

**Detailed Magnetometer Survey Report  
Land at Shrub Lane  
Burwash, East Sussex**

**NGR: 567950 125484  
(TQ 67950 25484)**

**Site Code: SLB16  
ASE Project No: 160602  
ASE Report No: 2016313  
OASIS ID: archaeol6-259435**




**By John Cook**

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<b>Date of Issue:</b>	August 2016		
<b>Revision:</b>			

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**Abstract**

*Archaeology South-East (ASE) was commissioned by Denton Homes Ltd to conduct a magnetometer survey on a site totalling approximately c.4.6 hectares of land at Shrub Lane, Burwash, East Sussex. The work was undertaken on Tuesday 26th and Wednesday 27th July 2016.*

*Evidence for possible archaeological features is represented by moderate positive and negative anomalies. The northernmost of these features indicates a possible bank and ditch with a sharp turn but otherwise following the contours of the slope and overlooking the valley. In the south of the site broad anomalies suggest a feature such as a Holloway. Neither of these features appear on the 1839 tithe map, where the enclosure is shown as being cultivated for hops, nor do they appear on later Ordnance Survey mapping. Possible cut features such as pits are indicated across the site. A small number of dipolar anomalies may relate to heat related activity such as kilns, ovens or furnaces. However, these are more likely to relate to near surface ferrous (iron) objects..*

**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.*

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## **1.0 INTRODUCTION**

### **1.1 Site background**

- 1.1.1 Archaeology South-East was commissioned by Denton Homes Ltd to conduct a magnetometer survey on a site totalling c.4.6 hectares of land at Shrub Lane, Burwash, East Sussex, henceforth referred to as 'the site' (NGR. 546999 123691; Figure 1).
- 1.1.2 A formal planning application for residential development will be submitted to Rother District Council (RDC) in the near future. Initial consultation with RDC's Archaeological Advisor (Casper Johnson, East Sussex County Council, hereafter 'the ESCC Archaeologist') has established that the application should be supported with a geophysical survey. The resultant report will be submitted to the ESCC Archaeologist and RDC in order to allow informed decisions to be made as to whether or not any planning consent granted for the site should be subject to an archaeological planning condition or if there is justification to undertake intrusive investigation (e.g. trial trenching) ahead of determining planning consent.
- 1.1.3 A Written Scheme of Investigation (WSI) for geophysical survey at the site (ASE 2016) was prepared on behalf of the client and their planning consultant (PRP) was submitted to the ESCC Archaeologist for approval prior to the commencement of fieldwork.

### **1.2 Geology and topography**

- 1.2.1 According to the British Geological Survey (BGS 2016a) 1:50,000 scale geological mapping the bedrock geology of the site comprises Wadhurst Clay mudstone, with outcrops of Tunbridge Wells Sand Formation to the south and west. No superficial deposits are recorded. No boreholes are recorded on the BGS Borehole Viewer (BGS 2016b) on or in the immediate vicinity of the site.
- 1.2.2 The site comprises farmland and woodland totalling approximately 4.6 hectares, bounded to the north-west and north-east by farmland and to the south-west and south-east by housing (Figure 2)

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

- 1.3.1 The general aim of this programme of geophysical survey is to obtain a better understanding of the archaeological potential of the site. This work will allow informed decisions to be made as to the need, nature and scope of any further intrusive investigations and/or mitigation measures that may be required.
- 1.3.2 The geophysical survey will comprise a detailed magnetometer survey within all accessible areas shown on Figure 2. The survey will aim to detect any anomalies of an archaeological origin that are within the boundaries of the survey area. The features detected will naturally be limited to those features that will produce a measurable response to the instrumentation used.

#### **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 Tom Simms. The project was managed by Paul Mason (fieldwork), Jim Stevenson and Dan Swift (post-fieldwork).

## **2.0 ARCHAEOLOGICAL BACKGROUND**

2.1 The following information is taken from the HER consultation report for the site (ESCC 2016; search reference 340/16).

2.2 The site is located to the north-east of the centre of Burwash. The site is not located within an Archaeological Notification Area. There has been limited past archaeological investigation in this area but in the wider 'High Weald' landscape there is an increasing awareness of archaeological potential for a range of periods of human history including:

- Late Upper Palaeolithic and Mesolithic hunter-gatherer activity with a significant increase in activity in the Late Mesolithic/Early Neolithic transitional period
- Early Bronze Age activity (e.g. increasing numbers of ring ditches of possible EBA date, barbed-and-tanged arrow heads, 'Beaker' pottery etc.)
- Middle Bronze Age and Late Bronze Age re-use/continued use of ring ditches and on the better-drained soils the development of field systems and droveways
- Romano-British activity particularly that related to exploitation of the iron resource and the attendant agricultural and economic evidence – with evidence for settlement activity on spurs and higher ground
- Medieval historic landscape, significant aspects of which such as fields and tracks have survived through to the present day.

2.3 Late 19th and early 20th century historic mapping does not show any development on the site.

2.4 A single listed building lies within 150m of the site; 51 and 53 Shrub Lane, an 18th century house.

### **3.0 SURVEY METHODOLOGY**

#### **3.1 Geophysical survey**

3.1.1 A fluxgate gradiometer (magnetometry) survey was undertaken across a single parcel of land, as depicted on Figure 2 (NGR 567950 125484). The work was undertaken on Thursday 14<sup>th</sup> January 2016 during dry, clear and cold weather.

#### **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 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 and processed data greyscale plots.



## 4.0 GEOPHYSICAL SURVEY RESULTS

### 4.1 Description of site

4.1.1 The survey area comprised c.2.6 hectares of the total 4.6 hectare area and consisted of pasture land, bounded by woodland in the west, to the north and north-east by farmland and to the south-west and south-east by housing.

### 4.2 Survey limitations

4.2.1 Physical obstructions encountered on site included hidden dips and wire fences (Figure 2). 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. 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 Evidence of possible archaeological activity included the following described anomalies (Figure 5). The most obvious possible archaeological anomalies are the linear and discrete moderate positive anomalies, noted as A1 and A4, and likely to be due to cut features such as a ditches. These are associated with negative anomalies (A2 and A5) that may relate to archaeological features such as banks and earthworks. However, negative anomalies may also stem from the dipolar effect of certain magnetic anomalies.

4.4.3 A number of discrete moderate positive anomalies may indicate cut features such as pits. However, these anomalies may also relate to in filled natural features.

4.4.4 Negative linear magnetic anomalies (A3) are observed that may relate to services or service trenches and correspond to features noted in aerial photography (figure 6a).

4.4.5 Discrete dipolar anomalies (A6) may relate to thermoremanent may relate to a scattering of near surface ferrous material such as that due to kilns and furnaces or, more likely, near surface ferrous objects.

4.4.6 Magnetic debris (A7) may relate to a scattering of near surface ferrous material, ground disturbance or made ground.

4.4.7 Magnetic disturbance is noted near the site boundary in the south west (A8).

4.4.8 Closely spaced linear anomalies run down the slope (A9) probably the result of ploughing.

## **5.0 CONCLUSIONS**

### **5.1 Discussion**

- 5.1.1 Evidence for possible archaeological features is represented by moderate positive and negative anomalies (A1, A2, A4 and A5). The northernmost of these features (A1 and A2) indicates a possible bank and ditch with a sharp turn but otherwise following the contours of the slope and overlooking the valley. In the south of the site broad anomalies (A4 and A5) suggest a feature such as a hollow-way. Neither of these features appear on the 1839 tithe map, where the enclosure is shown as being cultivated for hops, nor do they appear on later Ordnance Survey mapping.
- 5.1.2 Possible cut features such as pits are indicated across the site. However, these may relate to infilled natural features or to previous agricultural activity such as the aforementioned hop cultivation.
- 5.1.3 Possible services or service trenches (A3) correspond to features noted in aerial photography (figure 6a)
- 5.1.4 A small number of dipolar anomalies (A6) may relate to heat related activity such as kilns, ovens or furnaces. However, these are more likely to relate to near surface ferrous (iron) objects.
- 5.1.5 Magnetic debris (A7) and disturbance (A8) may relate to near or above surface ferrous material, ground disturbance or made ground.
- 5.1.6 Former ploughing (A9) is noted running down the slope.

## **Bibliography**

ASE 2016 Land at Shrub Lane, Burwash, East Sussex: Written Scheme of Investigation for a Magnetometer Survey.

BGS 2016a. *Geology of Britain Viewer*

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Accessed 4<sup>th</sup> July 2016

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

Accessed 4<sup>th</sup> July 2016

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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 Denton Homes Ltd for commissioning the survey.

## HER Summary

<b>Site code</b>	SLB16				
<b>Project code</b>	160602				
<b>Planning reference</b>					
<b>Site address</b>	Land at Shrub Lane, Burwash, East Sussex				
<b>District/Borough</b>	East Sussex				
<b>NGR (12 figures)</b>	567950 125484				
<b>Geology</b>	Wadhurst Clay mudstone, with outcrops of Tunbridge Wells Sand Formation				
<b>Fieldwork type</b>				Survey	
<b>Date of fieldwork</b>	26 <sup>th</sup> -27 <sup>th</sup> July 2016				
<b>Sponsor/client</b>	Denton Homes Ltd				
<b>Project manager</b>	Neil Griffin				
<b>Project supervisor</b>	John Cook				
<b>Period summary</b>					
<b>Project summary</b>	<p>Archaeology South-East was commissioned by Denton Homes Ltd to conduct a magnetometer survey on a site totalling approximately c.4.6 hectares of land at Shrub Lane, Burwash, East Sussex. The work was undertaken on Tuesday 26th and Wednesday 27th July 2016. Evidence for possible archaeological features is represented by moderate positive and negative anomalies. The northernmost of these features indicates a possible bank and ditch with a sharp turn but otherwise following the contours of the slope and overlooking the valley. In the south of the site broad anomalies suggest a feature such as a Holloway. Neither of these features appear on the 1839 tithe map, where the enclosure is shown as being cultivated for hops, nor do they appear on later Ordnance Survey mapping. Possible cut features such as pits are indicated across the site. A small number of dipolar anomalies may relate to heat related activity such as kilns, ovens or furnaces.</p>				

**OASIS ID: archaeol6-259435**

Project details

Project name Detailed Magnetometer Survey: land at Shrub Lane,  
Burwash, East Sussex

Short description of the project Archaeology South-East was commissioned by Denton Homes Ltd to conduct a magnetometer survey on a site totalling approximately c.4.6 hectares of land at Shrub Lane, Burwash, East Sussex. The work was undertaken on Tuesday 26th and Wednesday 27th July 2016. Evidence for possible archaeological features is represented by moderate positive and negative anomalies. The northernmost of these features indicates a possible bank and ditch with a sharp turn but otherwise following the contours of the slope and overlooking the valley. In the south of the site broad anomalies suggest a feature such as a Holloway. Neither of these features appear on the 1839 tithe map, where the enclosure is shown as being cultivated for hops, nor do they appear on later Ordnance Survey mapping. Possible cut features such as pits are indicated across the site. A small number of dipolar anomalies may relate to heat related activity such as kilns, ovens or furnaces. However, these are more likely to relate to near surface ferrous (iron) objects.

Project dates Start: 26-07-2016 End: 27-07-2016

Previous/future work Not known / Not known

Any associated project reference codes 160602 - Contracting Unit No.

Any associated project reference codes SLB16 - Sitecode

Type of project Field evaluation

Site status None

Current Land use Grassland Heathland 1 - Heathland

Monument type NONE None

Monument type 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)	Wadhurst Clay
Drift geology	Unknown
Techniques	Magnetometry
Project location	
Country	England
Site location	EAST SUSSEX ROTHER BURWASH Land at Shrub Lane, Burwash, East Sussex
Postcode	TN19 7BU
Study area	2.6 Hectares
Site coordinates	TQ 67950 25484 51.003614616498 0.394049722211 51 00 13 N 000 23 38 E 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	Developer
Name of sponsor/funding body	Denton Homes Ltd

Project archives	
Physical Archive Exists?	No
Digital Archive recipient	ASE
Digital Media available	"Geophysics", "Images raster / digital photography"
Paper Archive Exists?	No
Project bibliography	
1	
Publication type	Grey literature (unpublished document/manuscript)
Title	Detailed Magnetometer Survey: land at Shrub Lane, Burwash, East Sussex
Author(s)/Editor(s)	Cook, J.
Other bibliographic details	2016313
Date	2016
Issuer or publisher	Archaeology South East
Place of issue or publication	Portslade, East Sussex
Entered by	John Cook (john.cook@ucl.ac.uk)
Entered on	5 August 2016



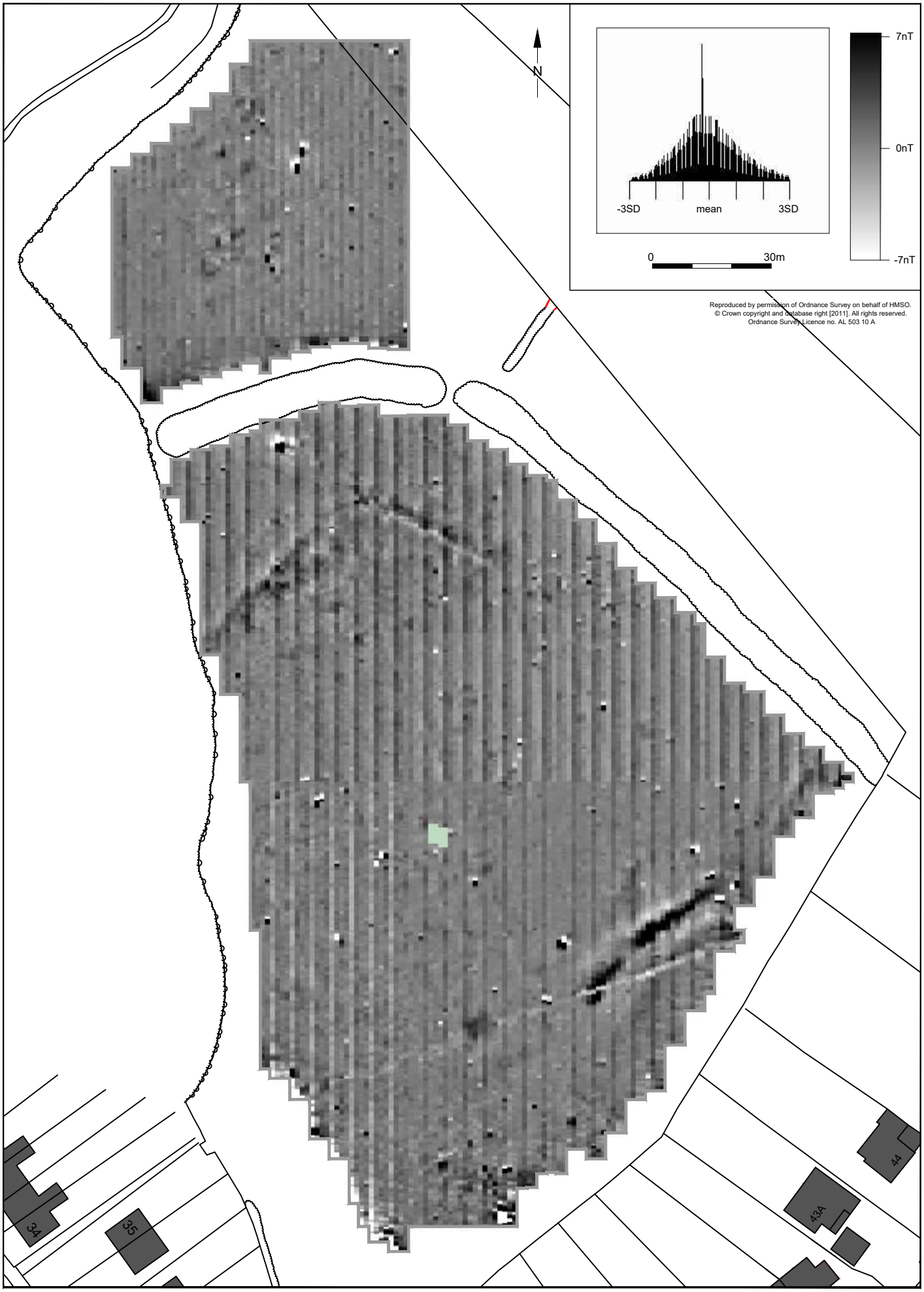


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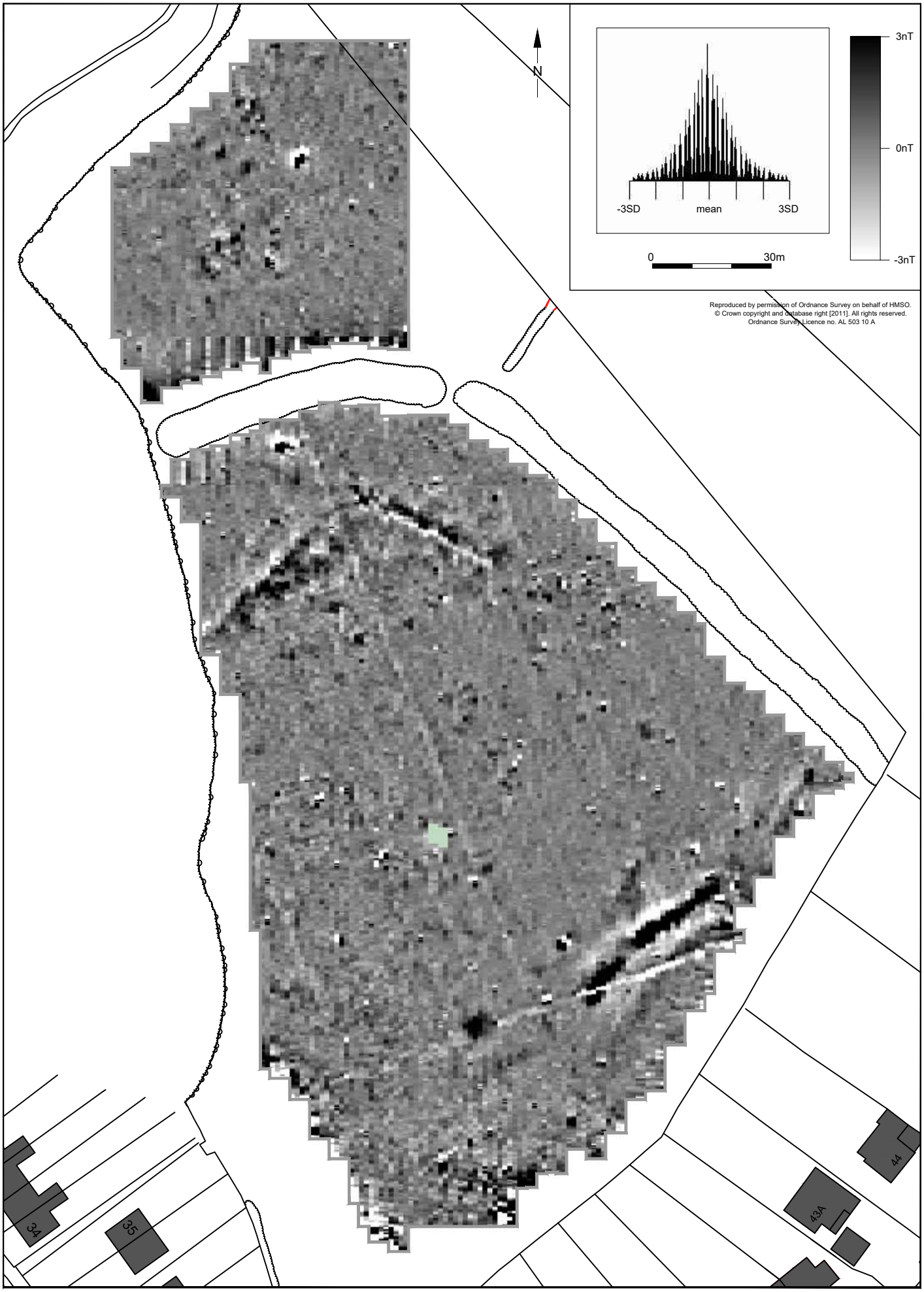
© Archaeology South-East		Land at Shrub Lane, Burwash, East Sussex	Fig. 1
Project Ref: 160602	August 2016	Site location	
Report Ref: 2016313	Drawn by: JC		



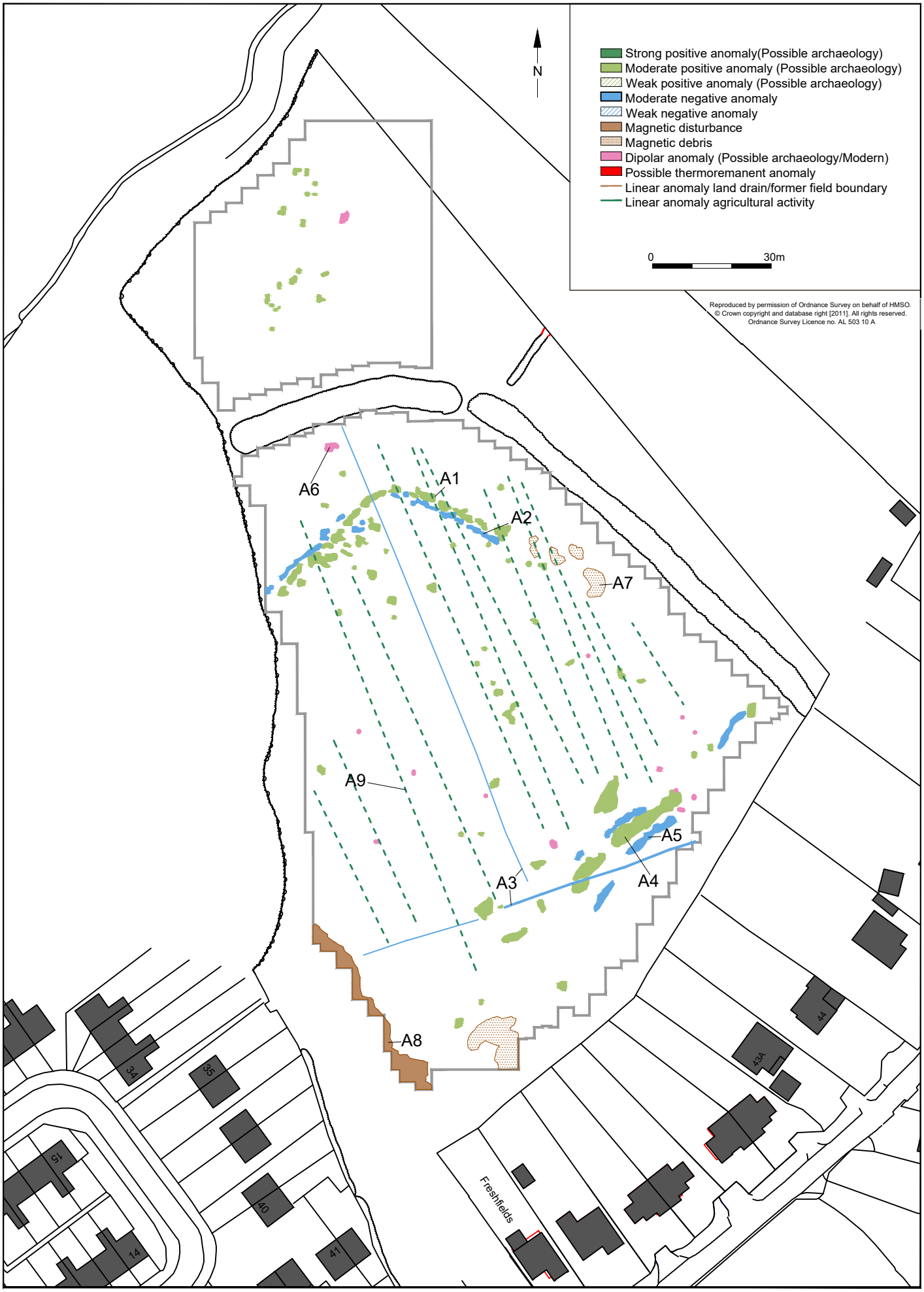
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Project Ref: 160602	August 2016	Site plan		
Report Ref: 2016313	Drawn by: JC			



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Project Ref: 160602	August 2016	Raw data	
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Project Ref: 160602	August 2016	Processed data	
Report Ref: 2016313	Drawn by: JC		



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Project Ref: 160602	August 2016	Interpretation		
Report Ref: 2016313	Drawn by: JC			



Fig. 6a Oblique Google Earth imagery showing scars for possible service trenches or tracks



Fig. 6b Oblique Google Earth 3D imagery with geophysical survey data overlain 75% transparency

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Project Ref: 160602	August 2016	Google Earth images	
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Fig. 7a Vertical Google Earth 3D imagery with geophysical survey data overlain showing survey in relation to Burwash (possible ditch in red, possible hollow way in magenta)

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Project Ref: 160602	August 2016	Google Earth images	
Report Ref: 2016313	Drawn by: JC		



Fig. 7a geophysical survey area from southern corner



Fig. 7b geophysical survey area showing vegetation



Fig. 7c geophysical survey area looking north showing wire fence

© <b>Archaeology South-East</b>		Shrub Lane, Burwash, East Sussex	Fig. 8
Project Ref: 160602	August 2016	Site photographs	
Report Ref: 2016313	Drawn by: JC		



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