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**LAND AT ROYSTON ROAD, BARKWAY,
HERTFORDSHIRE**

GEOPHYSICAL SURVEY

Authors: Mark Blagg-Newsome David Bescoby John Summers	
NGR: TL 3840 3620	Report No: 5146
District: North Hertfordshire	Site Code: AS1828
Approved: Claire Halpin MCIfA	Project No: 5817
Signed:	Date: 13th June 2016 (revised 29th July 2016)

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OASIS SUMMARY SHEET

Project details			
Project name	<i>Land at Royston Road, Barkway, Hertfordshire</i>		
<p><i>In June 2016, Archaeological Solutions Ltd carried out a magnetic gradiometer survey on 4.1 hectares of land at Royston Road, Barkway, Hertfordshire (NGR TL 3840 3620; NHDC Planning Ref. 16/00714/1PRE). The survey was commissioned to inform and support a planning application for a proposed residential development.</i></p> <p><i>The survey identified two possible enclosures, one in the north-western sector of the site (1) and another towards the centre of the survey area (4). Both had evidence of possible internal features. A further possible ring ditch or pennanular enclosure (5) was identified in the eastern part of the survey. A strongly positive linear anomaly (2) running 10m N-S across possible enclosure (1) may be associated. Two parallel weakly positive linear anomalies (3) may represent part of a trackway close to enclosure (1). Two other linear anomalies (6 and 7) were present in the data, as well as three large sub-circular anomalies, potentially indicative of quarrying activity (9). Three discrete, high amplitude anomalies are synonymous with possible burning events and may represent past industrial activity (8).</i></p>			
Project dates (fieldwork)	<i>6th - 8th June 2016</i>		
Previous work (Y/N/?)	<i>N</i>	Future work	<i>TBC</i>
P. number	<i>5817</i>	Site code	<i>AS1828</i>
Type of project	<i>Geophysical Survey</i>		
Site status	<i>-</i>		
Current land use	<i>Agricultural</i>		
Planned development	<i>Residential</i>		
Main features (+dates)	<p><i>Two possible enclosures (1 and 4) with potential internal features (undated)</i> <i>A further possible ring ditch or penannular enclosure (5) (undated)</i> <i>Two parallel linear anomalies (3) representing a possible trackway (undated)</i> <i>Two other positive linear anomalies (6 and 7) (undated)</i> <i>Three possible large cut features (9) (undated)</i> <i>Three discrete high amplitude anomalies (8) representing possible burning (undated)</i></p>		
Significant finds (+dates)	<i>-</i>		
Project location			
County/ District/ Parish	<i>Hertfordshire</i>	<i>North Hertfordshire</i>	<i>Barkway</i>
HER/ SMR for area	<i>Hertfordshire Historic Environment Record</i>		
Post code (if known)	<i>-</i>		
Area of site	<i>c.4.1ha</i>		
NGR	<i>TL 3840 3620</i>		
Height AOD (max/ min)	<i>c.140m AOD</i>		
Project creators			
Brief issued by	<i>n/a</i>		
Project supervisor/s	<i>Mark Blagg-Newsome</i>		
Funded by	<i>Rand Brothers</i>		
Full title	<i>Land at Royston Road, Barkway, Hertfordshire: Geophysical Survey</i>		
Authors	<i>Blagg-Newsome, M., Bescoby, D. and Summers, J</i>		
Report no.	<i>5146</i>		
Date (of report)	<i>June 2016 (revised July 2016)</i>		

LAND AT ROYSTON ROAD, BARKWAY, HERTFORDSHIRE

GEOPHYSICAL SURVEY

SUMMARY

In June 2016, Archaeological Solutions Ltd carried out a magnetic gradiometer survey on 4.1 hectares of land at Royston Road, Barkway, Hertfordshire (NGR TL 3840 3620; NHDC Planning Ref. 16/00714/1PRE). The survey was commissioned to inform and support a planning application for a proposed residential development.

The survey identified two possible enclosures, one in the north-western sector of the site (1) and another towards the centre of the survey area (4). Both had evidence of possible internal features. A further possible ring ditch or pennanular enclosure (5) was identified in the eastern part of the survey. A strongly positive linear anomaly (2) running 10m N-S across possible enclosure (1) may be associated. Two parallel weakly positive linear anomalies (3) may represent part of a trackway close to enclosure (1). Two other linear anomalies (6 and 7) were present in the data, as well as three large sub-circular anomalies, potentially indicative of quarrying activity (9). Three discrete, high amplitude anomalies are synonymous with possible burning events and may represent past industrial activity (8).

1 INTRODUCTION

1.1 In June 2016, Archaeological Solutions Ltd carried out a magnetic gradiometer survey on 4.1 hectares of land at Royston Road, Barkway, Hertfordshire (NGR TL 3840 3620; NHDC Planning Ref. 16/00714/1PRE). The survey was commissioned to inform and support a planning application for a proposed residential development, based on the advice of Hertfordshire County Council Historic Environment Advisory Team (HCC HEAT).

1.2 The project was carried out in accordance with a specification compiled by AS (revised 31st May 2016) and approved by HCC HEAT. The geophysical survey was carried out in accordance with the Historic England document *Geophysical Survey in Archaeological Field Evaluation* (2014), and CfA, *The use of Geophysical Techniques in Archaeological Evaluations* and CfA *Standard and Guidance for Archaeological Geophysical Survey* (2014).

Objectives

1.3 The investigation of the site by geophysical survey was designed to determine the nature, extent and significance of sub-surface features in order to inform and target further trial trench evaluation of the site.

Planning policy context

1.4 The National Planning Policy Framework (NPPF 2012) states that those parts of the historic environment that have significance because of their historic, archaeological, architectural or artistic interest are heritage assets. The NPPF aims to deliver sustainable development by ensuring that policies and decisions that concern the historic environment recognise that heritage assets are a non-renewable resource, take account of the wider social, cultural, economic and environmental benefits of heritage conservation, and recognise that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. The NPPF requires applications to describe the significance of any heritage asset, including its setting that may be affected in proportion to the asset's importance and the potential impact of the proposal.

1.5 The NPPF aims to conserve England's heritage assets in a manner appropriate to their significance, with substantial harm to designated heritage assets (i.e. listed buildings, scheduled monuments) only permitted in exceptional circumstances when the public benefit of a proposal outweighs the conservation of the asset. The effect of proposals on non-designated heritage assets must be balanced against the scale of loss and significance of the asset, but non-designated heritage assets of demonstrably equivalent significance may be considered subject to the same policies as those that are designated. The NPPF states that opportunities to capture evidence from the historic environment, to record and advance the understanding of heritage assets and to make this publicly available is a requirement of development management. This opportunity should be taken in a manner proportionate to the significance of a heritage asset and to impact of the proposal, particularly where a heritage asset is to be lost.

2 DESCRIPTION OF THE SITE

2.1 The village of Barkway is located 21 km south of Cambridge and 5km south-east of Royston. The site comprises a field at the north end of the village where Royston Road branches off from High Street. It is bordered on the west side by Royston Road with elements of Barkway village to the south-west and north-west. The remainder of the site borders arable fields, with public footpaths bordering its northern and eastern edges.

2.2 The site is located on fairly level ground at approximately 140m AOD on the eastern end of a spur, on the edge of the Chiltern scarp. The Chiltern scarp slopes down immediately to the north and to a lesser degree also slopes down to the south and towards the village of Barkway. The valley of the River Quin is located 400m to the south-east of the site, flowing in a north-east to south-west direction. It is joined by another stream located 330m south-west of the site running from Reed to Barkway.

2.3 The solid geology of the Chiltern Scarp comprises Upper Cretaceous

white chalk, often containing flint nodules. This is overlain by superficial geology of chalky till. The Hertfordshire Historic Landscape Characterisation places the site in a small area of later enclosure where 18th and 19th century changes have been made to earlier field boundaries.

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 A recent archaeological desk-based assessment of the site (Thompson 2015) summarised:

The top of the Chiltern scarp was an area of interest to prehistoric inhabitants with the Ickniel Way crossing 4.7km to the west, and favourable for prehistoric funerary activity in the form of long and round barrows. The only possible prehistoric remains within proximity of the site comprise the cropmarks of a possible 15m diameter ring ditch and an associated trackway some 200m to the west (HHER 6154 & 7792). Romano-British remains in the vicinity of Highfields Farm, Barkway, some 800m south of the site, including ditches, a pit, pottery, quern stones, animal bones and a coin hoard, indicate the presence of a nearby farmstead. A small quantity of struck and burnt flint was recovered during field walking 180m north of the assessment site. Remains of a double bayed or aisled rectangular building of 11th to mid 12th century date was identified at Manyons Farm some 440m south-west of the site.

The Domesday Survey indicates that the local area was quite heavily populated with settlements centred on Barkway, Newsells and Cokenach. There is also a relatively high concentration of moated sites in the area, thought to be medieval, which are focused predominantly on the neighbouring parish of Reed, as well as a possible motte and bailey castle on Periwinkle Hill. A windmill is recorded in 1271, located approximately 70m west of the site, with one remaining continuously on the spot until the 20th century. Field walking centred 180m north of the present site recovered a small quantity of medieval and post-medieval pot, and evidence for 12th century occupation was recorded at the Manyon Farm site.

The closest listed building is a late medieval Grade II hall house located 160m to the south. A second post-medieval mill was built approximately 60m west of the assessment site. The area around the site was not developed as it is today until between 1921 and 1976, remaining predominantly open land before that. However, the potential for archaeological remains based on the evidence presented is low.*

4 METHOD OF WORK

Introduction

4.1 The magnetic survey was performed using a dual sensor Grad601-2 Magnetic gradiometer manufactured by Bartington instruments Ltd. The

gradiometer measures small distortions in the earth's magnetic field caused by the presence of magnetically susceptible buried objects. The instrument is extremely sensitive and capable of detecting changes in magnetic field strength of the order of 0.1 nanoTesla (nT).

Survey Methodology

4.2 Grid squares measuring 30m x 30m were set out across the entirety of the survey area, forming a grid network – see **Fig. 3**. The exact spatial location of the survey grid was recorded using a Leica GS09 GPS smart rover. Geophysical data were collected systematically in a zig-zag pattern within each grid square along traverses spaced at 1 m apart. The gradiometers were configured to record measurements at 0.25m intervals along each traverse, giving a total of 3600 measurements per grid square.

Data Processing

4.3 The remedial processing of the data can enhance anomalous responses caused by potential archaeological features and eliminate magnetic noise from natural/modern sources. Data processing also allows for the correction of spatial errors introduced during the survey and inherent instrument heading errors. The survey data were processed using Terrasurveyor LITE software, where the following data processing routines were applied:

Destripe: Removal of striping effects from the raw data caused by discrepancies between different sensors and walking directions.

Low-pass filter: A 3x3 Gaussian low-pass filter was applied to lessen the contribution of the many random short wavelength anomalies present in the data.

Clip: Clipping the data replaces all values outside a specified minimum and maximum with those values. This reduces the large dynamic range of the data, improving the visibility of weaker magnetic anomalies. The data were clipped to 1 standard deviation, resulting in a dynamic range of 3.97nT to -3.86nT.

Display and interpretation

4.4 The processed data are displayed as a greyscale magnetic map (**Fig. 5**) and the interpretation of anomalous magnetic responses undertaken manually with recourse to documented responses from subsequently excavated features, along with reference to Hertfordshire HER and historic map data. A graphical interpretative plan of the site identifying potential archaeological features (**Fig. 6**) was produced in AutoCAD LT2015.

5 RESULTS

5.1 The unprocessed data from the magnetic survey are shown in **Fig. 4**, displayed as an x-y trace plot indicating the overall range of magnetic values recorded within the study area. The processed data, following the application of the data processing methodology described in 4.3 above, is shown in **Fig. 5**. The processed data revealed several anomalous responses of potential archaeological significance, the interpretation of which is described below, with reference to numbered anomalies represented on the interpretation plot (**Fig. 6**).

Probable archaeological anomalies

5.2 A positive curvilinear anomaly (1) was present in the north western corner of the survey. The anomaly appears to form part of an enclosure with a broadly N-S orientation. The anomaly runs into the northern boundary of the site on its eastern edge. Positive responses within this possible enclosure may represent internal features. A further strongly positive linear anomaly (2) running 10m N-S across possible enclosure (1) may also be associated, but this is conjectural at present.

5.3 Two parallel, weakly positive linear anomalies (3) with a NE-SW orientation were identified within 5m of possible enclosure (1). Although only providing weak magnetic responses, it is possible that these linear anomalies (3) represent part of a trackway running across the north western corner of the site.

5.4 Towards the centre of the survey area was a second possible enclosure (4). The feature was represented by an interrupted curvilinear positive response, forming a sub-circular enclosure measuring c.16m in diameter. Further positive responses within the possible enclosure may be representative of internal features.

5.5 Close to the eastern boundary of the site was a curvilinear positive anomaly (5) forming a pennanular enclosure c.10m across. This could represent the remains of a ring ditch or similar enclosure, with an apparent opening to the SE.

5.6 Two further positive linear anomalies were identified (6 and 7). The first (6) had a WNW-ESE orientation and ran for 91m across the north eastern corner of the site. The second (7) was in the far south east of the survey area, outside the proposed development. It was a far weaker response, had an E-W orientation and can be identified running for 37m.

5.7 Three irregular, strongly positive responses (8) were identified within the survey area. These measured between 6 and 11 metres, and their magnetic profiles were suggestive of either high concentrations of ferrous materials or areas of burning synonymous with industrial-type activities.

5.8 Three sub-circular areas defined by a slightly elevated magnetic response were also observed (9), the largest and most northerly measuring 18m across. These were typical of infilled features which may be of geomorphological origin, such features being common over chalk. Alternatively represent the remains of human activity, such as quarrying.

Geological anomalies

5.9 In the south eastern portion of the survey was an area of varied magnetic responses (10). This area has a broadly NE-SW orientation and is likely to be the result of geomorphological processes.

Modern anomalies/ disturbance

5.10 Five weakly positive, relatively wide linear anomalies (11) were identified with a broadly E-W orientation in the northern part of the survey area. They could mostly be identified across the full width of the site and were set between 20 and 30 metres apart. The weak magnetic response, consistent orientation and relatively regular spacing of these anomalies suggest that they represent modern land drains, although a geomorphological origin cannot be ruled out.

5.11 A strong bipolar linear anomaly (12) with a NE-SW orientation was identified running for 64m from the site's eastern boundary. This is likely to represent a buried modern service, although the reason for its abrupt termination within the survey area is uncertain.

5.12 Six high amplitude magnetic spikes can be seen in the survey data (13). Each of these discrete magnetic spikes consists of a well defined dipolar response. Their high amplitudes suggests the presence of ferrous debris in the plough soil.

5.13 Along the western boundary was a narrow (c.7m) band of magnetic disturbance (14). This relates to modern housing in the NW and the present Royston Road, which runs along much of the site's western boundary. Although not extensive, it is possible that this could have obscured weaker archaeological anomalies along the western edge of the survey area.

6 CONCLUSIONS

6.1 The magnetic gradiometer survey on land at Royston Road, Barkway, identified a number of positive magnetic anomalies of likely archaeological origin. Key amongst these were two possible enclosures, one in the north west of the site (1) and another towards the centre of the survey area (4). Both had evidence of possible internal features. A strongly positive linear anomaly (2) running 10m N-S across possible enclosure (1) may be associated. Two parallel weakly positive linear anomalies (3) may represent part of a trackway close to enclosure (1). In addition was a possible ring ditch

or pennanular enclosure (5) close to the eastern boundary of the site.

6.2 Two other linear anomalies (6 and 7) were present in the data, as well as three relatively large sub-circular features that may represent past quarrying activity (9). Three further discrete high amplitude anomalies (8) conform to the possible presence of burning/ industrial-type events.

6.3 Although of generally small amplitude, detected anomalies showed reasonable contrast with the natural base values, indicating that soil conditions on the site were conducive to magnetic survey methods. Although some areas of modern magnetic disturbance were noted (14), including a modern service (12), the area covered by these was relatively small and unlikely to have had a significant impact on the recognition of magnetic anomalies of archaeological origin.

ACKNOWLEDGEMENTS

Archaeological Solutions Limited would like to thank the client, Rand Brothers, for funding the project and for their assistance, and Strutt & Parker LLP for their assistance.

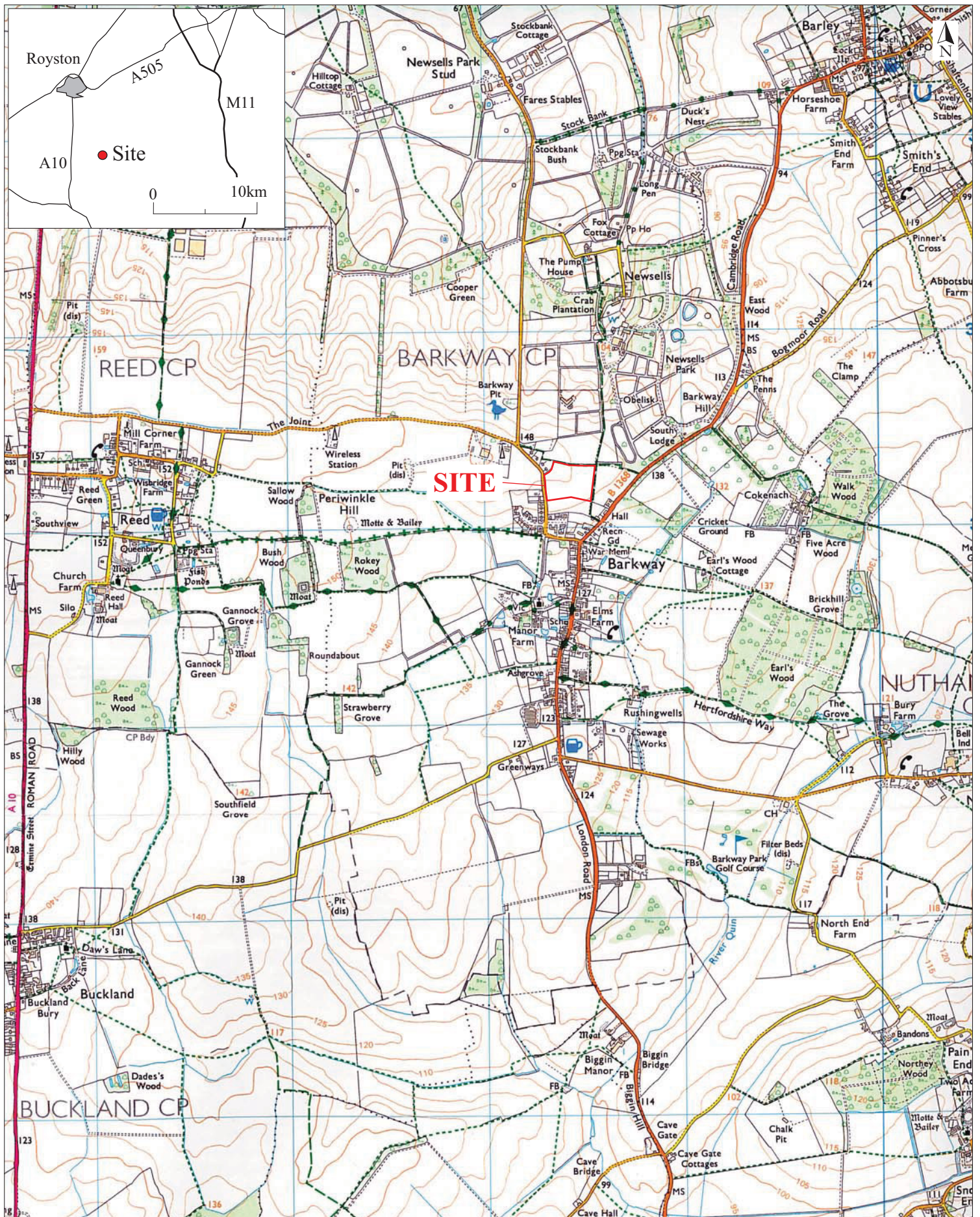
AS is pleased to acknowledge the advice and input of Hertfordshire County Council Historic Environment Advisory Team (HCC HEAT), in particular comments and revisions to the original report by Mr Matt Adams.

BIBLIOGRAPHY

Chartered Institute For Archaeologists, 2014, *Standard and Guidance for Archaeological Geophysical Survey*. Available online at: http://www.archaeologists.net/sites/default/files/CIAS&GGeophysics_1.pdf

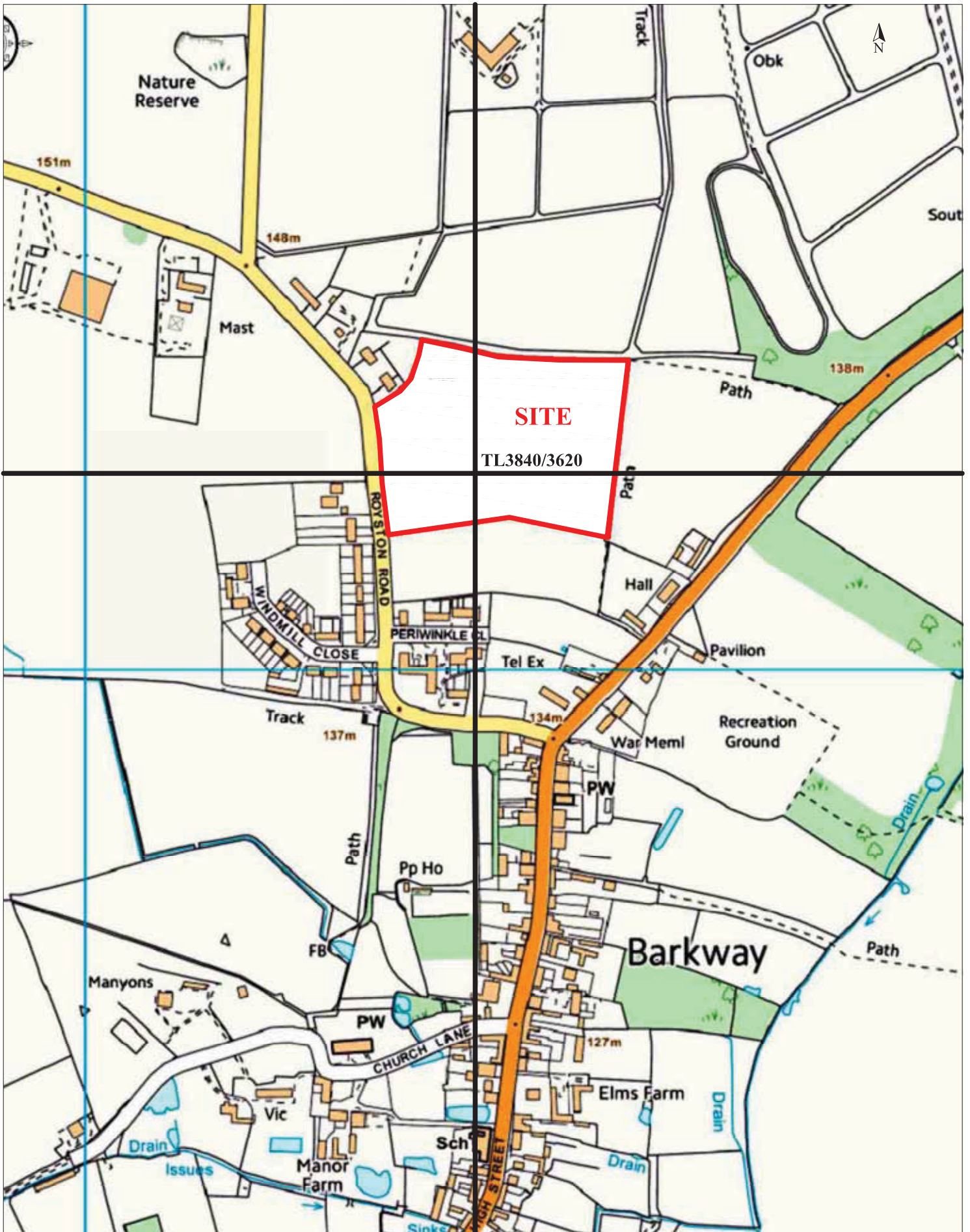
Historic England (English Heritage), 2014. *Geophysical Survey in Archaeological Field Evaluation*, London, Historic England

Thompson, P. 2015, *Land at Royston Road, Barkway, Hertfordshire: An Archaeological Desk-Based Assessment*, Archaeological Solutions Ltd Report 5056



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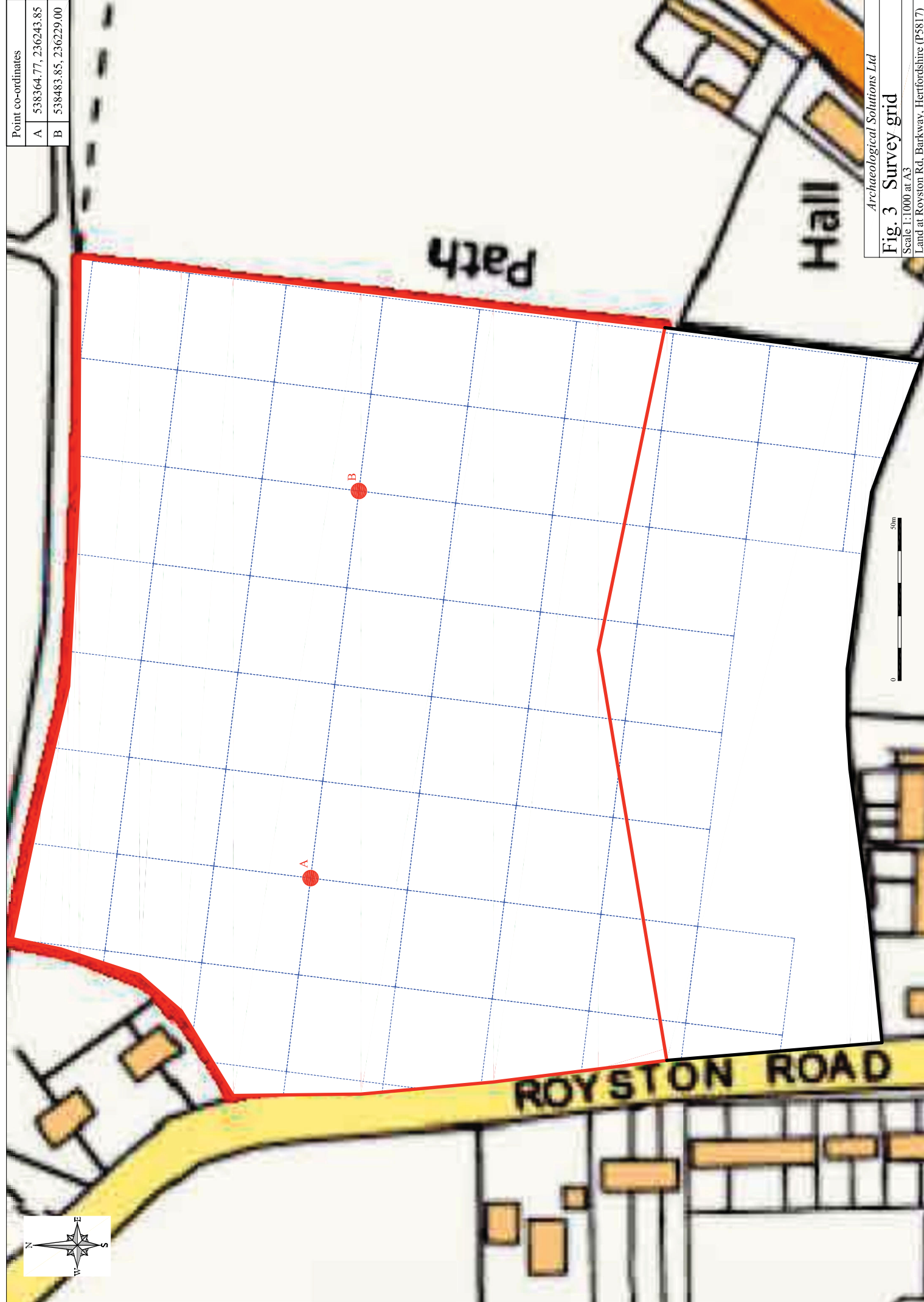
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Fig. 1 Site location plan
 Scale 1:25,000 at A4
 Land at Royston Rd, Barkway, Hertfordshire (P5817)



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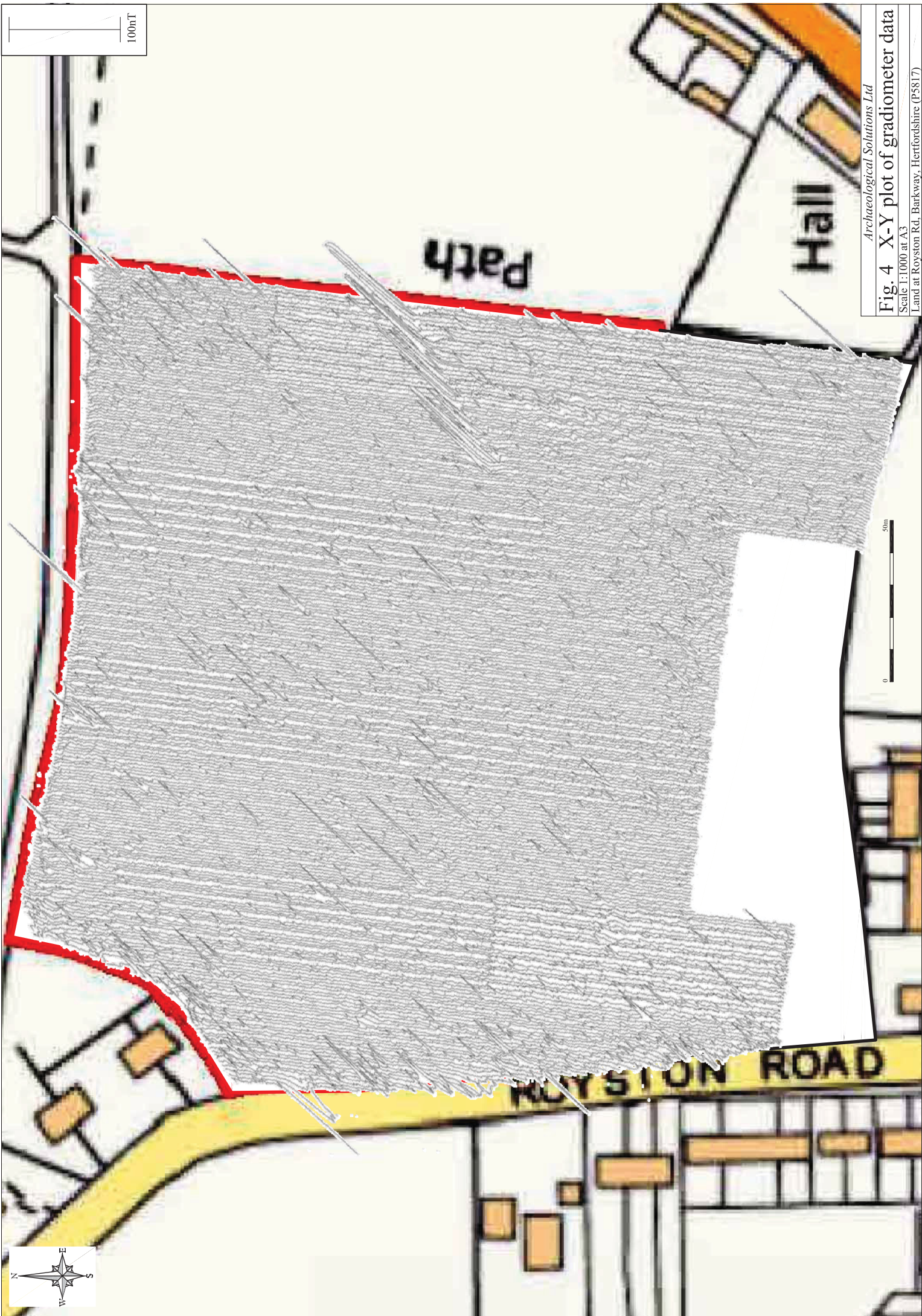
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Fig. 2 Detailed site location plan
 Scale 1:5000 at A4
 Land at Royston Rd, Barkway, Hertfordshire (P5817)

Point co-ordinates	
A	538364.77, 236243.85
B	538483.85, 236229.00

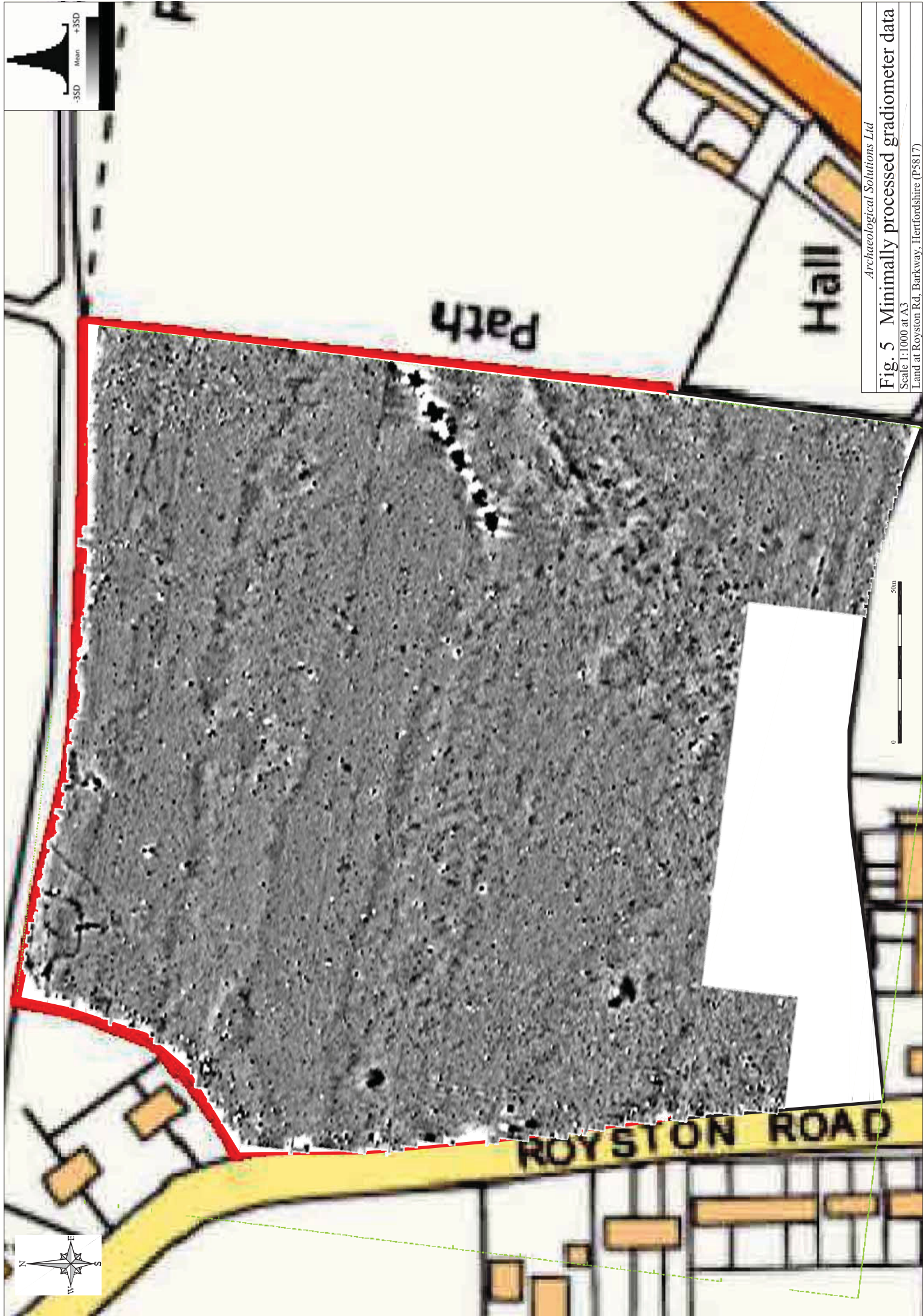


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Fig. 3 Survey grid
 Scale 1:1000 at A3
 Land at Royston Rd, Barkway, Hertfordshire (P5817)





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Fig. 4 X-Y plot of gradiometer data
Scale 1:1000 at A3
Land at Royston Rd, Barkway, Hertfordshire (P5817)



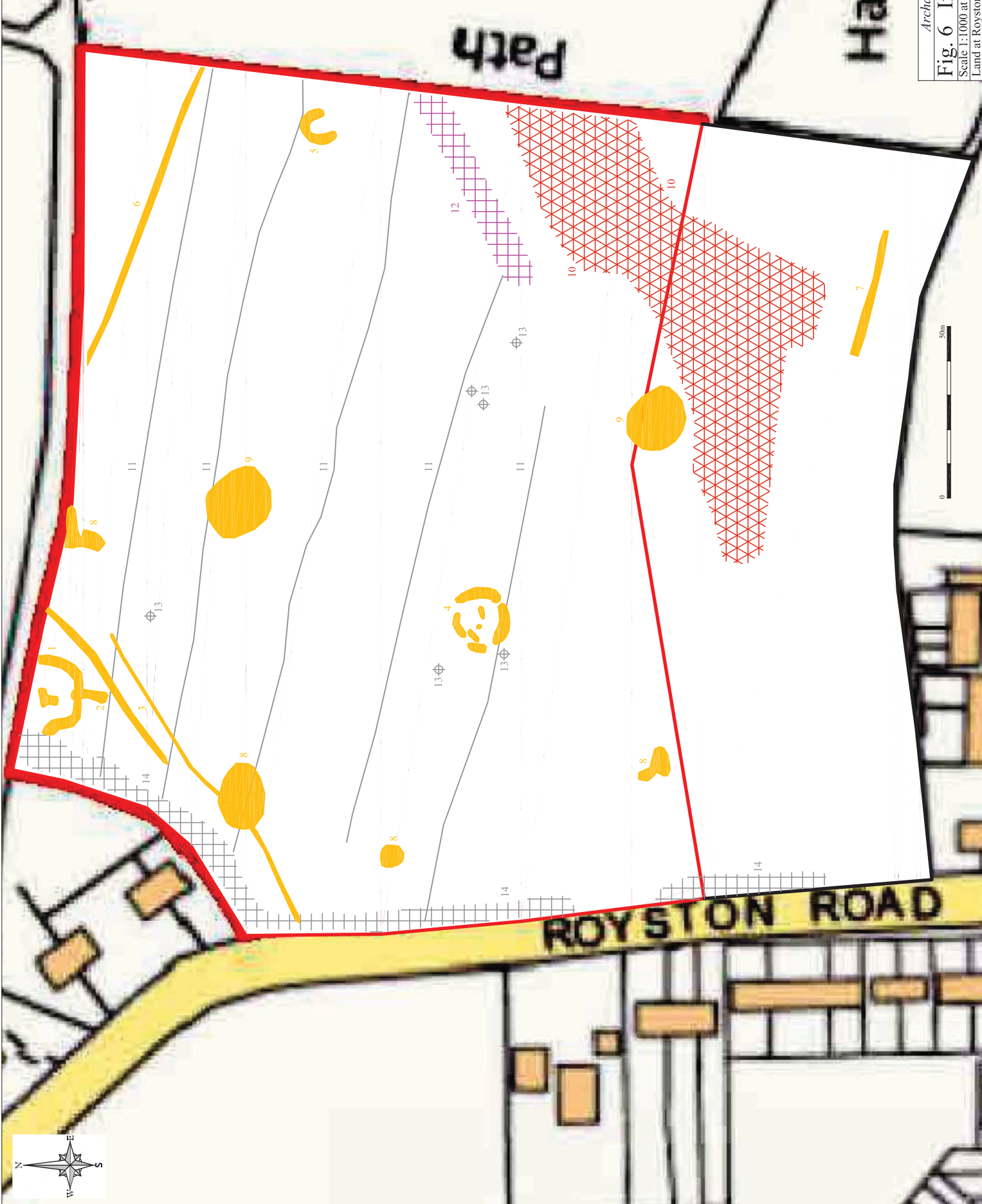
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Fig. 5 Minimally processed gradiometer data

Scale 1:1000 at A3

Land at Royston Rd, Barkway, Hertfordshire (P5817)

KEY	
ARCHAEOLOGY	
	Positive anomaly, probable cut feature of archaeological origin
OTHER ANOMALIES	
	Area of natural magnetic variation
	Linear anomaly- possible land drain
	Bipolar linear anomaly- modern service (pipe/cable)
	Magnetic Spike- probable ferrous object
	Strong magnetic debris- disturbed ground



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Fig. 6 Interpretation plot
 Scale 1:1000 at A3
 Land at Royston Rd, Barkway, Hertfordshire (P5817)