



Phase I Geo-Environmental Desk Study

Land adjacent to Horseshoe Farm

London Road
Barley
Hertfordshire
SG8 8JE

Prepared for:

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EPS Project Reference: UK25.7240

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LAND ADJACENT TO HORSESHOE FARM, LONDON ROAD, BARLEY

NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a Phase I Geo-Environmental Desk Study which was carried out to assess risks posed by contaminated land and to provide an initial assessment of geological and geotechnical aspects to inform how the proposed development might be affected.

- The site currently consists of a disused barn and outbuildings which form part of Horseshoe Farm within the village of Barley, Hertfordshire. The proposed scheme involves the conversion of the central building to a residential dwelling and associated private garden.
- The site is reported to be underlain by superficial Diamicton of the Lowestoft Formation above chalk bedrock, both of which have notable resource potential and groundwater is protected in the local area. No significant surface watercourses are present nearby. Therefore, the site is considered to lie within an area of low to moderate environmental sensitivity.
- Historically the site consisted of a rectangular agricultural building and remained unchanged until the mid-1970s. From this time, two more buildings were constructed, with limited development since, albeit an infilled pond is anticipated in the southeast. With regards to the surrounding area, a few sources of potential contamination were identified, but are not considered to pose a significant risk to soil or groundwater beneath the plot.
- Based on the information collected, particularly the site's historical use as being located within or next to a farmyard, there is a possibility that infilled soils (made ground) and localised contamination could be present in proposed garden areas, which could impact future site users particularly. Therefore, it is recommended that some modest ground investigation is undertaken to collect shallow soils samples to confirm if the material meets modern standards for residential gardens.
- A copy of this report should be provided to the Environmental Health department of North Hertfordshire District Council so that it may be used to support planning proposals for the site.

By their very nature, the above bullet points represent a simplified summary of our work and **must not** be relied upon to form the basis for key decisions for the proposed development. A full picture is provided in the following report, or alternatively give us a call and we'll talk you through it.



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Title:	Phase I Geo–Environmental Desk Study - Land adjacent to Horseshoe Farm, London Road, Barley	
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The report has been written, reviewed and authorised by the persons listed above. It has also undergone EPS' in house quality management inspection. Should you require any further assistance regarding the information provided within the report, please do not hesitate to contact us.

The National Planning Policy Framework requires a competent person to prepare site investigation information, which is defined as a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation. EPS considers that it fulfils these criteria and would welcome any request for staff CVs or case studies to demonstrate it.

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1 INTRODUCTION

In January 2025, Environmental Protection Strategies Ltd (EPS) was commissioned by Brown & Co on behalf of Mr Geoffrey Wilkerson to complete a Phase I Geo-Environmental Desk Study for Land adjacent to Horseshoe Farm, London Road, Barley, Hertfordshire, SG8 8JE ('the site'); see Figure 1.

The work was commissioned to support full planning proposals for the conversion of a barn to one 4-bed dwelling, including single storey extension, and associated infrastructure works, by addressing the requirements of the planning process, as relating to contaminated land. The proposals have been filed under North Hertfordshire District Council application reference: 23/02707/FP.

This report presents the findings, conclusions, and recommendations of the Phase I Desk Study undertaken for the site as instructed.

1.1 Objectives

The purpose of this desk study is to evaluate the potential contaminant linkages which may be active at the site in its current condition, or could become active in future, and to determine if any action is required to investigate them further or to break them.

This is achieved by carrying out the following activities:

- a) Examining the site history - late 1800s to present day, through collection of historical maps of the area, site records, records held by relevant local authorities, the Environment Agency and review of other information databases.
- b) Characterising the site's environmental and geological sensitivity through examination of existing geological, hydrogeological, topographical, and historical maps and aerial photographs of the area.
- c) Identifying Potential Areas of Concern (PAOC's) through a combination of historical map and data review.
- d) Consideration of any future plans for the site and the effects any proposed changes may have on contaminant linkages over time.
- e) Development of a Conceptual Site Model through a Preliminary Risk Assessment to evaluate the potential risks posed by the site and make recommendations for any further work that may be required to ensure suitability for use and safe development. In accordance with the Environment Agency's *Land Contamination: Risk Management* guidance and the *National Planning Policy Framework*.

1.2 Project Limitations and Constraints

The purpose of this report is to present the findings of a Phase I Geo-Environmental Desk Study conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, EPS makes the following statements:



This report does not include specific investigation for the presence of either Potential Asbestos Containing Material (PACM) or Japanese Knotweed at the subject site however, if obvious evidence of either is observed during EPS site walkover, details will be provided in this report. Specialist contractors should be commissioned to make detailed assessments and recommendations if these materials are suspected.

2 SITE CHARACTERISATION

The following section provides a summary of the information collected in relation to the site location and history.

2.1 Site Location and Description

Detail	Description
Location	The site is located approximately 6.4km southeast of Royston, in the west of the village of Barley, immediately south of London Road.
Grid Reference	539730, 238230
Topographic Elevation	The site lies around 112m Above Ordnance Datum (AOD) and is relatively flat.
Description of Site	A walkover survey was completed by EPS in January 2025 and the study area was found to comprise a roughly rectangular plot of land measuring 0.24 hectares. Access was gained from the east via Smith's End Lane, which leads to a private road that arcs between structures located just inside the eastern boundary, and the main barn (east of centre); which is to be converted as part of proposed development plans. This barn consisted of a disused timber frame and clad structure, with corrugated sheet metal roofing and some internal brick walls. A large, bolted door was noted on the eastern elevation, and adjacent to this, along the southern side is a concrete extension. To the west of the building is a smaller shed and sporadic miscellaneous farm equipment. Further west are two rectangular buildings of similar construction, made with timber and metal. These structures run just inside the northern and southern borders of this portion of the study area, and are surrounded by overgrown vegetation. Trees, bushes and shrubs also extend further west, covering much of this third of the plot. An open-sided structure was noted opposite the main barn to the east, made of the same timber cladding and a tiled roof. This barn appeared to have stored more miscellaneous farm equipment and was partially obscured by further climbing plants. The buildings all benefited from concrete floors throughout and no evidence of fuel or chemical storage was identified.

Detail	Description
Description of Site (cont.)	Anecdotal evidence from the Client indicates the main barn is approximately 100 to 150 years old, and was used to ration/ store animal feed.
Surrounding Land Use	The site is surrounded to the south and west by undeveloped agricultural fields. To the north and east are residential dwellings within the village of Barley, including the main farmhouse associated with Horseshoe Farm.

A plan showing the site location is provided as Figure 1 and the current site layout is detailed on Figure 2, with an aerial photograph included as Figure 3. Selected Site Photographs are included as Appendix A along with the Walkover Notes, a proposed development plan has been included as Appendix B and relevant extracts of a Landmark Envirocheck report are included as Appendix C.

2.2 Geo-Environmental Setting

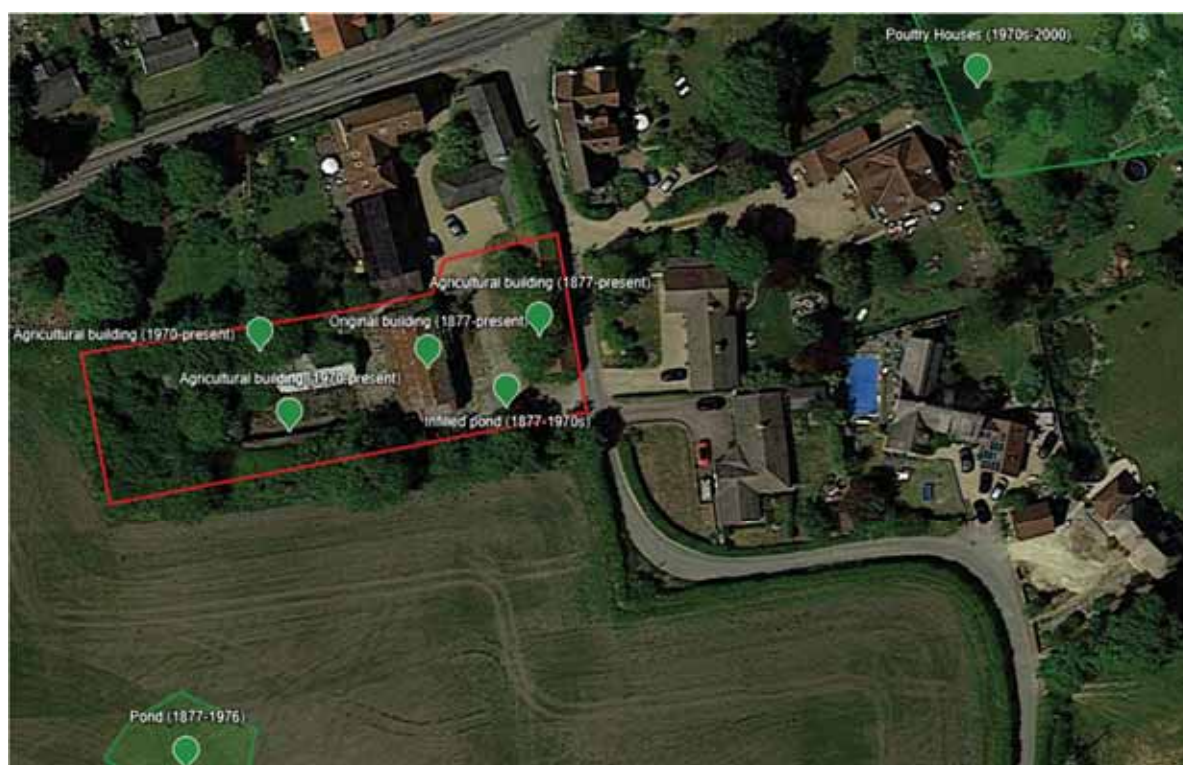
Detail	Description	
Geology	Geological maps of the area indicate the site is underlain by superficial Diamicton of the Lowestoft Formation and Lewes Nodular Chalk Formation and Seaford Chalk Formation bedrock below. Information on the site’s geological context is included as Appendix D.	
British Geological Survey (BGS)	An historic borehole log has been obtained from the BGS for a location approximately 260m northwest of the site, which recorded ‘boulder clay’ to 10.67m, overlying loose chalk to the maximum borehole depth (51.5m). Resting groundwater level was reported at approximately 63mbgl. A copy of the historic borehole is included within Appendix D.	
Geological Hazards	Hazard	On-site Risk
	Mining (non-coal)	Rare
	Collapsible Ground	Very Low
	Compressible Ground	No Hazard
	Ground Dissolution	Very Low
	Running Sand	Very Low
	Landslide	Very Low
	Shrinking / Swelling Clay	Low
	No natural or man-made cavities are listed within 1km.	
Radon	The Envirocheck indicates the site to lie within a lower probability radon area, where less than 1% of homes are estimated to be at or above the Action Level. It also confirms that no radon protective measures are necessary in the construction of new dwellings or extensions.	

Detail	Description		
Hydrogeology	Groundwater vulnerability maps of the area indicate the superficial geology is classified as a Secondary Aquifer, whilst the bedrock is classified as a sensitive Principal Aquifer. No groundwater abstractions have been noted within 500m, however the plot is located within a Zone 3 (Total Catchment) Source Protection Zone (SPZ). Groundwater vulnerability maps are included as Appendix E.		
Hydrology & Flood Risk	The nearest surface water feature is located 215m southeast of the site and appears to be a small pond. The nearest watercourse comprises an unnamed drain around 320m south, with the more notable watercourses Wardington Bottom and Cumberton Bottom around 900m west and 1.1km east respectively. No surface water abstractions are located within 500m. Review of the EA Flood Zone Map for the area indicates that the site lies within Flood Zone 1, which is defined as the area with a low potential risk of flooding from fluvial or tidal sources. It should be noted that the EA maps do not take into account flooding from poor drainage, or groundwater. A copy of the flood map for the site and surrounding area is also included within Appendix E.		
Landfill & Waste	No active or historic landfills are recorded within 500m. Additionally, there is no potentially infilled land entries within 500m, the closest being 658m southwest of the boundary and listed as an unknown pit or quarry. However, there are four areas of potentially infilled land (water) noted within 250m, the closest of which is around 86m south.		
Permitted Industrial Activity	No permitted industrial activity has been recorded within 1km of the site.		
Industrial Land Use & Points of Interest	The Envirocheck report lists 5 industrial land uses/ points of interest within 500m, the most pertinent of which are summarised below.		
	Land Use	Distance (Direction)	Status
	John Foy Ltd (Car Body Repairs)	249m (NE)	Active
	Cooper (Car Dealers)	318m (NE)	Inactive
	Junk Busters (Waste Disposal Services)	353m (NE)	Inactive
	Fbc (Heating Equipment- Sales and Service)	404m (N)	Inactive
	One fuel station entry is listed 522m north, known as Richmond Garage, which is possibly not active.		

Detail	Description
Pollution Incidents	No pollution incidents have been recorded within 500m.
Previous Investigation or Remediation	EPS are not aware of any previous site investigations or remedial works undertaken at the site.
Sensitive Land Use	The site lies within a Nitrate Vulnerable Zone where surface and groundwater are identified as being at risk from nitrates leaching from agricultural land.

2.3 Site History

A summary of historical map data from 1887 to 2023 is provided below. Key points are highlighted and copies of relevant historic maps and any others examined during the investigation are included in this report as Appendix F.



- From 1887 to the mid-1970s, the site consisted of the existing agricultural buildings in the centre east of the plot and along the eastern boundary with a small orchard possibly present to the west. The property remained unchanged until approximately 1976 when two more agricultural buildings were constructed, running perpendicular to the original structures and effectively replacing the orchard. A pond was also present towards the southeast corner which appears to have been infilled by the 1970s. During this time, the site appeared to adopt the name Horseshoe Farm and has remained relatively unchanged since.

- In the late 1800s, the farmhouse and associated buildings appeared to extend offsite to the north and remained for such a purpose until it was recently adjusted for predominantly residential use. As in the present, the land to the south has broadly remained undeveloped throughout the period whilst the village of Barley has gradually expanded to the north and east through the documented map series. The only real exception to this was a poultry houses located around 100-200m east between the 1970s and 2000.

3 PRELIMINARY RISK ASSESSMENT & CONCEPTUAL SITE MODEL

In accordance with the Environment Agency's *Land Contamination: Risk Management* guidance, there are three stages to managing contaminated land (Risk Assessment, Remedial Options Appraisal / Remediation and Verification). This section outlines the first tier of Stage 1, the Preliminary Risk Assessment.

The following section provides a review of the contaminant linkages that may be active at the site, whereby EPS have examined the potential sources that may be present as a result of historic and / or current site activities and where potential interaction between these sources and the identified human / environmental receptors may occur.

3.1 Background

A Desk Study comprises the first stage of any geo-environmental assessment, the purpose of which is to determine what potentially contaminative activities may have occurred at the property or the surrounding area which may pose an environmental or geological risk to site users, the surrounding environment or proposed development, either at present or in the future.

The method used in this investigation to assess the environmental risk posed is based on the concept of 'contaminant linkage', which considers the following three factors:

Source	The location from which an environmentally hazardous / contaminative substance is, (or was,) derived.
Pathway	A route or mechanism via which a source could come into contact with a receptor to cause significant harm.
Receptor	An environmentally sensitive object or condition e.g. person, property, controlled water, or ecological system, which may be present now or in future.

If all three factors are identified, there is the potential for a 'contaminant linkage' to be active, which could result in significant harm being caused to the environment or human health.

3.2 Source Characterisation

The following potential contaminant sources have been identified at the site and in the surrounding area:

Potential Source	Source Description	Principal Contaminants of Concern
Current Site Use	Infill material of unknown origin (Made Ground) used to level areas beneath the former and existing buildings/ hardstanding.	PAH, Metals & ACM
	Current and historic use of the site as part of Horseshoe Farm.	TPH, PAH, Metals & ACM
	Possible infilled pond in the southern section of the plot from the 1870s to at least 1960.	PAH, Metals, ACM & Ground Gases (CH ₄ , CO ₂)
	Historic orchard in the western third of the plot.	Metals, Herbicides & Pesticides
Current / historic surrounding land use	Historically infilled ponds located within 100m of the boundary.	Ground Gases (CH ₄ , CO ₂)
	Historic commercial/industrial use of the surrounding area including poultry houses and car body repairs.	VOC, TPH, PAH, Metals

Notes:

PAH	Polycyclic Aromatic Hydrocarbons	ACM	Asbestos Containing Materials
VOC	Volatile Organic Compounds	TPH	Total Petroleum Hydrocarbons
CH ₄	Carbon Dioxide	CO ₂	Carbon Dioxide

3.3 Potential Receptors

A framework for the assessment of risks arising from the presence of contamination in soils has been produced by the Environment Agency and the Department for the Environment, Food and Rural Affairs (DEFRA) and is presented with the report: 'Using Science to Create A Better Place: Updated Technical Background to the CLEA Model – Science Report SC050021/SR3'. This guidance document defines a series of standard land-uses which have been further developed into six generic landuses in the Category 4 Screening Levels project for Land Affected by Contamination (DEFRA/Contaminated Land: Applications in Real Environments (CL:AIRE) Project Report SP1010, 2014) which form a basis for the development of the Conceptual Site Model.

Risks posed to controlled waters have been considered in line with the Environment Agency's *approach to groundwater protection* (v1.2, 2018) and associated position statements.

The proposed development plan for the site is for the conversion and extension of one of the buildings to form a new dwelling with associated private gardens. This proposed land use has been considered as:

- Residential (with home-grown produce)

In view of the environmental setting, current and potential future land use of the site and surrounding sites, the potential receptors for any contaminant impact are discussed below:

Receptor	Site Specific Description
Human	Future site users, construction workers involved in the site redevelopment, and those working and living in the surrounding area have the potential to be at risk from exposure to potential contaminants of concern (CoCs).
Groundwater	The site is reported to be underlain by bedrock defined by the EA as a Principal Aquifer, with the overlying superficial unit a Secondary Aquifer. The site is also in a Total Catchment SPZ, and on this basis, groundwater should be considered as a sensitive receptor to site derived contaminants of concern at this stage.
Surface Water	The nearest surface water feature is a pond located 215m southeast of the site, with the nearest surface watercourse comprising an unnamed drain around 320m south. Given the distance and nature of these features, they are not considered to be a sensitive receptor to site derived contamination.
Flora and Fauna	The proposed development includes the provision of private gardens. Some of the identified contaminants of concern are known to be phytotoxic and as such, the potential for this impact should be considered.
Buildings & Infrastructure	Subsurface structures are likely to be present at the site which may be adversely affected by the potential presence of the identified contaminants of concern. These include concrete used in building foundations, buried potable water supply pipes and other service lines and pipes.
Adjacent Land	Adjacent properties are mainly residential units, which could be at risk from potential contaminants found at the site.

3.4 Potential Pathways

Where contaminants may be present in soil, there are a number of potential pathways that enable human receptors to come into contact with or be exposed to them. The most direct pathways, considered under current UK legislation, can be summarised as follows:

- Direct ingestion of contaminated soil
- Ingestion of household dust
- Ingestion of contaminated vegetables
- Ingestion of soil attached to vegetables
- Dermal contact with contaminated soil
- Dermal contact with household dust
- Inhalation of fugitive soil dust
- Inhalation of fugitive household dust
- Inhalation of vapours outdoors
- Inhalation of vapours indoors

Clearly, not all of these potential pathways apply for every standard land-use. For example, ingestion of contaminated vegetables will not apply to land uses other than residential with plant uptake and allotments.

However, in addition to direct exposure pathways, a number of physical transport mechanisms / pathways may also exist at a site that allow remote or less accessible contaminants in soil or groundwater to reach human or environmental receptors both at a site and beyond the site boundary. These include the following:

- Downward and lateral movement of contaminants in soil either by gravity or through being 'leached' by percolating rainwater.
- Lateral migration of contaminants dissolved in groundwater.
- Direct seepage or leaching of contaminants from soil into subsurface drains or supply pipework.
- Volatilisation of contaminants from groundwater or unsaturated soils into buildings or outdoor air.

Through examination of the standard land use and environmental setting at each site, the presence of pathways and transport mechanisms described above must be considered when assessing whether a contaminant linkage may plausibly be active, and therefore be included in the conceptual site model.

3.5 Summary of Contaminant Linkages

Considering the site use and environmental setting, and the proposed land use; the plausible contaminant linkages that have been identified through the Preliminary Risk Assessment which require further investigation are summarised in the following table:

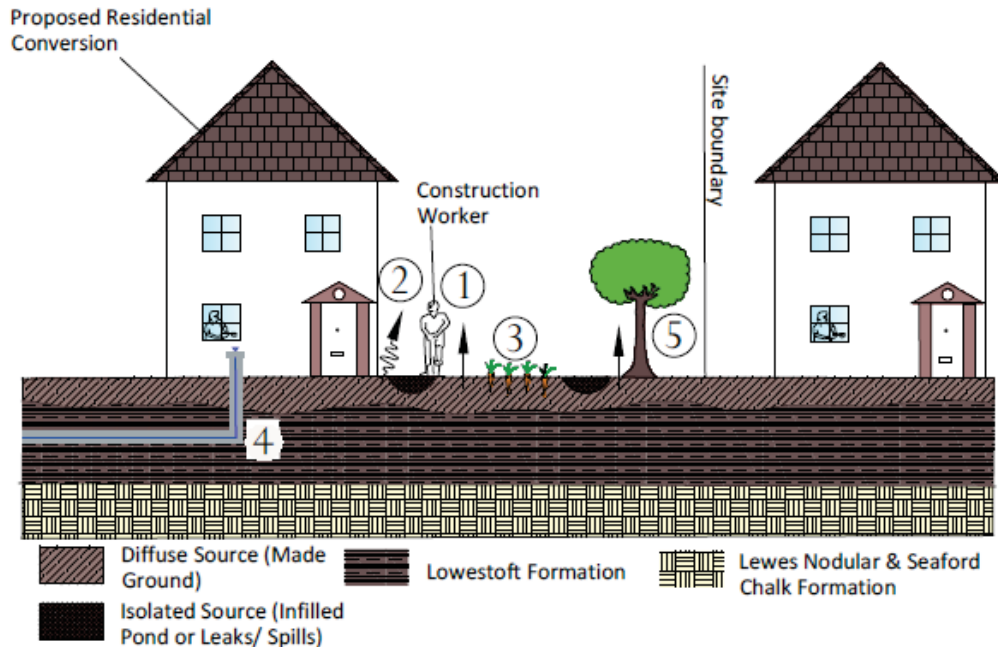
Source	Pathway	Receptor
Contaminated Soil (made ground)	Direct contact and inadvertent ingestion by eating or smoking with dirty hands	Construction workers during redevelopment & site users
	Inhalation of fugitive dusts	Site users
	Direct uptake and / or adherence of contaminated soil to vegetation and subsequent ingestion	
	Ingress / diffusion through permeable potable water supply pipes	
	Direct uptake via root systems	Plants

The following comments are made with respect to contaminant linkages which have been considered through development of the conceptual model, but have not been concluded as 'plausible' – i.e. through which a significant possibility of significant harm could occur to an identified receptor:

- Although contaminants of concern have been identified which could theoretically pose a risk to groundwater below the site, local historic borehole logs indicate that groundwater is present at depths >60m below the surface. Furthermore, the chalk aquifer is anticipated to be separated from any potential sources of contamination by a significant layer of superficial clay around 10m thick, which is typically a 'practically impermeable' material and would not allow the vertical migration of contaminants. As such, a plausible pathway between any contamination and the underlying groundwater has not been established.
- As potentially infilled ponds have been recorded within close proximity to the site, and one within the southeast of the boundary itself, the potential for ground gas generation was highlighted. However, given the period since these features were infilled (~50+ years), and the limited size of the ponds, as well as the likely nature of the infill material, no discernible risk from ground gas generation is considered to be potentially active. However, it should be recognised that direct and indirect contaminant linkages associated with soil quality within the on-site pond should be maintained.
- Historic commercial/ industrial land uses in the local area have also been noted as viable sources of contamination, however, the vast majority of these were located at a distance greater than 250m from the site, whilst a long period has elapsed since the nearer poultry houses were active. As such, risks associated with these offsite sources of contamination are considered to be negligible.
- Agri-chemicals may have been historically utilised on-site during the former possible use as an orchard, although given the small scale nature of this section, these are unlikely to have been applied in significant quantities, if at all. Furthermore, for the quantities in which they are likely to have been applied, and given the low residence time of these contaminants in soil, it is considered highly unlikely that significant pesticide or herbicide contamination associated with these sources would still be present in shallow soils within concentrations capable of posing a risk to on-site receptors or controlled waters.

The following diagram provides an illustration of the plausible contaminant linkages that may be active at the site and which may need further investigation or control to ensure safe development:

Land adjacent to Horseshoe Farm, Barley - Illustrative Conceptual Site Model



- 1 Direct contact and inadvertent ingestion by eating or smoking with dirty hands
- 2 Inhalation of fugitive dusts
- 3 Direct uptake and / or adherence of contaminated soil to vegetation and subsequent ingestion
- 4 Ingress / diffusion through permeable potable water supply pipes
- 5 Direct uptake via root systems

3.6 Key Areas of Potential Concern & Uncertainty

The main area of focus within the property boundary is the potential for the interaction between ground workers/ future site users and potentially contaminated shallow soils on-site, during both the redevelopment works and post construction phase when the private gardens have been established. Given the nature of the former site use, infilled soils could prevail throughout the sub surface, but particularly beneath sections of hardstanding, current and historic buildings and within the footprint of the former pond.

4 GEOTECHNICAL GROUND MODEL

Geological records indicate the ground conditions to comprise superficial Lowestoft Formation overlying chalk bedrock, although given the historic use, made ground is anticipated to be present at the surface. A conceptual geotechnical ground model is provided in the table below which assesses design elements, anticipated strata and ground conditions:

Strata	Foundations		
	Allowable Bearing Pressure	Settlement	Volume Change Potential
Made Ground	Not appropriate as a bearing strata	High sensitivity	Depends upon the soil composition
Lowestoft Formation	75 to 125kN/m ²	Moderate sensitivity	Medium
Lewes Nodular Chalk Formation & Seaford Chalk Formation	75 to 150kN/m ²	Low sensitivity	Low
	Drainage – Permeability		
Made Ground	Not suitable for infiltration drainage		
Lowestoft Formation	Unlikely suitable for infiltration drainage		
Lewes Nodular Chalk Formation & Seaford Chalk Formation	Likely to be suitable for infiltration drainage		
	Concrete Grade		
Made Ground	Low to moderate risk of high sulphate levels		
Lowestoft Formation			
Lewes Nodular Chalk Formation & Seaford Chalk Formation	Low risk of high sulphate levels		

Potential Hazard	Comment
Trees & Vegetation	Some large trees have been noted around the site and as shallow soils may be cohesive this could lead to deepening of foundations.
Below Ground Structures	Some below ground structures/ foundations may be present within the sub-surface from the sites historic / current use and fill material may contain waste that could form localised obstructions.
Excavation Stability	Made ground materials are expected that are likely to be unstable in unsupported excavations.

5 CONCLUSIONS & RECOMMENDATIONS

The site is generally low to moderate risk in terms of contaminated land.

This Phase I Desk Study has identified that a number of plausible contaminant linkages have the potential to be active or to become active through the redevelopment, primarily as a result of the current and historical use of the site as a farmyard. It is also anticipated that an infilled pond could be present in the southeast, leading to the potential presence of localised fill materials.

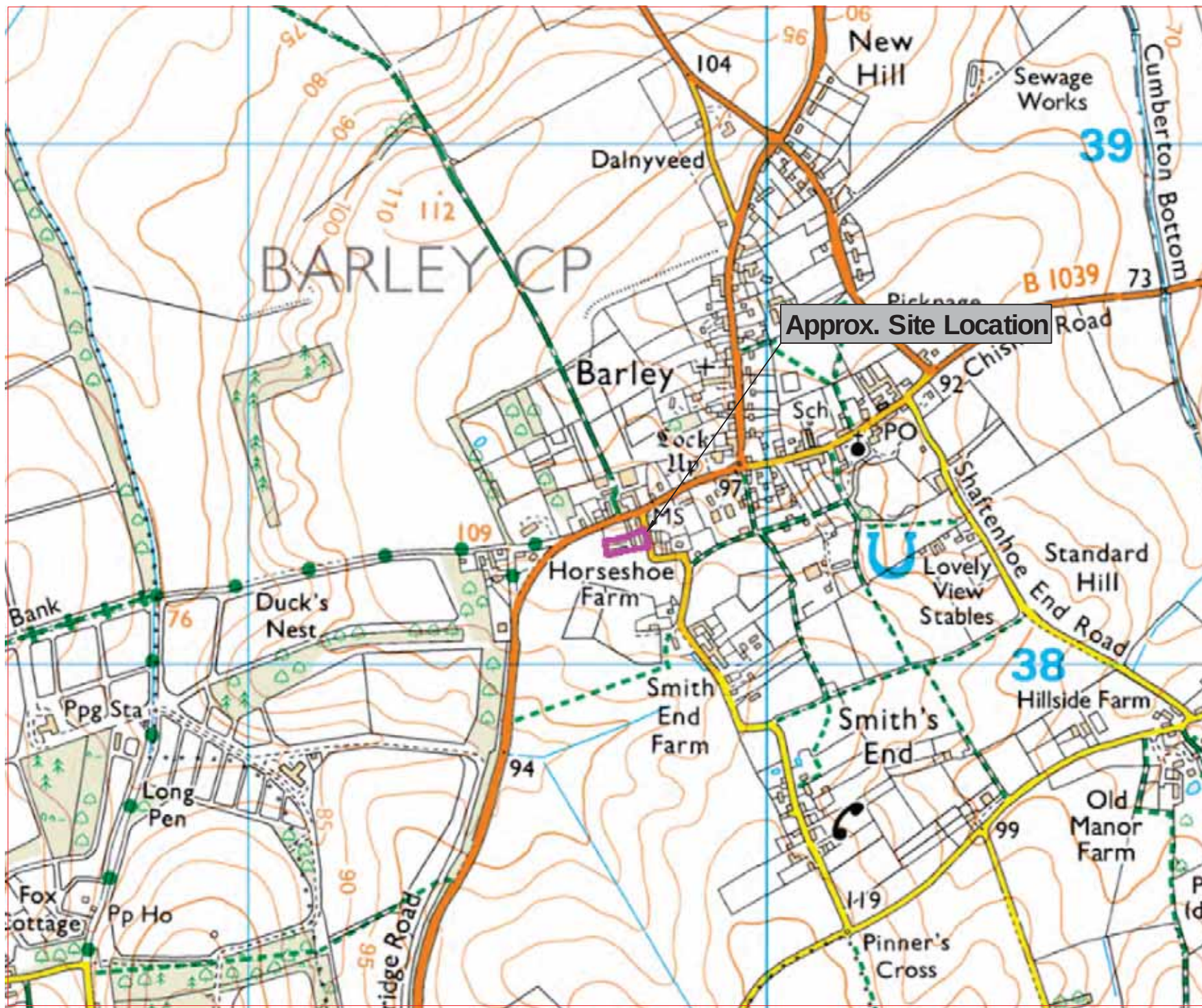
In the context of potentially unacceptable or acceptable risks as outlined within the Environment Agency's *Land Contamination: Risk Management* guidance, the contaminant linkages which pose potentially unacceptable risks and warrant further assessment to determine the most appropriate action are as follows:

- Human health risks associated with interaction between future residents and potentially contaminated shallow soils, especially within domestic garden areas.
- Potential exposure of site workers to contaminated soils during the proposed redevelopment.
- Risks posed to future infrastructure such as buried potable water supply pipework and other services.

It is therefore recommended that, initially, the identified plausible contaminant linkages should be further investigated by means of a modest intrusive investigation. Given the size of the site, this is likely to comprise the forming of a limited number of boreholes or trial pits across the plot on an appropriate sampling pattern to investigate ground conditions and obtain shallow soil samples for laboratory testing. The locations should target future garden areas which have previously been developed, as well as the location of the former pond, to confirm the nature of any infilled soils. A proposed scope and costing for this work can be provided upon request and, where appropriate discussed and agreed with the local authority prior to commencement.

A copy of this report should be provided to the Environmental Health department of North Hertfordshire District Council so that the information may be used to support planning proposals for the site.

FIGURES



KEY:
 SITE BOUNDARY

Rev	Date	Drawn	Description	Chkd



The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site
 Land Adjacent to Horseshoe Farm London
 Road Barley Hertfordshire SG8 8JE

Client
 Geoffrey Wilkerson

Title
 Figure 1 - Site Location Plan

Surveyed by:	Drawn by:	BP
Checked by:	Date:	January 2025

Scale	(A4 Sheet)	Drawing Reference
NTS		1

Job No	UK25.7240	Rev	00
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KEY:
— SITE BOUNDARY

Rev	Date	Drawn	Description	Chkd



The Geotechnical and Environmental Engineers
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Site
Land Adjacent to Horseshoe Farm London
Road Barley Hertfordshire SG8 8JE

Client
Geoffrey Wilkerson

Title
Figure 2 - Current Site Layout

Surveyed by:		Drawn by:	BP
Checked by:		Date:	January 2025

Scale	(A4 Sheet)	Drawing Reference
NTS		2

Job No	UK25.7240	Rev	00
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KEY:
SITE BOUNDARY

Rev	Date	Drawn	Description	CHK'd



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Site
Land Adjacent to Horseshoe Farm London
Road Barley Hertfordshire SG8 8JE

Client
Geoffrey Wilkerson

Title
Figure 3 - Aerial Photograph

Surveyed:		Drawn by:	BP
Checked by:		Date:	January 2025

Scale	(A4 Sheet)	Drawing Reference
NTS		3

Job No	Rev
UK25.7240	00



APPENDICES

APPENDIX A

Selected Site Photographs & Walkover Notes



KEY:
— SITE BOUNDARY

Rev	Date	Drawn	Description	CHK'd



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Site
Land Adjacent to Horseshoe Farm London
Road Barley Hertfordshire SG8 8JE

Client
Geoffrey Wilkerson

Title
Appendix A- Photo Location Plan

Surveyed by:		Drawn by:	BP
Checked by:		Date:	January 2025

Scale	(A4 Sheet)	Drawing Reference
NTS		A

Job No	UK25.7240	Rev	00
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Photo 1: View looking along the southern elevation of the main barn.



Photo 2: Photograph looking towards the north of the plot.



Photo 3: Rear of barn showing open field to south.



Photo 4: Large bolted door leading into barn from the east.



Photo 5: Photograph looking towards the west of the plot.



Photo 6: View looking towards the access point.



EPS Site Walkover Checklist

Submitted by: WEvansEPS

Submitted time: 30 Jan 2025, 10:17:50

General Information

Job Number

Horseshoe Farm

Date

30 Jan 2025

Engineer Initials

BP

EPS Lower Risk Assessment Completed?

Yes

Completed Air Quality Walkover Checklist?

No

General Site Information

Site Description

Site is a disused farm building

General Site Photo 1



general_site_photo_1-20250130-101210.jpg

General Site Photo 2



general_site_photo_2-20250130-101217.jpg

General Site Photo 3



general_site_photo_3-20250130-101230.jpg

General Site Photo 4



general_site_photo_4-20250130-101238.jpg

General Site Photo 5



general_site_photo_5-20250130-101249.jpg

General Site Photo 6



general_site_photo_6-20250130-101259.jpg

Geotechnical Evidence/Comments

Are there any abrupt changes in slope profiles?

No

Is there evidence of overburden on the slopes?

No

Is there evidence of excavation at the base of a slope?

No

Are there signs of landslip, such as tilting trees/posts?

No

Are there signs of subsidence?

No

Is there evidence of cracked ground?

No

Is there evidence of compressible ground (i.e. Peat)?

No

Is there evidence of an abrupt change in ground conditions?

No

Is there evidence of high groundwater, such as areas of waterlogged ground?

No

Do signs of water loving plants such as reeds exist?

No

Are there any ponds, streams, ditches (even if dry), springs or wells?

No

Is there vegetation?

Yes

What is the nature of the vegetation?

Overgrown shrubs and weeds

Are there trees?

Yes

Species & height of trees

Relatively large deciduous trees

Can you identify the nature and condition of vegetation on the adjoining land?

Yes

What is the nature and condition of vegetation on adjoining land?

Grazing fields

Is there evidence of former vegetation?

No Former Vegetation Seen

Is there evidence of movement in any existing structures?

No

Evidence of below ground structures & services?

No

Any evidence of mine shafts or adits? (Check Coal Authority Mapping)

No

Is there any access issues for a digger/drilling rig (slopes, height, gates etc.)?

No

Contamination Evidence/Comments

Evidence of ground contamination?

No

Evidence of ground & surface water contamination?

No

Evidence of historic site use?

Yes

Comment on historic site use?

The site is an old barn which appears to be made of wooden planks

Photo of historic site use.



photo_of_historic_site_use-20250130-101444.jpg

Have all buildings been accessed internally?

No

Evidence of /suspected asbestos?

Yes

Describe condition and form (cement/fibrous).

Unsure if it is asbestos sheet roofing or corrugated metal.

Photo of suspected asbestos



photo_of_suspected_asbestos-20250130-101523.jpg

Any man-made surfacing present?

Yes

Describe condition of hardstanding.

Concrete harstanding underlying old barn

Any fuel or oil storage present?

No

Obvious drainage features observed?

No

Any waste deposition observed, such as fly-tipped soils or chemical containers/ drums or areas of burning?

No

On-site electricity substation present, maintained/operational?

No

Evidence of previous investigation/remediation?

No

Can you identify any off-site sources of contamination?

No

Do you have any anecdotal evidence?

No

Additional Site Photos

Additional Photo 1



additional_photo_1-20250130-101616.jpg

Additional Photo 2



additional_photo_2-20250130-101627.jpg

Additional Photo 3



additional_photo_3-20250130-101636.jpg

Additional Photo 4



additional_photo_4-20250130-101642.jpg

Additional Photo 5



additional_photo_5-20250130-101706.jpg

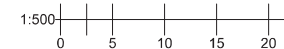


APPENDIX B

Proposed Development Plan



Issue Status		
Planning		
This drawing is copyright. Only figured dimensions to be worked to.		
Revision		By
P1	First Issue	W
P2	Amendments as per conservation officer comments	W
P3	Updated as per conservation officer comments	W



client		Wilkerson
project		Barn Conversion Smith End Lane Barley
drawing		Site Plan As Proposed
date	03.08.23	scale
drawn	WF	AD



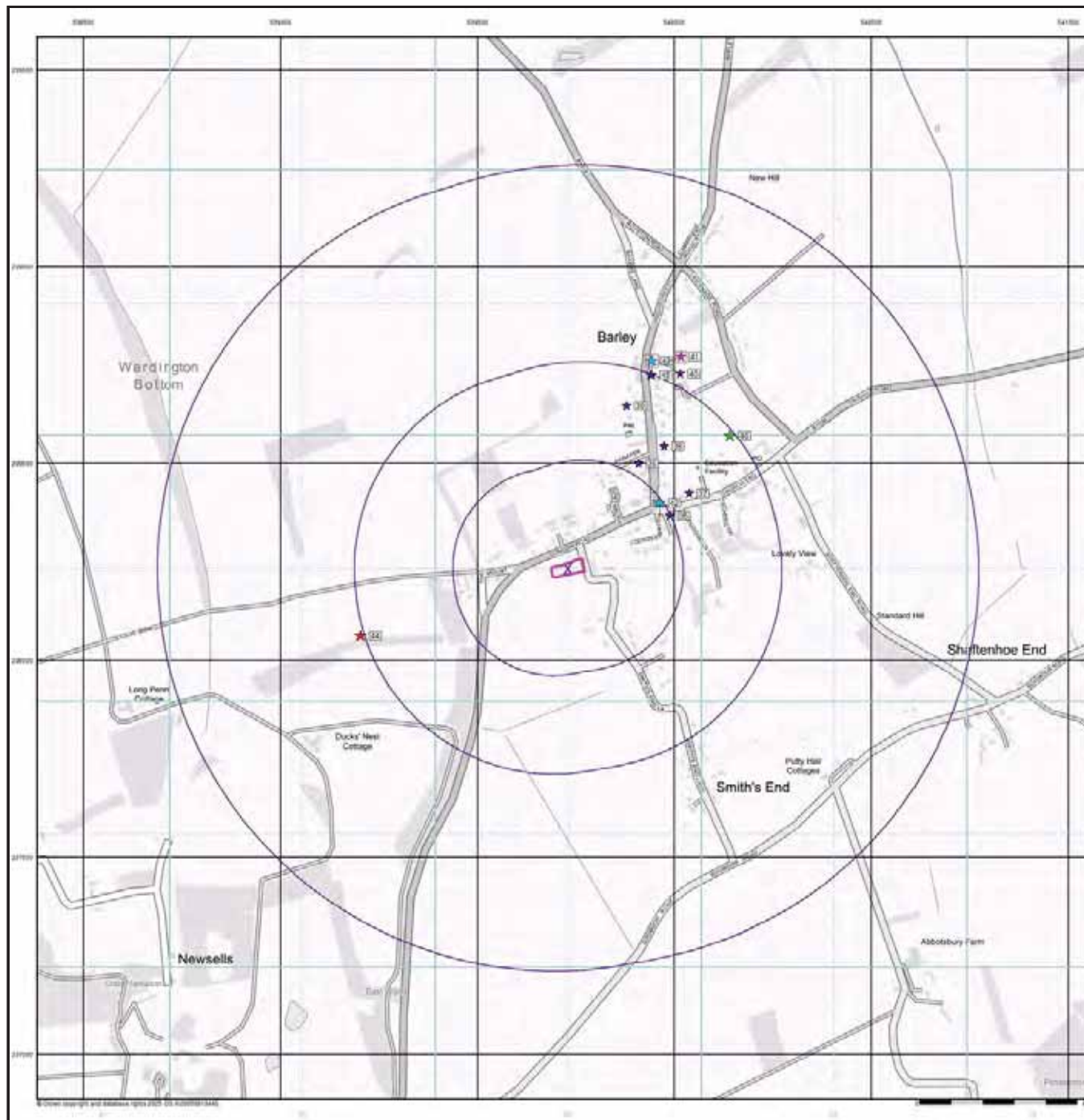
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APPENDIX C

Surrounding Land Use



Industrial Land Use Map

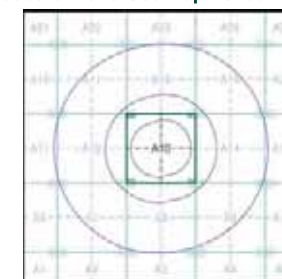
General

- Specified Site
- Slice
- Search Buffer(s)
- Map ID
- Bearing Reference Point

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

Industrial Land Use Map - Slice A



Order Details

Order Number: 367330005_1_1
 Customer Ref: UK25.7240
 National Grid Reference: 539730, 238230
 Slice: A
 Site Area (Ha): 0.24
 Search Buffer (m): 1000

Site Details

Site at 539750, 238240



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APPENDIX D

Geological Context

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	WGR	Worked Ground (Undivided)	Void	Not Supplied - Holocene
	MGR	Made Ground (Undivided)	Artificial Deposit	Not Supplied - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LOFT	Lowestoft Formation	Diamicton	Not Supplied - Anglian
	GFDMP	Glaciofluvial Deposits, Mid Pleistocene	Sand and Gravel	Not Supplied - Cromerian
	HEAD	Head	Clay, Silt, Sand and Gravel	Not Supplied - Quaternary
	ALF	Alluvial Fan Deposits	Clay, Silt, Sand and Gravel	Not Supplied - Quaternary
	HEAD	Head	Gravel, Sand, Silt and Clay	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LESE	Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated)	Chalk	Not Supplied - Turonian
	CKR	Chalk Rock Member	Chalk	Not Supplied - Turonian
	NPCH	New Pit Chalk Formation	Chalk	Not Supplied - Turonian
	TRK	Top Rock Bed	Chalk	Not Supplied - Turonian



Geology 1:50,000 Maps

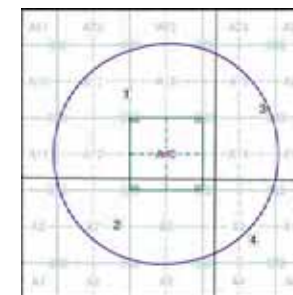
This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.

The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID: 1	Map ID: 2
Map Sheet No: 204	Map Sheet No: 221
Map Name: Biggleswade	Map Name: Hitchin
Map Date: 2001	Map Date: 1995
Bedrock Geology: Available	Bedrock Geology: Available
Superficial Geology: Available	Superficial Geology: Available
Artificial Geology: Available	Artificial Geology: Available
Faults: Not Supplied	Faults: Not Supplied
Landslip: Available	Landslip: Available
Rock Segments: Not Supplied	Rock Segments: Not Supplied
Map ID: 4	Map ID: 3
Map Sheet No: 222	Map Sheet No: 205
Map Name: Great Dunmow	Map Name: Saffron Walden
Map Date: 1990	Map Date: 2002
Bedrock Geology: Available	Bedrock Geology: Available
Superficial Geology: Available	Superficial Geology: Available
Artificial Geology: Available	Artificial Geology: Available
Faults: Not Supplied	Faults: Not Supplied
Landslip: Not Available	Landslip: Not Available
Rock Segments: Not Supplied	Rock Segments: Not Supplied

Geology 1:50,000 Maps - Slice A



Order Details:

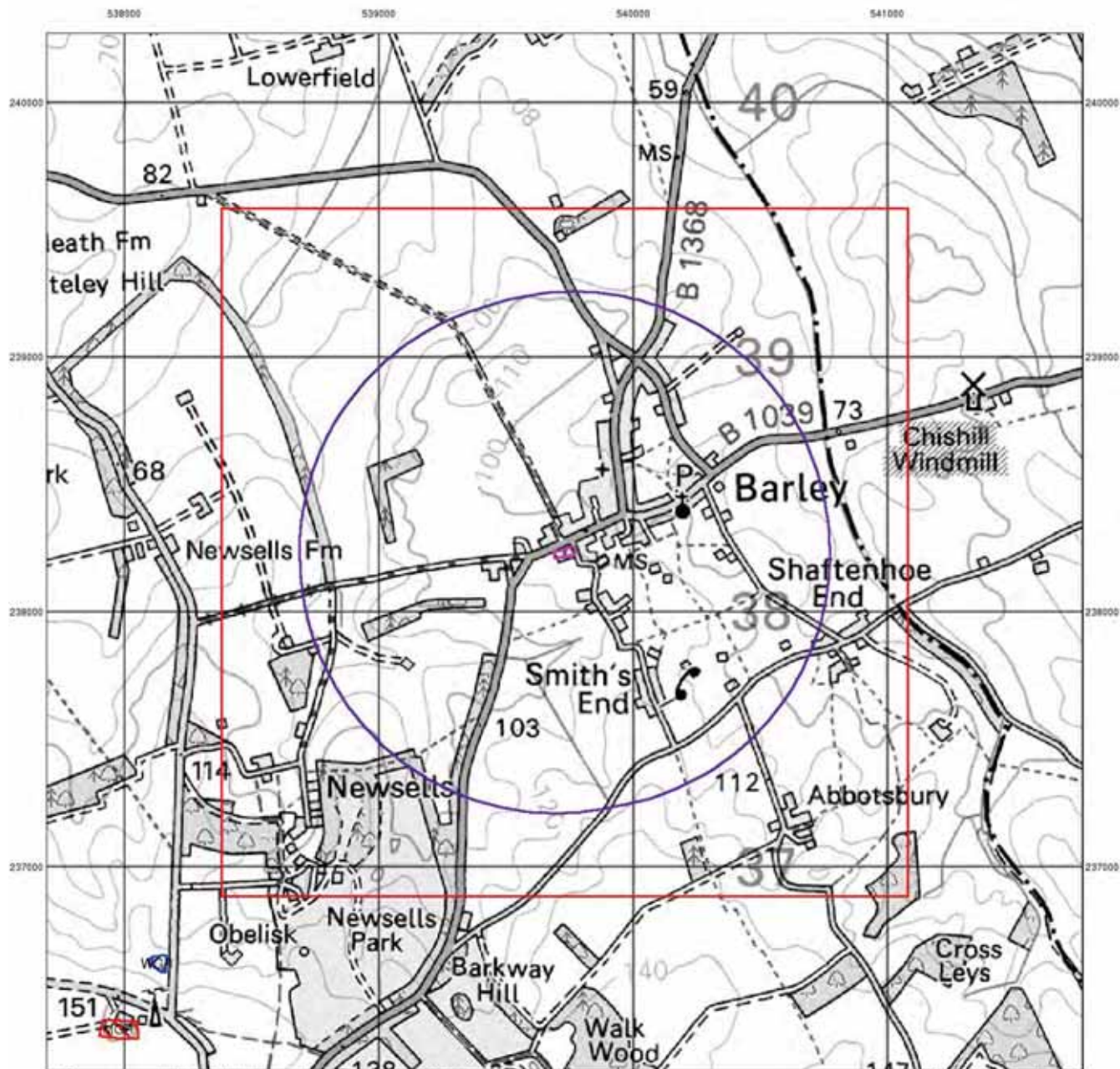
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 Customer Reference: UK25.7240
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 Search Buffer (m): 1000

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Artificial Ground and Landslip

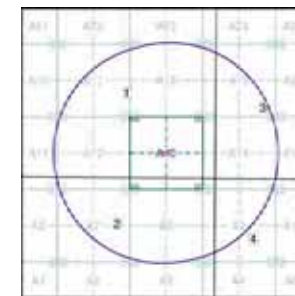
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



Order Details:

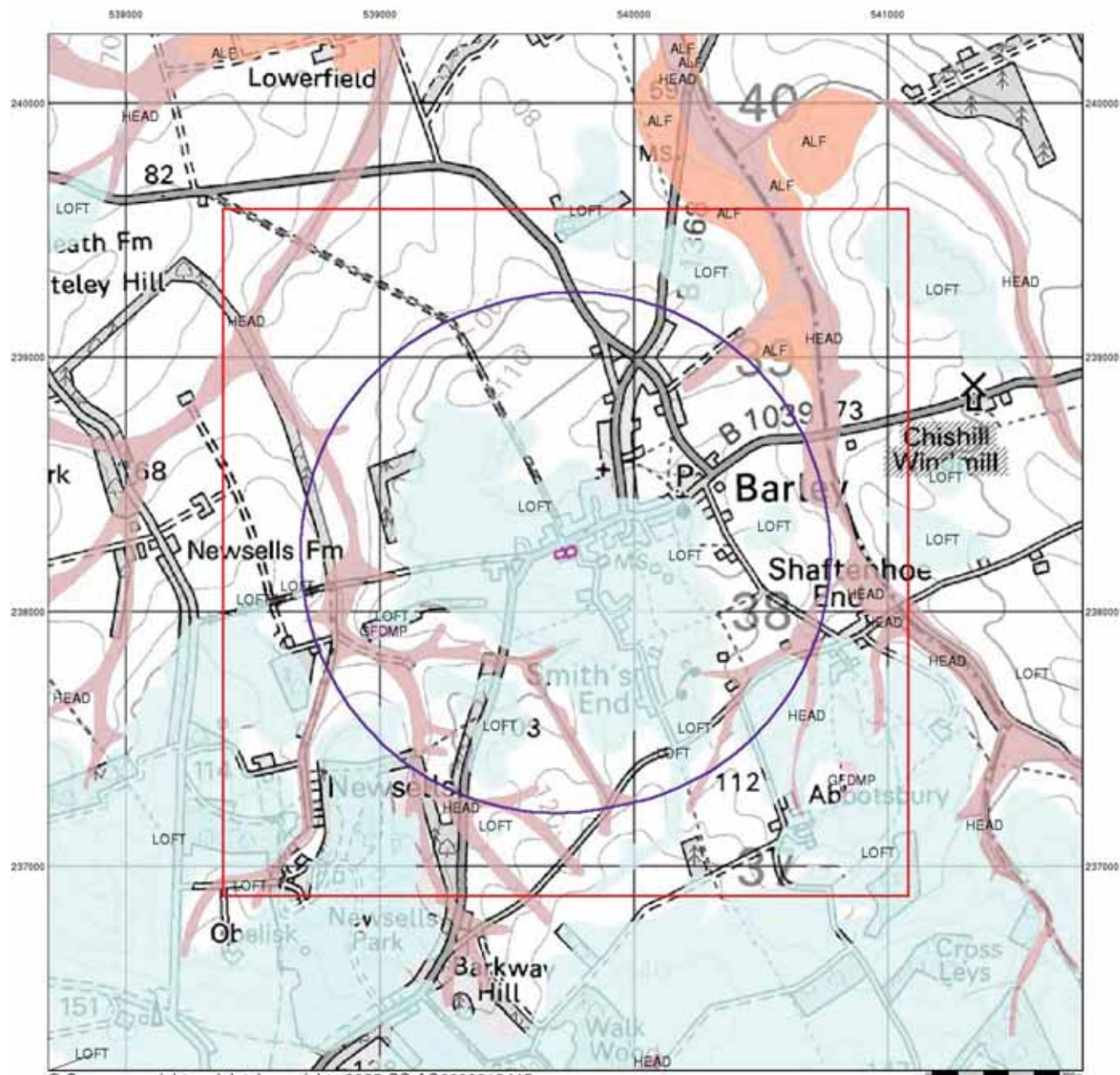
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 Customer Reference: UK25.7240
 National Grid Reference: 539730, 238230
 Slice: A
 Site Area (Ha): 0.24
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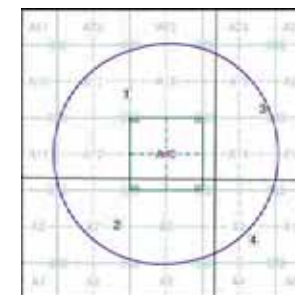
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



Order Details:

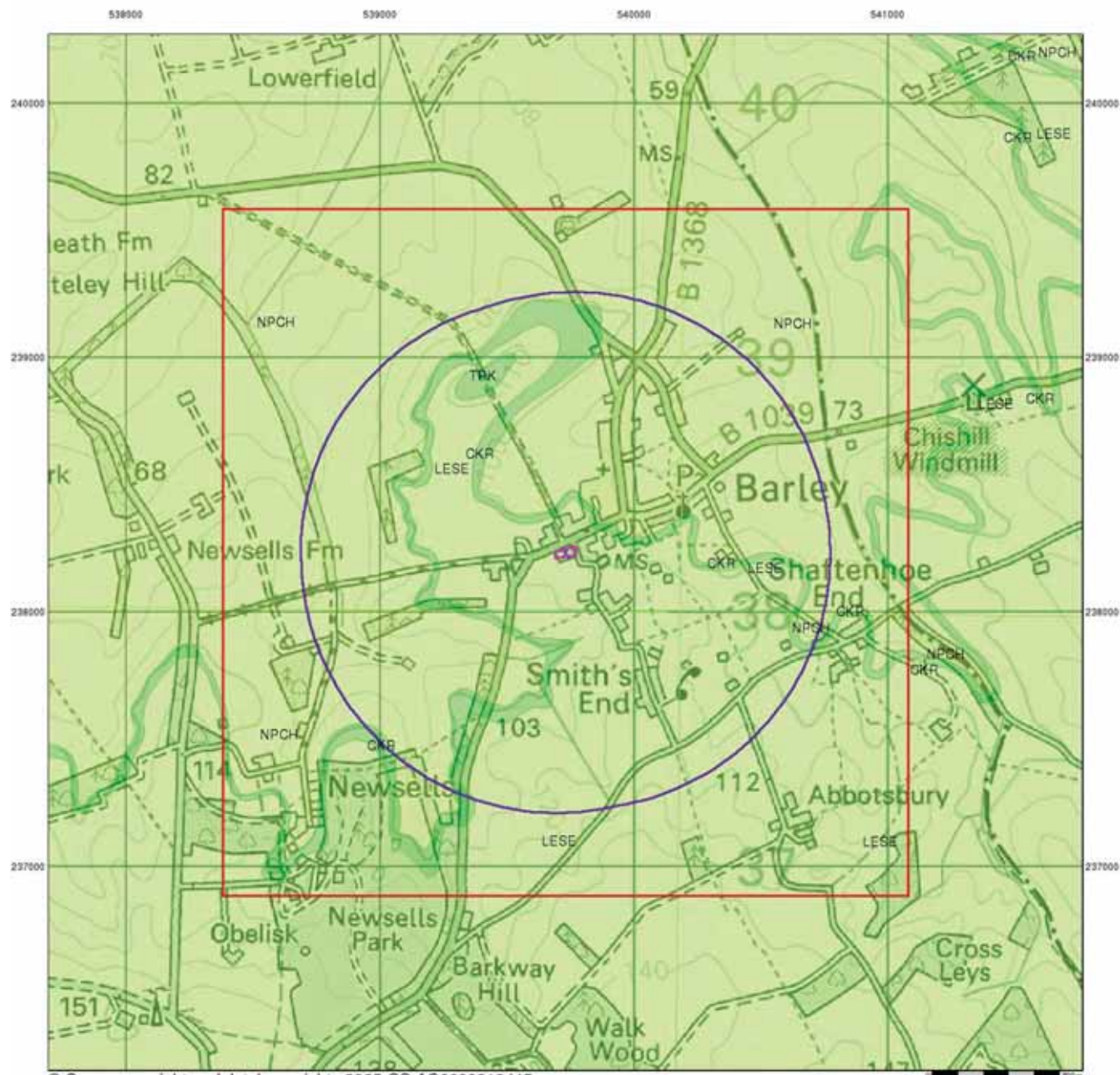
Order Number: 367330005_1_1
 Customer Reference: UK25.7240
 National Grid Reference: 539730, 238230
 Slice: A
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Bedrock and Faults

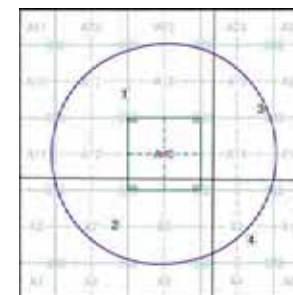
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



Order Details:

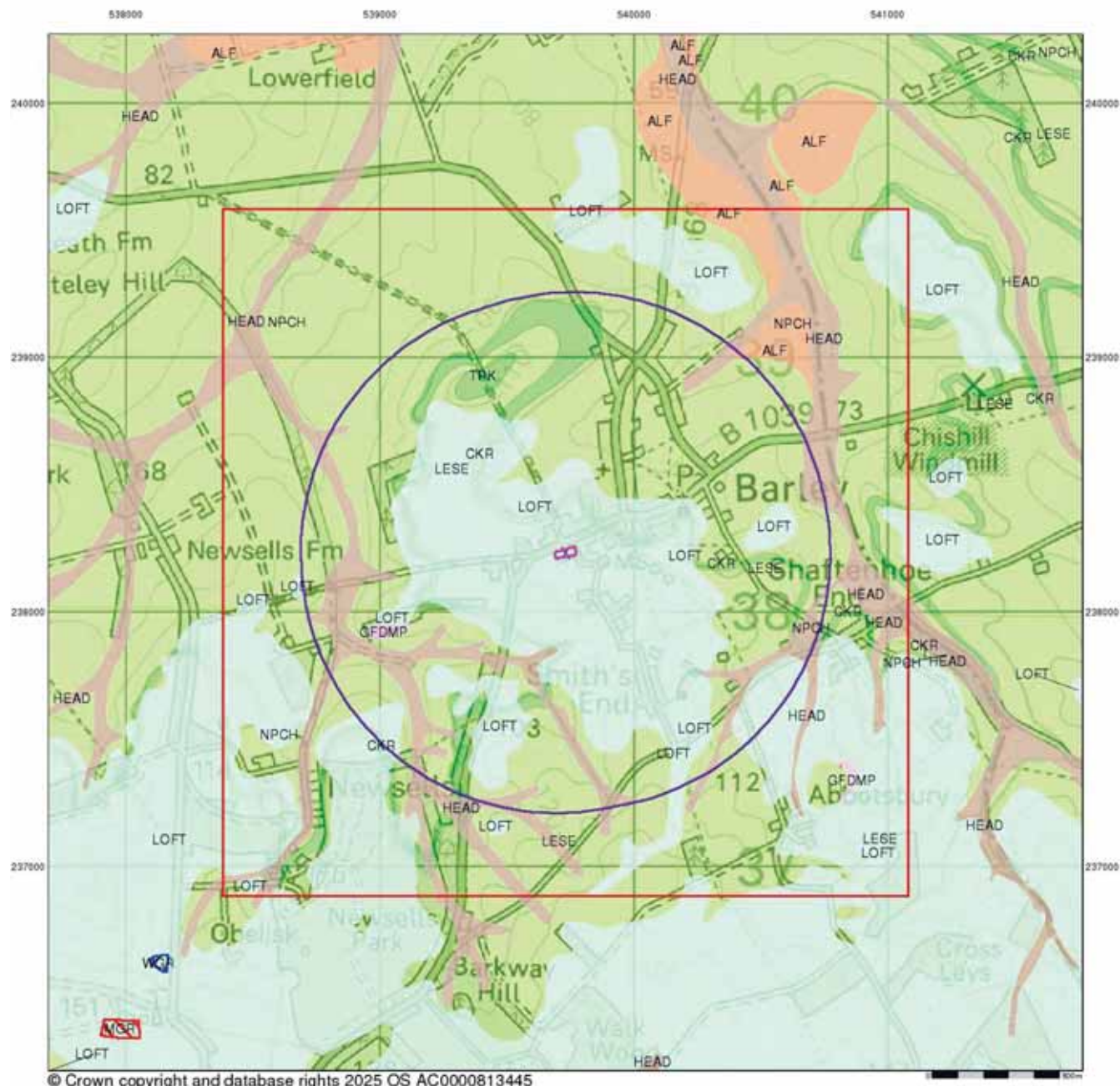
Order Number: 367330005_1_1
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 National Grid Reference: 539730, 238230
 Slice: A
 Site Area (Ha): 0.24
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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

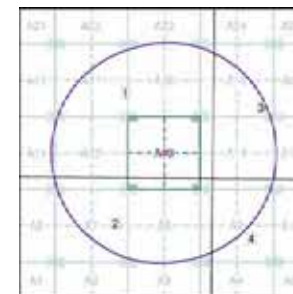
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



Order Details:

Order Number: 367330005_1_1
Customer Reference: UK25.7240
National Grid Reference: 539730, 238230
Slice: A
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Search Buffer (m): 1000

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204

107

Barley.

Ordnance Map 204, new ser. (Herts. 5, SW. 1. Geologic Map 47.

1. The Homestall, 1899.

Mod. and communicated by H. G. FEATHERBY.

362 ft. above Ordnance Datum.

Shaft of 4 ft. diameter in the clear. Top 44 ft. dry stoned.

Rest-level of water, September, 1899, 207 ft. down; February, 1900, 201 ft. down.

Boulder clay

[? Middle Chalk]

Deepened in 1902.

Loose chalk	35	} 214 ft.
Chalk, with very few flints and frequent layers of hard clunch	10	
	189	

Visited. In use. Hornsby oil engine O.D. 362 ft.
Sited on 6" N.E. 5 SW/E

20.4.42

Visited.

Sealed

PP

16/9/60

Water Supply of
Bucks. & Herts.

Page 177

204

107

TL 3951 3829

Barley.

Ordnance Map 204, new ser. (Herts. 5, SW/E Geologic Map 47.

1. The Homestall, 1899.

Made and communicated by H. G. FEATHERBY.

362 ft. above Ordnance Datum.

Shaft of 4½ ft. diameter in the clear. Top 4½ ft. dry steined.

Rest-level of water, September, 1899, 207 ft. down; February, 1900, 201 ft. down.

Boulder clay	...	...	...	...	35
[? Middle Chalk]	...	Loose chalk	...	...	10
		Chalk, with very few flints and frequent layers of hard chunch	...	160	214 ft.

Deepened in 1902.

TL 33/24

*Visited. In use. Homestall oil engine. O.D. 362 ft.
Sited on 6° Herts. 5 SW/E*

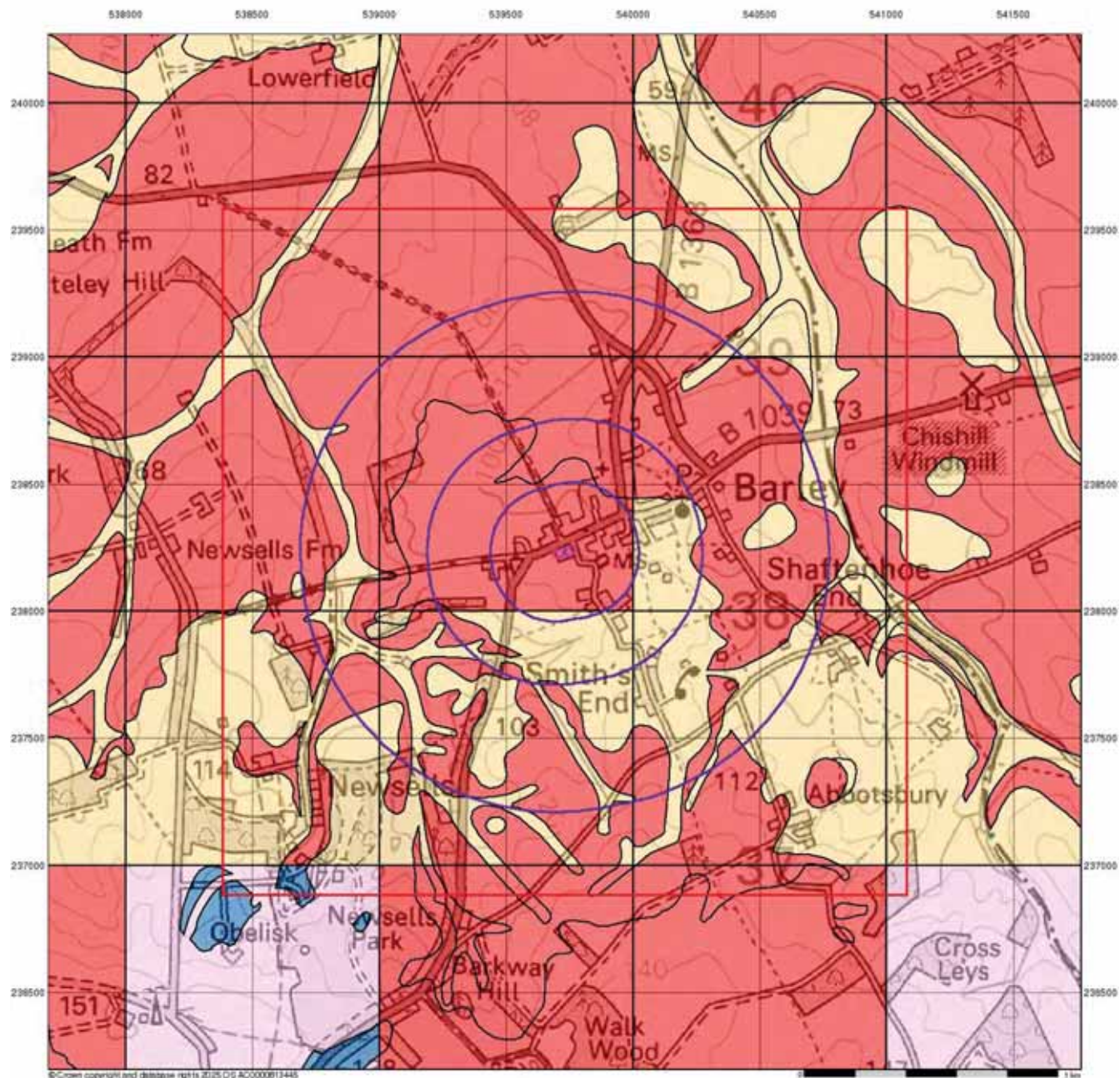
20.4.42

Visited. Sealed pp 16/9/60

Contact BGS: ngdc@bgs.ac.uk

APPENDIX E

Groundwater Vulnerability and Flood Maps



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Groundwater Vulnerability

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Bedrock Aquifers

- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

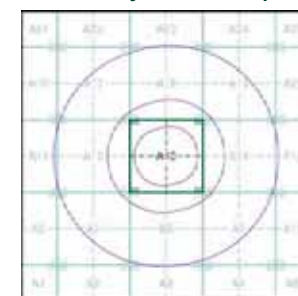
Superficial Aquifers

- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

Unproductive Aquifer

Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

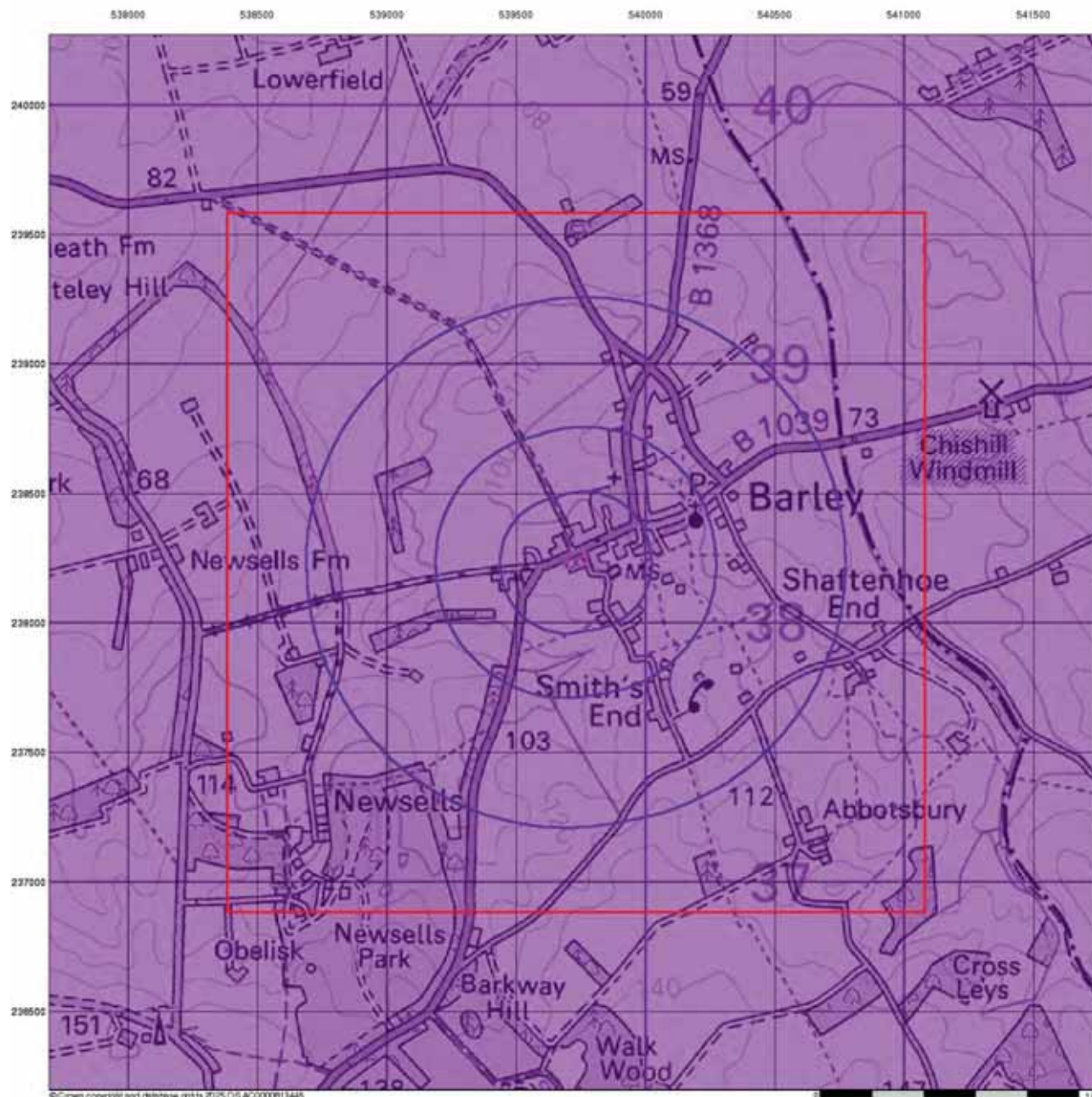
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 Customer Ref: UK25.7240
 National Grid Reference: 539730, 238230
 Slice: A
 Site Area (Ha): 0.24
 Search Buffer (m): 1000

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Bedrock Aquifer Designation

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Site
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

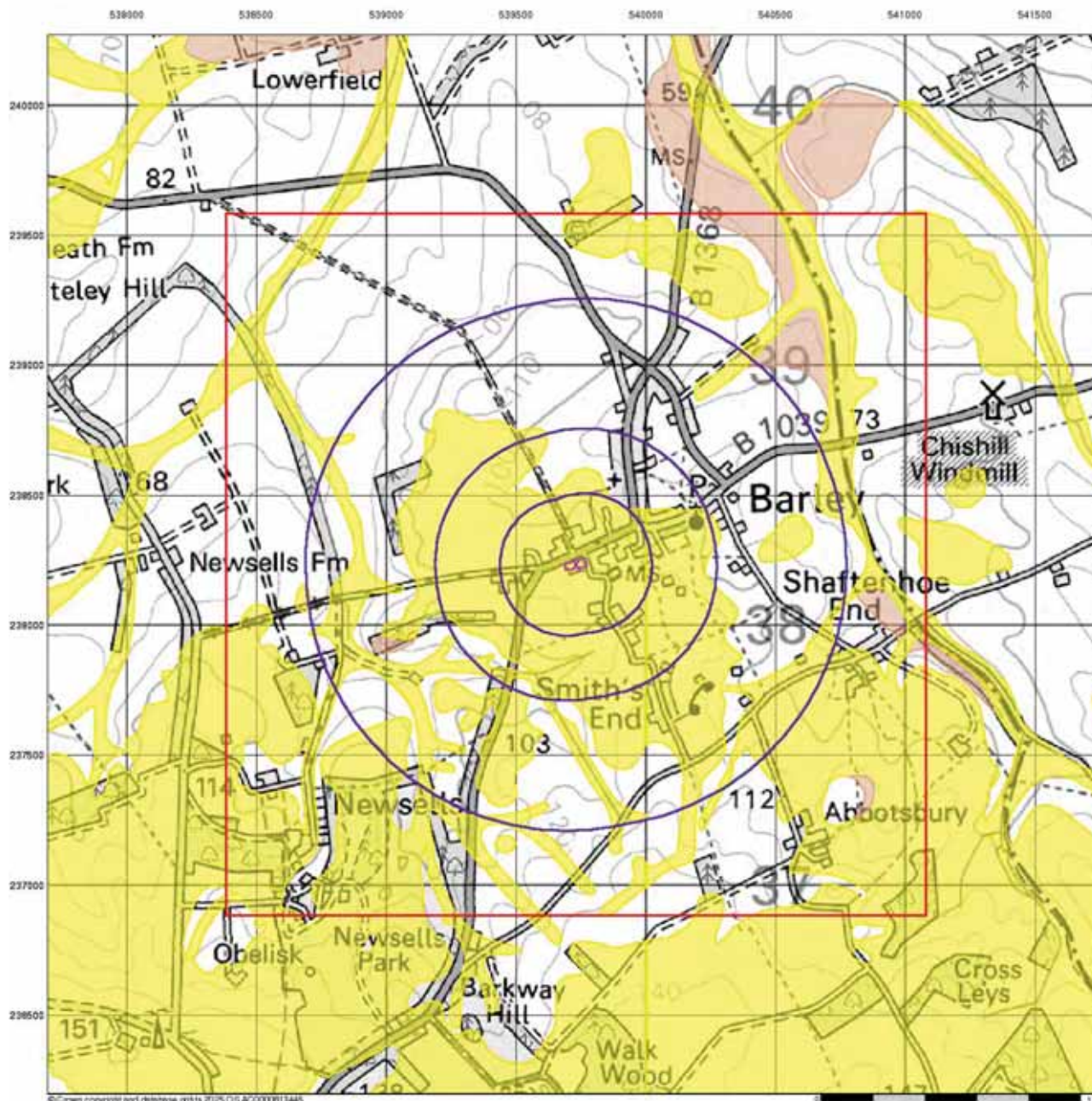
Order Number: 367330005_1_1
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 Site Area (Ha): 0.24
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Superficial Aquifer Designation

General

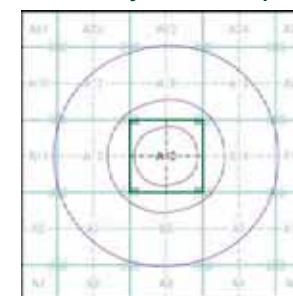
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Site
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

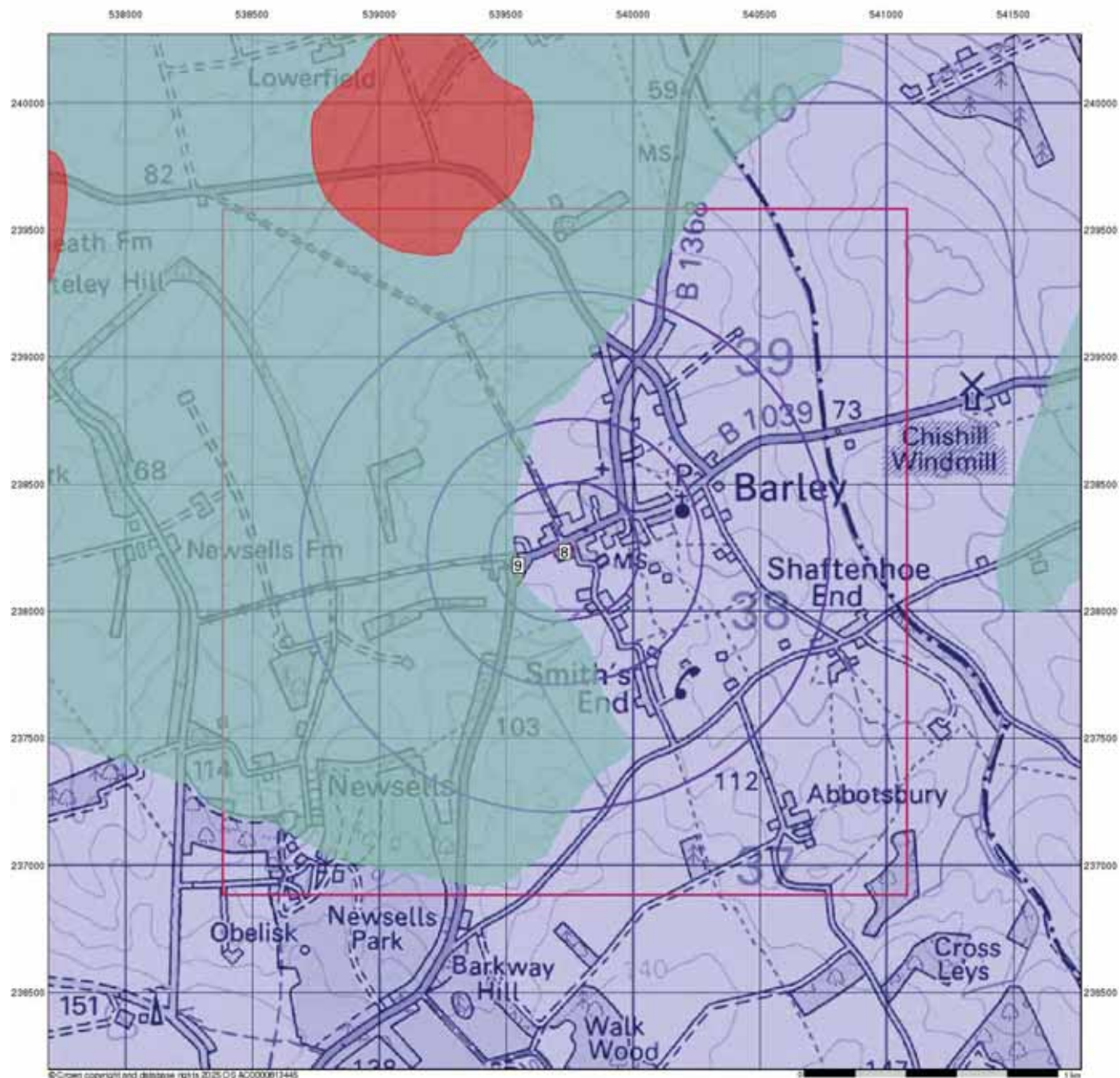
Order Number: 367330005_1_1
 Customer Ref: UK25.7240
 National Grid Reference: 539730, 238230
 Slice: A
 Site Area (Ha): 0.24
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Site Details

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Source Protection Zones

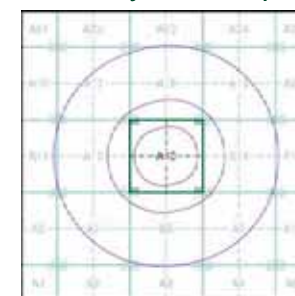
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



Order Details

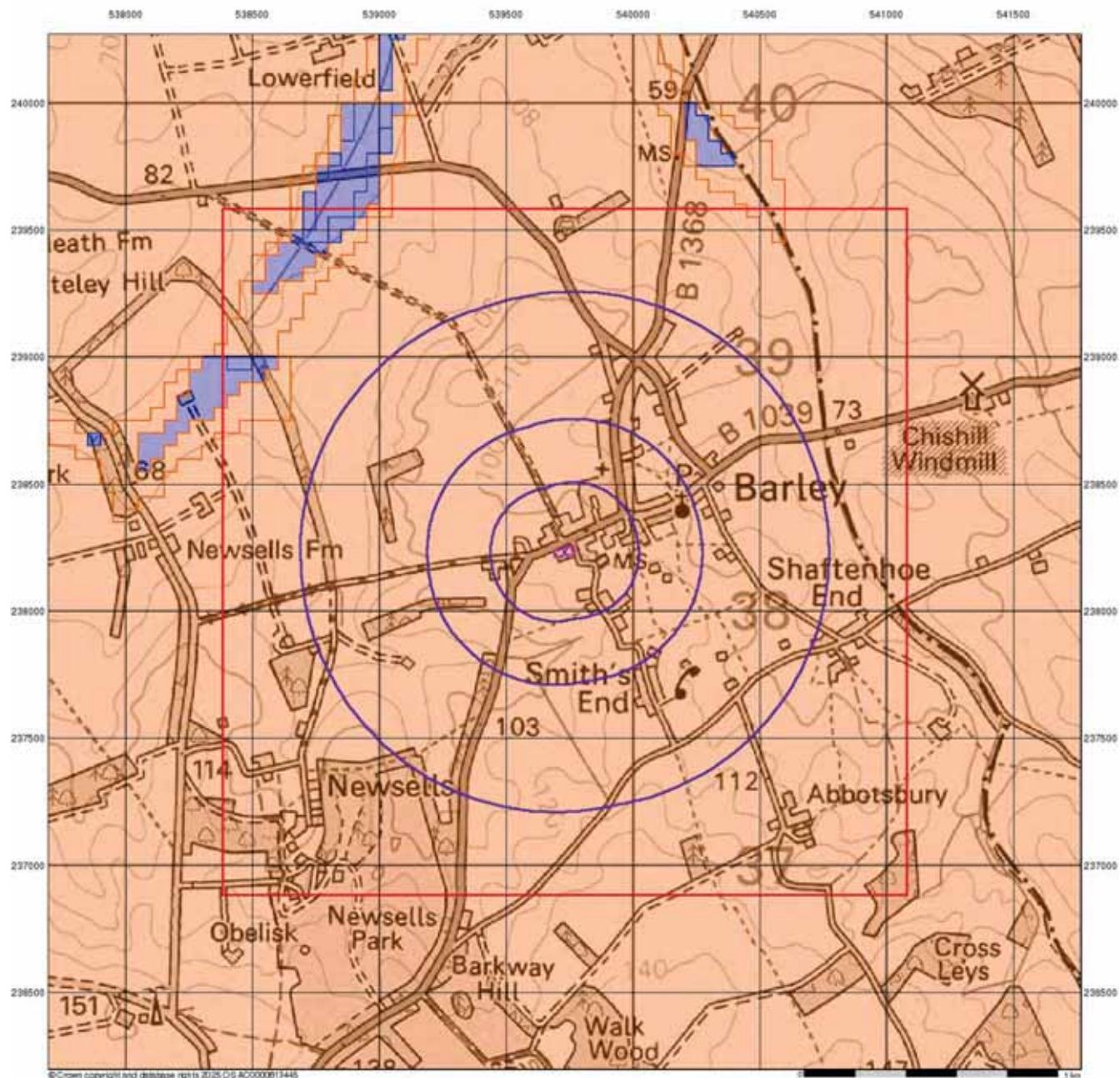
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Site Details

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BGS Flood GFS Data

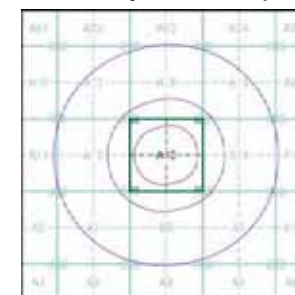
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 367330005_1_1
 Customer Ref: UK25.7240
 National Grid Reference: 539730, 238230
 Slice: A
 Site Area (Ha): 0.24
 Search Buffer (m): 1000

Site Details

Site at 539750, 238240



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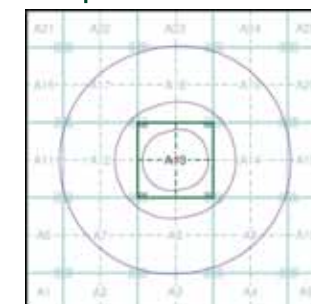
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

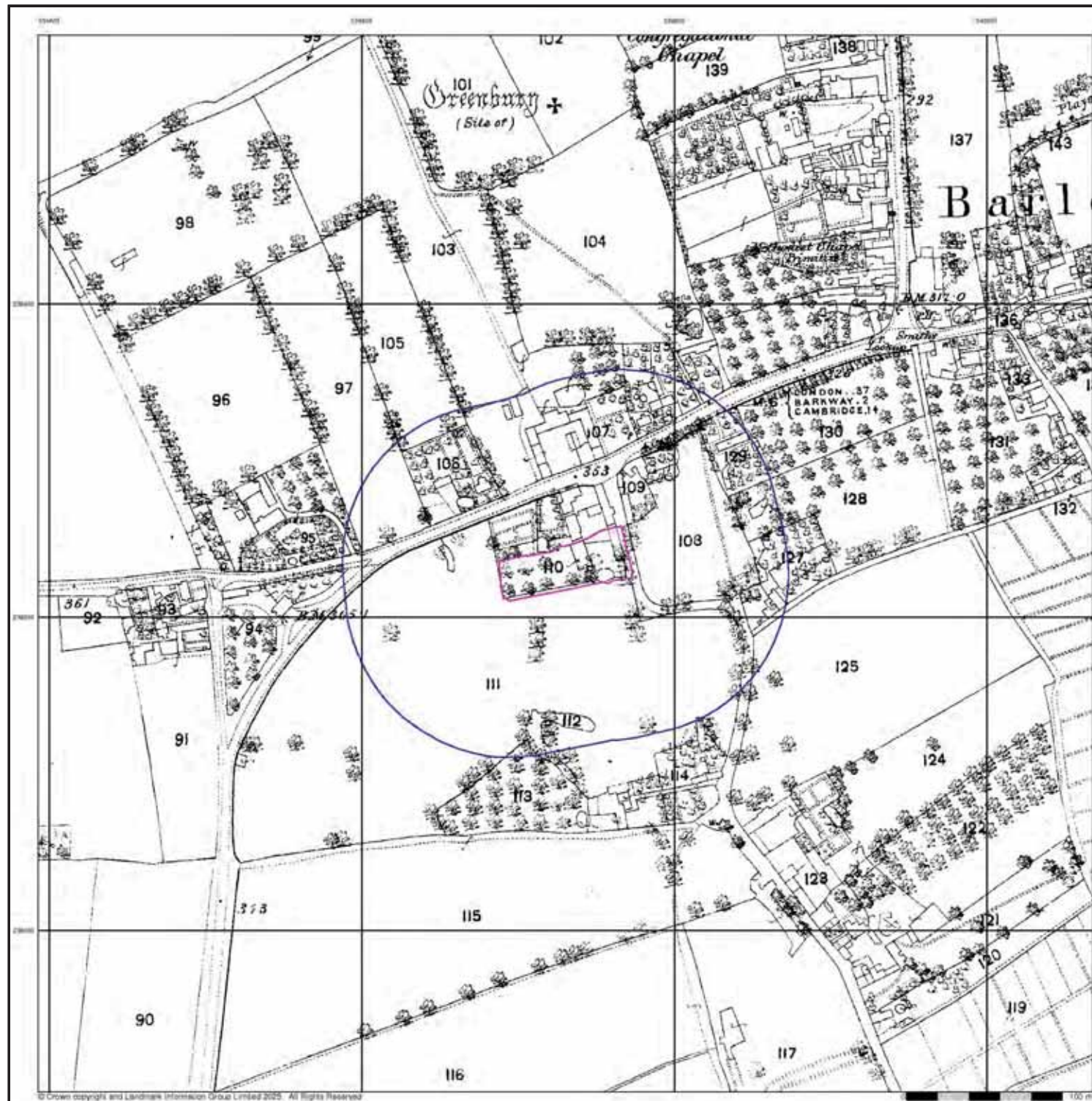
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Customer Ref: UK25.7240
National Grid Reference: 539730, 238230
Slice: A
Site Area (Ha): 0.24
Search Buffer (m): 1000

Site Details

Site at 539750, 238240

APPENDIX F

A Selection of Historic Maps



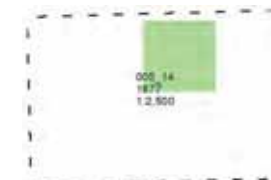
Hertfordshire

Published 1877

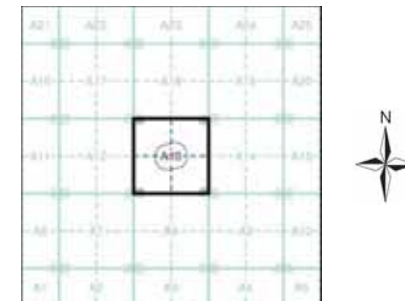
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1895 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

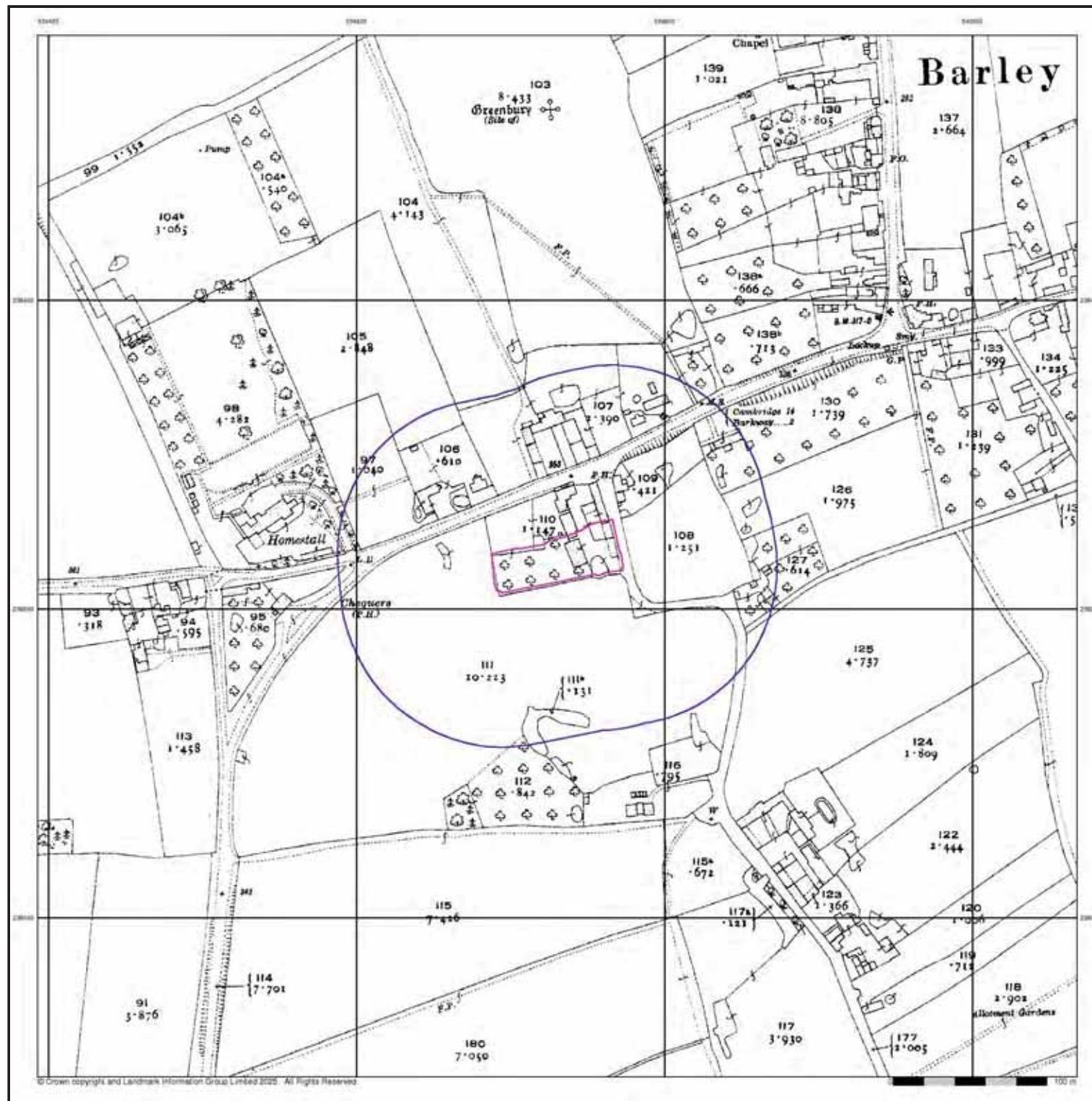
Order Number: 367330005_1_1
 Customer Ref: UK25.7240
 National Grid Reference: 539730, 238230
 Slice: A
 Site Area (Ha): 0.24
 Search Buffer (m): 100

Site Details

Site at 539750, 238240

Landmark
 INFORMATION GROUP

Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



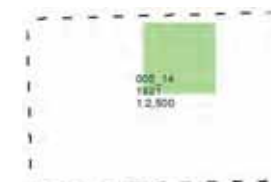
Hertfordshire

Published 1921

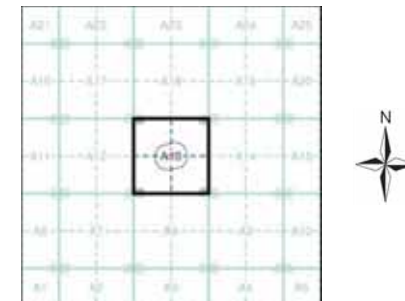
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1895 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

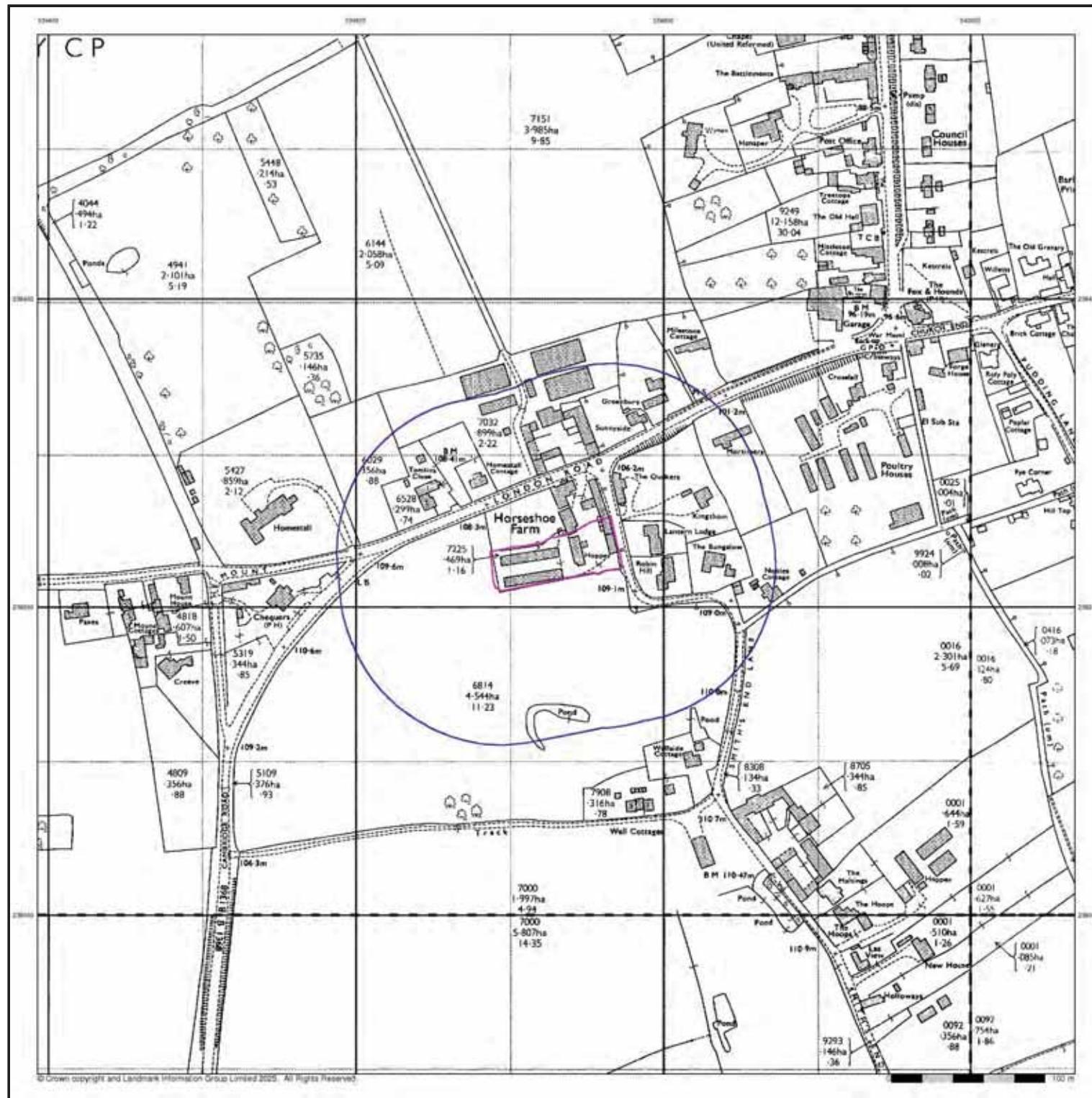
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 Customer Ref: UK25.7240
 National Grid Reference: 539730, 238230
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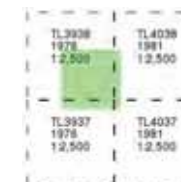
Ordnance Survey Plan

Published 1976 - 1981

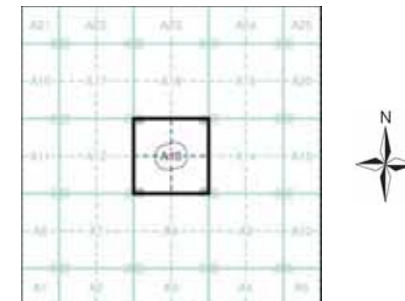
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840 s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1895 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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Large-Scale National Grid Data

Published 1993

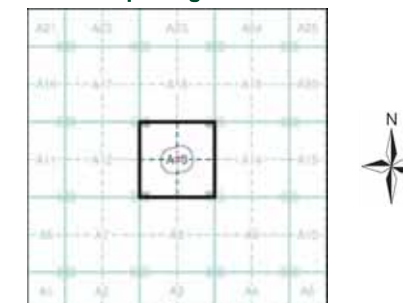
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

TL3936 1993 1:2,500	TL4036 1993 1:2,500
TL3937 1993 1:2,500	TL4037 1993 1:2,500

Historical Map - Segment A13



Order Details

Order Number: 367330005_1_1
Customer Ref: UK25.7240
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