

Site Details:

LAND AT MILL LANE AND
LONDON ROAD, ST IPPOLYTS,
HITCHINHERTFORDSHIRE, SG4
7NN

Client Ref: GE23305/PO9083
Report Ref: GS-FNR-DP4-OBK-EHM
Grid Ref: 519059, 227425

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

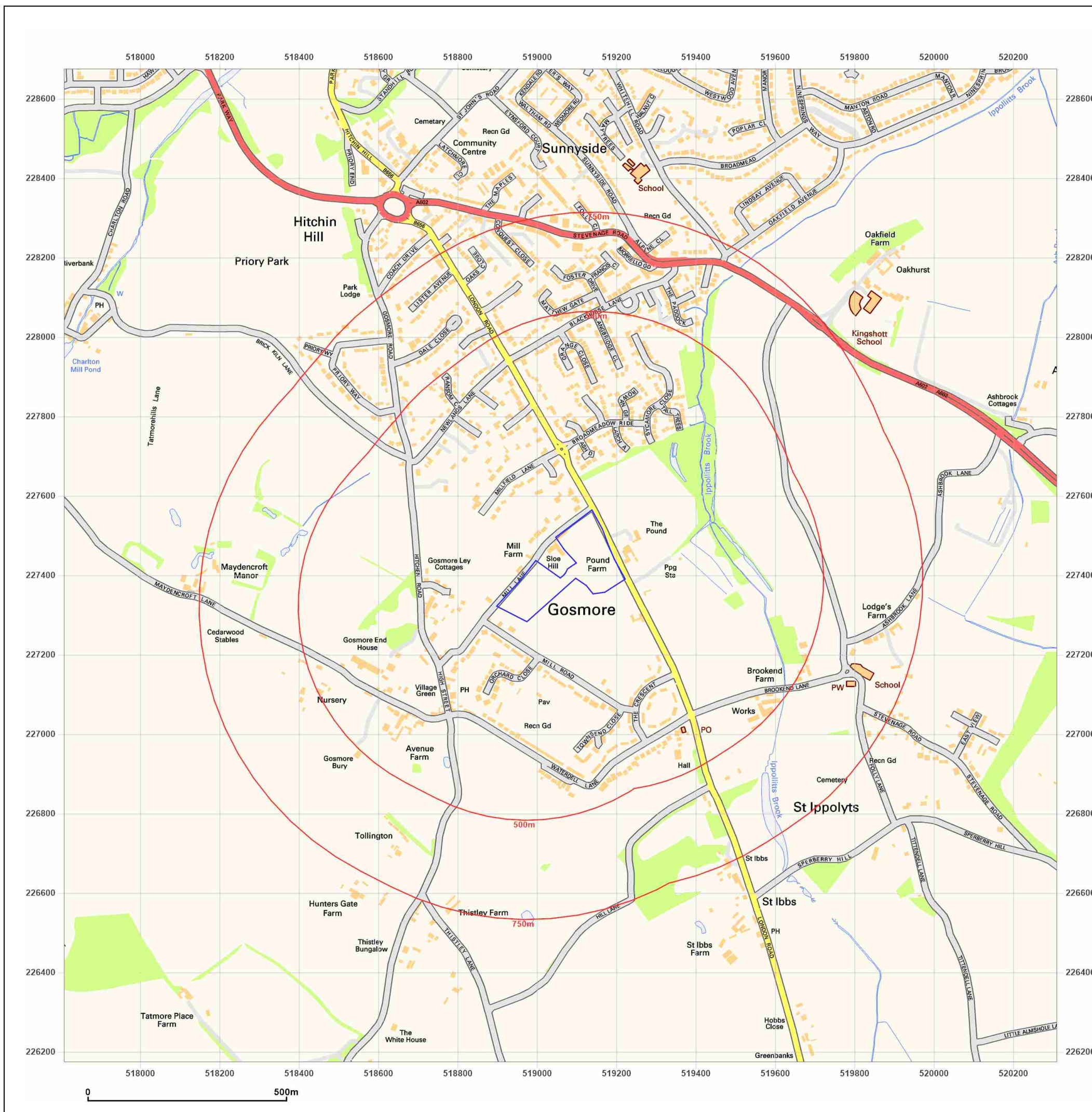


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2025

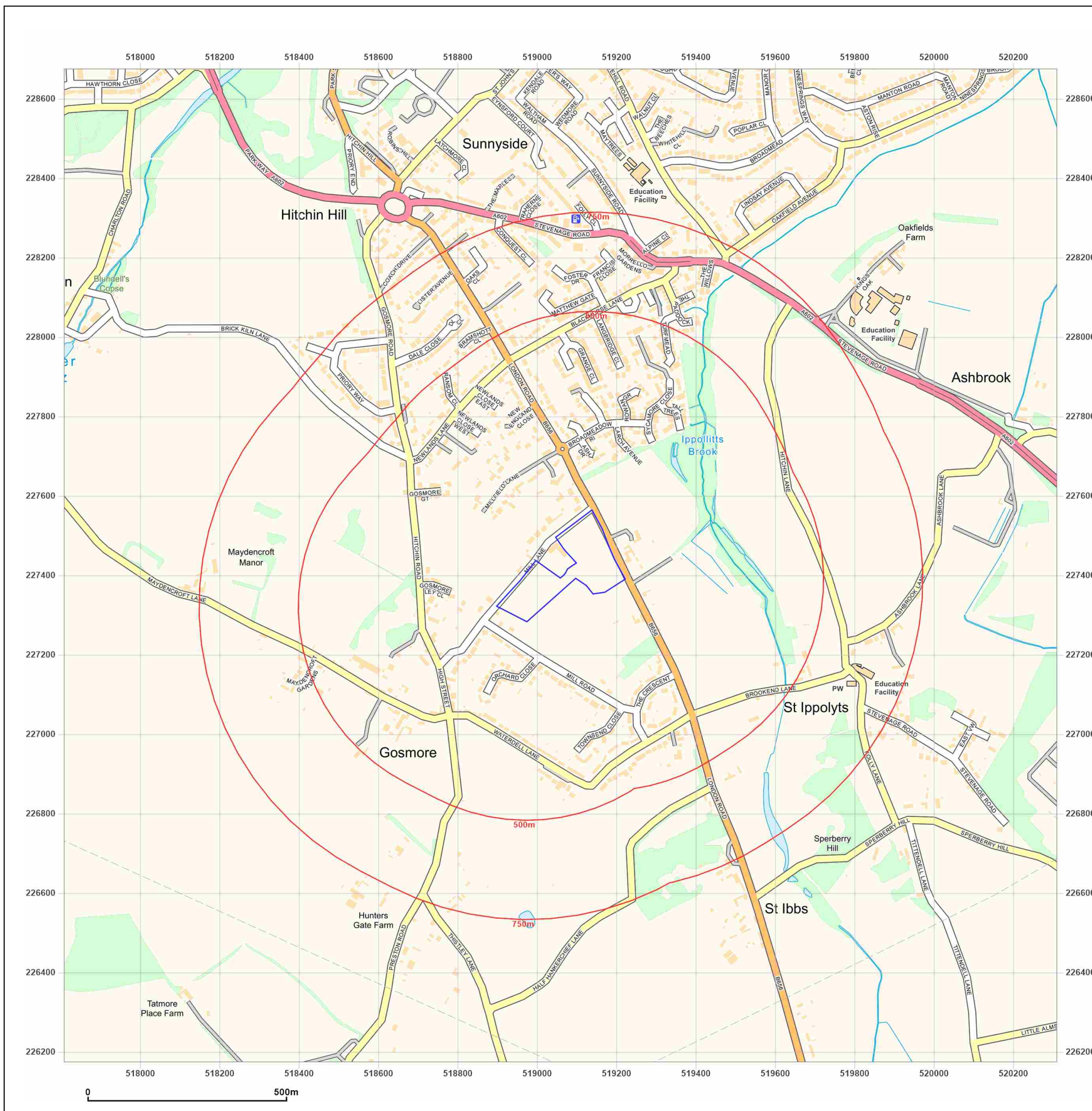


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Our ref: 1920378-L01 (00)

10th January 2019

Martin Grant Homes
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RH5 6QP

Dear Isabella,

**RE: LAND AT MILL LANE / LONDON ROAD, ST IPPOLYTS, HITCHIN, HERTFORDSHIRE
SITE INVESTIGATION**

1. INTRODUCTION

On the instruction of Martin Grant Homes (Client), RSK Environment Ltd (RSK) has carried out a site assessment for the above-mentioned site. It is understood that the site is being considered for acquisition and an initial assessment will identify possible environmental concerns pertaining to the previous and current use of the site in order to ascertain any potential contamination liabilities.

This report is subject to the service constraints given in **Appendix A**.

1.1 Site location and description

The site is located at National Grid reference 519070, 227410 and is bounded to the north by Mill Lane and to the east by London Road, as shown on **Figure 1**.

The site is understood to be agricultural land and currently consists of rough grassland bordered by hedges and mature/semi mature trees on the perimeter of the site. The area around the site is predominantly residential and agricultural land as detailed in **Table 1**.

Table 1: Site setting

To the north:	Immediately to the north the site is bounded by Mill Lane beyond which lies residential housing.
To the east:	Adjacent to the east of site lies London Road and beyond this agricultural land is present.
To the south:	The south of the site is adjacent to agricultural land and beyond this lies residential properties.
To the west:	Adjacent to the west the site is bounded by Mill Road with residential properties beyond

The site covers approximately 2.84 hectares at an elevation of approximately 80 m above Ordnance Datum (mAOD). The site is generally level with a slight slope upwards towards the north.

2. SITE DEVELOPMENT HISTORY

- The earliest available map records from 1881 as detailed in the Landmark report **Appendix B** show the site to be operating as a farm with a sand pit located in the southwest of the site. The Hopground cottages are shown to border the site at the western end;
- The 1884 map shows a well is also present on the parcel of land to the south east of the site;
- By 1898 the sand pit is now inactive and buildings have been constructed adjacent to Mill Lane; The Hopground cottages are no longer present and the site has been developed with a different configuration of five small buildings;
- The 1924 historical map shows another small building to have been constructed on site and the addition of a pump;
- The site remained relatively unchanged until 1981 where it appears the inactive sand pit has now been infilled and Mill Farm is no longer operating on the land parcel of the western section of the site. A sewage works is now visible to the east of site beyond London Road;
- Aerial photography from 2000 shows the site to be characterised by grassland and bordered by mature trees and hedges with a small number of mature trees located on site;
- By 2006 the sewage works are no longer identifiable to the east of the site;
- The latest map available from 2018 indicates the south western land parcel of the site to have a surface layer now characterised by rough grassland.

3. GEOLOGY

The BGS website indicates the geology of the site to be characterised by the succession shown in **Table 2** below.

Table 2: Conjectural geological succession beneath the site

Geological unit	Brief description	Thickness
Superficial soils		
Glaciofluvial deposits	Sands and gravels	Unknown
Solid geology deposits		
Zig Zag Chalk Formation	Chalk – mostly firm, pale grey to off-white blocky chalk	Up to 75 m

Some made ground is likely to be present due to the existing history of development on site dating back to before the 1900's and the infilling of a former sand pit.

4. HYDROGEOLOGY

4.1.1 Aquifer characteristics

Based on the findings of the Landmark report dated 23rd November 2018 **Appendix B**, the hydrogeology of the site is likely to be characterised by the presence of a Secondary A aquifer within the superficial glaciofluvial deposits and a Principal aquifer within the chalk bedrock.

It is also possible that localised perched water may be present in any made ground.

4.1.2 Vulnerability of groundwater resources

The site has been classified by the EA website to overlie a:

- Secondary A aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers, and;
- Principal aquifer: Principal Aquifers (previously called Major): geology that exhibit high permeability and/or provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

The soils beneath the site are classified as having HIGH URBAN (HU) leaching potential.

HU - soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere, so a worst-case vulnerability classification is assumed until proven otherwise.

Information available on the DEFRA Magic website indicates that the site lies within a currently designated zone 3 (total Catchment) groundwater Source Protection Zone. This zone is defined as the total area needed to support the abstraction or discharge from the protected groundwater source.

4.1.3 Licensed groundwater abstractions

The environmental database report (Landmark report, dated 23rd November 2018) indicates the presence of one licensed groundwater abstraction within a 1 km radius of the site. The licence is for domestic and agricultural purposes located 819 m south west of site which operates under licence number 6/33/13/*g/063.

5. SITE INVESTIGATION STRATEGY & METHODOLOGY

5.1 Introduction

RSK carried out intrusive investigation works on 3 December 2018.

Prior to conducting intrusive works, utility service plans were obtained and buried service clearance undertaken in line with RSK's health and safety procedures. Copies of statutory service records obtained by RSK as part of the agreed scope of works are contained in **Appendix C**.

5.2 Objectives

The specific objectives of the investigation were as follows:

- to establish the location and extent of an infilled former sand pit, identified on historic maps in the south-western corner of the site, including the thickness of the fill
- to determine the composition of the infill material and assess its contamination status; and
- to obtain samples for chemical testing.

5.3 Selection of investigation methods

The techniques adopted for the investigation were chosen with consideration of the objectives and site constraints.

Mechanically excavated trial pitting was chosen to obtain a sufficient number of investigation locations, to achieve greater visibility of the made ground and consequently enable delineation of the former sand pit.

5.4 Investigation strategy

The ground investigation was carried out using intrusive ground investigation techniques in general accordance with the recommendations of BS5930: 2015 Code of practice for ground investigations, which maintains compliance with BS EN 1997-1 and 1997-2 and their related standards. Whilst every attempt was made to record full details of the strata encountered in the boreholes, techniques of hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks.

The investigation strategy involved targeted trial pits, focussing on the area of the possible location of the former sand pit, identified on historic maps in the south-western corner of the site.

Twelve machine excavated trial pits were dug to a maximum depth of 4 m bgl before being backfilled with arisings.

5.5 Implementation of investigation works

The exploratory holes were logged by an engineer in general accordance with the recommendations of BS 5930:2015 (which incorporates the requirements of BS EN ISO 14688-1, 14688-2 and 14689-1).

Soils collected for laboratory analysis were placed in a variety of containers appropriate to the anticipated testing suite required. They were dispatched to the laboratory in cool boxes under chain of custody documentation. Samples were stored in accordance with the RSK quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination.

Selected samples were placed in polythene bags for headspace screening with a photo-ionisation detector (PID) fitted with a 10.2 eV bulb PID screening results are presented on the exploratory hole records (**Appendix D**).

5.6 Laboratory testing

Laboratory testing was undertaken at a UKAS accredited laboratory with ISO17025 and MCERTS accredited test methods were specified where applicable for contamination testing and as shown in the laboratory test certificates appended.

The soil sampling strategy was designed to characterise made ground that has been used to infill the former sand pit.

The programme of chemical tests undertaken on soil samples obtained from the intrusive investigation is presented in **Table 3** with the laboratory testing results contained in **Appendix E**.

Table 3: Summary of chemical testing of soil samples

Stratum	Tests undertaken	No. of tests
Made ground	Asbestos screening, Speciated PAH - 16MS, TPHCWG (spec. TPH), pH, As, Cd, Cr, Cu, Hg, Pb, Ni, Se, Zn, Total Sulphate, w/s Sulphate	6
Glaciofluvial deposits	Speciated PAH - 16MS, TPHCWG (spec. TPH), pH, As, Cd, Cr, Cu, Hg, Pb, Ni, Se, Zn, Total Sulphate, w/s Sulphate	1

6. GROUND CONDITIONS ENCOUNTERED

The results of the intrusive investigation and subsequent geo-environmental analysis undertaken are detailed below.

6.1 Ground conditions encountered

The descriptions of the strata encountered, notes regarding visual or olfactory evidence of contamination, list of samples taken, field observations of soil and groundwater and in-situ testing are included on the exploratory hole records presented in **Appendix D**.

The exploratory holes appear to confirm the presence of the infilled sand pit, recorded on historic maps in the south-western corner of the site. A cross-section of the possible sand pit is presented in **Figure 3**.

It should be noted that the area to the west-north of the former sand pit was not accessible due to very dense vegetation, including shrubs and bushes, therefore the north-western boundary of the sand pit could not be established.

The ground conditions encountered during the fieldworks are summarised in **Table 4** and discussed below.

Table 4: General succession of strata encountered

Stratum	Exploratory holes encountered	Depth to top of stratum m bgl	Proven thickness (m)
Topsoil	All	0	0.2 - 0.40
Made ground	TP3, TP5, TP6, TP9 and TP12	0.20 - 0.40	1.20 - 3.60
Glaciofluvial deposits	Majority of locations except for TP3 and TP5	0.30 – 3.90	Not proven

6.1.1 Topsoil

Topsoil generally comprised soft dark brown very sandy clay, with rootlets.

6.1.2 Made ground

Made ground was encountered in the south-western corner of the site, within the area of the former sand pit recorded on historic maps.

Suspected infilled material was identified in 5 trial pits below topsoil (see attached Exploratory hole location plan): TP3 (to full depth of 3.2 m bgl), TP5 (to full depth of 3.4 m bgl), TP6 (between 0.3 m and 1.5 m bgl), TP9 (between 0.2 m and 2.4 m bgl) and TP12 (between 0.3 m and 3.9 m bgl).

The made ground was generally described as orangish brown very sandy very gravelly CLAY and occasional partings of clayey very sandy gravel in places. Gravel was flints with a significant proportion of anthropogenic material including fragments of bricks, concrete, bituminous material, charcoal, ceramic, structured chalk, rare glass, slate and fragmented wood.

6.1.3 Variable cohesive and granular soils of the Glaciofluvial Deposits

This stratum was encountered at a depth of between 0.30 m and 3.90 m below ground level, the thickness of which was not proven. The soils generally comprised a granular soil described as medium dense yellowish/reddish brown silty fine to medium sand with variable gravel of angular to rounded fine to coarse flint, in places. Soft near ground level and firm to stiff at depth orangish brown clay was also encountered within these deposits.

6.1.4 Visual/olfactory evidence of soil contamination

No asbestos containing material was visually identified and no visual or olfactory contamination of concern was noted within the fill. PID results obtained from samples of suspected fill material were generally <0.1 ppm indicating an absence of significant concentrations of volatile petroleum hydrocarbons and other volatile organic compounds.

6.1.5 Groundwater encountered during intrusive works

Groundwater was not encountered during the investigation works to a maximum depth of 4 m bgl.

7. LABORATORY TEST RESULTS

The chemical soil testing results are presented in **Appendix E**.

7.1.1 Oral, dermal and inhalation exposure with impacted soil by future occupants/site users

As an initial assessment, the soil test results have been compared against the GAC for residential with home-grown produce end use, assuming the worst-case scenario, since the exact nature of the proposed development is unknown. The assessment is presented in **Appendix G**.

A soil organic matter (SOM) of 1% has been selected, assuming the worst-case scenario, as the soil organic matter has not been tested.

One sample obtained from the natural stratum (TP10) marginally exceeded the arsenic screening value of 37 mg/kg. The result was 43 mg/kg. However, none of the samples obtained from the made ground exceeded the arsenic screening value. Furthermore, the BGS Estimated Soil Chemistry Data (Landmark, November 2018) indicates that the site is underlain by a natural stratum with estimated arsenic concentrations between 15 and 25 mg/kg with some areas in the vicinity of the site with arsenic concentrations of between 35 and 45 mg/kg. Therefore, the slightly elevated arsenic concentration is considered to be naturally occurring within the underlying stratum.

The assessment also indicates that all samples obtained from the made ground exceeded the chromium VI screening value of 21 mg/kg. The results varied between 21 and 33 mg/kg. However, this is only a slight exceedance and considered not to be of concern. Also, total chromium (undifferentiated) has been tested. For chromium III (Cr III), the screening value of 9100 mg/kg could be adopted and therefore results are significantly below the adopted GAC.

7.1.2 Inhalation exposure of future occupants/site users to asbestos fibres

The visual inspection at the laboratory identified no materials suspected of potentially containing asbestos and the scheduled laboratory screening for asbestos found no detectable asbestos fibres within the samples of made ground.

7.1.3 Uptake of contaminants by vegetation potentially inhibiting plant growth (phytotoxicity)

The results have been compared with the GAC presented in **Appendix G** for this linkage. The results indicate that a relevant contaminant linkage is unlikely to exist associated with phytotoxic effects for future plant growth.

8. PRELIMINARY WASTE ASSESSMENT

Technical Guidance WM3 sets out requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity.

The classification of waste soil is a two-stage process, the first being an assessment of whether the soil is considered hazardous or not following the guidance within Technical Guidance WM3. For off-site disposal to landfill the results of Waste Acceptance Criteria (WAC) testing must then be reviewed to

establish if the soil is acceptable at the relevant class of landfill or requires pre-treatment to reduce specific hazardous properties.

The samples collected from shallow pits were tested for metals, asbestos, Polycyclic Aromatic Hydrocarbon (PAH), Total Petroleum Hydrocarbons (TPH) and BTEX. Envirolab, an RSK company, has developed a waste soils characterisation assessment tool (HASWASTE), which follows the guidance within Technical Guidance WM3. The analytical results have been assessed using this tool for off-site disposal of materials in the future. The results are presented in **Appendix H**.

The initial hazardous waste risk assessment indicates that none of the samples contain hazardous properties. Therefore, to determine whether waste might be classified as inert or non-hazardous, WAC testing will need to be undertaken.

9. GAPS AND UNCERTAINTIES

The area to the west-north of the suspected former sand pit was not accessible due to very dense vegetation, including shrubs and bushes, therefore the north-western boundary of the pit could not be established. In addition, the thickness of the made ground has not been proven in TP3 and TP5.

Although asbestos was not encountered during the site works and not found in made ground samples tested, asbestos containing material (ACM) could still be present in discrete locations.

10. CONCLUSIONS

The main feature of potential contamination on site identified from the findings of the desk study relate to the potential for made ground associated with the fill material used to infill the historical sand pit on site. It was recommended that an intrusive investigation was conducted to further investigate the nature and magnitude of the fill material.

The ground conditions encountered during the site investigation carried out on 3 December 2018 were generally in line with the initial conceptual site model. The former sand pit, recorded on historic maps appears to have been located in the western corner of the site. Suspected infilled material was identified in 5 trial pits below the topsoil. The proven depths of the former sand pit varied between 1.5 m bgl (TP6) and 3.9 m bgl (TP12). The fill material was generally described as orangish brown very sandy very gravelly clay and occasional partings of clayey very sandy gravel in places. Gravel was flints with a significant proportion of anthropogenic material including fragments of bricks, concrete, bituminous material, charcoal, ceramic, structured chalk, rare glass, slate and fragmented wood.

Variable cohesive and granular soils of the Glaciofluvial Deposits were encountered below the topsoil at a depth of between 0.3 m to 0.4 m bgl or below the made ground in the area of the suspected former sand pit at a depth of between 1.4 m and 3.9 m bgl.

Groundwater was not encountered to a depth of 4mbgl.

No asbestos containing material was visually identified and no visual or olfactory contamination of concern was noted within the fill. No asbestos has been found in made ground samples tested.

Generally, the results of the GQRA indicate that relevant pollutant linkages are not present.

The marginally elevated arsenic concentration in the sample obtained from the superficial deposits is considered to be naturally occurring within the underlying stratum. No exceedances of arsenic were indicated in made ground samples. Marginal exceedances in chromium indicated in made ground samples were considered not to be of concern.

The initial hazardous waste risk assessment indicates that none of the samples contain hazardous properties therefore waste might be classified as inert or non-hazardous (subject to WAC testing).

In terms of any future development, it is likely that any proposed buildings in the location of the former sand pit may need to give consideration to a piled foundation solution.

Should a redevelopment option be pursued, then further site investigation will be required across the rest of the site, and possibly to greater depths depending on the exact scheme proposed.

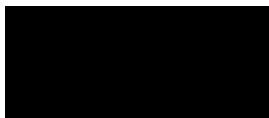
Yours faithfully
For RSK Environment Ltd



Louisa Willmott
Graduate Geo-Environmental Engineer



Sylwia Mianowska
Graduate Geo-Environmental Engineer



David Anchor
Director

Figures

- | | |
|----------|--------------------------------|
| Figure 1 | Site location plan |
| Figure 2 | Exploratory hole location plan |
| Figure 3 | Cross-section SW-NE/S-N |

Appendices

- | | |
|------------|--|
| Appendix A | RSK Service Constraints |
| Appendix B | Landmark report |
| Appendix C | Utility service plans |
| Appendix D | Exploratory hole records |
| Appendix E | Laboratory certificates for soil analysis |
| Appendix F | Generic assessment criteria for human health |
| Appendix G | GQRA data screening tables |
| Appendix H | WM3 assessment |
| Appendix I | Photographic Log |

FIGURES



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Client

MARTIN GRANT HOMES

Project Title

LONDON ROAD,
HITCHIN

Drawing Title

SITE LOCATION PLAN

Rev	Drawn	Date	Checked	Date	Approved	Date
01	ASC	03.01.19	SM	03.01.19	SM	03.01.19
Dimensions		Scale		Original Size		
m		1:50,000		A4		

Project Number

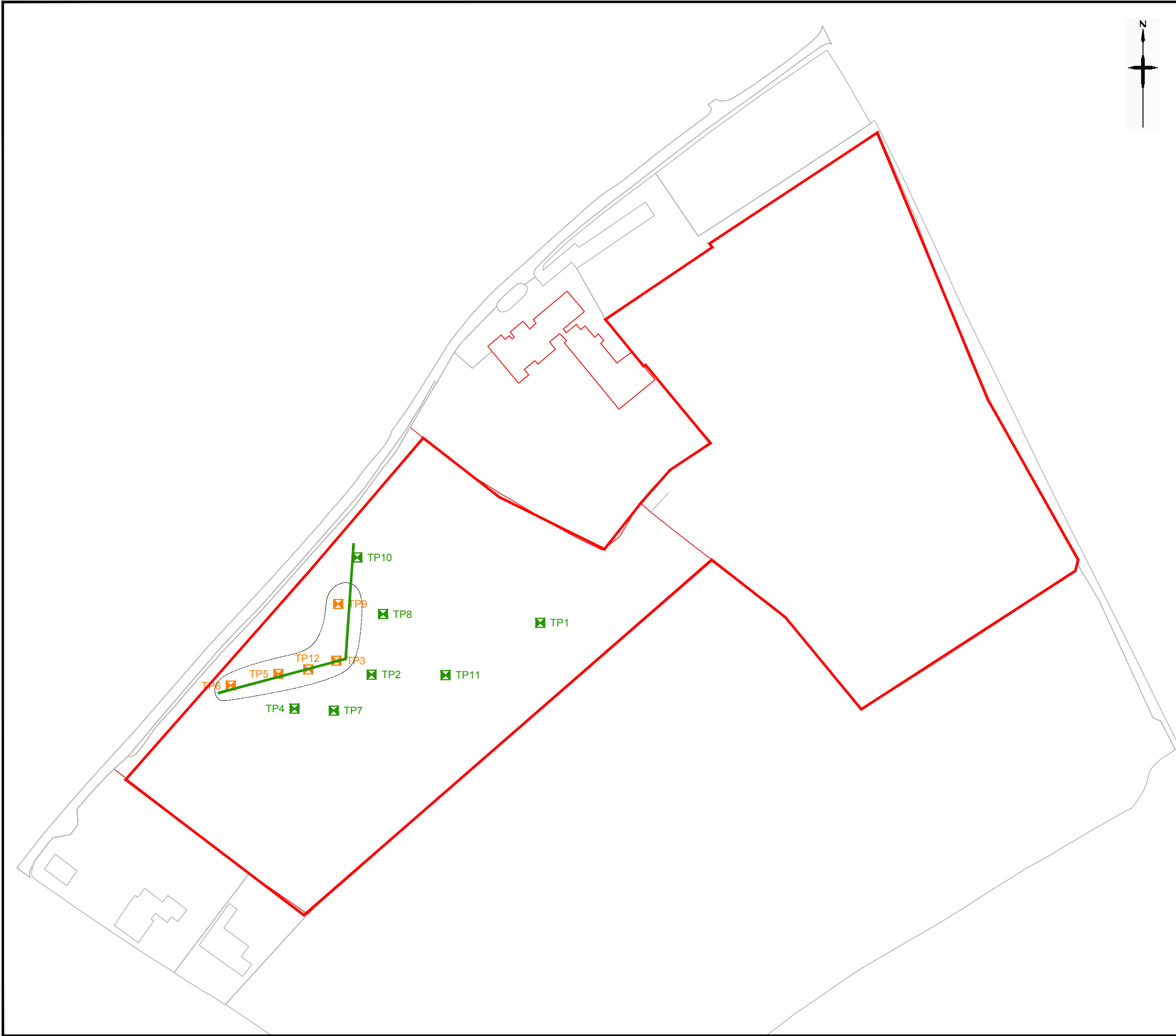
1920378 - L01

Drawing File

1920378 - SLP.dwg

Drawing Number

FIGURE 1



LEGEND

- Site Boundary
- Section Line (See Figure 3)
- Area of Infilled Material Encountered
- Trial Pit Location
- Trial Pit Location with Suspected Infilled Material Encountered

Rev.	Date	Amendment	Drawn	Chkd.	Appd.



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Client
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Project Title
**LONDON ROAD,
HITCHIN**

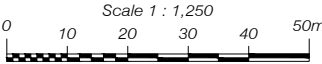
Drawing Title
**EXPLORATORY HOLE
LOCATION PLAN**

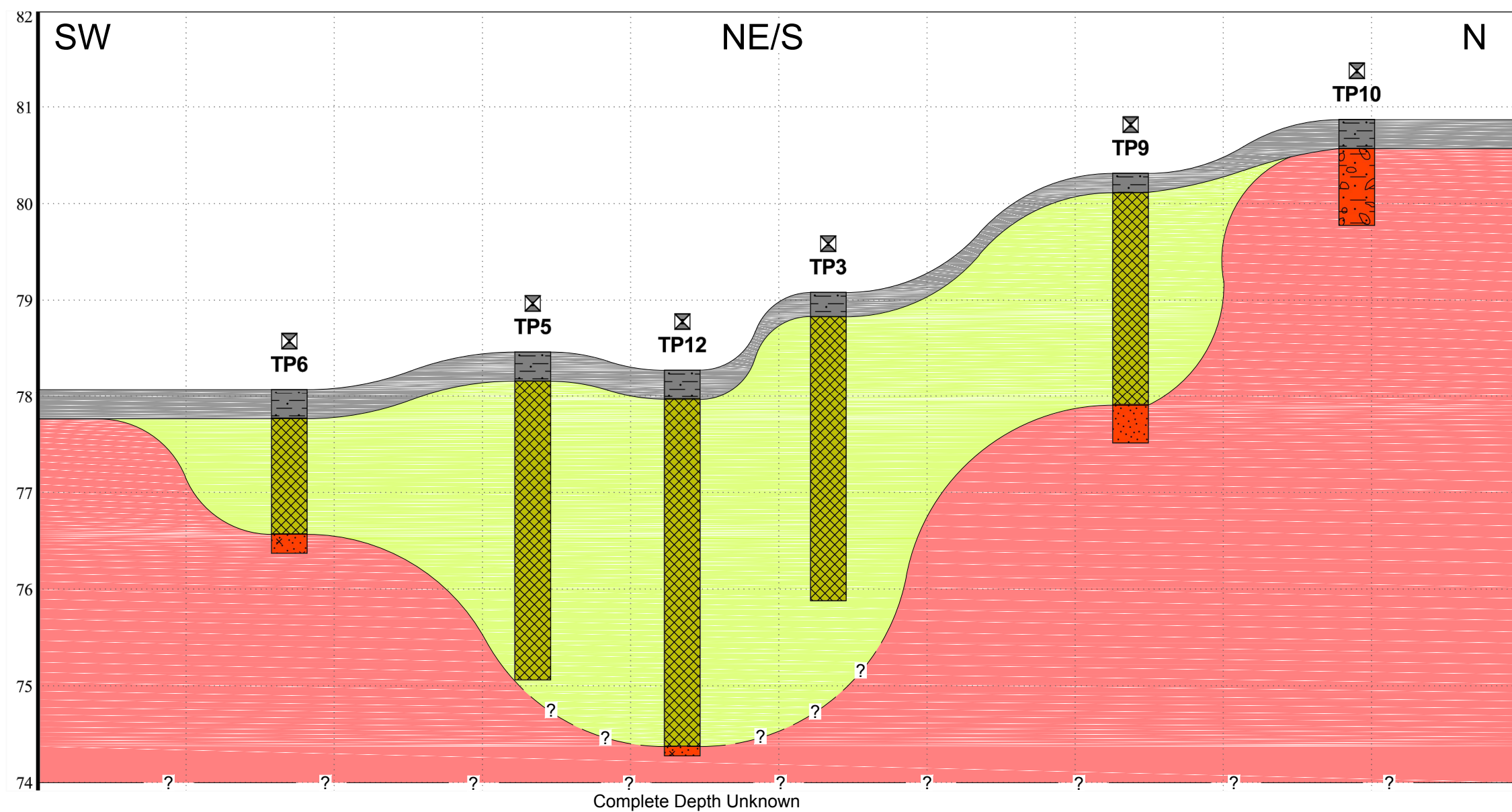
Drawn	Date	Checked	Date	Approved	Date
ASC	03.01.19	SM	03.01.19	SM	03.01.19

Scale	Orig Size	Dimensions
1:1250	A3	m

Project No.	Drawing File
1920378 - L01	1920378 (L01) Fig 2.dwg

Drawing No.	Rev.
FIGURE 2	P1





Complete Depth Unknown

LEGEND

-  Topsoil
 Made Ground (Suspected Infilled Sand Pit)
 Glaciofluvial Deposits

Rev.	Date	Amendment	Drawn	Chkd.	Appd.



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Project Title

HITCHIN,
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Drawing Title

GEOLOGICAL CROSS SECTION PLAN

Drawn	Date	Checked	Date	Approved	Date
ASC	03.01.19	SM	03.01.19	SM	03.01.19
Scale	Orig Size		Dimensions		
NTS	A3		m		
Project No.			Drawing File		
1920378 - L01			1920378 (L01) Fig 3.dwg		
Drawing No.					Rev.
FIGURE 3					P1

APPENDIX A

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Martin Grant Homes Ltd (the "client") in accordance with the terms of a contract [RSK Group Standard Terms and Conditions] RSK and the "client", dated 21 November 2018. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):
 - a. the Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely
 - b. the Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection
 - c. the Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the

doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.

8. The intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on-site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on-site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

APPENDIX B

LANDMARK REPORT

Geology 1:10,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	Holocene - Holocene
	WGR	Worked Ground (Undivided)	Void	Holocene - Holocene
	LSGR	Landscaped Ground (Undivided)	Unknown/Unclassified Entry	Holocene - Holocene
	WMGR	Infilled Ground	Artificial Deposit	Holocene - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	SUPNM	Superficial Theme Not Mapped [For Digital Map Use Only]	Unknown/Unclassified Entry	Not Supplied - Not Supplied
	ALV	Alluvium	Clay, Silty [Unlithified Deposits Coding Scheme]	Flandrian - Pleistocene
	LOFT	Lowestoft Formation	Diamicton	Anglian - Flandrian
	GFDMP	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	Sand and Gravel	Ipswichian - Cromerian
	GLLMP	GLACIOLACUSTRINE DEPOSITS, MID PLEISTOCENE	Clay, Silty [Unlithified Deposits Coding Scheme]	Ipswichian - Cromerian
	HEAD	Head	Clay, Silt, Sand and Gravel	Quaternary - Ryazanian
	HEAD	Head	Clay, Silty [Unlithified Deposits Coding Scheme]	Quaternary - Ryazanian
	DVY	Dry Valley Deposits	Clay, Silt, Sand and Gravel	Quaternary - Ryazanian
	CWF	Clay-with-flints Formation	Diamicton	Quaternary - Pridoli

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	CKR	Chalk Rock Member	Chalk	Turonian - Turonian
	LESE	Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated)	Chalk	Santonian - Turonian
	ZZCH	Zig Zag Chalk Formation	Chalk	Cenomanian - Cenomanian
	WMCH	West Melbury Marly Chalk Formation	Chalk	Cenomanian - Cenomanian
	HNCK	Holywell Nodular Chalk Formation and New Pit Chalk Formation (Undifferentiated)	Chalk	Turonian - Cenomanian
	GLT	Gault Formation	Mudstone	Albian - Albian



Geology 1:10,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:10,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around a site. This mapping may be more up to date than previously published paper maps.

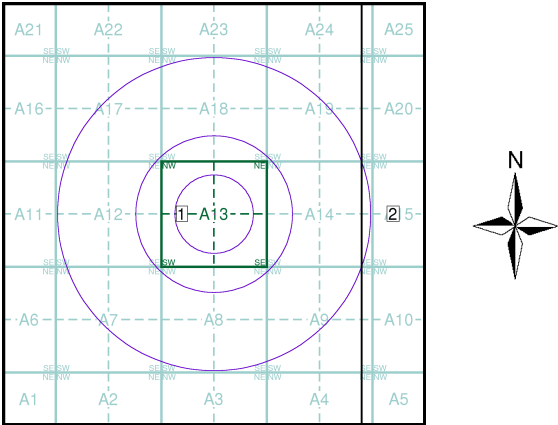
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page.

Please Note: Not all of the layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:10,000 Maps Coverage

Map ID:	2	Map ID:	1
Map Name:	TL22NW	Map Name:	TL12NE
Map Date:	1992	Map Date:	1992
Bedrock Geology:	Available	Bedrock Geology:	Available
Superficial Geology:	Available	Superficial Geology:	Available
Artificial Geology:	Available	Artificial Geology:	Available
Faults:	Not Available	Faults:	Available
Landslip:	Not Available	Landslip:	Not Available
Rock Segments:	Not Available	Rock Segments:	Not Available

Geology 1:10,000 Maps - Slice A

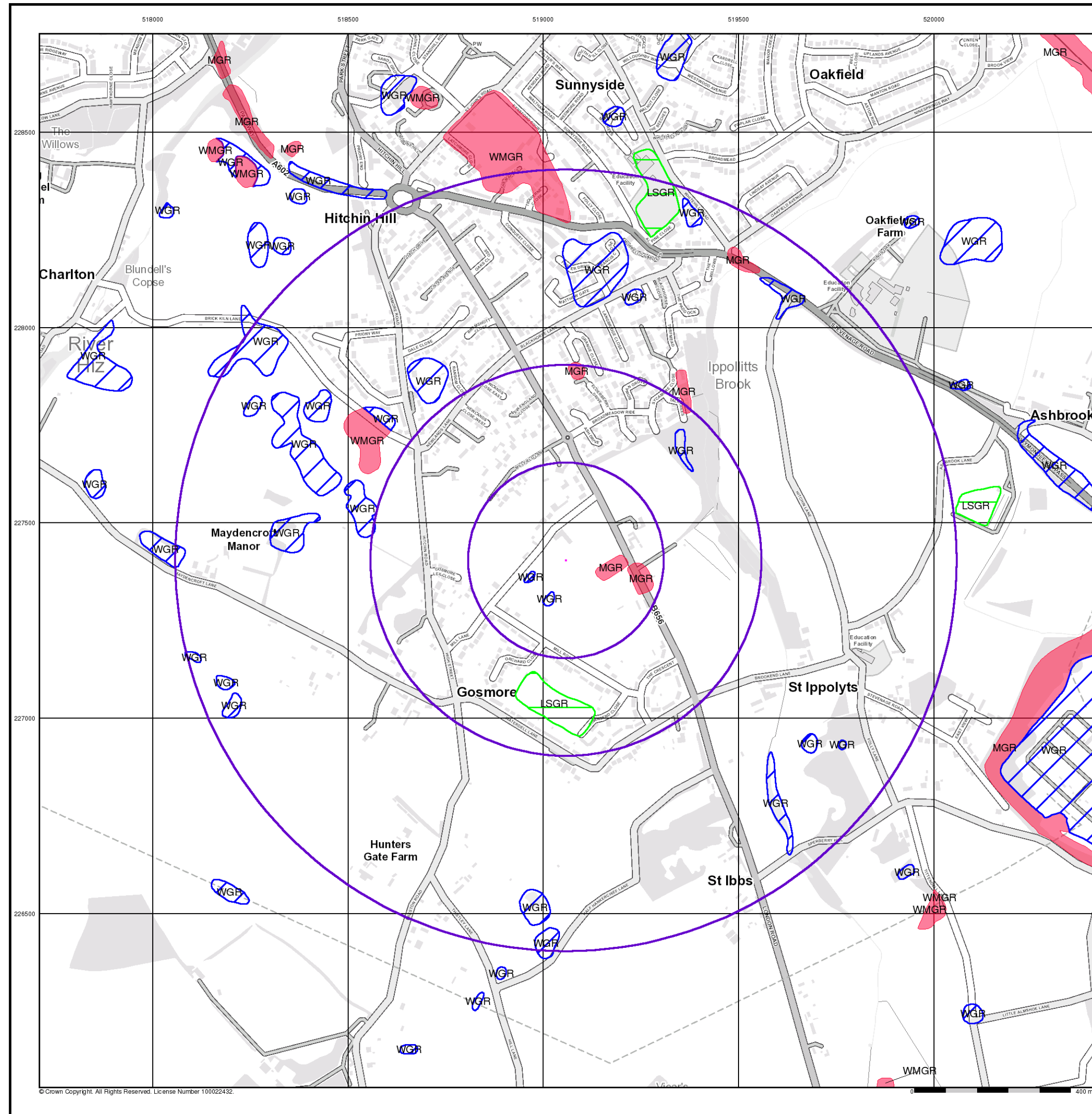


Order Details

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Customer Ref:	1920378
National Grid Reference:	519060, 227400
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	1000

Site Details

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Artificial Ground and Landslip

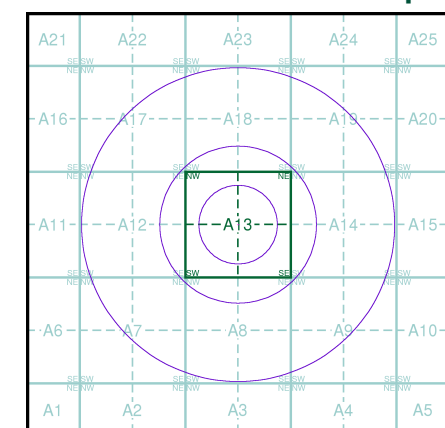
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions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

Artificial Ground and Landslip Map - Slice A



Order Details

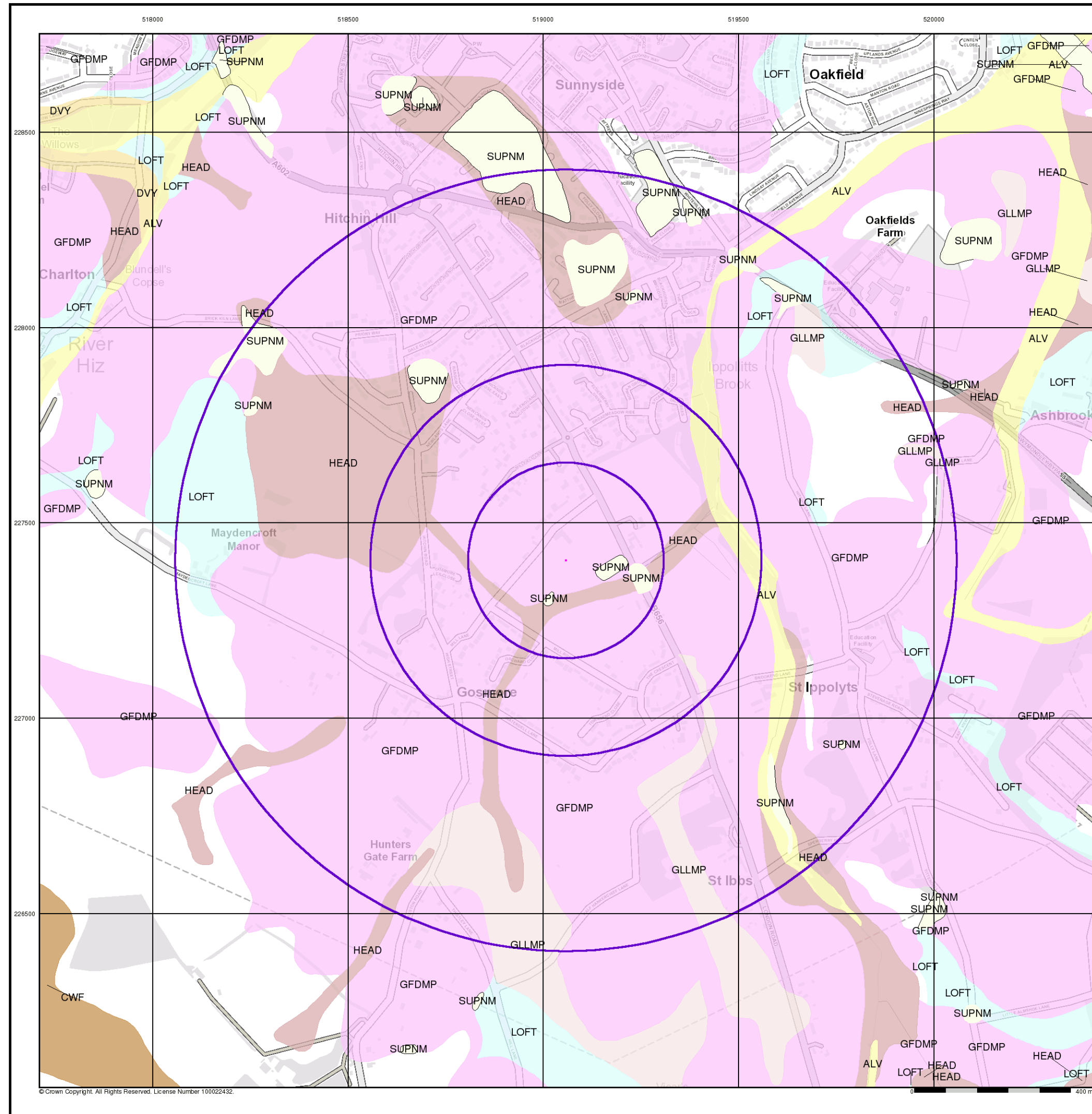
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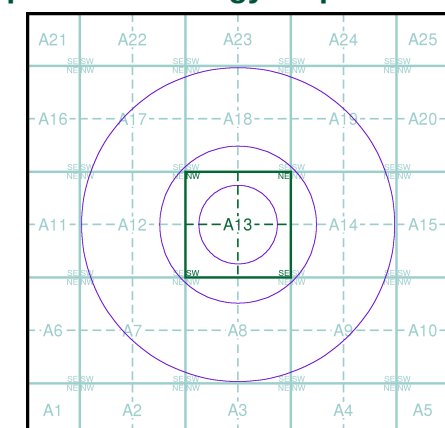
Superficial Geology

BGS 1:10,000 Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, 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

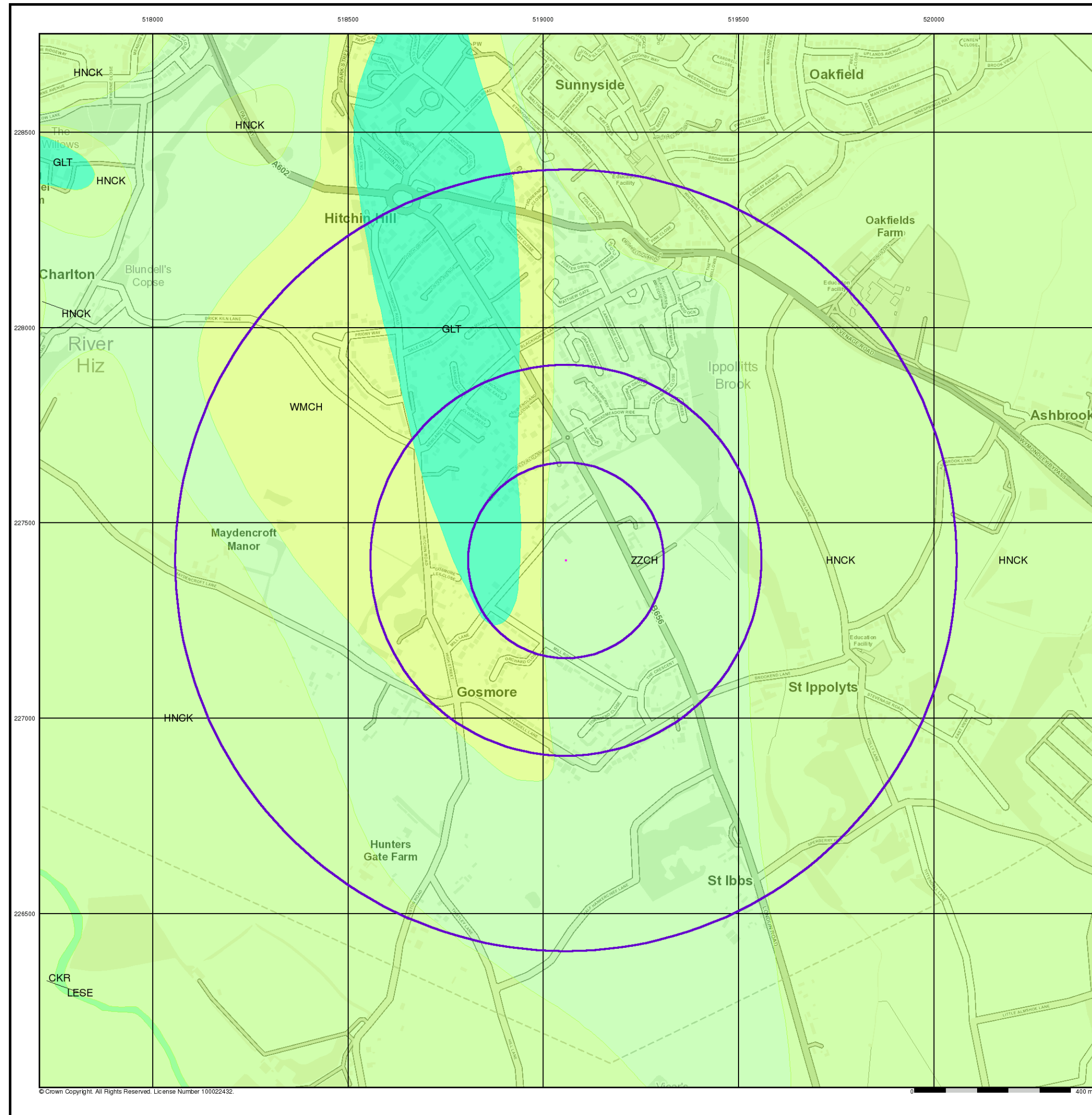
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Bedrock and Faults

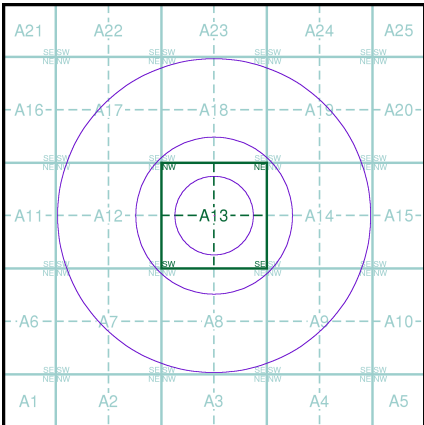
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

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 and thin beds mapped as lines such as coal seams and mineral veins. These are not restricted by age and could relate to features of any of the 1:10,000 geology datasets.

Bedrock and Faults Map - Slice A



Order Details

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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.

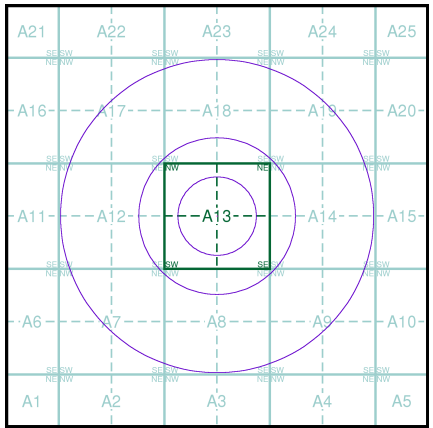
Additional Information

More information on 1:10,000 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



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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		
	Site of Antiquities		Bench Mark		
	Pump, Guide Post, Signal Post		Well, Spring, Boundary Post		
	285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	Road over Stream				
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Bracken		Heath
	Marsh		Reeds
	Building		Glasshouse
	Sloping Masonry		Pylon
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge
	Geographical County		Administrative County, County Borough or County of City
	Municipal Borough, Urban or Rural District, Burgh or District Council		Borough, Burgh or County Constituency
	Civil Parish		
	BP, BS		Ch
	CH		F E Sta
	FB		Fn
	GP		MP
	MS		Pol Sta
	PO		PC
	PH		SB
	Spr		TCB
	TCP		W
	Police Station		Post Office
	Public Convenience		Public House
	Signal Box		Spring
	Telephone Call Box		Telephone Call Post
	Well		

1:10,000 Raster Mapping

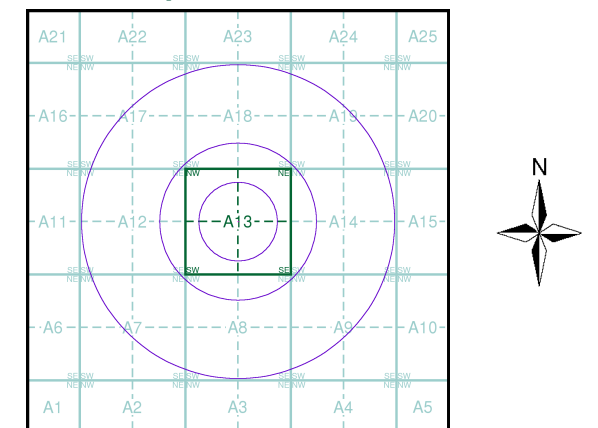
	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	Mean high water (springs)		Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Hertfordshire	1:10,560	1884	2
Hertfordshire	1:10,560	1899	3
Hertfordshire	1:10,560	1924 - 1925	4
Hertfordshire	1:10,560	1924	5
Hertfordshire	1:10,560	1946	6
Hertfordshire	1:10,560	1947 - 1950	7
Ordnance Survey Plan	1:10,000	1960	8
Ordnance Survey Plan	1:10,000	1964	9
Ordnance Survey Plan	1:10,000	1976	10
Ordnance Survey Plan	1:10,000	1981 - 1982	11
Ordnance Survey Plan	1:10,000	1992	12
10K Raster Mapping	1:10,000	1999	13
10K Raster Mapping	1:10,000	2006	14
VectorMap Local	1:10,000	2018	15

Historical Map - Slice A



Order Details

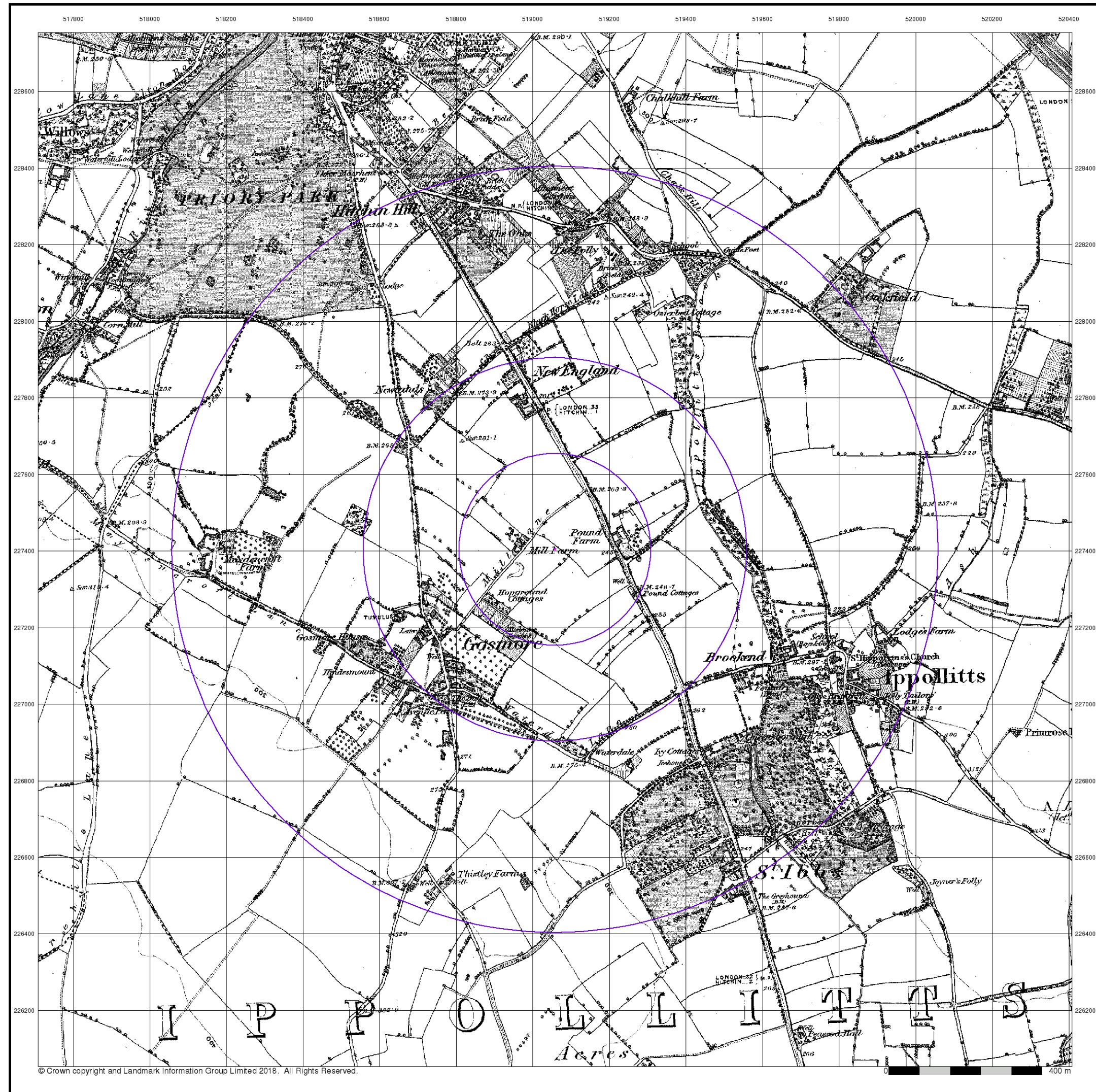
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 National Grid Reference: 519060, 227400
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

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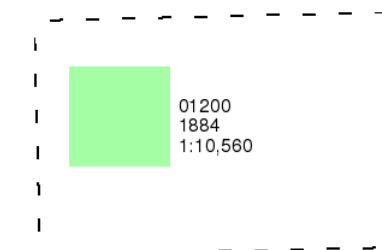
Hertfordshire

Published 1884

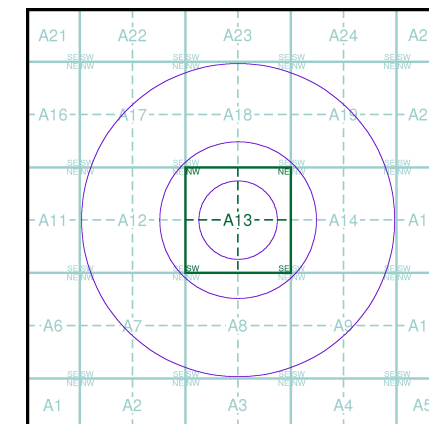
Source map scale - 1:10,560

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

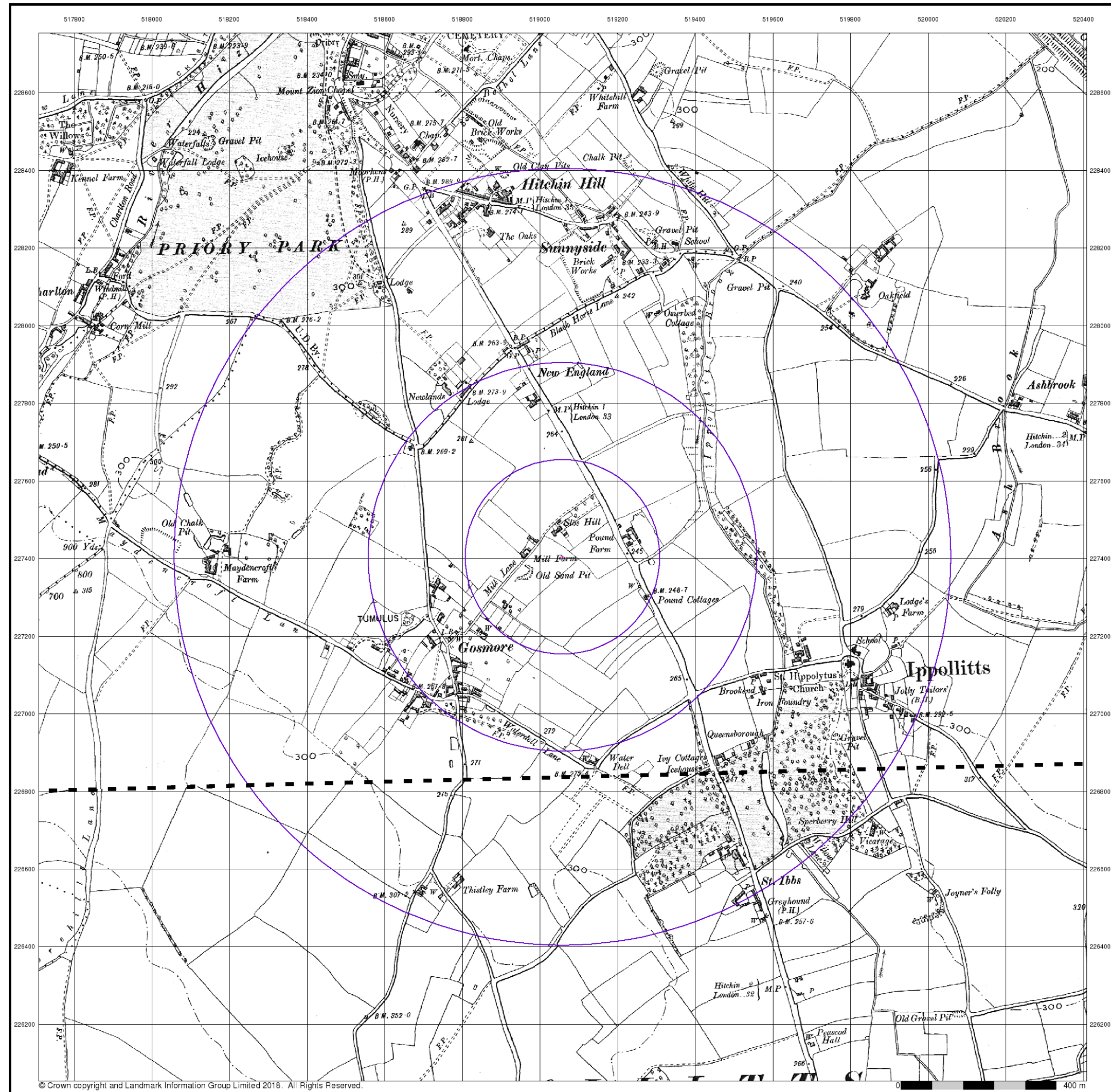
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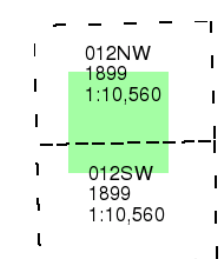
Hertfordshire

Published 1899

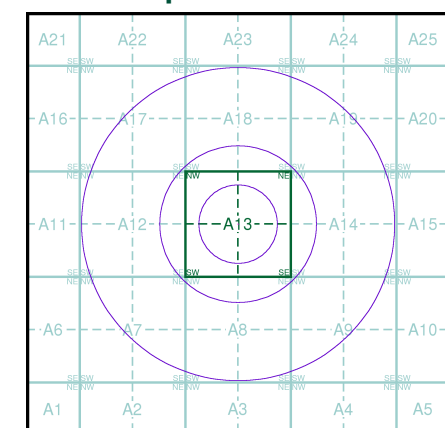
Source map scale - 1:10,560

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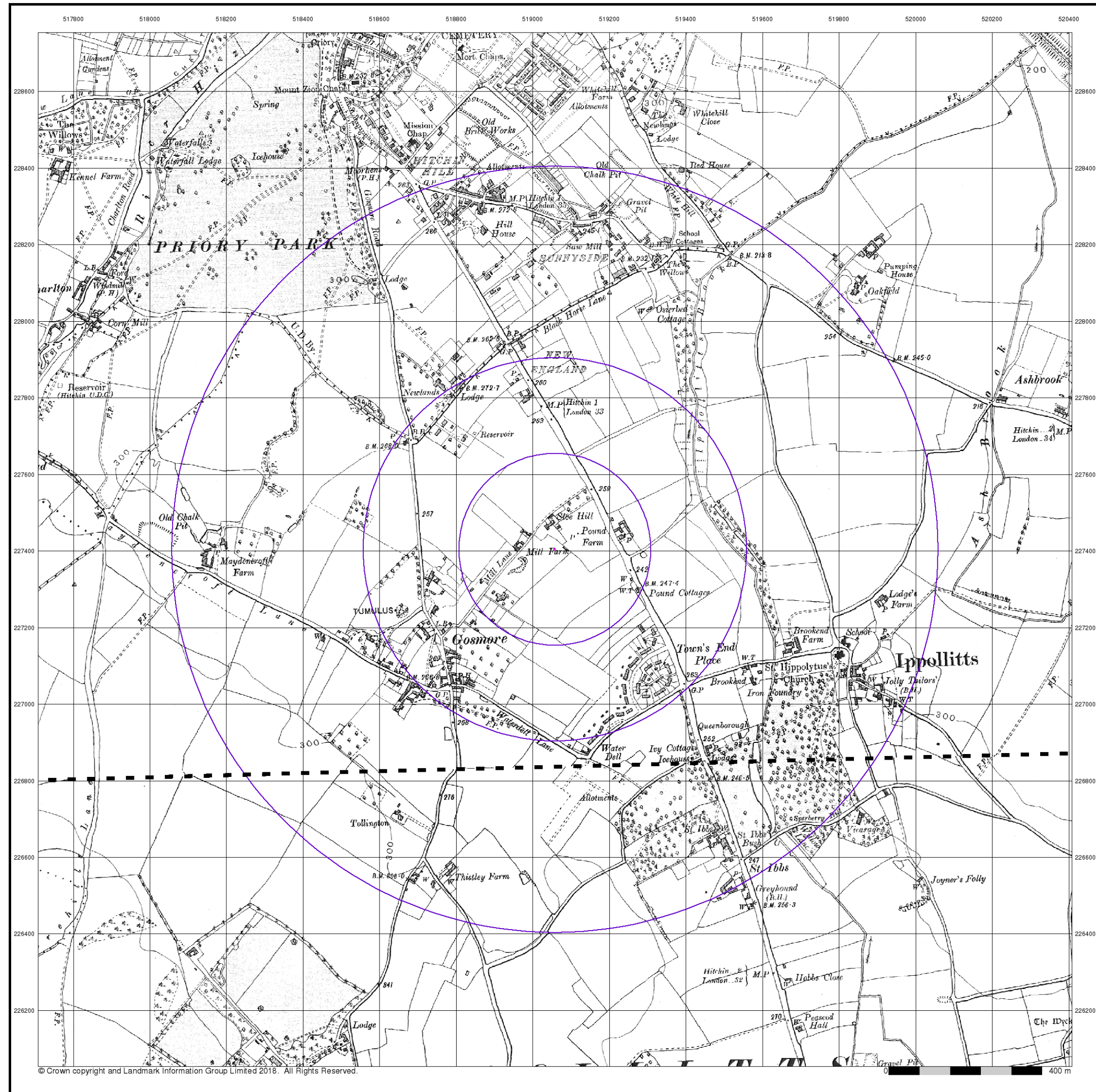
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Hertfordshire

Published 1924 - 1925

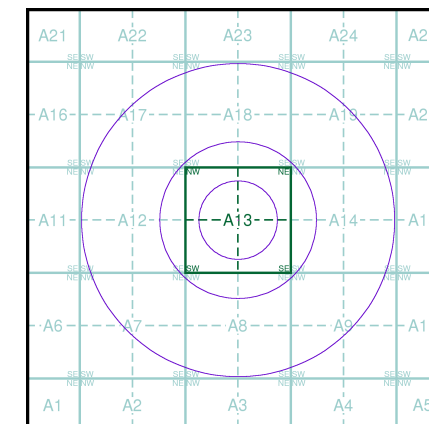
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

012NW
1925
1:10,560
012SW
1924
1:10,560

Historical Map - Slice A



Order Details

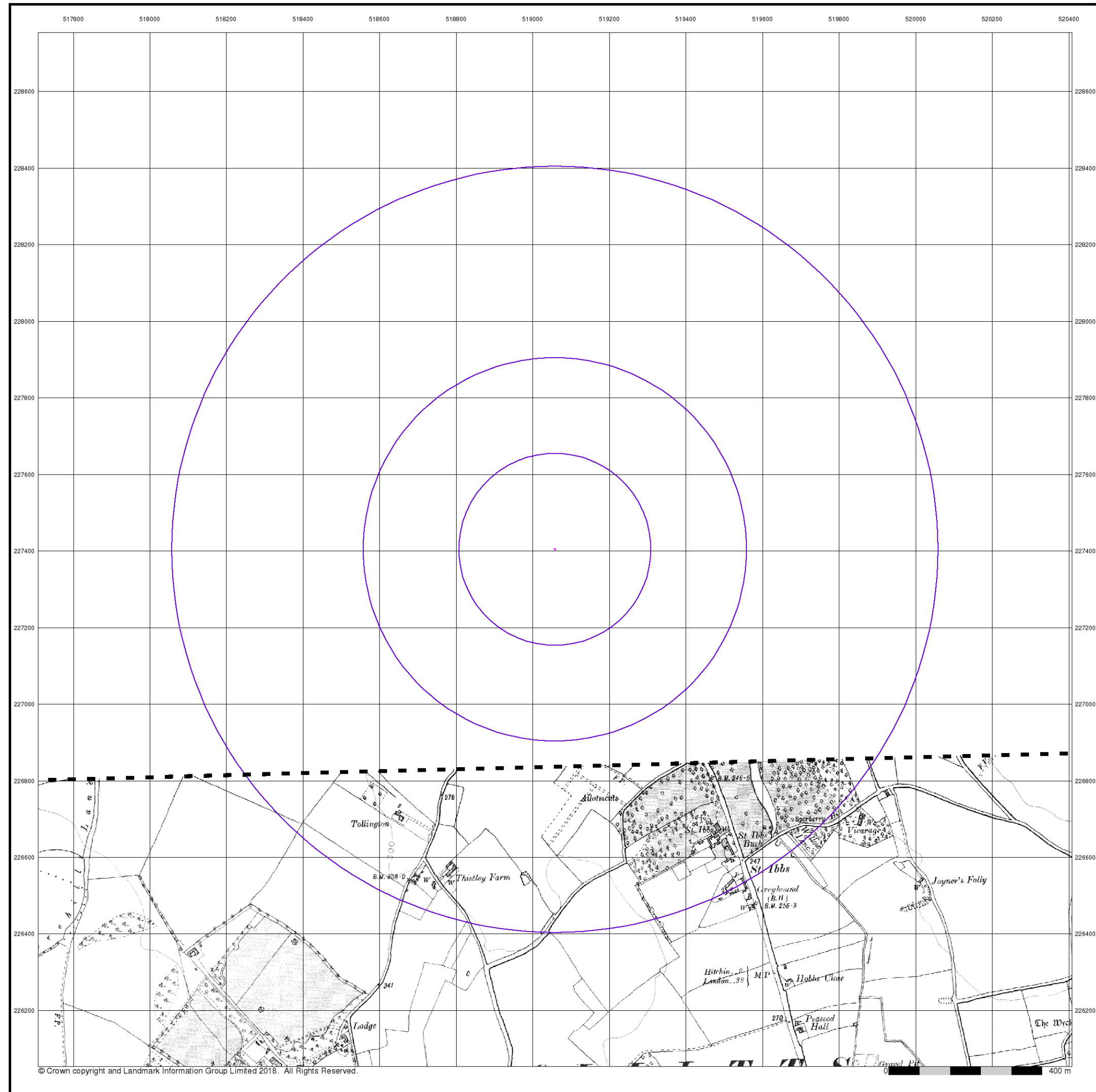
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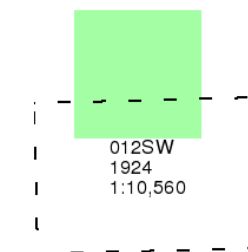
Hertfordshire

Published 1924

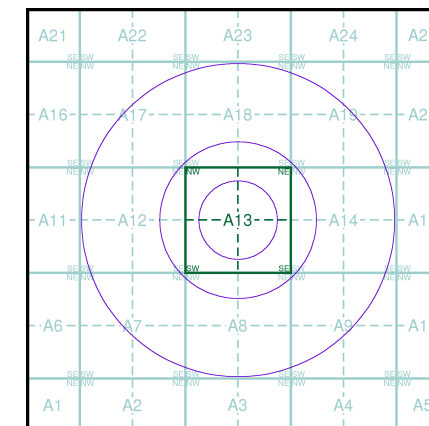
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

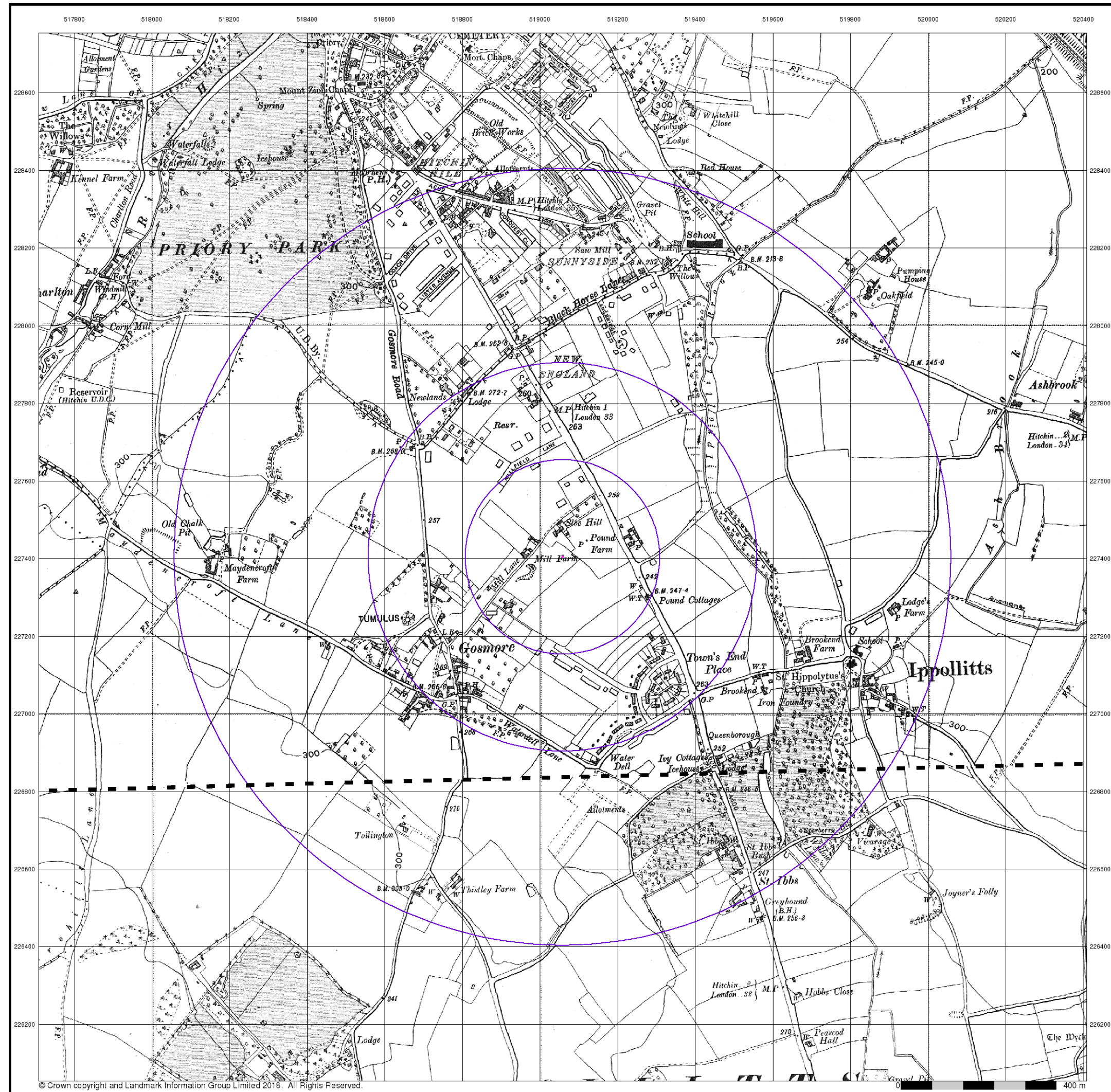
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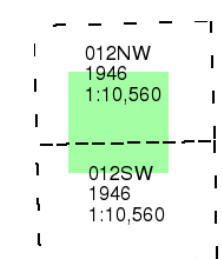
Hertfordshire

Published 1946

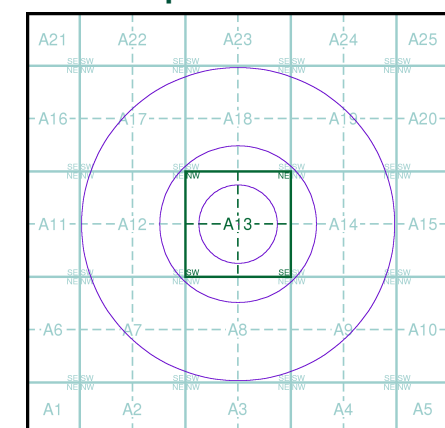
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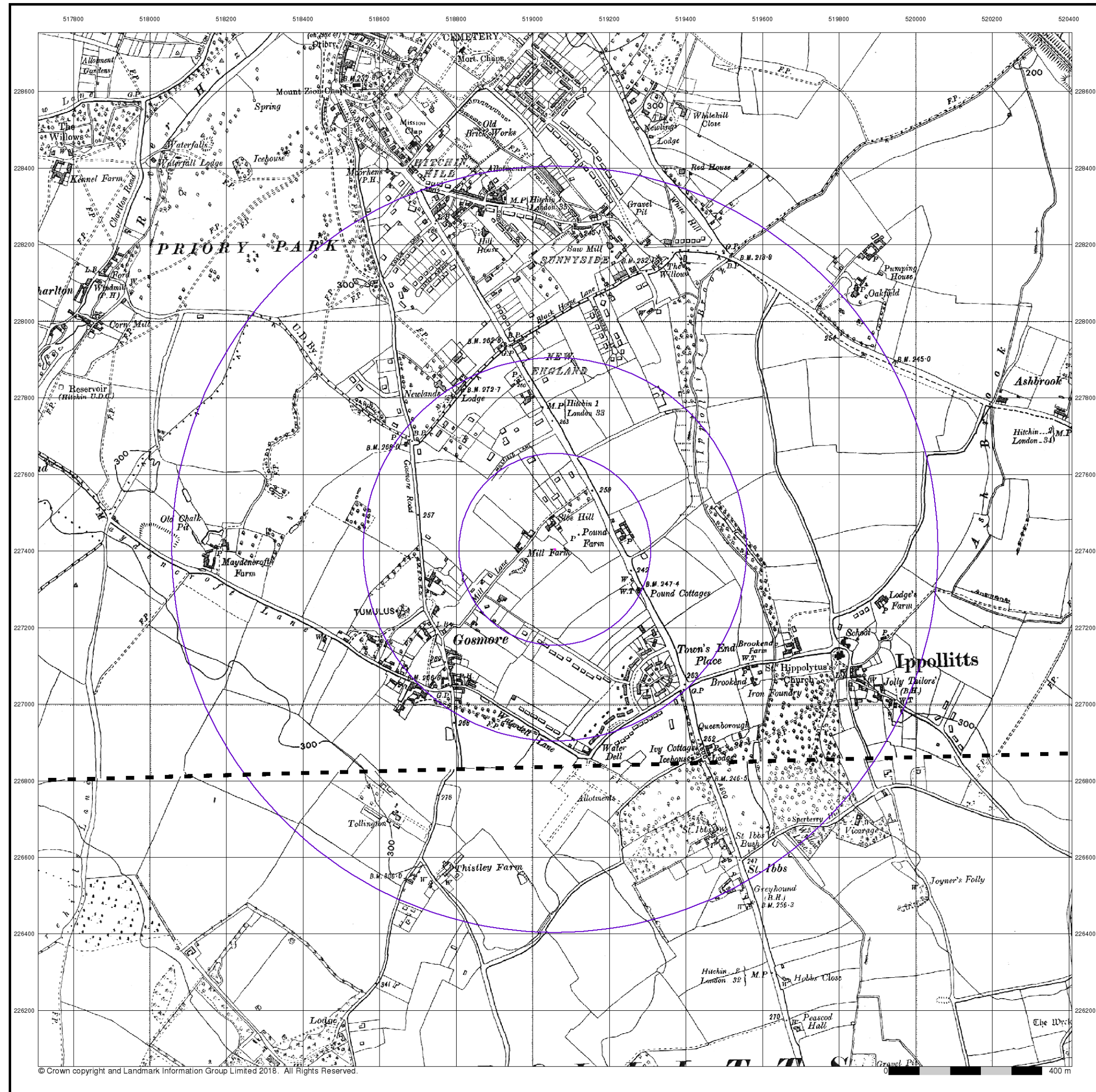
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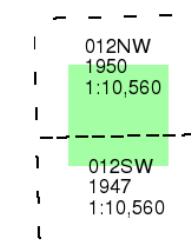
Hertfordshire

Published 1947 - 1950

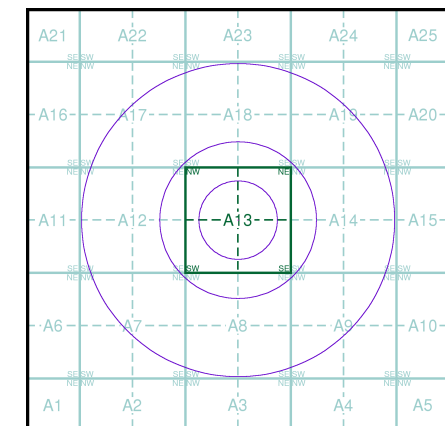
Source map scale - 1:10,560

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