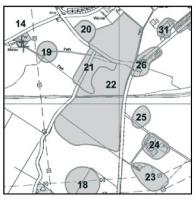
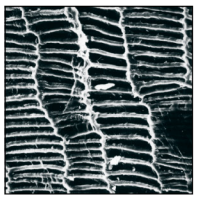
HCFW/01










HAMM COURT FARM, WEYBRIDGE, SURREY

GEOPHYSICAL SURVEY

commissioned by Orion Heritage

December 2016

HEADLAND ARCHAEOLOGY

REGISTERED ORGANISATION CIfA

HAMM COURT FARM, WEYBRIDGE, SURREY

GEOPHYSICAL SURVEY

commissioned by Orion Heritage

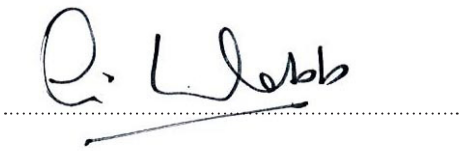
December 2016

project info

HA JOB NO.	HCFW/01
NGR	TQ 0671 6544
LOCAL AUTHORITY	Surrey
OASIS REF.	headland5-271126

project team

PROJECT MANAGER	Alistair Webb
AUTHOR	David Harrison
FIELDWORK	Charlotte Palmer Craggs, Joe Turner
GRAPHICS	Caroline Norrman, David Harrison
APPROVED BY	Alistair Webb – Project Manager



HEADLAND ARCHAEOLOGY

NORTH
Headland Archaeology
Unit 16, Hillside, Beeston Road, Leeds, LS11 8ND

0113 387 6430
north@headlandarchaeology.com

www.headlandarchaeology.com

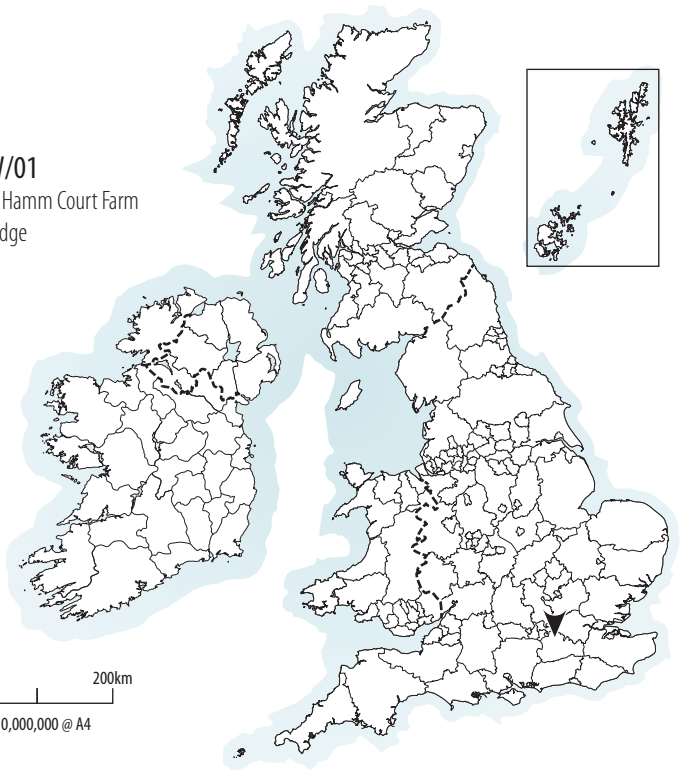
PROJECT SUMMARY

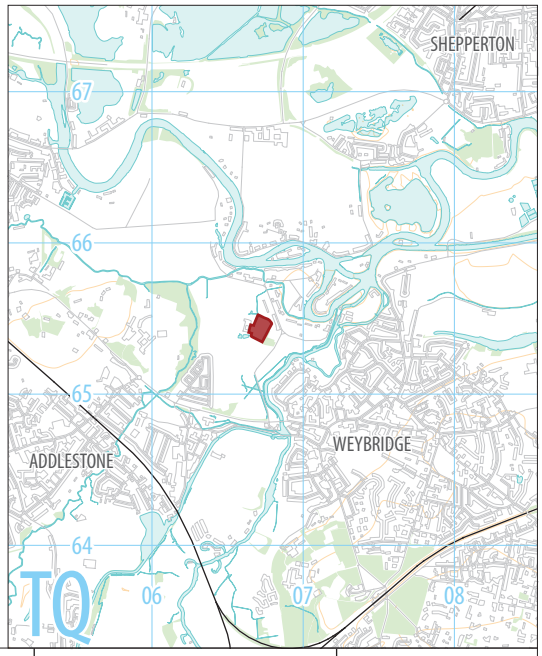
Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey, covering approximately 1 hectare, within a moated area adjacent to Hamm Court Farm, Weybridge to inform future archaeological strategy in advance of any proposed development of the site. The survey has identified linear anomalies which locate former internal boundaries within the moated enclosure. Areas of magnetic disturbance are probably caused by rubble resulting from the demolition of Hamm Court, and two buried pipes may be associated with a former well. Other discrete anomalies may be indicative of activity within the moated area. No anomalies of clear archaeological potential have been identified by the survey but it should be noted that broad areas of high magnitude magnetic disturbance, such as that in the south-west of the moated enclosure, may mask any weaker anomalies of archaeological potential, if present, within the affected area. For this reason, based solely on the results and interpretation of the magnetic data, the archaeological potential within the south-west of the site remains unclear, whilst a moderate archaeological potential is assigned to the remainder of the site.

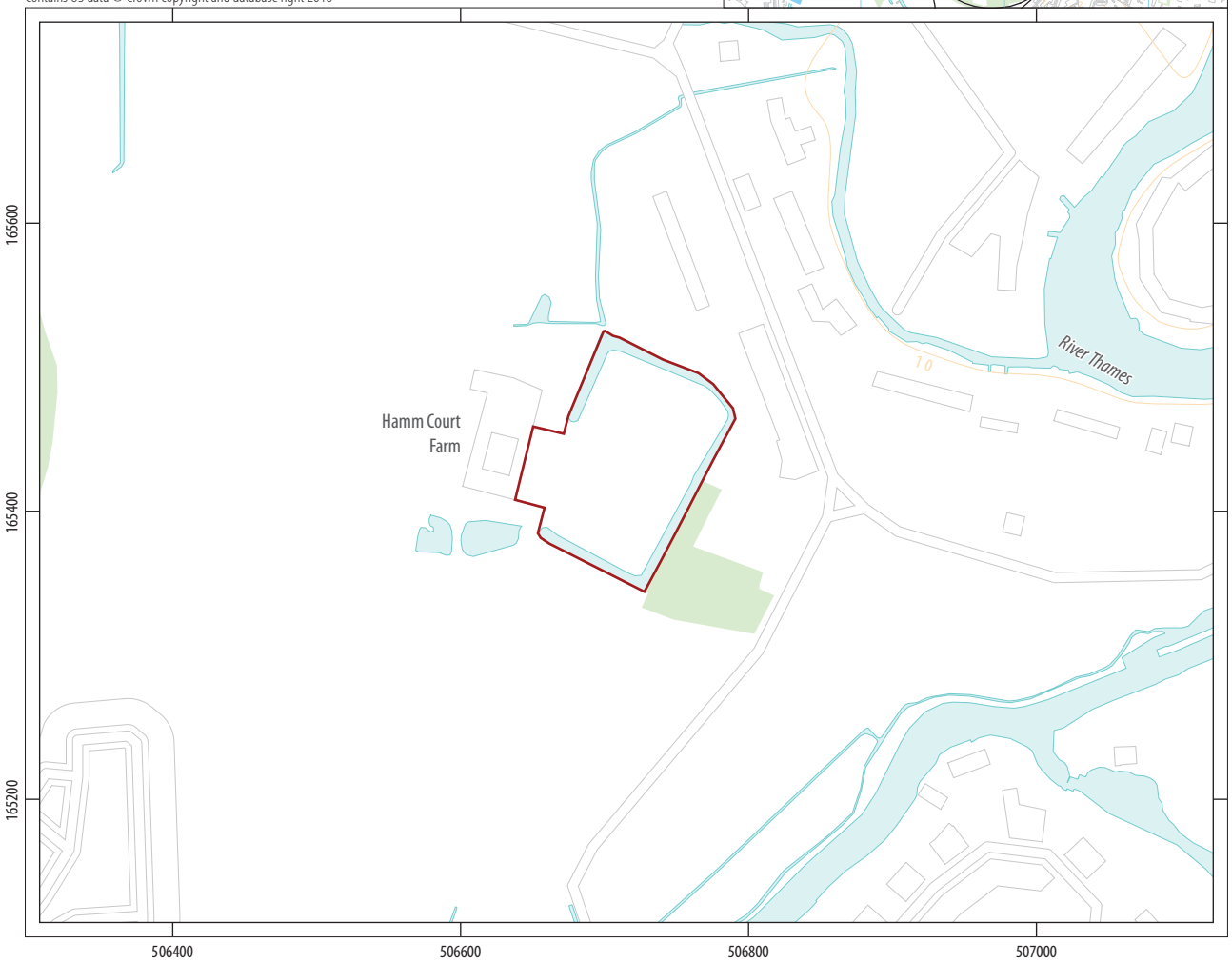
CONTENTS

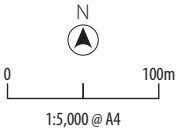
LIST OF ILLUSTRATIONS

HCFW/01
land at Hamm Court Farm
Weybridge
Surrey









KEY
geophysical survey area

HEADLAND ARCHAEOLOGY
NORTH
Unit 16, Hillside, Beeston Road
Leeds LS11 8ND
0113 387 6430
www.headlandarchaeology.com

ILLUS 1 Site location

HAMM COURT FARM, WEYBRIDGE, SURREY

GEOPHYSICAL SURVEY

1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by Orion Heritage (The Client), to undertake a geophysical (magnetometer) survey of a small parcel of land at Hamm Court Farm, Weybridge, (Illus 1) to inform forthcoming archaeological strategy in advance of the possible development of the site.

The work was undertaken in accordance with a Written Scheme of Investigation (Headland Archaeology 2016), submitted to the Client, and was undertaken in accordance with guidance contained within the National Planning Policy Framework (DCLG 2012). All work was also undertaken in line with current best practice (CIfA 2014, English Heritage 2008).

The survey was carried out on November 23rd in order to provide information on the archaeological potential of the site.

1.1 SITE LOCATION, TOPOGRAPHY AND LAND-USE

The geophysical survey area (GSA) comprises a single rectangular area of approximately 1 hectare, centred at TQ 0671 6544, immediately to the east of Hamm Court Farm. It comprises an enclosure, moated to all sides (see Illus 2), which is recorded as Hamm Court Gardens on historic mapping.

The GSA is flat, being at 12m above Ordnance Datum. At the time of the survey the site was under short mown grass apart from the south-western corner which was partly tree-covered, overgrown and unsuitable for survey (see Illus 3).

1.2 GEOLOGY AND SOILS

The underlying bedrock consists of Bagshot formation sands which are overlain by Shepperton sands and gravels (NERC 2016).

The soils are classified in the Soilscape 22 association, characterised as loams with naturally high groundwater (Cranfield University 2016).

2 ARCHAEOLOGICAL BACKGROUND

The PDA is located within a moated enclosure, immediately east of the extant Hamm Court Farm. The enclosure is shown on 18th century mapping with a building, probably Hamm Court, within the south-west. A building and a well are shown in the south-west of the enclosure on the 1892–1905 six inch Ordnance Survey (OS) map, with the remainder of the site being used as an orchard (see Illus 2).

3 AIMS, METHODOLOGY AND PRESENTATION

The main aim of the geophysical survey was to provide sufficient information to enable an assessment to be made of the impact of any proposed development on any sub-surface archaeological remains, if present.

The general archaeological objectives of the geophysical survey were:

- to provide information about the nature and possible interpretation of any magnetic anomalies identified;
- to therefore model the presence/absence and extent of any buried archaeological features; and
- to prepare a report summarising the results of the survey.

3.1 MAGNETOMETER SURVEY

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. Features such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the Earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney and Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying

frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10-15cm sample interval) on roaming traverses 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R8s Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc.) software was used to collect and export the data. Terrasurveyor V3.0.31.0 (DWConsulting) software was used to process and present the data.

3.2 REPORTING

A general site location plan is shown in Illus 1 at a scale of 1:5,000. Illus 2 is a 1:1,500 scale survey location plan showing the GPS swath data overlying the 1892-1905 six inch OS map.

Detailed data plots of the fully processed data (greyscale) and minimally processed data (XY traceplot), with an accompanying interpretative plot, are presented at a scale of 1:1,500 in Illus 3 to Illus 5 inclusive.

Technical information on the equipment used, data processing and magnetic survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the site archive. Data processing details are presented in Appendix 4. A copy of the OASIS entry (Online Access to the Index of Archaeological Investigations) is reproduced in Appendix 5.

The survey methodology, report and any recommendations comply with the Written Scheme of Investigation (Headland Archaeology 2016) and guidelines outlined by Historic England (English Heritage 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations from Ordnance Survey mapping are reproduced with the permission of the controller of Her Majesty's Stationery Office (Ó Crown copyright).

The illustrations in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All illustrations are presented to most suitably display and interpret the data from this site based on the experience and knowledge of management and reporting staff.

4 RESULTS AND DISCUSSION

The magnetic background is variable across the majority of the site mainly as a result of ferrous contamination within the upper soil horizons. Against this background numerous anomalies have been identified. These are discussed below and cross-referenced to specific anomalies on the interpretative drawings, where appropriate.

4.1 FERROUS AND MODERN ANOMALIES

Ferrous anomalies, characterised as individual 'spikes', are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris or material is common on most sites, often being present as a consequence of manuring or tipping/infilling. There is no apparent clustering to these ferrous anomalies and they are consequently not considered to be of any archaeological significance.

Two high magnitude dipolar linear anomalies (SP1 – SP2 see Illus 3-5) locate buried service pipes. The pipes intersect towards the centre of the moated enclosure close to a well which is shown on the historic OS mapping (see Illus 2).

The south-western part of the GSA is dominated by high magnitude magnetic disturbance. This area corresponds roughly with the location of Hamm Court which is depicted on historic mapping and it is possible that the magnetic disturbance is caused by demolition material within the upper soil horizons. However, no clear pattern is discernible from the data and the disturbance could equally be due to modern dumping or landscaping. A localised area of extremely high magnitude disturbance, (M see Illus 3–5) within the west of the GSA corresponds closely to part of the backfilled moat. The high magnetic values are caused by the accumulation of magnetic material (e.g. brick, concrete etc) within the backfill.

Other magnetic disturbance around the edge of the GSA is due to ferrous material within or close to the margins of the moated enclosure.

4.2 GEOLOGICAL ANOMALIES

Numerous low magnitude areas of discrete magnetic enhancement are identified throughout the dataset. The anomalies form no coherent archaeological pattern and are probably due to localised variations in the depth and composition of the soils, perhaps being exacerbated by former land use, such as the former orchard. However, given the known archaeological potential of the site, an archaeological origin should not be completely dismissed.

4.3 AGRICULTURAL ANOMALIES

Four former boundaries (FB1 – FB4 see Illus 3-5) have been detected as linear anomalies within the north, south and centre of the moated enclosure. The anomalies are aligned parallel with, and at right angles to, the moat and reflect former internal divisions as depicted on historical mapping from the 18th century onwards.

5 CONCLUSION

The geophysical survey has successfully evaluated the moated enclosure and provided evidence for four former internal divisions, two buried service pipes, and a broad area of possible demolition material within the south-west of the enclosure, probably relating to the former Hamm Court. No anomalies have been identified which cannot confidently be attributed to features depicted on historic mapping. However, it should be noted that high magnitude magnetic disturbance such as that in the south-west of the survey area may mask any anomalies of archaeological potential, if present,

within the affected area. For this reason, based solely on the results and interpretation of the magnetic data, the archaeological potential within the south-west of the site remains unclear whilst a moderate archaeological potential is assigned to the remainder of the site.

6 REFERENCES

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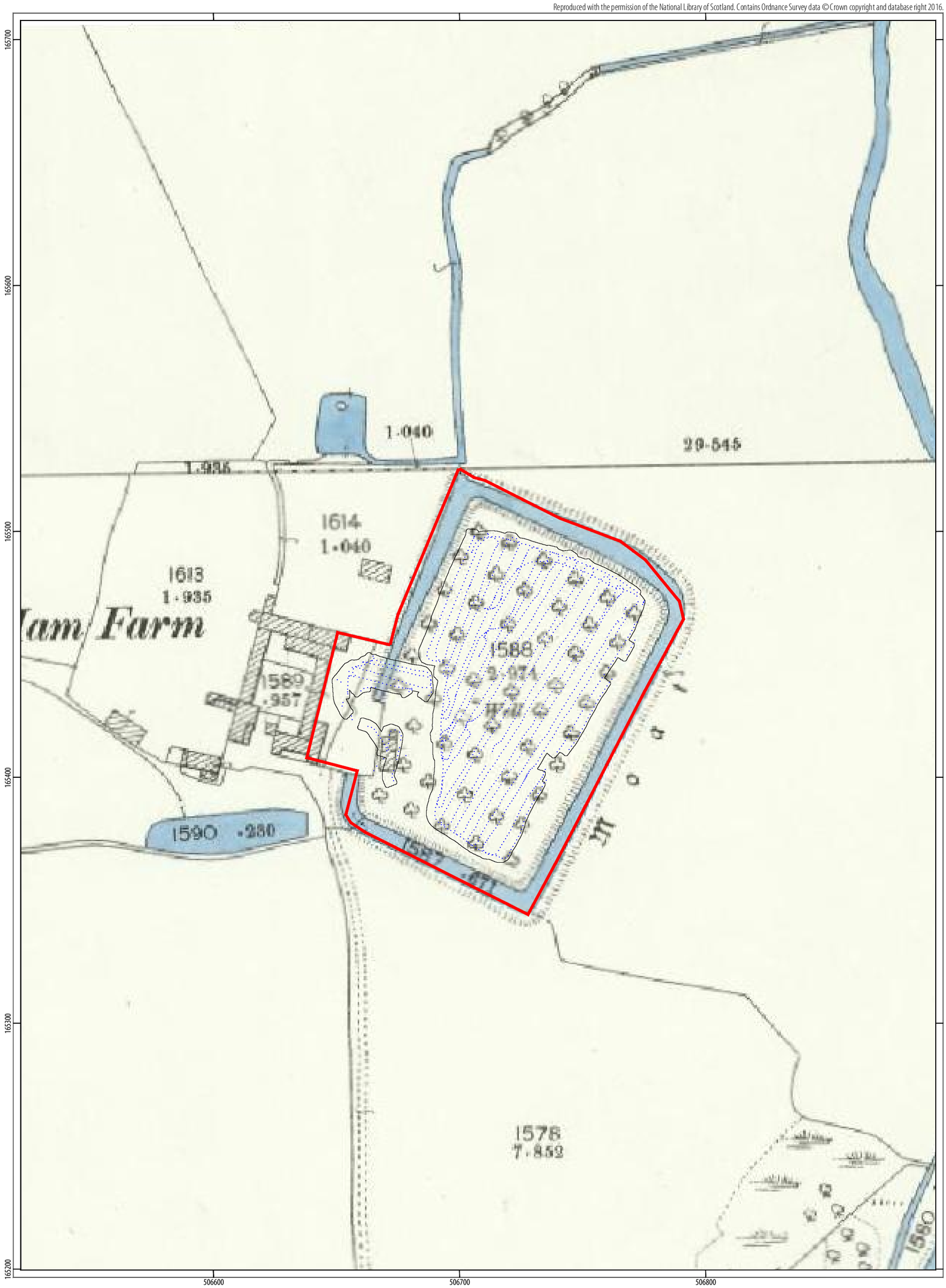

geophysical survey area
GPS swaths

N
0 50m
scale 1:1,500 @ A3

PROJECT HCFW/01
Hamm Court Farm
Weybridge
Surrey

CLIENT Orion Heritage

HEADLAND ARCHAEOLOGY

NORTH Unit 16, Hillside, Beeston Road
Leeds LS11 8ND
0113 387 6430
www.headlandarchaeology.com

ILLUS 2 Survey location showing GPS swaths and overlying the 1892–1905 six inch OS map

area unsuitable for survey

nT
-5.0 5.0

N
0 50m
scale 1:1,500 @ A3

PROJECT HCFW/01
Hamm Court Farm
Weybridge
Surrey

CLIENT Orion Heritage

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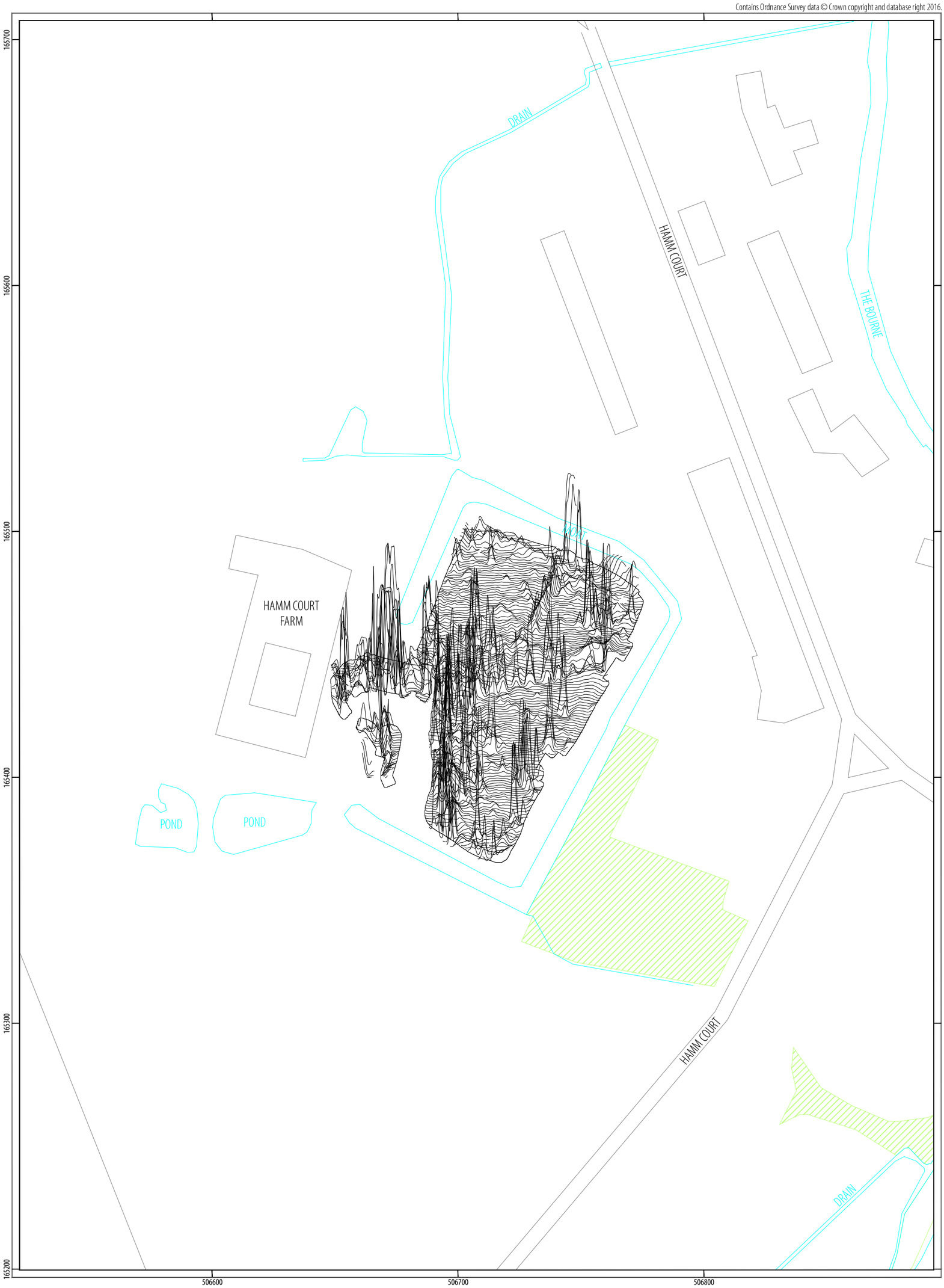
NORTH Unit 16, Hillside, Beeston Road
Leeds LS11 8ND
0113 387 6430
www.headlandarchaeology.com

ILLUS 3 Processed greyscale magnetometer data



45.0nT/cm

N

0 50m

scale 1:1,500 @ A3

PROJECT HCFW/01
Hamm Court Farm
Weybridge
Surrey

CLIENT Orion Heritage

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NORTH Unit 16, Hillside, Beeston Road
Leeds LS11 8ND
0113 387 6430
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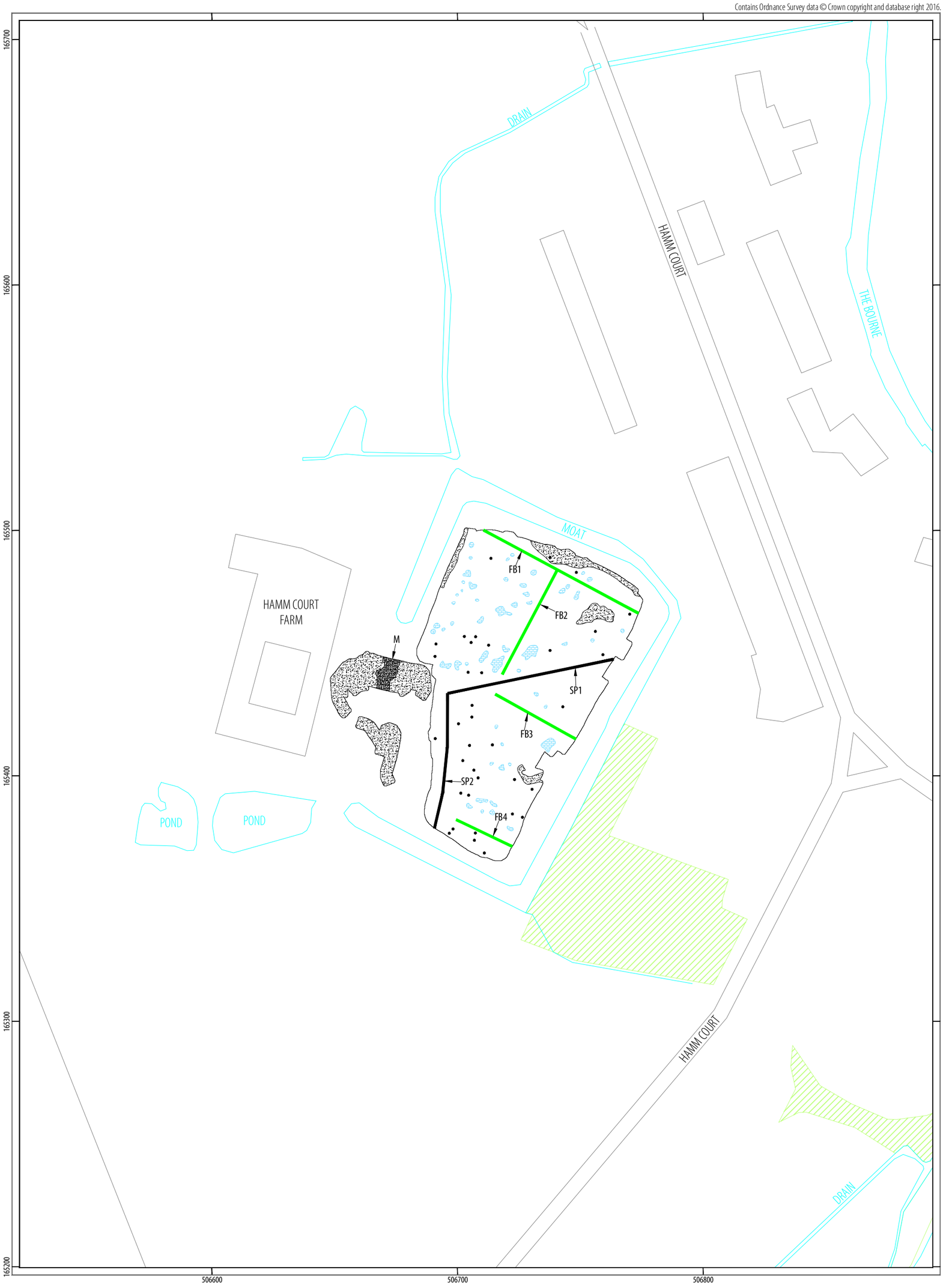
ILLUS 4 XY trace plot of minimally processed magnetometer data



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	service pipe
linear	former boundary
magnetic enhancement	geology

ABBREVIATIONS

M moat
FB former boundary
SP service pipe

N

0 50m

scale 1:1,500 @ A3

PROJECT HCFW/01
Hamm Court Farm
Weybridge
Surrey

CLIENT Orion Heritage

HEADLAND ARCHAEOLOGY

NORTH Unit 16, Hillside, Beeston Road
Leeds LS11 8ND
0113 387 6430
www.headlandarchaeology.com

ILLUS 5 XY trace plot of minimally processed magnetometer data

7 APPENDICES

APPENDIX 1 MAGNETOMETER SURVEY

Magnetic susceptibility and soil magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

Types of magnetic anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes) These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

APPENDIX 2 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associate world file, and a PDF of the report.

The project will be archived in-house in accordance with recent good practice guidelines (http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_3). The data will be stored in an indexed archive and migrated to new formats when necessary.

APPENDIX 4 DATA PROCESSING

The gradiometer data has been presented in this report in processed greyscale and minimally processed XY trace plot format.

Data collected using RTK GPS-based methods cannot be produced without minimal processing of the data. The minimally processed data has been interpolated to project the data onto a regular grid and de-striped to correct for slight variations in instrument calibration drift and any other artificial data.

A high pass filter has been applied to the greyscale plots to remove low frequency anomalies (relating to survey tracks and modern agricultural features) in order to maximise the clarity and interpretability of the archaeological anomalies.

The data has also been clipped to remove extreme values and to improve data contrast.

APPENDIX 5 OASIS DATA COLLECTION FORM: ENGLAND

OASIS ID: headland5-271126

PROJECT DETAILS	
Project name	Hamm Court Farm, Weybridge
Short description of the project	Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey, covering approximately 1 hectare, within a moated area adjacent to Hamm Court Farm, Weybridge to inform future archaeological strategy in advance of any proposed development of the site. The survey has identified linear anomalies which locate former internal boundaries within the moated enclosure. Areas of magnetic disturbance are probably caused by rubble resulting from the demolition of Hamm Court, and two buried pipes may be associated with a former well. Other discrete anomalies may be indicative of activity within the moated area. No anomalies of clear archaeological potential have been identified by the survey but it should be noted that broad areas of high magnitude magnetic disturbance, such as that in the south-west of the moated enclosure, may mask any weaker anomalies of archaeological potential, if present, within the affected area. For this reason, based solely on the results and interpretation of the magnetic data, the archaeological potential within the south-west of the site remains unclear, whilst a moderate archaeological potential is assigned to the remainder of the site.
Project dates	Start: 23-11-2016 End: 23-11-2016
Previous/future work	Not known / Not known
Any associated project reference codes	HCFW/01 - Contracting Unit No.
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 5 - Character undetermined
Monument type	N/A None
Monument type	N/A None
Significant Finds	N/A None
Significant Finds	N/A None
Methods & techniques	"Geophysical Survey"
Development type	Not recorded
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Not known / Not recorded
Solid geology (other)	Bagshot Formation
Drift geology	GLACIAL SAND AND GRAVEL
Techniques	Magnetometry

PROJECT LOCATION	
Country	England
Site location	SURREY ELMBRIDGE WEYBRIDGE Hamm Court Farm, Weybridge
Postcode	KT13 8XZ
Study area	1 Hectares
Site coordinates	TQ 0671 6544 51.377467035297 -0.466594160816 51 22 38 N 000 27 59 W Point

PROJECT CREATORS	
Name of Organisation	Headland Archaeology
Project brief originator	Orion Heritage
Project design originator	Headland Archaeology
Project director/manager	Webb, A.
Project supervisor	Bishop, R
Type of sponsor/funding body	Developer

PROJECT ARCHIVES	
Physical Archive Exists?	No
Digital Archive Exists?	No
Digital Media available	"Geophysics"
Paper Archive Exists?	No
Paper Media available	"Report"

PROJECT BIBLIOGRAPHY 1	
Publication type	Grey literature (unpublished document/manuscript)
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Place of issue or publication	Leeds
Description	A4 bound report
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Entered on	13 December 2016

SOUTH & EAST
Headland Archaeology
Building 68C, Wrest Park, Silsoe
Bedfordshire MK45 4HS

01525 861 578
southandeast@headlandarchaeology.com

MIDLANDS & WEST
Headland Archaeology
Unit 1, Clearview Court, Twyford Road
Hereford HR2 6JR

01432 364 901
midlandsandwest@headlandarchaeology.com

NORTH
Headland Archaeology
Unit 16, Hillside, Beeston Road
Leeds LS11 8ND

0113 387 6430
north@headlandarchaeology.com

SCOTLAND
Headland Archaeology
13 Jane Street
Edinburgh EH6 5HE

0131 467 7705
scotland@headlandarchaeology.com

www.headlandarchaeology.com