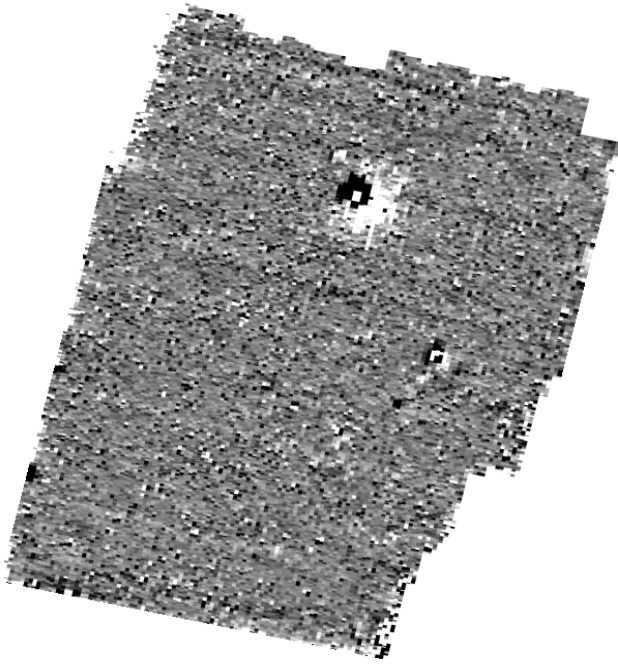




Northamptonshire Archaeology

Archaeological geophysical survey of land at
Kenninghall Road, East Harling
Norfolk, June 2011



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Report 11/127

June 2011



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QUALITY CONTROL

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OASIS REPORT FORM

PROJECT DETAILS		
Project title	Archaeological geophysical survey of land at Kenninghall Road, East Harling, Norfolk, June 2011	
Short description	Northamptonshire Archaeology was commissioned by ULAS, on behalf of Heritage Developments Limited, to conduct a detailed geophysical survey of a proposed development site at Kenninghall Road, East Harling, Norfolk, by a combination of detailed magnetometer and earth resistance survey. This has revealed medieval ridge and furrow cultivation.	
Project type	Geophysical Survey	
Site Status	None	
Previous work	Desk-Based Assessment (Howlett 2010)	
Current land use	Overgrown Pasture	
Future work	Unknown	
Monument type and period		
PROJECT LOCATION		
County	Norfolk	
Site address	Land off Kenninghall Road, East Harling	
Post code		
OS co-ordinates	TL 998 863	
Area	2ha	
Height aOD	20m	
PROJECT CREATORS		
Organisation	Northamptonshire Archaeology (NA)	
Project brief originator	The Howlett Consultancy	
Project Design originator	The Howlett Consultancy	
Director/Supervisor	Ian Fisher (NA)	
Project Manager	Adrian Butler (NA)	
Sponsor or funding body	Heritage Developments Limited	
PROJECT DATE		
Start date	19 May 2011	
End date	03 June 2011	
ARCHIVES	Location (Accession no.)	Contents
Physical	NA store	Site records
Paper		Client report PDF
Digital		Survey data
BIBLIOGRAPHY	Journal/monograph, published or forthcoming, or unpublished client report (NA report)	
Title	Archaeological geophysical survey of land at Kenninghall Road, East Harling, Norfolk, June 2011	
Serial title & volume	Northamptonshire Archaeology Reports 11/127	
Author(s)	Paul Clements	
Page numbers	13	
Date	7 June 2011	

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**ARCHAEOLOGICAL GEOPHYSICAL SURVEY OF LAND AT
KENNINGHALL ROAD, EAST HARLING, NORFOLK
JUNE 2011**

Abstract

Northamptonshire Archaeology was commissioned by ULAS, on behalf of Heritage Developments Limited, to conduct a detailed geophysical survey of a proposed development site at Kenninghall Road, East Harling, Norfolk, by a combination of detailed magnetometer and earth resistance survey. This has revealed medieval ridge and furrow cultivation.

1 INTRODUCTION

Northamptonshire Archaeology (NA) was commissioned by University of Leicester Archaeological Services (ULAS), on behalf of Heritage Developments Limited, to conduct a detailed geophysical survey of a proposed development site at Kenninghall Road, East Harling, Norfolk (centred on TL 998 863, Fig 1).

A single field, with an approximate area of 2ha, was investigated by a combination of a detailed magnetometer survey over the full 2ha and an earth resistance survey covering 0.7ha over a strip 30m wide aligned north-west to south-east, to determine the possible archaeological impacts of the development.

2 TOPOGRAPHY AND GEOLOGY

The proposed development site comprises c 2ha of land located on the eastern edge of East Harling, Norfolk (Fig 1).

The development area is bounded by East Harling Primary School to the west, Kenninghall Road to the south and Mount Pleasant Farm to the south-east. The field is enclosed by hedges with agricultural pastureland to the north and east.

At the time of survey the field was rough pasture.

The site has a gentle slope to the west and at c 20m above Ordnance Datum (aOD). The floodplain of the River Thet is located just west of the village of East Harling. The superficial geology consists of a 'coversand' overlying a chalky drift. With soils being sandy, gravelly and light (Howlett 2011). Prior to this survey in May 2011 there was a long period of drought in Norfolk and the eastern counties. Occasional rainfall did not serve to rehydrate the soil to any great extent.

3 ARCHAEOLOGICAL BACKGROUND

An archaeological desk based assessment was undertaken by The Howlett consultancy (Howlett 2010) and the details were included in the Written Scheme of Investigation (WSI) (Howlett 2011). This identified potential for prehistoric and Roman buried remains within the development area.

“The proposed development site lies within an area of archaeological potential on, or adjacent to, the projected course of a Roman road. The road is a northern continuation of a Roman road that extends from the Roman town at Chelmsford through major settlements of the period at Long Melford and Packenham in Suffolk and on into Norfolk. The course of the road can be traced to just south of east Harling village with a further section recorded to the northeast of the proposed development site at Eccles Heath. Its course continuation to the northeast is clear but it is possible that it led to the Roman small town at Wicklewood near Wymondham.” (Howlett 2010, 9).

There are no known archaeological remains within the development site. However, it is possible that the buried remains of any past period may be present.

4 METHODOLOGY

The magnetometer survey was conducted with *Bartington Grad 601-2*, twin sensor array, vertical component fluxgate gradiometers (Bartington and Chapman 2003). These are standard instruments for archaeological survey and can resolve magnetic variations as slight as 0.1 nanoTesla (nT).

A tape measure and optical square were used to divide each field into 30m grid squares, which formed the basic units of survey. The grid was then located by means of a *Leica System 1200 dGPS*. The gradiometers were carried at a brisk but steady pace through each grid, collecting data along 1m spaced traverse lines. Measurements were automatically triggered every 0.25m along the traverses, giving a total of 3600 measurements per grid.

Earth resistance survey was carried out utilising a *Geoscan Instruments RM15* resistance meter in twin-probe configuration (0.5m separation). The area surveyed was divided into 20m grid squares, for ease of survey. Data was then collected at 1m intervals along 1m - spaced traverses thus totalling 400 measurements per grid.

All fieldwork methods complied with the specification, and guidelines issued by English Heritage and by the Institute for Archaeologists (Howlett 2010; EH 2008; IfA forthcoming). A single grid of each survey technique, selected at random, was re-surveyed each day on site (Fig 6).

All survey data was processed using Geoplot 3.00v software.

Magnetometer: Striping, caused by slight mismatches in sensor balance, was removed using the ‘Zero Mean Traverse’ function and destaggering of the data was performed as necessary.

Both the raw and processed data are presented in this report in the form of greyscale plots (scale +4nT to -4nT black ~ white) which have been scaled, rotated and resampled (georectified) for display against the Ordnance Survey base mapping (Fig 2). An interpretative plot has been produced and overlaid on the data in Figure 3.

Earth Resistance: Differences in background resistances between individual grids were removed using the ‘Edge Match’ function. Outlying data was statistically removed with ‘De-Spike’. The resultant greyscale plots of raw and processed data (400Ω - 1400Ω white ~ black) were geo-rectified onto mapping in Figure 4 and an interpretation included in Figure 5.

5 SURVEY RESULTS

5.1 Magnetometer (Figs 2 & 3)

The survey found medieval ridge and furrow cultivation identified by a series of weak linear anomalies on a west-north-west to east-south-east alignment. The north of the field contains a highly magnetic anomaly, probably ferrous material, located on the position of a telephone pylon. A second ferrous anomaly, also likely to be modern, is identified south-east of the pylon. Other dipolar (paired positive / negative) magnetic anomalies across the field represent ferrous and ceramic debris in the topsoil.

5.2 Earth Resistance (Figs 4 & 5)

The second phase of survey, aimed at intersecting the putative line of a Roman Road (above, 3) was carried out by earth resistance. These features are the 'classic' target for this method of survey, a pair of (low resistance) ditches flanking a (high resistance) gravel or cobbled surface (Gaffney & Gater 2003, 143). No likely ditches were detected by the magnetic survey.

The survey instrument encountered high contact resistances with the ground, reducing the overall number of successful measurements. The speckled appearance (dummy readings) and reduced area of data (Fig 4) are both due to the same factor: the extreme resistivity of the bulk of the soil on site.

Some little information can be discerned from the data. A broad pattern of high resistance anomalies was detected along the axis of the survey. It is likely that this represents shallow geological topography.

6 CONCLUSION

The magnetometer survey identified medieval ridge and furrow cultivation across the whole survey area.

It did not detect any anomalies that indicate the presence of a Roman road. In response to the magnetometer results a 30m strip, aligned north-west to south-east, was subjected to Earth Resistance survey. However, this part of the survey was limited by the extreme resistivity of the soil. No anomalies were detected that can be credited to a Roman road. The high resistance anomalies detected by the survey are geological topography.

BIBLIOGRAPHY

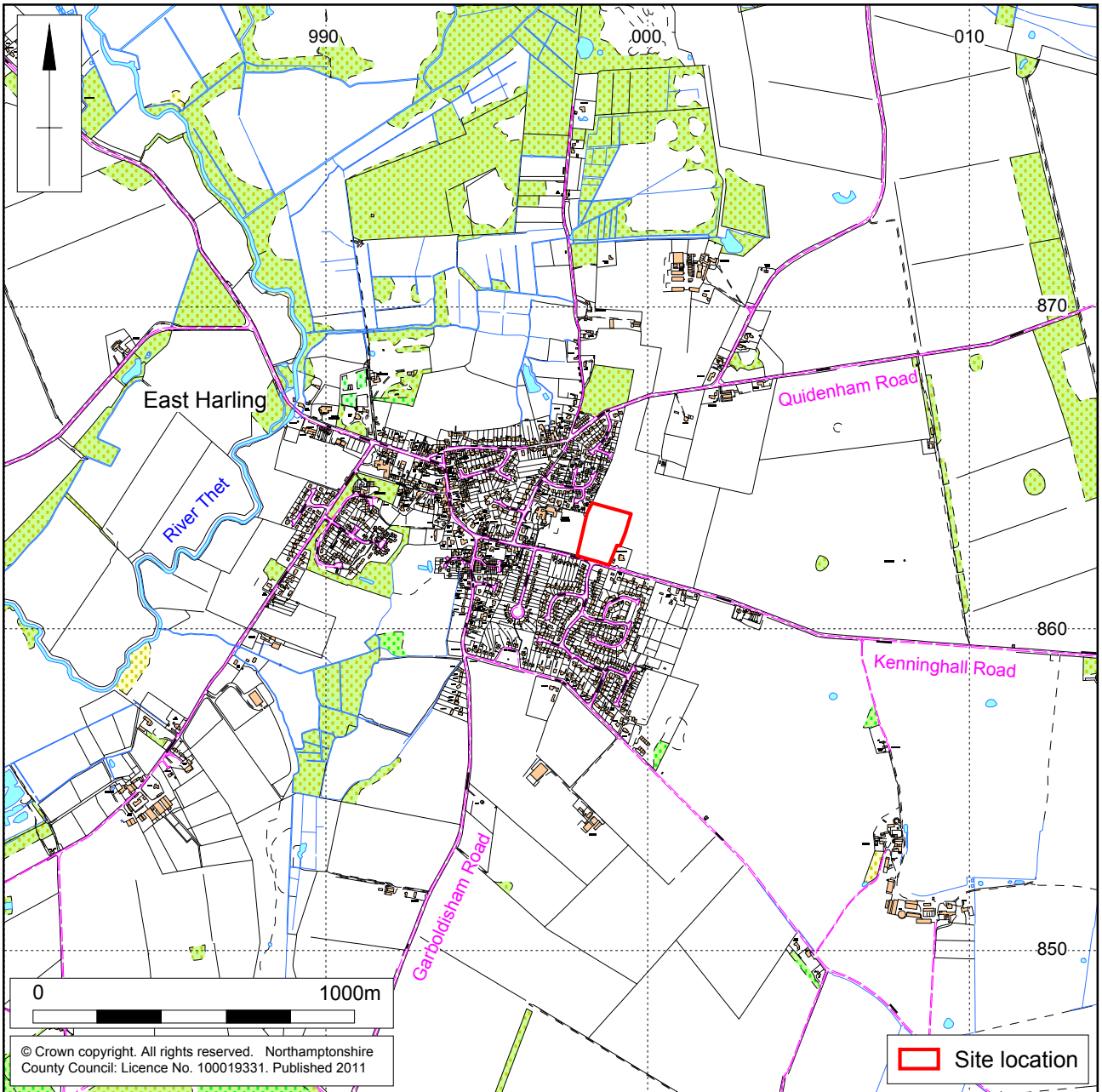
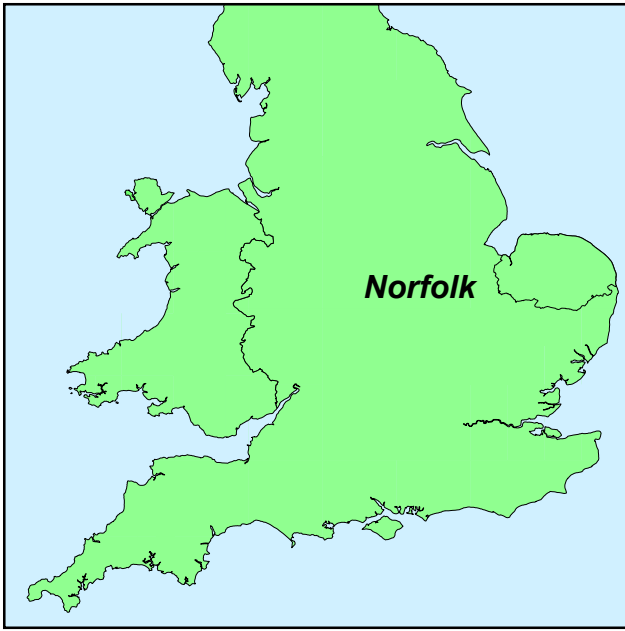
Bartington, G, and Chapman, C, 2003 A high-stability fluxgate magnetic gradiometer for shallow geophysical survey applications, *Archaeological Prospection*, **11**, 19-34

Gaffney, C, and Gater, J, 2003 *Revealing the Buried Past*, Tempus

Howlett, C, 2011 *Kenninghall Road East Harling Norfolk Written Scheme of Investigation For Archaeological Field Evaluation Stage 1: Geophysical Survey*, The Howlett Consultancy HC/102/B

EH 2008 *Geophysical Survey in Archaeological Field Evaluation*, English Heritage

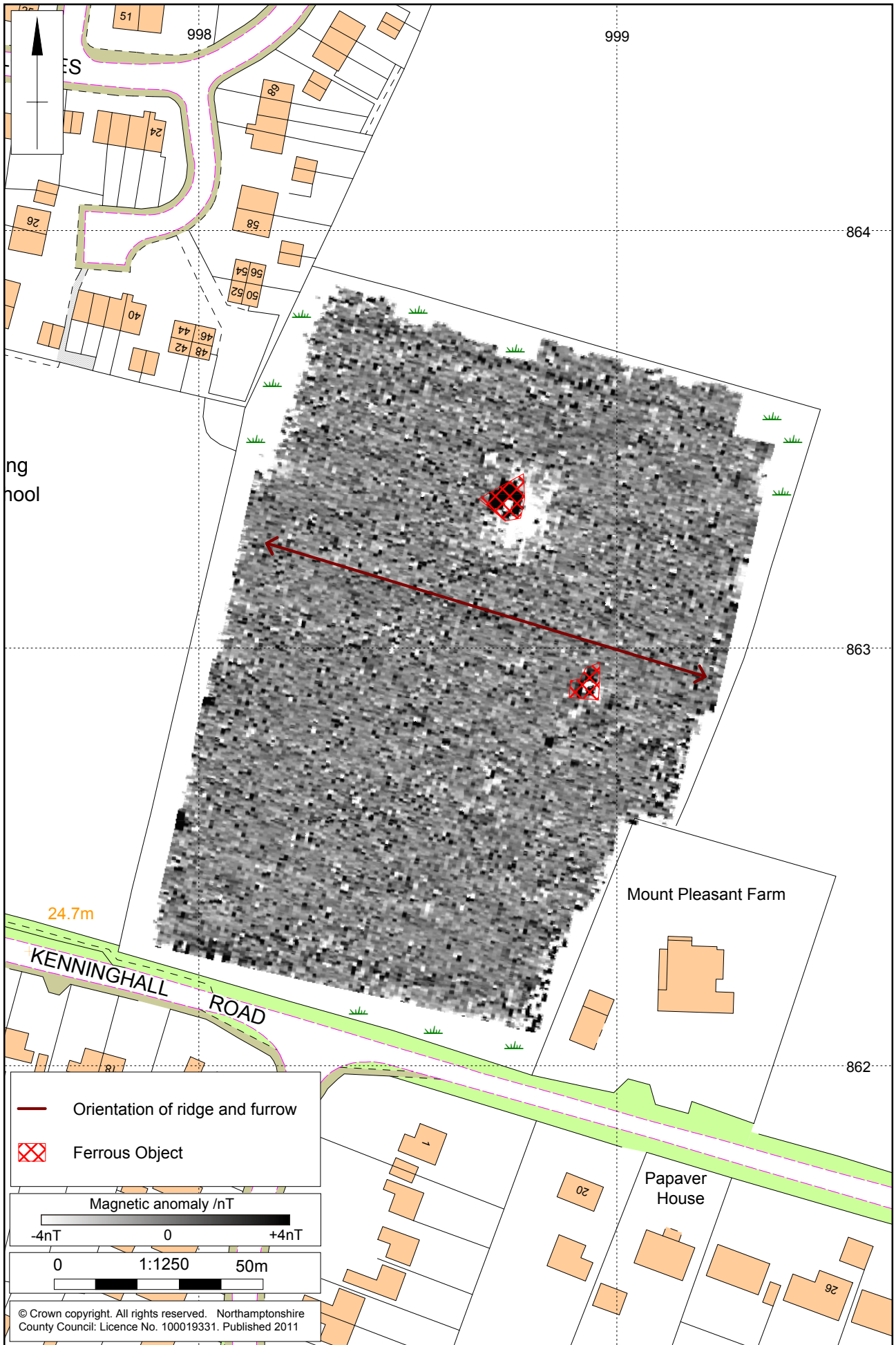
IfA forthcoming (2011) *Standard and Guidance for Archaeological Geophysical Survey*, Institute for Archaeologists Technical Paper



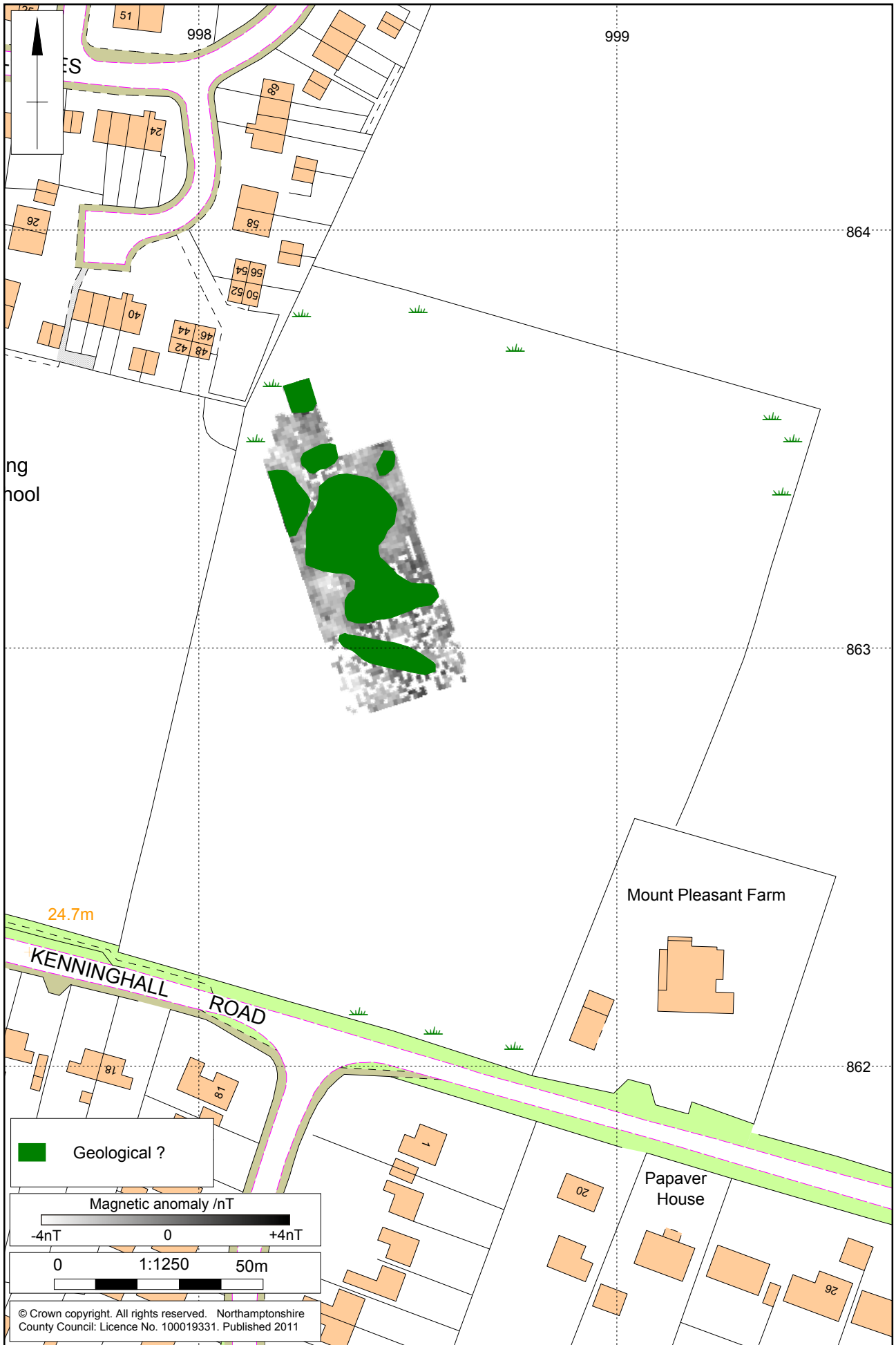
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Site location Fig 1

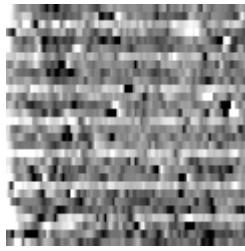




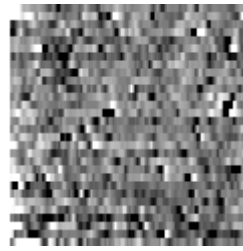




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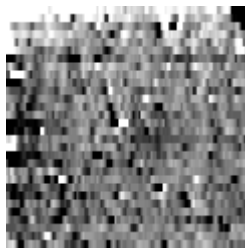


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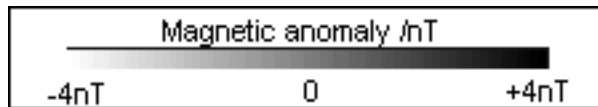
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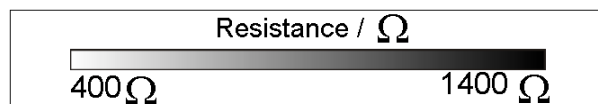
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