



# North Hemel Hempstead Broad Location

## Historic Environment Desk-Based Assessment

December 2019

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# North Hemel Hempstead Broad Location

## *Historic Environment Desk-Based Assessment*

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## Executive Summary

*Oxford Archaeology (OA) were commissioned by Pigeon Investment Management Ltd. on behalf of Pigeon (Hemel Hempstead) Ltd. (in February 2019) to prepare an Historic Environment Desk-Based Assessment for a parcel of land identified as part of a draft Broad Location for Development at North Hemel Hempstead, henceforth known as 'the site'.*

*The draft version of this report was produced in early March 2019. It was subsequently updated in April 2019 to include the results of the geophysical survey carried out across Area A within the site. In July 2019 OA were commissioned to expand this report to cover the whole of the North Hemel Hempstead Broad Location Site as identified in Policy S6 iv of the St Albans City & District Local Plan 2020-2036 Publication Draft 2018.*

*No designated heritage assets have been recorded within the site. However, a number of regionally significant Grade II listed buildings and a nationally significant scheduled monument have been recorded within the wider study area including the Grade II Listed buildings at Holtsmere Manor, and Wood End Farm Cottages which are in proximity to the site. Several non-designated historic buildings were identified immediately to the north of the site at Little Revel End Farm. These are considered to be of local significance. This site is also considered to have the potential to contain previously unidentified archaeological remains.*

*The Historic Landscape Character (HLC) of the site is described as a combination of Pre- 19th century Co-axial Enclosure which is considered to be of regional significance; and an area of, at most, locally significant, 1950s boundary loss. Within these two HLC types, several hedgerows meeting the criteria for an important hedgerow, have been identified. Important hedgerows receive statutory protection under the Hedgerow Regulations and are considered to be of regional significance.*

*The proposed development would result in the loss of existing agricultural land and the urbanisation of parts of the site. Detailed development plans are not available, but depending on the scale and design of the proposed development and without mitigation it could result in a minor or moderate adverse effect upon the setting of the Grade II listed Wood End Farm Cottages, a minor adverse effect on Holtsmere Manor and a minor adverse effect on the non-designated historic buildings at Little Revel End Farm. It is recommended that mitigation in the form of appropriate off-sets from these properties and intervening landscape planting is incorporated into the Masterplan to reduce or avoid any potential adverse impacts on these heritage assets.*

*The loss of the existing enclosure pattern and field boundaries within the site would have a minor adverse effect on the wider historic landscape character of the area. The removal (wholly or in part) of important hedgerows as part of the proposed development would have an adverse effect upon these heritage assets. Consultation should be carried out with the Local Planning Authority (LPA) prior to the removal of any important hedgerows from the site.*

*The geophysical survey conducted within the western area of the site revealed no significant archaeological deposits although it did further clarify the nature of one of the archaeological sites identified in the desk-based assessment.*

*Invasive groundworks resulting from the proposed development would remove or truncate any archaeological remain within the development footprint. Accordingly, in line with NPPF paragraph 189 it is suggested that further archaeological evaluation comprising trial trenching) would be required to ascertain the presence (or absence) of any archaeological remains within the site. The results of these evaluation works will be used to clarify the nature, significance, extent and survival of any archaeological deposits within the application site and will inform a suitable mitigation strategy intended to reduce or remove any potential impacts of the scheme upon the archaeological resource. The scope of any further archaeological work should be agreed with the Hertfordshire County Archaeologist prior to commencement.*

*It is considered that, subject to mitigation, there are likely to be no significant impacts on the historic environment that should preclude the allocation of the site within the Local Plan.*

## 1 INTRODUCTION

- 1.1.1 Oxford Archaeology (OA) has been commissioned by Pigeon Investment Management Ltd. on behalf of Pigeon (Hemel Hempstead) Ltd. to prepare an Historic Environment Desk-Based Assessment for a parcel of land adjacent to Holtsmere End Lane, Hemel Hempstead henceforth known as ‘the site’. The site is centred on National Grid Reference 508619 210302, and its location is shown on Figure 1.
- 1.1.2 The first version of this report was produced in early March 2019. It was subsequently updated in April 2019 to include the results of the geophysical survey carried out across Area A within the site. In July 2019 OA were commissioned to expand this report to cover the whole of the North Hemel Hempstead Broad Location Site as identified in Policy S6 iv of the St Albans City & District Local Plan 2020-2036 Publication Draft 2018. This report presents the findings of this assessment.
- 1.1.3 The site lies within the St Albans City and District administrative area and has been identified as part of a draft Broad Location for Development at North Hemel Hempstead for a minimum of 1,500 dwellings and associated development within the emerging St Albans local plan. The site is divided into four areas (Fig.1):
- **Area A:** which covers an area of 20.83ha, comprises land proposed for removal from the Green Belt in the draft allocation;
  - **Area B:** which covers an area of 11.04ha, comprises land which will remain in the Green Belt in the draft allocation; and
  - **Area C:** which covers an area of 3.53ha and comprises additional land which falls outside the North Hemel Hempstead allocation site boundary.
  - **Area D:** which covers an area of 47.20ha and comprises the northern part of the North Hemel Hempstead site, north of Areas A-C and outside Pigeon’s ownership.
- 1.1.4 The report has been prepared in accordance with the Chartered Institute for Archaeologists (CIfA) Standards and guidance for Historic Environment Desk-based Assessment and Historic England’s Historic Environment Good Practice Advice in Planning Notes (2015a, 2015b, 2017).

## 2 LOCATION, TOPOGRAPHY AND GEOLOGY

- 2.1.1 The site is situated on the outskirts of Hemel Hempstead, approximately 24 miles to the north-west of London. It is bounded to the south by the B487 (Hemel Hempstead Road), to the west by Holtsmere End Lane and to the north by field boundaries and Holtsmere End Lane. The eastern boundary of the site is formed by hedged field boundaries and agricultural land. The site is currently in use as agricultural land and is divided into 4 large fields and two smaller fields located to the south of Little Revel End and adjacent to the south-east of Holtsmere End Farm.
- 2.1.2 The site ascends gently uphill reaching a maximum height of 122m above Ordnance Datum (aOD) in the south west corner of the site. The eastern boundary of the site ranges from 105 -108m aOD and the north-west corner of the site is situated at 113m aOD.



**2.1.3** The bedrock geology of the site is Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated). This is a sedimentary bedrock laid down approximately 84 -94 Million Years Ago (MYA) in an environment dominated by warm chalk seas (British Geological Survey (BGS)). Superficial deposits of Head - Clay, Silt, Sand and Gravel are recorded in the eastern corner of the site immediately to the north of the B487. These deposits were laid down up to 3 MYA and are detrital deposits which have accumulated at the base of the hill. Superficial deposits of Clay-with-flint Formation - clay, silt sand and gravel are recorded in the north-west and south-west corners of the site. These deposits were formed up to 23 MYA in the Quaternary and Neogene Periods (BGS).

### **3 AIMS AND OBJECTIVES**

**3.1.1** The purpose of this desk-based assessment is to determine, as far as is reasonably possible from existing records and observations, an understanding of the historic environment within and surrounding the site in order to:

- provide an assessment of known heritage assets and the potential for as yet unknown heritage assets to survive within the site;
- provide an assessment of the significance of the known or predicted heritage assets considering their archaeological, historic, architectural and artistic interests;
- assess the likely impacts of previous development on the survival of any archaeological remains;
- assess the impact of the proposed development or other land use changes on the significance of the heritage assets and their settings;
- provide strategies for further evaluation whether or not intrusive, where the nature, extent or significance of the resource is not sufficiently well defined;
- provide strategies to ensure that the proposed North Hemel Hempstead development incorporates measure to conserve the significance of heritage assets, and their settings;

## **4 PLANNING BACKGROUND**

### **4.1 Ancient Monuments and Archaeological Areas Act 1979**

**4.1.1** The Ancient Monuments and Archaeological Areas Act (1979), specifies that an archaeological site or historic building of national importance can be designated as a scheduled monument and registered with the Department of Culture, Media and Sport (DCMS). Under the terms of the act any development that could affect either the scheduled monument is subject to the granting of Scheduled Monument Consent. Historic England provide advice to DCMS regarding individual applications for scheduled monument consent, and also offers advice on the management of scheduled monuments.

## 4.2 Planning (Listed Buildings and Conservation Areas) Act 1990

- 4.2.1 Works that affect listed buildings or structures and conservation areas are subject to additional controls administered by the Local Planning Authority (LPA) under the Planning (Listed Buildings and Conservation Areas) Act 1990 (amended by the Enterprise and Regulatory Reform Act 2013). Section 66 states that in considering development which affects a listed building or its setting the LPA shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses. In respect to conservation areas Section 72 states that special attention should be paid to the desirability of preserving or enhancing the character or appearance of that area.
- 4.2.2 Under the terms of the act a listed building may not be demolished, altered or extended in any manner which would affect its character as a building of special architectural or historic interest without Listed Building Consent being granted.
- 4.2.3 There are three grades of listing (in descending order):
- Grade I: Buildings of exceptional interest
  - Grade II\*: Particularly important buildings of more than special interest; and
  - Grade II: Buildings of special interest, warranting every effort to preserve.
- 4.2.4 Historic England is a statutory consultee in relation to works affecting Grade I/II\* listed buildings.

## 4.3 The Hedgerows Regulations 1997 (amended 2003)

- 4.3.1 The Hedgerows Regulations (1997), specify various criteria used to identify important hedgerows for wildlife, landscape or historical reasons. Important hedgerows are subject to statutory protection.
- 4.3.2 Under the terms of the regulations a hedgerow is considered important if it has existed for more than 30 years and meets one of the following criteria:
- It marks a boundary between parishes existing before 1850;
  - It marks an archaeological feature that is a scheduled monument or noted on the Historic Environment Record;
  - It marks the boundary of a pre-1600 estate or manor, or  
It forms an integral part of a pre-parliamentary enclosure field system.

## 4.4 National Planning Policy

- 4.4.1 Section 16 of National Planning Policy Framework (NPPF: revised February 2019) sets out the Government's planning policies in relation to the conservation and enhancement of the historic environment.
- 4.4.2 Paragraph 189 and 190 state:
- 189. In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the*

*proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.*

*190. Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.*

#### 4.4.3 Paragraph 193 and 194 state:

*193. When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.*

*194. Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:*

*a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional;*

*b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II\* listed buildings, grade I and II\* registered parks and gardens, and World Heritage Sites, should be wholly exceptional (non-designated heritage assets of archaeological interest, which are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets).*

#### 4.4.4 Paragraph 195 and 196 state:

*195. Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:*

*a) the nature of the heritage asset prevents all reasonable uses of the site; and*

*b) no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and*

*c) conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and*

*d) the harm or loss is outweighed by the benefit of bringing the site back into use.*

*196. Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.*

#### 4.4.5 Paragraph 197 states:

*The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.*

#### 4.4.6 Paragraph 199 states:

*Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.*

#### 4.4.7 Paragraph 200 and 201 state:

*200. Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.*

*201. Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 195 or less than substantial harm under paragraph 196, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.*

## 4.5 Local Planning Policy

### ***The District Local Plan Review 1994 (adopted November 1994)***

4.5.1 The current adopted local plan for the St Albans City and District administrative area is The District Local Plan Review, which was adopted in 1994. This plan originally covered the period up to 27th September 2007. In 2007 a direction was made saving specified policies from the Local Plan Review. The saved policies relevant to this assessment are included below:

- Policy 86 Buildings of Special Architectural or Historic Interest:  
*‘(i) In considering any application for listed building consent for the demolition, alteration or extension of a listed building (and also any application for planning permission for development which affects a listed building or its setting), the council*

*will have special regard for the desirability of preserving the building or its setting or any features of architectural or historic interest which it possesses'*

- Policy 109 Scheduled Ancient Monuments:  
*'Planning applications for development which would adversely affect a Scheduled Ancient Monument, as defined by the Proposals Map...will be refused on archaeological grounds unless prior scheduled monument consent has been obtained from the Secretary of State for the Environment. If scheduled monument consent has been granted the District Council will seek to preserve the amenity of ancient monuments by resisting proposals within the scheduled area which would detract from their Character.'*
- Policy 111 Archaeological Sites where Planning permissions may be subject to a Recording condition  
*'Within the sites listed below and defined on the Proposals Map, the District Council will not normally refuse planning applications on archaeological grounds. However, following evaluation, planning permission may be subjected to a condition requiring facilities for the Council to record remains by excavation in advance of construction. The evaluation which may involve limited excavation or other work (e.g. geophysical survey), is to be carried out by the Council or an archaeologist approved by the Council'*

### ***St Albans Local Plan Publication 2018***

4.5.2 The District Local Plan Review 1994 is being replaced by a new Local Plan (hereafter the Draft Local Plan). This sets out the long-term planning strategy for the City and District of St Albans and provides policies and proposals for the future development of the District up to 2036. Policy L30 sets out the Councils approach to the Historic Environment, relevant extracts of this policies have been included below

4.5.3 Policy L30 Historic Environment states that:

*'...Heritage assets will be conserved in a manner appropriate to their significance. Great weight will be given to the conservation of the District's designated heritage assets. Currently undiscovered / undesignated heritage assets with equivalent interest will be similarly valued and conserved.'*

*Heritage assets worthy of conservation include the District's high level of above and below ground archaeology, locally listed buildings, locally listed historic parks and gardens and other locally recorded features of heritage significance.*

#### ***Development affecting heritage assets***

*Development that will affect heritage assets, including their setting, must have regard to the significance of the heritage asset. All submissions must include a Heritage Statement giving proportionate but sufficient information to enable full understanding of the proposals and their impact on the heritage assets significance.*

*New development must respect the wider context of the asset, with particular regard to important views of the District's built heritage and landscapes. Overall townscape*

*character should be preserved and enhanced. Long views are particularly important in conservation of the historic City Centre of St Albans as the historic roofscape of the City is considered to be an important element of the Conservation Area's significance.*

*Development must seek to preserve, enhance or better reveal the significance of a heritage asset. This may include that arising from its setting, including any important views to or from the asset.*

*Where development leads to unavoidable change to a heritage asset, or provides an opportunity to increase knowledge of the affected asset, conditions or planning obligations will be used to ensure effective recording and museum archiving of the records created.*

*Development affecting heritage assets will be assessed in relation to the following considerations:*

- a) Viable uses...*
- b) Demolition...*
- c) Listed buildings: Development will only be supported where the significance of the listed building, including any gained from its setting, is protected and respected, and, where relevant, better revealed. Proposals must not have a harmful impact on the building's historic fabric and features and special architectural and historic interest, including its setting....*
- d) Conservation Areas...*
- e) Locally listed buildings...*
- f) Archaeology: Planning permission for development which would adversely affect the significance of, or fail to preserve or enhance, a designated or known archaeological site (including a Scheduled Monument) will be refused.*

*Development may be permitted in exceptional circumstances, following evaluation, if important remains would not be destroyed or the character of the site adversely affected.*

*Any archaeological work must be carried out by an appropriately qualified archaeologist approved under a planning condition.*

- g) Historic Landscapes: Development which would destroy, damage or adversely affect the character, appearance or setting of an historic landscape, or any of its features, including both designated and undesignated historic parks and gardens, will be refused. Schemes to improve, restore and manage the historic landscape will be sought in connection with, and commensurate with, the scale of any new development affecting an historic landscape. Development will only be supported where the proposals would preserve and enhance the character and special qualities of the landscape.*

*Management and maintenance plans, which may include increased public access, will be required by conditions or planning obligations where appropriate. There are historic landscapes other than those on the national or local list of historic parks and gardens, and additional parks and gardens, to which this policy may apply. Historic landscapes also include ancient farming systems, unimproved*



*grasslands, water meadows, old orchards, ancient woodlands, veteran trees, battlefields and former settlement sites.'*

## 5 METHODOLOGY

### 5.1 Scope and Sources Consulted

- 5.1.1 A 1.3km search area (hereafter the study area) has been used to identify designated and non-designated heritage assets which could be affected by the proposed development. The size of the study area was specified by the Historic Environment Record Officer for Hertfordshire (Pers. Comms. 23rd July 2019). The assessment was informed through both a desk-based review and a site visit.
- 5.1.2 The following sources were consulted to inform the presence of heritage assets within the site and surrounding study area and form the archaeological and historic baseline:
- The National Heritage List for England (NHLE) for designated heritage assets;
  - Hertfordshire Historic Environment Record (HER) for non-designated heritage assets and archaeological events (supplied in March 2019 and updated in July 2019);
  - Hertfordshire Archives for historic maps and manuscripts;
  - Groundsure Mapping for Ordnance Survey maps
  - Historic England Archives in Swindon for historic aerial photographs and National Mapping Project (NMP) data.
  - LiDAR data held by the Environment Agency;
  - Geo-technical data as held by the client and British Geological Survey; and
  - Other relevant primary and secondary sources included published and unpublished works as held by OA, the Oxfordshire History Centre and the Sackler and Bodleian Libraries, Oxford and other archives as identified.
- 5.1.3 For ease of reference each heritage asset identified has been allocated a unique OA number. This is included in the heritage gazetteer provided in Appendix A, referred to in the text where relevant and marked on Figures 2 – 10. A full list of sources consulted can be found in Appendix B. Figures 11-24 show historic mapping of the site.

### 5.2 Assumptions and Limitations

- 5.2.1 Data used to compile this report consists of secondary information derived from a variety of sources. The assumption is made that this data, as well as that derived from other secondary sources, is reasonably accurate.
- 5.2.2 The records held by the Hertfordshire HER are not a record of all surviving heritage assets, but a record of the discovery of a wide range of archaeological and historical components of the historic environment. The information held within it is not complete and does not preclude the subsequent discovery of further heritage assets that are, at present, unknown.



## 6 WALKOVER SURVEY

- 6.1.1 A walkover survey of Area A, Area C and the southern part of Area B was carried out on the 27th February 2019 in dry sunny conditions. All areas of the site were accessed and no new archaeological features were identified during the visit. This part of the site comprised 2 large fields and a third smaller field (Plate 1). All three fields were in agricultural use at the time of the site visit and were divided by mature hedged field boundaries (Plates 2-8).
- 6.1.2 A walkover survey of Area D and the northern part of Area B was carried out on 31st July 2019 in dry overcast conditions. All areas of the site were accessed and no new archaeological features were identified. This part of the site comprised seven fields; three large fields within the centre, two smaller fields within the northern part of Area D and a further two small fields to the north and west of Little Revel End Farm split between Areas D and B (Plate 16). The three larger fields were in agricultural use and at the time of the site visit they were under crop (Plate 17-18). A modern housing development is situated within the northern part of Area D.
- 6.1.3 Designated heritage assets within the study area were visited (from points of public access) to assess the level of inter visibility between the site and the heritage assets. The Grade II listed Wood End Farm Cottages (OA 3) (Plate 9) had direct views across the Hemel Hempstead Road into Area A (Plates 10 and 11). Views from the Grade II listed farm buildings at Wood End Farm (OA 9, 4, 46), looking towards the site were blocked by existing planting and topography. The rooftops and chimneys of these farm buildings could however be seen from a high point along the northern boundary of Area A (Plate 12).
- 6.1.4 The Grade II listed buildings at Holtsmere End Farm (OA 6, 10) are separated from Area D by Holtsmere End Lane. Any views between the Barn (OA 6) and the site are completely screened by dense planting in the grounds of Holtsmere Manor (OA 10) and along Holtsmere End Lane. There is however intervisibility between Holtsmere Manor (OA 10) and the site, although these views are primarily of the modern houses located along the northern boundary of Area D (Plate 19). Any further views into Area D from Holtsmere Manor are heavily obscured by this modern development and the dense planting which lines both sides of Holtsmere End Lane (Plate 25).
- 6.1.5 The Grade II listed buildings at Great Revel End Farm (OA 5, 8) to the east of Area B are screened from the site by the dense shrub and tree planting that runs to the north, west and south of the farmstead. There are some limited views of the farmstead from Areas B and D (Plates 20-21) but only the modern barns are visible in these views. The site shares no intervisibility with the listed farm buildings.
- 6.1.6 No other designated heritage assets within the study area shared intervisibility with the site.
- 6.1.7 Little Revel End Farm (Plates 13-14) lies within Area B. The farm is identified by the HER as a non-designated heritage asset. It lies to the south-east of Area D and there are some limited views of the farm looking south from Area D (Plates 22-23).

## **7 GEOPHYSICAL SURVEY**

### **7.1 Introduction**

- 7.1.1 A Geophysical Survey of Area A of the site was carried out by Magnitude Surveys between 13<sup>th</sup> and 15<sup>th</sup> March 2019. The full survey report is included in Appendix C and a summary of the results is included below.

### **7.2 Results of Survey**

- 7.2.1 The results of the survey were partially compromised by the presence of a probable green waste spread across the majority of the site. Green waste is often contaminated by metal and other domestic waste which can impact upon the effectiveness of magnetic survey and affect the interpretation of weaker, more ephemeral features. However, the survey report gives no indication that this has significantly affected the general conclusions of the report. In summary the survey did not identify any significant archaeological deposits within the site although it did identify the possible site of an undated (but apparently pre-19<sup>th</sup> century) demolished building, the presence of some extractive pits, a soil-filled channel and some old field boundaries. In this, and as discussed below, it broadly supports the findings of the desk-based assessment whilst also suggesting that the site has a generally low identified potential for significant archaeological remains.

## **8 HISTORIC ENVIRONMENT BASELINE**

### **8.1 Introduction**

- 8.1.1 The following section identifies the known heritage assets within the study area. These were identified from sources listed in section 5 and through a site walkover. In accordance with Step 1 of Historic England's Historic Environment Good Practice Advice Note 3 (December 2017) this section also identifies heritage assets that have the potential to receive effects to their setting and heritage significance from the proposed development within the site.

### **8.2 Designated Heritage Assets**

- 8.2.1 There are no designated heritage assets<sup>1</sup> within the site. In the wider study area one scheduled monument (OA 1) and eleven Grade II listed buildings (OA 2-10, 68-9) have been identified (Fig.2).
- 8.2.2 The scheduled defensive enclosure known as The Aubreys (OA 1), which comprises a double ditched Iron Age hillfort, is located c 400m to the north-east of the site. The Hillfort is situated within the agricultural landscape which separates the settlements of Hemel Hempstead and Redbourn.

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<sup>1</sup> Statutorily protected sites including scheduled monuments, listed buildings, conservation areas, registered parks and gardens and registered battlefields

- 8.2.3 The listed buildings (OA 2-9, 68-9) consist of 16th century and later farmhouses (and occasionally associated barns etc.) located fairly evenly across the study area. These buildings reflect the general agricultural nature of the landscape surrounding the site.
- 8.2.4 The closest listed buildings to the site are the Grade II listed Wood End Farm Cottages (OA 3), located 70m to the south of the site, and separated from it by the Redbourn/Hemel Hempstead Road (B487) and the Grade II listed Great Revel End Farm House (OA 5) and Barn (OA 8) located c 100m to the east of the site. The Grade II listed Holtsmere Manor (OA 10) and Barn (OA 6) are located between 50m and 125m north of the site and the Grade II listed buildings at Wood Farm (OA 4 and OA 9) are recorded c 300m to the south of the site.

### 8.3 Areas of archaeological significance

- 8.3.1 Three Areas of Archaeological Significance (AAS) as defined by the Hertfordshire Historic Environment Record (HER), are recorded within the study area, although none are recorded within the site. AAS demark areas considered to have the potential to contain particularly significant archaeological remains. Within the study area they encompass the scheduled Iron Age Hillfort (OA 1) and its immediate surrounds, which lie to the north-east of the site; the deserted medieval settlement of Rutherford (OA 36) which lies to the north and east of the site between Great Revel End Lodge and Great Revel End Farm; and a Roman cemetery (OA 32) and a Roman industrial site (OA 34) which lie to the south-west of the site.

### 8.4 Previous Archaeological Investigations

- 8.4.1 The site contains no known archaeological or heritage sites and recent programmes of Geophysical Survey (OA 16 & 18) and trenching evaluation (OA 19) on sites immediately to the south of the site and of Redbourn Road have not produced evidence of significant or concentrated archaeological activity. The results of the recent (March 2019) Geophysical survey of Area A have been summarised in Section 7 above. The full survey report is included as Appendix C.

### 8.5 Prehistoric Period (500,000 BP – AD 43)

- 8.5.1 No known Palaeolithic, Mesolithic or Neolithic activity has been recorded within the site or the wider study area. The only known Bronze Age remains within the study area are a Bronze Age socketed axehead and possible Bronze Age feature (OA 27), recorded 553m to the north-west of the site. The feature, interpreted as a dew pond or a natural feature contained Neolithic/Bronze Age flint flakes and fragments of prehistoric flint-gritted pottery.
- 8.5.2 The majority of the prehistoric activity in the study area dates to the Iron Age and during the Iron Age, the defensive enclosure (OA 26) known now as the Aubrey's would have been a focal point within the study area and the surrounding landscape. The area within the hillfort may have been in use as early as the Neolithic period and as such the hillside may have been a focus for activity throughout the prehistoric period. The site lies within the hinterland of the fort which has produced further evidence of prehistoric activity. Late Iron Age features comprising a gravel surface

topped by a possible hearth and six sherds of grog-tempered Iron Age pottery (OA 25) were recorded at Great Revel End Farm to the north of the site, and a late Iron Age silver coin (OA 28) was recorded 865m to the east of the site.

- 8.5.3 A possible palaeochannel (former watercourse) (OA 55, Figs. 8-9) has been identified within the site following a south-east to north-west alignment through the site. Prehistoric activity within Hertfordshire has often been recorded in proximity to water courses and accordingly the areas alongside the palaeochannel have an enhanced potential to contain prehistoric remains.
- 8.5.4 Cropmark remains which suggest at the presence of prehistoric remains have been recorded on the edge of the study area and include a possible prehistoric ring ditch (OA 77) which is located to the south of the site, a prehistoric trackway (OA 78) located to the north-west of the site and possible circular enclosures (OA 76) located to the north-east of the site.

## 8.6 Romano-British Period (AD 43 – 410)

No Roman remains have been recorded within the site or its immediate environs. Occupation of the hillfort (OA 26) and the surrounding landscape continued into the Romano-British Period. Roman finds have been recovered in metal detecting surveys carried out in the area of the hillfort (OA 33), suggesting that this landscape remained in use into the early Roman period. Further Romano-British activity is recorded to the south-east of the site within the suburbs of Hemel Hempstead. This activity comprises an area of Roman cremations (OA 32) and an industrial complex (OA 34).

- 8.6.1 The proposed location of a Roman road running between *Verulamium* (Gorhambury) and Ivinghoe Beacon (OA 29 and 30) (Margary 1967, 176) is also recorded within this part of the study area. Evidence for the road comprises stony patches, and lengths of historic road and lanes. The route of the road has not been confirmed by excavation and evidence suggests it may have followed a different alignment running to the Gorhambury Roman Villa to the west of the proposed alignment (Hertfordshire HER 2019). A second Roman road (OA 81) was recorded in the north-western part of the study area during an excavation carried out at Spencers Park. Cropmark remains of a possible Roman villa (OA 79) have been recorded in this area.
- 8.6.2 Other Roman remains within the study area have been recorded 825m to the south-east of the site, between Punchbowl Lane and the B487 Redbourn. Archaeological work in this area uncovered a large quantity of 1st century AD pottery together with burnt clay, charcoal and a lump of copper alloy metal working debris. This material appeared to be a dumped deposit in the butt end of a small drainage ditch (OA 31).

## 8.7 The Medieval Period (AD 410 – 1550)

### *Early-Medieval Period (AD 410 – 1065)*

- 8.7.1 No early-medieval remains have been recorded within the site. In the surrounding study area, the only evidence of early-medieval activity has been recorded 990m to the south of the site and comprises an early medieval occupation site (OA 82). The majority of early-medieval remains in Hertfordshire have been recorded in the northern part of the country where a greater proportion of the population lived in

large nucleated villages (Bryant 2011). From the 7th century onwards settlements began to appear on the gravel terraces of the larger river valleys at Old Parkbury, near St Albans and Watford on the River Colne, Ware and Wheathampstead on the River Lea and St Albans on the River Ver. By the late 8th century most of Hertfordshire had fallen under the control of the Mercian King Offa. Hitchin and St Albans both probably fell under his control as royal estates, and elsewhere in the county large Late-Saxon estates appear to have developed (*Ibid*), including Hemel Hampstead which is the closest of these estates to the site.

### ***Later Medieval Period (1066 – 1550)***

- 8.7.2 During the medieval period, settlement appears to have been located away from the site at the nearby settlements of Redbourn (3.5km to the north-east) and Hemel Hampstead (4.5m to the south-west). Both settlements are recorded in the Domesday Book of 1086 which describes Hemel Hampstead as a quite large settlement of 23 households under the lordship of the Earl of Leofwin. The settlement was associated with 30 ploughlands, 4 ploughs of meadows, woodland for 1200 pigs (Palmer, Powel-Smith 2019).
- 8.7.3 Redbourn, to the north-east of the site is described as a quite large settlement divided between 3 lordships. The majority of the settlement comprising 18 villagers and 2 cottagers, with their associated 18 ploughlands, 1.5 ploughs of meadow and woodland for 500 pigs, belonged to the Abbey of St Albans. The remaining 4 smallholders and their associated lands (3.5 ploughlands and 1 plough of meadow) were divided between King Edward who held 1 ploughland and 1 plough of meadow, and the Earl of Leofwin who held 0.5 ploughlands (Palmer, Powel-Smith 2019).
- 8.7.4 The manorial centre of Flamstead (OA 83) has been recorded on the north-eastern edge of the study area in the area of Flamsteadbury Farm. Flamstead is recorded in the Domesday Survey as quite a large settlement held by Ralph of Tosney. The settlement comprised 22 villages, 4 slaves and 7 cottagers and was associated with 12 ploughlands and woodland for 1000 pigs (Palmer and Powel-Smith 2019).
- 8.7.5 During the medieval period, the site and the surrounding landscape would largely have been part of the open fields associated with Redbourn and Hemel Hampstead. Evidence of this land use is visible as cropmarks suggesting the presence of a headland (OA 35) to the west of the site and ridge and furrow (OA 37) to the south.
- 8.7.6 Other evidence of medieval activity comprising medieval ridge and furrow earthworks, boundary ditches and possible house platforms (OA 36) have been recorded 751m to the north of the site, between Great Revel Lodge and Great Revel Farm. The earthworks have been interpreted as the deserted medieval settlement of Rutherford End, one of the many small hamlets that made up the township of Redbourn, during the medieval period. To the north of the settlement at Revel End, metal finds (OA 53) dating to the medieval period have been recorded.

## **8.8 Post-Medieval Period (1550-1900)**

- 8.8.1 This agricultural use of the surrounding landscape continued into the post-medieval period when the study area was characterised by dispersed farmsteads and farmland.

The closest farmstead to the site is Little Revel End Farm (OA 49) which is situated within the site. Little Revel End Farm is shown on the 1841 Tithe map as 'Revel End', and at this time the farm was a long narrow farmhouse set on the north-side of an irregular yard, with several farm buildings along the lane frontage. By the late 19th century the farm was called 'Little Revelend Farm'. The 1st edition Ordnance Survey (OS) map shows little change to the layout of the farm since its depiction on the Tithe Map but later in the 20th century most of the farm buildings along the lane were demolished and the remainder were converted into domestic use.

- 8.8.2 Approximately 500m to the north of Little Revel End Farm is the Grade II listed Great Revel End Farmhouse and Barn (OA 39, OA 8, OA 5). In 1663, the Hearth Tax recorded several medium sized houses at Revel End, none of which seems to have been more substantial than the others. The present Grade II listed farmhouse (OA 5) at Revel End dates to the late 16th or early 17th century and accordingly it is likely to be a survivor of the group of houses described in the tax return.
- 8.8.3 Wood End Farm (OA 46), comprising the Grade II listed Wood End Farm House (OA 9), Barn (OA 4), and Wood End Farm Cottages (OA 3), lies to the south of the site. The farmhouse (OA 9, situated 283m to the south of the site) dates back to the 16th or early 17th century, with 18th century additions, and is believed to be the site of a former Quaker meeting place. The Barn (OA 4, situated 345m to the south of the site) was constructed in the 18th or early 19th century. Both of these buildings are separated from the site by the B487 (Hemel Hempstead Road) and the former line of the Harpenden to Hemel Hempstead Railway (OA 42). Wood End Farm Cottages (OA 3) are situated 70m south of the site, to the north of the former railway line (OA 42) and to the south of the Hemel Hempstead Road. The Grade II listed cottages were built in the late 16th or early 17th century and have been subject to 19th and 20th century additions.
- 8.8.4 Several post-medieval buildings are located within Holtsmere End, which lies to the north of the site. The Grade II listed Holtsmere Manor (OA 10) and a Grade II listed Barn (OA 6) located at Holtsmere End Farm, which both date to the c 17th-century are located within the hamlet. The 1841 Tithe map also illustrates two buildings, comprising a possible house and associated ancillary building, shown as 'Holmer End' on the northern boundary of the site at this time.
- 8.8.5 Other post-medieval farmsteads in the wider study area include); the remains of the 16th century Fosters Farm (OA 45, situated 656m to the north-east of the site) which includes the Grade II listed restaurant at Aubrey Park Hotel (OA 76); the site of the early 19th century Woodhall Farm (OA 43), which was situated 652m to the west of the site and has since been demolished; and the Grade II listed 16th century St Agnell's Farmhouse (OA 2,10) which lies 941m to the west of the site and has since been encompassed by the 20th century suburbs of Hemel Hempstead. The post-medieval farmsteads of Cherry Trees Farm (OA 84-5), Eastbrookhay Farm (OA 86) and Heavensgate Farm (OA 87) are also recorded in the study area over 1km from the site.
- 8.8.6 The site continued in agricultural use throughout the 17th, 18th and 19th century. The possible site of a former Quaker meeting place and burial ground (OA 38, located 128m to the south-west of the site), is shown on the Gorhambury estate map of 1768, but



no trace of the site was revealed during the geophysical survey and evaluation of the area carried out in 2005 (OA 18) and 2007 (OA 19).

- 8.8.7 The Harpenden to Hemel Hempstead railway line (OA 42, situated c 170m south of the site) was opened in 1877 and is shown on the 1st edition Ordnance Survey map (Fig. 12) of the site. The line was intended to connect Harpenden Central Station to the gasworks near Boxmoor which was on the London and North Western Railway line. In 1886 the railway line was taken over by Midland Railway, but the connection to the London and North Western Railway was never completed. The line remained in use transporting coal and passengers until 1947. The route of the railway line is preserved in place by a cycle and pedestrian route known as the Nicky Way. A railway bridge (OA 41) associated with the line is recorded 907m south-west of the site.
- 8.8.8 Other post-medieval heritage assets within the site include a post medieval clay pit (OA 30), recorded 895m to the south-west of the site; and two metal coins (OA 50, 51) found in a metal detecting survey carried out to the east of the site.

## 8.9 Modern

- 8.9.1 The agricultural nature of the site has persisted until the present day although some of the earlier field boundaries within the site have been lost. The buildings first illustrated on the 1841 Tithe map along the northern boundary of the site had been demolished by 1920 (Fig.14). By 1981 (Fig.19) two residential buildings had been constructed within this part of the site.
- 8.9.2 The surrounding landscape remained relatively unchanged between the 1883-4 Ordnance Survey (OS) map and the 1920 OS map (Fig. 13- 14). The only changes in this period, appear to be some quarrying activity shown on the 1920 OS map 150m to the east of the site and the construction of a small building called The Ham in the area known as Belvedere to the south of the site.
- 8.9.3 By the time of the 1938 Ordnance Survey map (Fig. 15) a fireworks factory had been constructed to the east of the site on the land formerly associated with Woodhall Farm. The factory remained a prominent feature within the landscape until at least the 1960s when it is shown on the 1963 OS map (Fig. 18), but by 1981 it had been demolished and replaced by residential housing. The period between 1963 and 1981, saw significant expansion of Hemel Hempstead and by the 1981 OS map (Fig.19) the suburbs of the town had expanded into the land immediately to the west of the site.
- 8.9.4 The area to the east of the site (now known as Betts Cottages and North Barn) appears to have been first developed between 1955 and 1960, when a number of small buildings are shown in the area.

## 8.10 Undated

- 8.10.1 The HER records a series of cropmark linear ditches (OA 54, located 508m to the south-east of the site), probably representing former field boundaries or woodland boundary banks. In addition to the recorded archaeological remains a review of aerial photographs and Environment Agency LiDAR has identified several further features of



possible archaeological origin within the site and surrounds. These are discussed in Section 7.11 and 7.12 below.

- 8.10.2 The recent geophysical survey of the site identified a number of undated (but almost certainly post-medieval) extraction pits and the site of an undated but probably post-medieval demolished building (OA 57). The undated building (OA 57) was originally identified as a mound on the LiDAR survey. The geophysical survey identified possible deposits of fired or burnt material (most likely brick) which suggest that the building had a post-medieval date. The exact date of the building is unclear as it does not appear upon the 1841 Tithe Map (Fig. 11) or upon any of the detailed sequence of historic OS maps (1883-present) examined for this study. This suggests that it either pre-dates 1841 or was too ephemeral to be recorded by any of the historic maps.

## 8.11 Aerial Photograph

- 8.11.1 A review of aerial photographs (APs) held at Historic England Archive in Swindon was carried out as part of the baseline assessment. A total of 175 aerial photographs comprising vertical and oblique images covering the period 1946 – 2004 were reviewed. Figure 9 provides a sketch plot of the cropmarks identified during the review. Nine possible cropmark features including a possible palaeochannel (OA 55), three areas of possible extractive pits (OA 58, 63, 97), a possible cropmark enclosure (OA 61) and four former field boundaries (OA 59, 66, 96, 98) were identified within the site boundary. The former field boundaries within the site (OA 66, 98) are shown on the 1883-1884 Ordnance Survey map, while the field boundaries to the north of the site (OA 59, 60, 96) are not shown on the historic Ordnance Survey maps suggesting an earlier date. The two extractive pits (OA 58, 63) both appear on the 1st edition Ordnance Survey map while the small pits further to the north (OA 97) are not shown on the historic maps of the site.

- 8.11.2 No cropmarks were identified within site or surrounds within the NMP.

## 8.12 LiDAR

- 8.12.1 The LiDAR data utilized in this report was captured by the Environment Agency (EA) and made available via the EA online archive. In this instance Digital Terrain Model (DTM) tiles for Ordnance Survey Sheet TLO0NE and TLO1SE were downloaded.
- 8.12.2 This data was surveyed at 1 m intervals and was collected 10/03/2011. The DTM data were processed using the Relief Visualisation Toolkit (RVT) and visualisations were created using Hill Shade, Slope, Sky View factor, open-positive, open-negative and simple local relief model (SLRM) visualisation techniques.
- 8.12.3 Figure 5 presents the results of the multi-hillshade analysis, which was processed using a sun height of 35 from 16 directions. Figure 6 presents the results of the slope analysis and Figure 7 presents the results of the Anisotropic Sky View analysis. Figure 8 Shows a plot of the features identified in this analysis.
- 8.12.4 The LiDAR analysis identified earthwork remains associated with two former field boundaries (OA 60, 66), a possible mound in the north-west corner of the site (OA 57), identified in the geophysical survey as being an undated and demolished structure, several small pits to the north of the site (OA 56), a possible extractive pit in the

northern part of the site (OA 58) and a possible palaeochannel (OA 55). The palaeochannel (OA 55), the extractive pit (OA 58) and one of the field boundaries (OA 60), were also visible as cropmarks on aerial photographs of the site (see section 7.11 above).

### 8.13 Historic Landscape Character

8.13.1 The site is divided between two Historic Landscape Character (HLC) types (Fig 10). The eastern and northern parts of the site is described as pre-18th century Co-axial Enclosure. Co-axial fields comprise long linear field boundaries all on the same geographical alignment with a number of smaller boundaries at right angles to the larger boundaries. Elsewhere in Hertfordshire similar landscapes have been dated back to the Bronze Age. The landscapes within the site have yet to be firmly dated, but based upon their morphology they could be of a similar date and function (Dyson-Bruce et al 2006). The majority of the surviving field boundaries in this part of the site date back to at least mid-19th century, when they are shown on the 1841 Tithe map, although their origins could be much earlier.

8.13.2 The western part of the site is described as an area of post 1950 boundary loss. This historic landscape type was formed from the amalgamation of earlier enclosure in the 20th century. The southern part of the site is shown as enclosed land (Upper Crouch Field and Lower Crouch Field) on the Gorhambury Estate Map of 1768, suggesting that the land in this area was enclosed from at least the mid-18th century. The surviving hedgerows in this area reflect those shown on the 1841 Tithe Map (Fig. 11).

### 8.14 Previous Impacts and Survival

8.14.1 The site had been in agricultural use since at least the medieval period, when the site was probably part of the common fields associated with Redbourn. The area has been subject to some quarrying, and the remains of small chalk pits can be observed in the western part of the site of the site (and were picked up by both the geophysical survey and the LiDAR). The chalk pits would have had a localised impact on any earlier archaeological remains present. Away from these pits the site has been subject to arable cultivation, the repeated ploughing of the site in the medieval, post-medieval and modern periods would have had an impact upon any shallow archaeological remains present. However, below this depth of disturbance archaeological remains, if present, are likely to be well preserved.

## 9 STATEMENT OF SIGNIFICANCE

### 9.1 Introduction

9.1.1 In accordance with Step 2 of Historic England's Historic Environment Good Practice Advice Note 3 (December 2017) the following section assesses the heritage significance of the known heritage assets as identified in the historic baseline that have the potential to receive effects from development within the site. The section assesses whether and to what degree the site contributes towards the setting and heritage

significance of these heritage assets. The archaeological potential of the site is then summarised based on the historic environment baseline and known previous impacts.

## 9.2 Designated Heritage Assets

### Scheduled Monuments

- 9.2.1 The site is situated to the west of a scheduled defensive enclosure, known as The Aubreys (OA 1) which is situated within the agricultural landscape between Hemel Hempstead and Redbourn. The scheduled monument is considered to be of national significance due to its historic and archaeological interests, which arise from the visible defensive earthworks which make up the site, and the below ground archaeological remains within the scheduled area.
- 9.2.2 The site forms a very small part of the agricultural landscape which surrounds the hillfort and contains no known Iron Age remains. Views between the site and the hillfort are screened by the surrounding topography, which rises to the west of the hillfort and to the north and east of the site (Plate 15). The site is further screened by the mature hedgerows and the existing planting within the surrounding landscape as well as the settlement located to the south-west of the hillfort and to the east of the site.
- 9.2.3 The site has no visible connection and no known historic connection with the scheduled Iron Age Hillfort. Accordingly, it is not considered to make a contribution to the setting and heritage significance of the hillfort. As a result, the hillfort has been scoped out from further assessment within this report.

### Listed buildings

- 9.2.4 Eleven Grade II listed farm buildings have been identified within the study area. These buildings are considered to be of regional significance due to their historic and architectural interests, which arise from their design and layout, as well as their historic fabric. The listed buildings were visited at the time of the site visit to establish whether there was any inter visibility between the site and the buildings. Limited views were identified between the Grade II listed Wood End Farm Cottages (OA 3), and the site (Plates 9-11). The rooftop and chimneys of the Grade II listed buildings (OA 4, 9) at Wood End Farm (OA 46) are visible from a high point in the north-western part of Area A (Plate 12). There is also intervisibility between Holtsmere Manor (OA 10) and the northern part of Area D (Plate 19, 25).
- 9.2.5 The remaining seven listed buildings (OA 2, 5-8, 68-69) are separated from the site by distance, the surrounding topography, and the existing planting and development. Accordingly, the site is not considered to make a contribution to the setting and heritage significance of these buildings. As a result, these buildings have been scoped out and are not assessed further assessment within this report.

### Wood End Farm Cottages (OA 3)

- 9.2.6 Wood End Farm Cottages (OA 3) are a pair of Grade II listed, late 16th or early 17th century timber framed cottages, which were doubled to the rear in the mid-late 19th century. The cottages are set within a small gardens surrounded by agricultural farmland.

- 9.2.7 The Grade II listed Wood End Farm Cottages are considered to be of regional heritage significance due to their architectural and historic interest, which is derived from the age, rarity and survival of the historic fabric of these buildings. From at least the 19th century the buildings are referred to as Wood End Farm Cottages suggesting a historic connection to the Grade II listed Wood End Farm to the south. This historic connection contributes to the historic interest of both sets of buildings and may well date back to the 16th/17th century when the farmhouse and the cottages were built.
- 9.2.8 The immediate setting of the cottages is defined by the small hedged yards in which they are situated, and it is from this setting that the architectural and historic interest of the buildings can be best experienced.
- 9.2.9 The wider setting of the Wood End Farm Cottages incorporates the agricultural landscape surrounding the cottages and the Grade II listed buildings at Wood End Farm (to the south), which together preserve the historic rural character of the cottages. The land within the southern part of the site (including parts of Area A and Area B), Wood End Farm (OA 46) and Wood End Farm Cottages (OA 3) were all part of the Gorhambury Estate in the mid-18th century, and the site has remained in agricultural use ever since. Large parts of Area A and Area B (see Fig. 1) are clearly visible from the Grade II listed cottages. As a result, of the historic connection and the inter visibility between these parts of the site and Grade II listed cottages, Area A and Area B are currently considered to make a low positive contribution to the wider rural setting of Wood End Farm Cottages. Area C is not currently visible from the Grade II listed cottages and was not historically part of the agricultural land associated with the Gorhambury Estate, accordingly it is currently considered to make a neutral contribution to the setting of these buildings.

#### Wood End Farmhouse and Barn (OA 4,9)

- 9.2.10 Wood End Farm (OA 46) incorporates 2 Grade II listed buildings comprising a 16th or 17th century farmhouse (OA 9) and a later 18th-19th century barn (OA 4). These agricultural buildings are set within a small farmyard.
- 9.2.11 The Grade II listed buildings are considered to be of regional heritage significance due to their architectural and historic interest which is derived from the age of the buildings, their rarity, and their surviving historic fabric. The listed buildings at Wood End Farm and Wood End Farm Cottages to the north were both part of the 18th century Gorhambury Estate, and have shared a name since at least the 19th century. This historic connection contributes to the historic interest of both sets of buildings and could date back to the 16th-17th century when the farmhouse (OA 9) and the cottages (OA 3) were built.
- 9.2.12 The immediate setting of the farm buildings is defined by the small farmyard in which the buildings are set, and it is from this setting that their architectural and historic interest can best be appreciated.
- 9.2.13 The agricultural land surrounding the farm, and Wood End Farm Cottages to the north, preserve the historic rural character of the landscape surrounding the site and as such is considered to form the wider setting of Wood End Farm House and Barn.

9.2.14 The southern part of the site (including parts of Area A and Area B) was historically part of the Gorhambury Estate, and the whole site has remained in agricultural use ever since. There are no direct views from the farm onto the site but the chimneys and roof of Wood End Farmhouse, can be seen from high ground in the northern part of Area A. While the southern part of the site was historically associated with the farm, the two areas were divorced from one another by the creation of the railway line in the mid-19th century which physically separated the farm buildings from the agricultural landscape to the north. As a result of this visual and physical separation the site (Areas A, B and C) is currently considered to make a neutral contribution to the setting of the Grade II listed farmhouse and barn.

#### **Holtsmere Manor (OA 10)**

9.2.15 Holtsmere Manor (OA 10) is a Grade II listed 17th-century or earlier house and with a later 19th-century wing. The timber framed red brick building is set within a large garden. Holtsmere Manor is considered to be of regional heritage significance due to its architectural and historic interest which derives from its age, rarity, and surviving historic fabric.

9.2.16 Two buildings, formerly located along the northern boundary of the site, are referred to as 'Holmer End' on the 1841 Tithe map suggesting a possible historic connection to the Grade II listed Holtsmere Manor which is also referred to as 'Holtsmore End' and 'Holtsmere End' among other variations. These buildings no longer survive within the site, although their historic presence may indicate a possible historic connection between the site and Holtsmere Manor, which would contribute toward the historic interest of the building.

9.2.17 The immediate setting of Holtsmere Manor is defined by the large garden in which the building is set. It is from this immediate setting that the architectural and historic interest can best be appreciated.

9.2.18 The wider setting of the building is defined by its rural location and its association with Holtsmere End Farm, which includes the contemporary Grade II listed Barn (OA 6), both of which contribute toward Holtsmere Manor's historic interest. Whilst the modern houses within the northern part of the Area D are visible from the listed building (Plate 19), the majority of Area D is screened by modern development and dense planting along Holtsmere End Lane (Plate 25). The modern houses do not contribute to the historic rural setting of the building and interrupt the legibility of any historic connection between the northern part of Area D and the manor. Views into presently undeveloped parts of Area D are largely obscured however, their agricultural nature contributes to the historic rural setting of the building. Accordingly, these parts of the northern end of Area D make a low positive contribution to the wider setting of Holtsmere Manor.

#### **Non-designated Buildings**

##### **Little Revel End Farm (OA 48)**

9.2.19 Little Revel End Farm (OA 48) is a non-designated farm building shown on the 1841 Tithe Map of the site. The farm contains several farm buildings dating to a 19th century (possibly earlier) and is considered to be of local significance due to its surviving

historic fabric and architectural features. The farmhouse was originally associated with several small farm buildings aligned along the lane frontage but a number of these were demolished in the 20th century when the farm was converted for domestic use.

- 9.2.20 Little Revel End Farm is a non-designated building identified by the Hertfordshire HER. As a non-designated building it is considered to have local heritage significance which is derived from the area, rarity and survival of the historic farm buildings.
- 9.2.21 The immediate setting of the farmhouse is defined by the former agricultural buildings to the west and south of the 19th century farmhouse. These buildings together with the farmhouse itself define the historic farmyard. It is from this farmyard that the architectural and historic interests of the farm can be best appreciated. The wider setting of the farm is defined by the rural character of the surrounding landscape which helps to preserve agrarian character of the former farm buildings.
- 9.2.22 The site is made up of agricultural land which was associated with Little Revel End Farm during the mid-19th century. There are clear views from the historic buildings over Area B and the northern part of Area C and limited views into Area D from the rear of the historic farm buildings. These areas have remained in consistent agricultural use from the medieval period. The agricultural nature of these parts of the site helps to preserve the historic rural character of the historic farm buildings and accordingly makes a low positive contribution to the wider setting of Little Revel End Farm. Area A is screened from the historic buildings by the existing hedgerows and the topography of the site, accordingly it is currently considered to make a neutral contribution to the wider setting of Little Revel End Farm.

### 9.3 Archaeological Potential

- 9.3.1 No Palaeolithic or Mesolithic activity has been recorded within the study area and accordingly there is considered to be a low potential for sites and finds dating to these periods within the site.
- 9.3.2 The only Neolithic or Bronze Age activity recorded within the study area is located to the north of the site at Great Revel End Farm, where a Bronze Age socketed axe head, and a collection of flint flakes and fragments of prehistoric pottery have been found. The presence of these remains suggest that prehistoric populations were moving through this landscape and accordingly, there is considered to be a low-moderate potential for similar features and finds to be present within the site. If similar remains are present within the site, they would be considered to have local significance.
- 9.3.3 The majority of the known prehistoric activity in the study area dates to the Iron Age, and during this period the site would have been situated within the hinterland of the Iron Age hillfort to the north-east of the site. The site is considered to have a moderate potential to contain Iron Age remains. Such remains if present would likely be of local or at most regional significance.
- 9.3.4 The occupation of the site and surrounding landscape continued into the Roman period. No known Roman remains have been recorded within the site, but given the large amount of activity within the wider study area the site is considered to have a



moderate potential to contain Roman remains. Such remains if present would be considered to have local or regional significance.

- 9.3.5 A review of aerial photographs and LiDAR data for the site has identified a possible palaeochannel (silted up and buried river or stream channel) within the site. The palaeochannel has the potential to have prehistoric remains along its banks and may contain preserved environmental evidence which if present could be of regional significance.
- 9.3.6 During the Saxon, medieval and post-medieval periods settlement activity was likely focused away from the site in the modern-day settlements of Hemel Hempstead and Redbourn. The site was most likely to have been in agricultural use during these periods and accordingly is considered to have a moderate potential to contain surviving features and finds associated with the agricultural usage of the landscape. Such remains would be considered to have at most a local significance.
- 9.3.7 Several possible features of unknown date have been recorded in the site, the majority of these have been interpreted as former field boundaries and extractive pits, which if present would be of local significance. In addition to these features small undated and demolished open-sided building has been identified in the north-western corner of the site, and a cropmark enclosure has been recorded in the eastern part of the site. The nature and date of these features have yet to be established and accordingly they are considered to have an unknown significance.

## 9.4 Historic Landscape

- 9.4.1 The historic landscape character of the site is recorded as a combination of pre-18th century co-axial enclosure and 1950s boundary loss. The later HLC type is modern in date and relatively well represented in Hertfordshire, accordingly it is considered to have at most a local historic environment significance. The pre-18th century co-axial enclosure is older and less well represented. Elsewhere fields of this type have been found to have prehistoric origins. Given the potential age and rarity of this HLC type it is considered to have a regional historic environment significance.
- 9.4.2 The site contains several hedgerows which meet the criteria for 'important hedgerows' under the Hedgerow Regulations (1997) (shown on Fig. 10). These hedgerows are considered important as they preserve a land enclosure pattern that predates 1845. In accordance with the Hedgerow Regulations (1997) hedgerows would be considered important if they 'mark a field system predating the Enclosure Acts'. Natural England guidance published in 2014 and updated in 2017 states that a pre-enclosure field system is considered to be a field system 'that is before 1845' (Natural England 2014).
- 9.4.3 The majority of the hedgerows, within the site are located within the area of pre-18th century co-axial enclosure to the east. The hedgerows in the eastern part of the site are shown on the 1768 Gorhambury estate map and the 1841 Tithe map, accordingly they represent part of a pre-1845 field system and are considered to be important hedgerows. Some older hedgerows, shown on the 1841 tithe map also survive within the area of 1950s boundary loss in the western part of the site and in the area of pre-18th century co-axial enclosure in the northern part of the site (Area D). Where these



hedgerows survive they preserve part of a pre-1845 field system and as such are also considered to be important hedgerows.

- 9.4.4 Hedgerows meeting the criteria of an important hedgerow appear in all four parts of the site (Areas A, B, C and D) (Fig.10). The north and west boundary of Area A and the surviving internal field boundaries within this area are marked by hedgerows which may have existed since at least 1841. The two south-west to north-east aligned hedgerows in the northern part of Area B and the hedgerows marking the northern and southern boundary of Area C are also shown on the 1841 Tithe map and represent part of a pre-1845 field system. In Area D the majority of the surviving hedgerows meet the criteria for important hedgerows as they appear on the 1841 Tithe map.

## 10 POTENTIAL IMPACTS

### 10.1 Introduction

- 10.1.1 In accordance with Step 3 of Historic England's Historic Environment Good Practice Advice Note 3 (December 2017) this section assesses the effects of the proposed scheme on designated and non-designated heritage assets and their setting. It also assesses the potential impact the proposed scheme may have on archaeological remains of present.

### 10.2 Proposed Scheme

- 10.2.1 The site forms a proposed Broad Location for Development within the St Albans Local Plan 2020-2036 Publication Draft 2018 for the development of a minimum of 1500 dwellings together with a care home, local centre, primary school, Country Park and associated infrastructure. For the purposes of this assessment the site is divided into three areas:

- Area A, is located in the western part of the site (see Fig 1) and is proposed for removal from the Green Belt as part of the proposed allocation.
- Area B, covers the majority of the eastern part of the site (see Fig 1) and would be retained as Green Belt land and incorporate part of the proposed Country Park.
- Area C, falls outside of the proposed North Hemel Hempstead allocation boundary (see Fig.1) and will remain within the Green Belt but may form part of the proposed Country Park. It will not be subject of any development although it may incorporate some green infrastructure.
- Area D, is located in the northern part of the site (see Fig 1). Approximately 35.47 ha of Area D would be developed as part of the proposed allocation. The eastern part of this area would be retained within the Green Belt and would incorporate public open space and a landscaped green buffer.

- 10.2.2 Detailed development plans for the site are not yet available but it is anticipated that the proposed development will involve the construction of new buildings, with associated access roads and services. It is anticipated that development will be located away from Areas B and C and the eastern part of Area D (east of the power lines) which will remain in the Green Belt.

## 10.3 Assessment of the Proposed Scheme

### Designated Heritage Assets

- 10.3.1 The Grade II listed Wood End Cottages (OA 3), and the Grade II listed farmhouse (OA 9) and Barn (OA 4) at Wood End Farm, have been identified as designated heritage assets that may receive setting effects from proposed development within the site.
- 10.3.2 Detailed design proposals for the development are not currently available and accordingly this assessment provides a general consideration of possible constraints based on the currently available information.

### Wood End Farm Cottages (OA 3)

- 10.3.3 It is anticipated that as part of the proposed development new buildings would be constructed within Area A. Any new buildings located within Area A would be clearly visible from the Grade II listed Wood End Cottages and would result in the urbanisation of the formerly rural setting of the cottages. The agricultural land that makes up Area A is currently considered to make a low positive contribution to the setting of the listed cottages. The loss of the rural character of landscape within Area A would diminish the agricultural context of these buildings, which, without mitigation, could result in a minor or possibly moderate adverse impact on the setting of the listed building depending on the nature and design of the proposed development.
- 10.3.4 Area C is currently screened from the cottages by the topography of the landscape and the existing field boundaries and planting. This area would be retained within the Green Belt which would preserve the rural character of this part of the site. Given this, and the lack of the visibility between Area C and Wood End Farm Cottages, this would be unlikely to result in impacts upon the setting of the cottages.
- 10.3.5 The rural landscape of Area B is currently considered to make a low positive contribution to the wider rural setting of Wood End Farm Cottages. It is anticipated that this land would be retained as Green Belt land which would preserve the rural character of this part of the site, and accordingly this would be unlikely to result in impacts upon the setting of Wood End Farm Cottages.

### Wood End Farmhouse (OA 9) and Barn (OA 4)

- 10.3.6 Areas A, B and C of the site are currently all considered to make a neutral contribution to the setting of the Grade II listed Wood End Farmhouse and Barn. There are currently no direct views between the farm buildings and the site (although the chimneys and roof tops of some farm buildings at Wood End Farm can be seen from some parts of the site), and the site is physically separated from the listed buildings by the line of the former 19th century railway. It is anticipated that development within Area A would not be visible from these listed buildings, unless the new buildings were particularly large in scale, and Areas B and C would be retained as Green Belt land, incorporating part of the proposed Country Park. Accordingly, the proposed development is considered unlikely to impact upon the setting of these listed buildings.

### Holtsmere Manor (OA 10)

10.3.7 The northern part of Area D is considered to make a low positive contribution to the setting of the Grade II listed Holtsmere Manor. There are direct views between the house and the modern development located within the northern part of Area D, which will not be affected by the proposed development. There are heavily obscured views between the house and currently undeveloped part of the northern end of Area D. As part of the proposed development new buildings will be constructed within Area D. Any new buildings within the currently undeveloped parts of the northern end of Area D will result in the urbanisation of the formerly rural landscape. Without mitigation, this could result in a minor adverse impact on the setting of the listed building depending on the nature and design of the proposed development.

## 10.4 Non-designated buildings

10.4.1 The historic buildings at Little Revel End Farm within Area B and immediately to the north of Area C of the site and accordingly the setting of the building will be largely framed by the proposed Country Park within these parts of the site.

10.4.2 Area B, C and D are considered to make a low positive contribution to the setting of the historic farm buildings at Little Revel End Farm. There are clear views into Areas B and C from the farm buildings and limited views into Area D from the rear of the historic farm buildings. Public open space and a landscape buffer will be incorporated in the eastern parts of Areas C & D with the retention of existing landscaping along field boundaries.

10.4.3 The eastern part of Area D is partially visible in views looking north-west from the rear of the historic farm buildings (Plate 23). Under the proposal the eastern part of Area D will be incorporate a landscaped green buffer with the retention of existing landscaping along the field boundaries. This would preserve the green character of this part of Area D and accordingly would be unlikely to result in impacts upon the setting of the historic buildings. The western part of Area D is proposed for development. This part of the site is not visible from Little Revel End Farm and development in this part of Area D would be unlikely to affect the setting of the historic farm buildings at Little Revel End Farm.

10.4.4 Current proposals suggest that Areas B and C would be retained as Green Belt land. This would preserve the current rural character of this part of the site and accordingly would be unlikely to result in impacts upon the setting of the historic buildings at Little Revel End Farm.

## 10.5 Archaeology

10.5.1 The site has been in agricultural use since at least the medieval period and accordingly is has been subject to little previous ground disturbance and is considered to have the potential to contain well preserved archaeological remains.

10.5.2 While detailed development plans are not yet available it is anticipated that the scheme will include invasive groundworks associated with some or all of the following activities:

- Landscaping and grading of the site to create level ground to construct the new buildings;
- The removal of topsoil and overburden for the creation of new access, roads and pavements within the site; and
- The excavation of trenches for foundation of new buildings, services and soakaways.

### **Area A**

10.5.3 A review of aerial photograph and LiDAR data has identified several possible features within the site. Area A contains the remains of a possible palaeochannel (OA 55), possible extractive pits (OA 58, 63), an undated (but most probably post-medieval) building of which only the demolition rubble remains (OA 57) and several field boundaries (OA 66). The former field boundaries, and extractive pits in this area are considered to be of local significance, while the possible palaeochannel is considered to be of regional significance due to its potential to contain environmental remains. Area A is also considered to have the potential to contain previously unidentified archaeological remains, which have an unknown but possibly local or regional significance.

10.5.4 Area A has been identified within the draft allocation as an area of land which will be removed from the Green Belt. It is anticipated that this area would be developed for housing. Invasive ground works associated with construction and landscaping activity within this area would have an adverse effect upon any archaeological remains present truncating or completely removing any archaeological deposits.

### **Area B**

10.5.5 Area B contains the cropmark remains of former field boundaries (OA 66) which are considered to be of local significance. It is also considered to have the potential to contain previously unidentified archaeological remains, which have an unknown but possibly local or regional significance.

10.5.6 Area B has been identified within the draft allocation as an area of land which will be retained within the Green Belt. It is anticipated that the landscape within Area B will not be developed as part of the proposed development. However, the proposed allocation within the St Albans Local Plan includes provision for a Country Park which could result in some landscaping works. Any invasive ground works in this area would have an adverse effect upon any archaeological remains present truncating or completely removing any archaeological deposits.

### **Area C**

10.5.7 Area C contains a possible cropmark enclosure (OA 61) of unknown significance. It is also considered to have the potential to contain previously unidentified archaeological remains, which have an unknown but possibly local or regional significance.

10.5.8 Area C falls outside of the proposed allocation boundary and will remain in the Green Belt. It will not be subject to development although it may incorporate some green infrastructure which could involve some landscaping works. Any invasive ground works in this area would have an adverse effect upon any archaeological remains if present, truncating or completely removing any archaeological deposits.

## Area D

- 10.5.9 Area D contains the cropmark remains of parallel medieval ditches (OA 35) and the remains of several post-medieval field boundaries (OA 59-60, 96, 98) and quarry pits (OA 57, 97). It is also considered to have the potential to contain previously unidentified archaeological remains, which have an unknown but possibly local or regional significance.
- 10.5.10 Area D occupies the northern part of the draft allocation. It is anticipated that most of this area will be developed for housing. It is proposed that the eastern part of Area D will be retained as a landscaped green buffer. Intrusive groundworks associated with construction and landscaping activity within Area D would have an adverse effect upon any archaeological remains present truncating or completely removing any archaeological deposits.

## 10.6 Historic Landscape

- 10.6.1 The site is split between two Historic Landscape Character (HLC) types, as identified in the Hertfordshire HLC Assessment. The eastern part of the site comprising Area B and C, is mostly made up of Pre 18th century Co-axial Enclosure which is considered to be of regional significance. The landscape within Areas B and C will not be developed as part of the proposed development. However, the proposed allocation within the St Albans Local Plan 2020-2036 Publication Draft includes provision for a Country Park which could result in the loss of the HLC type from these areas of the site.
- 10.6.2 Area A is currently made up an area of 1950s boundary loss which is of at most local significance, and a small area of Pre 18th century Co-axial enclosure. Area A is proposed for removal from the Green Belt, and it is anticipated that this area would be redeveloped for housing. This would result in the loss of both of the HLC types from this part of the site.
- 10.6.3 The southern part of Area D is currently made up of an area of 1950s boundary loss which is considered to be of at most local significance. The northern part of Area D is made up of Pre 18th century Co-axial Enclosure which is considered to be of regional significance. It is anticipated that most of Area D would be developed for housing. The eastern part of Area D would form a green landscape buffer. The development and landscaping works would result in the loss of both of the historic landscape types from this part of the site.
- 10.6.4 The proposed development could result in the loss of the regionally significant Pre 18th century Co-axial enclosure, and the (at most) locally significant area of 1950s boundary loss, from the site. According to the Hertfordshire HLC Assessment pre 18th century enclosure currently covers 15% of the Hertfordshire landscape (approximately 24937 ha) (Dyson-Bruce et al 2006). The proposed development would result in the loss of a very small proportion of the surviving 18th century enclosure within the county and accordingly would have a minor adverse effect upon this HLC type. Twentieth century agricultural land (including areas of 1950s boundary loss) currently covers 30% of the county (approximately 49288 ha) (*ibid*). The proposed development

would result in the loss of a very small proportion of the 20th century agricultural land within the county and accordingly would have a minor adverse effect upon this HLC type.

- 10.6.5 Several hedgerows, considered to meet the criteria for ‘important hedgerows’ have been identified within the site. Important hedgerows receive statutory protection under the Hedgerow Regulations and are considered to be of regional historic environment significance. Whilst it is proposed that the majority of the important hedgerows within the site will be retained and incorporated into the proposals, the removal (wholly or in part) of important hedgerow as part of the proposed development would have an adverse effect upon these heritage assets. Consultation should be carried out with the Local Planning Authority (LPA) prior to the removal of any important hedgerows.

## 11 POTENTIAL FOR FURTHER WORK

- 11.1.1 The site has been subject to limited previous ground disturbance and has the potential to contain surviving archaeological remains which would be impacted by groundworks associated with the proposed development. Accordingly, in line with NPPF paragraph 189 further archaeological evaluation (likely comprising geophysical survey and trial trenching) is likely to be required in order to ascertain the presence (or absence) of any archaeological remains that might be damaged or destroyed by development within the Site.
- 11.1.2 A geophysical survey of the Area A was carried out immediately following the production of the initial desk-based assessment report. The survey did not identify any significant archaeological remains within the site. Although not conclusive (sites which have produced no or only limited magnetic responses have been shown to contain archaeological sites if investigated archaeologically) this would suggest that this part of the site has a generally low potential to contain significant archaeological remains and clearly suggests that the site does not contain any deposits likely to prevent or significantly constrain development. Taking this (and the results of the other prospection surveys such as walkover survey, aerial photographic analysis and LiDAR analysis) into account it would appear reasonable to argue that any programme of further evaluation (trial trenching) which may be required by the planning process could be imposed as a condition at the application stage (post-determination) rather than as a pre-determination survey. The results of any such survey which may be required could then be used to clarify the nature, significance, extent and survival of any archaeological deposits within the site and inform a suitable mitigation strategy intended to reduce or remove any potential impacts of the scheme upon the archaeological resource. Mitigation (if required) would most likely involve archaeological excavation or monitoring to preserve by record any remains that might be damaged or destroyed. The requirement for and scope of any further archaeological work should be agreed with the Hertfordshire County Archaeologist prior to commencement.



## 12 CONCLUSION

- 12.1.1 The site is situated to the north-east of Hemel Hempstead within the St Albans City and District administrative area. It has been identified as part of a proposed Broad Local for Development within the emerging local plan. The site has been divided into four areas. Area A covers the land which will be removed from the Green Belt as part of the draft allocation and is anticipated to be mostly developed for housing; Area B covers the land within the site that will be retained as Green Belt and incorporated into the Country Park; Area C covers the part of the site which falls outside of the allocation boundary and will remain within the Green Belt and may form part of the Country Park; and Area D covers the northern part of the draft allocation which, it is anticipated, would be developed for housing.
- 12.1.2 No designated heritage assets have been recorded within the site. However, a number of regionally significant Grade II listed buildings and a nationally significant scheduled monument have been recorded within the study area surrounding the site. Several non-designated historic buildings were identified immediately to the north of the site at Little Revel End Farm. These are considered to be of local significance.
- 12.1.3 A review of aerial photographs and LiDAR data was carried out as part of this assessment. This identified the remains of several possible non-designated heritage assets within the site including, a possible palaeochannel, field boundaries, extractive pits, and a possible enclosure. In addition, the site is considered to have a low potential to contain previously unidentified archaeological remains dating to the Palaeolithic and Mesolithic period, a low-moderate potential to contain previously unidentified archaeological remains dating to the Neolithic and Bronze Age, a moderate potential to contain Iron Age and Roman remains and a moderate potential to contain Saxon, medieval and post-medieval agricultural remains. Such remains, if present would likely be of local or regional significance.
- 12.1.4 A geophysical survey of Area A carried out in March 2019 identified no significant archaeological features which suggests that this part of the site has a generally low potential to contain substantial or significant archaeological remains.
- 12.1.5 The Historic Landscape Character of the site is described as a combination of regionally significant Pre 18th century Co-axial Enclosure and an area of, at most locally significant, 1950s boundary loss. Within these two Historic Landscape Character Type, several hedgerows meeting the criteria for an important hedgerow, have been identified. Important hedgerows receive statutory protection under the Hedgerow Regulations and are considered to be of regional historic environment significance.
- 12.1.6 Detailed development plans for the site are not currently available, however the draft policy S6 iv of the St Albans Local Plan 2020-2036 Publication Draft 2018 identifies the proposed North Hemel Hempstead Broad Location for Development for the development of a minimum of 1500 dwellings together with a care home, local centre, primary school, Country Park and associated infrastructure. It is anticipated that the proposed development will involve the construction of new buildings, with associated access roads and services. Areas B and C within the site will remain within the Green



Belt as part of the draft allocation accordingly it is understood that development will be located away from this part of the site.

- 12.1.7 The proposed development would result in the loss of the existing agricultural character of the site and the urbanisation and development of Areas A and D. Depending on the scale and design of the new development and associated mitigation, this could result in a minor or moderate adverse effect upon the Grade II listed Wood End Farm Cottages, which lie to the south of the site, a minor adverse effect upon the Grade II listed Holtsmere Manor located to the north of the site and a minor adverse effect on the non-designated historic buildings at Little Revel End Farm which is situated to the north and east of the site. However, with the incorporation of appropriate mitigation measures in the form of offsets between these heritage assets and the developed parts of the site and the incorporation of appropriate landscaping within the proposed scheme there would be scope to reduce or avoid any adverse impacts. The remaining designated heritage assets within the study area are separated from the site by the intervening distance, topography, and existing planting, accordingly they are considered unlikely to receive setting affects from the proposed development and have been scoped out of this assessment.
- 12.1.8 The loss of the existing enclosure pattern and field boundaries within the site would have a minor adverse effect on the wider historic landscape character of the area. Whilst it is proposed that the historic hedgerows present within the site will be largely retained as part of the proposed development, the removal (wholly or in part) of important hedgerows would have an adverse effect upon these heritage assets. Consultation should be carried out with the Local Planning Authority (LPA) prior to the removal of any important hedgerows within the site.
- 12.1.9 The site has been in agricultural use since the medieval period and accordingly has the potential to contain well preserved archaeological remains. Invasive groundworks associated with any construction and landscaping activities within the site would remove or truncate any archaeological remain within the development footprint. Accordingly, in line with NPPF paragraph 189 further archaeological evaluation (likely comprising geophysical survey and trial trenching) may be required as part of the planning process to ascertain the presence (or absence) of any archaeological remains within the site.
- 12.1.10 A geophysical survey of Area A was carried out immediately following the production of the initial desk-based assessment report and did not identify any significant archaeological remains within the site. This initial work would suggest that this part of the site does not contain any deposits likely to prevent or significantly constrain development. Taking this (and the results of the other prospection surveys such as walkover survey, aerial photographic analysis and LiDAR analysis) into account it would appear reasonable to argue that any programme of further evaluation (trial trenching) which may be required by the planning process could be imposed as a condition (post-determination) rather than as a pre-determination survey. The results of any such survey which may be required could then be used to clarify the nature, significance, extent and survival of any archaeological deposits within the site and inform a suitable mitigation strategy intended to reduce or remove any potential impacts of the scheme upon the archaeological resource. Mitigation (if required) would most likely involve

archaeological excavation or monitoring to preserve by record any remains that might be damaged or destroyed. The requirement for and scope of any further archaeological work should be agreed with the Hertfordshire County Archaeologist.

- 12.1.11 It is considered that, subject to mitigation, there are likely to be no significant impacts on the historic environment that should preclude the allocation of the site within the Local Plan.



## APPENDIX A GAZETTEER OF KNOWN ARCHAEOLOGY WITHIN THE STUDY AREA

OA = Oxford Archaeology

SMR = Sites and Monuments Record

HER = Oxfordshire Historic Environment Record

OA	HER ref.	List entry	Name	Type	Period
1	DHT10840	1003520	The Aubreys camp	SM	N/A
2	DHT2227	1078122	ST AGNELL'S FARMHOUSE	Gr II LB	N/A
3	DHT8126	1102907	WOOD END FARM COTTAGES	Gr II LB	N/A
4	DHT8164	1102945	LARGE BARN AT WOOD END FARM, 30 METRES SOUTH SOUTH WEST OF FARMHOUSE	Gr II LB	N/A
5	DHT8176	1102957	GREAT REVEL END FARMHOUSE	Gr II LB	N/A
6	DHT2489	1172813	BARN AT HOLTSMEERE END FARM (30 METRES TO SOUTH OF HOUSE)	Gr II LB	N/A
7	DHT8643	1295539	RESTAURANT AT AUBREY PARK HOTEL	Gr II LB	N/A
8	DHT8647	1295569	BARN AT GREAT REVEL END FARM	Gr II LB	N/A
9	DHT8831	1347230	WOOD END FARMHOUSE	Gr II LB	N/A
10	DHT2782	1348462	HOLTSMEERE MANOR	Gr II LB	N/A
11	EHT4217	N/A	Excavation at Punchbowl Lane (Petrofina Pipeline), 1990	Event	N/A
12	EHT4219	N/A	Excavation at The Aubreys, Redbourn, 1995-8	Event	N/A

OA	HER ref.	List entry	Name	Type	Period
13	EHT4222	N/A	Geophysical survey, M1 motorway Junction 8/9, 1995	Event	N/A
14	EHT8614	N/A	Excavation at Spencer's Park (Phase 2), Three Cherry Trees Lane, Hemel Hempstead 2017-18	Event	N/A
15	EHT1545	N/A	Excavation on the eastern bank, The Aubreys, Redbourn, 2006	Event	N/A
16	EHT8294	N/A	Geophysical survey of land east of Hemel Hempstead, 2016	Event	N/A
17	EHT4428	N/A	Evaluation at St Agnell's Farm, Hemel Hempstead, 1997	Event	N/A
18	EHT7169	N/A	Geophysical survey of land south of Redbourn Road, 2005	Event	N/A
19	EHT6932	N/A	Evaluation on land south of Redbourn Road, Hemel Hempstead, 2007	Event	N/A
20	EHT6933	N/A	Geophysical survey of land at Spencer's Park, Three Cherry Trees Lane, Hemel Hempstead, 2007	Event	N/A
21	EHT6934	N/A	Evaluation of land at Spencer's Park, Three Cherry Trees Lane, Hemel Hempstead, 2008	Event	N/A
22	EHT8326	N/A	Strip, map & sample at Aubrey Park Hotel, Redbourn, 2015-16	Event	N/A
23	EHT8082	N/A	Excavation at Spencer's Park (phase 1), Three Cherry Trees Lane, Hemel Hempstead, 2015-16	Event	N/A
24	EHT8023	N/A	Geophysics at Spencer's Park (Phase 2), Three Cherry Trees Lane, Hemel Hempstead, 2015	Event	N/A
25	12657	N/A	LATE IRON AGE OCCUPATION, GREAT REVEL END FARM, REDBOURN	Mon	Prehistoric
26	25	N/A	DEFENSIVE ENCLOSURE, THE AUBREYS, REDBOURN	Mon	Prehistoric
27	13091	N/A	BRONZE AGE SOCKETED AXEHEAD AND POSSIBLE BRONZE AGE FEATURE, GREAT REVEL END FARM, REDBOURN	FS	Prehistoric
28	29245	N/A	LATE IRON AGE SILVER COIN, REDBOURN	FS	Prehistoric
29	4171	N/A	SUPPOSED ROMAN ROAD, VIATORES 169B, VERULAMIUM TO IIVINGHOE BEACON	Mon	Roman
30	4597	N/A	SUPPOSED LINE OF ROMAN ROAD, VIATORES 169B, VERULAMIUM TO IIVINGHOE BEACON	Mon	Roman
31	9625	N/A	LATE IRON AGE/ROMANO-BRITISH DITCH FILL, BETWEEN PUNCHBOWL LANE AND B487, REDBOURN	Mon	Roman

OA	HER ref.	List entry	Name	Type	Period
32	15191	N/A	ROMAN CREMATIONS, SPENCER'S PARK, CHERRYTREE LANE, HEMEL HEMPSTEAD	Mon	Roman
33	21409	N/A	EARLY ROMAN COPPER-ALLOY CART FITTING, REDBOURN	FS	Roman
34	31091	N/A	EARLY ROMAN INDUSTRIAL COMPLEX, SPENCER'S PARK, THREE CHERRY TREES LANE, HEMEL HEMPSTEAD	Mon	Roman
35	16962	N/A	CROPMARKS OF PARALLEL DITCHES, NE OF CUPID GREEN ESTATE, HEMEL HEMPSTEAD	Mon	Med
36	6373	N/A	MEDIEVAL EARTHWORKS, GREAT REVEL END FARM, REDBOURN	Mon	Med
37	9044	N/A	CROPMARKS OF RIDGE AND FURROW, REDBOURN	Mon	Med
38	9664	N/A	QUAKER BURIAL GROUND AND SITE OF MEETING HOUSE, MEETING HOUSE FIELD, REDBOURN	Mon	Post-med
39	12658	N/A	GREAT REVEL END FARMHOUSE, AND BARN, GADDESSEN LANE, REDBOURN	Mon	Post-med
40	31428	N/A	HOLTSMORE END FARM, HOLTSMERE END, FLAMSTEAD	Mon	Post-med
41	5595	N/A	RAILWAY BRIDGE, CUPID GREEN, HEMEL HEMPSTEAD	Mon	Post-med
42	9809	N/A	HARPENDEN TO HEMEL HEMPSTEAD RAILWAY ('THE NICKY LINE')	Mon	Post-med
43	30832	N/A	WOODHALL FARM, ARKLEY ROAD, CUPID GREEN, HEMEL HEMPSTEAD	Mon	Post-med
44	13601	N/A	POST-MEDIEVAL CLAY PIT, PRATT'S DELL, THREE CHERRY TREES LANE, HEMEL HEMPSTEAD	Mon	Post-med
45	15130	N/A	REMAINS OF FOSTER FARM, AUBREY PARK HOTEL, REDBOURN	Mon	Post-med
46	15618	N/A	WOOD END FARM, REDBOURN	Mon	Post-med
47	15619	N/A	CHERRYTREE FARM, CHERRYTREE LANE, REDBOURN	Mon	Post-med
48	10797	N/A	ST AGNELL'S FARM, CUPID GREEN LANE, HEMEL HEMPSTEAD	Mon	Post-med
49	18758	N/A	LITTLE REVEL END FARM, LITTLE REVEL END, REDBOURN	Mon	Post-med
50	21482	N/A	POST-MEDIEVAL SILVER SIXPENCE, REDBOURN	FS	Post-med
51	21483	N/A	POST-MEDIEVAL SILVER HALFGROAT, REDBOURN	FS	Post-med
52	30665	N/A	SITE OF COPT HALL, REDBOURN	Mon	Post-med

OA	HER ref.	List entry	Name	Type	Period
53	12656	N/A	ROMAN, MEDIEVAL AND POST-MEDIEVAL METALWORK, GREAT REVEL END FARM, REDBOURN	FS	Prehistoric; Roman; Med ;Post-med
54	9046	N/A	CROPMARKS OF LINEAR DITCHES, REDBOURN	Mon	Undated
55	N/A	N/A	Earthwork ditch shown on LiDAR, interpreted as a Palaeochannel, also shown clearly as a cropmark on an aerial photograph taken on 4-3-1955 (RAF/58/1673 Frame: 57)	LiDAR	Undated
56	N/A	N/A	Small circular depressions shown on LiDAR, interpreted as former extractive pits	LiDAR	Undated
57	N/A	N/A	Small mound shown on LiDAR, could be archaeological or natural feature	LiDAR	Undated
58	N/A	N/A	Small pit shown on LiDAR, former extractive pit	LiDAR	Undated
59	N/A	N/A	Shallow bank shown on LiDAR, former field boundary	LiDAR	Undated
60	N/A	N/A	Shallow bank shown on LiDAR, former field boundary	LiDAR	Undated
61	N/A	N/A	Cropmark enclosure shown on aerial photograph taken 2nd June 1947 (RAF/CPE/UK/2136 Frame: 4052)	AP	Undated
62	N/A	N/A	Rectilinear cropmark shown on aerial photograph taken 2nd June 1947 (RAF/CPE/UK/2136 Frame: 4054)	AP	Undated
63	N/A	N/A	Cropmark remains of a former extractive pit shown on aerial photograph taken 16-08-61 (RAF/58/4627 Frame: 486)	AP	Undated
64			Curvilinear cropmark shown to the north of the site on an aerial photograph taken 16-08-61 (RAF/58/4627 Frame: 486)	AP	Undated
65	N/A	N/A	Circular features to the south of the site possibly extractive pits or mounds, shown on an aerial photograph taken 4-3-55 (RAF/58/1673 Frame 56)	AP	Undated
66	N/A	N/A	Former field boundaries shown on 1st edition Ordnance Survey map, visible as cropmarks on aerial photograph, dated 13-6-69 (OS69264 Frame: 109)	AP	Undated
67	N/A	N/A	Extractive Pit shown as cropmarks on aerial photographs dated 17-4-84 (OA/84021 Frame 001)	AP	Undated



OA	HER ref.	List entry	Name	Type	Period
68	N/A	N/A	Possible important hedgerows	N/A	Undated
68	N/A	110125 6	EASTBROOK HAY FARMHOUSE AND ATTACHED BARN, 17th century farmhouse and barn	Gr II LB	N/A
69	N/A	134719 6	FLOWERS FARMHOUSE, 17th century timber framed farmhouse	Gr II LB	N/A
70	EHT1493	N/A	Observation along the Boxted to Friars Wash pipeline, 2006	Event	N/A
71	EHT4356	N/A	Evaluation of land east and west of the M1, Redbourn, 1996	Event	N/A
72	EHT4509	N/A	Geophysical survey of land by the M1 at Redbourn, 1996	Event	N/A
73	EHT4510	N/A	Fieldwalking over land east and west of the M1 motorway at Redbourn, 1996	Event	N/A
74	EHT8411	N/A	Monitoring at 4 Finway Road, Hemel Hempstead	Event	N/A
75	EHT8678	N/A	Evaluation at Spencer's Park Phase 2, Land between Three Cherry Trees Lane and Cherry Tree Lane, Hemel Hempstead	Event	N/A
76	9047	N/A	CROPMARKS OF CIRCULAR ENCLOSURES, FLAMSTEAD	Mon	Prehistoric; Undated
77	9045	N/A	CROPMARKS OF A RING DITCH, REDBOURN	Mon	Prehistoric
78	30970	N/A	POSSIBLY PREHISTORIC TRACKWAY, GADDESSEN ROW	Mon	Prehistoric
79	12977	N/A	CROPMARK OF PROBABLE ROMAN VILLA, STAGS END, GREAT GADDESSEN	Mon	Roman
80	MHT3160 7	N/A	POSSIBLE ROMAN ROAD	Mon	Roman
81	4575	N/A	ROMAN ROAD, GADDESSEN ROW	Mon	Roman
82	9641	N/A	EARLY MEDIEVAL OCCUPATION, NORTH OF PUNCHBOWL LANE, REDBOURN	FS	Medieval
83	30835	N/A	FLAMSTEADBURY FARM, FLAMSTEADBURY LANE, FLAMSTEAD	Bld	Medieval; Post-medieval
84	18663	N/A	SITE OF THREE CHERRY TREES FARM, THREE CHERRY TREES LANE, HEMEL HEMPSTEAD	Mon	Post-medieval
85	18664	N/A	SITE OF THREE CHERRY TREES FARM, THREE CHERRY TREES LANE, HEMEL HEMPSTEAD	Mon	Post-medieval

OA	HER ref.	List entry	Name	Type	Period
86	15144	N/A	EASTBROOKHAY FARM, CUPID GREEN LANE, GREAT GADDESSEN	Bld	Post-medieval
87	16969	N/A	SITE OF HEAVENSGATE FARM, GADDESSEN LANE, FLAMSTEAD	Mon	Post-medieval
88	18757	N/A	FLOWER'S FARM, HEMEL HEMPSTEAD ROAD, REDBOURN	Bld	Post-medieval
89	21566	N/A	POST-MEDIEVAL SILVER SHILLING, REDBOURN	FS	Post-medieval
90	21568	N/A	POST-MEDIEVAL SILVER HALFGROAT, REDBOURN	FS	Post-medieval
91	21903	N/A	POST-MEDIEVAL COPPER-ALLOY HALFPENNY TOKEN, REDBOURN	FS	Post-medieval
92	22132	N/A	POST-MEDIEVAL BRASS PIPE TAMPER, REDBOURN	FS	Post-medieval
93	9819	N/A	SITE OF CLAYDALE BRICKWORKS, CUPID GREEN, HEMEL HEMPSTEAD	Mon	Modern
94	12524	N/A	GREEN LANE AND HEAVENS WOOD, HOLTSMORE END, FLAMSTEAD	Mon	Undated
95	4187	N/A	GARMER LANE, WATER END, GREAT GADDESSEN	Mon	Undated
96	N/A	N/A	Former field boundary shown on 1984 aerial photograph	AP	Undated
97	N/A	N/A	Possible pits shown on 1984 aerial photographs	AP	Undated
98	N/A	N/A	Former field boundary shown on 1984 aerial photograph	AP	Undated

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## **APPENDIX C**

## **GEOPHYSICAL SURVEY REPORT (MAGNITUDE SURVEYS MARCH 2019)**



**magnitude  
surveys**

**Geophysical Survey Report  
of**

**Land adjacent to Holtsmere End Lane  
Hemel Hempstead, Hertfordshire**

**For  
Oxford Archaeology**

**On Behalf Of  
Pigeon Investment Management**

**Magnitude Surveys Ref: MSTL461**

**HER Event Number: TBC**

**April 2019**



# magnitude surveys

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Version	Purpose/Revision	Author	Interpretation/Figures	Checked By	Date Issued
1.0	Initial draft to line manager	Freddie Salmon BSc	Lauren Cadman BA	Marta Fortuny BA MA	21 March 2019
1.1	Corrections from line manager	Freddie Salmon BSc Marta Fortuny BA MA	Lauren Cadman BA	Marta Fortuny BA MA	25 March 2019
1.2	Further corrections from report analyst	Freddie Salmon BSc	Freddie Salmon BSc	Leanne Swinbank BA ACIfA	25 March 2019
1.3	Draft to client	Marta Fortuny BA MA	Marta Fortuny BA MA	DR Kayt Armstrong MCIfA	26 March 2019
2.0	Final to client	Amedeo Viccari BSc MSc	N/A	Marta Fortuny BA MA	01 April 2019

## Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 20.8ha area of land adjacent to Holtsmere End Road. A fluxgate magnetometer survey was successfully undertaken across the survey area. The geophysical data has recorded a large extent of green waste (or similar scattered debris), which has complicated the identification of weak, more ephemeral features. A series of linear anomalies are tentatively interpreted as the footings and previous extent of a building that pre dates historic mapping and aerial photography of the site. Areas of chalk extraction have been identified in the north of the survey area, correlating with historic maps sources. Bands of colluvial detritus is noted running across the middle of the survey area correlating to the contours of the site.

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## 1. Introduction

- 1.1. Magnitude Surveys Ltd (MS) was commissioned by Oxford Archaeology on behalf of Pigeon Investment Management to undertake a geophysical survey on a c.20.8ha area of land adjacent to Holtsmere End Road, Hemel Hempstead, Hertfordshire (TL 0863 1027).
- 1.2. The geophysical survey comprised hand-carried GNSS-positioned fluxgate magnetometer survey.
- 1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David et al., 2008), the Chartered Institute for Archaeologists (CIfA, 2014) and the European Archaeological Council (Schmidt et al., 2015).
- 1.4. Survey was conducted in line with a WSI produced by Magnitude Surveys Ltd (2019).
- 1.5. The survey commenced on 13<sup>th</sup> March 2019 and took three days to complete.

## 2. Quality Assurance

- 2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society of Archaeological Prospection).
- 2.2. Director Dr. Chrys Harris is a Member of CIfA, has a PhD in archaeological geophysics from the University of Bradford and is the Vice-Chair of ISAP. Director Finnegan Pope-Carter is a Fellow of the London Geological Society, the chartered UK body for geophysicists and geologists, as well as a member of GeoSIG, the CIfA Geophysics Special Interest Group. Reporting Analyst Dr. Kayt Armstrong has a PhD in archaeological geophysics from Bournemouth University, is the Vice Conference Secretary and Editor of ISAP News for ISAP, and is the UK Management Committee representative for the COST Action SAGA.
- 2.3. All MS managers have relevant degree qualifications to archaeology or geophysics. All MS field and office staff have relevant archaeology or geophysics degrees and/or field experience.

## 3. Objectives

- 3.1. The geophysical survey aimed to assess the subsurface archaeological potential of the survey area.

## 4. Geographic Background

4.1. The site is located c.4.5km north east of the centre of Hemel Hempstead and c.800m west of the M1 (Figure 1). Survey was undertaken on a predominately agricultural field. The northern boundary of the survey area is bounded by an un-named agricultural trackway with further agricultural land extending to the north past this. To the east, a hedge line marks the boundary between the survey area and further agricultural land. Roads bound the site to the south and west; to the south, Hemel Hempstead Road and to the west, Holtsmere End Lane (Figure 2).

4.2. Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	Arable land. At the time of survey, the site was under a young winter wheat crop. A small area in the north west corner of site was un-sown and comprised grass cover.	A general upward sloping trend was noted towards the northern boundary. The land sloped downwards from the southern boundary towards the centre of the site.

4.3. The underlying geology comprises an undifferentiated bedrock of the Lewes Nodular Chalk Formation and Seaford Chalk Formation. Superficial geology within the survey area is predominantly un-recorded; however, in the northern and southern corners of the survey area zones of the Clay-With-Flints Formation is recorded, providing a dimictic silt, sand and gravel superficial layer (British Geological Survey, 2019).

4.4. The soils through the northern corner of the survey area consist of a slightly acid, loamy and clayey soil with impeded drainage. Through the central and southern portion of the survey area soils are mainly freely draining slightly acid but base-rich (Soilscapes, 2019).

## 5. Archaeological Background

- 5.1. The following section summarises a Heritage Gateway search within 1km of the centre of the survey area and a map regression of freely available historic and modern OS maps.
- 5.2. Evidence for Prehistoric activity in the vicinity comprises a Bronze Age axe fragment found c. 800m to the northwest during excavations (HHER 13091), as well as an excavated Late Iron Age ditch features c. 850m to the north of the survey area (HHER 12657).
- 5.3. A Roman cremation cemetery and Roman industrial complex were surveyed and excavated in advance of development c. 1km to the southwest (HHER 15191, 31091).
- 5.4. Cropmarks of possible Medieval agricultural headlands were recorded c. 150m north of the survey area (HHER 16962). Findspots of Medieval potsherds have also been recorded c. 1km southeast (HHER 9641). Medieval ridge and furrow cultivation has been identified from cropmarks c. 900m to the south of the survey area (HHER 9044).
- 5.5. During a map regression an old chalk pit was identified on the 1878 OS map, located within the survey area. This was situated close to centre of northern boundary and a second smaller pit was marked as being within the copse of trees in the eastern extent of the survey area.

## 6. Methodology

### 6.1. Data Collection

6.1.1. Geophysical prospection comprised the magnetic method as described in the following table.

6.1.2. Table of survey strategies:

Method	Instrument	Traverse Interval	Sample Interval
Magnetic	Bartington Instruments Grad-13 Digital Three-Axis Gradiometer	1m	200Hz reprojected to 0.125m

6.1.3. The magnetic data were collected using MS' bespoke hand-carried GNSS-positioned system.

6.1.3.1. MS' hand-carried system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a multi-channel, multi-constellation GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The RTK GPS is accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

6.1.3.2. Magnetic and GPS data were stored on an SD card within MS' bespoke datalogger. The datalogger was continuously synced, via an in-field Wi-Fi unit, to servers within MS' offices. This allowed for data collection, processing and visualisation to be monitored in real-time as fieldwork was ongoing.

- 6.1.3.3. A navigation system was integrated with the RTK GPS, which was used to guide the surveyor. Data were collected by traversing the survey area along the longest possible lines, ensuring efficient collection and processing.

## 6.2.Data Processing

- 6.2.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to Historic England's standards for "raw or minimally processed data" (see sect 4.2 in David et al., 2008: 11).

Sensor Calibration – The sensors were calibrated using a bespoke in-house algorithm, which conforms to Olsen et al. (2003).

Zero Median Traverse – The median of each sensor traverse is calculated within a specified range and subtracted from the collected data. This removes striping effects caused by small variations in sensor electronics.

Projection to a Regular Grid – Data collected using RTK GPS positioning requires a uniform grid projection to visualise data. Data are rotated to best fit an orthogonal grid projection and are resampled onto the grid using an inverse distance-weighting algorithm.

Interpolation to Square Pixels – Data are interpolated using a bicubic algorithm to increase the pixel density between sensor traverses. This produces images with square pixels for ease of visualisation.

## 6.3.Data Visualisation and Interpretation

- 6.3.1. This report presents the gradient of the sensors' total field data as greyscale images, as well as the total field data from the upper and/or lower sensors. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plot (Figure 9 & 12). XY trace plots visualise the magnitude and form of the geophysical response, aiding in anomaly interpretation.

- 6.3.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historic maps, LiDAR data, and soil and geology maps. Google Earth (2019) was consulted as well, to compare the results with recent land usages.

- 6.3.3. Geodetic position of results - All vector and raster data have been projected into OSGB36 (ESPG27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively. Figures will be provided with raster and vector data projected against OS Open Data.

## 7. Results

### 7.1. Qualification

7.1.1. Geophysical results are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is inherently subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency, it is often not possible to classify all anomaly sources. Where possible an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of comparing excavated results with the geophysical reports. MS actively seek feedback on their reports as well as reports of further work in order to constantly improve our knowledge and service.

### 7.2. Discussion

7.2.1. The geophysical results are presented in consideration with contours (Figure 5), historic maps (Figure 6) and with XY Traces (Figures 9 & 12).

7.2.2. The magnetic survey results across the site are primarily characterised by a relatively uniform dipolar noise, which is characteristic of green waste or a similar debris spread. 'Green waste' refers to organic garden waste collected by councils, which is composted and sold as a soil fertiliser. Green waste contaminated with metal and other domestic waste can impact the effectiveness of magnetic survey, as this material can exhibit a strong magnetic signal which introduces noise across the results. As a result, the interpretation and identification of weaker, more ephemeral features is impacted. Consulting wider plotting ranges (Figure 4), topographic contour plots (Figure 5) and XY traces (Figures 9 & 12) of the site, has aided in the interpretation of the results. This has allowed for the identification of areas of possible archaeological, industrial and agricultural activity.

7.2.3. Areas of natural enhancement are well-correlated to changes in the site's topography. These originate from the same colluvial process as hill washing; where more enhanced materials flow into depressions in the landscape. Soak-away deposition often laminates with clay or smaller particulate material on the surface, with a wider band of less magnetically enhanced sand or gravel below, producing a 'halo'-type effect.

7.2.4. Several linear anomalies interpreted to be of possible archaeological origin are noted within the survey area. In the northwest, a possible building extent which pre-dates historic mapping of the site is recorded.

7.2.5. Several discrete linear trends have been interpreted to be of agricultural origin or drainage features within the site. The distinction between these two types of anomalies has been made considering the signal strength and orientation; most drainage features within the survey area align towards the hill wash channel within the central portion of site, whilst ploughing trends run parallel to either the east or western boundary of the

field. Various orientations of these linear features could be suggestive of long-standing landscape management.

## 7.3. Interpretation

### 7.3.1. General Statements

- 7.3.1.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.
- 7.3.1.2. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures along the edges of the field and by services that cross the survey area have been classified as ‘Magnetic Disturbance’.
- 7.3.1.3. **Ferrous (Spike)** – Discrete ferrous-like, dipolar anomalies are likely to be the result of isolated modern metallic debris on or near the ground surface. Predominantly visible within the north-western corner of the site, the vast amount of green waste disturbance elsewhere has made identification of these features more difficult.
- 7.3.1.4. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentrated deposition of discrete, dipolar ferrous anomalies and other highly magnetic material.
- 7.3.1.5. **Undetermined** – Anomalies are classified as Undetermined when the anomaly origin is ambiguous through the geophysical results and there is no supporting or correlative evidence to warrant a more certain classification. These anomalies are likely to be the result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally not ferrous in nature.

### 7.3.2. Magnetic Results - Specific Anomalies

- 7.3.2.1. **Possible Archaeology / Building Extent (Rubble)** – In the north-western corner of the survey area a series of discrete linear anomalies **[1a]** forming an open sided footing for a structure is located within an area of magnetically enhanced spread debris **[1b]** (Figure 5) this debris spread is likely representative of demolition rubble. Internal measurements of the building extent are c.31x37m, with the wider spread anomaly measuring c.73 x79m. The two anomaly types, discrete and debris spread share features similar in magnetic signature (Figure 9) suggesting these are comprised of a similar, or the same, material. Identifying the full extent of these anomalies has been difficult due to the surrounding magnetically enhanced rubble. Differing from the nearby extraction feature the rubble feature has a much more concentrated magnetic signature, corresponding closer to a fired or burnt material, such as brick.
- 7.3.2.2. **Extraction** – Two areas of strongly magnetically enhanced anomalies have been recorded in the northern extent of the survey area **[1c & 1d]** (Figure 8). The larger anomaly **[1c]** represents a chalk extraction feature measuring c. 55 x 47m



which correlates to the 1878 OS map of the site. A second smaller extraction feature has been interpreted c. 100m to the south of this [1d] corresponding to the location of a possible (un-mapped) extraction pit, as recorded in 1940's aerial photography of the site.

- 7.3.2.3. **Natural** – A large, broad, positively enhanced band of natural detritus [1e] has been interpreted running generally north west – south east through the central portion of the site. Directly relating to the site's topography (Figure 5) the origin of this feature is predominantly colluvial. Extensive hill washing from the higher elevations has swept more magnetically enhanced natural material into the landscape's depressions forming channel-like anomalies in the data. A band of natural material [1f] emanating perpendicular to the western boundary adjoins the main channel, following the contours within the survey area.

## 8. Conclusions

- 8.1. A fluxgate magnetometer survey has been successfully carried out across the entirety of the survey area. The geophysical data is predominantly affected by a probable green waste spread across the majority of the site, which has hindered the interpretation of fainter, more ephemeral anomalies. Despite this modern disturbance, evidence of possible construction activity, chalk extraction and natural variations in the soils have been recorded.
- 8.2. In the north-west corner of the survey area, an open sided building extent surrounded by a rubble-like spread has been identified. It is possible the spread is related to the demolition of the building, producing a magnetic signature similar to a burnt or fired material; however, the lack of contextual evidence makes it difficult to accurately determine origin.
- 8.3. Evidence of chalk extraction within the northern half of site has been recorded. Historic mapping shows the largest of these extraction areas as a copse of trees, indicating a subsequent infill occurring.
- 8.4. A colluvial channel has been recorded running across the survey area as a broad, natural band. Adjoined at its western edge by a further channel of similarly naturally enhanced detritus, they both follow the contours of the site and conform to general colluvial processes.
- 8.5. Widespread agricultural activity is recorded within the survey area as ploughing trends and drainage features; variations in the orientation is indicative of a longstanding agricultural landscape.

## 9. Archiving

- 9.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.
- 9.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to the any dictated time embargoes.

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## 11. References

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MSTL461 - Land adjacent to Holtsmere End Lane, Hemel Hempstead,  
Hertfordshire

Figure 1 - Site Location

1:25,000 @ A4

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 Survey Area

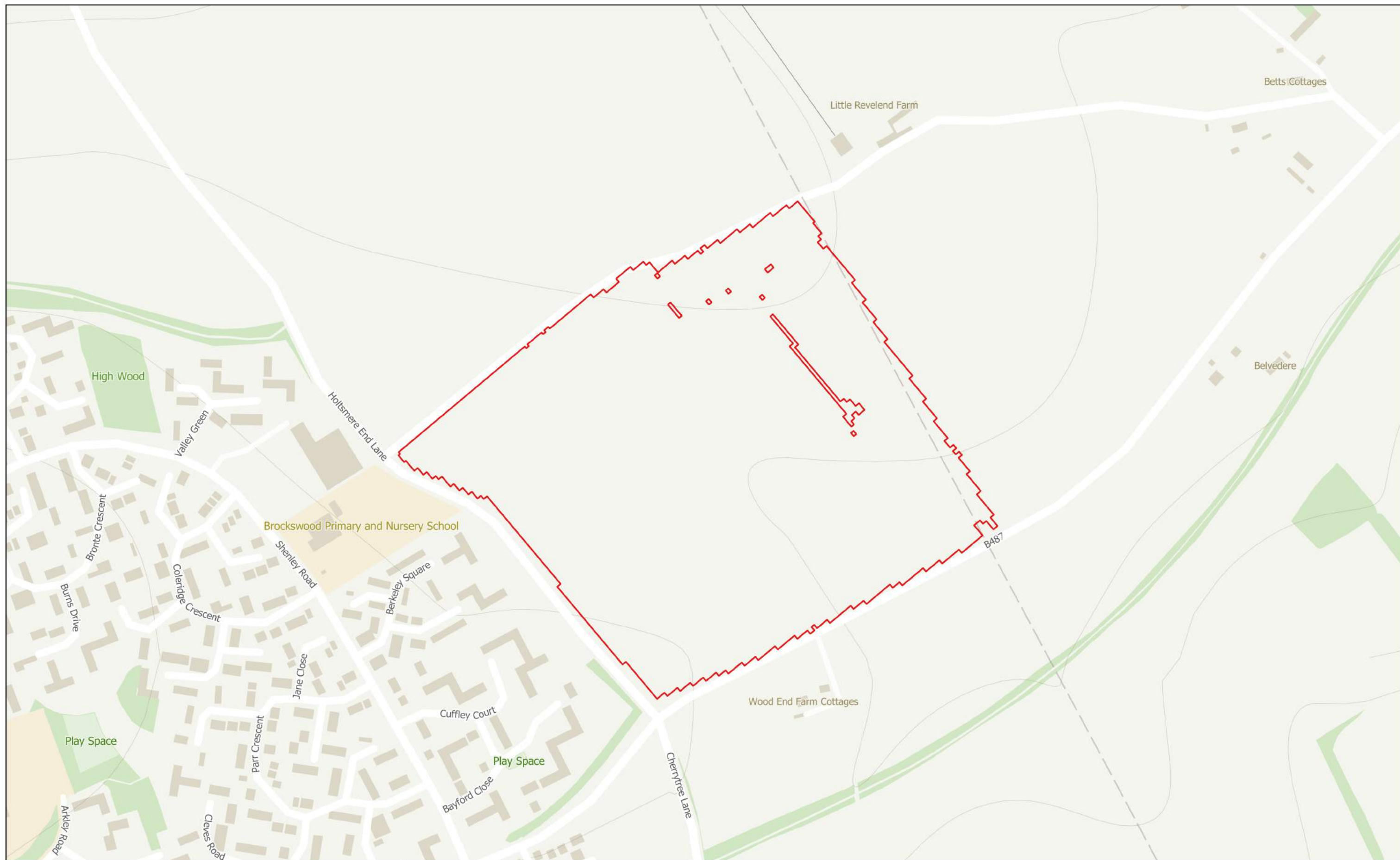


0 0.5 1 km



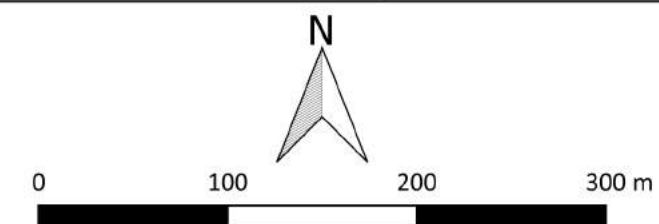
**magnitude  
surveys**





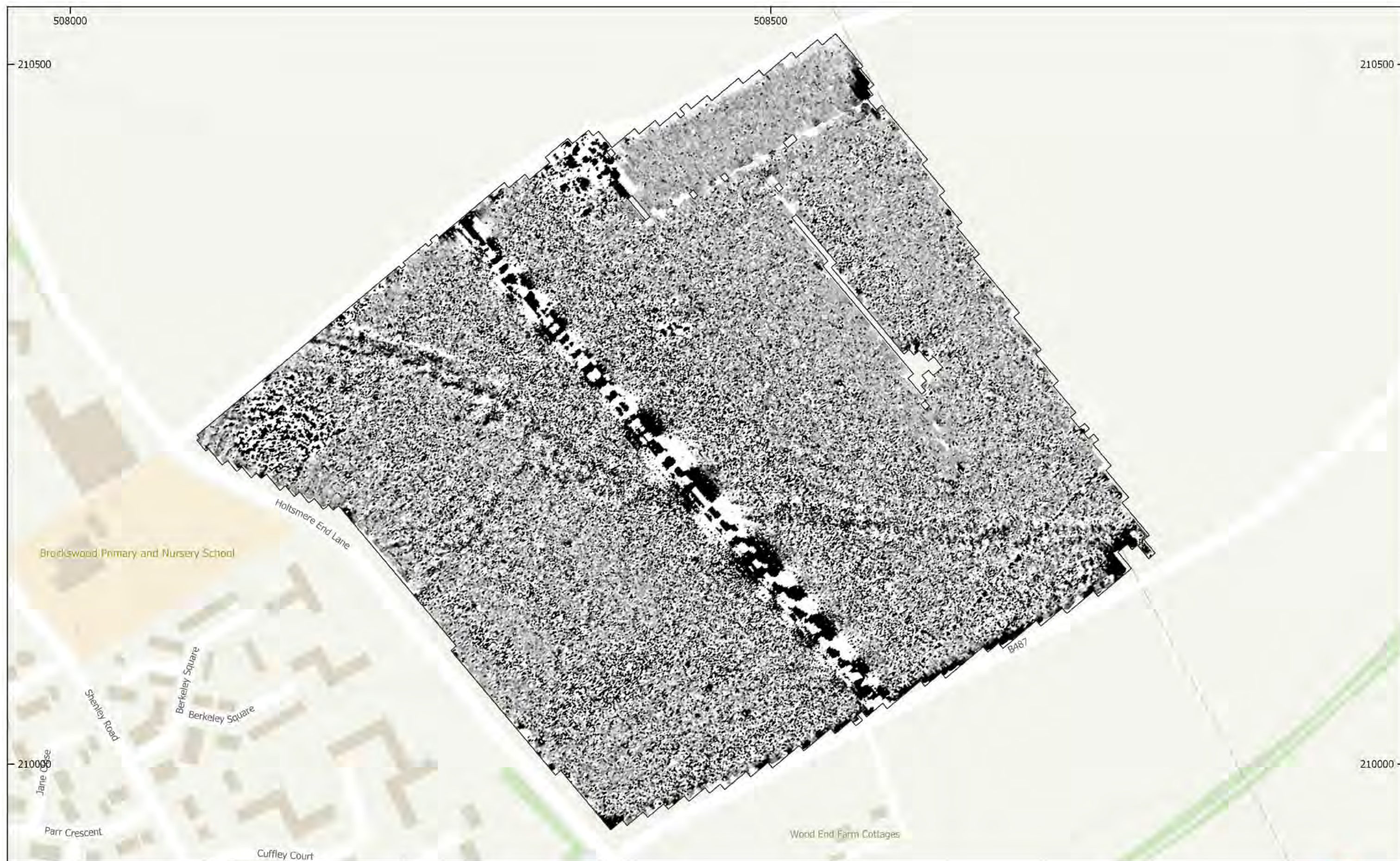
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Hertfordshire  
Figure 2 - Location of Survey Area  
1:4,000 @ A3  
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 Survey Extent

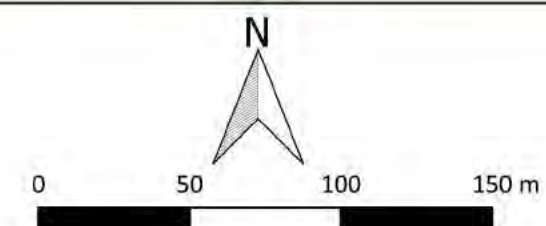


**magnitude**  
surveys

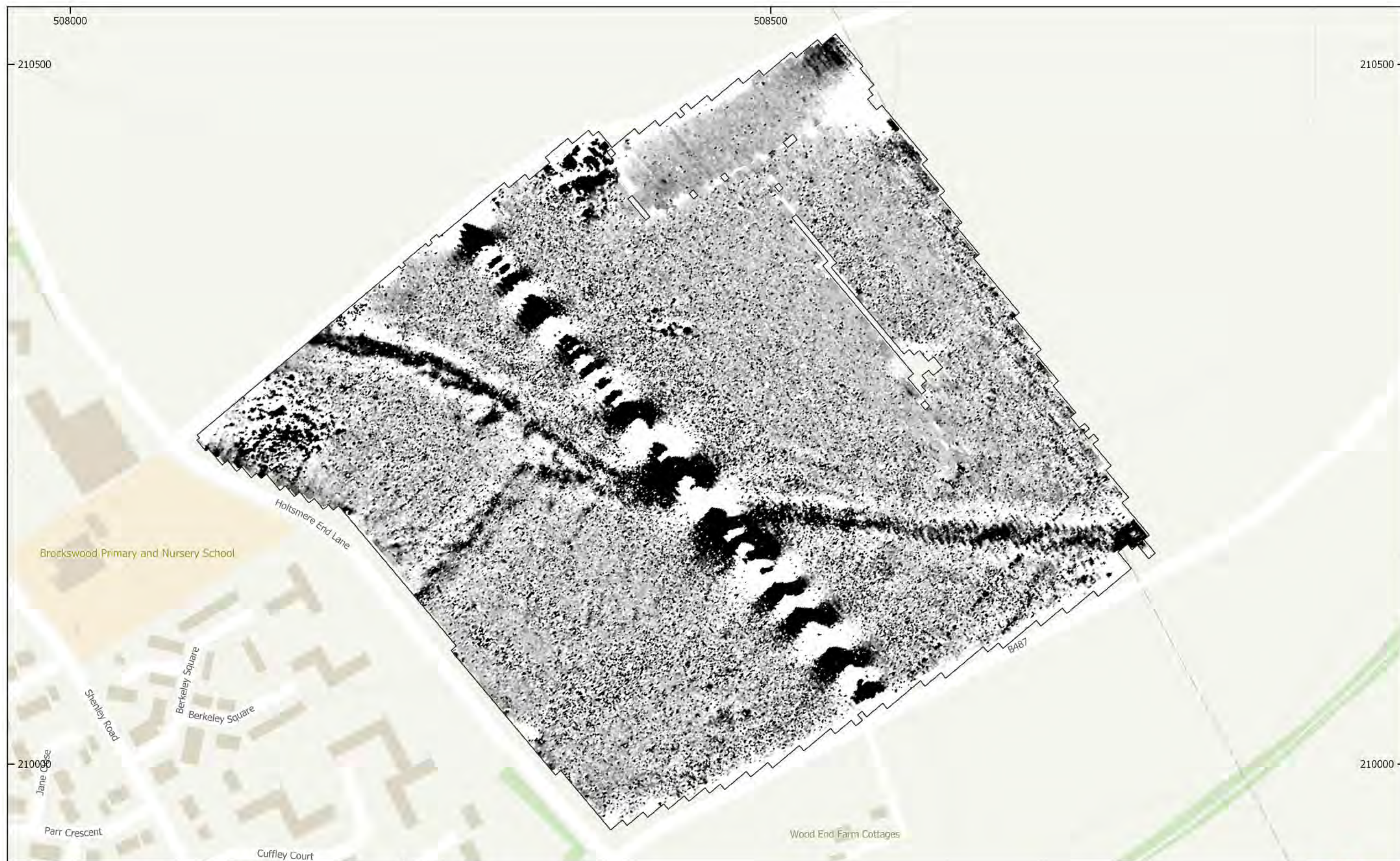




MSTL461 - Land adjacent to Holtsmere End Lane, Hemel Hempstead,  
Hertfordshire  
Figure 3 - Magnetic Gradient (Overview)  
1:2,500 @ A3  
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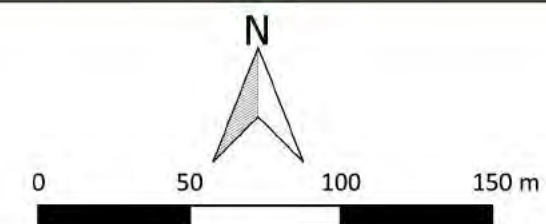
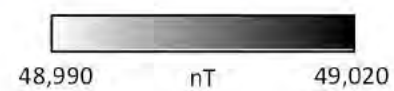


MSTL461 - Land adjacent to Holtsmere End Lane, Hemel Hempstead, Hertfordshire

Figure 4 - Magnetic Total Field (Lower Sensor) (Overview)  
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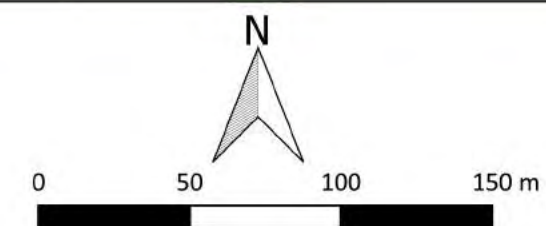




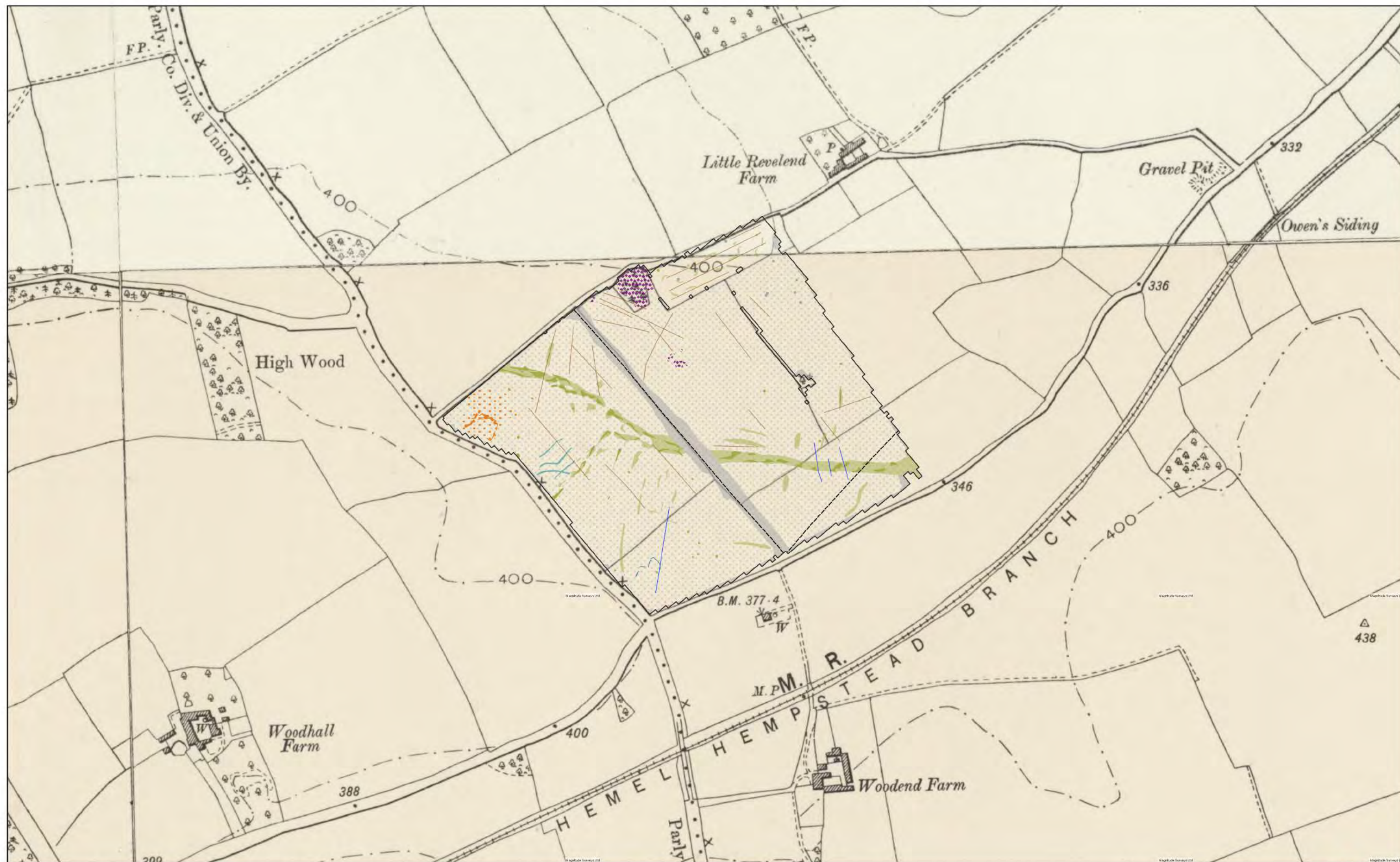


MSTL461 - Land adjacent to Holtsmere End Lane, Hemel Hempstead, Hertfordshire  
 Figure 5 - Magnetic Interpretation with Contours (Overview)  
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- |                               |                       |                  |
|-------------------------------|-----------------------|------------------|
| Archaeology Possible (Spread) | Natural (Strong)      | Service          |
| Archaeology Possible (Strong) | Natural (Weak)        | Drainage Feature |
| Green waste (Spread)          | Undetermined (Strong) | Ferrous (Spike)  |
| Extraction (Spread)           | Undetermined (Weak)   |                  |
| Magnetic Disturbance          | Agricultural (Trend)  |                  |

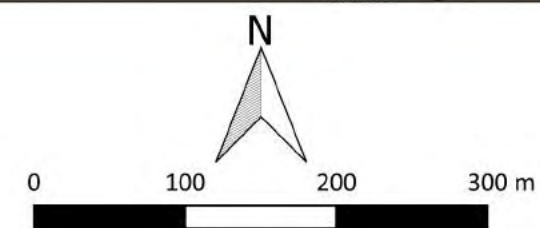




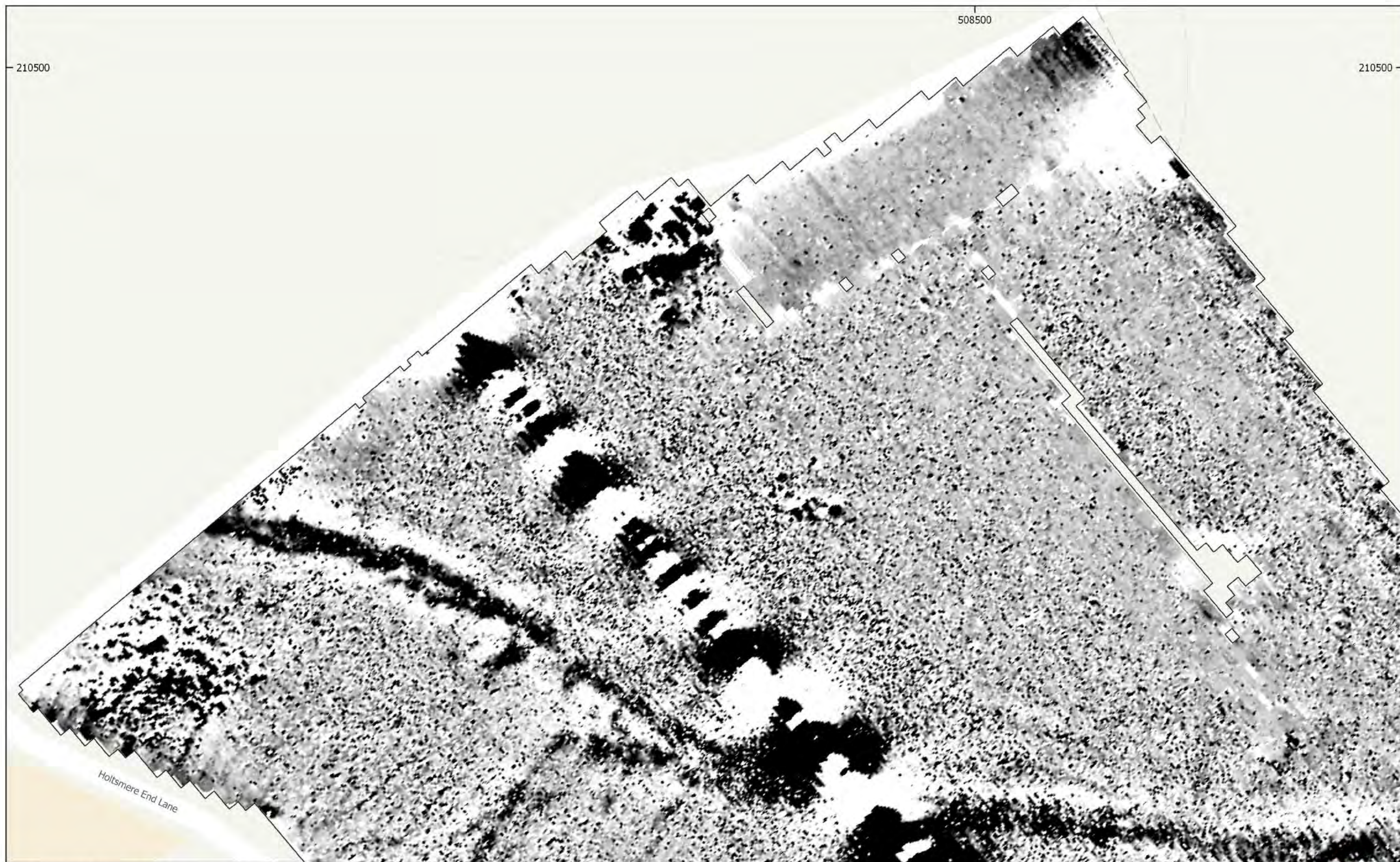


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 Figure 6 - Magnetic Interpretation Over Historic Maps  
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 Contains historic maps: Ordnance Survey, 6" 2nd edition c. 1882-1913 © National Library of Scotland

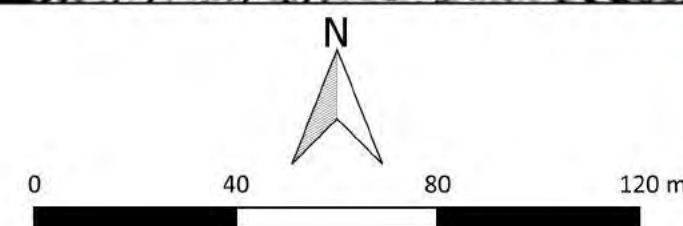
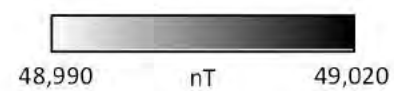
- |                                   |                         |                    |
|-----------------------------------|-------------------------|--------------------|
| ••• Archaeology Possible (Spread) | ■ Natural (Strong)      | --- Service        |
| ■ Archaeology Possible (Strong)   | ■ Natural (Weak)        | — Drainage Feature |
| ••• Green waste (Spread)          | ■ Undetermined (Strong) | • Ferrous (Spike)  |
| ••• Extraction (Spread)           | ■ Undetermined (Weak)   |                    |
| ■ Magnetic Disturbance            | — Agricultural (Trend)  |                    |







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Figure 7 - Magnetic Total Field (Lower Sensor) (North)  
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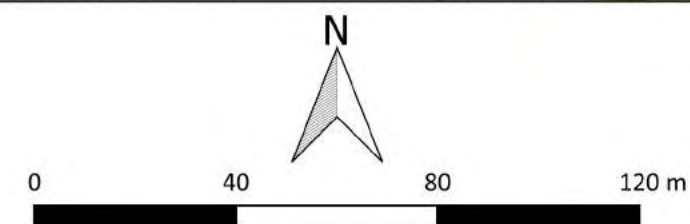




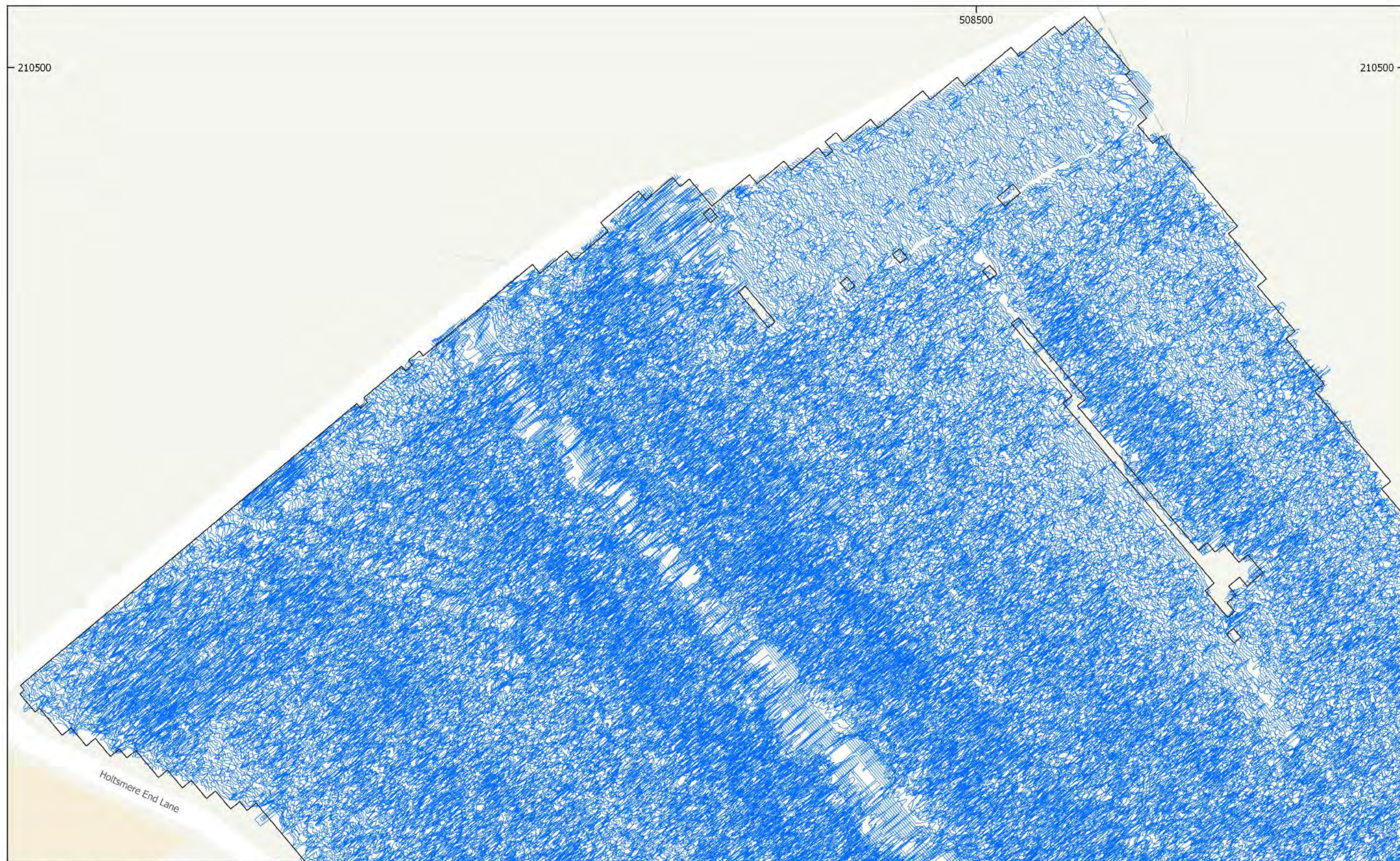


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 Figure 8 - Magnetic Interpretation (North)  
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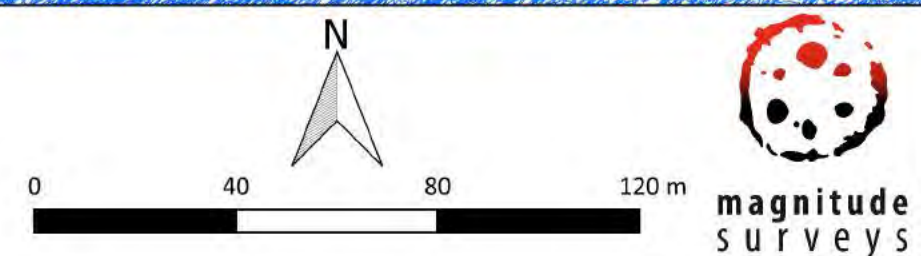
- |                               |                      |                      |
|-------------------------------|----------------------|----------------------|
| Archaeology Possible (Spread) | Magnetic Disturbance | Agricultural (Trend) |
| Archaeology Possible (Strong) | Natural (Strong)     | Service              |
| Green waste (Spread)          | Natural (Weak)       | Drainage Feature     |
| Extraction (Spread)           | Undetermined (Weak)  | Ferrous (Spike)      |



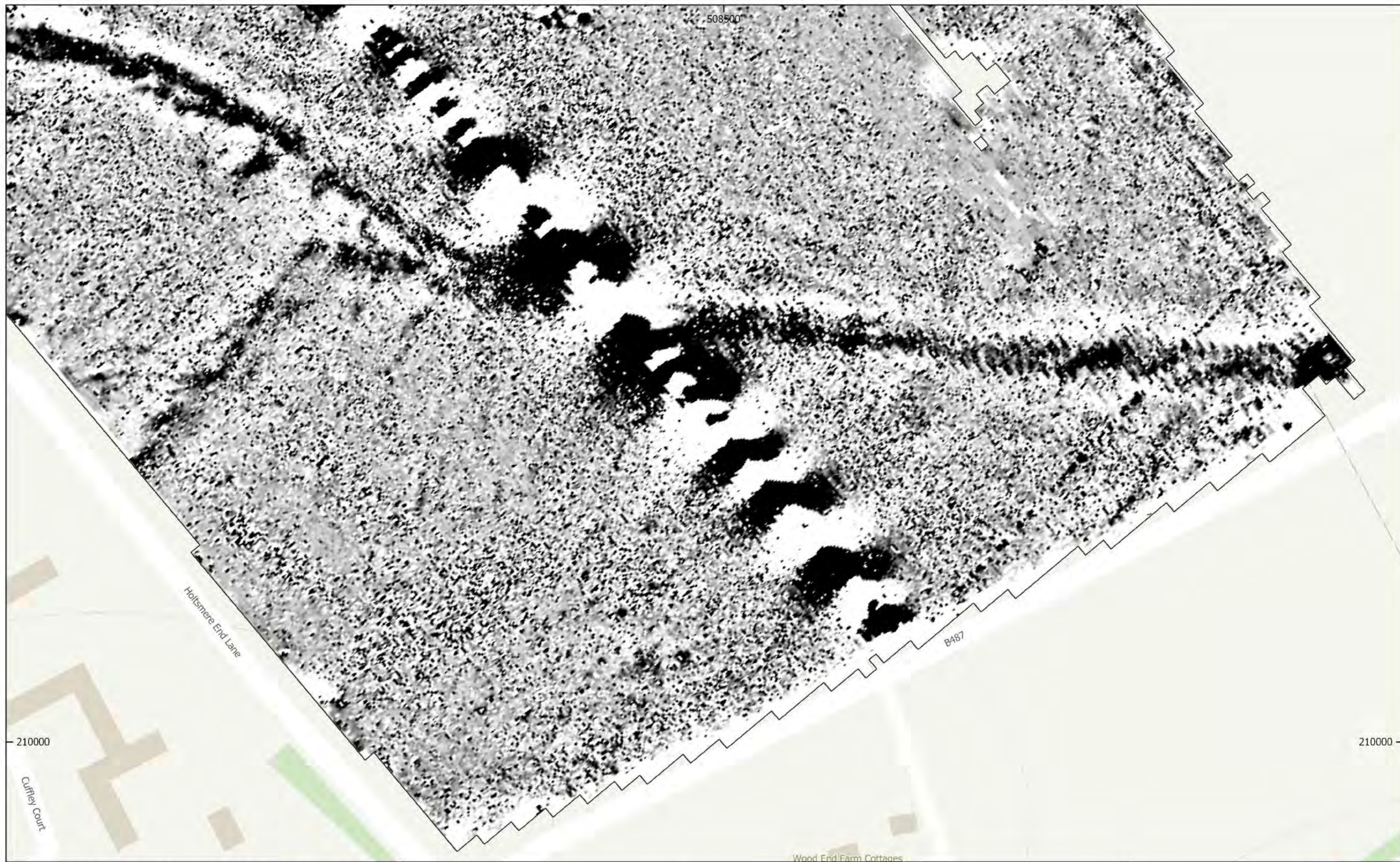




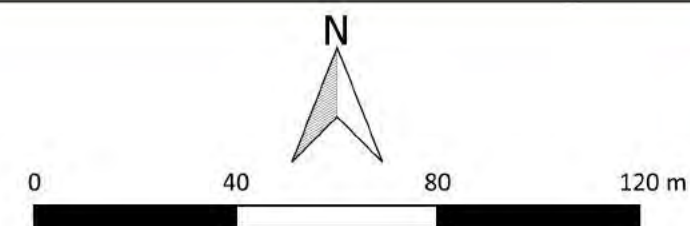
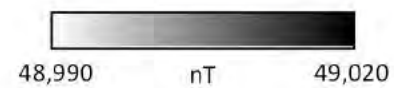
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Hertfordshire  
Figure 9 - XY Trace Plot (North)  
30nT/cm at 1:1,500 @ A3  
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Figure 10 - Magnetic Total Field (Lower Sensor) (South)  
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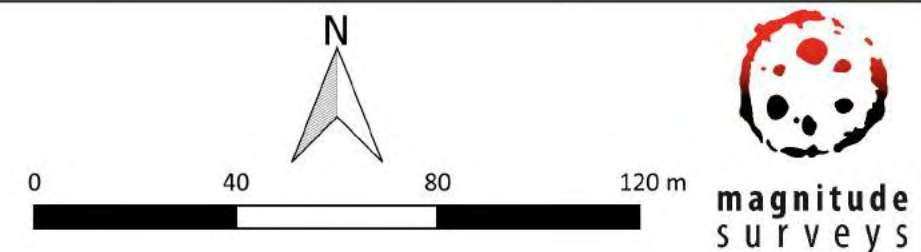




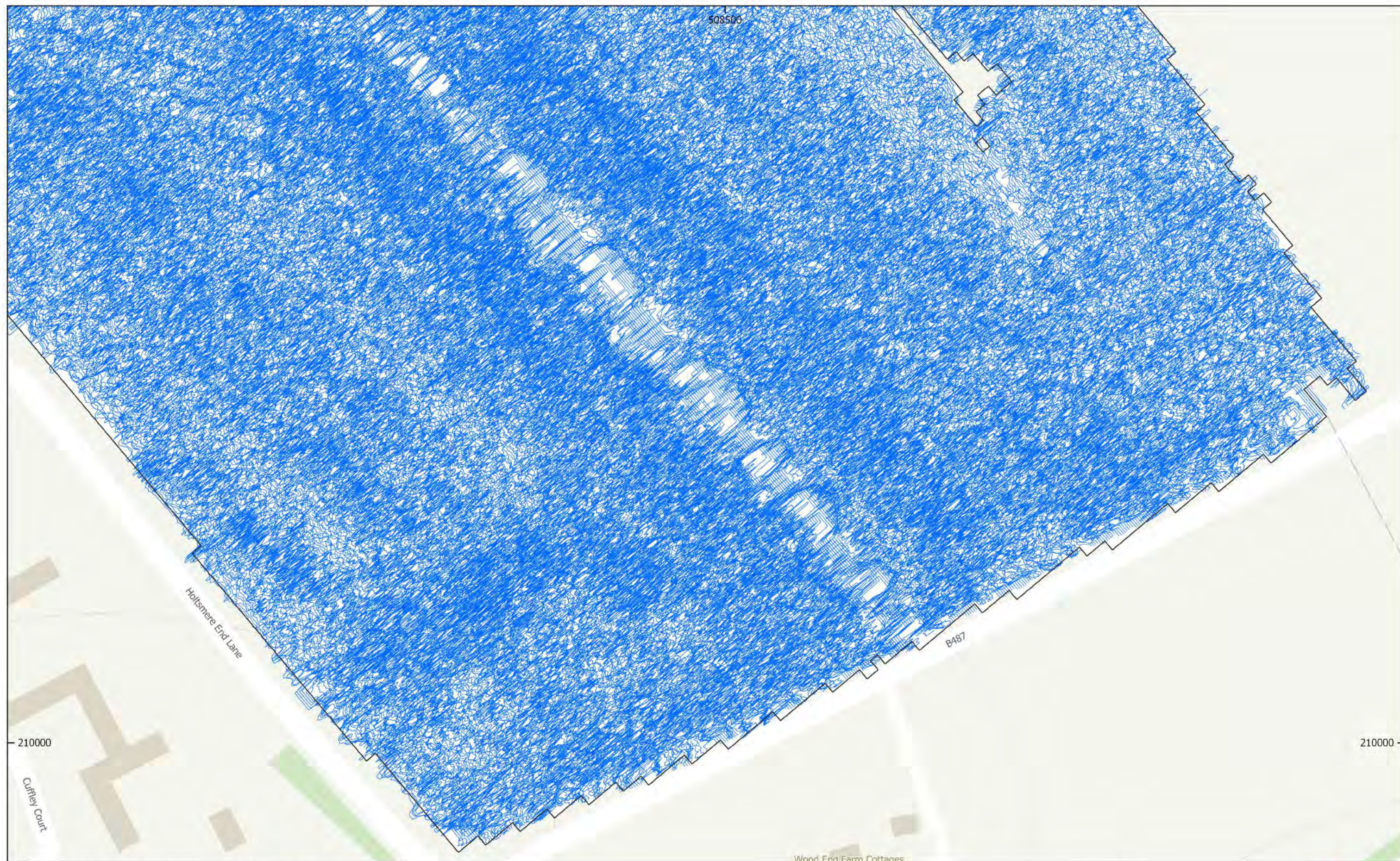


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 Figure 11 - Magnetic Interpretation (South)  
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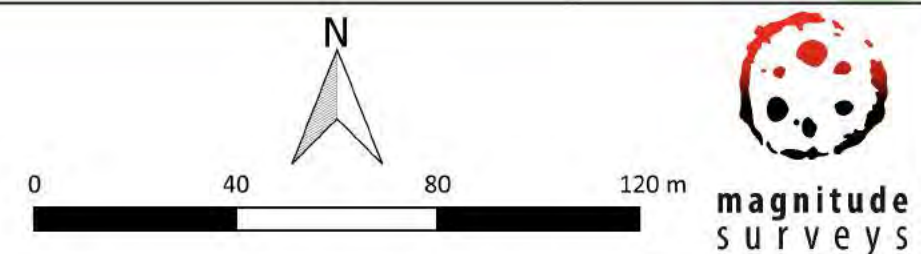
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 Green waste (Spread)  
 Extraction (Spread)  
 Magnetic Disturbance  
 Natural (Strong)  
 Natural (Weak)  
 Undetermined (Strong)  
 Undetermined (Weak)  
 Agricultural (Trend)  
 Service  
 Drainage Feature  
 Ferrous (Spike)







MSTL461 - Land adjacent to Holtsmere End Lane, Hemel Hempstead,  
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Figure 12 - XY Trace Plot (South)  
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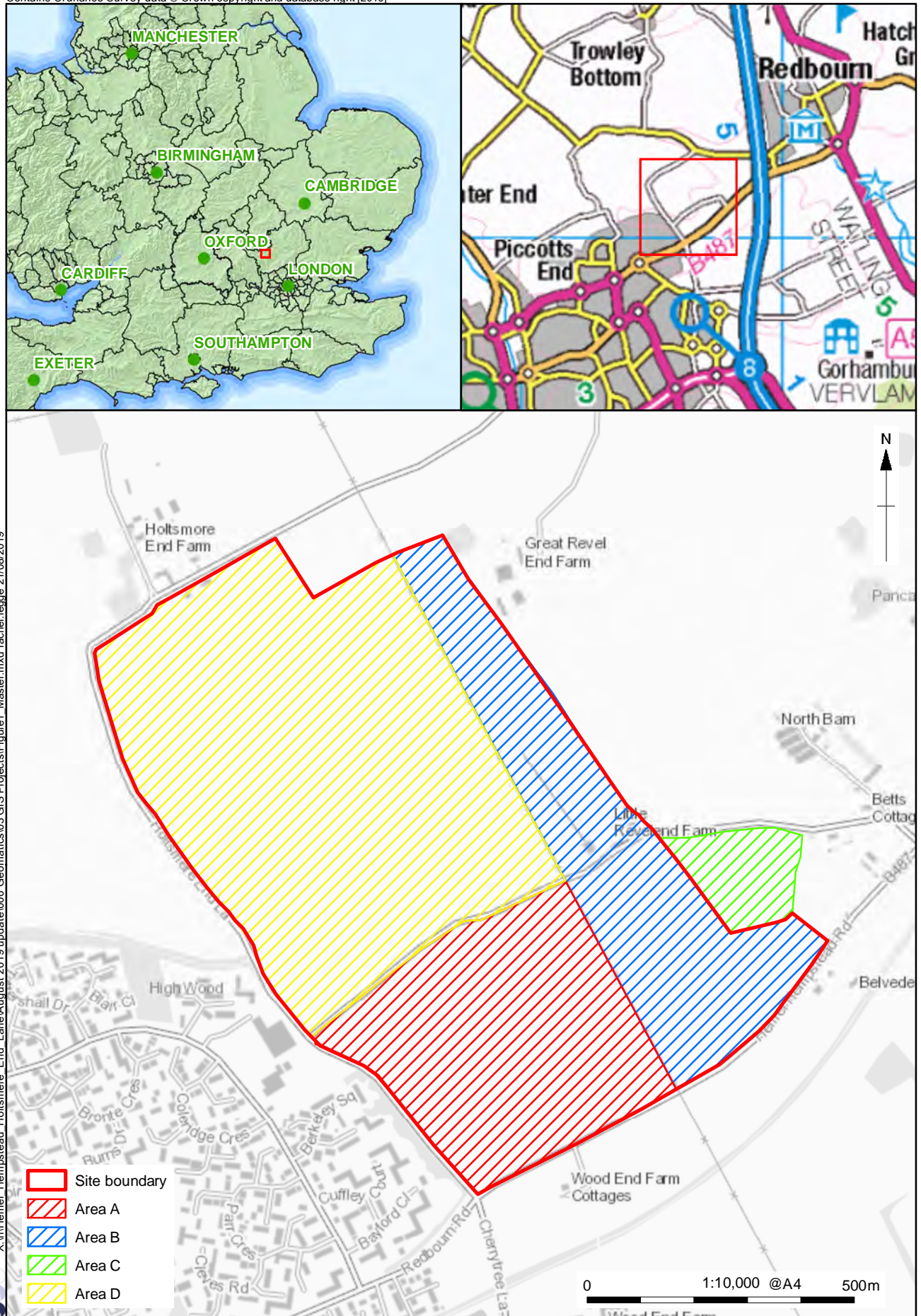


Figure 1: Site location

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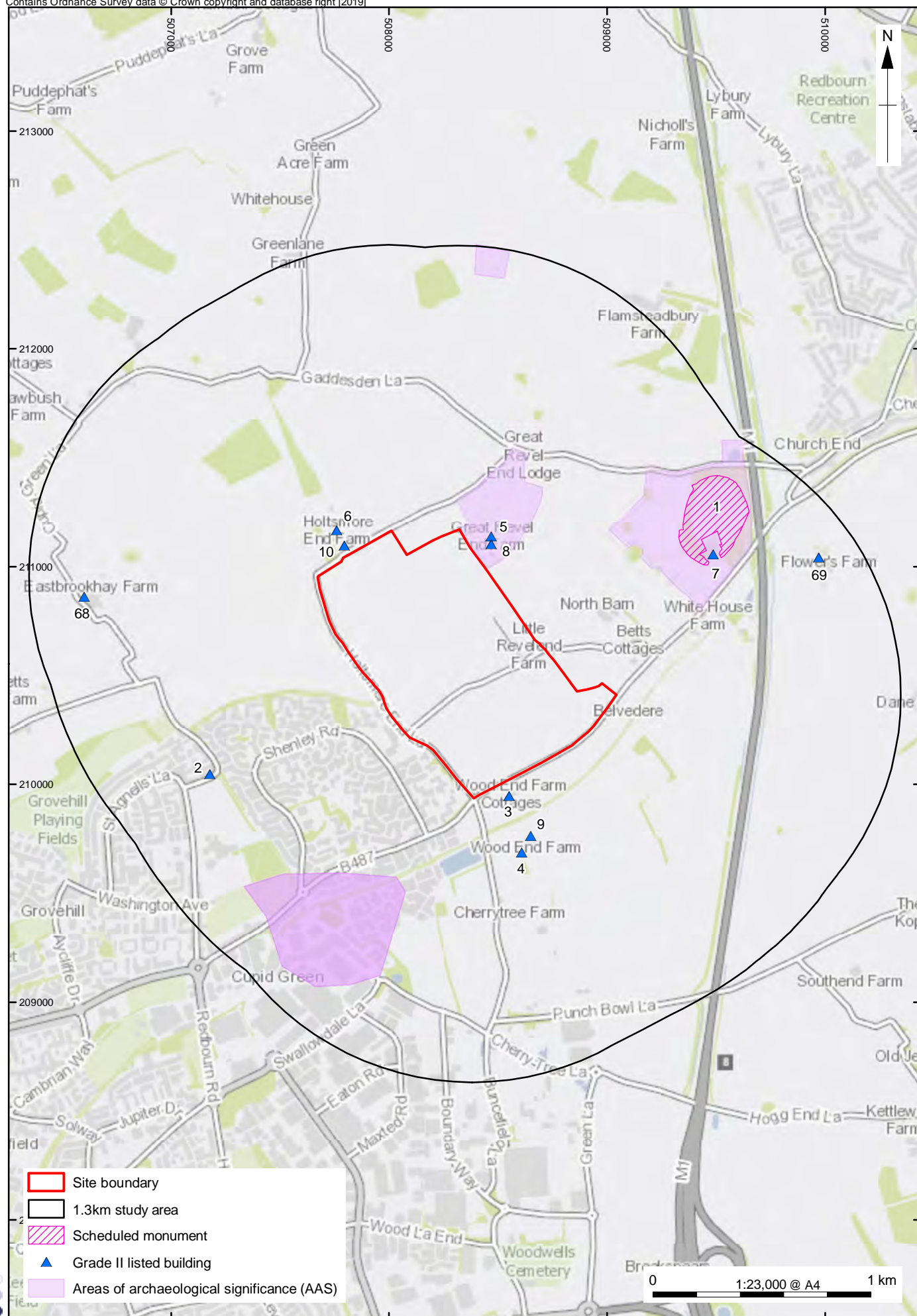


Figure 2: Designated heritage assets



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Figure 3: Previous archaeological events



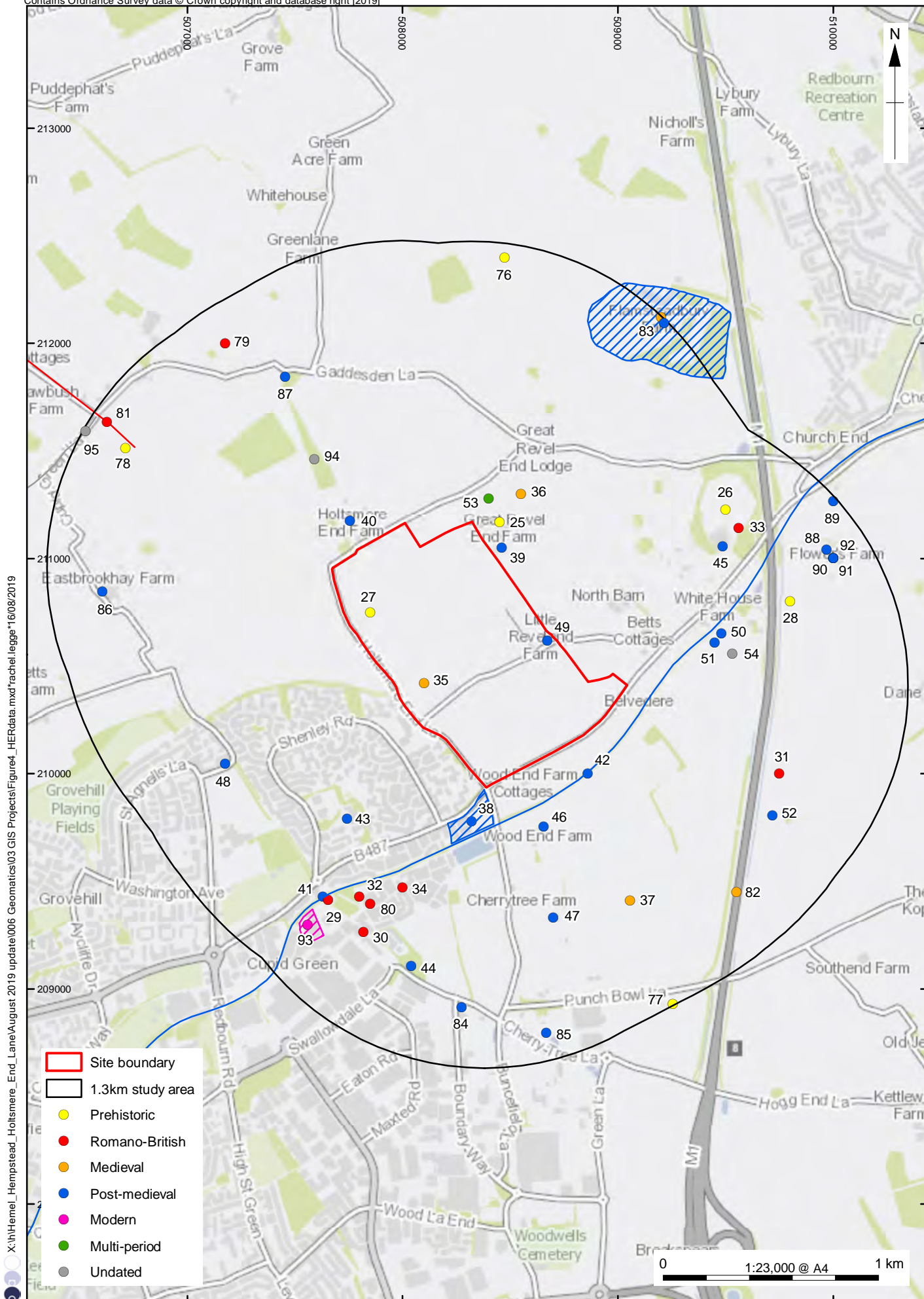


Figure 4: HER data

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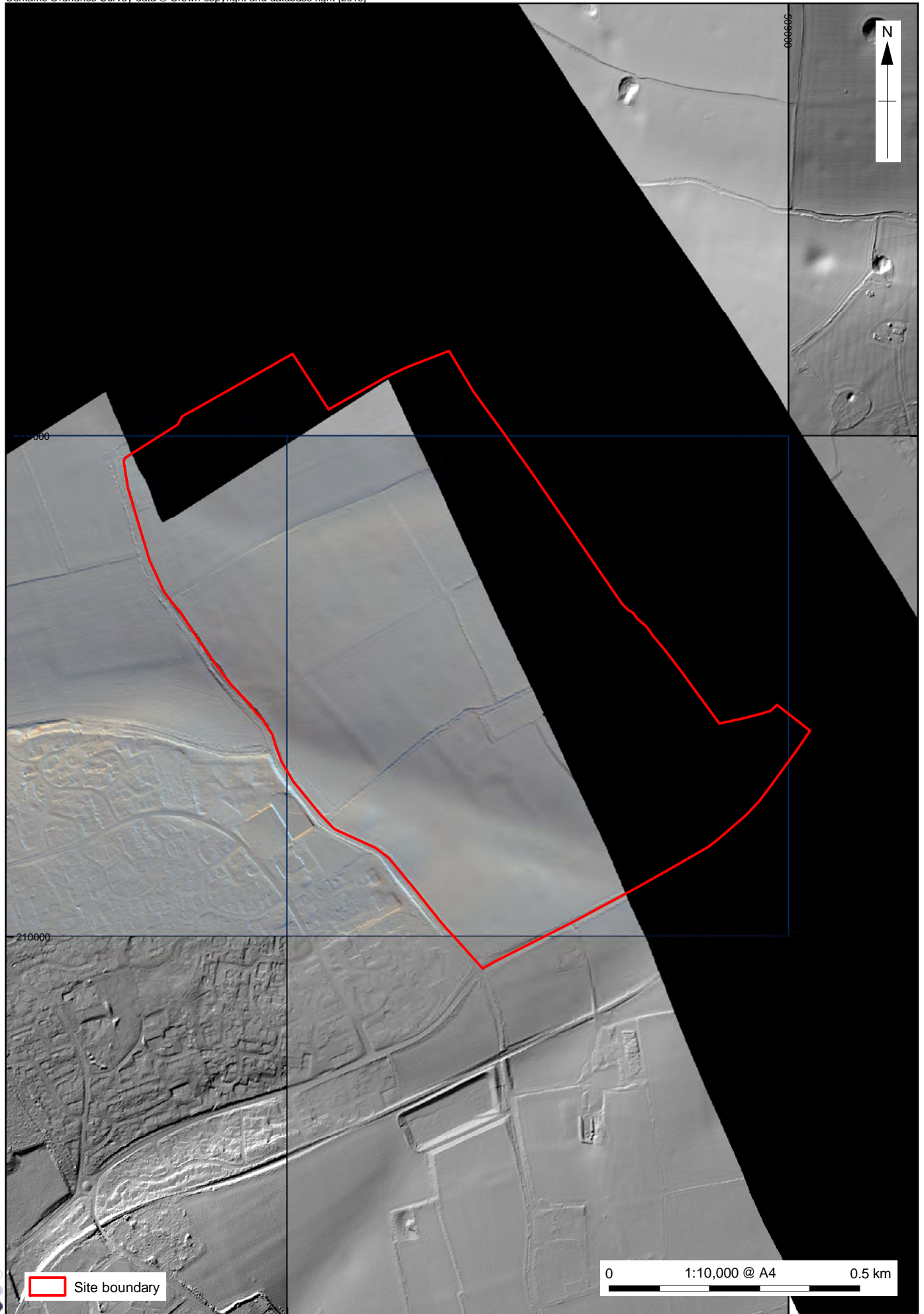


Figure 5: LiDAR Multi Hillshade



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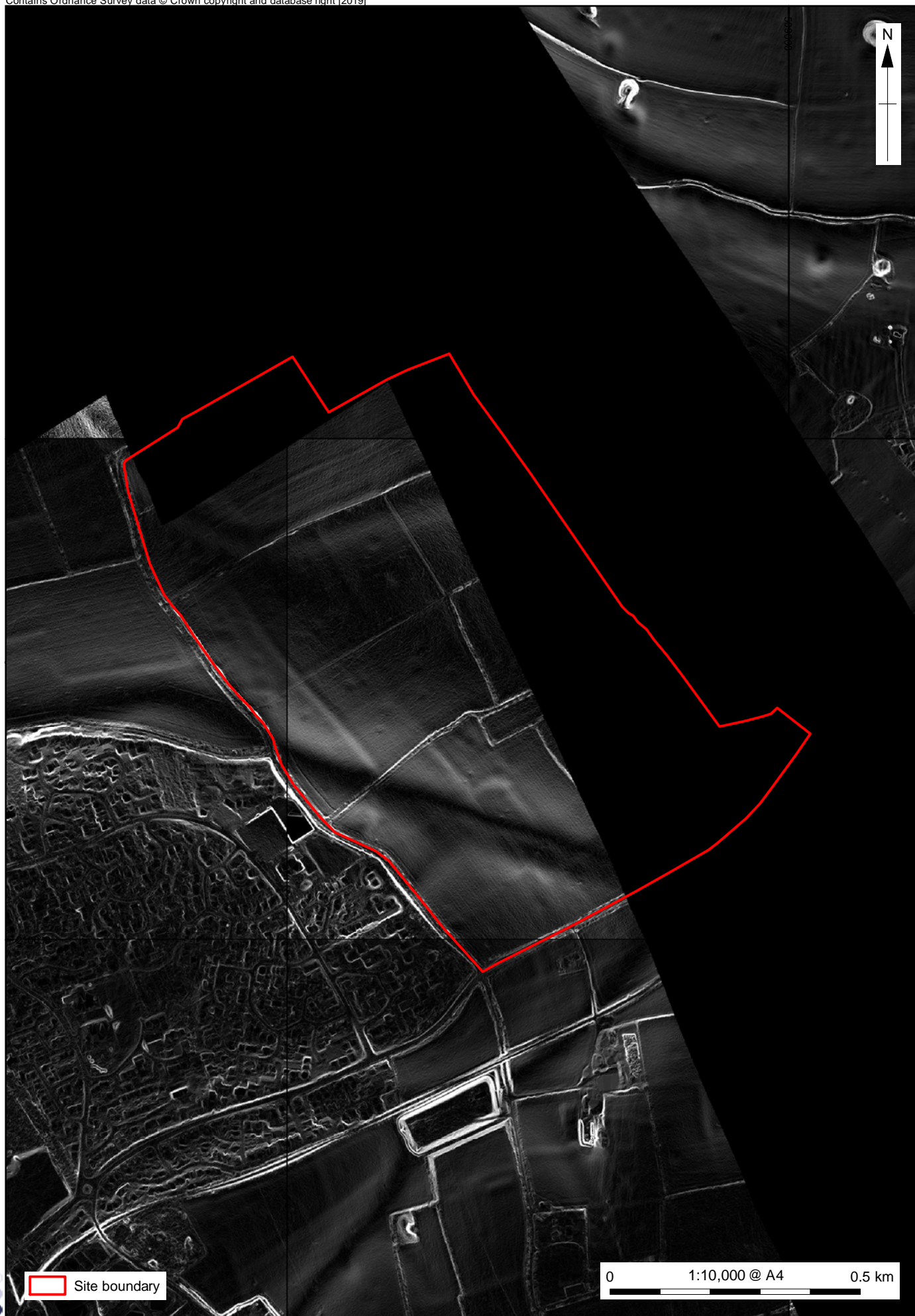


Figure 6: LiDAR Slope

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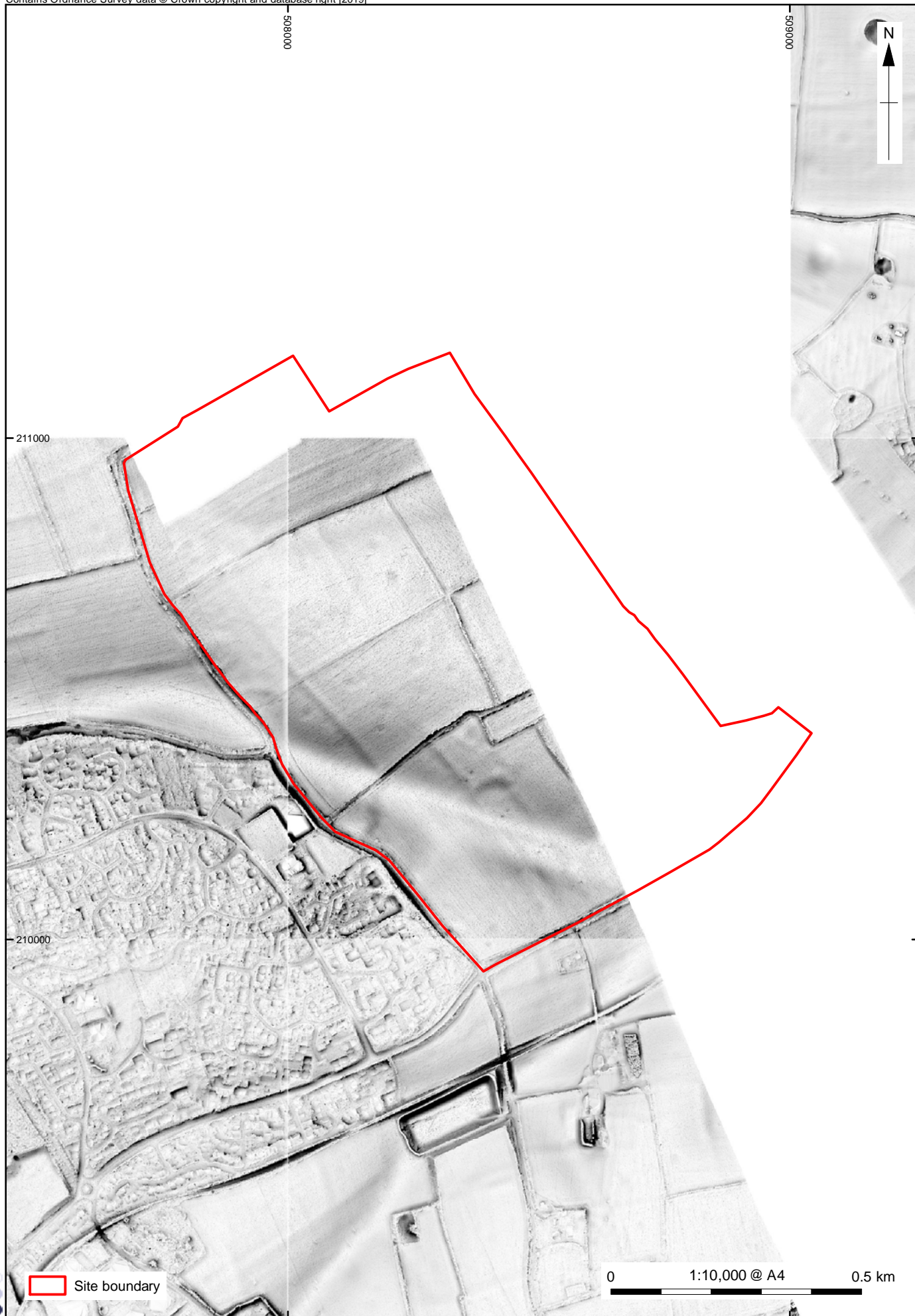


Figure 7: LiDAR Anisotropic sky-view factor



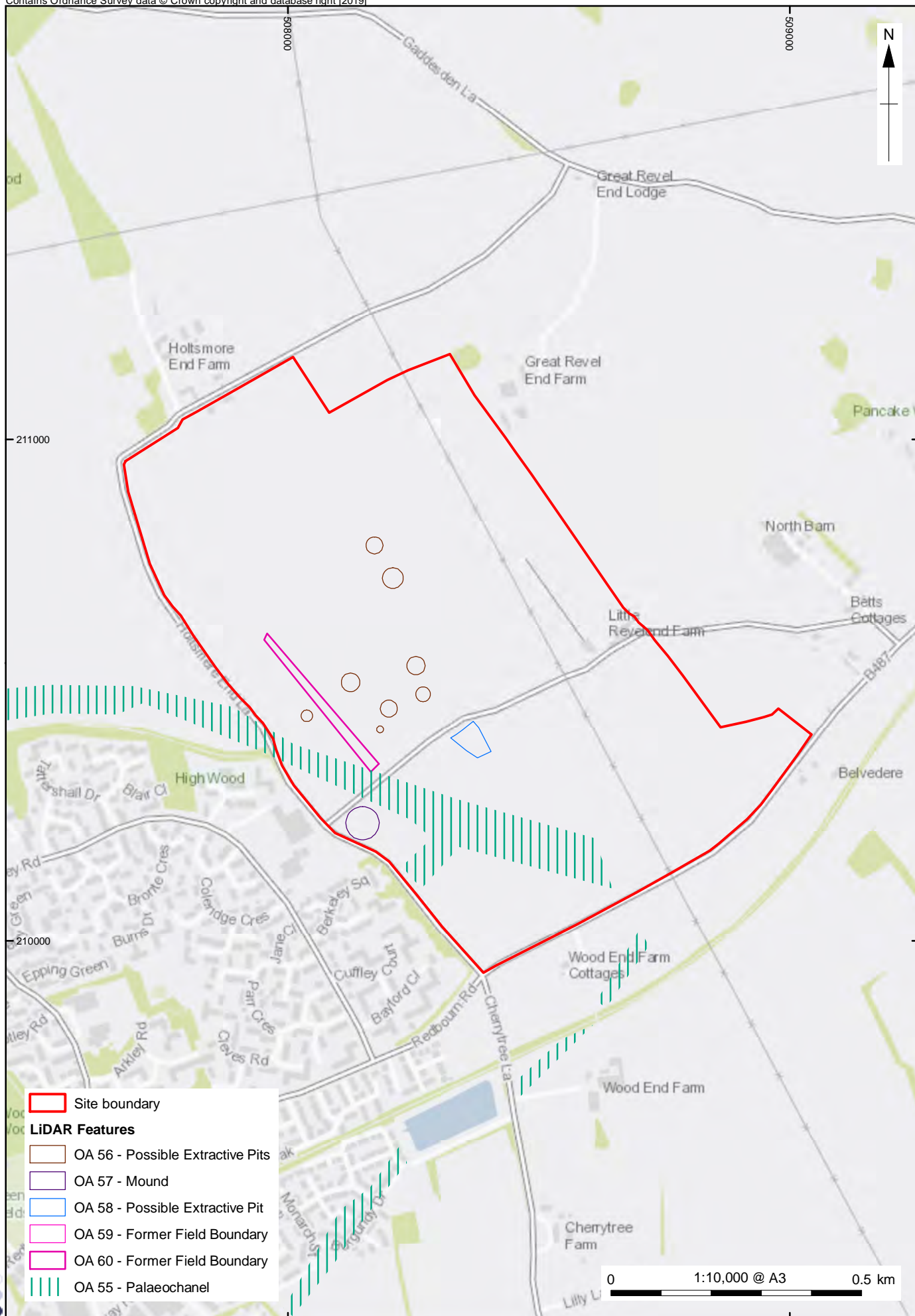


Figure 8: Features identified from LiDAR

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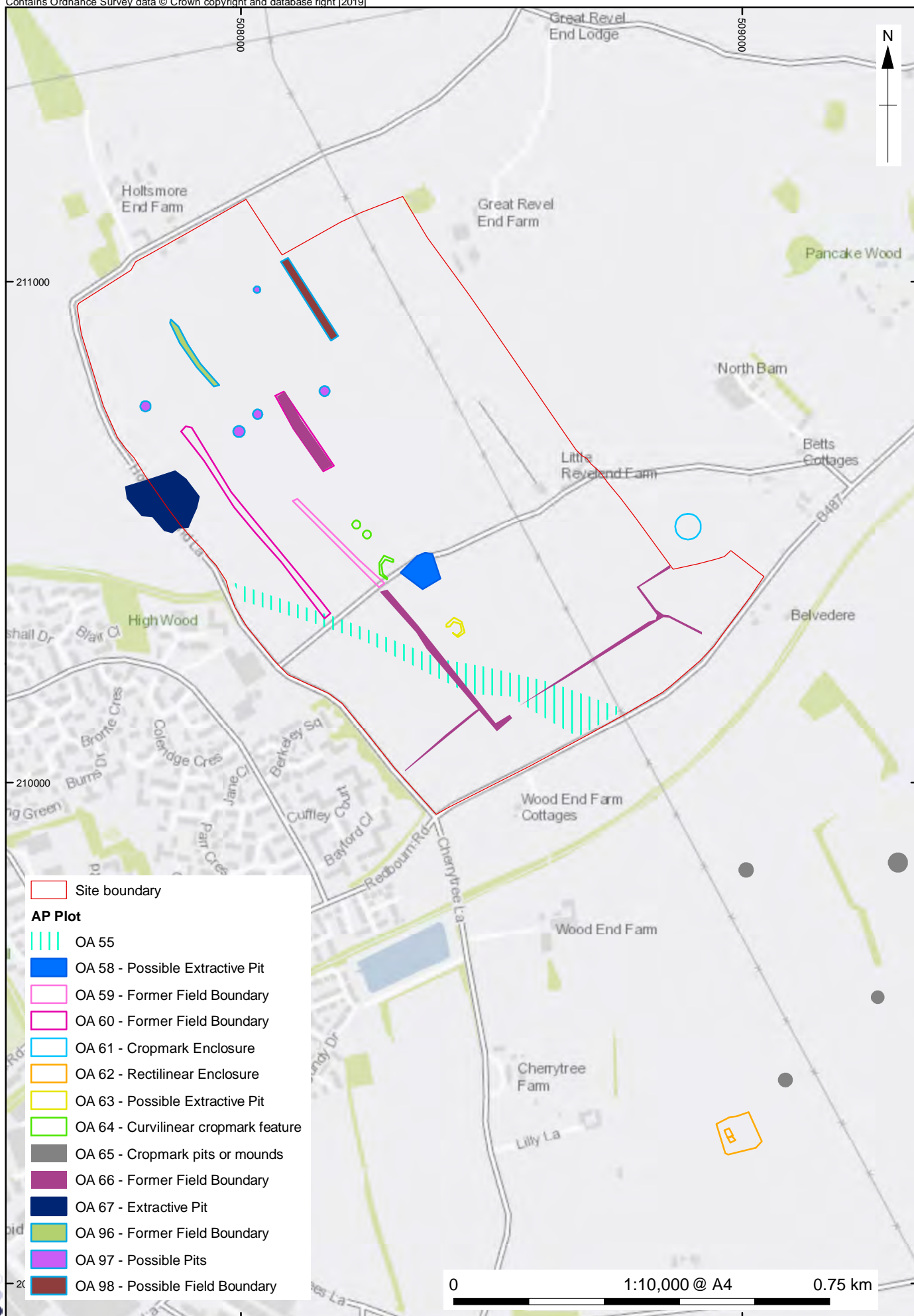


Figure 9: Cropmark features identified on aerial photographs



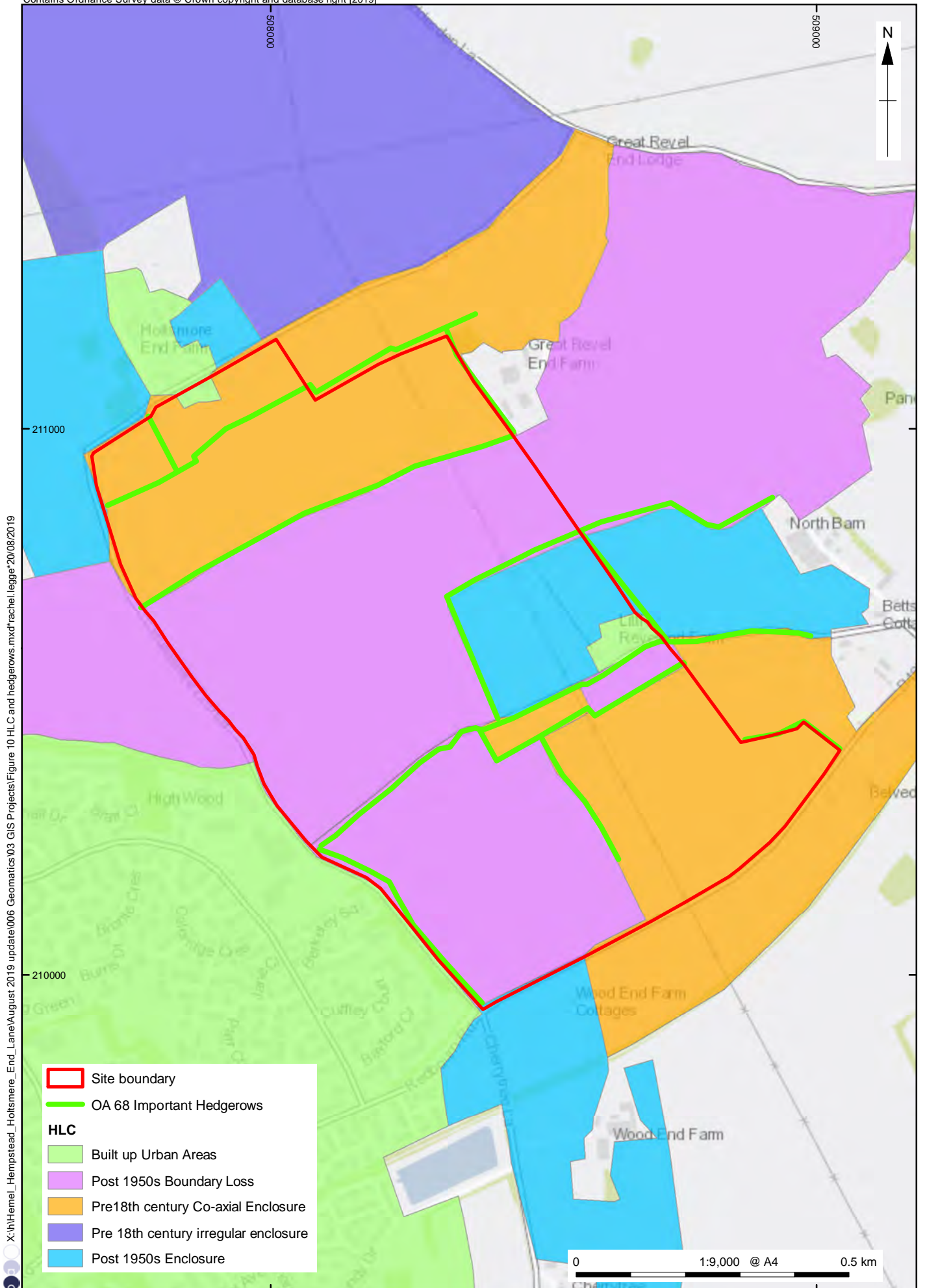
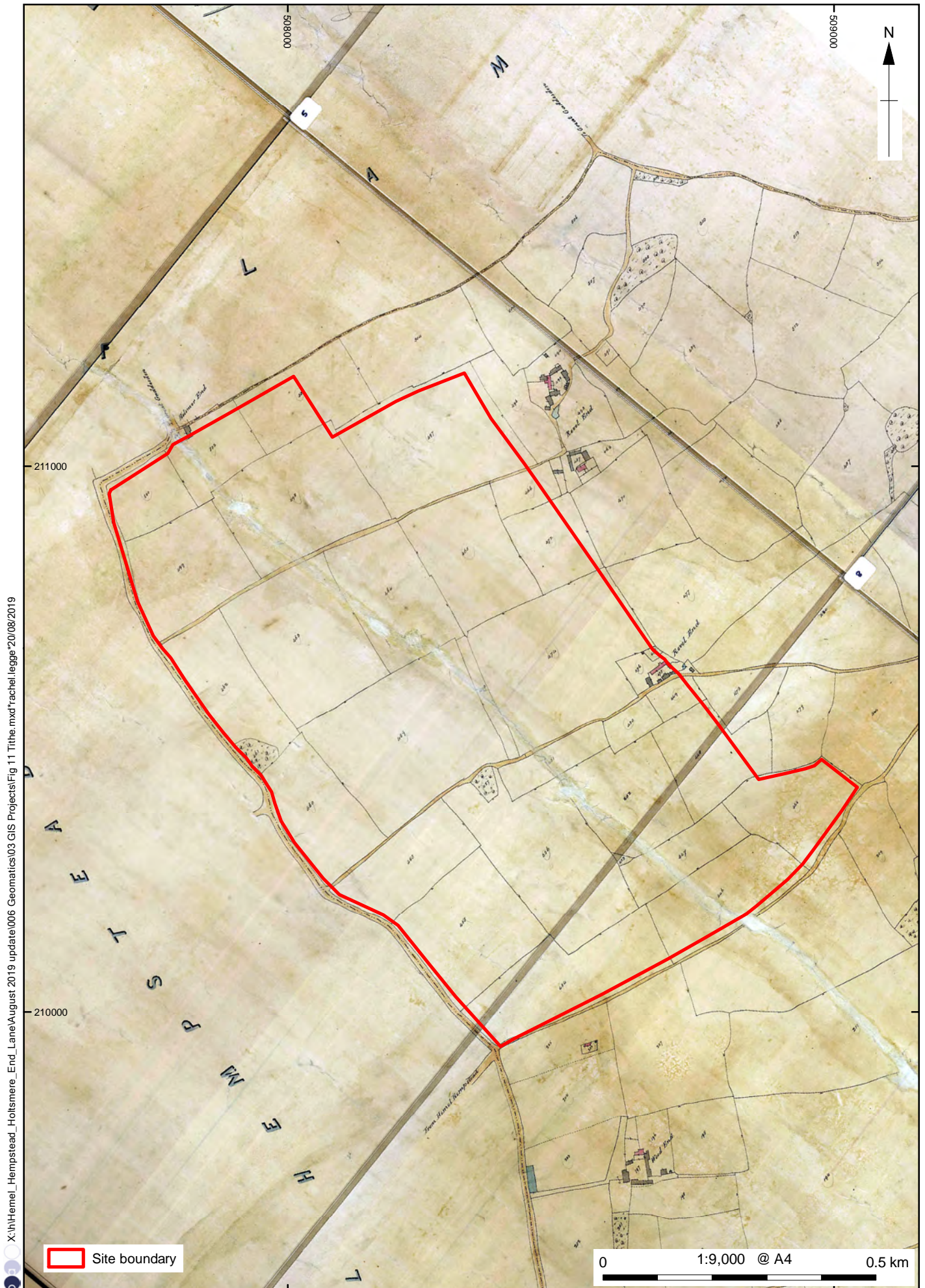
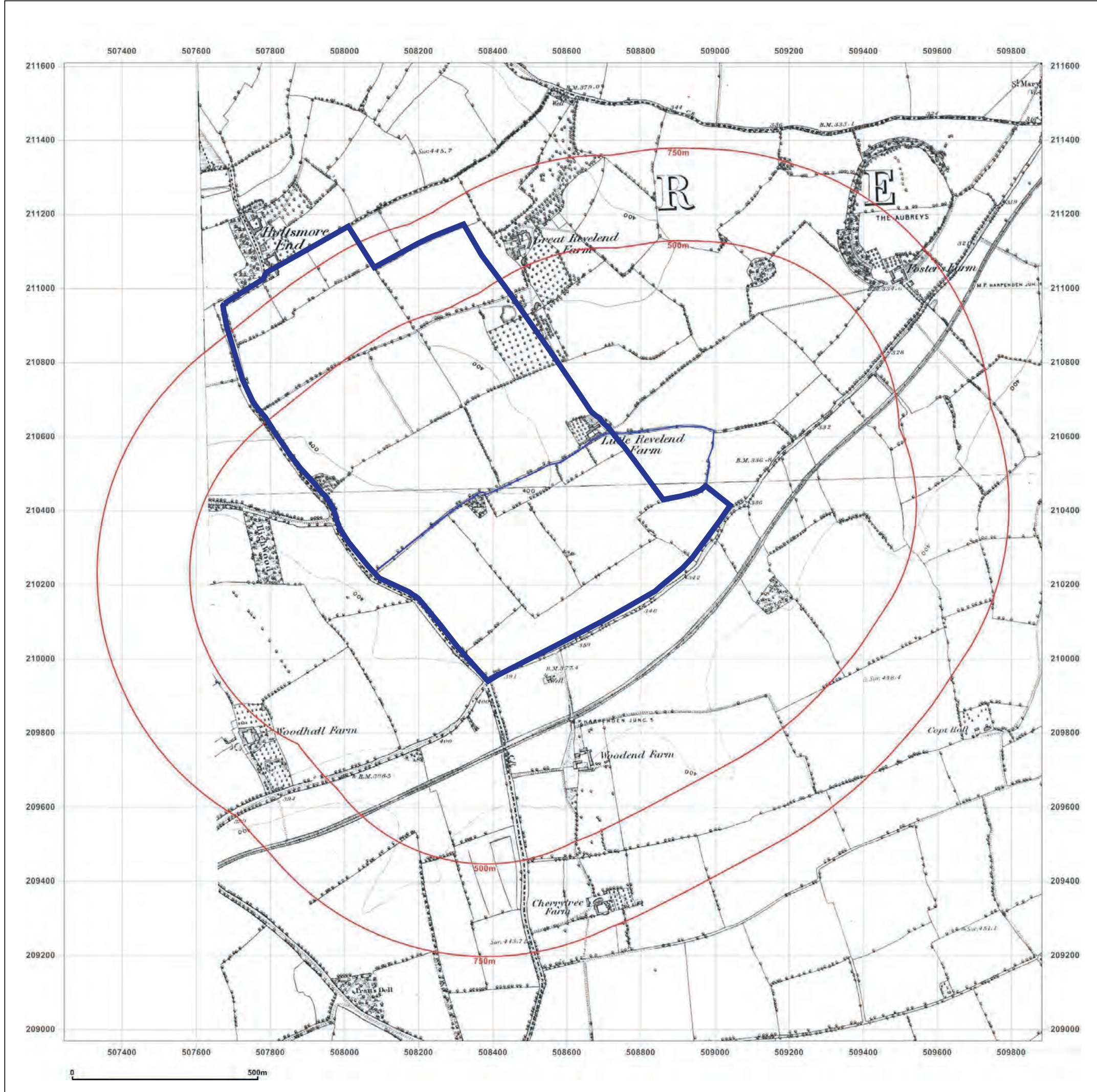


Figure 10: Historic Landscape Character and Important Hedgerows









Site Details:

508592.6941152358,  
210307.992861304

Client Ref: Hemel\_Hempstead\_Holtsmere\_End\_Lane  
Report Ref: GS-5802525  
Grid Ref: 508562, 210288

Map Name: County Series

Map date: **1883-1884**

Scale: 1:10,560

Printed at: 1:10,560

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W E  
S

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Edition 1884  
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Revised N/A  
Edition 1883  
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Figure 12: Ordnance Survey County Series map 1883-1884



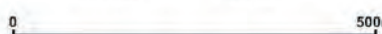
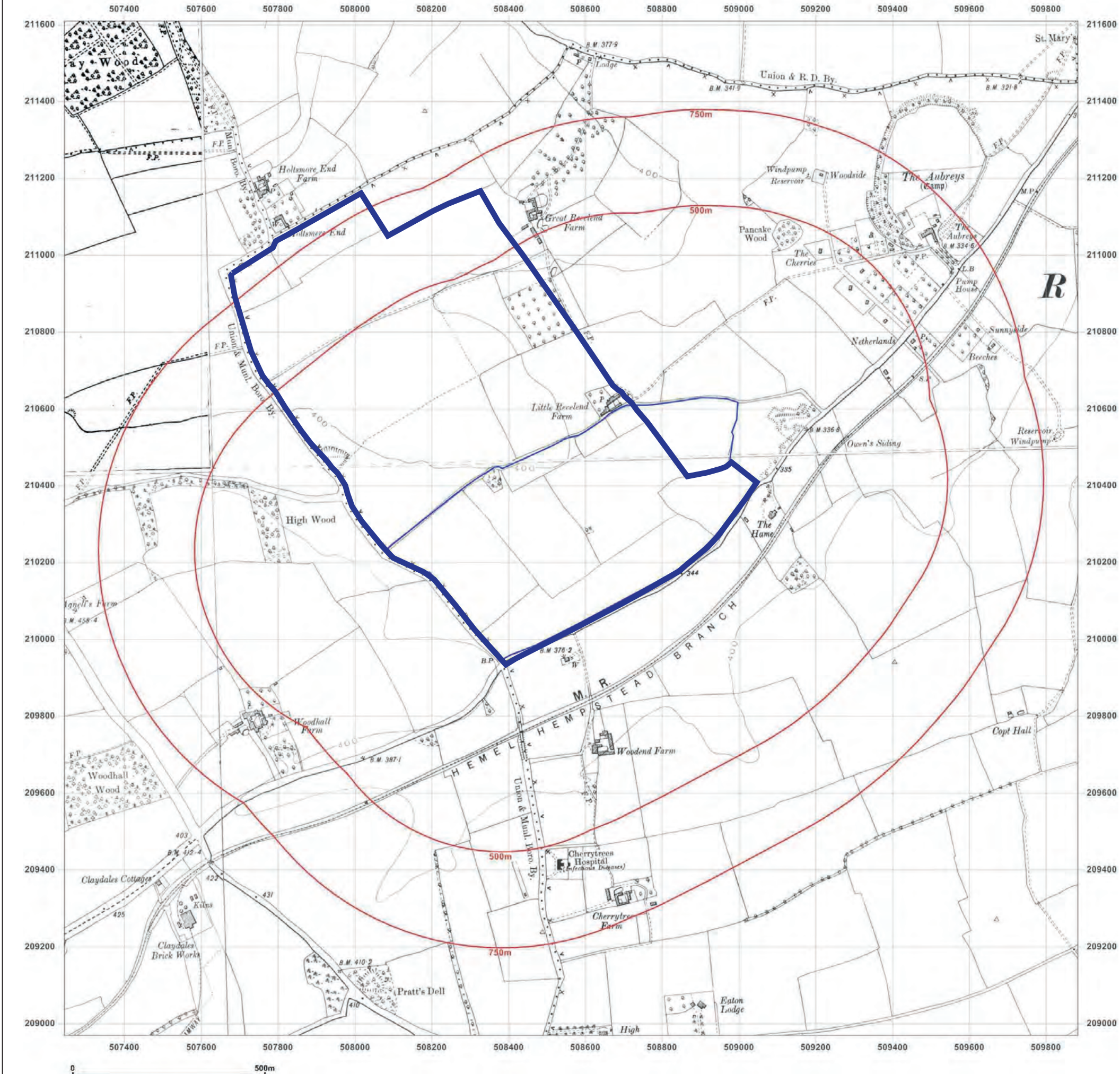


Figure 13: Ordnance Survey County Series map 1897 -1899





Site Details:

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210307.992861304

Client Ref: Hemel\_Hempstead\_Holtsmere\_End\_Lane  
Report Ref: GS-5802525  
Grid Ref: 508562, 210288

Map Name: County Series

Map date: **1920-1923**

Scale: 1:10,560

Printed at: 1:10,560



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Revised N/A  
Edition N/A  
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Surveyed 1877  
Revised 1922  
Edition N/A  
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Figure 14: Ordnance Survey County Series map 1920-23



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210307.992861304

Client Ref: Hemel\_Hempstead\_Holtsmere\_End\_Lane  
Report Ref: GS-5802525  
Grid Ref: 508562, 210288

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1877  
Revised 1938  
Edition N/A  
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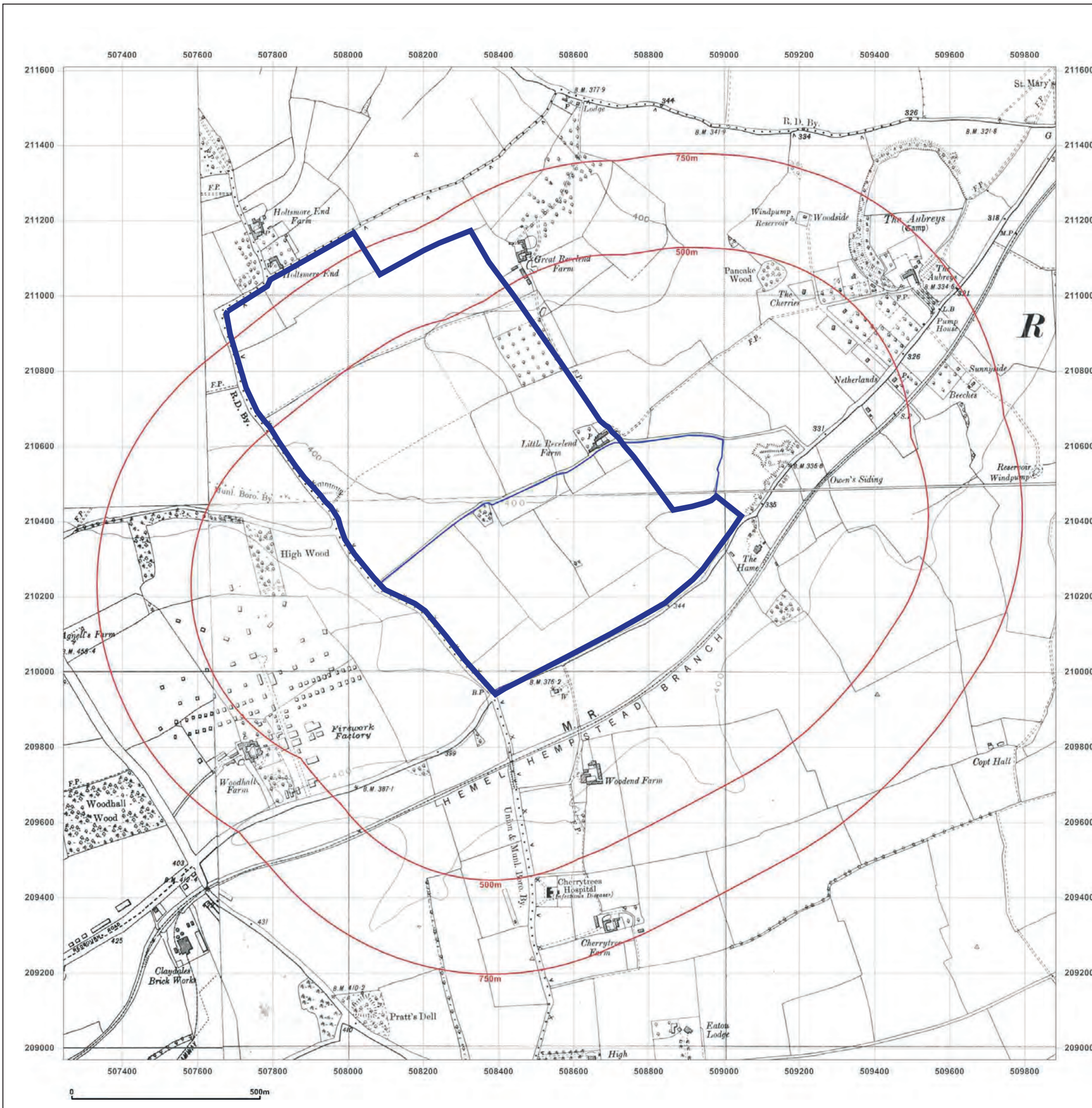


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Figure 15: Ordnance Survey County Series map 1938







Surveyed 1877  
Revised 1946  
Edition N/A  
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Surveyed 1887  
Revised 1947  
Edition N/A  
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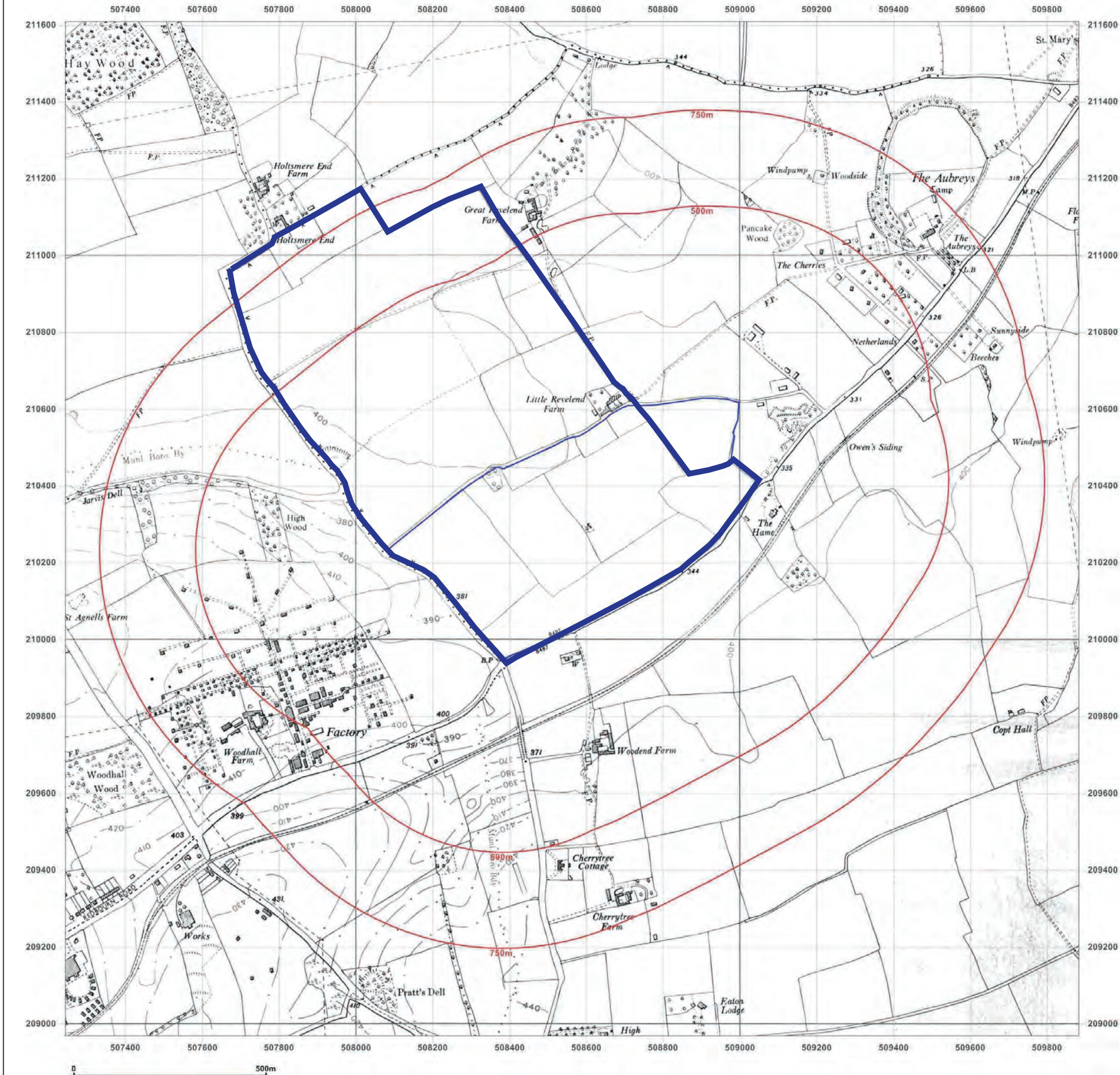
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Figure 16: Ordnance Survey County Series map 1946-1948





Site Details:

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210307.992861304

Client Ref: Hemel\_Hempstead\_Holtsmere\_End\_Lane  
Report Ref: GS-5802525  
Grid Ref: 508562, 210288

Map Name: Provisional

Map date: 1955-1960

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1951  
Revised 1960  
Edition N/A  
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Surveyed 1955  
Revised 1955  
Edition N/A  
Copyright N/A  
Levelled N/A



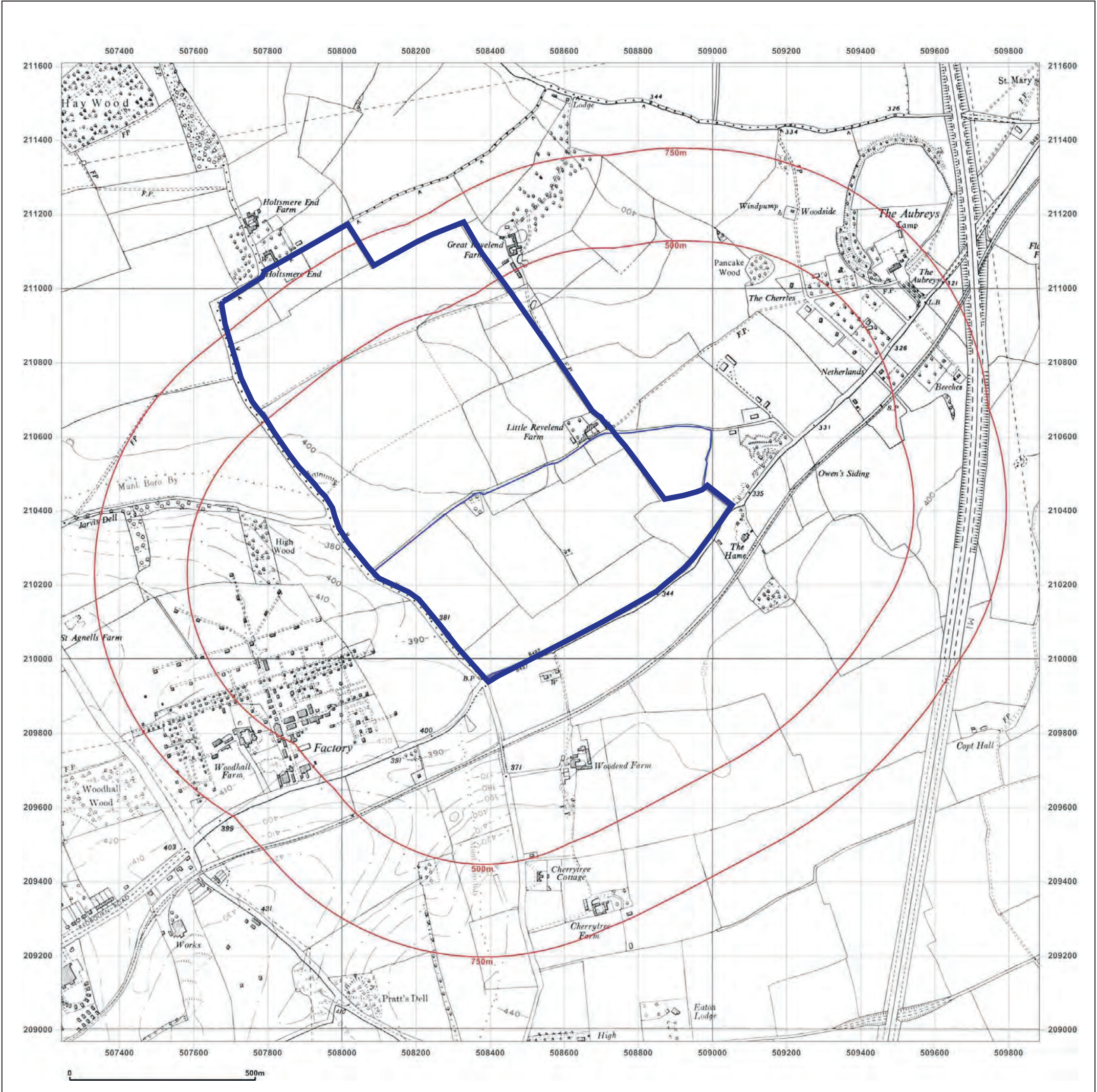
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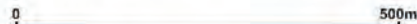
Production date: 05 February 2019

Figure 17: Ordnance Survey Provisional map 1955-60









Client Ref:	Hemel_Hempstead_Holtsmere_End_Lane
Report Ref:	GS-5802525
Grid Ref:	508562, 210288

Map Name:	National Grid
-----------	---------------

Map date: **1981-1982**

Scale: 1:10,000

Printed at: 1:10,000



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 Revised 1980  
 Edition N/A  
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Production date: 05 February 2019

Figure 19: National Grid map 1981-82





#### Site Details:

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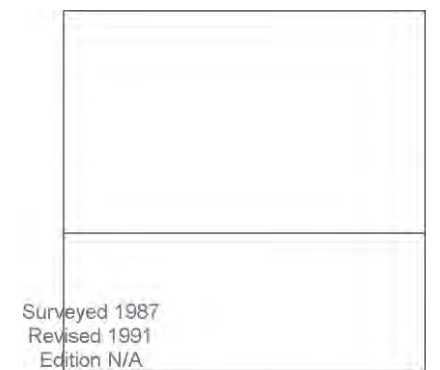
Client Ref: Hemel\_Hempstead\_Holtsmere\_End\_Lane  
Report Ref: GS-5802525  
Grid Ref: 508562, 210288

Map Name: National Grid

Map date: 1991

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1987  
Revised 1991  
Edition N/A  
Copyright N/A  
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Figure 20: National Grid map 1991





**Site Details:**

508592.6941152358,  
210307.992861304

Client Ref: Hemel\_Hempstead\_Holtsmere\_End\_Lane  
Report Ref: GS-5802525  
Grid Ref: 508562, 210288

Map Name: National Grid

Map date: **1995**

Scale: 1:10,000

Printed at: 1:10,000

Surveyed 1987  
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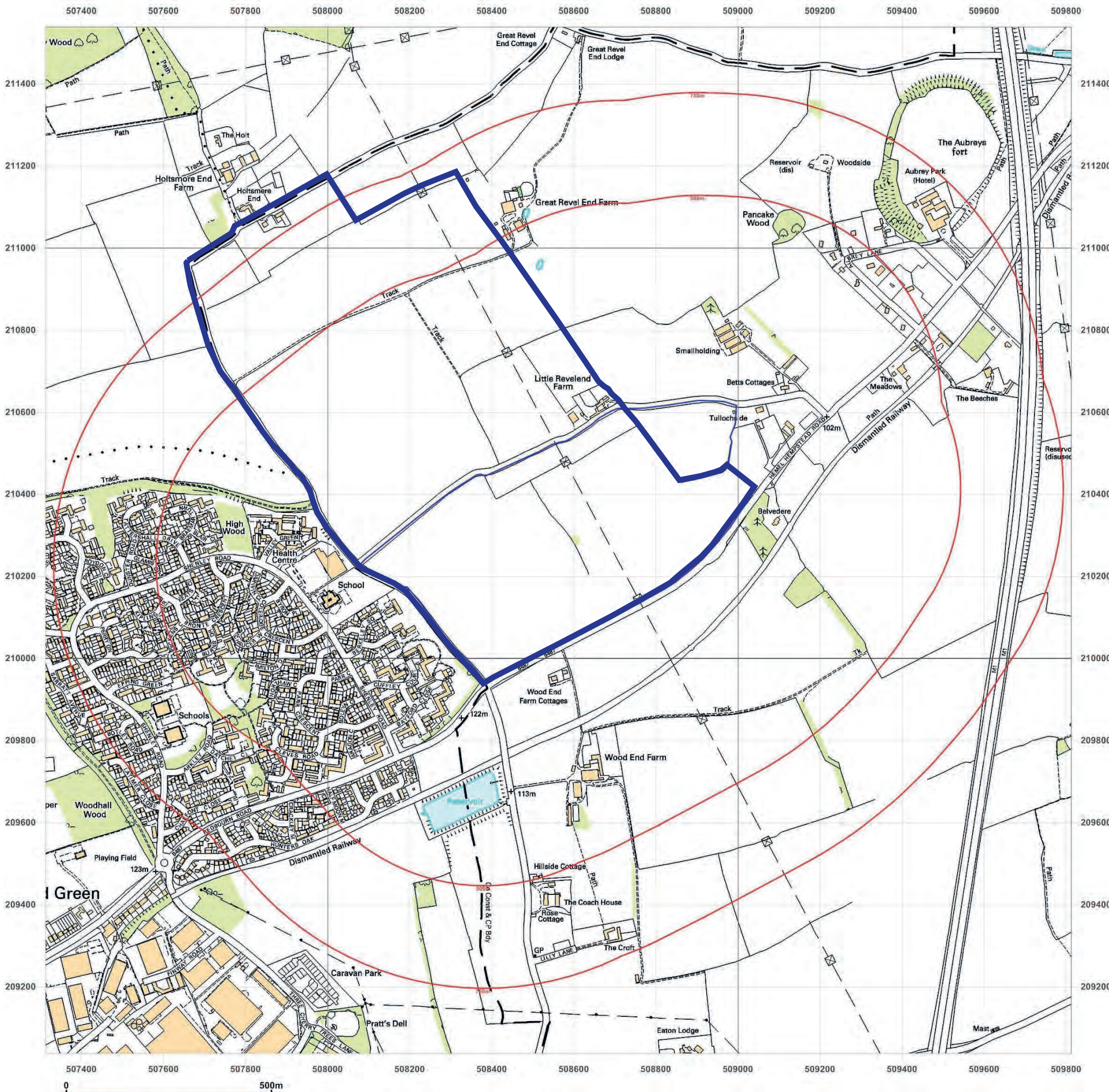
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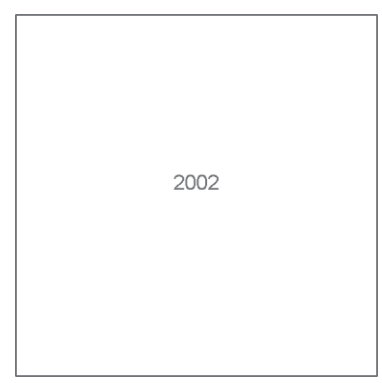
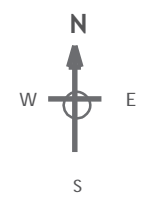
Production date: 05 February 2019

Figure 21: National Grid map 1995





Site Details:	
508592.6941152358, 210307.992861304	
Client Ref:	Hemel_Hempstead_Holtsmere_End_Lane
Report Ref:	GS-5802525
Grid Ref:	508562, 210288
Map Name:	1:10,000 Raster
Map date:	2002
Scale:	1:10,000
Printed at:	1:10,000



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Figure 22: 2002 Ordnance Survey map



508592.6941152358,  
210307.992861304

Client Ref: Hemel\_Hempstead\_Holtsmere\_End\_Lane  
Report Ref: GS-5802525  
Grid Ref: 508562, 210288

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010



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Production date: 05 February 2019

Figure 23: National Grid map 2010



Site Details:

508592.6941152358,  
210307.992861304

Client Ref: Hemel\_Hempstead\_Holtsmere\_End\_Lane  
Report Ref: GS-5802525  
Grid Ref: 508562, 210288

Map Name: National Grid

Map date: **2014**

Scale: 1:10,000

Printed at: 1:10,000



2014



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Figure 24: National Grid map 2014

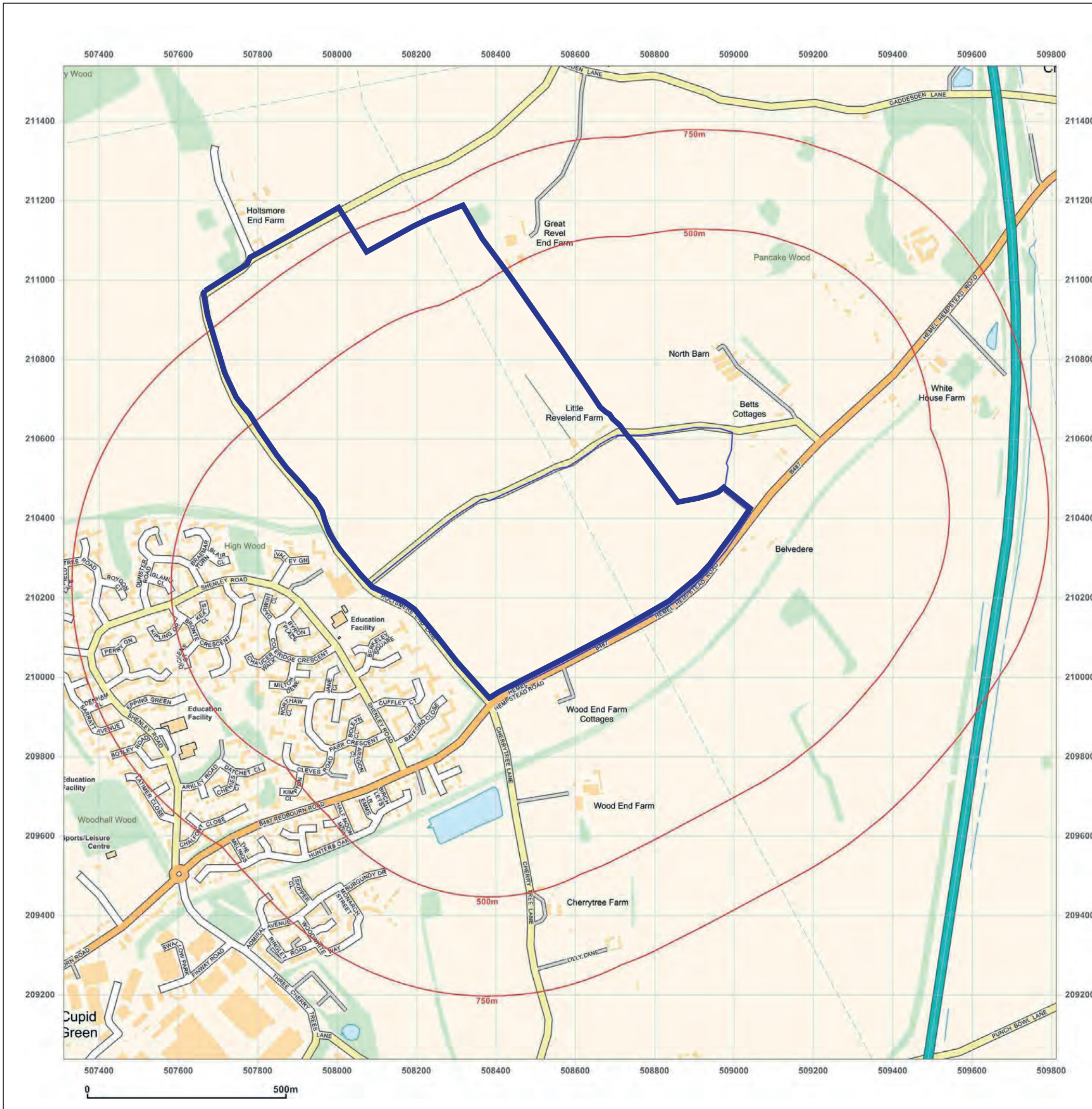






Figure 25: Results of Geophysical Survey (March 2019)





Plate 1: Google Earth satellite image (2019) showing the fields which make up southern part of the site (Areas A, C and the southern part of Area B)



Plate 2: View from the south-western corner of the site looking north-east across Area A





Plate 3: View looking north-east along the southern boundary of the site



Plate 4: View looking east along the northern edge of Area A





Plate 5: View looking east across Areas A and B



Plate 6: View from the south-eastern corner of Area B looking west





Plate 7: View looking west across Areas B and A, showing the over-head power lines crossing the site



Plate 8: View looking north along the central field boundary within Area A





Plate 9: Wood End Farm Cottages (OA 3)



Plate 10: View from Wood End Cottage (OA 3) looking north towards the Area A





Plate 11: View looking towards Wood End Farm Cottages (OA 3) from the northern boundary of Area A



Plate 12: View from Area A looking south towards Wood End Farm Cottage (OA 3), the roof tops of the buildings associated with Wood End Farm (OA 46) are visible behind the cottages





Plate 13: View toward Little Revel End Farm (OA 49), looking north across Area B



Plate 14: Little Revel End Farm (OA 49)





Plate 15: View across the hillfort (OA 1), looking south-west towards the site, which is not visible



Plate 16: Google Earth satellite image showing the fields which make up the northern part of the site (Area D and the northern part of Area B)





Plate 17: View looking east across the northern part of Area D



Plate 18: View looking east across the southern part of Area D





Plate 19: View looking north across the northern end of Area D towards the Grade II listed buildings at Holtsmere End (OA 6, 10)



Plate 20: View looking north-east from the northern part of Area B towards Great Revel End Farm (OA 5, 8), only modern farm buildings are visible





Plate 21: View looking north-east across Areas D and B towards Great Revel End Farm (OA 5, 8)



Plate 22: View looking south from the eastern edge of Area D across Area B, towards Little Revel End Farm (OA 49)





Plate 23: View looking south-east from Area D towards Little Revel End Farm (OA 49)



Plate 24: View looking north from Little Revel End Farm (OA 49) across Area B





Plate 25: View from Holtsmere Manor (OA 10), looking south into Area D





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