THAMES VALLEY

ARCHAEOLOGICAL

SERVICES

Land at Blounts Court, Sonning Common, Oxfordshire

Geophysical Survey (magnetic)

by Kyle Beaverstock

Site Code: BFS18/215

(SU 7136 8072)

Land at Blounts Court, Sonning Common, Oxfordshire

Geophysical Survey (Magnetic) Report

For Johnson Matthey

by Kyle Beaverstock

Thames Valley Archaeological Services Ltd

Site Code BFS 18/215

January 2019

Summary

Site name: Land at Blounts Court, Sonning Common, Oxfordshire

Grid reference: SU 71367 80723

Site activity: Magnetometer survey

Date and duration of project: 17th January 2019

Project coordinator: Tim Dawson

Site supervisor: Kyle Beaverstock

Site code: BFS 18/215

Area of site: c.2ha

Summary of results: Several magnetic anomalies were identified by the geophysical survey. These include an area which may represent a buried structure, possibly a kiln as suggested by archaeological fieldwalking, and a series of discrete anomalies which may indicate rows of pit-type features.

Location of archive: The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

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Land at Blounts Court, Sonning Common, Oxfordshire
A Geophysical Survey (Magnetic)

by Kyle Beaverstock

Report 18/215

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Blounts Court, Blounts Court Road, Sonning Common, Oxfordshire (SU 71367 80723) (Fig. 1). The work was commissioned by Sarah Isherwood on behalf of Vail Williams LLP, 550 Thames Valley Park Drive, Reading, Berkshire, RG6 1PT.

Planning permission is being sought from South Oxfordshire District Council for the development of a c. 2ha parcel of land for a new research facility at Blounts Court, Sonning Common, Oxfordshire. In consequence, a programme of archaeology is being perused which includes a geophysical survey. This is in accordance with the Department for Communities and Local Government's National Planning Policy Framework (NPPF 2012) and the District's policies on archaeology. The field investigation was carried out to a specification approved by Richard Oram, Planning Archaeologist for Oxfordshire County Council. The fieldwork was undertaken by Kyle Beaverstock and Benedikt Tebbit on 17th January 2019 and the site code is BFS 18/215.

The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

Location, topography and geology

The site is located on the eastern side of Sonning Common, c. 7km north of Reading. The bounds of the site are an arbitrary line drawn in the south eastern corner of a field currently being utilised for arable farming. The eastern boundary marks the edge of the Blounts Court facility and the southern edge is bounded by Blounts Court Road. This relatively flat parcel of land sits at a height of approximately c.96m above Ordinance Datum (aOD) and the underlying geology is stated as Head gravel (BGS 2000).

Site history and archaeological background

This area of south Oxfordshire has a relatively low number of findspots recorded in the county Historic Environment Record which may perhaps be due to a lack of opportunity for survey for survey rather than a genuine absence. However, a modest number of finds are recorded in the area such as Neolithic flint tools and Bronze Age bronze tools, an Iron Age enclosure spotted from aerial photography and Roman pottery. On the site

itself a significant amount of Roman pottery was discovered during a field-walking survey (BAS pers comm.) suggesting the possibility of pottery manufacturing being present. The site is also close to Blounts Court where the surviving farmhouse retaining some of the 16th century components.

Methodology

Sample interval

Data collection involved the traversing of the survey area along straight and parallel lines using two cart-mounted Bartington Grad601-2 fluxgate gradiometers. Even coverage was achieved with the use of regularly spaced markers at the ends of traverses and the real-time positional trace plot. Readings were taken at 0.25m intervals along traverses 1m apart, providing an appropriate methodology balancing cost and time with resolution. Traverses were walked at an alternating south-east to north-west zig-zag orientation across the survey area. Conditions during the survey were dry and there were no significant obstructions other than a fence separating the large western field from the small eastern field.

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. Under normal operating conditions it can be expected to identify buried features >0.5m in diameter. Features which can be detected include disturbed soil, such as the fill of a ditch, structures that have been heated to high temperatures (magnetic thermoremnance) and objects made from ferro-magnetic materials. The strength of the magnetic field is measured in nano Tesla (nT), equivalent to 10^{-9} Tesla, the SI unit of magnetic flux density.

Equipment

The purpose of the survey was to identify geophysical anomalies that may be archaeological in origin in order to inform a targeted archaeological investigation of the site prior to development. The survey and report generally follow the recommendations and standards set out by both European Archaeological Council (EAC 2015) and the Chartered Institute *for* Archaeologists (2002, 2014).

Magnetometry was chosen as a survey method as it offers the most rapid ground coverage and responds to a wide range of anomalies caused by past human activity. These properties make it ideal for the fast yet detailed surveying of an area.

The detailed magnetometry survey was carried out using two dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometers mounted upon a Bartington non-magnetic cart. A two-wheeled lightweight structure

pushed by hand, the cart consisted a bank of four vertically-mounted Bartington Grad601-2 magnetic sensor tubes at 1m apart and a Trimble Geo 7x centimetre edition GPS. Readings were collected by two Bartington Grad601-2 loggers and collated using MLgrad601 software on a Linx 12x64 tablet running Windows 10 mounted at the rear of the cart. This enables readings to be taken of both the general background magnetic field and any localised anomalies with the difference being plotted as either positive or negative buried features. All sensors are calibrated to cancel out the local magnetic field and react only to anomalies above or below this base line. On this basis, strong magnetic anomalies such as burnt features (kilns and hearths) will give a high response as will buried ferrous objects. More subtle anomalies such as pits and ditches can be seen from their infilling soils containing higher proportions of humic material, rich in ferrous oxides, compared to the undisturbed subsoil. This will stand out in relation to the background magnetic readings and appear in plan following the course of a linear feature or within a discrete area.

The Trimble Geo7x centimetre edition GPS system with centimetre real-time accuracy was used to tie the cart traverses into the Ordnance Survey national grid. This unit offers both real-time correction and post-survey processing; enabling a high level of accuracy to be obtained both in the field and in the final post-processed data.

Data gathered in the field was processed using the TerraSurveyor software package. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies, particularly those likely to be of archaeological origin. The table below lists the processes applied to this survey, full survey and data information is recorded in Appendix 1.

Process	**Effect**
Clip from -5.50 to 5.53 nT	Enhance the contrast of the image to improve the appearance of possible archaeological anomalies.
De-stripe: median, all sensors	Removes the striping effect caused by differences in sensor calibration, enhancing the visibility of potential archaeological anomalies.
De-spike: threshold 1, window size 3×3	Compresses outlying magnetic points caused by interference of metal objects within the survey area.

The raw data plot is presented as a greyscale plot shown in relation to the site (Fig. 2) with the processed data then presented as a second figure (Fig. 3), followed by a third plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 4). Anomalies are shown as colour-coded lines, points and polygons.

The greyscale plot of the processed data is exported from TerraSurveyor in a georeferenced portable network graphics (.PNG) format, a raster image format chosen for its lossless data compression and support for transparent pixels, enabling it to easily be overlaid onto an existing site plan. The data plot is combined with grid

and site plans in QGIS 3.4.2 and exported again in .PNG format in order to present them in figure templates in Adobe InDesign CS5.5, creating .INDD file formats. Once the figures are finalised they are exported in .PDF format for inclusion within the finished report.

Results

Several anomalies of possible significance were detected over the course of the survey. The most significant magnetic anomaly is **[Fig. 4: 1]** the irregularly shaped strong positive trend with a surrounding negative anomaly in the south eastern area of the site. The anomaly measures approximately 13m long and 5m wide, its shape although irregular suggests it may possibly be a Roman kiln identified by a large scattering of coarse ware pottery on the surface (BAS pers comm.). The strong positive anomaly surrounded by a strong negative anomaly may represent the thermoremnant enhancement of the buried kiln structure.

Across the site are several lines of discrete positive anomalies, possibly representing buried pits or postholes, two alignments are slightly curvilinear **[2 and 3]**, orientated from north-east to south-west and north-northwest to south-southeast respectively **[4]**. At the northern end of the survey area are two linear weak negative magnetic anomalies **[5]**. These usually indicate the presence of buried earthwork structures and, in this case may represent two banks, possibly field boundaries.

The eastern edge of the main survey field and the entirety of the smaller eastern field are characterised by strong magnetic disturbance and a concentration of magnetically enhanced debris. These are most likely a result of the trackway which leads along the edge of the main field and possible landscaping in the smaller field. The strength of these anomalies may mask weaker magnetic variations caused by buried archaeological features within these areas. A small number of magnetic spikes were recorded during the survey. These are usually the result of ferrous objects buried in the upper levels of soil.

Conclusion

The geophysical survey was undertaken successfully across the proposed area and recorded a variety of magnetic anomalies. Of these, one suggests the presence of a buried structure, possibly associated with Roman pottery scatters previously identified on the site, and others may represent lines of pits or postholes, all of which are of archaeological interest. The eastern edge of the survey was subject to strong interference by surface and boundary features and as such, weaker magnetic anomalies of archaeological origin may be present in these areas but masked by the strength of the disturbance.

References

BGS, 2000, *British Geological Survey*, 1:50,000, Sheet 268, Solid and Drift Edition, Keyworth

CI*f*A, 2014, 'Standard and Guidance for archaeological geophysical survey', Reading

EAC, 2015, *EAC Guidelines for the use of Geophysics in Archaeology: Questions to Ask and Points to Consider*, EAC Guidelines 2, Namur

IFA, 2002, 'The Use of Geophysical Techniques in Archaeological Evaluation', IFA Paper No. 6, Reading

NPPF, 2012, *National Planning Policy Framework*, Dept Communities and Local Government, London

Appendix 1. Survey and data information

Programme:
Name: TerraSurveyor
Version: 3.0.34.4

Raw data
Survey corner coordinates (X/Y):
Northwest corner: 471298.944135521, 180811.087599099 m
Southeast corner: 471531.384135521, 180613.877599099 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702

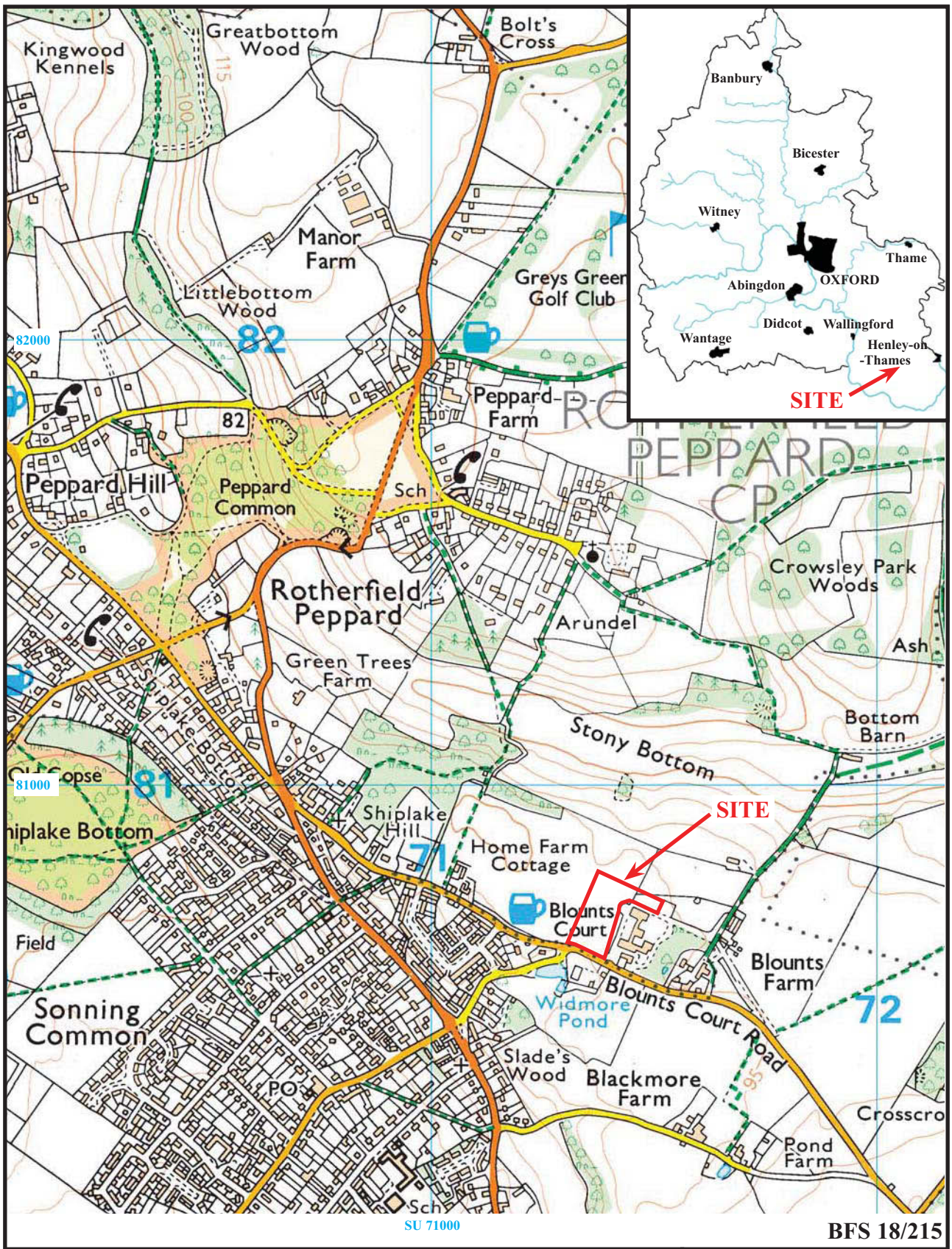
Source GPS Points: 53679

Dimensions
Composite Size (readings): 1788 x 1517
Survey Size (meters): 232 m x 197 m
Grid Size: 232 m x 197 m
X Interval: 0.13 m
Y Interval: 0.13 m

Stats
Max: 106.81
Min: -109.72
Std Dev: 19.62
Mean: 3.09
Median: 0.22
Composite Area: 4.5839 ha
Surveyed Area: 1.9413 ha

Processed data
Stats
Max: 5.53
Min: -5.50
Std Dev: 2.23
Mean: 0.20
Median: -0.01

GPS based Processes
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Despike Threshold: 1 Window dia: 3
5 Clip from -5.00 to 5.00
6 DeStagger by: 50.00cm, Shift Positions



BFS 18/215

Land at Blounts Court, Sonning Common, Oxfordshire, 2019
Geophysical Survey (Magnetic)

Figure 1. Location of site within Sonning Common and Oxfordshire.

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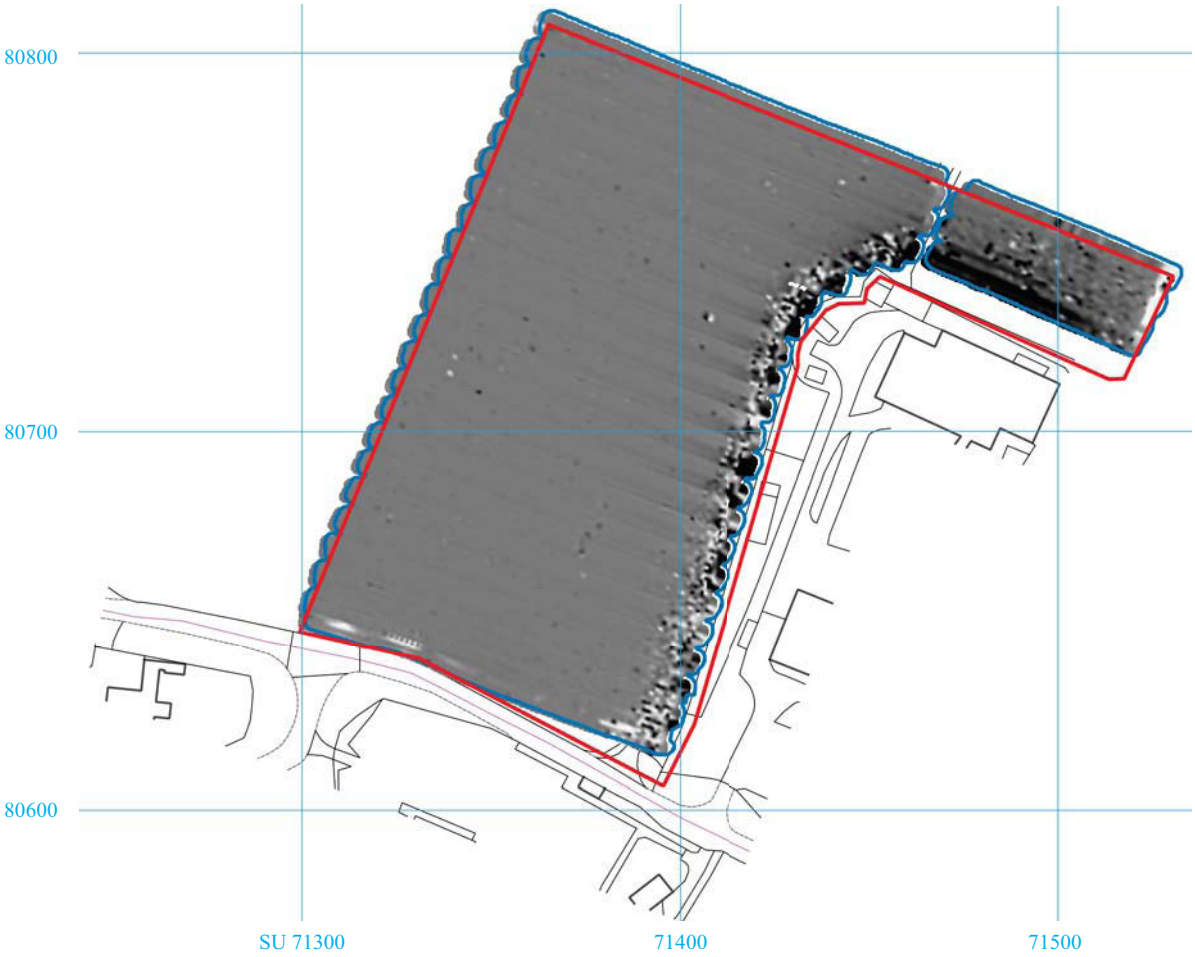

BFS 18/215

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Land at Blounts Court, Sonning Common, Oxfordshire, 2019
Geophysical Survey (Magnetic)
Figure 2. Plot of raw gradiometer data.

0m 100m

+100
nT
-100

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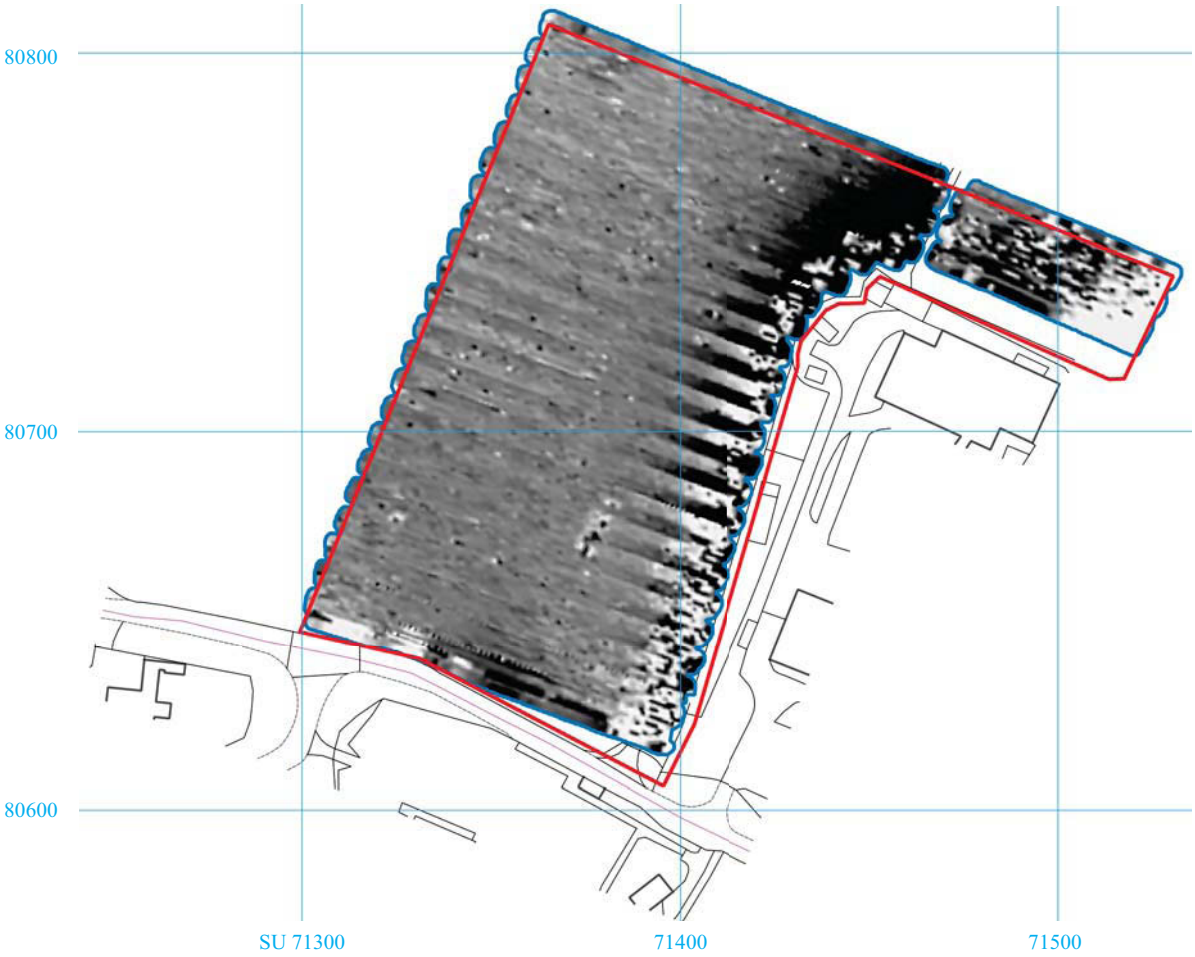

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N

Land at Blounts Court, Sonning Common, Oxfordshire, 2019
Geophysical Survey (Magnetic)
Figure 3. Plot of minimally processed gradiometer data.

0m 100m

+5.0
nT
-5.0

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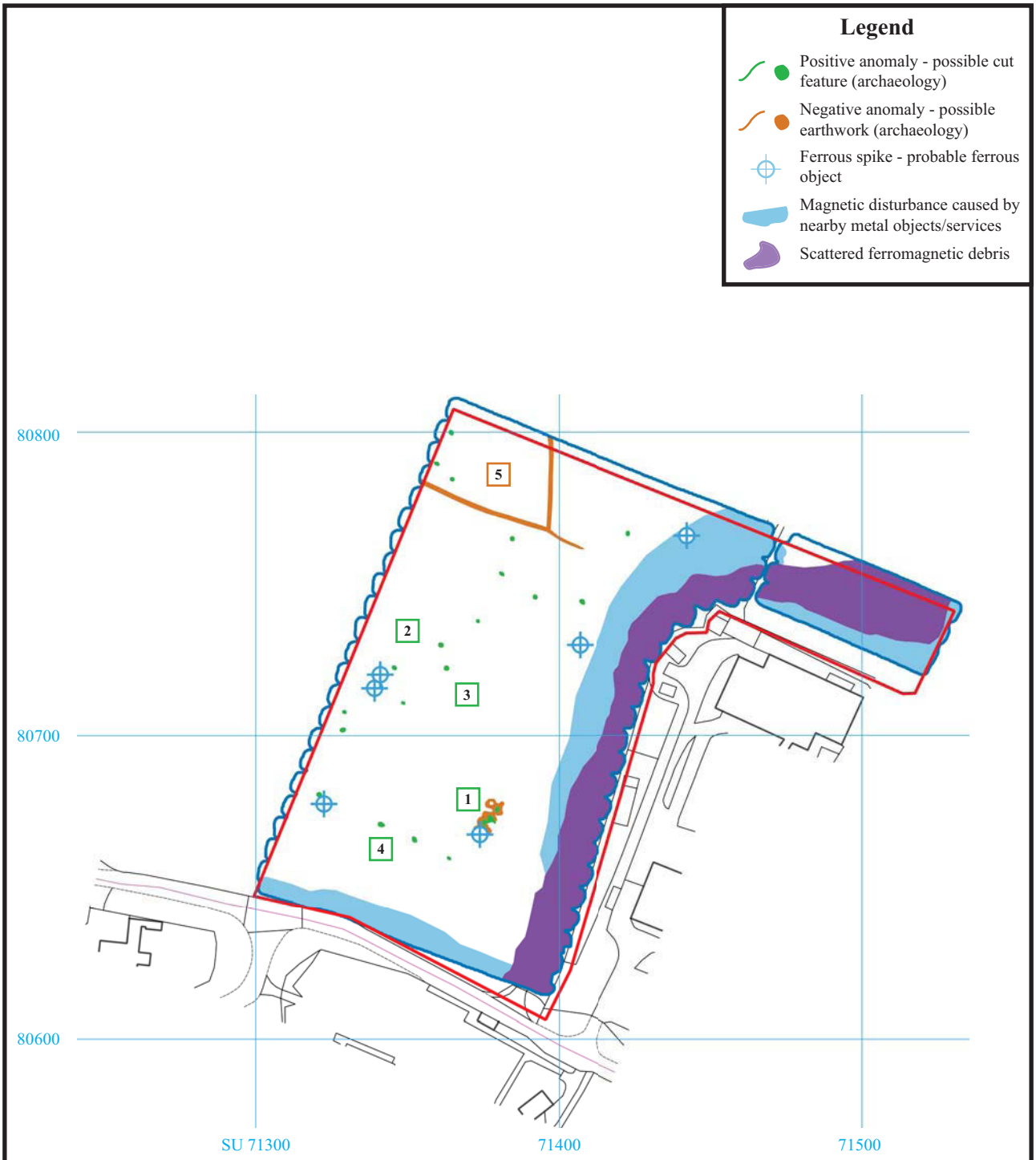

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Geophysical Survey (Magnetic)
Figure 4. Interpretation plot.

0m 100m

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Plate 1. Main survey area, looking south-west from eastern boundary.

Plate 2. Main survey area, looking north-west from eastern boundary.

Plate 3. Eastern survey area, looking east.

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Land at Blounts Court, Sonning Common, Oxfordshire, 2019
Geophysical Survey (Magnetic)
Plates 1 to 3.

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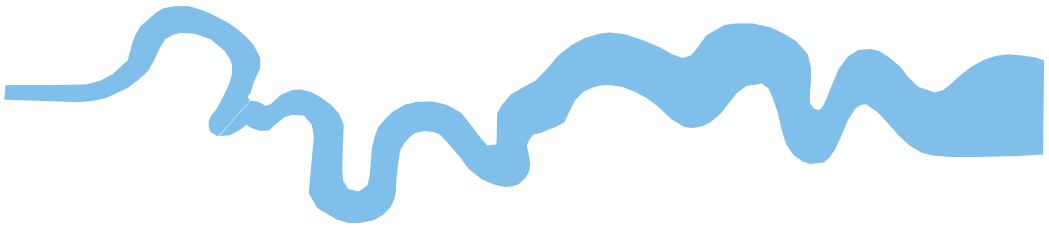
TIME CHART

	Calendar Years
Modern	AD 1901
Victorian	AD 1837
Post Medieval	AD 1500
Medieval	AD 1066
Saxon	AD 410
Roman	AD 43
	AD 0 BC
Iron Age	750 BC
Bronze Age: Late	1300 BC
Bronze Age: Middle	1700 BC
Bronze Age: Early	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
Mesolithic: Late	6000 BC
Mesolithic: Early	10000 BC
Palaeolithic: Upper	30000 BC
Palaeolithic: Middle	70000 BC
Palaeolithic: Lower	2,000,000 BC



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