MOUNTSORREL QUARRY, LEICESTERSHIRE

Report on Archaeological Geophysical Survey 2013

Surveyed by:

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Milton Keynes MK13 9HD

Mountsorrel Quarry, Leicestershire

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Introduction

The purpose of this preliminary geophysical survey was to test the suitability of land adjacent to Mountsorrel Quarry for further investigation by means of magnetometer surveying. The survey forms part of an archaeological evaluation of land which is under consideration for proposed extensions to the existing quarry.

The survey was commissioned from Bartlett-Clark Consultancy, Specialists in Archaeogeophysics of Oxford, by Archaeologica Ltd on behalf of Lafarge Tarmac Ltd. Fieldwork for the survey was done on 7 May 2013.

The Site

Location and topography

The survey covered two trial blocks of about 1ha each in farmland to the south of the quarry, and centred around NGR 456400, 314300. Area 1 (within Lafarge Site 2) is a pasture field north of Kinchley lane, and immediately to the south of the existing quarry. Area 2 (Lafarge Site 4) is a sample block in an arable field about 500m south of Area 1.

Both areas are to the south of the Mountsorrel granite outcrop, and so may be on a bedrock of the adjacent Triassic (Mercia) Mudstone, but the magnetic properties of the site for surveying purposes are likely to be determined mainly by the overlying glacial drift deposits rather than the bedrock. Glacial boulder clays provide variable, but often sufficiently favourable, conditions for magnetometer surveys. It is sometimes the case at sites with a high proportion of gravel in the drift material that naturally magnetic stones in the topsoil will give rise to small magnetic anomalies which need to be distinguished from potential archaeological features when interpreting the survey. Some magnetic activity of this kind may be present here (as indicated by small features outlined in light brown in the interpretation), but the effect is not conspicuous. It is probable, therefore, that the soil is predominantly clay, as is suggested by the magnetic susceptibility readings taken at the site during the survey. The readings indicated that the soil is unlikely to be strongly responsive to a magnetometer survey, although productive surveys have been undertaken elsewhere in comparable conditions. Readings were in the (relatively low) range of 9 to 12 (x 10^{-5} SI), which suggests that silted ditches or earthwork features removed from any source of magnetic enhancement will not necessarily be detectable, but concentrations of features or activity (of the kind which might be found at an ancient settlement or industrial site) should be identifiable.

Archaeological background

Area 1 is about 200m to the south of the Buddon Wood prehistoric settlement, where findings include a ditched settlement of Iron Age date, and previous activity dating back to the Neolithic. This site (reference 842/843) is indicated by coloured circles on the location plan (figure 1). The survey area is located immediately to the north of an old quarry.

The field containing Area 2 was previously investigated by fieldwalking, which identified a prehistoric flint scatter, and some prehistoric pottery (site 907/908). The survey block is located in an area of the field containing a slight increase in the density of surface finds.

Survey Procedure

The method used for this geophysical investigation was a recorded magnetometer survey, with readings collected along transects 1m apart using Bartington 1m fluxgate gradiometers, and plotted at 25cm intervals along each transect. The results of the survey are presented as a grey scale plot for each area in figure 2 and as a graphical (x-y trace) plot at 1:1250 in figures 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 shown superimposed on figure 3 (which permits the interpreted magnetic anomalies to be compared with the underlying data), and is reproduced separately to provide a summary of the findings (figure 4).

The graphical plot shows the magnetometer readings after minimal processing to adjust for irregularities in line spacing caused by variations in the instrument zero setting. Additional 2D low pass filtering has been applied to the grey scale plot to adjust background noise levels.

Colour coding has been used in the interpretation to distinguish different effects. Magnetic anomalies of possibly archaeological origin are outlined in red. Strong magnetic disturbances which are likely to be of recent origin are shown in dark brown. Some other individual strong magnetic anomalies which appear to represent iron objects are in blue, and weak natural or potential cultivation effects in green. Small background magnetic anomalies are in light brown.

Survey location

The survey grid was set out and tied to the OS grid using a Trimble differential GPS system (with Omnistar correction to give c. 10cm accuracy). 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.

Results

Area 1 (Site 2)

The survey has responded clearly to a number of features, but the findings cannot be claimed

to be of unambiguous archaeological significance. The main findings are a distinct ditch-like linear feature (as marked in red and labelled A in figure 4), and parallel linear markings (green). The features shown in green could be cultivation effects or drains, and appear to follow more than one alignment. Some of them are fragmented or intermittent in appearance (particularly in the grey scale plot), and so could represent sections of clay land drain, but the possibility that there could also be cultivation effects (perhaps indicating traces of ridge and furrow) cannot be entirely excluded.

It is also uncertain whether the linear feature A is a ditch (of possible archaeological relevance), or a more recent drain. There is perhaps a second branching feature at B, which suggests a drain, but A is continuous in appearance, as would be expected for a silted ditch.

Area 2 (Site 4)

The survey has again produced a clear representation of features which may include cultivation effects and drains. The linear feature (red) at C is more broken in appearance than A in Area 1, and so is likely to be a drain. The branching plan of features to the south (D, E) suggests they also are drains. Some of the parallel linear markings shown in green are represented by continuous magnetic anomalies, suggesting they are cultivation effects, but some terminate at the probable drain C. A few additional magnetic anomalies of a kind which could represent silted pits are outlined in red (as at F, G). There is no distinct group or concentration of pit-like features to suggest a concentration of archaeological findings.

Broad weak magnetic anomalies, as shown in light green in the south eastern corner of the survey at H, are of a kind commonly seen at wetland sites (where they may represent variations in the depth or composition of silt deposits), and are likely to be natural.

Conclusions

This trial survey has responded clearly to various subsurface features, but has not necessarily detected any findings of conclusive archaeological significance. The clay soil shows signs of waterlogging in Area 2, and both areas appear to contain complex systems of land drains.

Findings include a substantial infilled ditch (possibly forming part of a drainage system) at A in Area 1, and linear magnetic anomalies which are likely to represent clay drains (C, D, E) in Area 2. Some of the parallel background linear features (green) are also likely to be drains, but they could also include cultivation effects. The remaining findings (including possible pit-like features G, H) are minor and inconclusive.

These results suggest that a more extensive survey of these fields would produce a comprehensive picture of subsurface features and activity, but that archaeological findings (if present) would not necessarily respond as strongly as more recent disturbances.

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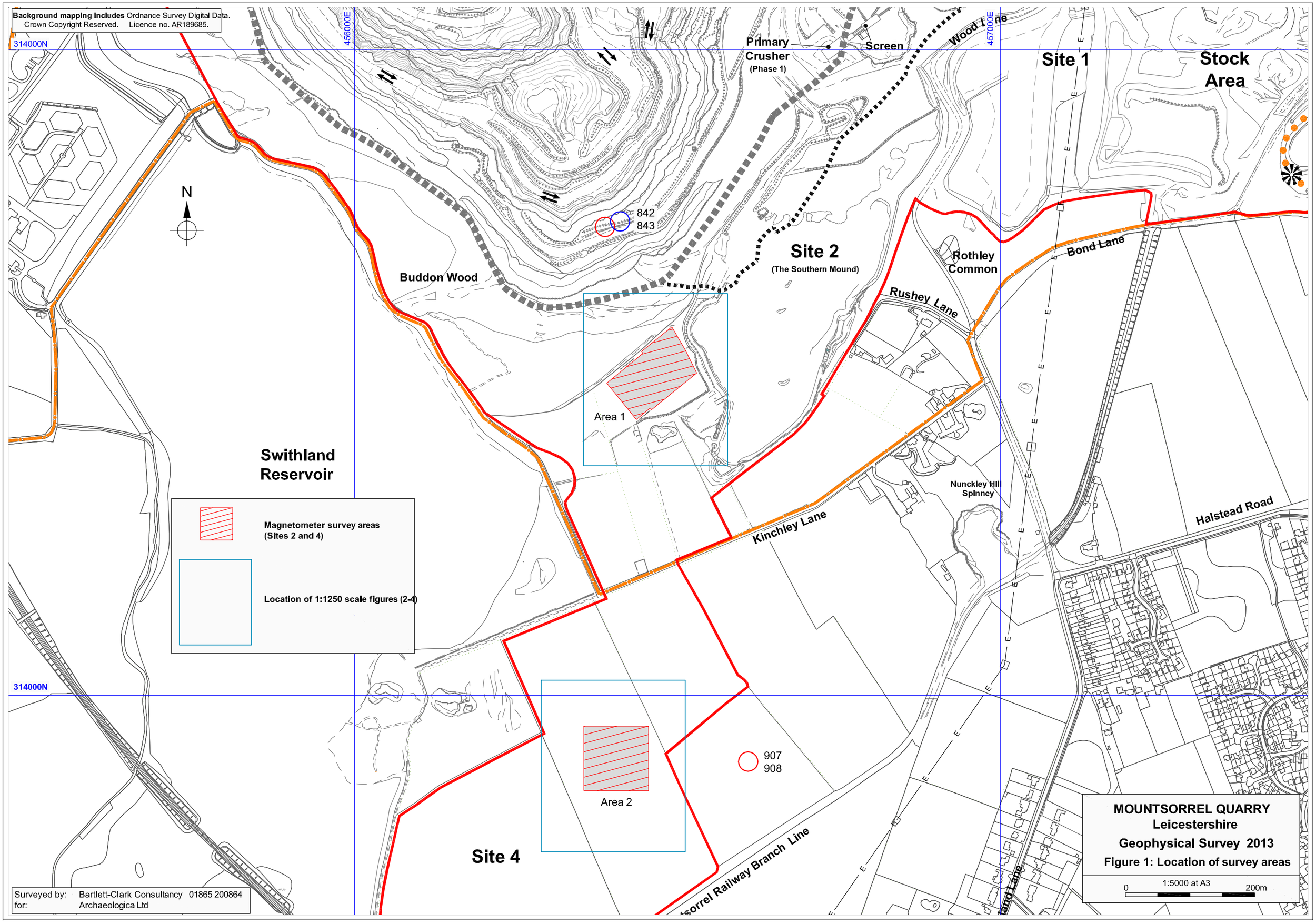
12 August 2013

The fieldwork for this project was done P. Cottrell and P. Heykoop.


Background mapping includes Ordnance Survey Digital Data.
Crown Copyright Reserved. Licence no. AR189685.
314000N
456000E
457000E
N
Primary Crusher
(Phase 1)
Screen
Wood Lane
Site 1
Stock Area
842
843
Site 2
(The Southern Mound)
Buddon Wood
Rothley Common
Bond Lane
Rushey Lane
Area 1
Swithland Reservoir
Nunckley Hill Spinney
Halstead Road
Kinchley Lane
Magnetometer survey areas (Sites 2 and 4)
Location of 1:1250 scale figures (2-4)
907
908
Area 2
Site 4
Railway Branch Line
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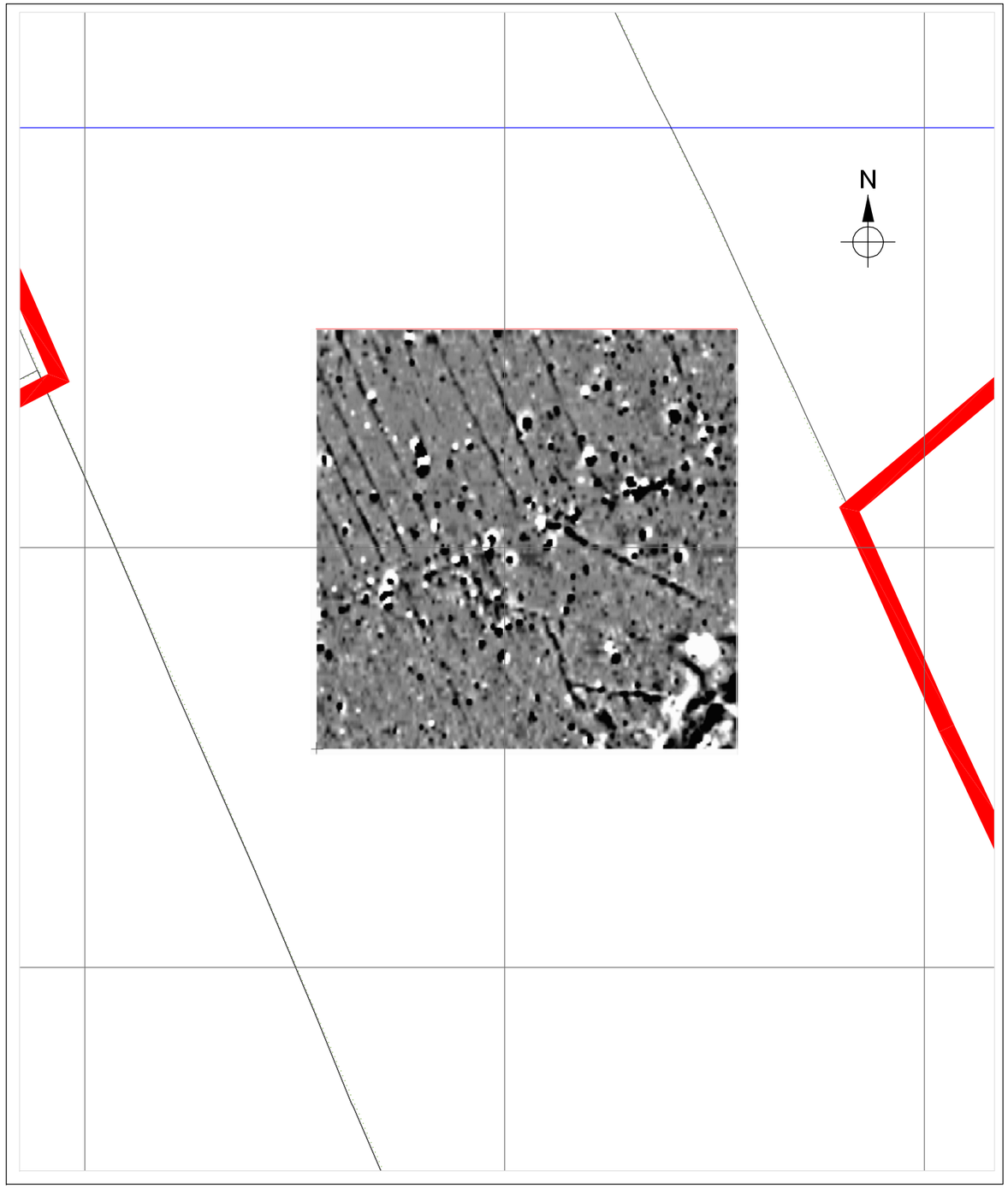
Leicestershire
Geophysical Survey 2013
Figure 1: Location of survey areas
0
1:5000 at A3
200m

Area 1



Area 2

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Figure 2: Magnetometer survey
(grey scale plot)

0 1:1250 at A3 50m

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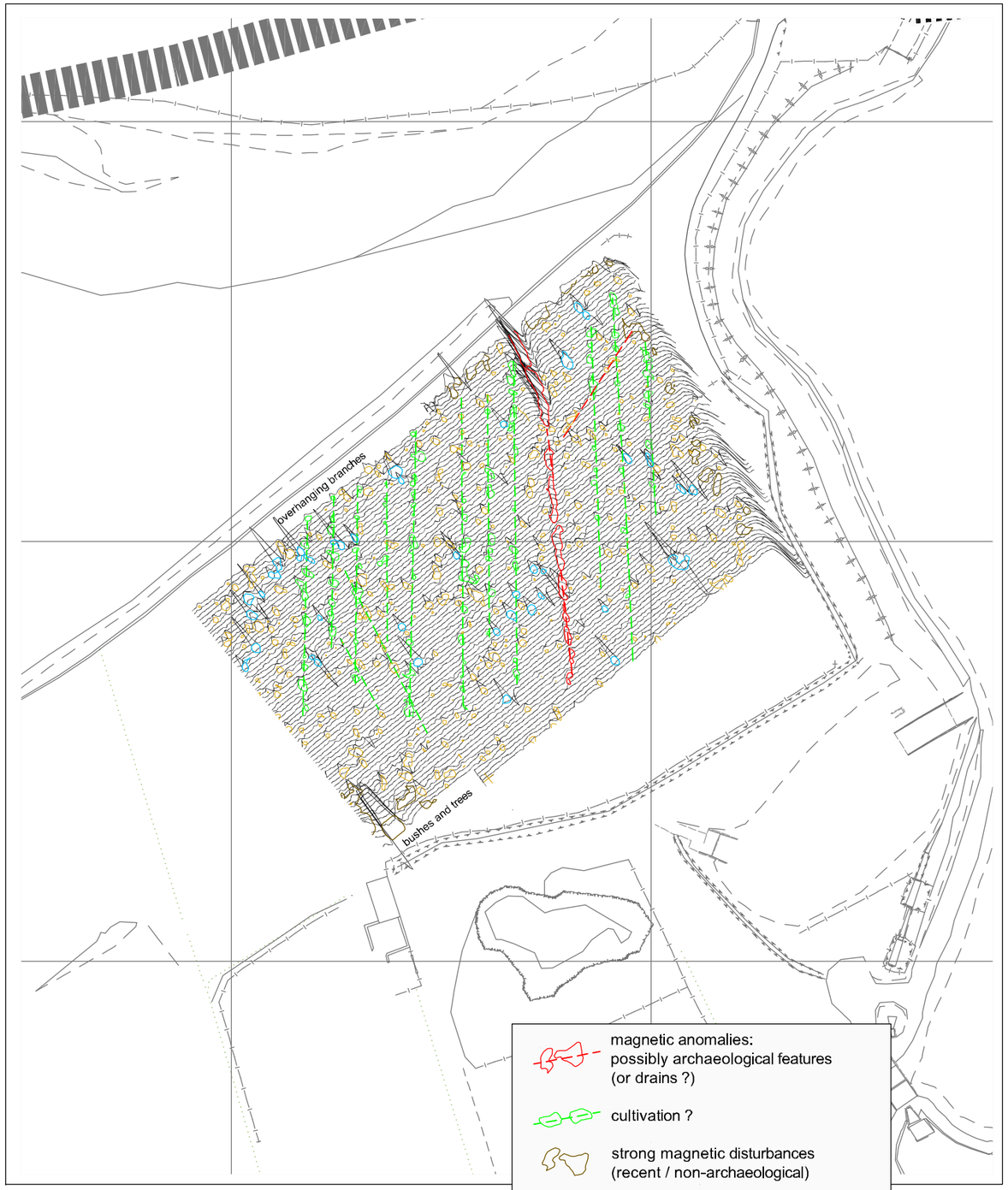
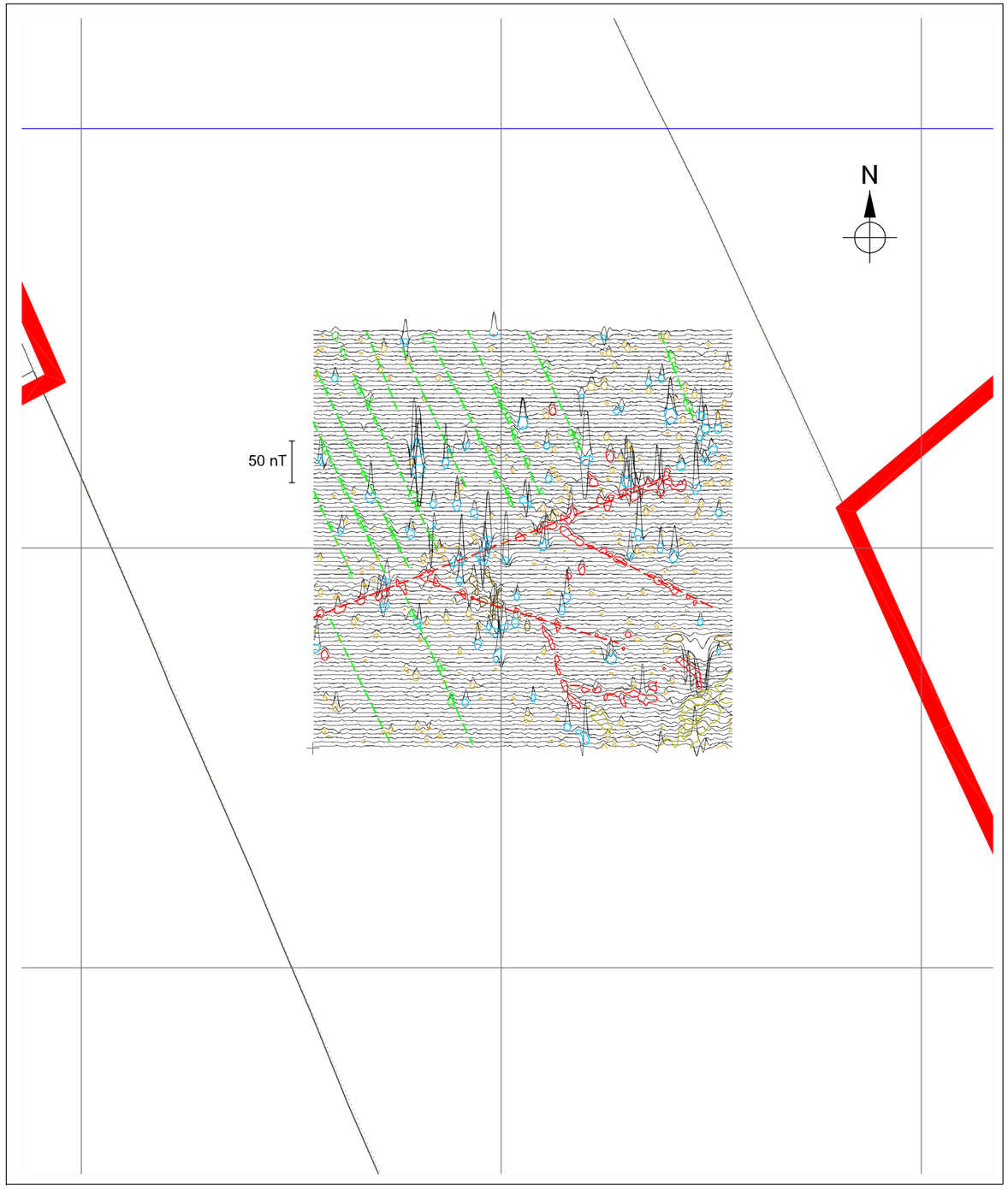


Area 1



Area 2

magnetic anomalies:
possibly archaeological features
(or drains ?)

cultivation ?

strong magnetic disturbances
(recent / non-archaeological)

small background magnetic anomalies
(geological / non -archaeological)

weak magnetic anomalies
(natural ?)

strong (ferrous) magnetic anomalies

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Figure 3: Magnetometer survey
(with interpretation)

0 1:1250 at A3 50m

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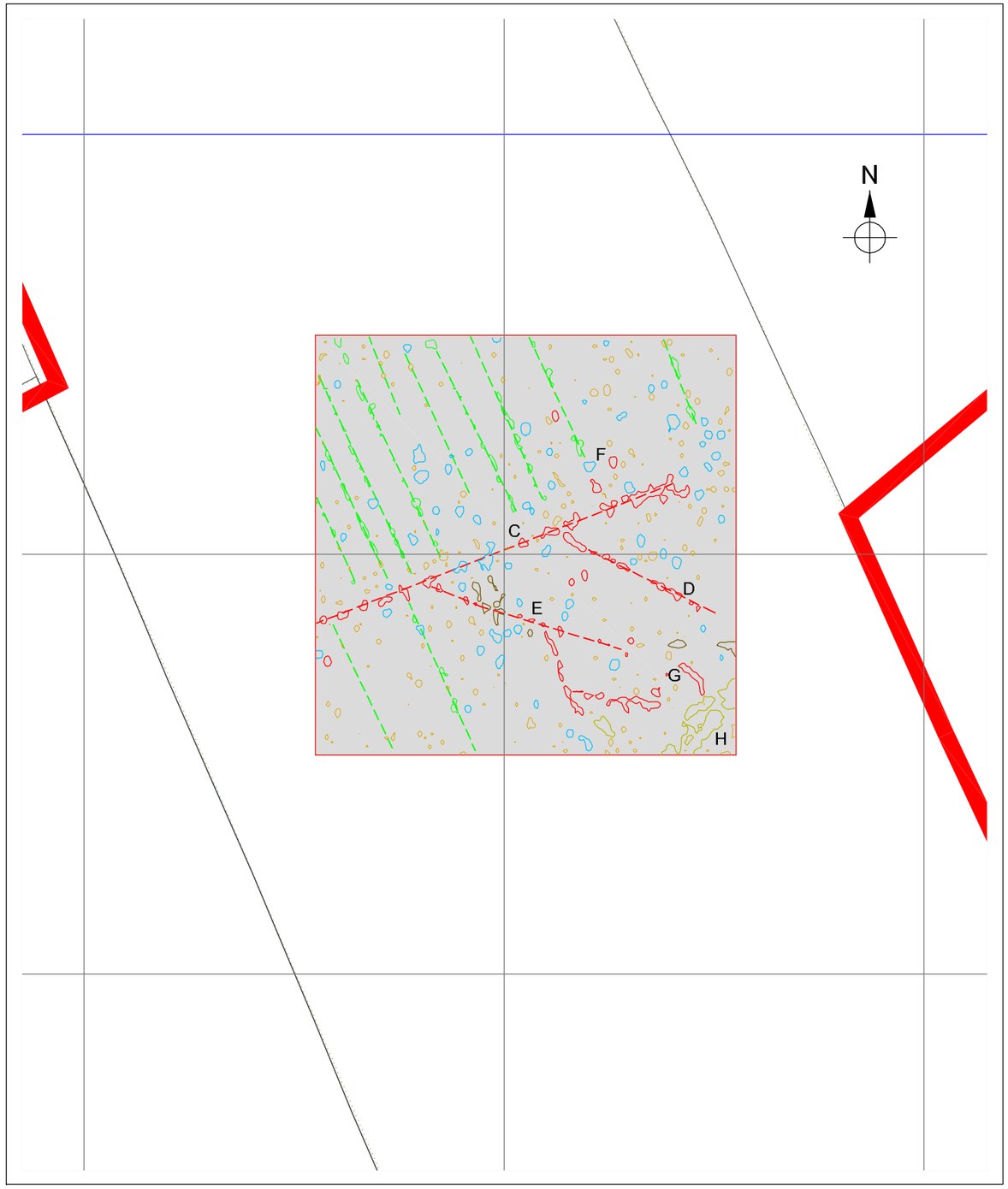
Area 1



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(natural ?)

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Figure 4: Summary of findings

0 1:1250 at A3 50m

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