Northamptonshire County Council

Northamptonshire Archaeology

Archaeological Geophysical Survey

on land at Ashton Green, Beaumont Leys

Leicester, March 2009

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Adrian Butler

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Report 09/30

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QUALITY CONTROL

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OASIS REPORT FORM

PROJECT DETAILS		
Project name	Geophysical Survey at Ashton Green, Beaumont Leys, Leicester	
Short description	Northamptonshire Archaeology were commissioned by University of Leicester Archaeological Services to carry out geophysical surveys at Ashton Green, Beaumont Leys, Leicester. Topsoil magnetic susceptibility survey mapped broad changes in the subsurface probably stemming from geological variation. Detailed magnetometer survey detected a possible sub-circular ditched enclosure and pits coincident with significant finds of Iron Age pottery and flint tools (field 4). Other features located former field boundaries and possible pits or geological erratics (fields 6 and 7).	
Project type	Geophysical survey	
Site status	None	
Previous work	None	
Current Land use	Agricultural	
Future work	Unknown	
Monument type/ period		
Significant finds	None	
PROJECT LOCATION		
County	Leicestershire	
Site address	Beaumont Leys Lane, Beaumont Leys, Leicester	
Study area	35ha	
OS Easting & Northing	456500 31030 – 45790 30890	
Height OD	85m AOD – 80m AOD	
PROJECT CREATORS		
Organisation	Northamptonshire Archaeology	
Project brief originator	Dr Patrick Clay	
Project Design originator	Dr Patrick Clay	
Director/Supervisor	Ian Fisher	
Project Manager	Adrian Butler	
Sponsor or funding body	University of Leicester Archaeological Services	
PROJECT DATE		
Start date	March 2009	
End date	March 2009	
ARCHIVES	**Location**	**Content**
Physical	n/a	
Paper	Y.A4.2009	Site survey records
Digital	Y.A4.2009	Geophysical survey & GIS data
BIBLIOGRAPHY	Journal/monograph, published or forthcoming, or unpublished client report	
Title	Archaeological Geophysical Survey at Ashton Green, Beaumont Leys, Leicester	
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ARCHAEOLOGICAL GEOPHYSICAL SURVEY ON LAND AT

ASHTON GREEN, BEAUMONT LEYS, LEICESTER

MARCH 2009

ABSTRACT

Northamptonshire Archaeology were commissioned by University of Leicester Archaeological Services to carry out geophysical surveys at Ashton Green, Beaumont Leys, Leicester. Topsoil magnetic susceptibility survey mapped broad changes in the subsurface probably stemming from geological variation. Detailed magnetometer survey detected a possible sub-circular ditched enclosure and pits coincident with significant finds of Iron Age pottery and flint tools (field 4). Other features located former field boundaries and possible pits or geological anomalies (fields 6 and 7).

1 INTRODUCTION

Northamptonshire Archaeology (NA) was commissioned by University of Leicester Archaeological Services (ULAS) to undertake an archaeological geophysical survey of land at Ashton Green, Beaumont Leys, Leicester.

The objectives of the geophysical survey were to identify the presence or absence of archaeological remains within the proposed development area. The programme consisted of a 17ha area topsoil magnetic susceptibility (MS) survey, coupled with magnetometer prospection of approximately 16ha. The magnetometer targeted four areas found to be of interest through fieldwalking (ULAS 2009) and a sample of the MS survey area.

2 TOPOGRAPHY AND GEOLOGY

The proposed Ashton Green development area lies on the northern edge of Beaumont Leys, a north-western suburb of the city of Leicester. The survey was divided between seven fields from Thurcaston Lane in the south-east and the A46 Leicester Western Bypass in the north-west (Fig 1, NGR SK 572 095 centre).

The site falls away slightly from 90m to 80m AOD south-east to north-west, towards Rothley Brook. Fields 1 – 3 were rough pasture, all others were under cultivation. The soils of Ashton Green are likely to be of the 411d Hanslope association (SSEW 1983). The area is mapped by the British Geological Survey as being located on a drift of boulder clay (BGS 1:625,000 geology map:

www.bgs.ac.uk/geoindex accessed 16/03/09).

Fields 6 and 7 reportedly contained pieces of a granite / granodiorite–type rock on the surface, mostly of pebble and cobble dimension but occasionally boulders. The nearest deposits of these types of acid igneous rock are five kilometres to the north in the Mountsorrell area.

3 ARCHAEOLOGICAL BACKGROUND

Ashton Green is situated in an area of archaeological interest. Archaeological field survey carried out prior to the construction of the A46 Leicester Western Bypass revealed surface material from the Neolithic, Bronze Age, Iron Age, and Roman periods in fields to the west of the study area (ads.ahds.ac.uk accessed 13/03/09). A middle Iron Age farmstead was fully excavated at Wanlip, approximately 1.5km north-east of Ashton Green (Beamish 1998).

ULAS (2009) carried out a fieldwalking survey of the arable fields in the development area as part of this project. A distribution plot of the results was provided to NA. Flint tools were identified in fields 4 to 7 and Iron Age pottery in field 4. Earthwork remains of a medieval Knights Templar preceptory and associated features are situated immediately south-west of the site. Leicester city centre, approximately 3km to the south-east, is known as a settlement focus from the Iron Age through Roman (*Ratae Corieltavaurum*) and medieval periods.

4 METHODOLOGY

Geophysical survey was carried out in accordance with English Heritage and the Institute of Field Archaeologists Guidelines (EH 2008 & Gaffney, Gater and Ovendon 2002). Seven fields were subject to geophysical survey.

Topsoil Magnetic Susceptibility Survey

Volumetric topsoil magnetic susceptibility (MS) survey data was obtained utilising a Bartington Instruments MS2D field loop and MS meter. Survey was carried out on a grid of 20m centres, set out manually by tape measure and optical square. MS survey was carried out over 43ha in Fields 1 to 3 (Fig 2). The recorded data was converted into a grey tone graphical representation, using Geoplot v.3.00u software. These images were then rectified to Ordnance Survey base mapping in MapInfo GIS and produced as Figure 2: MS Results, scaled between 0 – 30 ($x10^{-5}$) SI units, and an interpretation, Figure 3, generalised from that.

Magnetometer Survey

All detailed magnetometer survey was undertaken using Bartington Grad601-2 fluxgate gradiometers. The Grad601-2 is constructed as a dual-sensor instrument with two vertical gradiometers separated on a yoke to enable two lines of survey to be recorded in tandem.

The gradiometry was composed of a total of 138 whole and partial, 30m x 30m grid-squares. Each grid square was traversed at rapid walking pace in zigzag mode, data was recorded every 0.25m along traverses spaced at 1m intervals. All fieldwork was carried out in accordance with the aforementioned guidelines (EH 2008 & Gaffney, Gater and Ovendon 2002).

The data was analysed using Geoplot 3.00u software. Low (negative) magnetism is shown as white and high (positive) magnetism as black in the resultant greytone plots. To avoid the introduction of processing errors, minimal manipulation was carried out on the data. The 'Zero Mean Traverse' function was applied in order to bring the average level of each data line into a balanced zero.

The processed data is presented here in the form of a greyscale highlighting the magnetic anomalies in -5nT to +5nT scale; (Figs 4, 6, 8 and 10) georectified to the Ordnance Survey base. Interpretative plots has been generated from the results (Figs 5, 7, 9 and 11), both sets of figures are referred to directly in the following section.

5 SURVEY RESULTS

Magnetic Susceptibility Survey

The MS survey of fields 1-3 was hampered by considerable undergrowth in fields 1 and 2 and bunding within field 3. The high topsoil susceptibility values in the eastern side of field 1 and southern margin of field 2 can be directly attributed the inclusion of modern concrete and other building waste in the soil, presumably from the construction of the housing estate to the south.

A weak high to low trend (>10SI ~ <10SI) can be found aligned roughly towards the north-north-west in the underlying data of fields 1 and 2. In field 3 the data is within the higher part of the basal trend. It is likely that these macro changes in magnetic susceptibility are due to variation in the underlying geology or pedology.

Magnetometer Survey

Field 2 (Figs 4 & 5)

The block of gradiometer survey sited in field 2 was targeted at the bulk change in MS levels. Considerable levels of small dipolar magnetic anomalies were recorded, indicating ferrous waste across the area. Two narrow linear positive magnetic anomalies were detected, roughly parallel 75-80m apart, crossing the area north to south. The anomalies are likely to represent a pair of very narrow ditches (*c*0.25m wide) of unknown date and function.

Field 4 (Figs 6 & 7)

Survey was carried out over field 4 in response to fieldwalking finds of Iron Age pottery and flint tools. The area divided into two unequal blocks north-east and south-west. An intensely magnetic linear anomaly aligned with the Thurcaston Road indicates a ferrous pipeline. East – west aligned banding in the data, mostly from the northern part of the field indicates former medieval ridge and furrow. This would appear to be constrained towards the centre of the field by former field boundaries detected as positive anomalies.

A weakly magnetic, sub-circular anomaly of diameter approximately 20m, was located in the north-east of field 4 and is considered to be a possible ditched enclosure. The location of such an enclosure would match well with the finds recovered from fieldwalking. The eastern extent was affected by the anomaly of the adjacent pipeline and thus hidden. A possible pit was detected *c*60m south-west of the enclosure. In the southern half of the survey two discrete and two north-east to south-west aligned positive anomalies were detected, indicating two possible pits and short lengths of ditches.

Field 5 (Figs 8 & 9)

Prospection in field 5 was again targeted at the location of fieldwalked finds, particularly a flint tool and core. Parallel anomalies, evidence of north-west – south-east ridge and furrow, was located across the eastern half of the area. Two chains of dipolar anomalies, too weak to be ferrous in origin, indicated likely ceramic field drains on similar alignments to the furrows. A very weakly positive linear magnetic anomaly was detected on a more northerly alignment than the furrows and drains and possibly indicates a ditch of some antiquity. Two discrete positive anomalies, likely pits, were identified one in the eastern and one western half of field 5.

The north-west corner of the field 5 survey area was found to contain an area of highly magnetic anomalies. These have no readily apparent cause, no material was noted on the surface and the

form of the anomalies is not characteristic. It is assumed that the source is a collection of thermoremanently magnetised materials (ie highly heated such as ceramics, igneous rock). The proximity of the A46 Western Bypass suggests that construction waste could have been dumped in the field.

Fields 6 & 7 (Figs 10 & 11)
As with fields 4 and 5, these areas were placed to examine concentrations of notable fieldwalking finds.

Former ridge and furrow was detected in both fields, orientated south-west to north-east in field 6 and two blocks in north-easterly and slightly more northerly orientations in field 7. Probable ceramic field drains were identified, on the same alignment as furrows, occasionally in the data from both fields. A lineation of varying magnetic data was recorded aligned north-west to south-east through the north of field 6 and into field 7 where the direction changed towards the south. These anomalies would appear to represent a continuation of a former field boundary, cut by the creation of the A46 Western Bypass and still extant on the western side (1904 Leicestershire 1:10,560 map; www.old-maps.co.uk accessed 16/03/09).

The most intriguing aspect of the surveys in fields 6 and 7 were the numerous discrete positive magnetic anomalies in the data, particularly towards the north-east of field 7. Whilst many of the anomalies have the broad characteristics representing archaeological pits the sheer number of them suggests that a geological origin may be more likely (Note, not all 'pit' anomalies have been illustrated in Fig 11). For example, a substantial fragment of the erratic granites referred to in Section 2, buried at some depth would likely produce a magnetic field somewhat like a pit feature.

6 CONCLUSION

Geophysical prospection at Ashton Green has identified a number of anomalies probably relating to archaeological remains, but disturbance due to modern land use and geological factors reduced the inferences that can be drawn from the work. Topsoil magnetic susceptibility survey of fields 1 – 3 was hampered by vegetation and modern building waste. However, a large-scale variation in MS across the fields was identified, probably stemming from geological changes. The MS results were tested by detailed survey in field 2, resulting in the detection of a pair of parallel ditches across the field. It is possible that these features represent former boundaries within field 2.

Possible archaeological features were identified in field 4, including a sub-rectangular ditched enclosure and a pit in the north and two pits and pair of short ditches in the south. Both sets of features coincide approximately with the position of Iron Age pottery from field survey (ULAS 2009). Two likely pits were detected in field 5, together with an ephemeral ditch that may represent a boundary dividing the field, similar to that adjacent to the south.

Fields 6 and 7 were found to contain many pit-like features. It is postulated, however, that the quantity and lack of patterning in the discrete positive anomalies suggests a more geological origin for the majority (ie Mountsorrell granite erratics within the till substrate). This may be supported by the fact that no other archaeological features, other than a historical field boundary, are apparent in the data of fields 6 and 7.

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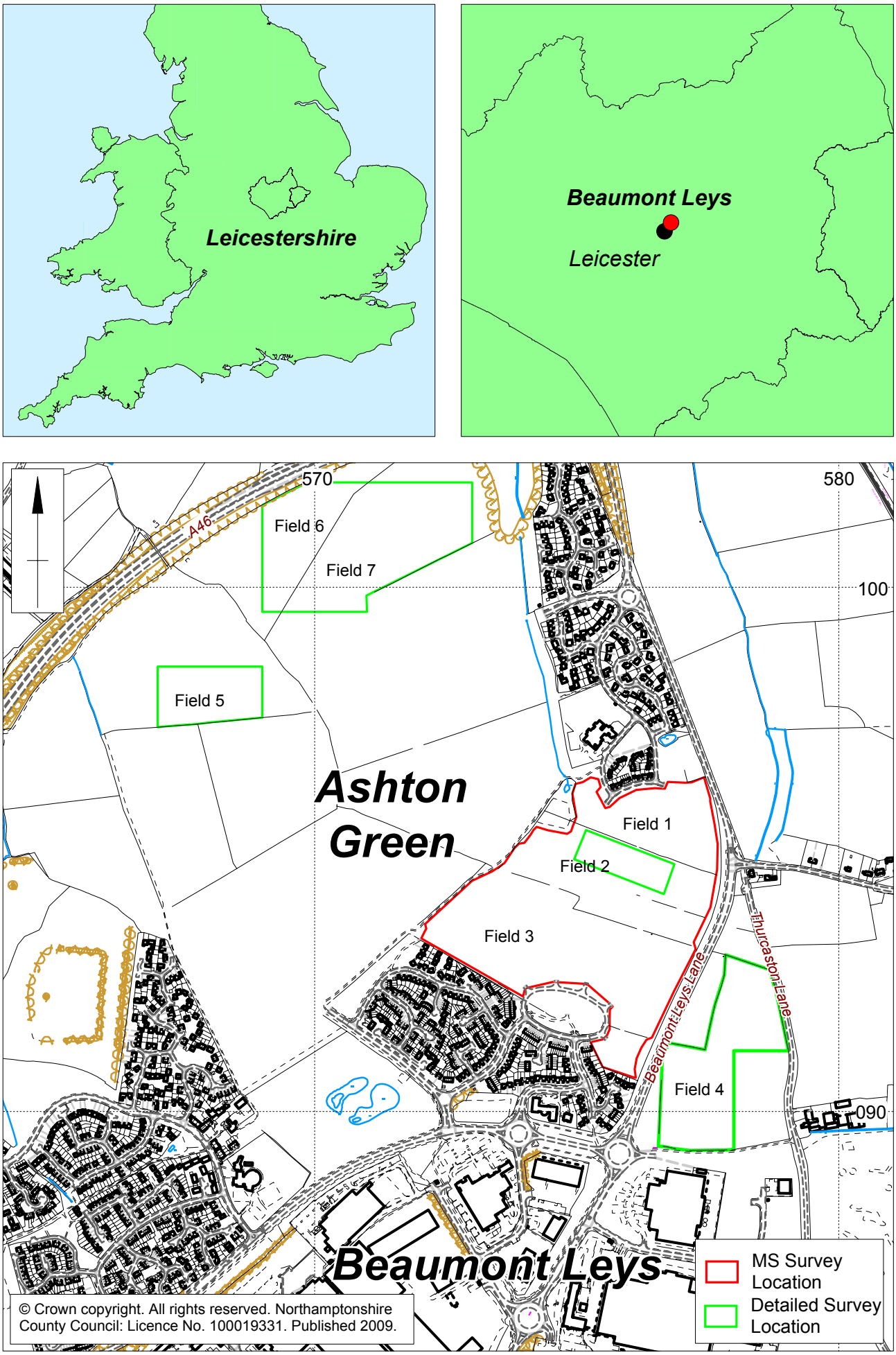


Scale 1:10,000

Site location Fig 1

Scale 1:5000

Magnetic Susceptibility Survey Results Fig 2

Scale 1:5000

Magnetic Susceptibility Survey Interpretation Fig 3

Scale 1:2500

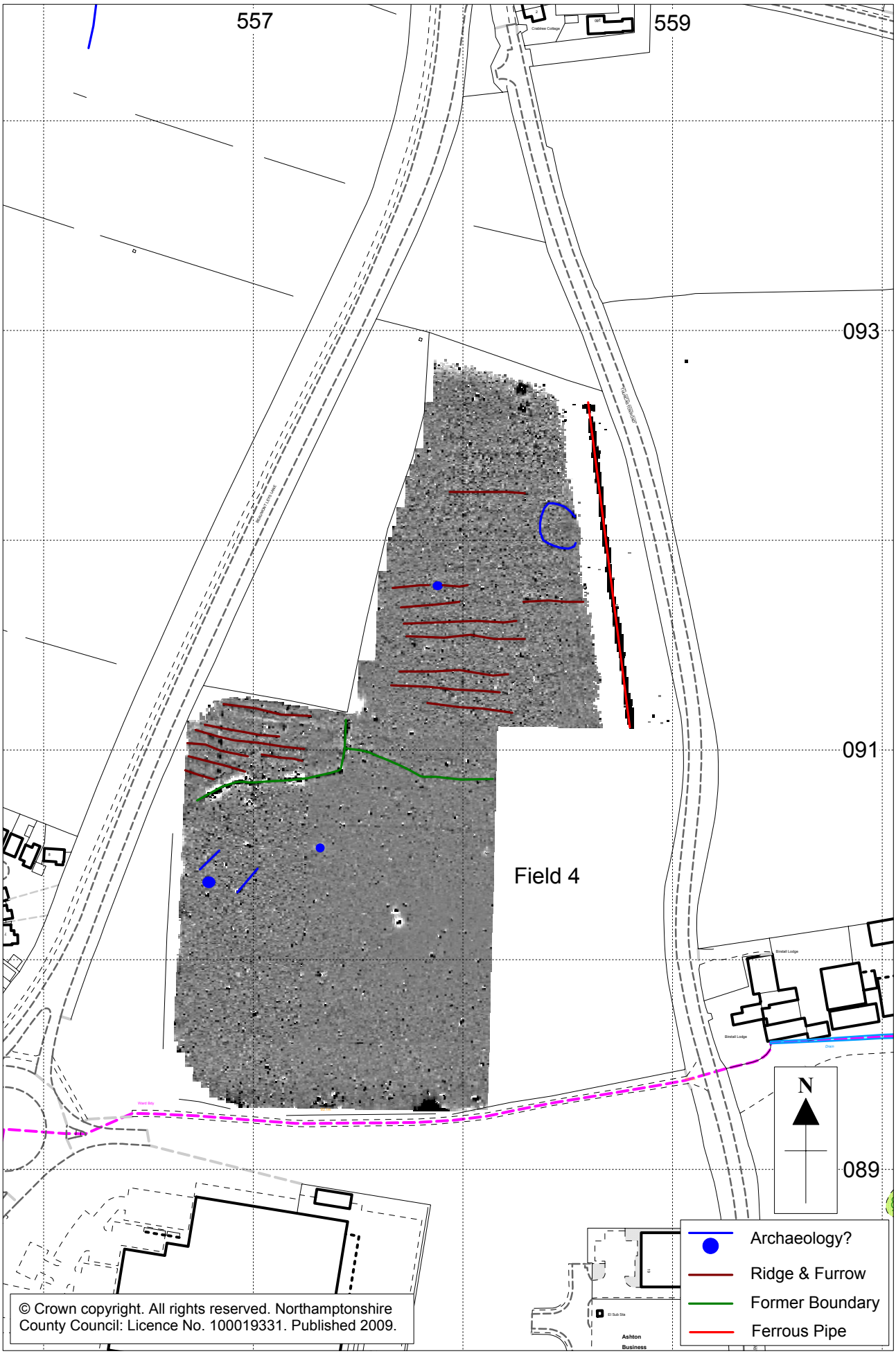
Gradiometer Survey Results Field 2 Fig 4

Scale 1:2500

Gradiometer Survey Interpretation Field 2 Fig 5

Scale 1:2500

Gradiometer Survey Results Field 4 Fig 6



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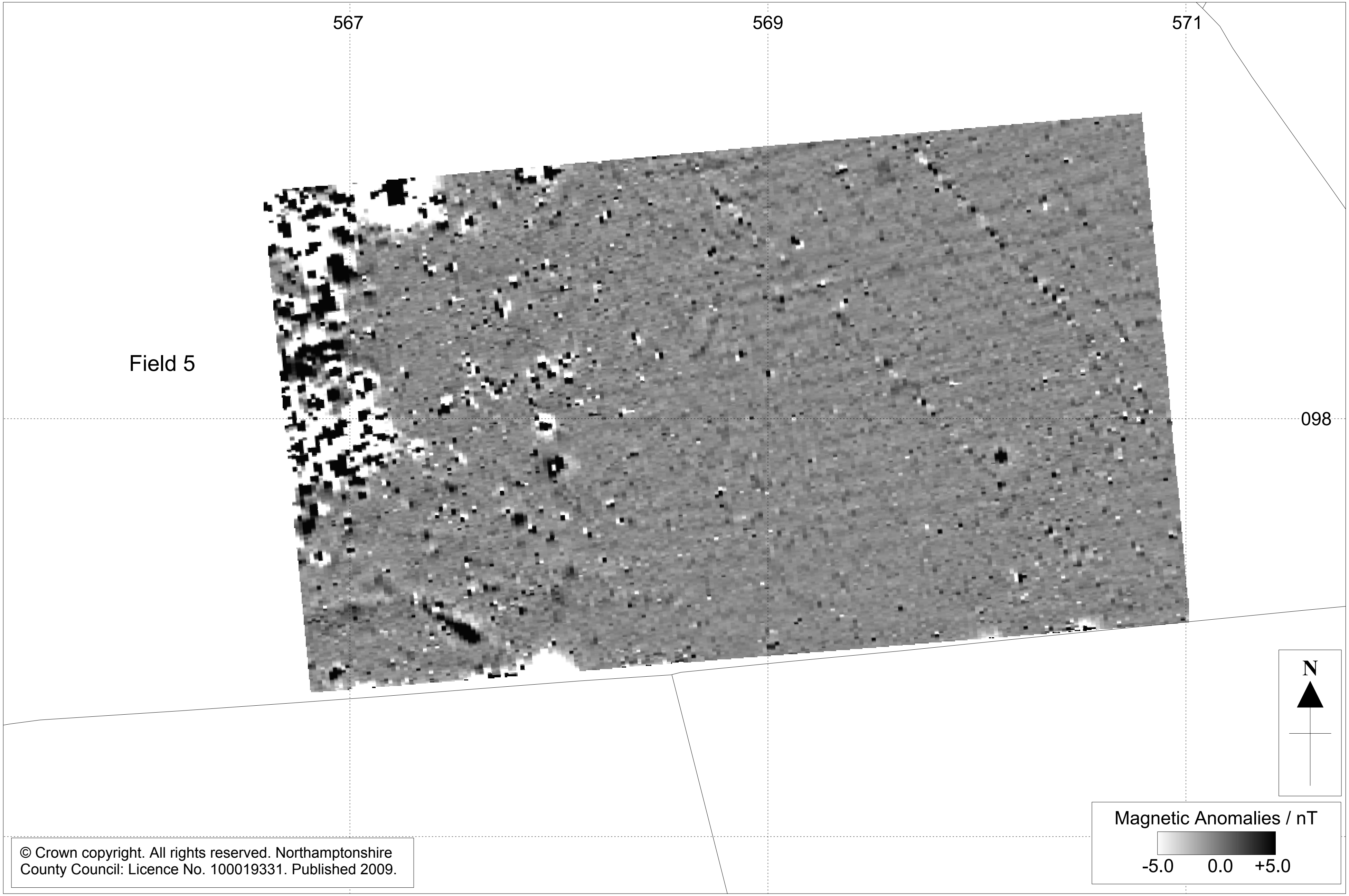
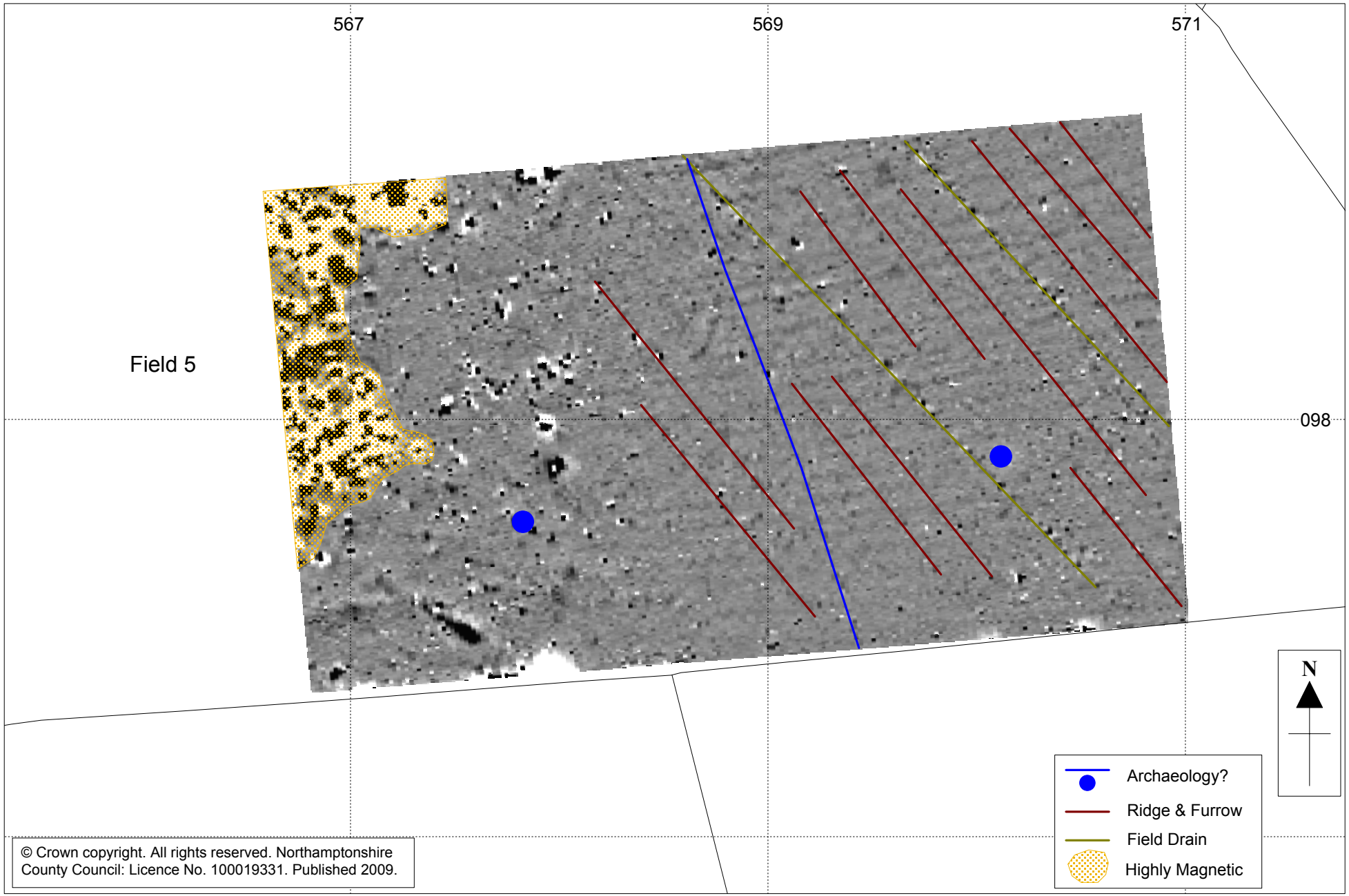
Gradiometer Survey Interpretation Field 4 Fig 7

Scale 1:1250



Gradiometer Survey Results Field 5 Fig 8


Scale 1:1250
Gradiometer Survey Interpretation Field 5 Fig 9
567
569
571
098
Field 5
N
Archaeology?
Ridge & Furrow
Field Drain
Highly Magnetic
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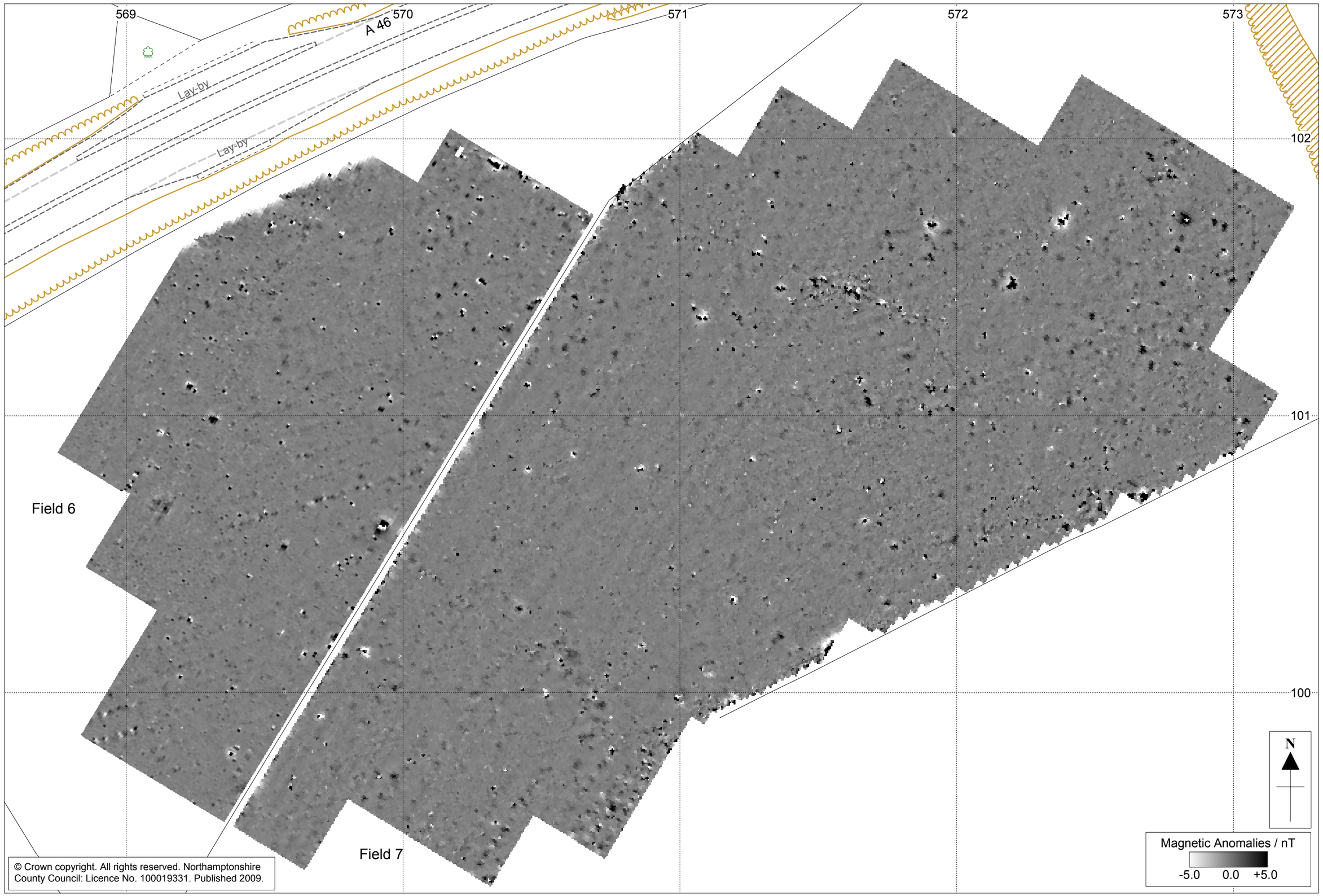

Scale 1:1250 @ A3

Gradiometer Survey Results Fields 6 & 7 Fig 10

Scale 1:1250 @ A3

Gradiometer Survey Interpretation Fields 6 & 7 Fig 11