Archaeology South-East

ASE

Detailed Magnetometer Survey Report
First Time Sewerage Scheme
Three Oaks, East Sussex

NGR 583969 114646
NGR TQ 839 146

Rother District Council (Delegated to ESCC)
Planning Reference: RR/2014/2177/CM

Site Code: TOS 14
ASE Project No: 6599

OASIS ID: archaeol6-190623
ASE Report No: 2014312

By Catherine Douglas

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By Catherine Douglas

September 2014

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
www.archaeologyse.co.uk

Abstract

Archaeology South East was commissioned by The Clancy Group to carry out a detailed fluxgate gradiometer survey on land at Three Oaks, East Sussex, prior to construction of a pumping station with contractor's compound, and a water treatment works. The survey covered approximately 1.5 hectares and took place between the 11th and 12th September 2014. The survey area consisted of three crop fields, north and south of Butcher's Lane.

The survey successfully detected limited evidence for possible archaeological activity. This evidence was largely restricted to a number of linear moderate positive anomalies and three discrete moderate positive anomalies. Evidence for later agricultural activity in the form of plough marks was also identified.

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

1.0 INTRODUCTION

1.1 Site background

1.1.1 Archaeology South-East was commissioned by The Clancy Group to conduct a Magnetometer survey on land at Three Oaks, East Sussex hitherto referred to as 'the survey area' (NGR 583969 114646; Figure 1).

1.1.2 The two major areas of potential impact from the proposed development are the construction of the pumping station / contractor's compound at the north of the scheme (Area 2), and the water treatment works at the south (Area 1). It is assumed that excavations and construction processes will truncate or destroy any surviving archaeological features within these areas.

1.2 Geology and topography

1.2.1 The village of Three Oaks is situated on a south-west facing slope, with the land to the north-east lying at around 50m OD, falling to around 20m OD at the south-west. It is bisected by the Hastings to Rye railway line, which cuts into and follows the slope around the 30 metre contour.

1.2.2 Sailor's Stream, a tributary of the River Brede which forms the northern boundary of Guestling parish, runs approximately north-south to the west of the village.

1.2.3 According to the British Geological Survey (2014) the site is located in an area of complex interbedded mudstone, sandstone and siltstone of both the Wadhurst Clay Formation to the north and Ashdown Formation to the south. Superficial deposits in this area are sparse, though immediately to the east of Fourteen Acre Lane at the north-east end of the village lies an area of head deposits, and a narrow band of alluvium extends along the north-south aligned road at the western end of the village (ASE 2014a).

1.2.4 A recent geotechnical investigation (Ashdown Site Investigation, 2014) corroborates the British Geological Survey data. This investigation records that beneath topsoil deposits varying between 0.10 and 0.70m, the geology of the western part of the site comprises Ashdown Formation deposits, with Wadhurst Clay Formation overlain by head deposits in the east. (ASE 2014a).

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 Catherine Douglas and Liz Chambers; project managed by Neil Griffin (fieldwork) and by Jim Stevenson and Dan Swift (post fieldwork).

2.0 ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

2.1.1 The Historic Environment Record maintained by East Sussex County Council (ESCC), and held at The Keep, Falmer, was consulted, together with the NMR National Inventory and Excavation Index. Listed Building and Conservation Area data was acquired from English Heritage and Rother District Council. Details were taken of all archaeological sites and listed buildings within the defined Study Area. These are discussed in detail in the Desk Based Assessment (ASE 2014a) and have been summarised below.

2.1.2 There are no scheduled monuments within the Study Area, the closest being a late medieval kiln site near Park Wood, approximately 2.5 kilometers to the southwest.

2.2 Archaeological Periods Represented

2.2.1 The timescale of the archaeological periods referred to in this report is shown below. The periods are given their usual titles. It should be noted that for most cultural heritage assessment purposes the boundaries between them are not sharply distinguished, even where definite dates based on historical events are used.

Palaeolithic c. 750,000 BC - c. 10,000 BC
Mesolithic c. 10,000 BC - c. 5000 BC
Neolithic c. 5000 BC - c. 2300 BC
Bronze Age c. 2300 BC - c. 600 BC
Iron Age c. 600 BC - AD 43
Romano-British: AD 43 - c. AD 410
Anglo-Saxon: c. AD 410 - AD 1066
Medieval: AD 1066 - AD 1540
Post-medieval: AD 1540 to date

2.3 Prehistoric

2.3.1 The East Sussex HER records no finds of prehistoric date within the Study Area, though a Bronze Age hoard of four palstave axes was found immediately to the north- west (HER MES8739).

2.4 Roman

2.4.1 Evidence for Roman activity in the Weald is sparse, confined mainly to roads and ironworking sites. Few settlement sites have been found in the Weald (Rudling 1999), although some sites such as villas at Chiddingfold in Surrey and Wiggonholt in West Sussex are known from the less bleak periphery. In and around the Hastings area, evidence for the Roman period is somewhat lacking, with most occupation occurring on the High Weald and associated with exploiting the natural resources of the area for iron production (Rudling 1999). There is little evidence for agricultural activity in the region at this time

(ASE 2014a).

2.4.2 The East Sussex HER records no Roman finds within the Study Area:

2.5 Anglo-Saxon

2.5.1 The East Sussex HER records no Anglo-Saxon finds or sites within the Study Area, though a sherd of pottery from the rim of a Middle to Late Saxon cooking pot was found at Brickyard Wood (previously Hoads Wood), approximately 300 metres to the southeast (HER MES2607).

2.6 Medieval

2.6.1 The East Sussex HER records four medieval sites within the Study Area, one of which is the listed building Great Maxfield while the remainder are farmsteads associated with listed buildings.

2.7 Post-Medieval

2.7.1 The landscape evident within the Weald in the present day is largely a fossilised late medieval landscape, comprising small irregular fields, carved (assarted) from the surrounding woodland, much of which has been left as shaws. These were often managed for woodland products, through coppicing and the exploitation of timber, ultimately supplying the huge resource demands of the local iron working and ship building industries. Scattered across this landscape are a number of large farms, often comprising buildings of early post-medieval date, but occupying sites several centuries older.

2.7.2 Some modification of the field pattern, including the grubbing out of shaws, took place during the 19th century when advances in technology allowed arable farming to be carried out on a much greater scale than before.

2.7.3 The East Sussex HER lists 10 post-medieval entries within the Study Area. These comprise 9 listed buildings and the railway platform of Three Oaks & Guestling Halt.

3.0 SURVEY METHODOLOGY

3.1 Geophysical survey

3.1.1 A fluxgate gradiometer (magnetometry) survey was undertaken in two areas depicted on Figure 2.

3.1.2 The fieldwork was undertaken on 11th and 12th September 2014 when the weather was hot, sunny and humid, with one light shower.

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.

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. Figures 4 and 7 display the processed survey data.

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 (Figures 3, 4, 6 and 7) as raw data and processed data greyscale plots. Interpretations are presented in Figures 5 and 8 and this information is overlain onto the proposed development in Figures 9 and 10.

4.0 GEOPHYSICAL SURVEY RESULTS (Figures 3 to 10)

4.1 Description of site

4.1.1 The survey area consisted of approximately 1.5 hectares of agricultural land. Area 1 comprised two recently harvested crop fields, separated by bushes and woodland. The fields were bounded by Butcher's Lane to the north and rock lane to the south-west, and a stream separated the fields from further open land to the east.

4.1.2 Area 2 was situated 750m north-east of Area 1. The survey area comprised the southern corner of a recently harvested crop field bounded by Butcher's Lane to the south, Fourteen Acre Lane to the West, and North Lane to the north-east.

4.2 Survey limitations

4.2.1 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.

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 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.

4.4 Interpretation of fluxgate gradiometer results

Area 1

(Figure 5)

4.4.1 The most significant anomalies noted in Area 1 comprised linear moderate positive anomalies. Two corresponding linear moderate positive anomalies identified in the west field and another in the east field may represent cut features such as ditches.

4.4.2 A number of surrounding linear moderate and weak positive anomalies throughout the area may represent agricultural practices such as ploughing. The anomalies are all quite equally spaced apart and appear to be on the same alignment as the field boundaries.

4.4.3 Occasional discrete moderate positive anomalies may reflect cut features such as pits. However, these anomalies may also relate to in filled natural features or more modern agricultural activity.

4.4.4 A moderate amorphous positive anomaly in the north-east part of the area may indicate a change in geology.

4.4.5 An area of magnetic disturbance was identified in the north-east end of the field. This is probably related to an electricity service in the corner of the field. A smaller area of magnetic disturbance may result from previously excavated boreholes in this area.

4.4.6 A scattering of dipolar/bipolar anomalies may reflect buried kilns or ovens or may result from discreet ferrous objects in the near surface of the field.

Area 2

(Figure 8)

4.4.7 Evidence of potential archaeological features in Area 2 consisted of two parallel linear moderate positive anomalies which may reflect cut features such as ditches.

4.4.8 A further two linear weak-moderate positive anomalies may also reflect cut features such as ditches. However these are slightly more ephemeral, possibly suggesting plough marks.

4.4.9 A discrete moderate positive anomaly may reflect a cut feature such as a pit. However this may also represent an infilled natural hollow.

4.4.10 An area of magnetic disturbance surrounding the edge of the field is probably a result of metal within the hedgerow or cars and objects within the road.

4.4.11 A small number of discrete dipolar/bipolar anomalies were identified in area 2. These may reflect buried kilns or ovens, but are more likely to result from large discreet ferrous materials on or just under the surface of the ploughed field.

5.0 CONCLUSION

5.1 Discussion

5.1.1 Evidence for archaeological features within the magnetic survey was, in general, relatively sparse. However, the survey did successfully detect a small number of linear anomalies of possible archaeological origin across the site. Other possible features included two discrete moderate positive anomalies identified in Area 1, and another in Area 2.

5.1.2 The anomalies identified have been assessed in relation to historic mapping (ASE 2014a). Several linear moderate positive anomalies of probable agricultural origin were identified. These anomalies run in at least two different directions indicating multiple phases of agriculture. Cartographic evidence shows Areas 1 and 2 have been mostly open land used for agriculture from as early as 1668. However, these anomalies are also cut features and a number of them may also relate to archaeological features. The moderate amorphous positive anomaly noted in Area 1, Figure 5, may relate to the former watercourse marked as Sailors Stream on the Hundred of Guestling, 1788.

5.1.3 It is important to remember that 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.

Bibliography

ASE 2014a *Three Oaks First-Time Sewerage Scheme: Historic Environment Desk Based Assessment*

ASE 2014b *Written Scheme of Investigation: Three Oaks First-Time Sewerage Scheme*

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David, A. 2nd Edition 2008. *Geophysical Survey in Archaeological Field Evaluation.* English Heritage: Research and Professional Services Guideline no.1

Acknowledgements

Archaeology South-East would like to thank The Clancy Group for commissioning the survey, in particular Nishil Dhanani. The helpful comments and assistance provided by Casper Johnson, ESCC Archaeologist throughout this project are also gratefully acknowledged.

HER Summary

Identification Name and Address	Three Oaks First Time Sewerage Scheme					
County, District &/or Borough	East Sussex					
OS Grid Refs.	583969 114646					
Geology	Wadhurst Clay Formation					
Arch. South-East Project Number	6599					
Type of Fieldwork					Survey	
Type of Site	Green Field					
Dates of Fieldwork				11th - 12th September 2014		
Sponsor/Client	The Clancy Group					
Project Manager	Neil Griffin					
Project Supervisor	Catherine Douglas					
Period Summary						

Summary

Archaeology South East was commissioned by The Clancy Group to carry out a detailed fluxgate gradiometer survey on land at Three Oaks, East Sussex, prior to construction of a pumping station with contractor's compound, and a water treatment works. The survey covered approximately 1.5 hectares and took place between the 11th and 12th September 2014.

The survey area consisted of three crop fields, north and south of Butcher's Lane. The survey successfully detected limited evidence for possible archaeological activity. This evidence was largely restricted to a number of linear moderate positive anomalies and three discrete moderate positive anomalies. Evidence for later agricultural activity in the form of plough marks was also identified.

OASIS form

OASIS ID: archaeol6-190623

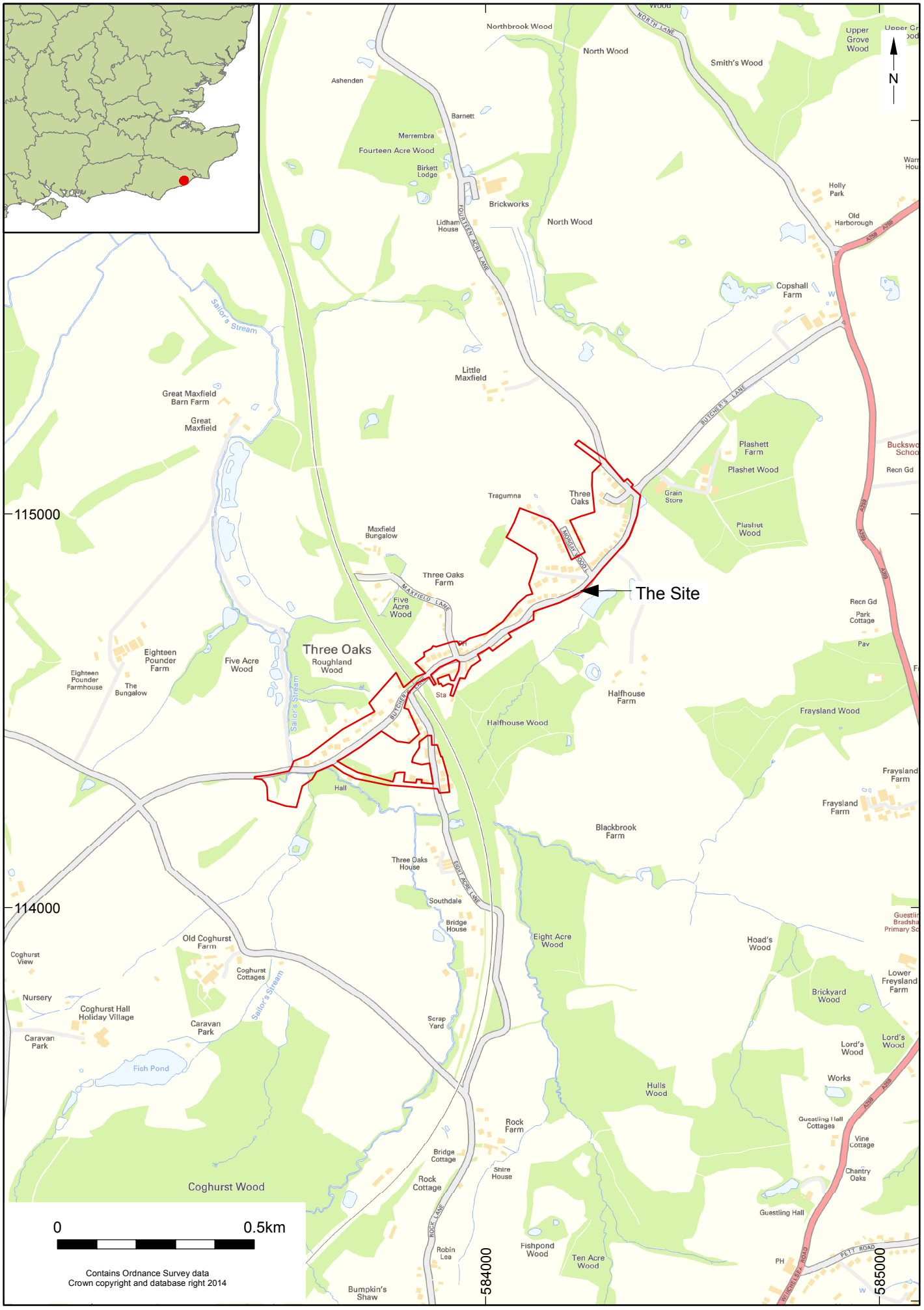
Project details	
Project name	Detailed Magnetometer Survey: Three Oaks First Time Sewerage Scheme
Short description of the project	Archaeology South East was commissioned by The Clancy Group to carry out a detailed fluxgate gradiometer survey on land at Three Oaks, East Sussex, prior to construction of a pumping station with contractor's compound, and a water treatment works. The survey covered approximately 1.5 hectares and took place between the 11th and 12th September 2014. The survey area consisted of three crop fields, north and south of Butcher's Lane. The survey successfully detected limited evidence for possible archaeological activity. This evidence was largely restricted to a number of linear moderate positive anomalies and three discrete moderate positive anomalies. Evidence for later agricultural activity in the form of plough marks was also identified.
Project dates	Start: 11-09-2014 End: 12-09-2014
Previous/future work	No / Yes
Type of project	Recording project
Site status	None
Current Land use	Cultivated Land 2 - Operations to a depth less than 0.25m
Investigation type	"Geophysical Survey"
Prompt	Planning condition
Solid geology	WEALD CLAY
Drift geology	ALLUVIUM
Techniques	Magnetometry
Project location	
Country	England
Site location	EAST SUSSEX ROTHER GUESTLING Three Oaks First Time Sewerage Scheme
Postcode	TN35 4NG
Study area	1.50 Hectares
Site coordinates	TQ 583969 114646 50.8803492851 0.251893652522 50 52 49 N 000 15 06 E Point
Project creators	
Name of Organisation	Archaeology South-East

Project brief originator	East Sussex County Council
Project design originator	Archaeology South-East
Project director/manager	Neil Griffin
Project supervisor	Catherine Douglas
Type of sponsor/funding body	Client
Name of sponsor/funding body	The Clancy Group

Project archives

Physical Archive Exists?	No
Digital Archive recipient	Local Museum
Digital Contents	"Survey"
Digital Media available	"Geophysics","Survey"
Paper Archive recipient	Local Museum
Paper Media available	"Report"

Entered by	Catherine Douglas (catherine.douglas@ucl.ac.uk)
Entered on	19 September 2014



© Archaeology South-East		Three Oaks First Time Sewerage Scheme, East Sussex	Fig. 1
Project Ref: 6599	September 2014	Site location	
Report Ref: 2014312	Drawn by: JC		

Area 2

N

584500, 114750

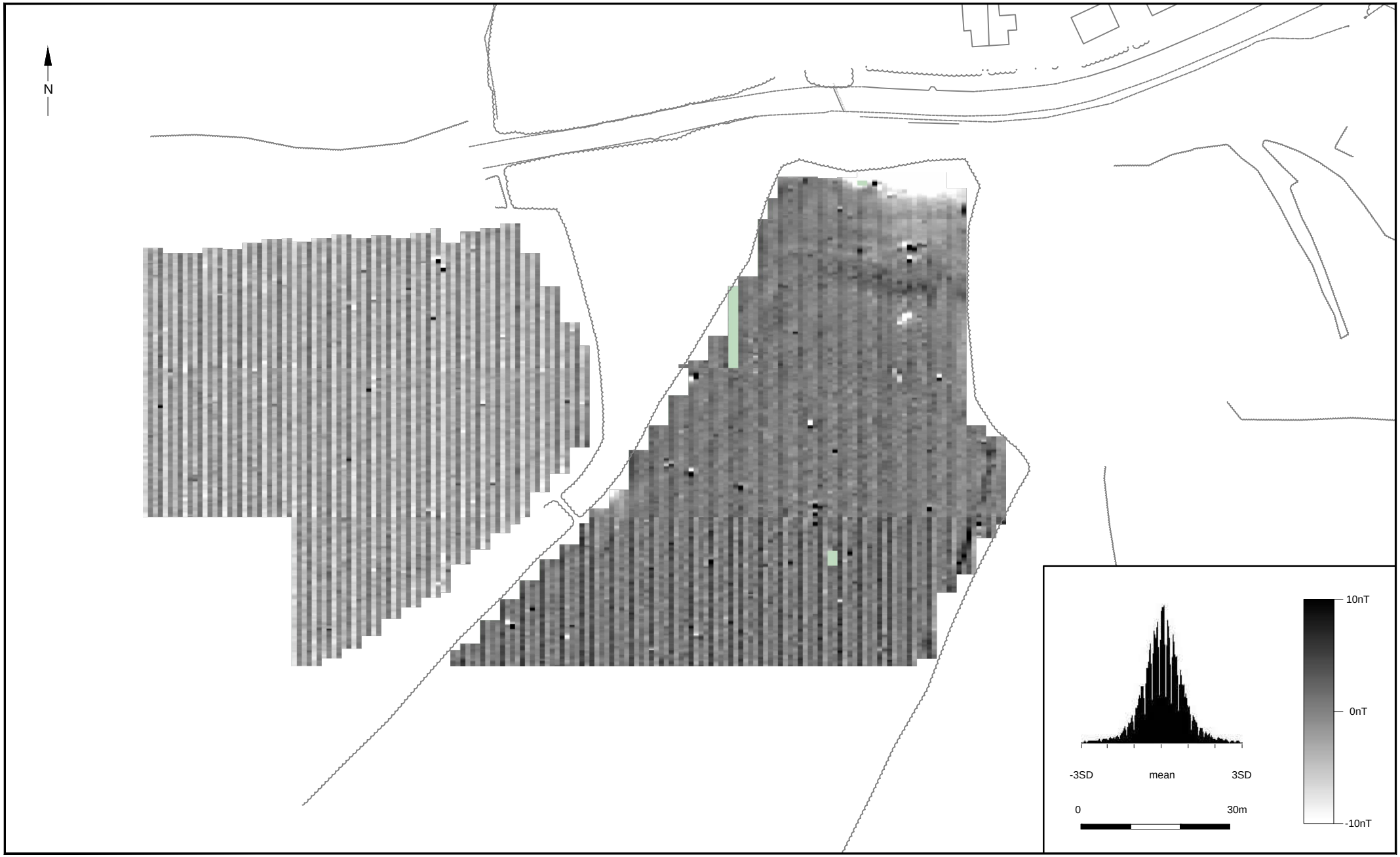
Site Boundary

583250, 114500

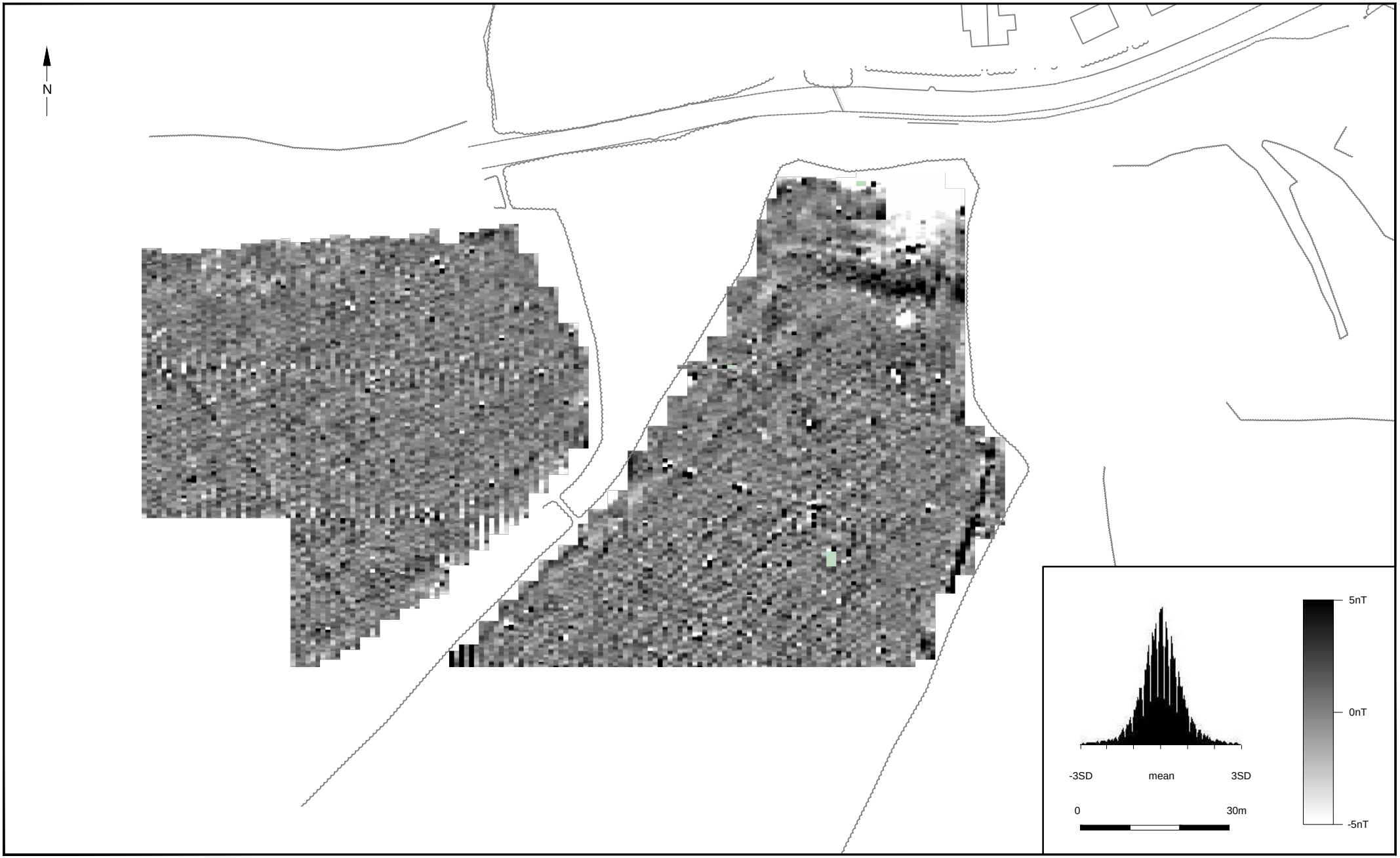
Area 1

0 100m

© **Archaeology South-East**		Three Oaks First Time Sewerage Scheme	Fig. 2
Project Ref: 6599	Sept 2014	Site plan	
Report Ref: 2014312	Drawn by: JLR		

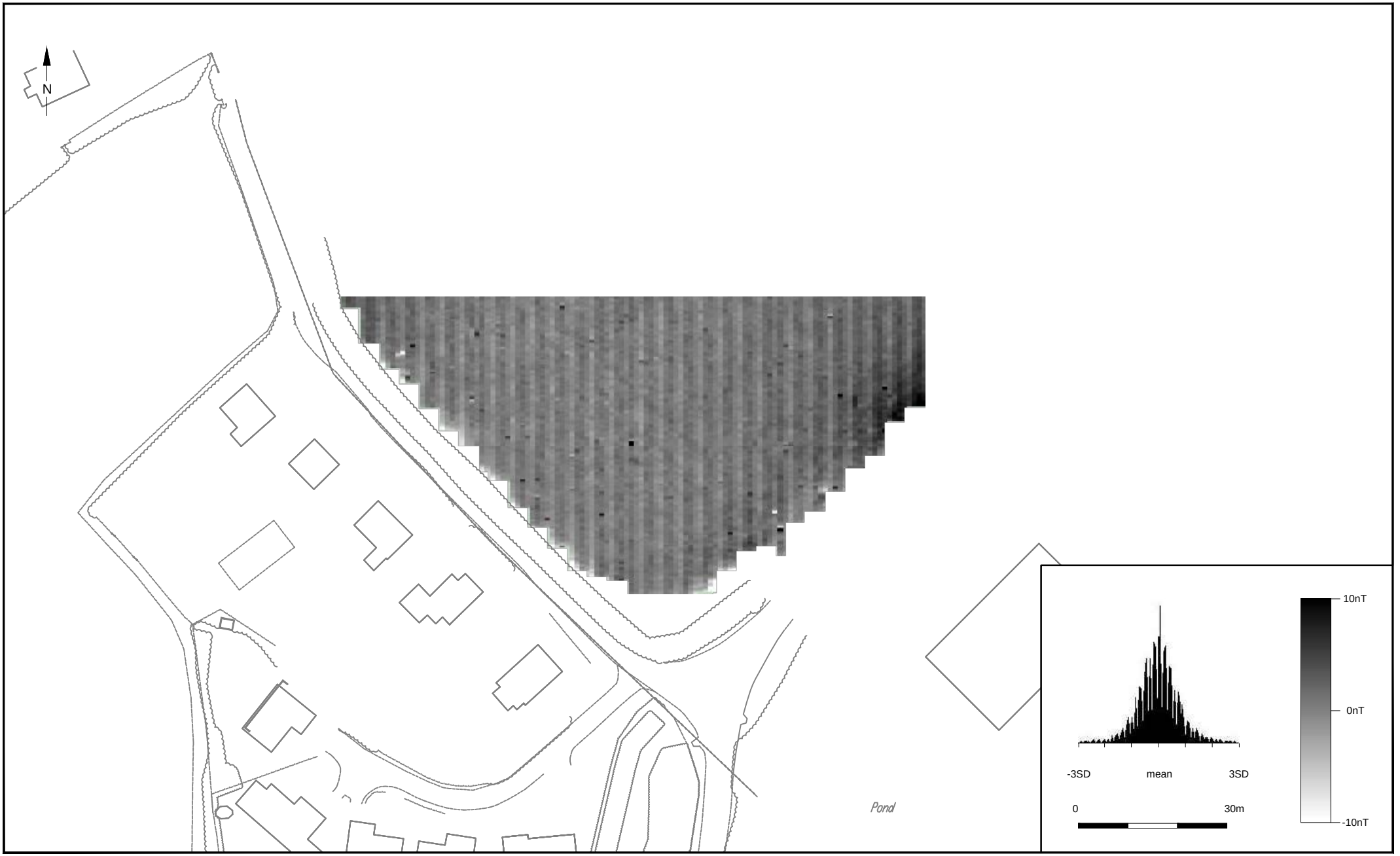


© Archaeology South-East		Three Oaks First Time Sewerage Scheme	Fig. 3
Project Ref: 6599	Sept 2014	Area 1 raw shade plot	
Report Ref: 2014312	Drawn by: JLR		

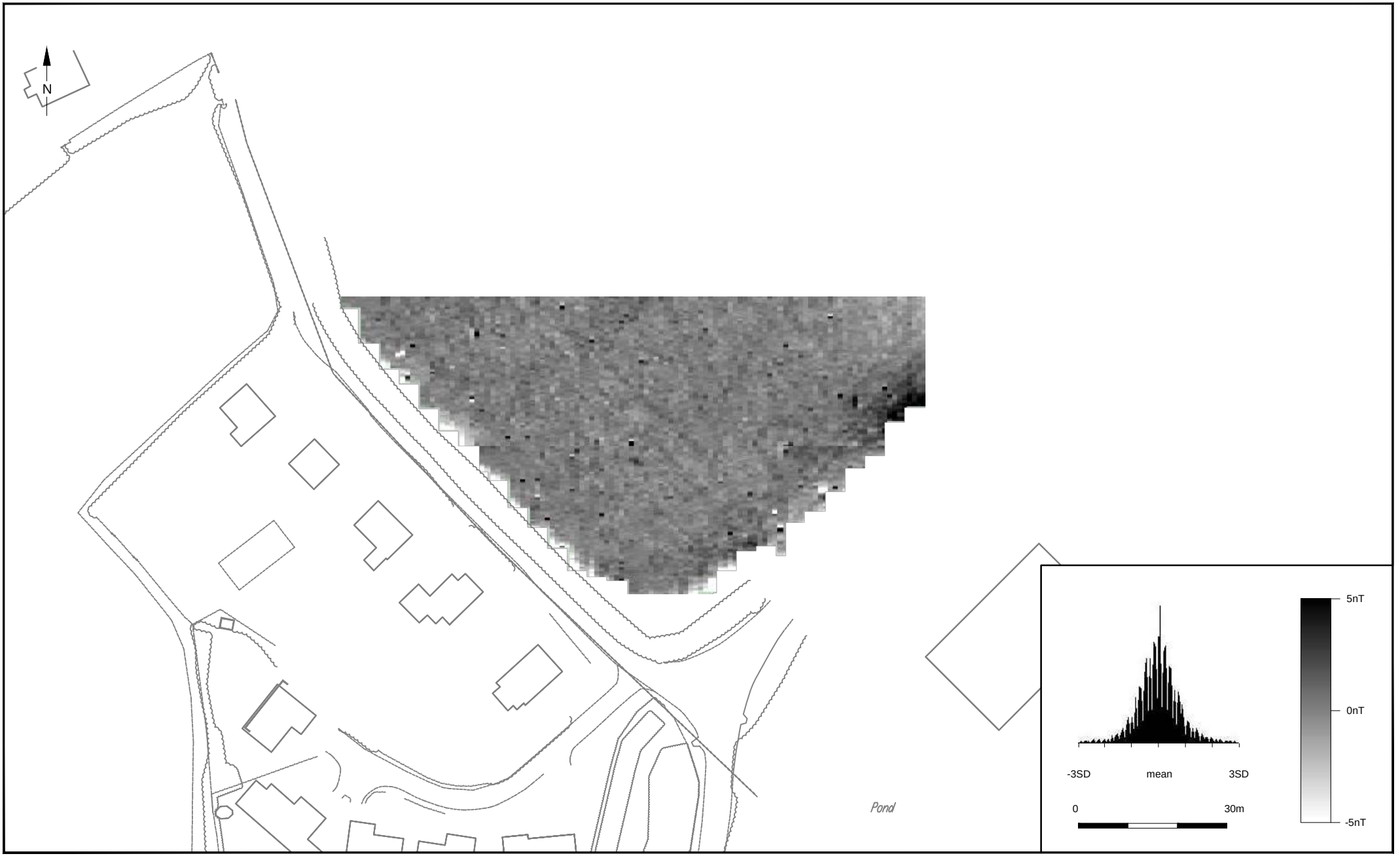


© Archaeology South-East		Three Oaks First Time Sewerage Scheme	Fig. 4
Project Ref: 6599	Sept 2014	Area 1 processed shade plot	
Report Ref: 2014312	Drawn by: JC		

© Archaeology South-East		Three Oaks First Time Sewerage Scheme	Fig. 5
Project Ref: 6599	Sept 2014	Area 1 interpretation	
Report Ref: 2014312	Drawn by: JC		



© Archaeology South-East		Three Oaks First Time Sewerage Scheme	Fig. 6
Project Ref: 6599	Sept 2014	Area 2 raw shade plot	
Report Ref: 2014312	Drawn by: JC		



© Archaeology South-East		Three Oaks First Time Sewerage Scheme	Fig. 7
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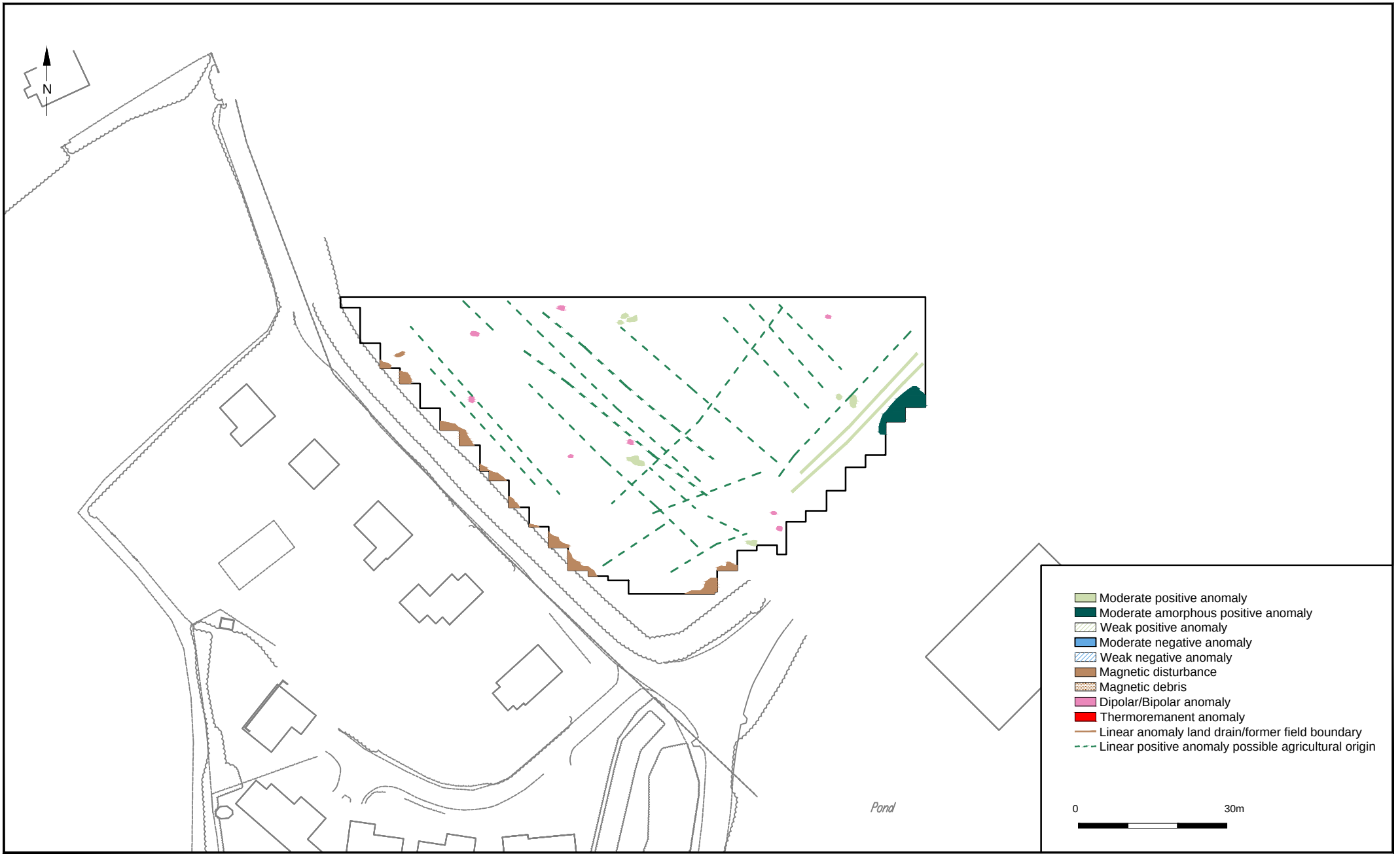

© Archaeology South-East		Three Oaks First Time Sewerage Scheme	Fig.8
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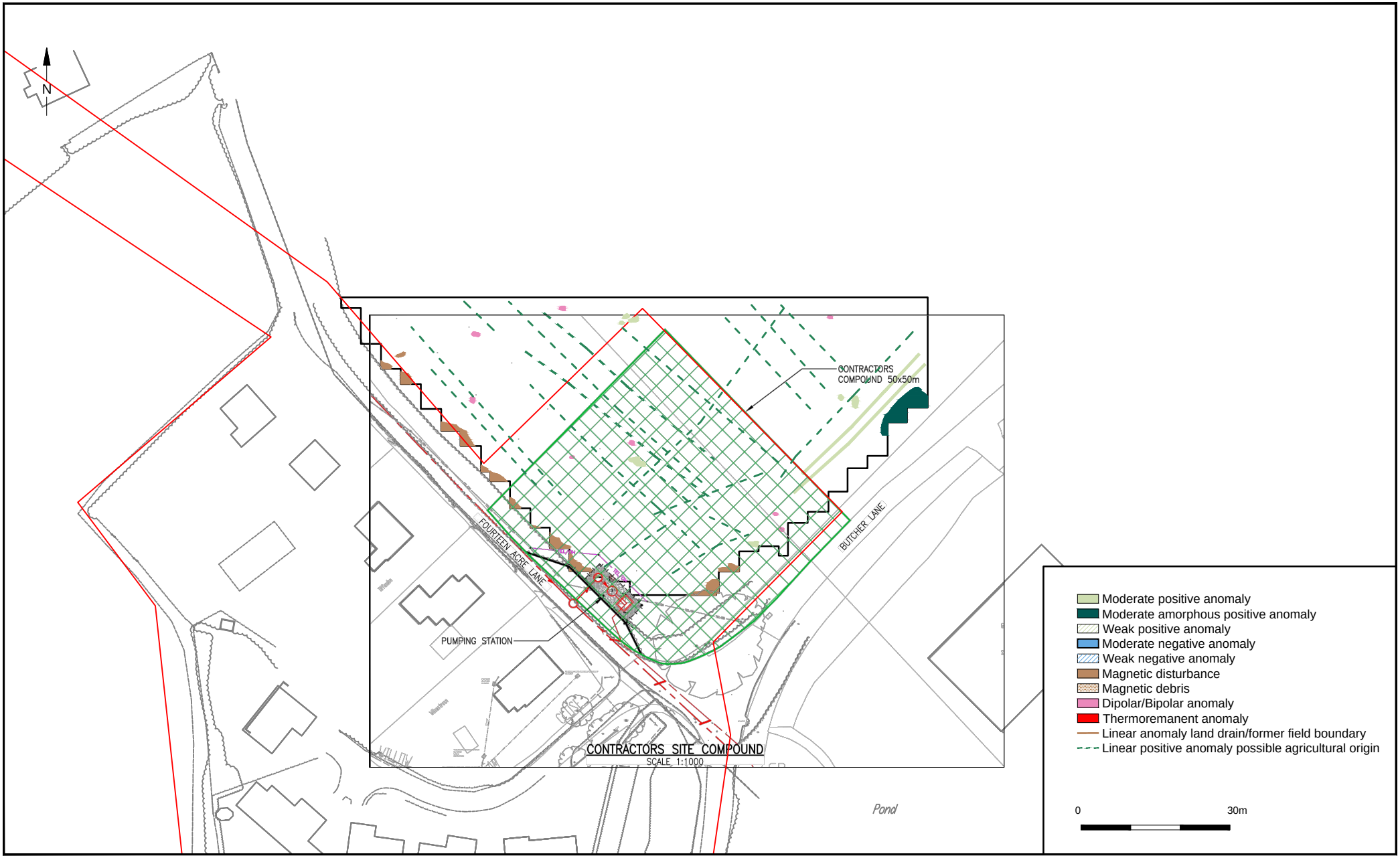
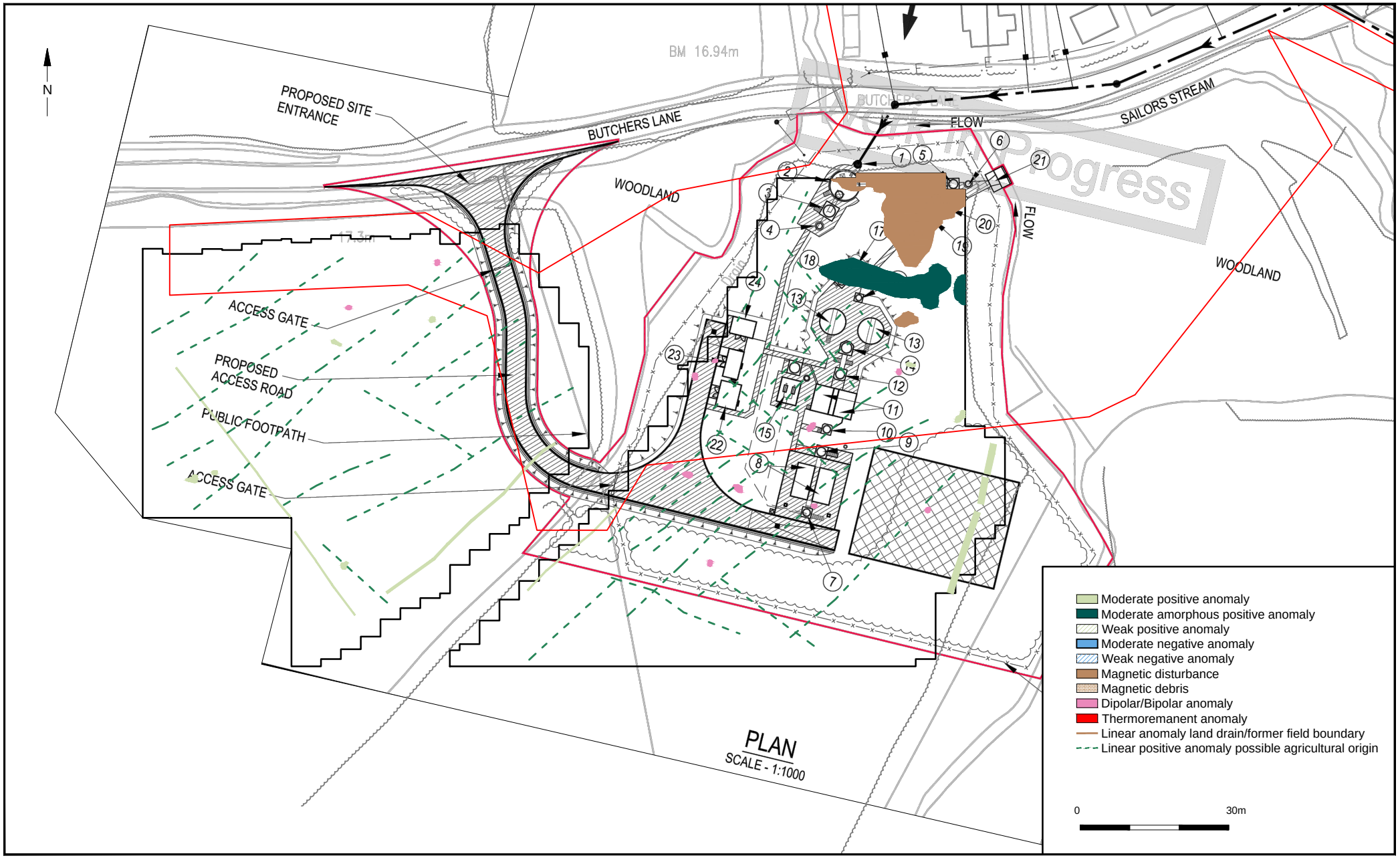


© Archaeology South-East		Three Oaks First Time Sewerage Scheme	Fig.10
Project Ref: 6599	Sept 2014	Area 2 interpretation over proposed pumping station	
Report Ref: 2014312	Drawn by: JC		



© Archaeology South-East		Three Oaks First Time Sewerage Scheme	Fig. 9
Project Ref: 6599	Sept 2014	Area 1 interpretation over proposed WTW	
Report Ref: 2014312	Drawn by: JC		

Sussex Office
Units 1 & 2
2 Chapel Place
Portslade
East Sussex BN41 1DR
tel: +44(0)1273 426830
email: fau@ucl.ac.uk
web: 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
web: 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
web: www.ucl.ac.uk/caa