

**LAND AT BRICKKILN LANE, MULBARTON,
NORFOLK**

**Report on Archaeological Geophysical Survey
2015**

Report by:

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Application Reference:

Land at Brickkiln Lane, Mulbarton, Norfolk

Geophysical Survey 2015

Abstract

A geophysical survey has been undertaken as part of an archaeological field evaluation of a proposed solar farm site located off Brickkiln Lane near Mulbarton, Norfolk.

The survey has detected one or more former field boundaries, together with traces of linear features at the north of the site. These may indicate remains of former ditches or channels which are not aligned with the modern field boundaries. There is no detectable evidence for magnetic disturbances of a kind which could suggest that settlement remains associated with the nearby Kenningham Medieval village extend into the evaluation area.

1. Introduction

The survey was commissioned from Bartlett Clark Consultancy (BCC), Specialists in Archaeogeophysics of Oxford, CgMs Consulting Ltd of Cheltenham on behalf of Lightsource Renewable Energy. Fieldwork for the survey was done on 5-7 August 2015.

Notes on the location and condition of the site, and the archaeological background to the project, were included in the Desk Based Assessment (DBA) which was previously prepared by CgMs [1], and also in the Written Scheme of Investigation submitted to CgMs by BCC in advance of the survey [2]. The following notes are reproduced in part from these documents.

2. The Site

Topography and geology

The proposed development area occupies two arable fields (from which crops had been recently removed at the time of the survey) located to the south of Brickkiln Lane, and 1km SE of Mulbarton village. The fields are largely bounded by substantial hedges. It is noted in the DBA that no evidence of earthworks, including ridge and furrow, has been identified at the site.

The site is centred at NGR TM203995, and is c. 10.2ha in extent. The ground rises gently

from 35m AOD at the SE of the evaluation area to c. 45m to the NW. The site was surveyed in full with the exception of small overgrown areas in the eastern field.

The site lies (according to the BGS on-line geology viewer) on a bedrock of White Chalk beneath glacial till drift deposits (Diamicton composed of sandy silty clay with gravel). Geological conditions at the site are similar to those at a site 2km to the north (Mangreen Hall Farm, Swardston), where previous magnetometer surveys (in 2010 and 2014) responded clearly to enclosures and settlement features of either medieval or earlier date.

Magnetic susceptibility measurements taken from soil samples collected at the site gave moderately, but not unusually, low values (mean = 12.3×10^{-8} SI/kg). These readings (which are affected by soil composition together with past and present land use, and indicate the probable strength of response to be expected from a magnetometer survey) suggest that soil conditions at the site should be sufficiently responsive to permit the magnetic detection of archaeological features.

Archaeological background

Archaeological findings from a 1km radius study area around the site are reviewed in the DBA, where it is noted that no known or undesignated archaeological assets are recorded within the study site itself.

Field walking carried out immediately to the east of the study site has identified a range of material dating from the prehistoric to the post-medieval period (MNF61863 and MNF64828). Field walking in 2009 recovered prehistoric worked flint, Roman, medieval and post-medieval pottery and post-medieval clay pipe fragments (MNF61863). Field walking as part of the Caistor Roman Project in 2012 recovered Roman and medieval to post-medieval pottery sherds (MNF64828).'

It is mentioned in the DBA (section 4.10) that the Medieval village of Kenningham (HER MNF10106/ HEA 391027) is located adjacent to the north eastern boundary of the study site. Earthworks of probable Medieval house platforms and other features are visible on the ground and on aerial photographs in fields to the north east of the site. There is some potential for settlement remains associated with the Medieval village to extend into the study site, although there is no direct evidence for this (i.e. earthworks or cropmarks). It is more likely that the study site formed part of the agricultural hinterland surrounding the Medieval village of Kenningham.

Historic mapping indicates that the study site formed agricultural land throughout the Post-Medieval and Modern periods. Any archaeological remains dating to the Post-Medieval and Modern periods are likely to derive from agricultural practices (i.e. former field boundaries).

3. Objectives of the Survey

The usual purpose in undertaking an archaeological geophysical survey is to test for evidence of archaeological sites or remains, and to provide information which may inform further stages of the archaeological evaluation.

A geophysical survey is usually able to identify the extent and character of any archaeological remains capable of producing a magnetic response. The magnetometer will detect cut features such as ditches and pits when they are silted with an increased depth of topsoil, which usually responds more strongly than the underlying natural subsoil. Fired materials, including baked clay structures such as kilns or hearths are also likely to produce a localised enhancement of the magnetic field strength, and the survey therefore responds preferentially to the presence of ancient settlement or industrial remains. The survey is also strongly affected by ferrous and other debris of recent origin.

4. Survey Procedure

The survey followed procedures as described in the standard brief for magnetometer surveys issued by Norfolk County Council [3]. [It was not practical in this case (in part because of dense rape stalks standing to considerable height) to use a cart-mounted magnetometer system as proposed in the revised version of the brief dated 13 June 2014.]

The site was investigated by means of a recorded magnetometer survey. Readings were collected along transects 1m apart using Bartington 1m fluxgate gradiometers, and are plotted at 25cm intervals along each transect. The survey data is shown at 1:2000 scale as a grey scale plot (figure 1), and as a graphical (x-y trace) plot at 1:1250 (figures 2-3). Comparison of these alternative presentations allows the detected magnetic anomalies to be examined in plan and profile respectively. An interpretation of the findings is also shown superimposed on figures 2-3 (which permits the interpreted outlines to be compared with the underlying data). A further interpreted summary of findings is presented in figure 4.

The graphical plot in figures 2-3 shows the magnetometer readings after minimal pre-processing [of the kind permitted by English Heritage (2008) *Geophysical Survey in Archaeological Field Evaluation* Section 4.8]. This includes adjustment for irregularities in line spacing caused by variations in the instrument zero setting, and truncation of extreme values. Additional weak 2D low pass filtering has been applied to the grey scale plot to adjust background noise levels.

Figure 5 is included in the report to meet additional specific requirements stated in the generic brief for magnetometer surveys, as issued by Norfolk Historic Environment Service [3]. This figure shows the magnetometer data without the conventional correction to the zero level in each transect, which is the usual initial step in data processing. The brief also requires a data block to be re-surveyed at the end of each day of fieldwork. The re-surveyed sample blocks are shown alongside the main survey in figure 5.

Colour coding has been used in the interpretation to distinguish different effects. The interpretation is intended to categorize most of the identifiable magnetic anomalies, but cannot reproduce the detail of the grey scale plots.

Magnetic anomalies which may show characteristics to be expected from features of potential archaeological interest are outlined (or indicated more schematically by broken lines) in red. Background magnetic anomalies which may be of natural or non-archaeological origin are indicated in light brown. Stronger (and perhaps recent) disturbances are in grey, and probable former field boundaries in brown. Some of the more conspicuous ferrous objects (identifiable as narrow spikes in the graphical plots) are

marked in light blue, and cultivation effects are indicated schematically in green.

Survey location

The survey grid was set out and tied to the OS grid using a Trimble ProXRT GPS system (with VRS correction to give accuracy of c. 0.1m). The plans are therefore geo-referenced, and OS co-ordinates of map locations can be read from the AutoCAD version of the plans, which can be supplied with this report.

5. Results

The survey response across the greater part of the site is unremarkable, and shows only background magnetic activity (natural and ferrous) of a kind which might be expected in any relatively undisturbed field. A few specific findings are identifiable. These include clearly visible linear markings towards the north end of the site (as labelled A and B in figure 4). These could be silted or infilled former ditches or channels (containing a clean earth fill). They do not align with modern boundaries and could perhaps indicate traces of a former field system or an incompletely detected enclosure. There is no evidence that related features survive to the south of the former field boundary at C.

The line of magnetic disturbances (outlined in brown) at C represents debris or disturbances along the line of a field boundary shown on 19th and 20th C maps (as on the 1887 OS map inset in figure 4). This boundary remains present on a map of 1975-9 (reproduced in the DBA), and must have been relatively recently removed. Another (weak) linear feature is visible in the grey scale plot at D. This aligns approximately with current boundaries, and terminates at C. It does not align with cultivation markings, and could perhaps therefore be a historic boundary removed before 1887.

The alignments of a few other parallel linear markings which are visible in the grey scale plot are indicated in green (as at E). These are likely to relate to recent or current cultivation. A narrow negative magnetic anomaly (F) in the south eastern field is an extant furrow visible on the ground.

The remaining findings include randomly distributed ferrous items (blue), and recent disturbances near field boundaries and entrances (grey). There are also a few magnetic anomalies which could (on the basis of their size and rounded profiles as seen in the graphical plots 2-3) be interpreted as silted pits. A few more distinct examples are outlined in red, as at G, H. Concentrations of such findings may be of archaeological relevance, but here they are isolated and dispersed. The individual pit-like features are not very clearly distinguishable from the overall scatter of small natural background magnetic anomalies (outlined in light brown). These findings do not therefore suggest that any concentrations of archaeological features are present.

6. Conclusions

The survey has detected a former boundary (C), as well as traces of two possible ditch-like features (at A and B), and has also detected other minor or insubstantial ground

disturbances. These include a second possible former boundary at D, and a narrow extant furrow at F. It is probably therefore that at least some magnetic activity would be visible if settlement remains from the Kenningham Medieval village, or earlier periods, were present at the site, but no such findings have been detected.

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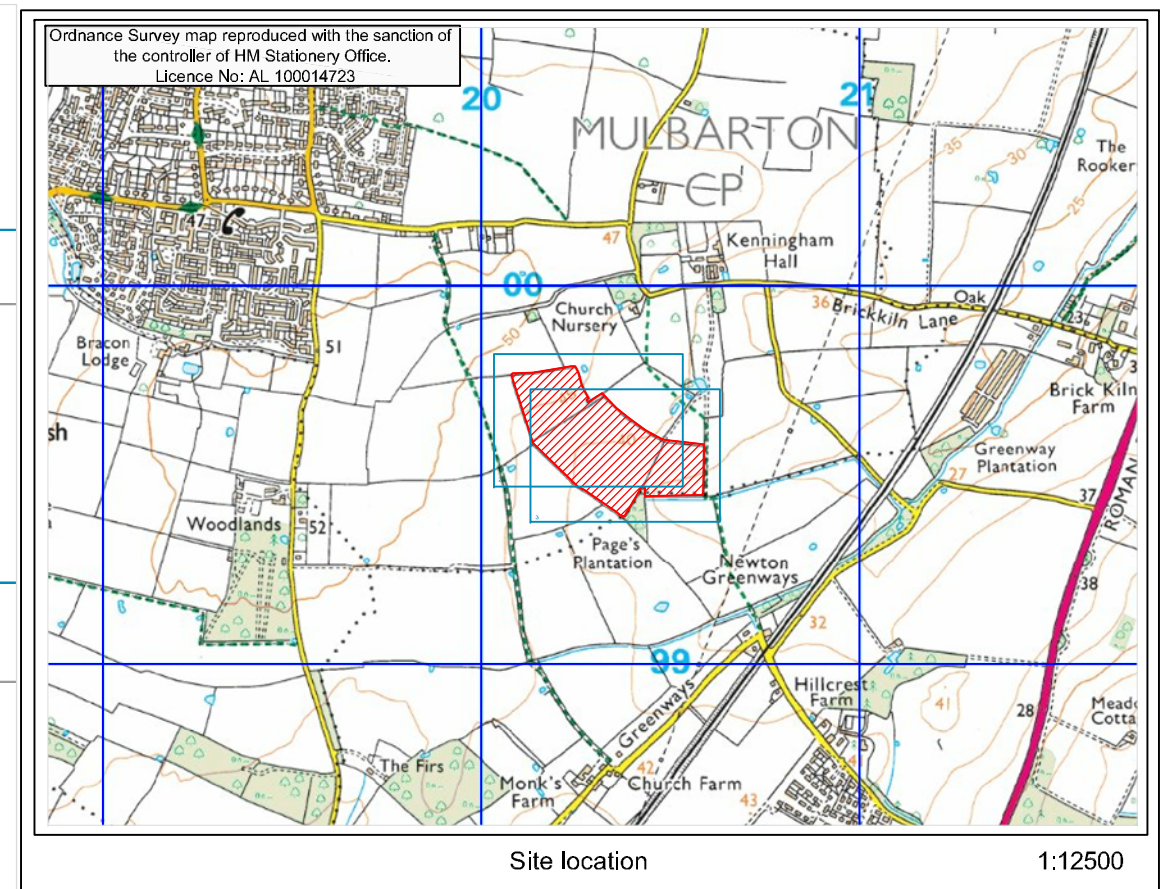
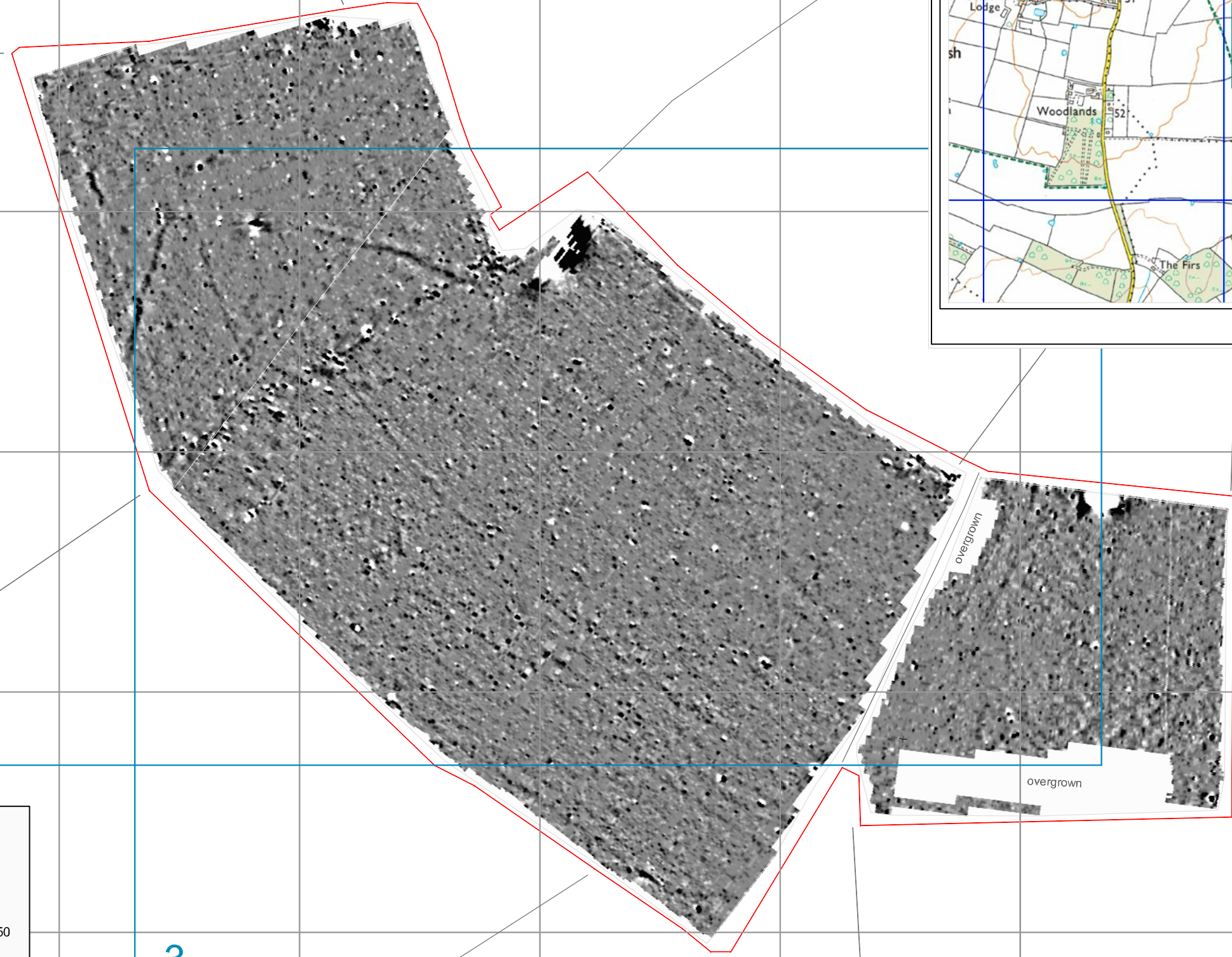
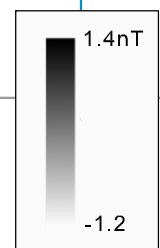
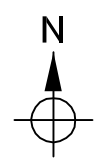
bcc123@ntlworld.com

12 August 2015

The fieldwork for this project was done by M. Berry and N. Paveley. Data processing was by M. Berry.


References

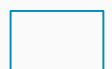
- [1] Archaeological Desk-Based Assessment: Land at Brickkiln Lane, Mulbarton, Norfolk. CgMs Ltd May 2015; CgMs Reference WB/SJ/19622.
- [2] Land at Brickkiln Lane, Mulbarton, Norfolk. Written Scheme of Investigation for Archaeological Geophysical Survey. Document submitted to CgMs by Bartlett Clark Consultancy; 4 August 2015.
- [3] *Generic Brief for Archaeological Evaluation by Magnetometer Survey*. Document issued by Norfolk County Council Historic Environment Service, 13/6/2014.



Site location

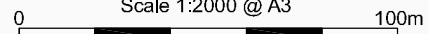
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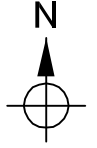
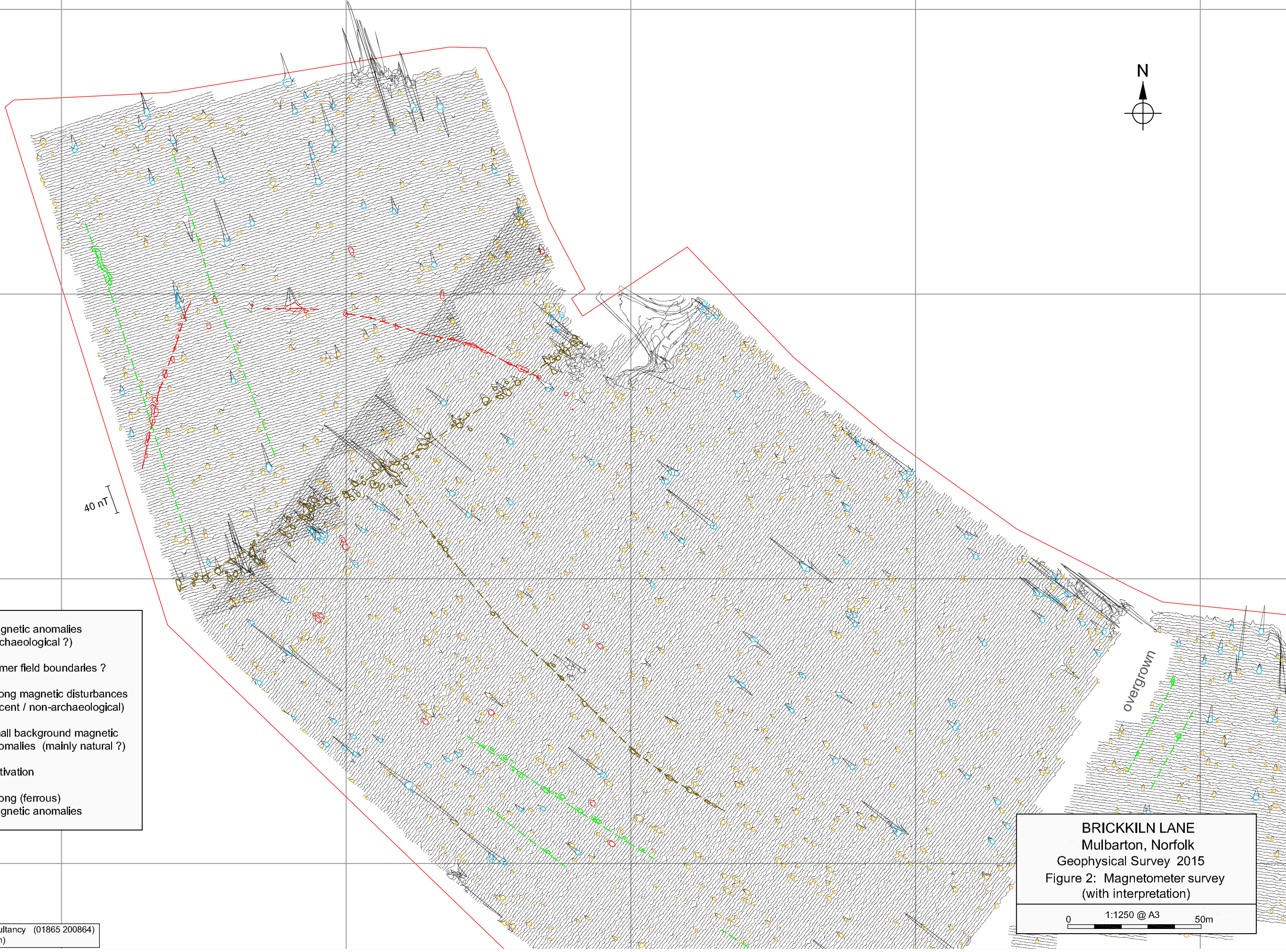
 Evaluation area

 Location of 1:1250 figures (2-3)







BRICKKILN LANE
Mulbarton, Norfolk
Geophysical Survey 2015
Figure 1: Magnetometer survey
(grey scale plot)

Scale 1:2000 @ A3





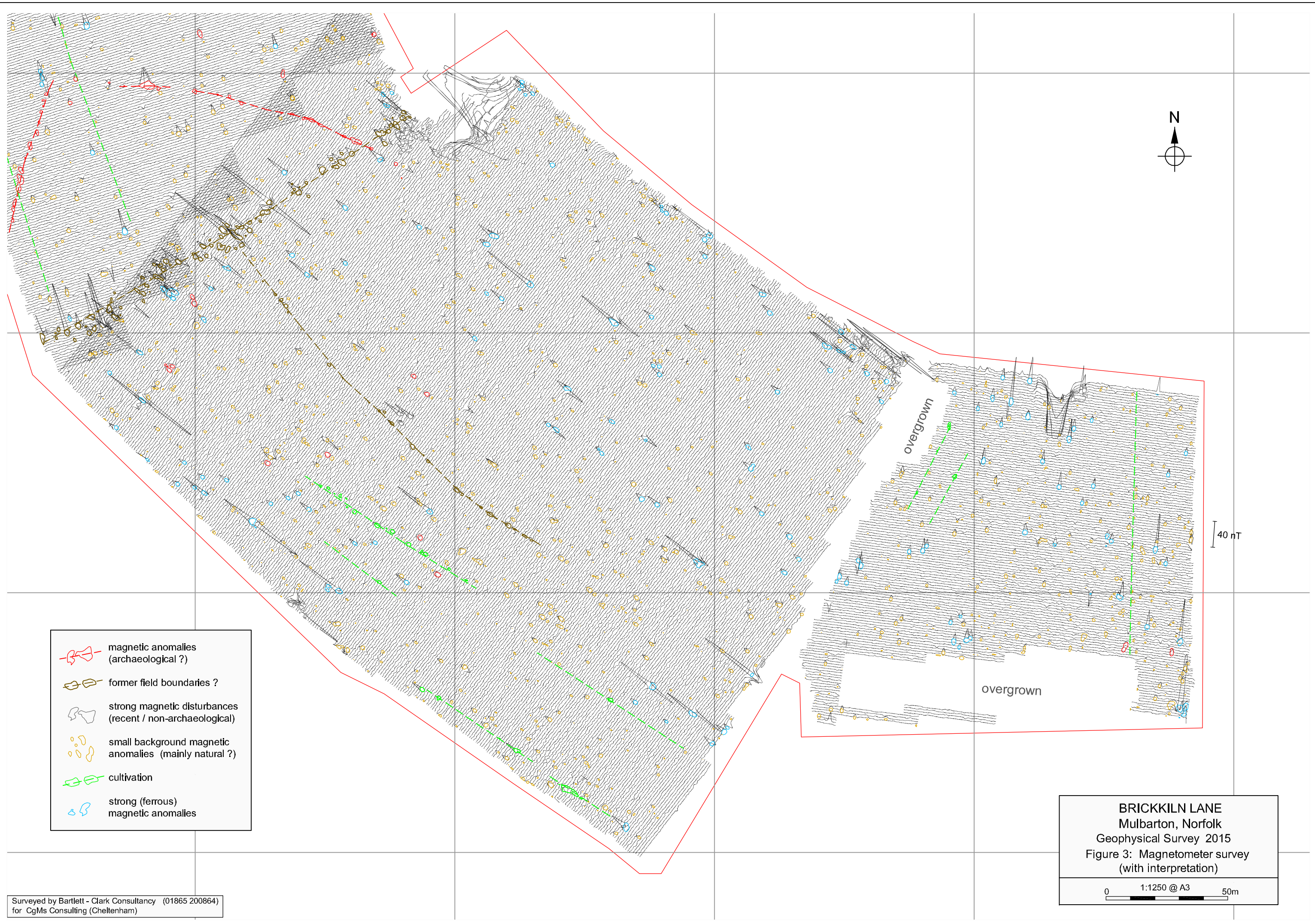
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
-  magnetic anomalies (archaeological ?)
-  former field boundaries ?
-  strong magnetic disturbances (recent / non-archaeological)
-  small background magnetic anomalies (mainly natural ?)
-  cultivation
-  strong (ferrous) magnetic anomalies

overgrown

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 Figure 2: Magnetometer survey
 (with interpretation)

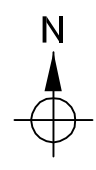
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-  magnetic anomalies (archaeological ?)
-  former field boundaries ?
-  strong magnetic disturbances (recent / non-archaeological)
-  small background magnetic anomalies (mainly natural ?)
-  cultivation
-  strong (ferrous) magnetic anomalies

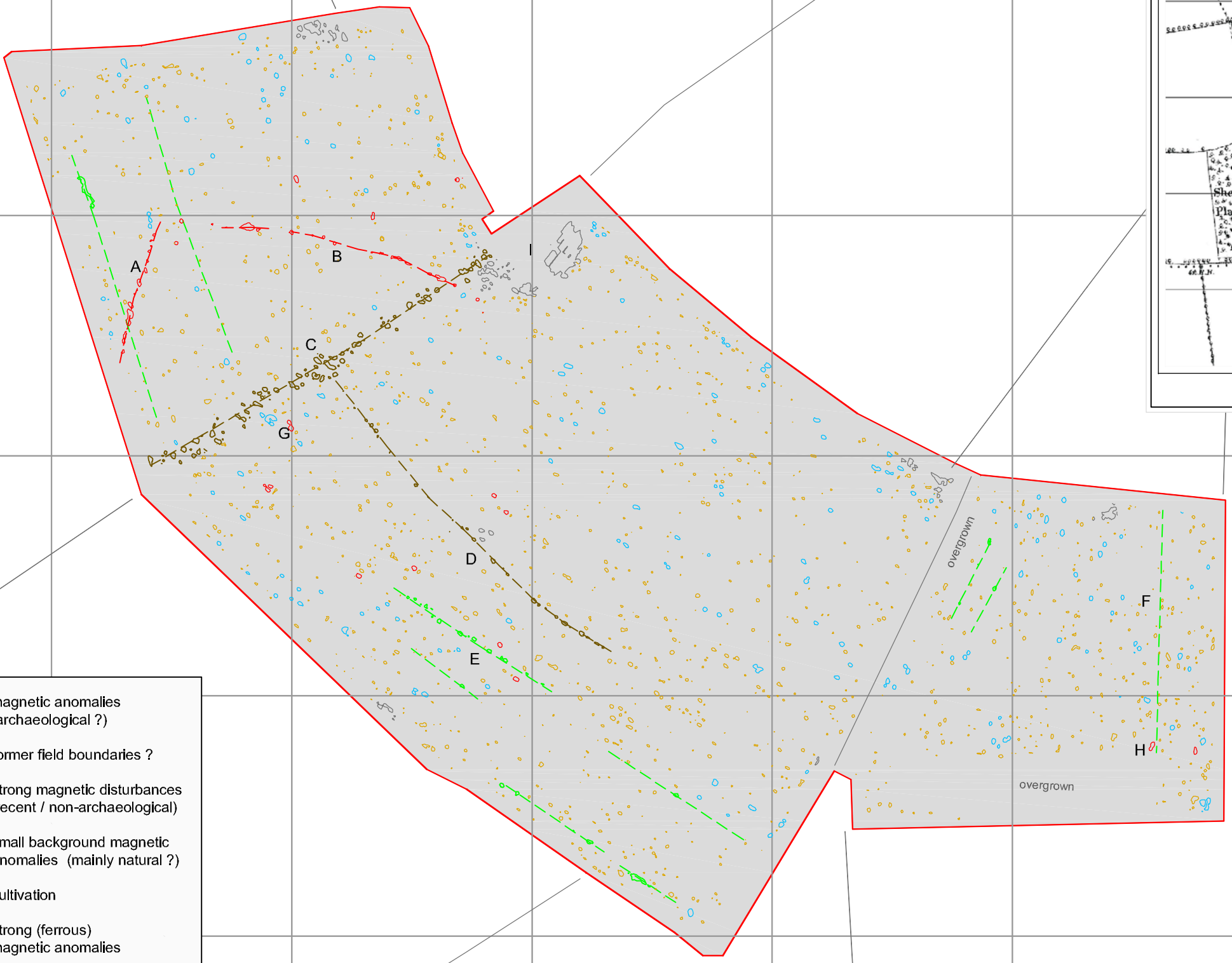
BRICKKILN LANE
 Mulbarton, Norfolk
 Geophysical Survey 2015
 Figure 3: Magnetometer survey
 (with interpretation)







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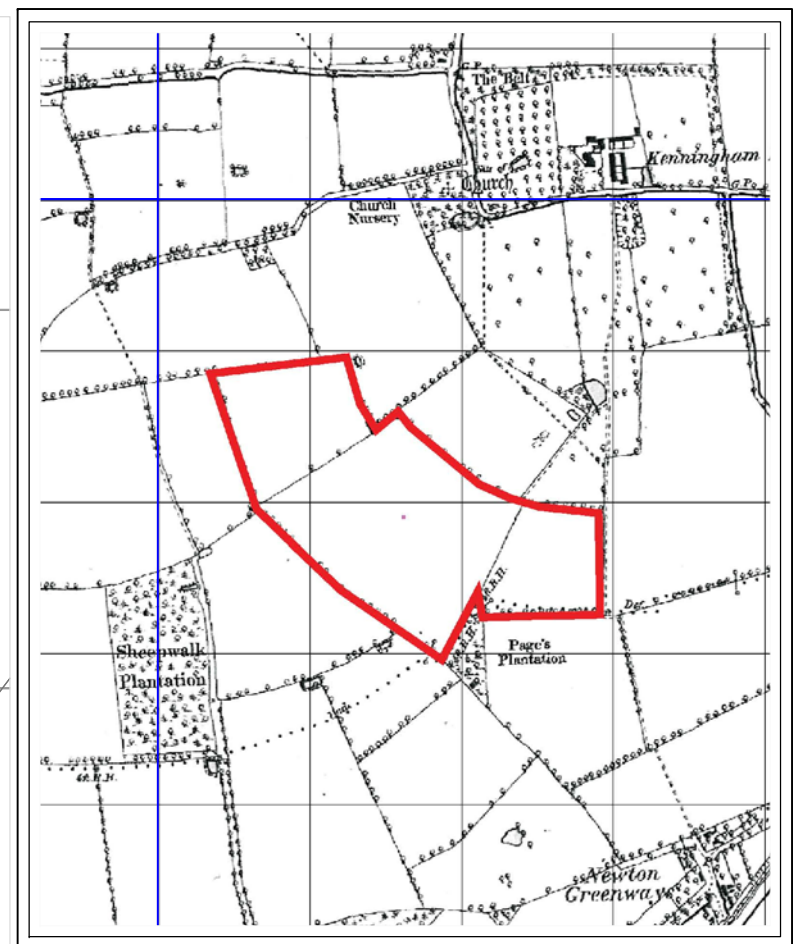


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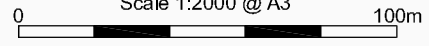
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-  strong (ferrous) magnetic anomalies

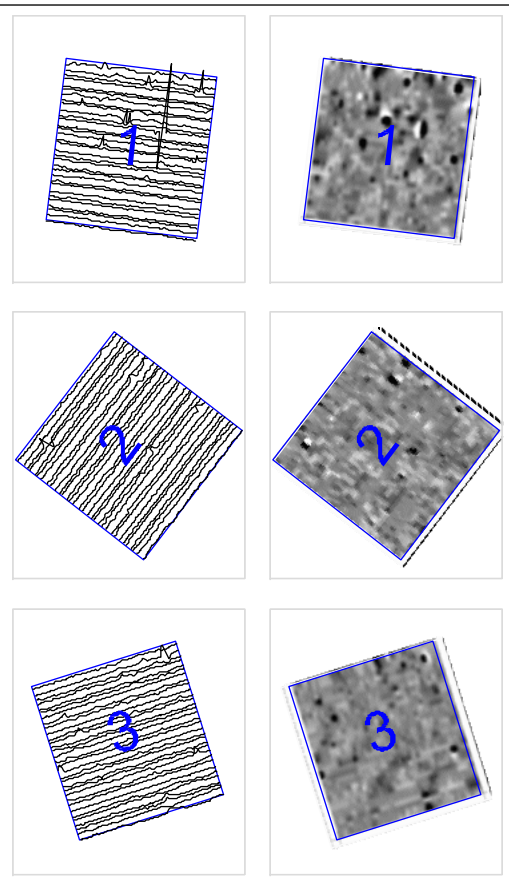
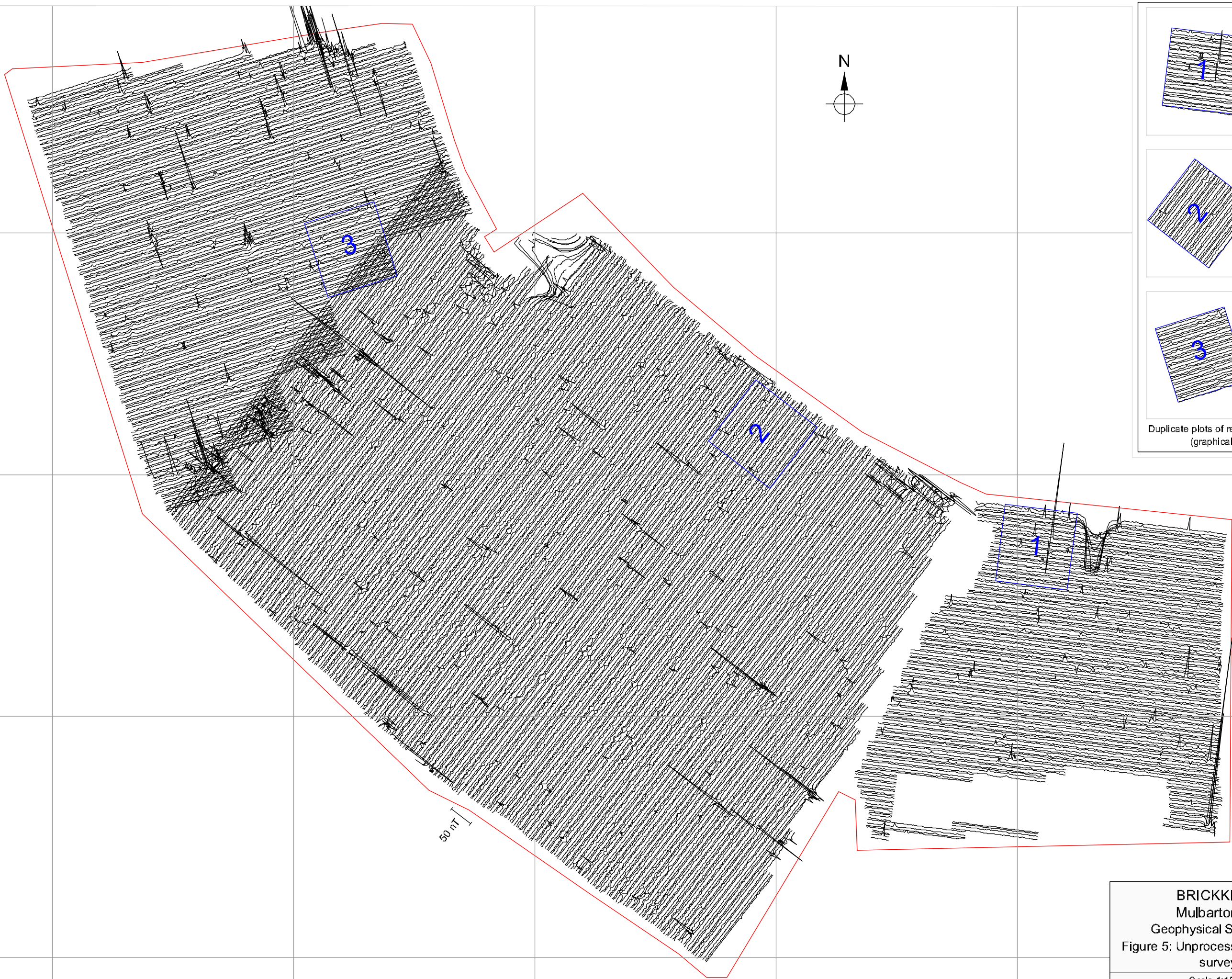
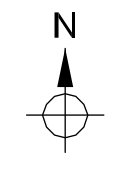


OS map 1887 (from DBA figure 2) 1:10000

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 Figure 4: Summary of findings

Scale 1:2000 @ A3





Duplicate plots of re-surveyed test areas: days 1-3
(graphical and grey scale plots)

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Figure 5: Unprocessed magnetometer
survey data

Scale 1:1500 @ A3