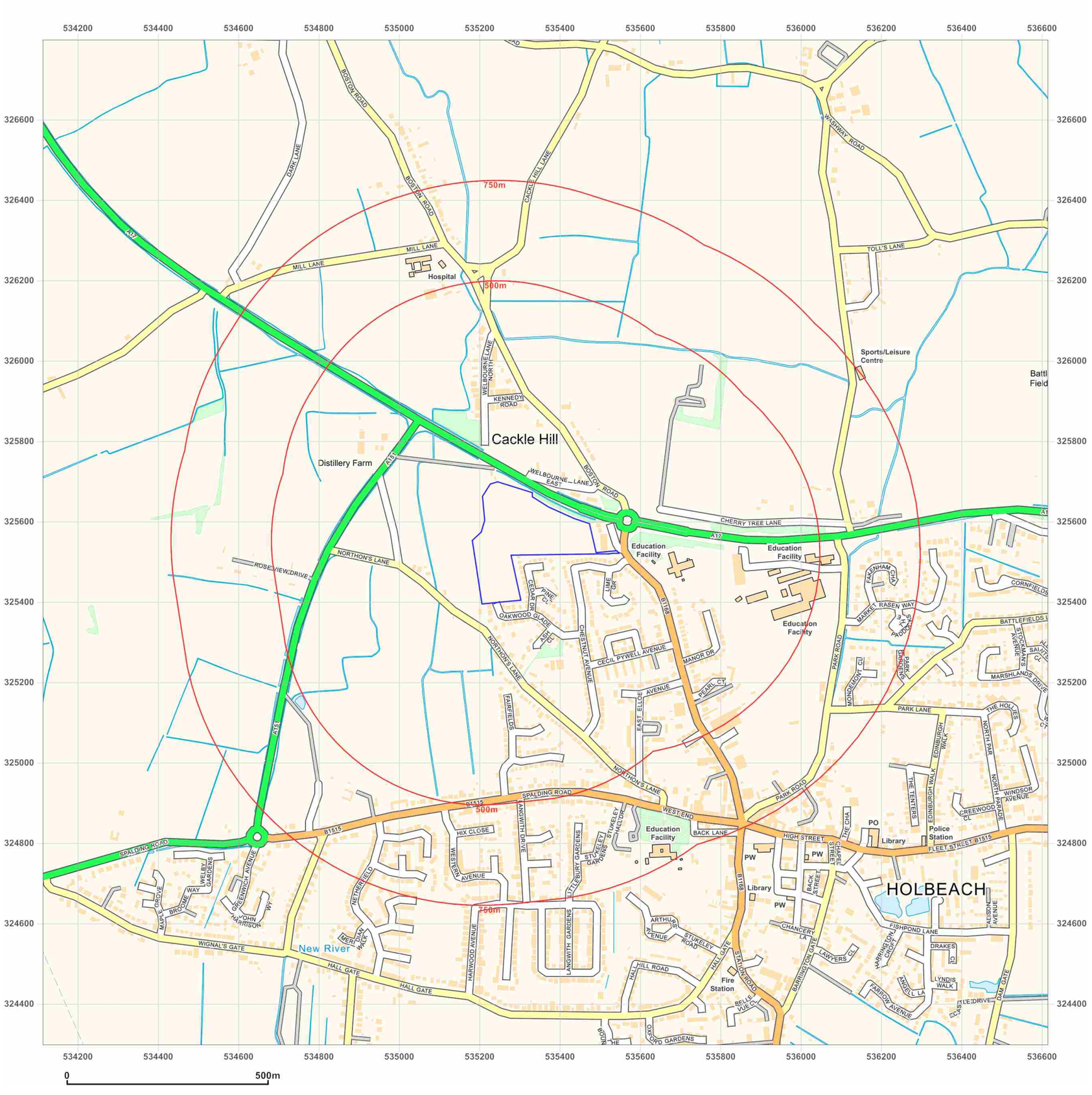
Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **2014**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

2014

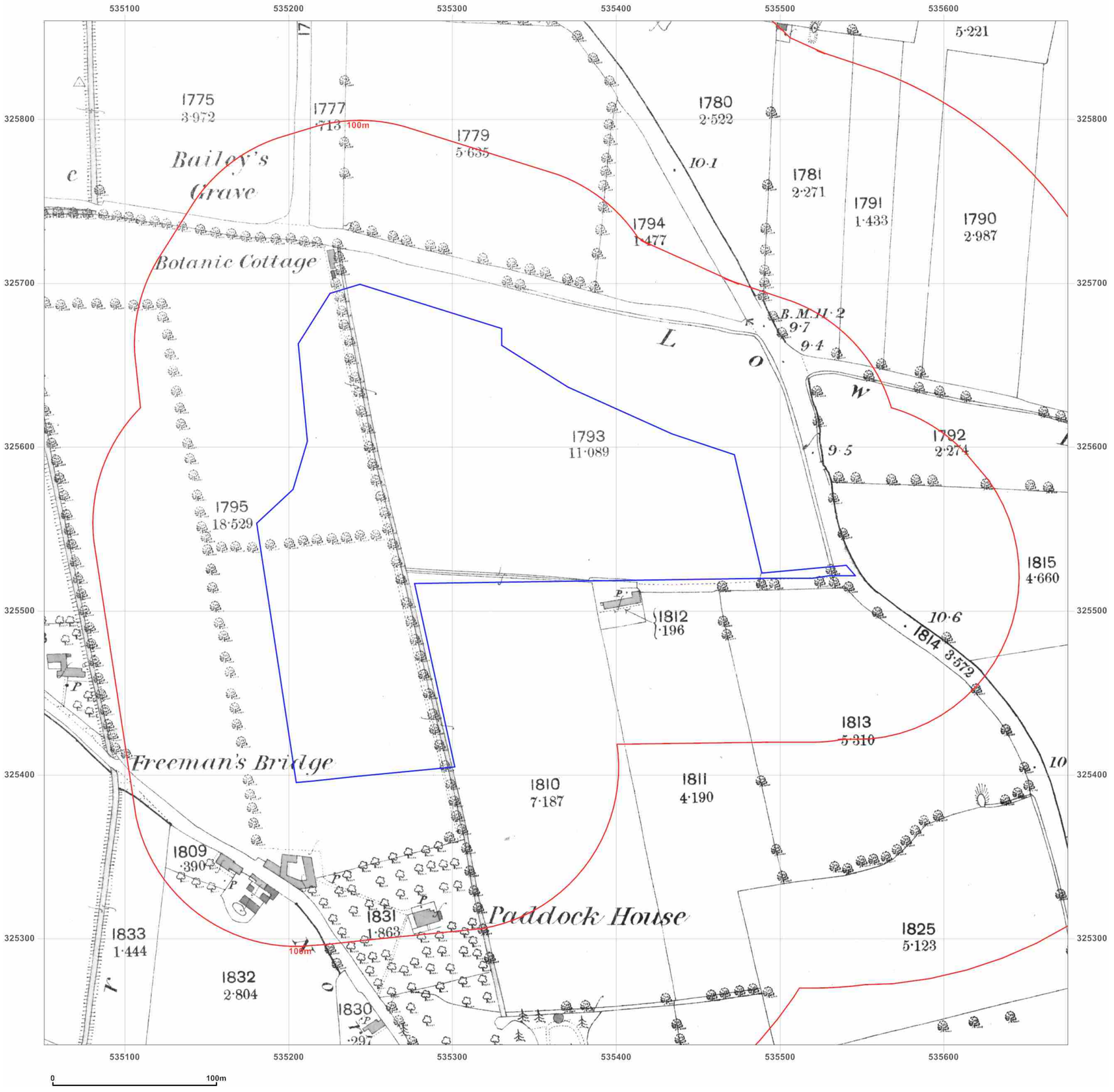
Powered by OS

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

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

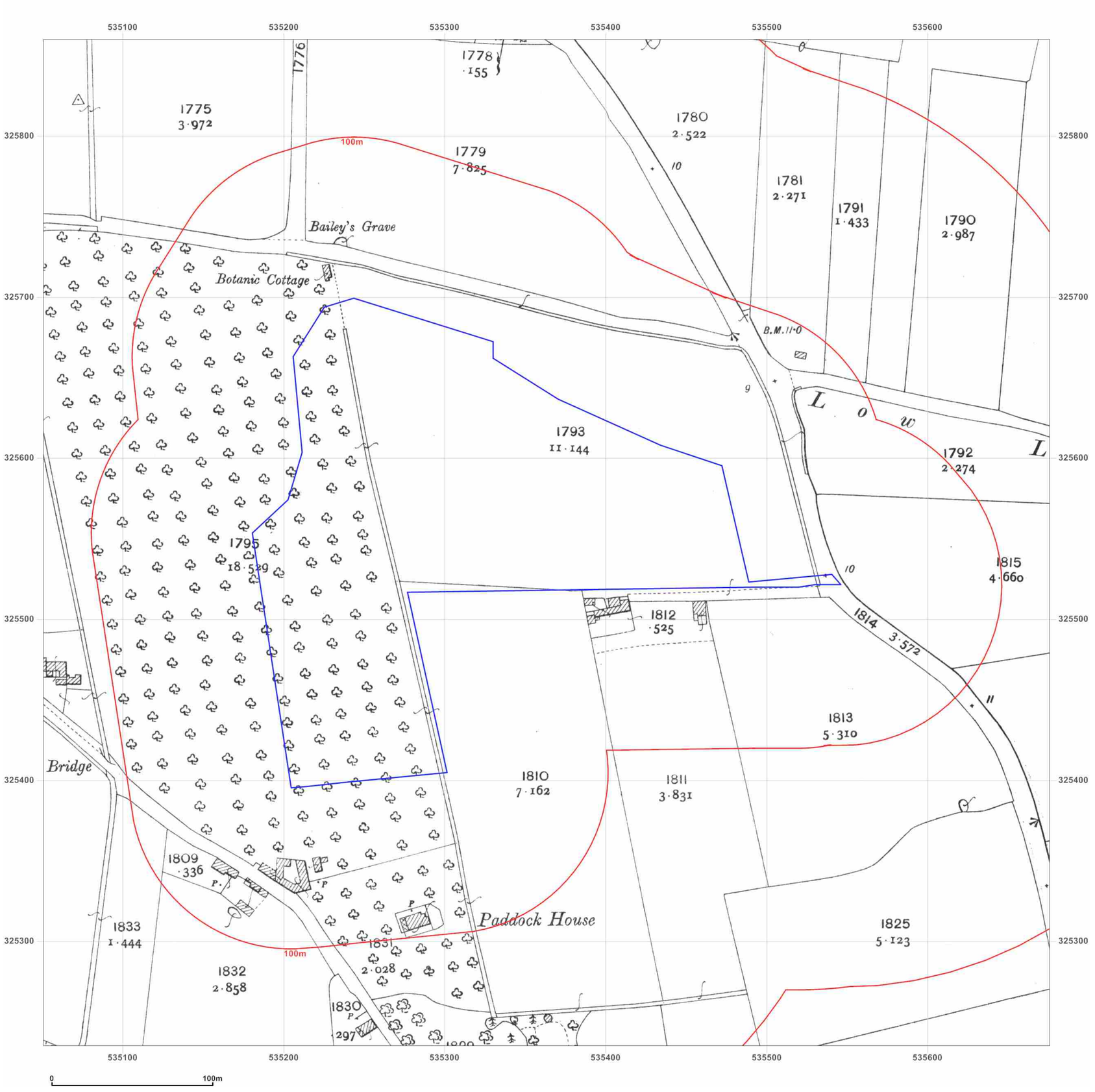
Powered by OS

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

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

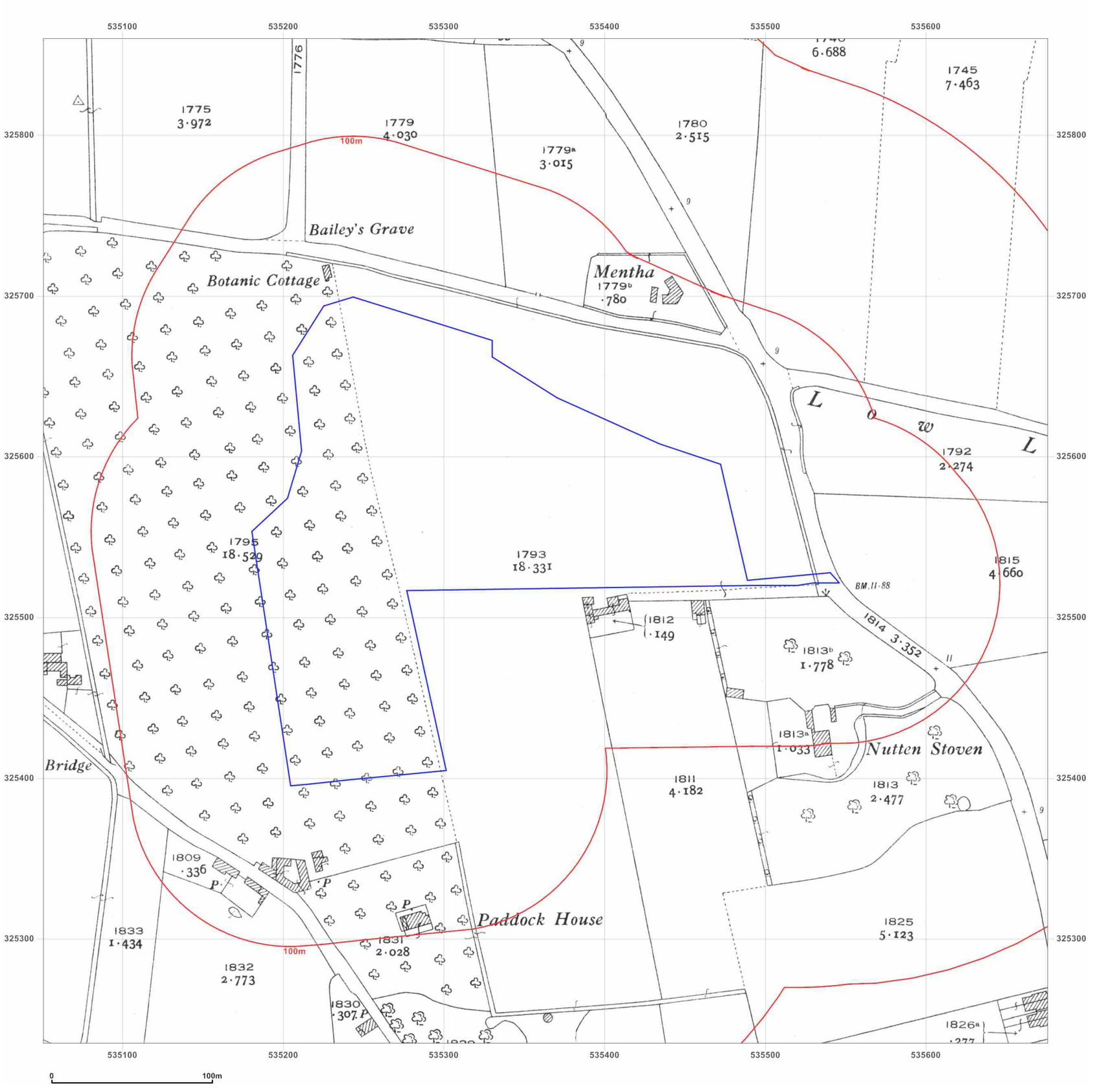
Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: County Series
Map date: **1931**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

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

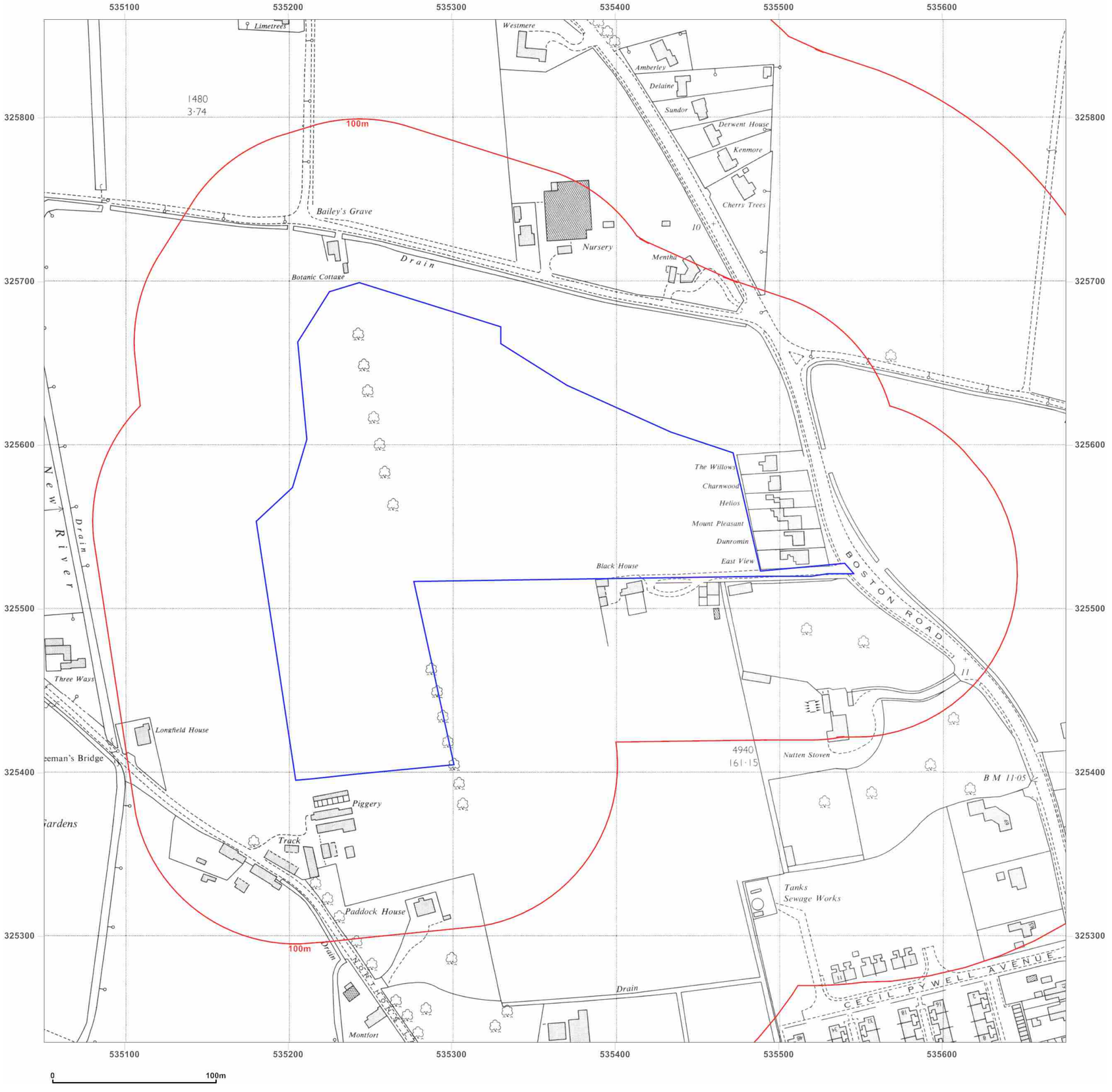
Powered by OS

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **1968**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1968
Revised 1968
Edition N/A
Copyright 1969
Levelled 1965

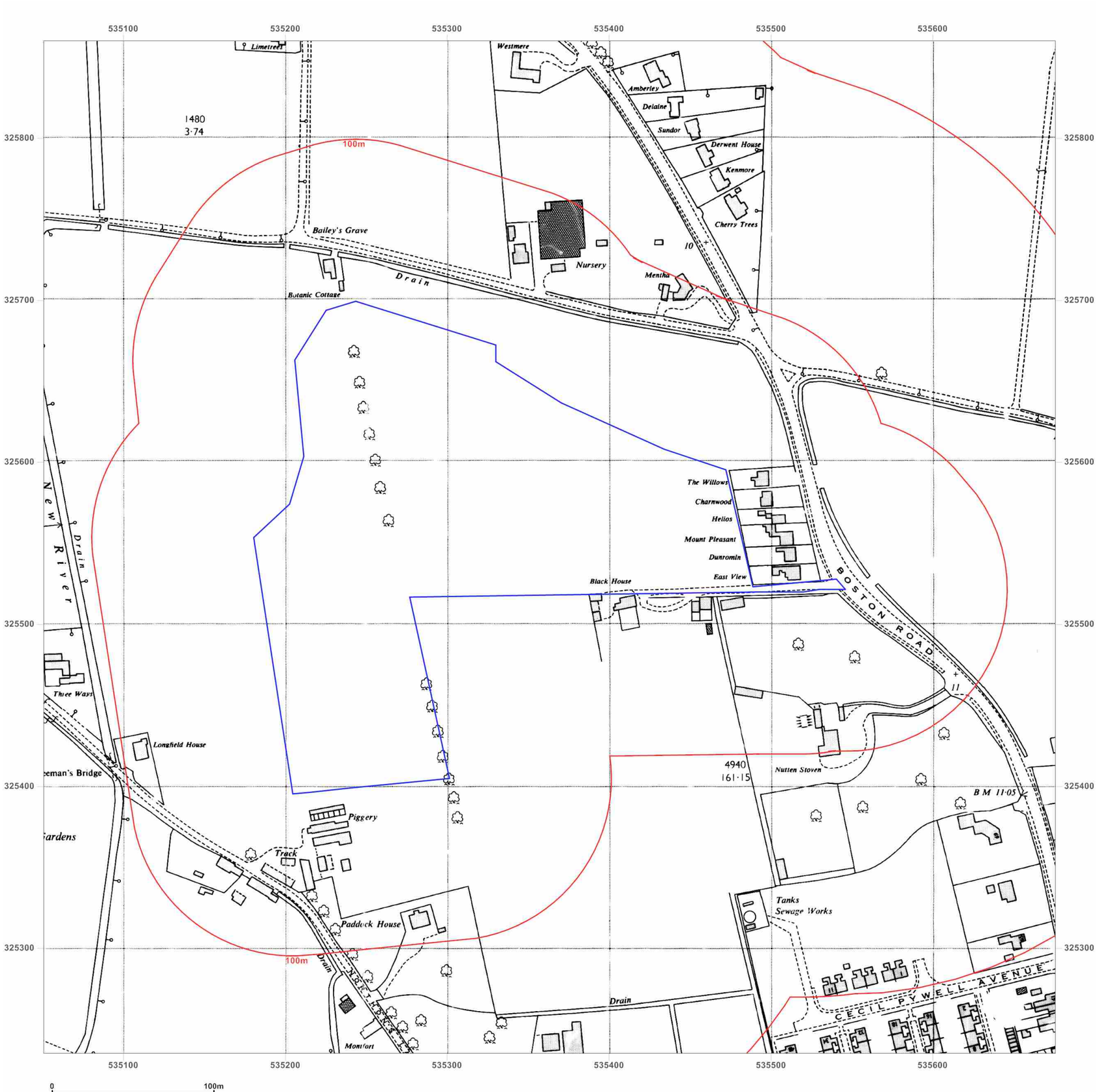
Powered by

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: 27 February 2019

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



Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **1969**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

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

Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **1976**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1976
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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **1977**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

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

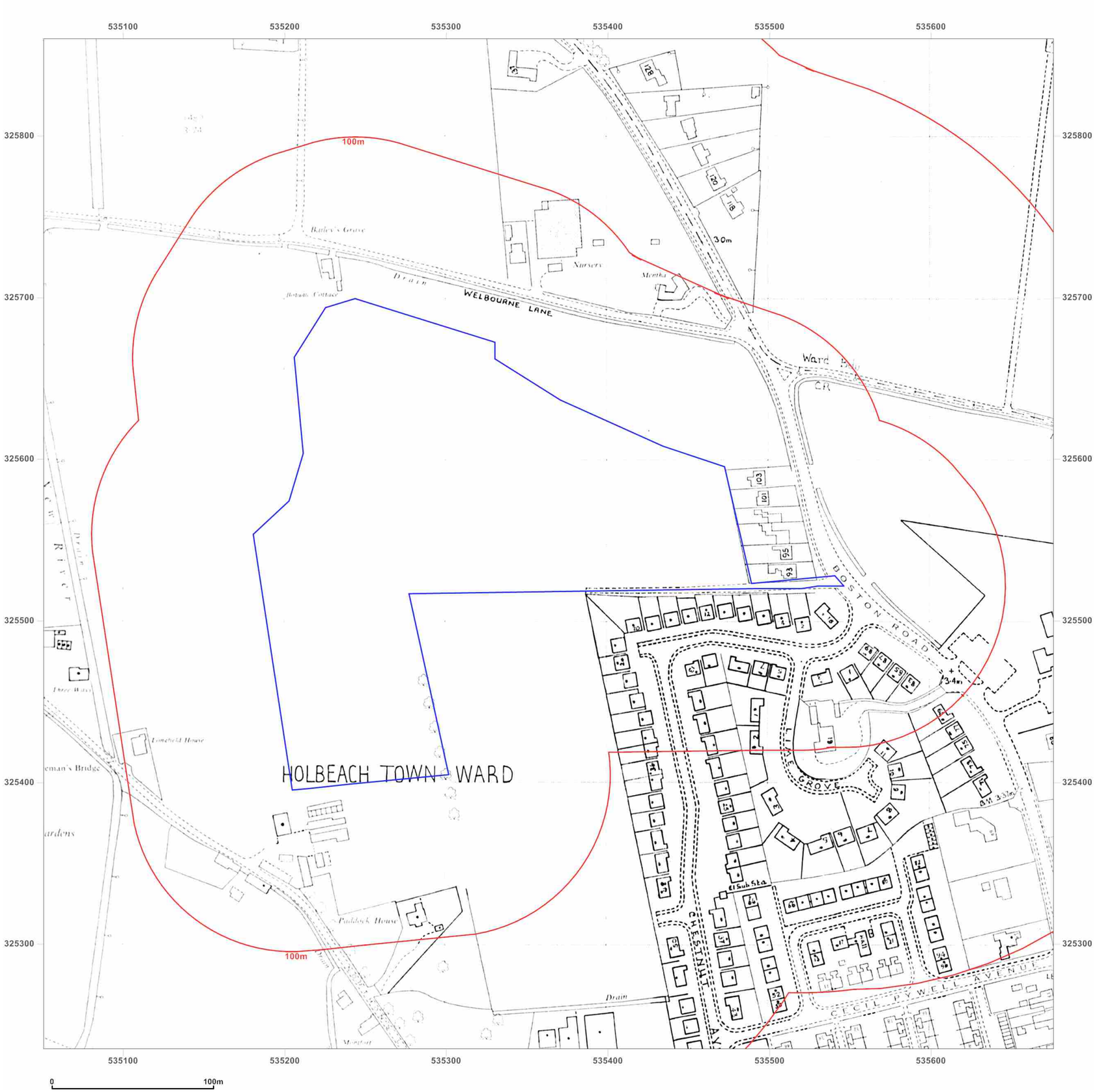
Powered by OS

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **1982**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1982
Levelled 1964

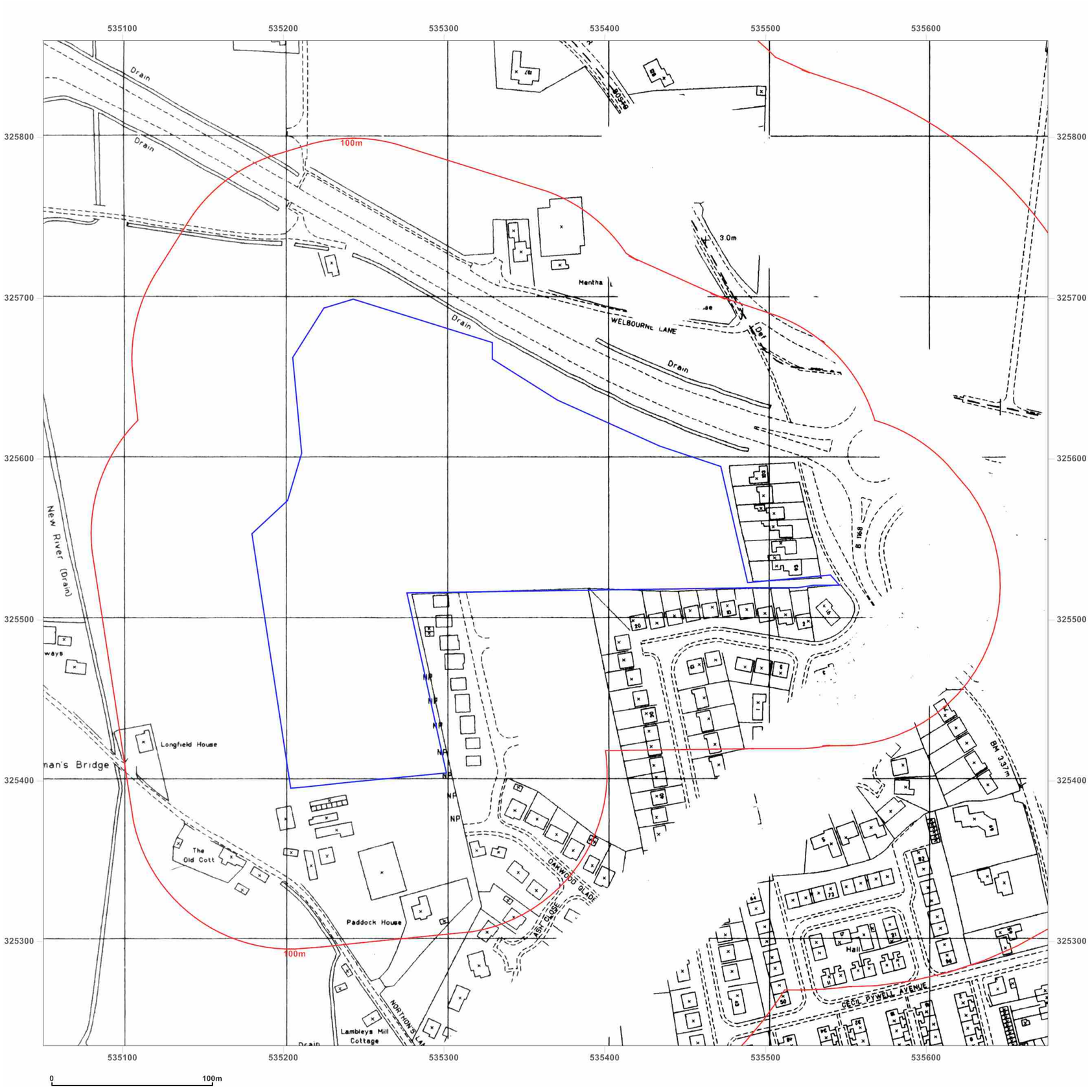
Powered by

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **1992**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

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

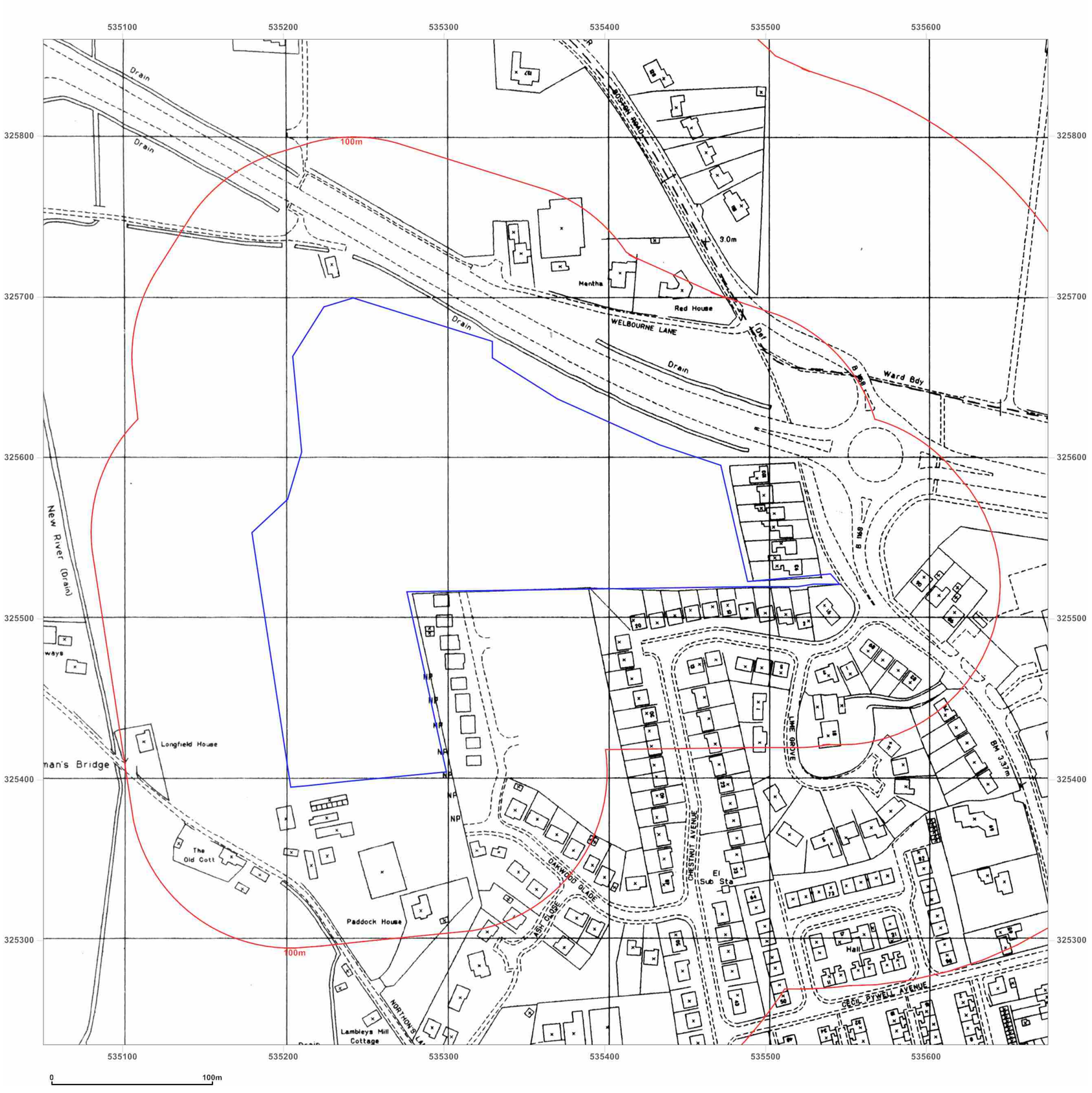
Powered by OS

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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **1992**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
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: 27 February 2019

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



Groundsure INSIGHTS

Site Details:

BROWN BUTLIN LTD,
NORTHONS LANE, HOLBEACH,
SPALDING, PE12 7JS

Client Ref: 8434N_-_24879
Report Ref: GS-5847760
Grid Ref: 535363, 325547

Map Name: National Grid

Map date: **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

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: 27 February 2019

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

APPENDIX F

PHASE I ENVIRONMENTAL RISK ASSESSMENT METHODOLOGY

LAND USE

This chapter establishes the former and current land uses that may have caused contamination or given rise to environmental concerns on the site. An inspection of the site has been undertaken to provide further details of the site and neighbouring activities and to observe environmental conditions.

Historical Maps
Information about the history of the site has been obtained primarily through an inspection of historical Ordnance Survey maps. These maps provide an excellent record of the historical uses of a site and can be very important in assessing potential liabilities. Historical maps can show past potentially contaminative uses at a site that would not necessary be obvious during a site inspection, for example storage tanks or previous usage such as a gas works or quarry.

Public Record Information
Information concerning environmental regulations relating to the site has been obtained from a public register which has been accessed from a commercial database operated by the Landmark Information Group. This is the quickest means of gathering publicly available information. The data is supplied from within a 1km radius of a given National Grid Reference of a site. The database contains information from the Environment Agency (EA) and other statutory authorities responsible for monitoring environmental protection measures within the area of a site under existing legislation (see below).

Information has also been obtained directly from the environmental regulators in order to gauge the environmental characteristics of the site in more detail and to establish whether there have been any breaches of environmental regulations or pollution incidents associated with the site. This is used to support the publicly available information gathered from the commercial database. The time in which responses are returned can vary between statutory authorities.

Environmental Legislation
The principal environmental legislation in England consists of the Environmental Protection Act 1990 (EPA 90), the Water Resources Act 1991 and the Environment Act 1995 (EA 95). These Acts prescribe protection measures for all the environmental media (land, water and air) and are regulated by the EA and the Local Authority. Part 1 of the EPA 1990 sets out the statutory framework for Integrated Pollution Control (IPC) and Air Pollution Control (APC).

ENVIRONMENTAL SETTING

This chapter assesses the environmental sensitivity of the site location to contamination/pollution. It is important to establish the environmental setting because, irrespective of the level of contamination on the site, if its location is not 'sensitive' to this contamination/pollution, there is a reduced risk of an environmental liability arising.

The sensitivity is assessed using British Geological Survey (BGS) information and data from the EA on groundwater and surface water. Data on abstractions have been obtained from the Landmark Information Group. The vulnerability of surface waters and groundwater is based on sensitivity to pollution, distance from abstractions, type and nature of groundwater and type of overlying strata. The EA have classified aquifers into three types - Principal Aquifers, Secondary aquifers and non-aquifers - depending upon the hydrogeological sensitivity, permeability and whether they support large abstractions for drinking water supplies.

Principal Aquifers (Highly Permeable)
These are highly permeable formations usually with a known or probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public supply and other purposes.

Secondary Aquifers (Variably Permeable)
These can be fractured or potentially fractured rocks which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although these aquifers will seldom produce large quantities of water for abstraction, they are important both for local supplies and in supplying base flow to rivers. Principal Aquifers may occur beneath Secondary Aquifers but on this map extract the underlying Principal Aquifer is only shown where the overlying Secondary Aquifer is a drift deposit.

Non-Aquifers (Negligibly permeable)
Formations which are generally regarded as containing insignificant quantities of groundwater form a third group. However, groundwater flow through such rocks, although imperceptible, does take place and needs to be considered in assessing the risk associated with persistent pollutants. Some non-aquifers can yield water in sufficient quantities for domestic use. Principal or Secondary aquifers may occur beneath non-aquifers.

Soil Classification
Three sub-classes are recognised for high soil classes:

HI Soils that readily transmit liquid discharges because they are either shallow or susceptible to rapid bypass flow directly to rock, gravel or groundwater;

H2 Deep, permeable, coarse textured soils that readily transmit a wide range of pollutants because of their rapid drainage and low attenuation potential; and

H3 Coarse textured or moderately shallow soils that readily transmit non-adsorbed pollutants and liquid discharges but which have some ability to attenuate absorbed pollutants because of their large clay or organic matter contents.

Flood Risk
The Flood Map combines detailed local data with information from a new national model of England and Wales and indicates where flooding from rivers, streams and watercourses is possible. Under Section 105 of the Water Resources Act 1991, the Environment Agency has a duty to survey matters relating to flooding.

ENVIRONMENTAL RISK ASSESSMENT

This chapter assesses the potential for the site to give rise to environmental risks and whether or not the risks are acceptable or if further assessment and/or remedial action is required.

The qualitative risk assessment firstly considers the source of contamination and potential contaminants associated with the source(s) (or hazards). As well as the type of source, the extent, concentration and availability of a contaminant is also assessed.

The effect of a hazard on an identified receptor is largely governed by the sensitivity of a receptor. Receptors may typically include people, buildings, animals, plants and local resources (such as groundwater, surface waters, mines etc). A change in the receptor should be considered if the end use of the site changes; for example, if a commercial site is to be

redeveloped into a residential housing estate, as a residential occupier is considered more sensitive than a commercial occupier.

The presence of contamination (as a potential hazard) does not necessary mean that there is a risk. It is the exposure pathway and the quantity of contamination that reaches the receptor that may determine the effect on a receptor (such as the integrity of a barrier between a contamination source and receptor).

The risk classifications for both likelihood and consequence are based on methodology presented in Contaminated Land Risk Assessment, A Guide to Good Practice (CIRIA C552, 2001) and has been developed from procedures outlined in DETR Circular 04/2012. The DETR, with the EA and Institute of Environment & Health, has also published guidance on risk assessment (Guidelines for Environmental Risk Assessment and Management). The guidance states that the designation of risk is based upon a consideration of both:

- The magnitude of the potential consequence (severity) of risk occurring, which takes into account both the potential severity of the hazard and the sensitivity of the receptor; and

- The likelihood of an event occurring (probability), which takes into account the both the presence of the hazard and receptor and the integrity of the pathway.

The magnitude of consequence (severity) and likelihood (probability) is defined in the CIRIA guidance, together with examples. The two classifications are then compared (as shown on Table A to obtain an estimation of risk for each pollutant linkage, ranging from very high risk to very low risk. A description of the risks and likely actions required is presented in Table B The benefit of estimating the risk in this way is that it can be revised after each investigation phase as the conceptual model and corresponding contaminant linkages are refined.

Table A: Comparison of consequence against probability

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

Table B: Description of the classified risks and likely action required

Level of Risk	Description of Classification
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. If this risk is realised, it is likely to result in significant environmental and financial liability to current and/or future site owners/occupiers. Urgent investigation (if not already undertaken) and remediation is likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. If risk is realised, it is likely to present a sizeable environmental and financial liability to current and/or future site owners/occupiers. Urgent investigation is required and remediation work may be necessary in the short term and likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the potential environmental liability. Some remedial works may be required over the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Limited investigation may be recommended to clarify the risk, dependent on the sensitivity of the receptor and view point of those of interest. Any remedial works are likely to be fairly limited.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is likely to be mild or minor.

The acceptability of risk will always depend upon the view point of those of interest, whether it is an occupier of a site, a regulator or stakeholder. As a result, it could be that action will be required to deal with a level of risk even if it is classified as very low.

APPENDIX G

NOTES ON LIMITATIONS

General

Mewies Engineering Consultants Ltd (M-EC) has completed the attached report for the use of the Client detailed on the front cover and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed.

Third parties should not use or rely upon the contents of the report unless written approval has been gained from M-EC; (due to legal requirements, a charge may be levied against such approval).

M-EC accepts no responsibility or liability for:

a) the consequences of this documentation being used for any purpose or project other than that for which it was commissioned, and

b) this document to any third party with whom approval for use has not been agreed.

Phase I Environmental Risk Assessments, Desk Studies and Site Audits

The work completed and utilised to provide this report comprises a study of available documentation. The opinions and results presented in this report have been arrived at by utilising the finite amount of data available at the time of writing and are relevant only to the purpose for which the report was commissioned. The data which has been reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative information pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, M-EC reserves the right to review this information and, if warranted, to modify the opinions presented in the report accordingly.

It should be noted that the risks which are identified in this report are perceived risks based on the available information at the time of writing and that the actual risks associated can only be assessed following a physical investigation of the site.

Phase II Intrusive Investigations

The intrusive investigation has been completed to provide information concerning the type and degree of contamination present along with ground and groundwater conditions which facilitates a reasonable risk assessment to be completed. The stated objectives of the ground investigation have been limited to assessing the proven risks which are associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work, chemical testing and monitoring completed has potentially been restricted by the short timescale available, and the locations of exploratory holes undertaken have potentially been restricted to areas unoccupied by buildings(s) and buried services. A more comprehensive post demolition / decommission investigation may be required if the site is to be redeveloped. For these reasons any costs included in relation to site remediation must be considered as tentative only at this time.

The exploratory holes investigate only a small volume of the ground in relation to the size of the site and therefore, can only provide a "snap shot" or general indication of ground conditions located on the site. The fact that the site has been investigated does not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided in this report take into account currently available guidance values relating to acceptable contamination concentrates; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Intrusive Geo-environmental Investigations

The intrusive investigation of the site has been completed to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of any associated risks together with engineering and development implications.

The exploratory holes investigate only a small volume of the ground in relation to the size of the site and therefore, can only provide a "snap shot" or general indication of ground conditions located on the site. The opinions provided and recommendations given in this report are based only on the ground conditions apparent at the site of the exploratory holes. It should be noted that there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments concerning groundwater conditions are based on observations made at the time of completion of site work, it should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects.

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

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

- Civil Engineering
- Transport
- Road Safety
- Flood Risk & Drainage
- Structures
- Geo-environmental
- M-EC Acoustic Air
- Utilities
- M-EC Geomatics
- Street Lighting
- Expert Witness

Birmingham
Brighton
Leeds
Leicester
Milton Keynes
Nottingham

T: 01530 264 753
group@m-ec.co.uk
www.m-ec.co.uk

Consulting Development Engineers