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Engineering Archaeological Services Ltd

*Land off Gordon Field, Market Rasen
Geophysical Survey*

December 2003

EAS Client Report 2003/34

EVENT L15078

SOURCE L19477

NEGATIVE

L17210

L18183

*Survey Commissioned
by
Archaeological Project Services*

*Surveyed
by
I.P. Brooks
Engineering Archaeological Services Ltd.*

*registered in England
Nº 2869678*



*Land off Gordon Field, Market Rasen
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December 2003

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NGR

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Gordon Field, Market Rasen, Geophysical Survey - Introduction:

NGR

Centred on TF 10665 88791

Location and Topography (Figure 1)

The survey area is between the houses fronting onto Gordon Field, Market Rasen and the railway station. This small area of open ground within the core of Market Rasen is bounded by back gardens on three sides and by the car park for Market Rasen station on the fourth. At the time of survey it was evident that the field had not been used for agriculture for some time as it had grown rank vegetation. This had been cut prior to the survey over most of the development area. As a result of this cutting the eastern side of the survey area was marked by a series of deep ruts as the cutting machinery had obviously sunk into the soft ground. The narrow strip of land at the northern end of the development area had not been cut, thus this area was excluded from the survey.

The development area can be divided into three main areas. The northern strip, already discussed, the central area and a southern area, south of a bank running across the field. The central area was basically flat with cut vegetation, however the north west corner had not been cut. This area had also been used for the informal dumping of modern rubbish and was therefore excluded from the survey.

The southern area had little open ground. It contained several semi-mature to mature trees and was also subject to a level of modern dumping. It was not possible to carry out detailed survey within this area, however, some informal magnetic scanning was undertaken.

Archaeological Background (Archaeological Project Services 2003)

It is proposed to build houses within the central area of the survey area and to convert the southern area to new allotments.

There is evidence of a large scale Roman pottery production site approximately 300 m to the south

east of the proposed development. Slag has also been recovered from this site suggesting the possibility of other industrial activities on the site. The recovery of pottery and coins from around Market Rasen would suggest settlement in the area, probably associated with the pottery production.

During the Medieval period the development site would appear to be within the area of strip fields associated with the town.

A map of AD 1828 indicates several kilns, some of which would appear to occupy a similar area to the known Roman pottery production site.

Aims of Survey

To gather sufficient information to establish the location and extent of any archaeological features within the development area and, if possible, to characterise the archaeology located.

SUMMARY OF RESULTS

Only a limited area proved to be suitable for magnetic survey. The field contained a large quantity of modern disturbance and had obviously been used for the informal dumping of rubbish for sometime. There was also the incorporation of some of the western boundary into the garden for the houses fronting onto Gordon Field with the construction of a few sheds on the edge of the field. The majority of anomalies would appear to reflect this modern disturbance, however, two anomalies of possible archaeological origins were located. No evidence of anomalies associated with kilns were recorded.

Gordon Field, Market Rasen, Geophysical Survey -Results:

Methods

The Fluxgate Gradiometer survey was undertaken using parts of twenty-four 30 x 30 m grid squares laid out as in Figure 2. Readings were taken at 0.5 m intervals along transects 1 m apart. These transects were walked in a zigzag pattern.

The survey was carried out using a Geoscan FM 36 Fluxgate Gradiometer with a ST 1 sample trigger. Grey Scale and X - Y Plots were produced using Geoscan Research "Geoplot" v. 3.00e.

Survey Results:

Area

The development area covers approximately 0.85 Ha, but because of the restrictions from the level of modern disturbance and unsuitable vegetation growth only approximately 0.3 Ha was available for detailed survey. A further 0.2 Ha, within the southern part of the development area, was subjected to informal magnetic scanning.

Display

The results are displayed as Grey Scale Image and as X-Y Trace Plots. Figures 3 and 4.

Results:

The plots are dominated by large areas of ferromagnetic responses which are the result of the level of modern disturbance in the field (Figures 5 and 6). These could be seen in the field and included two breeze block constructions with metal grills (Anomalies A and B, Figure 5) and areas of wire mesh from old fences (Anomalies F, K, L, and M). The other anomalies (C, D, E, G, H, I, N and O) all probably relate to other areas of modern disturbance with metal object within or on the topsoil.

Only two anomalies of possible archaeological origins were located. Anomaly P (Figure 5) was a short length of linear anomaly running approximately NE - SW. It is possible that this

may be part of the drainage within the field, however it does not appear to be aligned on the modern field pattern.

Anomaly Q (Figure 5) is a rectilinear anomaly approximately 4 x 6 m in size. The origins of this anomaly is unknown, however, it is possible that it relates to modern disturbance in this area of the field. It is also possible that it may be of earlier, archaeological origins.

The magnetic scanning in the southern area of the field showed the modern disturbance to continue into this area with highly variable responses. No responses of a type expected from a kiln were recorded.

Magnetic Susceptibility

It was possible to take soil samples in order to assess the magnetic susceptibility of the soils. It was not possible, however to obtain a subsoil sample for comparison.

Sample	Volume susceptibility χ_v	Mass susceptibility χ_m
Grid 1	59	49.2
Grid 3	80	75.5
Grid 4	101	98.1

In general, the susceptibilities, as measured, are of moderate values suggesting that the magnetic regime would have been suitable for magnetic survey if it were not for the level of modern disturbance. The variability between the samples may reflect underlying areas of activity within the field, however they may also reflect areas of modern disturbance.

Gordon Field, Market Rasen, Geophysical Survey - Conclusions:

Conclusions

It is a fundamental axiom of archaeological geophysics that the absence of features in the survey data does not mean that there is no archaeology present in the survey area only that the techniques used have not detected it.

The proposed development area was highly disturbed by modern rubbish including metal object which tended to mask any potential anomalies of archaeological origins. It would be expected, however, that potential kilns may have been recorded in the data if they existed away from the areas of modern disturbance. No such anomalies were recorded, however, the level of modern disturbance was very high.

Only two possible anomalies of archaeological origins were located and these form no consistent picture.

References

Archaeological Project Services 2003 Desk Based Assessment of Land at Gordon Field, Market Rasen. Unpublished Client Report

Gordon Field, Market Rasen, Geophysical Survey - Technical Information:

Techniques of Geophysical Survey:

Magnetometry:

This relies on variations in soil magnetic susceptibility and magnetic remanence which often result from past human activities. Using a Fluxgate Gradiometer these variations can be mapped, or a rapid evaluation of archaeological potential can be made by scanning.

Resistivity:

This relies on variations in the electrical conductivity of the soil and subsoil which in general is related to soil moisture levels. As such, results can be seasonally dependant. Slower than Magnetometry this technique is best suited to locating positive features such as buried walls that give rise to high resistance anomalies.

Resistance Tomography

Builds up a vertical profile or pseudosection through deposits by taking resistivity readings along a transect using a range of different probe spacings

Magnetic Susceptibility:

Variations in soil magnetic susceptibility occur naturally but can be greatly enhanced by human activity. Information on the enhancement of magnetic susceptibility can be used to ascertain the suitability of a site for magnetic survey and for targeting areas of potential archaeological activity when extensive sites need to be investigated. Very large areas can be rapidly evaluated and specific areas identified for detailed survey by gradiometer.

Instrumentation:

- 1. Fluxgate Gradiometer - Geoscan FM36**
- 2. Resistance Meter - Geoscan RM4/DL10**
- 3. Magnetic Susceptibility Meter - Bartington MS2**
- 4. Geopulse Imager 25 - Campus**

Methodology:

For Gradiometer and Resistivity Survey 20m x 20m or 30m x 30m grids are laid out over the survey area. Gradiometer readings are logged at either 0.5m or 1m intervals along traverses 1m apart. Resistance meter readings are logged at 1m intervals. Data is down-loaded to a laptop computer in the field for initial configuration and analysis. Final analysis is carried out back at base.

For scanning transects are laid out at 10m intervals. Any anomalies noticed are where possible traced and recorded on the location plan.

For Magnetic Susceptibility survey a large grid is laid out and readings logged at 20m intervals along traverses 20m apart, data is again configured and analysed on a laptop computer.

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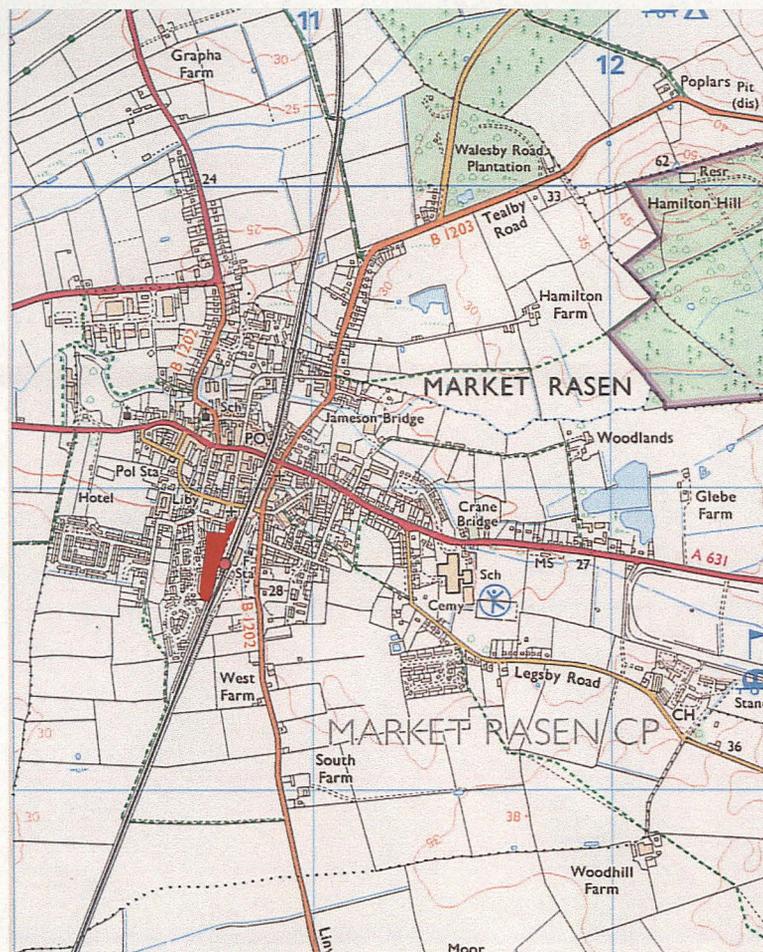


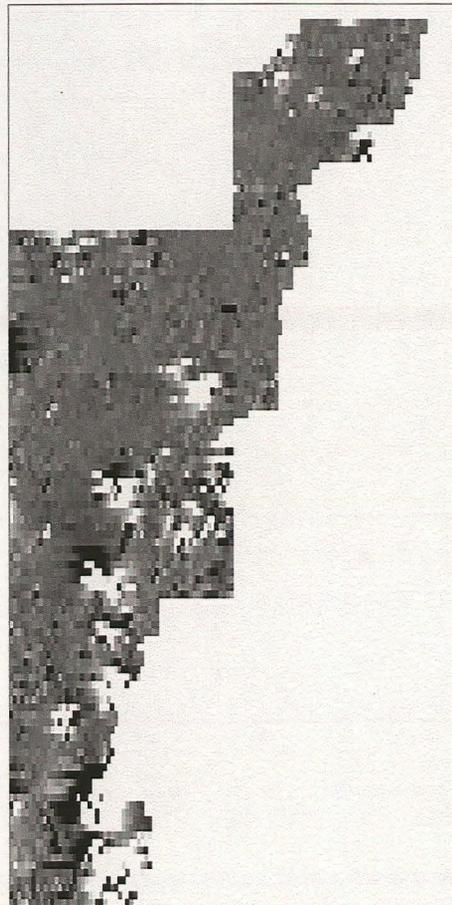
Figure 1: Land off Gordon Field,
Market Rasen.
Location
Scale 1:25,000

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**Figure 2: Land off Gordon Field,
Market Rasen.
Location of survey
Scale 1:1,250**

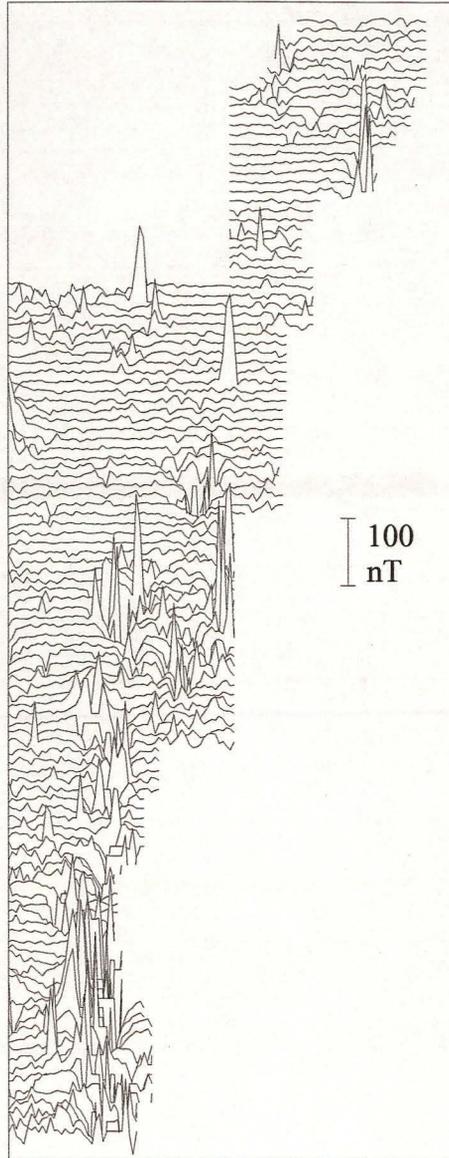
**Based on survey for
Wyemead Properties Ltd.**



22.43
18.38
14.32
10.27
6.21
2.15
-1.90
-5.96
-10.01
-14.07
-18.13
-22.18
-26.24
nT

Figure 3: Land off Gordon Field,
Market Rasen
Grey Scale Plot

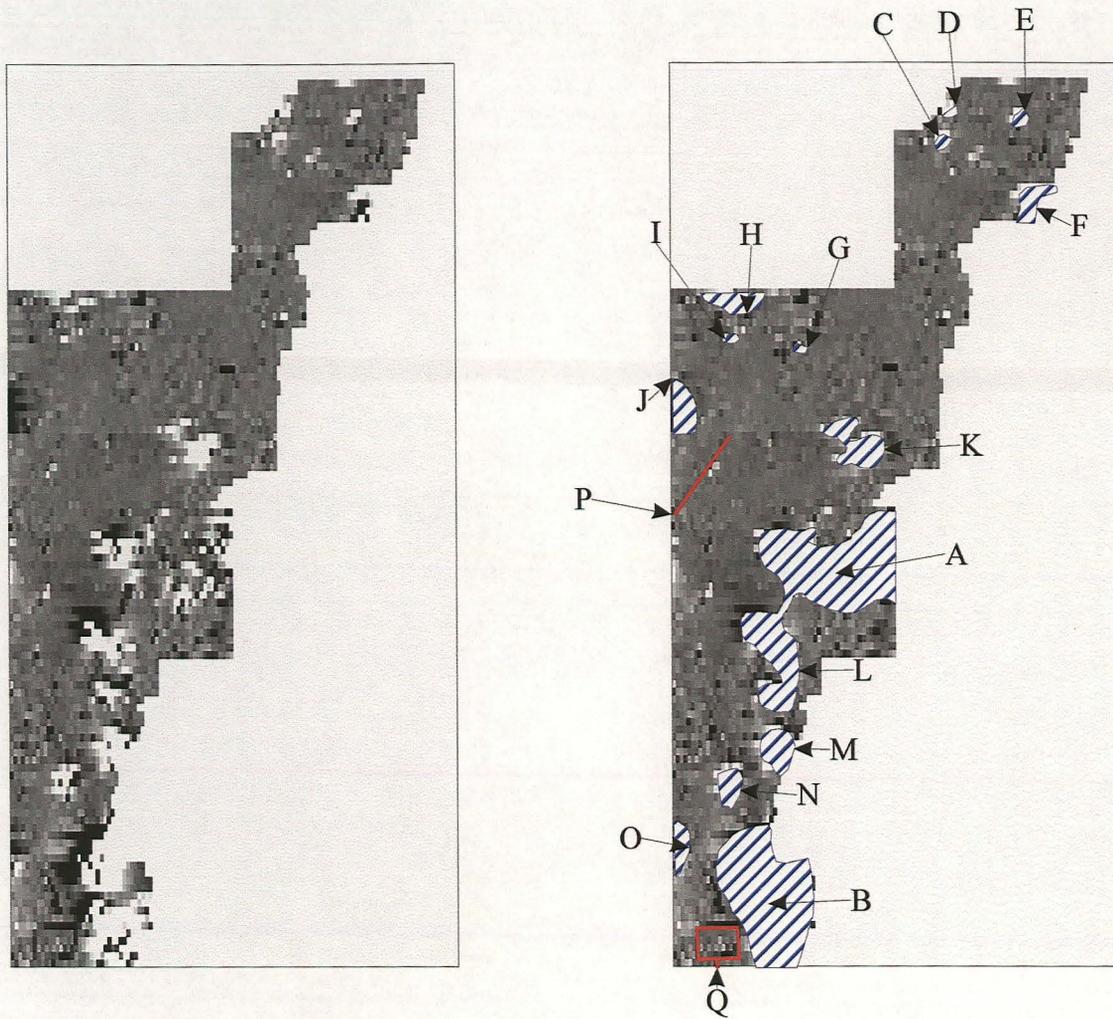
Scale 1:1000



100
nT

Figure 4: Land off Gordon Field,
Market Rasen
X - Y Plot

Scale 1:1000



 Ferromagnetic response

 Possible archaeology

Figure 5: Land off Gordon Field,
Market Rasen
Interpretation

Scale 1:1000



**Figure 6: Land off Gordon Field,
Market Rasen.
Summary
Scale 1:1,250**

**Based on survey for
Wyemead Properties Ltd.**