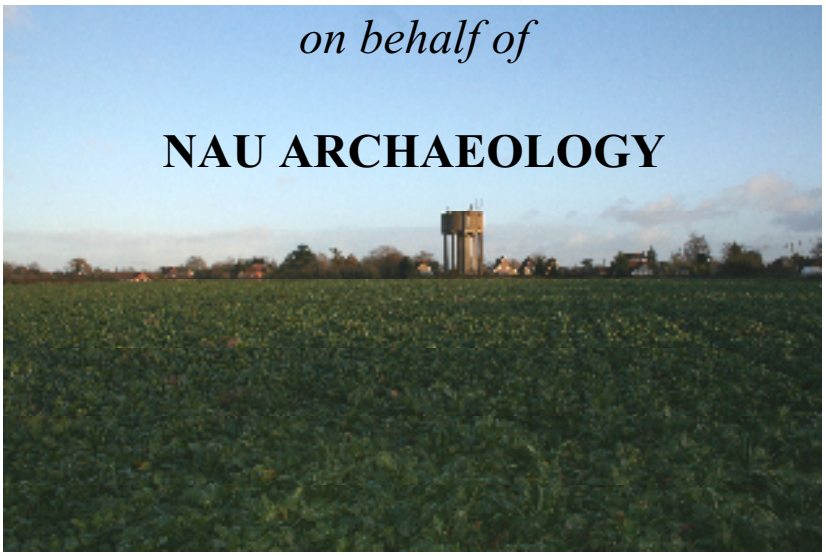
NPA GEOPHYSICAL SURVEYS

Client Report CP730 November 2008

GEOPHYSICAL SURVEY OF LAND NORTH OF GREAT MELTON ROAD, HETHERSETT, NORFOLK

on behalf of

NAU ARCHAEOLOGY



NGR: TG 1465 0526

OASIS ID: northpen3-52212

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SUMMARY

In November 2008, North Pennines Archaeology Ltd, commissioned by NAU Archaeology, undertook geophysical surveys of *c*.5.6ha of land on the north side of Great Melton Road. The survey was undertaken at the site of a proposed residential development, situated immediately northwest of Hethersett, Norfolk. The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site. The work was conducted in accordance the relevant English Heritage and IFA guidelines.

The site is situated in a single arable field to the north of Great Melton Road (NGR TG 1465 0526), in an area considered to have high archaeological potential. Of particular significance are a probable Roman villa complex that has been identified in fields to the north of the proposed development area. A possible Early Saxon cemetery has also been identified in fields to the north of Hethersett. Medieval building remains are believed to survive to the west of the site.

Modern agricultural features were detected over the majority of the survey area. Two service pipes were detected on the east side of the site. No definite archaeological anomalies were detected within the study area, suggesting that the area may have remained agricultural land throughout the Roman and later periods. Given the results of the survey, no further geophysical survey is recommended at the site.

1 INTRODUCTION *(Figure 1)*

1.1 In November 2008, North Pennines Archaeology Ltd, commissioned by NAU Archaeology, undertook a geophysical survey of *c*.5.6ha of land, on the north side of Great Melton Road. The survey was undertaken at the site of a proposed residential development, situated immediately northwest of Hethersett, Norfolk (Figure 1).

1.2 The site is situated in a single arable field to the north of Great Melton Road (NGR TG 1465 0526), in an area considered to have high archaeological potential. Of particular significance are a probable Roman villa complex that has been identified in fields to the north of the proposed development area. A possible Early Saxon cemetery has also been identified in fields to the north of Hethersett. Medieval building remains are believed to survive to the west of the site.

1.3 Hethersett occupies a plateau to the south of the River Yare, between the River Tiffey to the west and the River Tas to the east. The solid geology of the area comprises chalk, overlain by glacial sands and gravels (BGS 2001).

1.3 The objective of the geophysical survey was to determine the presence/absence, nature and extent of any archaeological anomalies within the proposed development area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to inform the need for any further evaluation work within the proposed development area. The work was conducted in accordance the relevant English Heritage and IFA guidelines.

1.7 The geophysical surveys were conducted by Martin Railton and Angus Clark, between 24th and 27st November 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton.

2 METHODOLOGY

2.1 Standards

2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 2008), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

2.2 Technique Selection

2.2.1 Geomagnetic survey was selected as the most appropriate technique, given the non-igneous environment, and the possible presence of cut archaeological features at depths of no more than 1.5m.

2.2.2 This technique involved the use of hand-held gradiometers, which measure variations in the vertical component of the earth's magnetic field. These variations can be due to the presence of sub-surface archaeological features. Data was recorded by the instruments and downloaded into a laptop computer for initial data processing in the field using specialist software.

2.3 Field Methods

2.3.1 The study area was located in a single arable field, located north of Great Melton Road. A 30m grid was established, and tied-in to known Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.

2.3.2 Geomagnetic measurements were determined using a Bartington Grad601-2 dual gradiometer system, with twin probes set 1m apart. It was expected that significant archaeological features at a depth of up to 1.5m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 30m grid units. A sample interval of 0.25m was used, with a traverse interval of 1m, providing 3600 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

2.4 Data Processing

2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce a 'grey-scale' image of the raw data. Positive magnetic anomalies are displayed as dark grey, and negative magnetic anomalies are displayed as light grey. A palette bar shows the relationship between the grey shades and geomagnetic values in nT.

2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

Despike: *to locate and suppress random iron spikes in the gradiometer data*

Clip: *to clip data to specified maximum and minimum values, in order to limit large noise spikes in the gradiometer data*

Destagger: *to reduce the effect of staggered gradiometer data, sometimes caused by difficult working conditions, topography, or operator error*

2.5 Interpretation

2.5.1 Two types of geophysical anomaly were detected in the gradiometer data:

positive magnetic: regions of anomalously high or positive magnetic gradient, which may be associated with the presence of high magnetic susceptibility soil-filled features, such as pits or ditches.

dipolar magnetic: regions of paired positive-negative magnetic anomalies, which typically reflect ferrous or fired materials, including fired/ferrous debris in the topsoil, modern services, metallic structures, or fired structures, such as kilns or hearths.

2.6 Presentation

2.6.1 The grey-scale image was combined with site survey data and Ordnance Survey data to produce the geophysical survey plan. A colour-coded geophysical interpretation diagram is provided, showing the locations and extent of positive and dipolar magnetic anomalies.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 A1 geophysical survey plans are available separately to the report at a scale of 1:500 should these be required. Trace plots of the unprocessed geophysical data are also available if required.

2.7 Project Archive

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

2.7.2 One copy of the survey report will be deposited with the County Historic Environment Record, where viewing will be available on request. The project is also registered with the **O**nline **A**cces**S** to the **I**ndex of archaeological investigation**S** (**OASIS**). The OASIS reference for this project is **northpen3-52212**

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 Historical Background

3.1.1 A desk-based assessment of the Hethersett area has previously been undertaken by NAU Archaeology (Watkins 2008), a summary of which is included below in relation to the proposed development area. References to the Norfolk Historic Environment Records (NHER) are shown in brackets where known.

3.1.2 A number of Neolithic and Bronze Age flints, as well as metal and pottery finds have been recovered from the Hethersett area, suggesting prehistoric activity took place in a variety of locations, including within the valleys around Hethersett and on the higher ground of the plateau. The remains of a number of Late Neolithic/Bronze Age round barrows also survive in the Hethersett area. Artefacts also attest to Iron Age activity in the area, but the extent of this activity is uncertain.

3.1.3 Roman period activity around Haddiscoe is represented by a large number of Roman finds. Of particular significance is a location in fields to the north of the proposed development area, where a significant quantity of material has been recovered suggesting the site may be a settlement focus, possible a Roman villa or farmstead (NHER 9270). Roman pottery fragments and coins are also believed to have been found within the study area (NHER 32865). It is also possible that a straight boundary, that runs north-south along the western edge of the proposed development area, was once part of a Roman road or track way.

3.1.4 Evidence for Saxon activity in the Hethersett area is generally limited to a small number of isolated finds. However, a significant amount of Early Saxon metalwork has been recovered from a location to the north of the town, which is believed to be the site of a possible inhumation cemetery (NHER 21862). The villages of Great Melton and Little Melton, probably have origins in the Middle or Late Saxon periods.

3.1.5 It is possible that Hethersett did not develop as a significant settlement until the medieval period. The Domesday entries for Hethersett record it as having been split between several manors. A number of possible moated sites have been identified. It is possible that medieval settlement extended along Great Melton Road to the west of Hethersett, on the edge of an area of former common land. Medieval building remains have been identified at several locations around the town.

3.1.6 The enclosure award of 1798 saw the subdivision of common land in the Hethersett area, and the creation of a number of new roads. A quantity of post-medieval pottery has been recovered from the proposed development area (NHER 32865), but this is probably due to agricultural activities.

3.2 Previous Archaeological Works

3.2.1 The archaeological potential of the area was confirmed in a field to the north of the site in 2005 by NAU Archaeology (Shelly and Green 2007). Excavation revealed a well, pits and ditches of Roman date, suggesting that the possible villa site was associated with an extensive field system.

3.2.2 No known archaeological works have previously taken place within the boundary of the proposed development area.

4 SURVEY RESULTS *(Figures 2-4)*

4.1 Gradiometer survey

4.1.1 The survey area measured *c*.5.6ha, and was situated immediately to the north of Great Melton Road, in a single arable field. At the time of the survey this field contained a mature crop of sugar beet. The field was bounded by wide hedgerows, with a public footpath along the north side. Houses and gardens bounded the survey area to the southeast. A concrete water tower stands at the southeast corner of the site.

4.1.2 Small discrete dipolar magnetic anomalies were detected across the whole of the survey area. These were almost certainly caused by fired/ferrous litter in the topsoil, which is typical for modern agricultural land.

4.1.3 The presence of the sugar beet crop and associated agricultural ridges at the time of the survey, produced some unavoidable striping in the gradiometer data, with a northwest-southeast alignment.

4.1.3 Strong dipolar magnetic anomalies were detected on the southeast side of the survey area, due to the presence of modern garden fences, modern household debris, and a bonfire. Two discrete dipolar magnetic anomalies were detected towards the centre of the survey area, due to the presence of two telegraph poles.

4.1.4 Two strong linear dipolar magnetic anomalies were detected on the east side of the survey area, aligned northeast-southwest and northwest-southeast. These almost certainly mark the locations of modern services, possibly water pipes associated with the nearby water tower and modern housing.

4.1.5 A number of weak linear positive magnetic anomalies were detected, which are believed to relate to modern agricultural practices. In addition a weak linear positive magnetic anomaly was detected on the east side of the survey area, aligned approximately north-south, which could tentatively be interpreted as a soil-filled feature or a land drain.

4.1.6 A weak linear positive magnetic anomaly was detected on the west side of the survey area, aligned approximately north-south. This was parallel with the western field boundary and may be a modern agricultural feature. However, the possibility exists that this is a remnant of an earlier boundary feature.

4.1.7 No definite archaeological features were detected by the geophysical survey.

5 CONCLUSIONS

5.1 Geomagnetic surveys covering *c*.5.6ha of land have been conducted in a single arable field to the north of Great Melton Road, Hethersett, covering the proposed location of a new residential development. Modern agricultural features were detected over the majority of the survey area. Two service pipes were detected on the east side of the site.

5.2 Despite the high archaeological potential of the area, no definite archaeological anomalies were detected within the study area, suggesting that the site may have been agricultural land throughout the Roman and later periods.

5.3 Given the results of the survey, no further geophysical survey is recommended at the site.

6 ACKNOWLEDGEMENTS

North Pennines Archaeology are grateful to David Whitmore of NAU Archaeology for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of NAU Archaeology.

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APPENDIX I – ILLUSTRATIONS

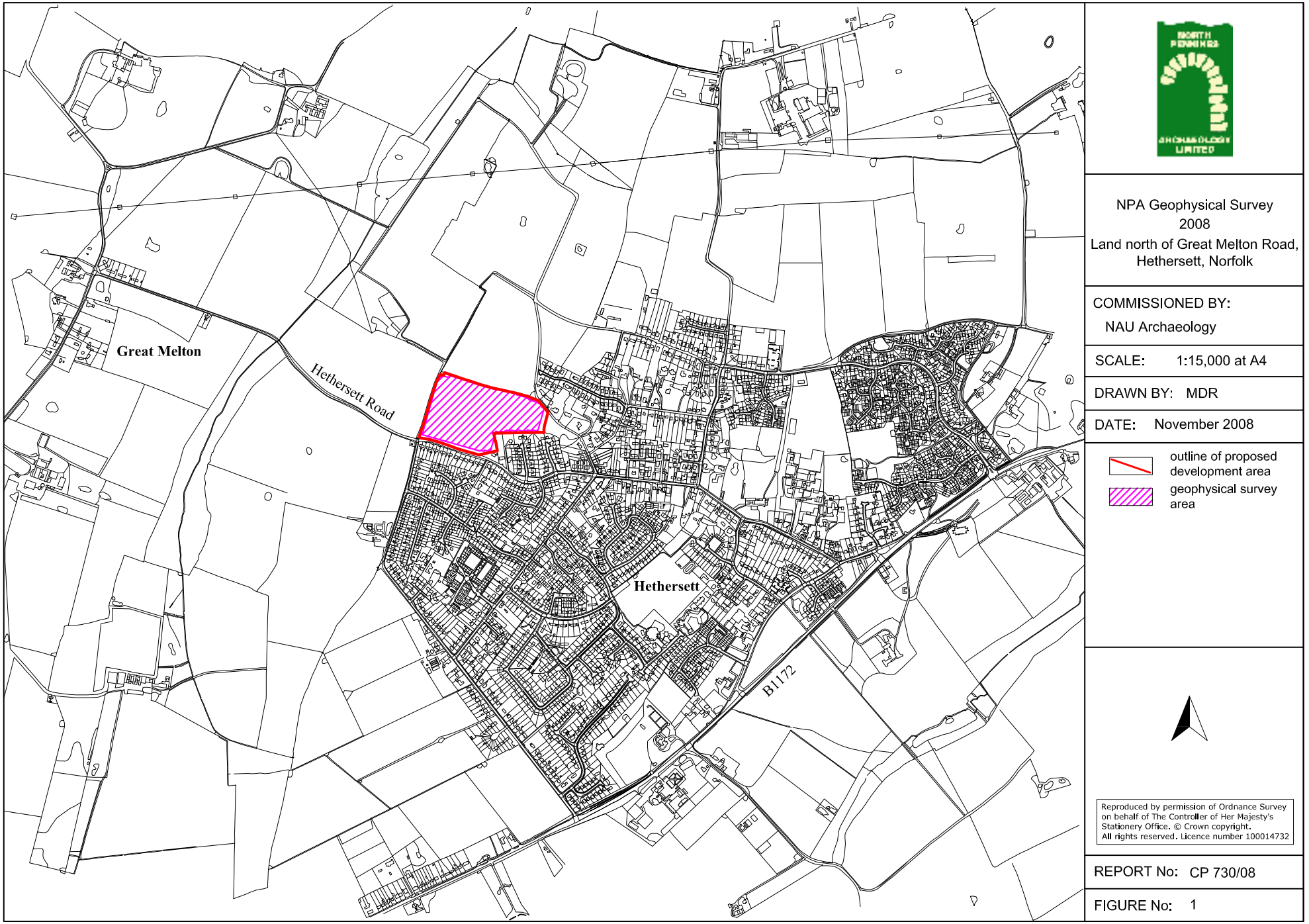
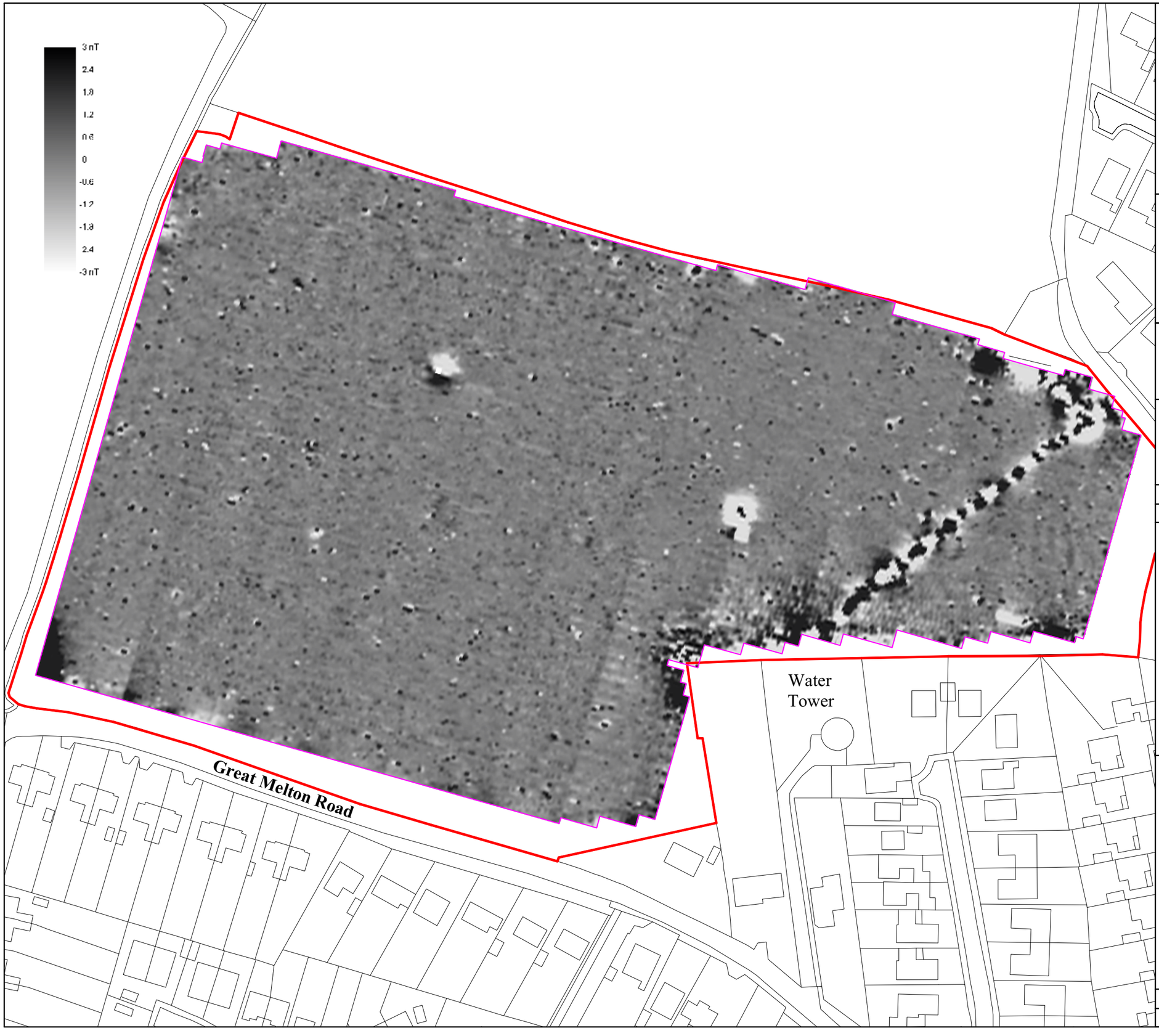


Figure 1 : Location of the geophysical survey area



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NPA Geophysical Survey
2008
Land north of Great Melton Road,
Hethersett, Norfolk

COMMISSIONED BY:
NAU Archaeology

Scale 1:1250 at A3

DRAWN BY: MDR

DATE: November 2008

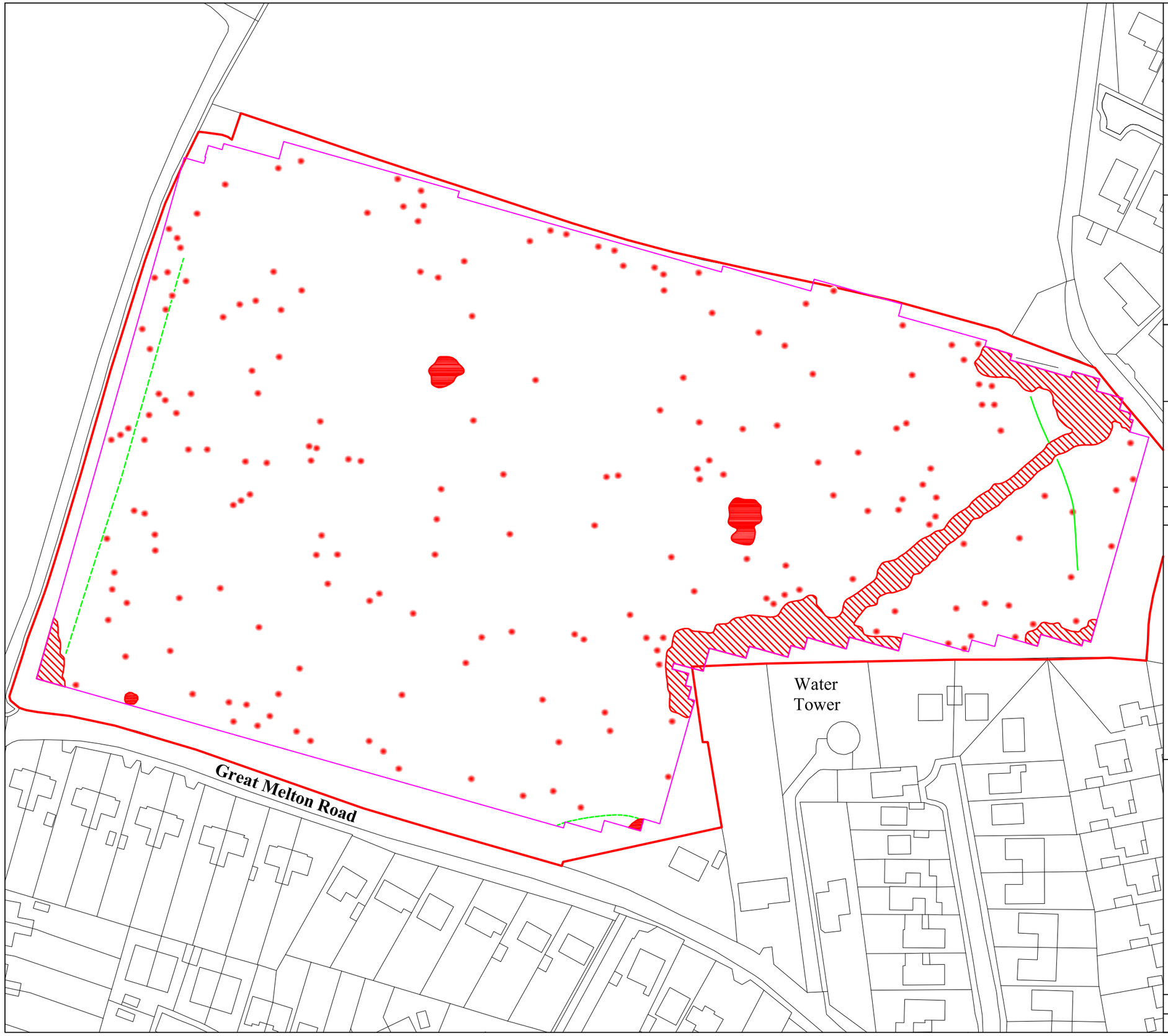
outline of proposed development area

outline of geophysical survey area

Report No: CP730/08

Figure No: 2

Figure 2 : Geophysical survey



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Scale 1:1250 at A3

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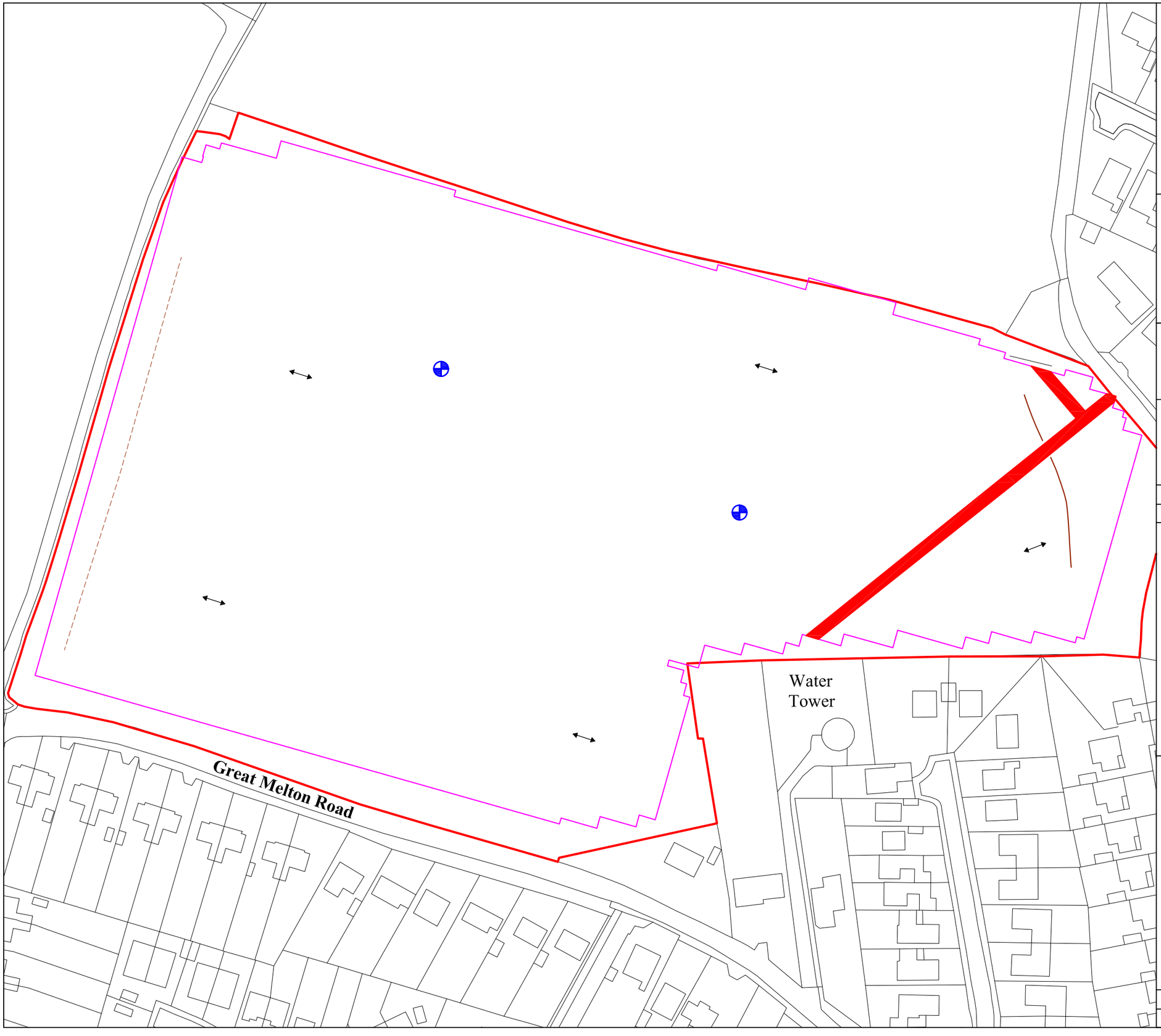
DATE: November 2008

- outline of proposed development area
- outline of geophysical survey area
- positive magnetic anomaly
- dipolar magnetic anomaly

Report No: CP730/08

Figure No: 3

Figure 3 : Geophysical interpretation



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outline of proposed development area
outline of geophysical survey area
direction of cultivation
service pipes
telegraph pole
possible soil-filled feature

Report No: CP730/08

Figure No: 4

Figure 4 : Archaeological interpretation