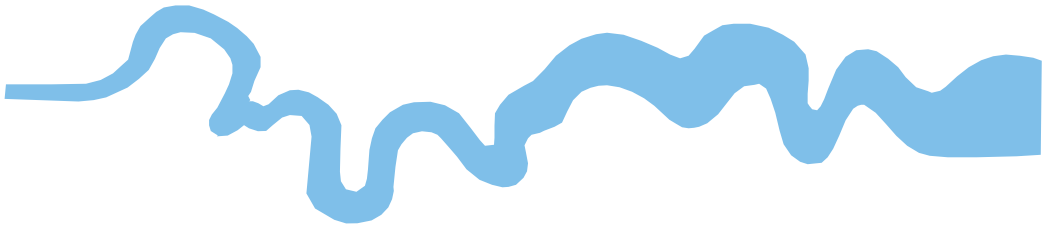
T V A S



SOUTH

Mobray Land at North Horsham, West Sussex (parcel 3)

Geophysical Survey (Magnetic)

by Kyle Beaverstock

Site Code: MLH22/242

(TQ 1950 3370)

Mobray Land at North Horsham, West Sussex, Land Parcel 3 Geophysical Survey

Geophysical Survey (Magnetic) Report

For Legal and General Strategic Land

by Luciano Cicu and Kyle Beaverstock

TVAS South

HLH22/242

December 2022

Summary

Site name: Mobray Land at North Horsham, West Sussex, Land Parcel 3

Grid reference: TQ 1948 3372

Site activity: Magnetometer survey

Date and duration of project: 14th October, 2022

Project coordinator: David Sanchez

Site supervisor: Kyle Beaverstock

Site code: MLH 22/242

Area of site: c.2ha

Summary of results: The geophysical survey detected a number of anomalies of possible archaeological interest whose morphology suggests prehistoric deposits. There is a possibility that some of the curvilinear anomalies are in fact natural features representing former meanders of the nearby now canalised stream.

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

Report edited/checked by:	Steve Ford✓ 19.12.22
	David Sanchez✓ 19.12.22

Mobray Land at North Horsham, West Sussex, Land Parcel 3
A Geophysical Survey (Magnetic)

by Luciano Cicu and Kyle Beaverstock

Report 22/242

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Rusper Road, North Horsham, West Sussex (TQ 1948 3372) (Fig. 1). The work was commissioned by Charlie Ward on behalf of Legal and General Strategic Land, Dorking Business Park, Station Road, Dorking, RG4 1HJ.

Outline planning permission (DC/16/1677) has been granted by Horsham District Council for a major development to the north of Horsham for residential and commercial purposes (Fig. 1). The planning permission is subject to a standard archaeological condition (22). A geophysical survey was conducted as part of the archaeological works. This is in accordance with the *National Planning Policy Framework* (NPPF 2021) and the district's policies on archaeology. The field investigation was carried out to a specification approved by Maria Medlycott, Senior Historic Environment Consultant for Essex County Council and advisor on archaeological matters to West Sussex County Council. The fieldwork was undertaken by Kyle Beaverstock and Edmund Cush on 14th October 2022 and the site code is MLH22/242.

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 northern edge of North Horsham (Fig. 1), 400m east of Rusper Road and 400m north of the A264. The site is bounded by Channells Brook to the south a tributary to the north and west and woodland to the east. This relatively flat parcel of land sits at a height of c. 56m above Ordnance Datum and the underlying geology is stated as Weald Clay (BGS, 1972).

Site history and archaeological background

The archaeological potential of the overall development site had been considered in a desk-based assessment, (ASE 2014, 2015) geophysical survey and fieldwalking (ASE 2016), trench evaluation (WA 2020) with some

follow-up fieldwork (Attard 2021; Attard in prep), In summary, the site lies within the Sussex Weald, until recently an area considered to contain few sites of archaeological interest prior to the medieval period (Rudling 2003). The exceptions to this were iron production sites in Iron Age, Roman and Saxon times (Cleere and Crossley, 1995) and Mesolithic sites on the fringes of the Weald in north-east Hampshire and south west Surrey (Rankine 1954). However, recent fieldwork has located several sites of different periods in the Horsham area and beyond (eg McNicoll et al 2017;). Horsham is also known for sites which area a variation of typical sites of Mesolithic date and which might represent a middle Mesolithic with a distinct microlith form- a Horsham Point (Clarke 1934; Jacobi 1976). Most Mesolithic sites in the arable lands of southern England comprise no more than clusters of lithic artefacts now usually found only within topsoil/ploughsoil contexts. Below ground cut features are extremely infrequently encountered. Recent evaluation of parts of the overall development has revealed little of archaeological interest except for small scatters of struck flintwork indicative of further Mesolithic occupation (WA 2020; 2021) and charcoal rich pits of Medieval date which are possibly charcoal clamps. Follow-up fieldwork has examined one of these Mesolithic flint scatters (Attard 2021) and investigation of Medieval and Post-Medieval deposits adjacent to Moathouse Farm also recorded areas of iron production (Attard in prep).

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 0.13m intervals along traverses 1m apart, providing an appropriate methodology balancing cost and time with resolution. Traverses were walked at an alternating zig-zag pattern along an east to west orientation across the survey area. The western part of the survey area was obstructed by a small pond located in the western portion of site. Conditions were dry and bright.

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 R2 Receiver, 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 R2 Receiver, 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 -1.87 to 1.77 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.
De-stagger: all grids, both by -1 intervals	Cancels out effects of site's topography on irregularities in the traverse speed.

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 2.18.15 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

In the south-eastern corner of the site, a bipolar anomaly **[1]** composed of high negative and positive responses. These are essentially associated with magnetic disturbance from ferrous materials in the surrounding fencing. To the west of the magnetic disturbance is a linear positive anomaly **[2]** with an associated with negative response, this anomaly measures 25m long and is orientated south to north before curving to the east. Across the north of the site are a series of positive and weak positive linears, these form rounded and sub-rectangular features which may suggest the presence of prehistoric occupational deposits. In the north-west of the site is a positive linear **[3]** that runs from the north-west to the south-east for 20m before turning to the north-east for a

further 17m forming part of a possible enclosure. To the south of this is a rounded weak positive linear **[4]** roughly 8m in diameter forming a possible ring ditch. Further south is a positive linear **[5]** orientated south-west to north-east and measuring c.48m long terminating at positive linear **[6]** which appears to be three sides of a sub-rectangular enclosure, c.18.8m wide and c.12m long. To the east of this is a rounded positive linear **[7]** forming part of an enclosure, 17m long and 25.5m wide. Below these is a weak positive linear **[8]** orientated east to west and running for c.48m long. Towards the north-east corner is a rounded positive linear **[9]** measuring 16m in diameter.

Conclusion

The geophysical survey revealed a number of magnetic anomalies of possible archaeological origin. These include a series of linears with a rounded or sub-rectangular morphology raising the possibility of enclosures and ring ditches and suggesting a prehistoric date. There is, however, a possibility that some of the anomalies are natural water features, such as stream meanders: it is noted that the stream following the modern field boundary has been canalised, whereas the same uncanalised stream to the north and a second stream to the south both still have numerous meanders.

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WA, 2021, North Horsham, West Sussex, Phase 1 (Principal Access Works 1, Principal Access Works 2, Sub (Phases 1a to 1d) and Sports Hub, 1 Archaeological Field Evaluation, Wessex Archaeology report 217770.5, Salisbury part 2

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Appendix 1. Survey and data information

Programme:
Name: TerraSurveyor
Version: 3.0.25.0

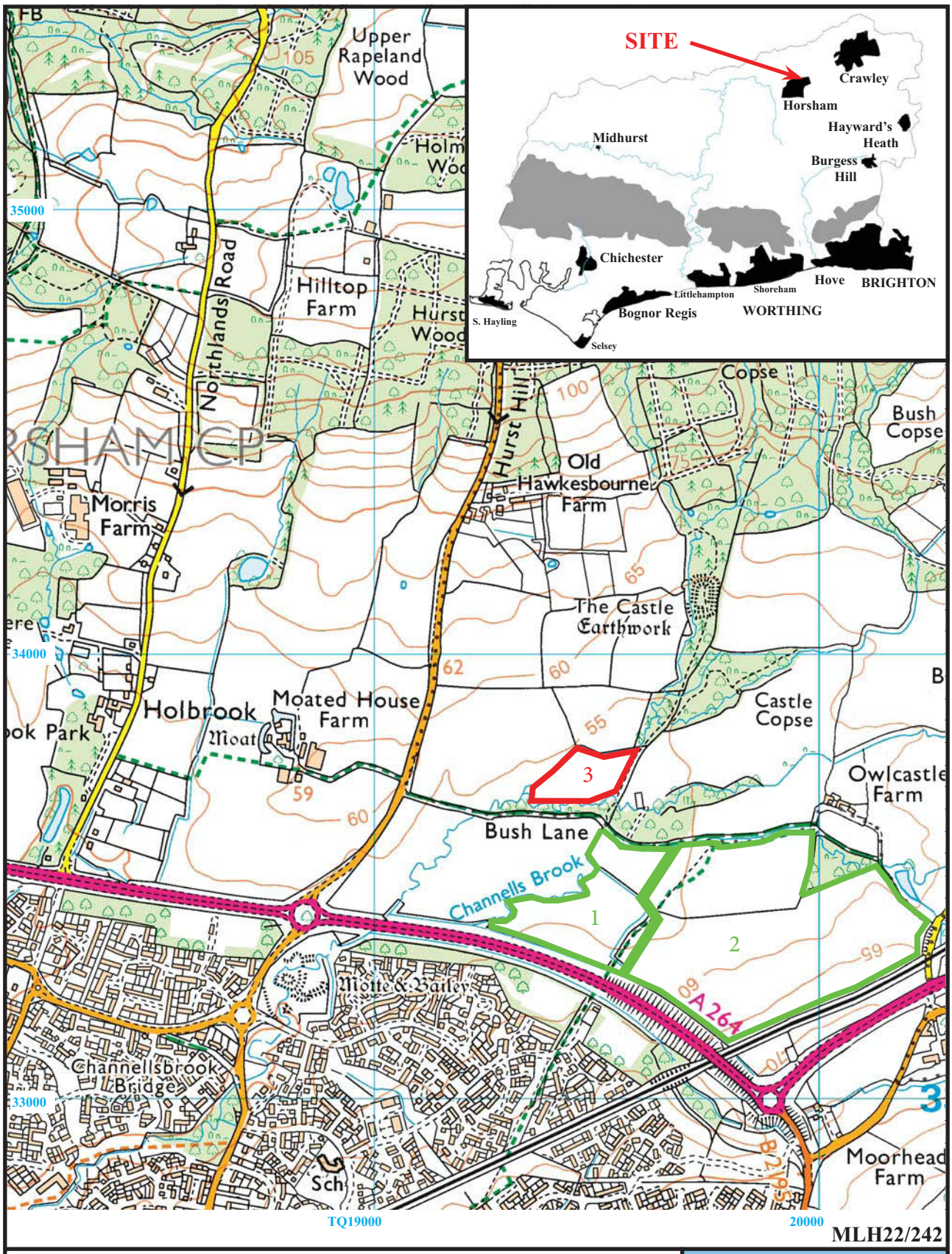
Raw data
Filename: North Horsham RAW.xcp
Instrument Type: MLgrad Import
Units:
UTM Zone: 30
Survey corner coordinates (X/Y):
Northwest corner: 519362.933649489, 133784.41974917 m
Southeast corner: 519593.163649489, 133671.44974917 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 2 @ 1 m spacing.
Dummy Value: 32702

Dimensions
Survey Size (meters): 230 m x 113 m
X&Y Interval: 0.13 m
Source GPS Points: Active: 43471, Recorded: 43471

Stats
Max: 103.59
Min: -106.05
Std Dev: 3.10
Mean: 1.66
Median: 1.92
Composite Area: 2.6009 ha
Surveyed Area: 1.2931 ha

Processed data
Filename: North Horsham.xcp
Stats
Max: 1.77
Min: -1.87
Std Dev: 0.67
Mean: 0.00
Median: 0.00
Composite Area: 2.6009 ha
Surveyed Area: 1.2931 ha

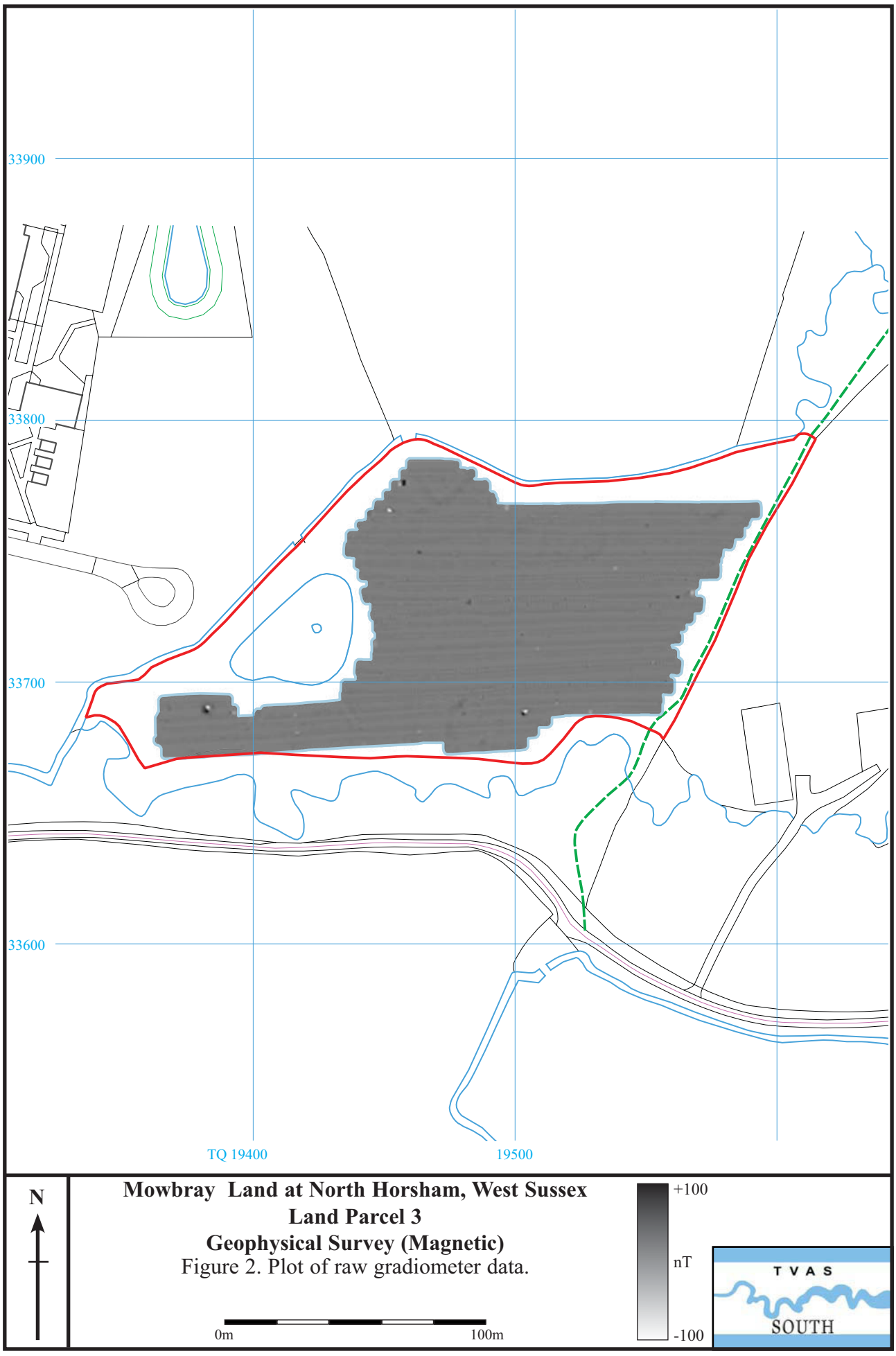
GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip at 1.00 SD
5 Clip from -1.70 to 1.60



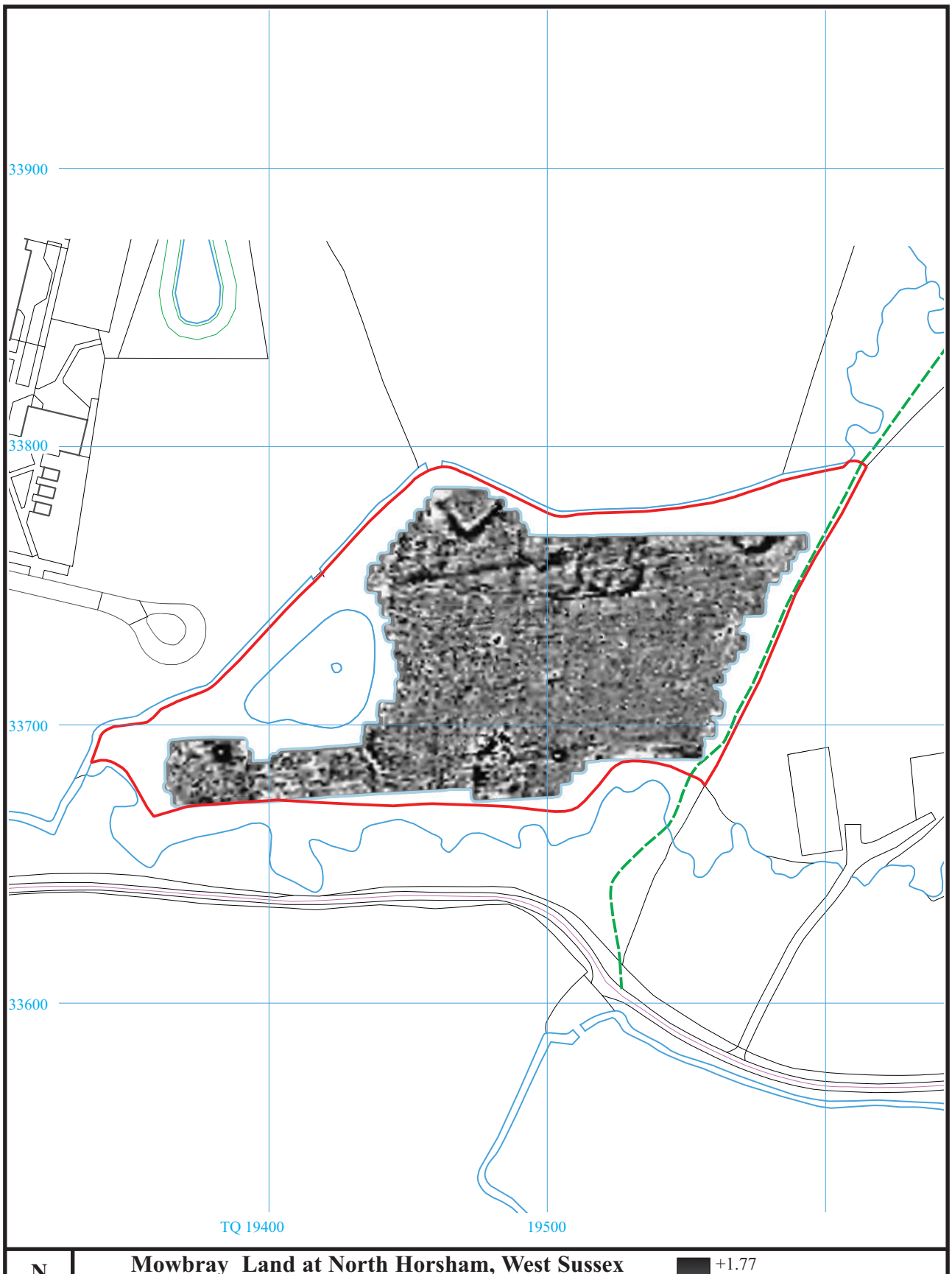
Mowbray Land at North Horsham, West Sussex
Land Parcel 3
Geophysical (magnetic) Survey

Figure 1. Location of site within Horsham and West Sussex.

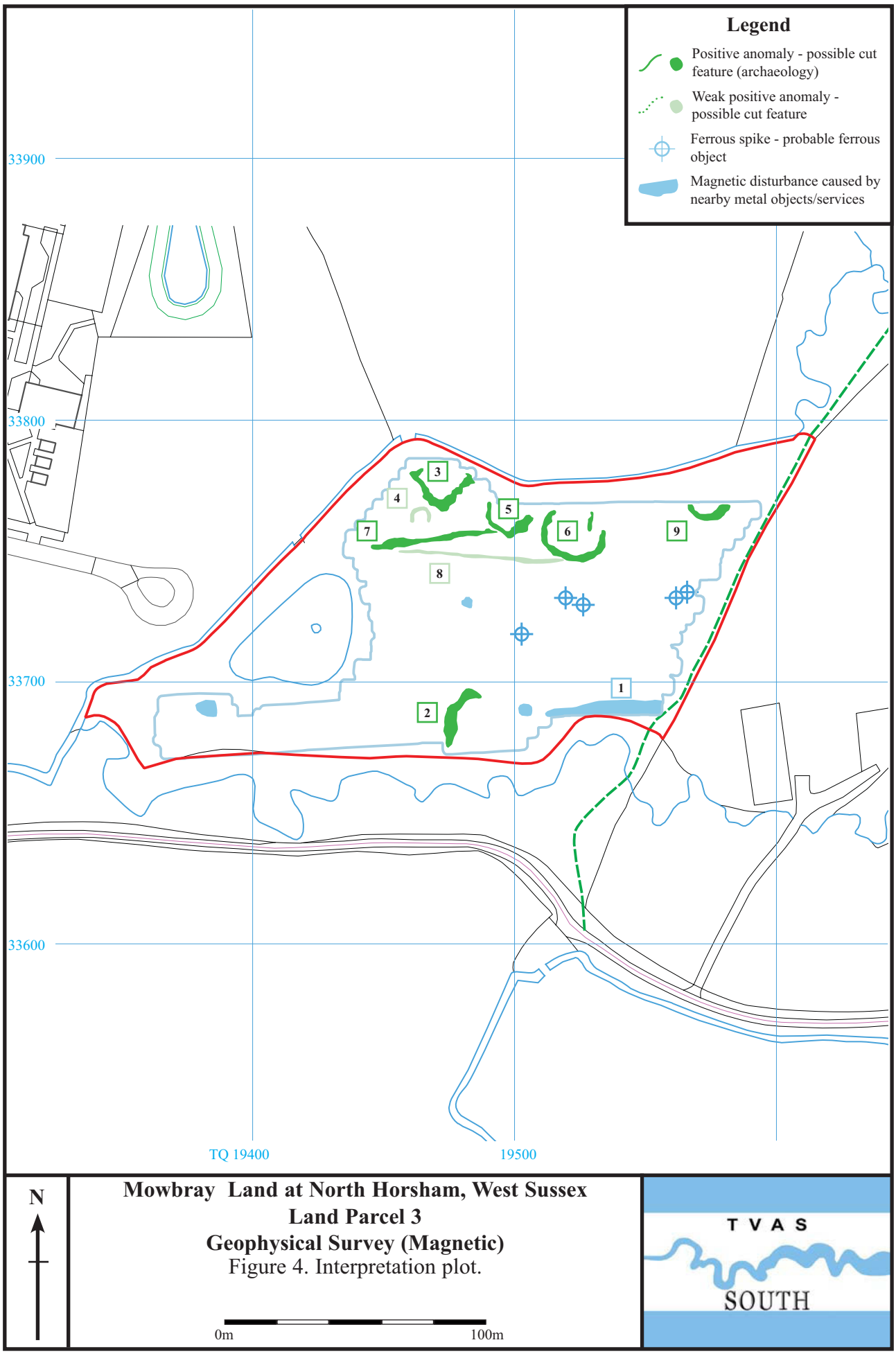
TVAS SOUTH



Mowbray Land at North Horsham, West Sussex
Land Parcel 3
Geophysical Survey (Magnetic)
Figure 2. Plot of raw gradiometer data.



Mowbray Land at North Horsham, West Sussex
Land Parcel 3
Geophysical Survey (Magnetic)
Figure 3. Plot of processed gradiometer data.



Mowbray Land at North Horsham, West Sussex
Land Parcel 3
Geophysical Survey (Magnetic)
Figure 4. Interpretation plot.

Plate 1: Site looking south east

Plate 2: Site looking west

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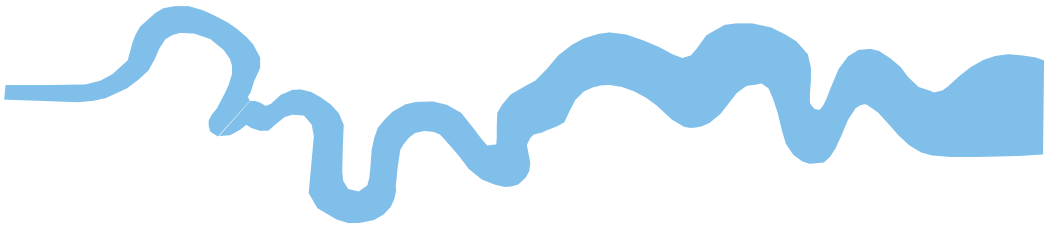
Mowbray Land at North Horsham, West Sussex
Land Parcel 3
Geophysical Survey (Magnetic)
Plates 1 and 2.

TVAS SOUTH

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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