

**Detailed Magnetometer Survey  
Land at Spithandle Lane, Ashurst,  
West Sussex**

**NGR: 516350 115250  
(TQ 16350 15250)**

**ASE Project No: 7211  
ASE Report No. 2015058**

**By John Cook BSc (Hons) ACiFA**



**February 2015**

**Archaeology South-East  
Units 1 & 2  
2 Chapel Place  
Portslade  
East Sussex  
BN41 1DR**

**Tel: 01273 426830  
Fax: 01273 420866  
Email: [fau@ucl.ac.uk](mailto:fau@ucl.ac.uk)  
[www.archaeologyse.co.uk](http://www.archaeologyse.co.uk)**

**Detailed Magnetometer Survey  
Land at Spithandle Lane, Ashurst,  
West Sussex**

**NGR: 516350 115250  
(TQ 16350 15250)**

**ASE Project No: 7211  
ASE Report No. 2015058**

**By John Cook BSc (Hons) ACiFA**

**February 2015**

**Archaeology South-East  
Units 1 & 2  
2 Chapel Place  
Portslade  
East Sussex  
BN41 1DR**

**Tel: 01273 426830  
Fax: 01273 420866  
Email: [fau@ucl.ac.uk](mailto:fau@ucl.ac.uk)  
[www.archaeologyse.co.uk](http://www.archaeologyse.co.uk)**

## **Abstract**

*Archaeology South-East was commissioned by RSK Environment Ltd to conduct a magnetometer survey on a site totalling approximately c.8.7 hectares of land at Spithandle Lane, Ashurst, West Sussex. The work was undertaken between Monday 9th and Friday 13th February 2015. The site consists of pasture land, with evidence for former arable use, with small areas of woodland. The site is mainly south facing over the crest of a low hill.*

*Limited evidence for possible archaeological features was represented by discrete and linear positive anomalies. These are representative of cut features such as pits and ditches. It is possible that a number of these anomalies may also relate to in filled natural features or more modern agricultural activity. A linear anomaly noted running east to west is observed, along with areas of magnetic debris, as corresponding to a former trackway noted since at least the 1st Edition OS map. An area of magnetic debris corresponds to the former Upper Barn also noted in historical mapping.*

## **Statement of Indemnity**

*Geophysical survey is the collection of data that relate to subtle variations in the form and nature of soil and which relies on there being a measurable difference between buried archaeological features and the natural geology. Geophysical techniques do not specifically target archaeological features and anomalies noted in the interpretation do not necessarily relate to buried archaeological features. As a result, magnetic and earth resistance detail survey may not always detect sub-surface archaeological features. This is particularly true when considering earlier periods of human activity, for example those periods that are not characterised by sedentary social activity.*

## CONTENTS

<b>1.0</b>	<b>INTRODUCTION</b>
<b>2.0</b>	<b>ARCHAEOLOGICAL BACKGROUND</b>
<b>3.0</b>	<b>SURVEY METHODOLOGY</b>
<b>4.0</b>	<b>GEOPHYSICAL SURVEY RESULTS</b>
<b>5.0</b>	<b>CONCLUSIONS</b>

**Bibliography**  
**Acknowledgements**

**Appendix. Raw survey data (CD)**  
**HER Summary**

### **Figures**

Front cover:	General site view looking north
Figure 1:	Site location
Figure 2:	Location of geophysics survey
Figure 3:	Raw data
Figure 4:	Processed data
Figure 5:	Interpolated data
Figure 6:	Interpretation
Figure 7:	Site photographs

## **1.0 INTRODUCTION**

### **1.1 Site background**

1.1.1 Archaeology South-East was commissioned by RSK Environment Ltd to conduct a magnetometer survey on a site totalling approximately c.8.7 hectares of land at Spithandle Lane, Ashurst, West Sussex henceforth referred to as 'the site' (NGR. 516350 115250; Figure 1).

### **1.2 Geology and topography**

1.2.1 According to the British Geological Survey (BGS 2015a) the bedrock geology of the site predominately comprises Weald clay formation - mudstone. No superficial drift deposits are recorded at the site. No boreholes are recorded on the BGS Borehole Viewer (BGS 2015b) on or in the immediate vicinity of the site.

1.2.2 The site consists of pasture land, with evidence for former arable use, with small areas of woodland. The site is mainly south facing over the crest of a low hill.

### **1.3 Aims of geophysical investigation**

1.3.1 The purpose of the geophysical survey was to detect any buried archaeological anomalies that might provide a measurable magnetic response.

### **1.4 Scope of report**

1.4.1 The scope of this report is to report on the findings of the survey. The project was conducted by John Cook with the assistance of John Hirst. The project was managed by Neil Griffin (fieldwork) and Jim Stevenson (post fieldwork).

## **2.0     ARCHAEOLOGICAL BACKGROUND**

On the 1st Edition OS mapping, dated 1875, Spithandle Lane is recorded as running along the western edge of the site. In addition, a small enclosure, with associated buildings is shown, along with enclosure boundaries that are no longer present. In the 1:25000 OS Explorer map for the area revised in 2003 a single building is noted as 'Upper Barn' and the boundaries noted in earlier mapping have been removed.

### **3.0 SURVEY METHODOLOGY**

#### **3.1 Geophysical survey**

3.1.1 A fluxgate gradiometer (magnetometry) survey was undertaken across two enclosures, as depicted on Figure 2 (NGR 516350 115250). The work was undertaken between Monday 9<sup>th</sup> and Friday 13<sup>th</sup> February 2015 during cold, dry weather, and strong winds.

#### **3.2 Applied geophysical instrumentation**

3.2.1 The Fluxgate Gradiometer employed was the Bartington Instrumentation Grad 601-2. The Grad 601-2 has an internal memory and a data logger that store the survey data. This data is downloaded into a PC and is then processed in a suitable software package.

3.2.2 30m x 30m grids were set out using a GPS (see below). Each grid was surveyed with 1m traverses; samples were taken every 0.25m.

3.2.3 Data was collected along north-south traverses in a zigzag pattern beginning in the south west corner of each grid, following the contours of the site.

#### **3.3 Instrumentation used for setting out the survey grid**

3.3.1 The survey grid for the site was geo-referenced using a Leica Viva Smartrover. The GPS receiver collects satellite data to determine its position and uses the mobile phone networks to receive corrections, transmitting them to the RTK Rover via Bluetooth to provide a sub centimetre Ordnance Survey position and height. Each surveyed grid point has an Ordnance Survey position; therefore the geophysical survey can be directly referenced to the Ordnance Survey National Grid.

#### **3.4 Data processing**

3.4.1 All of the geophysical data processing was carried out using TerraSurveyor published by DW Consulting. Minimally processed data was produced using the following schedule of processing. Due to the very high positive readings of some of the magnetic disturbance, the values were replaced with a dummy value so as to avoid detrimentally affecting the dataset when further processed. The first process carried out upon the data was to apply a DESPIKE to the data set which removes the random 'iron spikes' that occur within fluxgate gradiometer survey data. A ZERO MEDIAN TRAVERSE was then applied to survey data. This removes stripe effects within grids and ensures that the survey grid edges match.

#### **3.5 Data presentation**

3.5.1 Data is presented using images exported from TerraSurveyor into Autocad software and inserted into the geo-referenced site grid. Data is presented as raw data, processed data, an interpolated data greyscale plot, and a red greyscale blue plot.

## **4.0 GEOPHYSICAL SURVEY RESULTS**

### **4.1 Description of site**

- 4.1.1 The survey area consisted of approximately c.8.7 hectares of pasture land, *bounded by hedges, wire fences and woodland.*
- 4.1.2 The site consists of pasture land, with evidence for former arable use, with small areas of woodland. The site is mainly south facing over the crest of a low hill.

### **4.2 Survey limitations**

- 4.2.1 Physical obstructions encountered on site included trees and heavily waterlogged ground (Figure 7a). Obstructions for each area are noted in the results. In addition, the effectiveness of magnetometer surveys depends on a contrast between the absolute magnetic susceptibility of the topsoil to the underlying subsoil (Clark 1996). Features may also be difficult to detect where there has been significant primary silting and development of significant overburden. Areas where physical obstructions form a barrier to survey, or a health and safety issue, have been omitted. The site lies over mudstone geology. An average response to magnetometer is possible, although results may be variable (English Heritage 2008).

### **4.3 Introduction to results**

- 4.3.1 The results should be read in conjunction with the figures at the end of this report (Figures 3, 4, 5, 6 and 7). The types of features likely to be identified are discussed below.
- 4.3.2 *Positive Magnetic Anomalies*  
Positive anomalies generally represent cut features that have been in-filled with magnetically enhanced material.
- 4.3.3 *Negative Magnetic anomalies*  
Negative anomalies generally represent buried features such as banks or compacted ground that have a lower magnetic signature in comparison to the background geology.
- 4.3.4 *Magnetic Disturbance*  
Magnetic disturbance is generally associated with interference caused by modern ferrous features such as fences and service pipes or cables.
- 4.3.5 *Magnetic Debris*  
Low amplitude magnetic debris consists of a number of dipolar responses spread over an area and is indicative of ground disturbance.
- 4.3.6 *Dipolar Anomalies*  
Dipolar anomalies are positive anomalies with an associated negative response. These anomalies are usually associated with discreet ferrous objects or may represent buried kilns or ovens.



4.3.7 *Bipolar Anomalies*

Bipolar anomalies consist of alternating responses of positive and negative magnetic signatures. Interpretation will depend on the strength of these responses; modern pipelines and cables typically produce strong bipolar responses.

4.3.8 *Thermoremanence*

Thermoremanence is most commonly encountered through the magnetizing of clay through the firing process although stones and soils can also acquire thermoremanence.

4.3.9 Magnetism from ferromagnetic materials (iron) and from thermoremanence are forms of permanent magnetism and in most cases a magnetometer will not enable the separation of anomalies into the two categories. The interpretation of these anomalies into either category relies on field strength within an area. Magnetic anomalies due to iron normally rise and fall rapidly, forming a 'spike' in the data.

**4.4 Interpretation of fluxgate gradiometer results**

4.4.1 The interpretation of fluxgate gradiometer results should be read in conjunction with the figures at the end of the report. Specific examples of anomaly types are numbered in the figures and text but not all anomalies are numbered.

4.4.2 The site consists of parts of a level enclosure in the south and an undulating but mainly south and west facing enclosure in the north. At the time of the survey the land is currently under grazing.

4.4.3 Evidence of possible archaeological activity was, in general, sparse and included the following described anomalies. The most obvious possible archaeological anomalies are the linear moderate positive anomalies, noted as A1, and likely to be due to a cut feature such as a gully. Due to the form of these anomalies it is likely that that relate to drainage. Further linear positive anomalies occur in the north of the area (A2). Several discrete moderate positive anomalies (A3), may represent cut features such as pits. However, these anomalies may also relate to in filled natural features. A moderate negative linear anomaly is observed in the west of the area (A4) and may represent a remnant bank or earthwork. However, this anomaly may also relate to former agricultural activity. Negative anomalies may also stem from the dipolar effect of certain magnetic anomalies.

4.4.4 Areas of magnetic debris (A5, A6) may relate to a scattering of near surface ferrous material, ground disturbance or made ground.

4.4.5 Moderate and weak positive amorphous anomalies (A7, A8) may relate to cut archaeological features. However, due to size and shape, these anomalies are likely to relate to underlying geology.

4.4.6 Dipolar anomalies (A9) are observed across the area. These anomalies may relate to thermoremanent material such as that due to kilns and furnaces or near surface ferrous objects.

- 4.4.7 A single bipolar anomaly with associated magnetic disturbance (A10) is observed in a north-west to south-east orientation through both enclosures. This anomaly is likely to be due to a modern service.

## **5.0 CONCLUSIONS**

### **5.1 Discussion**

- 5.1.1 Limited evidence for possible archaeological features was represented by discrete and linear positive anomalies. These are representative of cut features such as pits and ditches. It is possible that a number of these anomalies may also relate to in filled natural features or more modern agricultural activity. A linear anomaly noted running east to west (A2) is observed, along with areas of magnetic debris (A5), as corresponding to a former trackway noted since at least the 1<sup>st</sup> Edition OS map (Figure 7c). An area of magnetic debris (A6) corresponds to the former Upper Barn also noted in historical mapping (Figure 7b).
- 5.1.2 A single bipolar anomaly is noted running across the site and represents a probable service.
- 5.1.3 Some of the features identified may be the result of more recent agricultural activity, infilling of natural features (A7) or combination of these.

## **Bibliography**

BGS 2015a. *Geology of Britain Viewer*

<http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html?src=topNav>

Accessed 19<sup>th</sup> February 2015

BGS 2015b. British Geological Survey, *Borehole Scans*

<http://www.bgs.ac.uk/data/boreholescans/home.html>

Accessed 19<sup>th</sup> February 2015

Clark, A. 1996. *Seeing Beneath the Soil*. (2<sup>nd</sup> edition). London: Routledge.

English Heritage 2008 *Geophysical Survey in Archaeological Field Evaluation 2<sup>nd</sup> Edition* Swindon: English Heritage

## **Acknowledgements**

Archaeology South-East would like to thank RSK Environment Ltd for commissioning the survey.

## HER Summary

Identification Name and Address	Detailed Magnetometer Survey Land at Spithandle Lane, Ashurst					
County, District &/or Borough	West Sussex					
OS Grid Refs.	516350 115250					
Geology	Weald clay formation - mudstone					
Arch. South-East Project Number	7211					
Type of Fieldwork	Eval.	Excav.	Watching Brief	Standing Structure	<b>Survey</b>	Other
Type of Site	<b>Green Field</b>	Shallow Urban	Deep Urban	Other		
Dates of Fieldwork	Eval.	Excav.	WB.	9 <sup>th</sup> – 13 <sup>th</sup> February 2015		
Sponsor/Client	RSK Environment Ltd					
Project Manager	Neil Griffin					
Project Supervisor	John Cook					
Period Summary	Palaeo.	Meso.	Neo.	BA	IA	RB
	AS	MED	PM	Other Modern		
<p>Summary</p> <p><i>Archaeology South-East was commissioned by RSK Environment Ltd to conduct a magnetometer survey on a site totalling approximately c.8.7 hectares of land at Spithandle Lane, Ashurst, West Sussex. The work was undertaken between Monday 9th and Friday 13th February 2015. The site consists of pasture land, with evidence for former arable use, with small areas of woodland. The site is mainly south facing over the crest of a low hill.</i></p> <p><i>Limited evidence for possible archaeological features was represented by discrete and linear positive anomalies. These are representative of cut features such as pits and ditches. It is possible that a number of these anomalies may also relate to in filled natural features or more modern agricultural activity. A linear anomaly noted running east to west is observed, along with areas of magnetic debris, as corresponding to a former trackway noted since at least the 1st Edition OS map. An area of magnetic debris corresponds to the former Upper Barn also noted in historical mapping.</i></p>						

## Oasis Form

**OASIS ID: archaeol6-204376**

### Project details

Project name	Detailed Magnetometer Survey Land at Spithandle Lane, Ashurst, West Sussex
Short description of the project	Archaeology South-East was commissioned by RSK Environment Ltd to conduct a magnetometer survey on a site totalling approximately c.8.7 hectares of land at Spithandle Lane, Ashurst, West Sussex. The work was undertaken between Monday 9th and Friday 13th February 2015. The site consists of pasture land, with evidence for former arable use, with small areas of woodland. The site is mainly south facing over the crest of a low hill. Limited evidence for possible archaeological features was represented by discrete and linear positive anomalies. These are representative of cut features such as pits and ditches. It is possible that a number of these anomalies may also relate to in filled natural features or more modern agricultural activity. A linear anomaly noted running east to west is observed, along with areas of magnetic debris, as corresponding to a former trackway noted since at least the 1st Edition OS map. An area of magnetic debris corresponds to the former Upper Barn also noted in historical mapping.
Project dates	Start: 09-02-2015 End: 13-02-2015
Previous/future work	Not known / Not known
Any associated project reference codes	7211 - Contracting Unit No.
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 4 - Regularly improved
Monument type	NONE None
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Not recorded
Prompt	Planning condition
Position in the planning process	Not known / Not recorded
Solid geology (other)	Weald Clay Formation - Mudstone
Drift geology (other)	None recorded
Techniques	Magnetometry

### Project location

Country	England
Site location	WEST SUSSEX HORSHAM ASHURST Spithandle Lane, Ashurst, West Sussex
Postcode	BN44 3DY
Study area	8.70 Hectares
Site coordinates	TQ 16350 15250 50.9244000843 -0.344356747702 50 55 27 N 000 20 39 W Point

---

### Project creators

Name of Organisation	Archaeology South East
Project brief originator	Archaeology South East
Project design originator	ASE
Project director/manager	Neil Griffin
Project supervisor	John Cook
Type of sponsor/funding body	Consultant
Name of sponsor/funding body	RSK Environment Ltd

---

### Project archives

Physical Archive Exists?	No
Digital Archive recipient	n/a
Digital Contents	"Survey"
Digital Media available	"Geophysics","Text"
Paper Archive recipient	n/a
Paper Contents	"Survey"
Paper Media available	"Report","Survey "

---

### Project

**bibliography 1**

Publication type	Grey literature (unpublished document/manuscript)
Title	Detailed Magnetometer Survey Land at Spithandle Lane, Ashurst, West Sussex
Author(s)/Editor(s)	Cook, J.
Other bibliographic details	Report number 2015058
Date	2015
Issuer or publisher	ASE
Place of issue or publication	Portslade

---

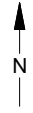
Entered by	John Cook (john.cook@ucl.ac.uk)
Entered on	20 February 2015





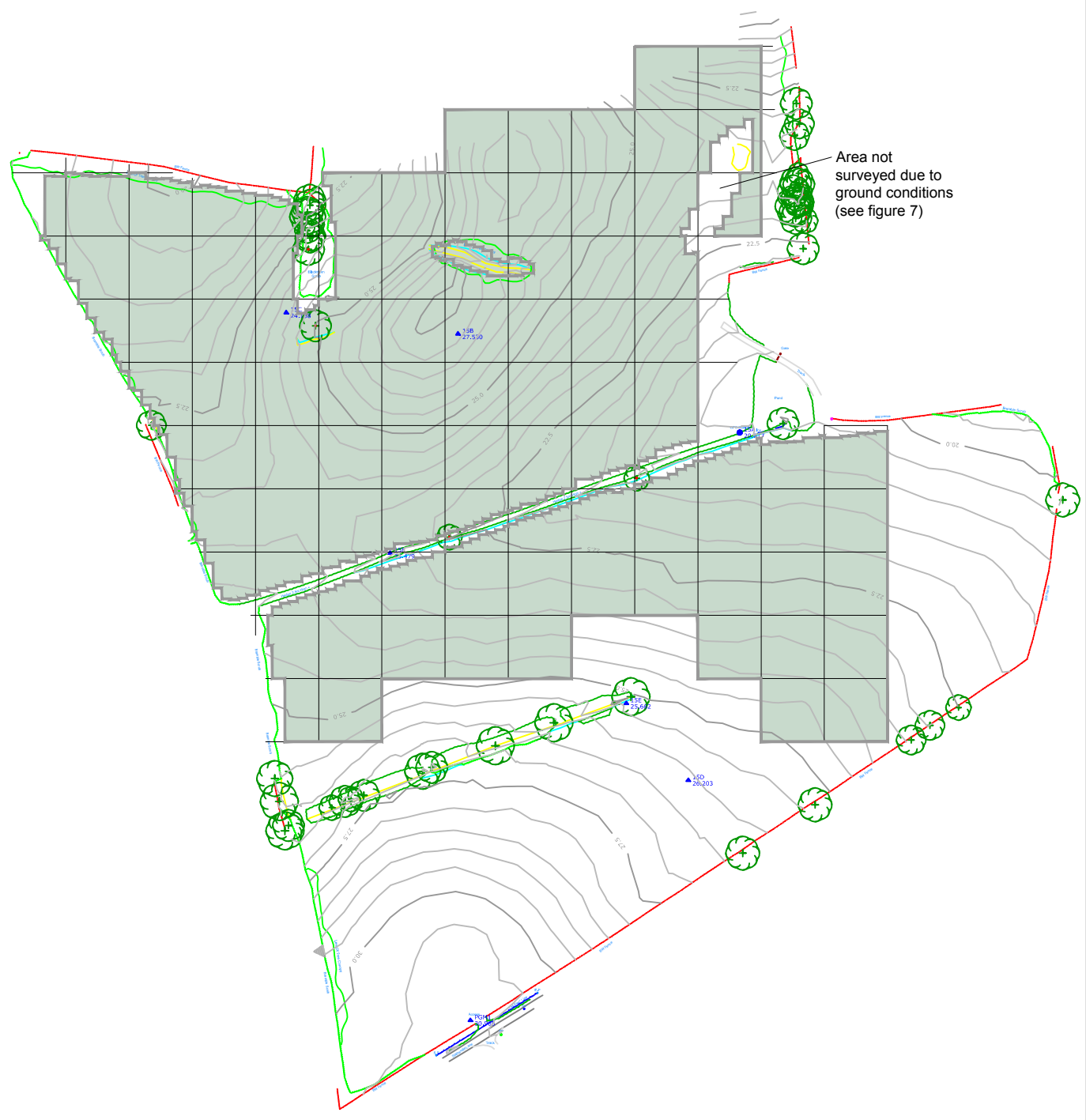
Contains Ordnance Survey data  
Crown copyright and database right 2014

© Archaeology South-East		Land at Spithandle Lane, West Sussex		Fig. 1
Project Ref: 7211	Feb 2015	Site location		
Report Ref: 2015058	Drawn by: JC			



+ 516120, 115460

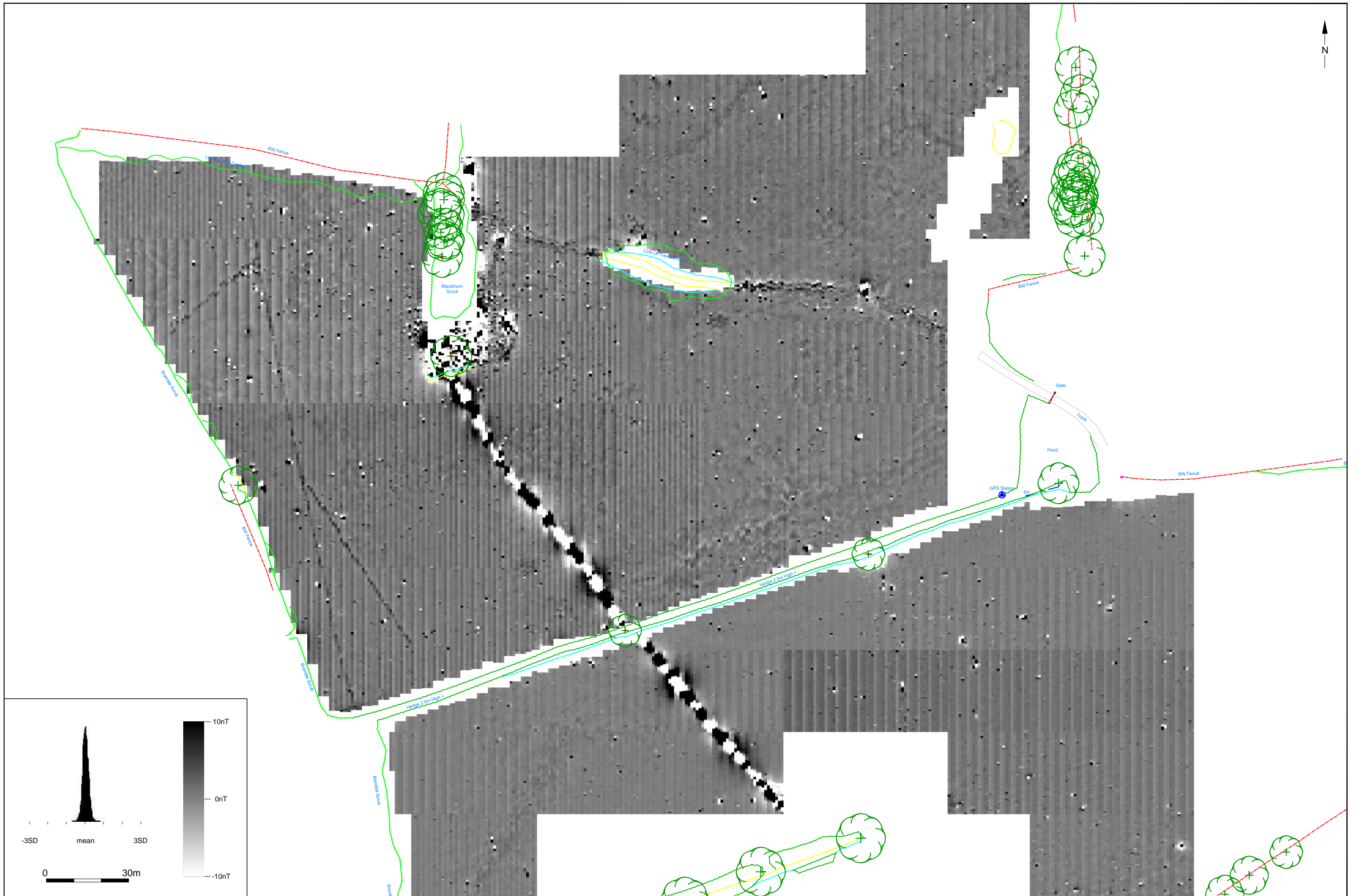
+ 516490, 115460



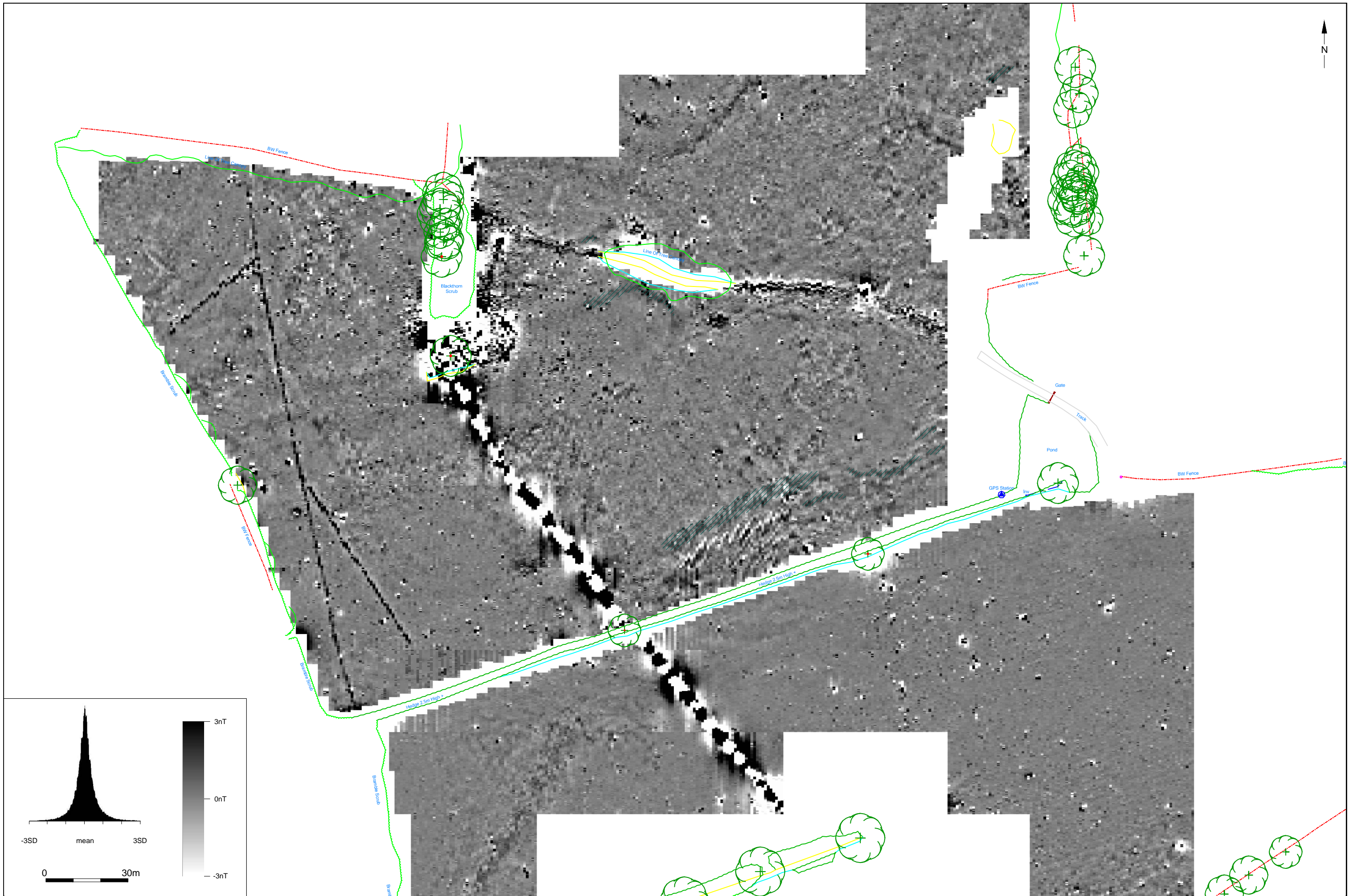
Area not surveyed due to ground conditions (see figure 7)

0 90m

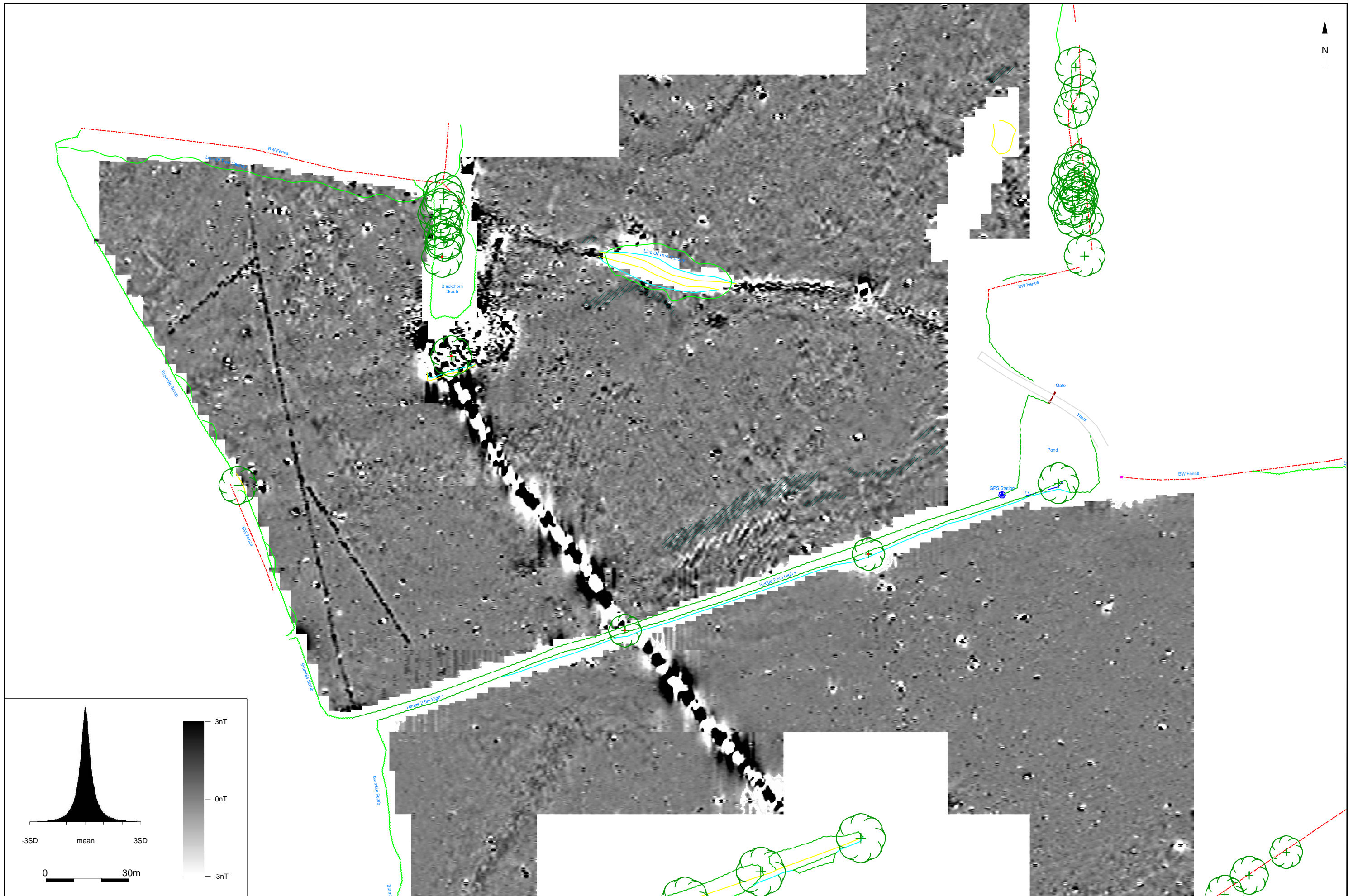
© Archaeology South-East		Land at Spithandle Lane, West Sussex	Fig. 2
Project Ref: 7211	Feb 2015	Location of geophysical survey	
Report Ref: 2015058	Drawn by: JC		



© Archaeology South-East		Land at Spithandle Lane, West Sussex		Fig. 3
Project Ref: 7211	Feb 2015	Raw data		
Report Ref: 2015058	Drawn by: JC			



© Archaeology South-East		Land at Spithandle Lane, West Sussex	Fig. 4
Project Ref: 7211	Feb 2015	Processed data	
Report Ref: 2015058	Drawn by: JC		



© Archaeology South-East		Land at Spithandle Lane, West Sussex		Fig. 5
Project Ref: 7211	Feb 2015	Interpolated data		
Report Ref: 2015058	Drawn by: JC			

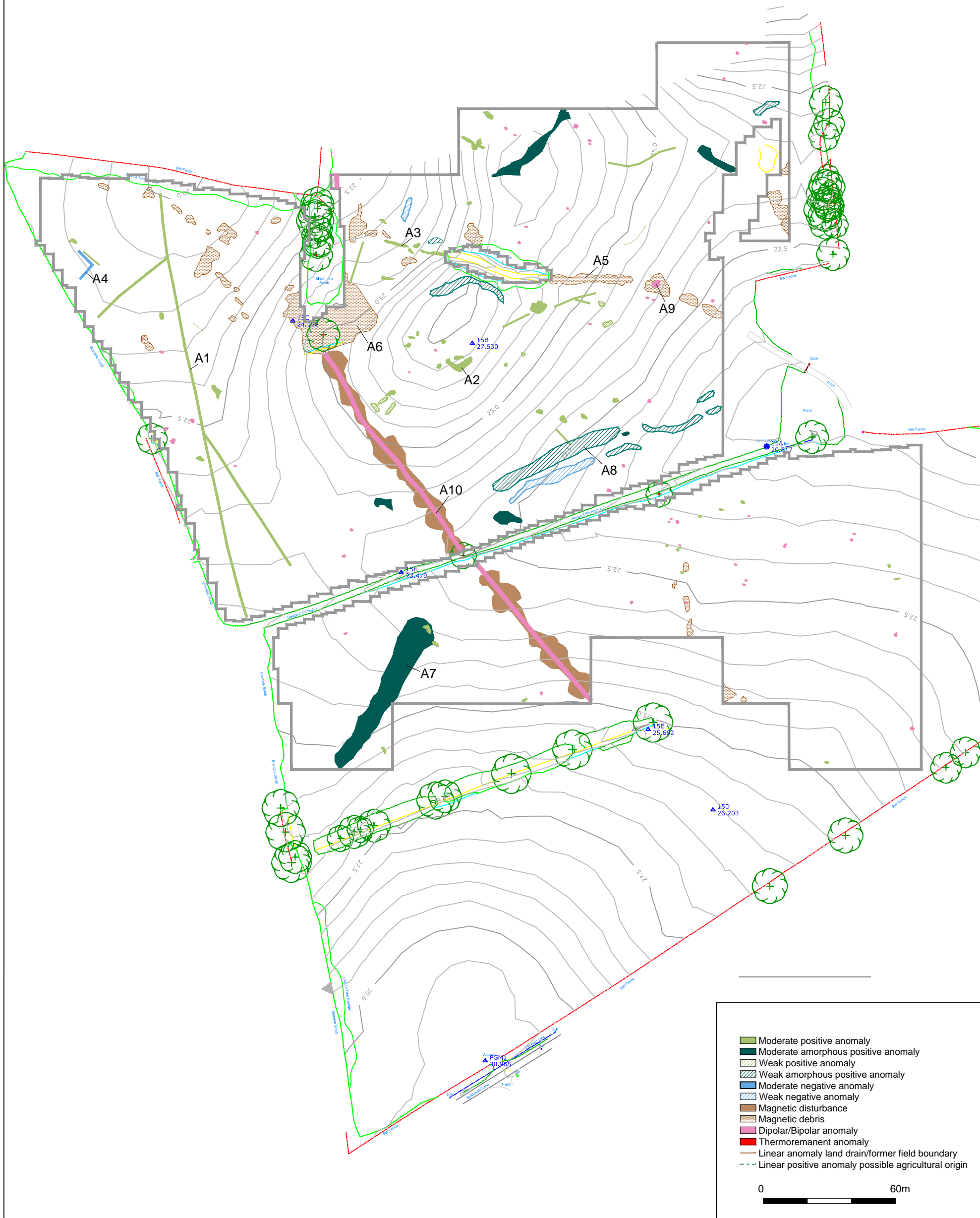
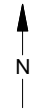




Fig. 7a Area of not surveyed due to ground conditions



Fig. 7b Site shot facing north west. Site of Upper Barn in foreground (beneath tree)



Fig. 7c Possible former trackway facing west

**Sussex Office**

Units 1 & 2  
2 Chapel Place  
Portslade  
East Sussex BN41 1DR  
tel: +44(0)1273 426830  
email: [fau@ucl.ac.uk](mailto:fau@ucl.ac.uk)  
web: [www.archaeologyse.co.uk](http://www.archaeologyse.co.uk)

**Essex Office**

The Old Magistrates Court  
79 South Street  
Braintree  
Essex CM7 3QD  
tel: +44(0)1376 331470  
email: [fau@ucl.ac.uk](mailto:fau@ucl.ac.uk)  
web: [www.archaeologyse.co.uk](http://www.archaeologyse.co.uk)

**London Office**

Centre for Applied Archaeology  
UCL Institute of Archaeology  
31-34 Gordon Square  
London WC1H 0PY  
tel: +44(0)20 7679 4778  
email: [fau@ucl.ac.uk](mailto:fau@ucl.ac.uk)  
web: [www.ucl.ac.uk/caa](http://www.ucl.ac.uk/caa)

