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Engineering Archaeological Services Ltd

EOLOCV

Sleaford
(Ewerby + Evedon Parish)
The Hoplands

Geophysical Survey

November 1996

N/28/0838/91

EU 10509 SU 13086/7.

PRN 64447, 74 65708.

*Survey Commissioned
by
Archaeological Project Services*

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by
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*Sleaford
(Ewerby + Evedon Parish)
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The Hoplands Geophysical Survey - Introduction:

NGR

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Centred On ~~SK 787624~~

Location And Topography

The area surveyed lies on the of the Old River Slea and adjacent to the railway line. The area is level and under pasture. The soil is sandy loam overlying gravels.

Archaeological Background

The western edge of the site is defined by the route of a Roman Road. Romano-British pottery has been recovered from within the survey area and from adjacent developments and the surrounding area is fairly rich in cropmarks.

The site is a prime location for Romano-British settlement.

Aims Of Survey

It was hoped that the magnetometer survey would help define the nature of the known archaeology and detect and locate any possible features and activity areas.

It was hoped that the resistivity survey would locate any stone buildings that might have existed during the Romano-British period.

Summary Of Results

The interpretation of the detailed survey data has indicated a concentration of archaeological features in the south western part of the site which might be associated with the Romano-British settlement.

No evidence was found for stone structures.

The Hoplands Geophysical Survey -Results:

Survey Results:

Area

An area of 3.16 Ha was surveyed in detail with the Gradiometer and 0.67 Ha. with the Resistivity meter. The rest of the area was scanned.

Display

The results are displayed as Grey Scale Image with plots of the raw data and processed data.

Results:

General

The results show a fair amount of noise particularly in the central and western parts of the site. Some of this is no doubt due to the incorporation of agricultural debris in the top soil e.g. horse shoes, nuts and bolts etc. but some is also due to disturbance.

Magnetometry:

A wide range of anomalies and responses was observed across the site. The anomalies or features have been divided into 5 categories which will be discussed separately:

Archaeology:

Archaeological features are principally confined to the south western part of the site where they are fairly dense. The exception being a linear feature at the far north east of the survey area. These features are illustrated in red on the interpretation (Figure 6)

The regularity of these features and their alignment parallel to the Roman road may indicate a degree of planning and therefore contemporaneity.

The feature to the north east is not very prominent and given its isolation may be the result of agricultural activity.

Agricultural:

The principal feature illustrated in green on the interpretation is almost certainly a former field boundary. In places it is still visible as a slight ridge, presumably a relict hedge bank. The anomaly as detected is both very strong and disturbed which possibly are due to surface disturbance of the bank.

A number of less well defined features in the south eastern part of the area correspond to the existing 'ridge and furrow'.

Ferrous:

Ferro-magnetic features occur along the southern limits of the survey area where they are due to a combination of the proximity of fences and disturbance associated with new boundaries.

The very prominent features along the western side of the survey area are the result of a gas pipeline and; a culvert.

Disturbance:

A number of areas of disturbance are illustrated in light blue on the interpretation. In character they are very similar to ferro-magnetic anomalies but in this case seem to be associated with areas of loose topsoil where there is evidence of both mole and rabbit activity.

Geology:

A broad band running across the northern part of the survey area corresponds with the break in slope marking the edge of the gravel terrace and is thus probably geological in origin.

Resistivity:

The resistivity survey suffered from the loose nature of the topsoil which was also surprisingly dry, thus giving high contact resistance and leading to poor resolution. Apart from a low resistance feature running down the eastern part

*of the area, which corresponds to the headland .
furrow of the existing 'ridge and furrow'.*

Magnetic Susceptibility

Soil samples were taken from random locations in the field in order to assess the magnetic susceptibility of the soils. Only one sub-soil samples was obtained for comparison.

The susceptibilities as measured are quite variable though they show reasonable contrast with the sub-soil susceptibility. It is notable that there is no clear correlation between the areas of occupation and the higher susceptibilities.

Sample	Volume susceptibility χ_v	Mass susceptibility χ_m
Subsoil 1	5	4.6
Grid 4	147	167
Grid 6	24	21.6
Grid 9	21	21.6
Grid 11	78	66.1
Grid 13	58	65.2
Grid 15	110	98.2
Grid 20	24	23.1
Grid 25	58	65.9
Grid 30	19	23.8

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.

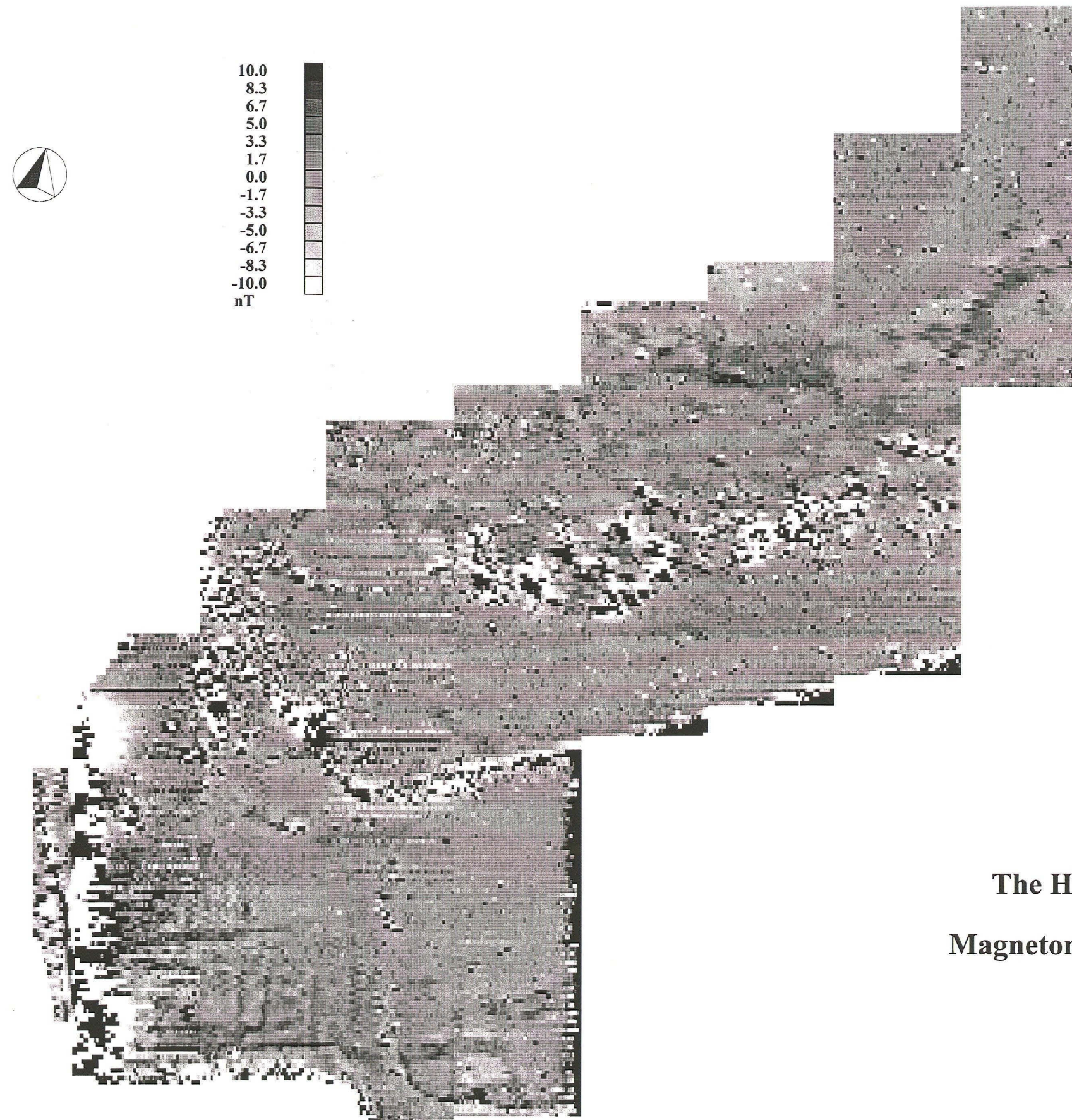
The archaeology does however seem to be confined to the south western part of the survey area.



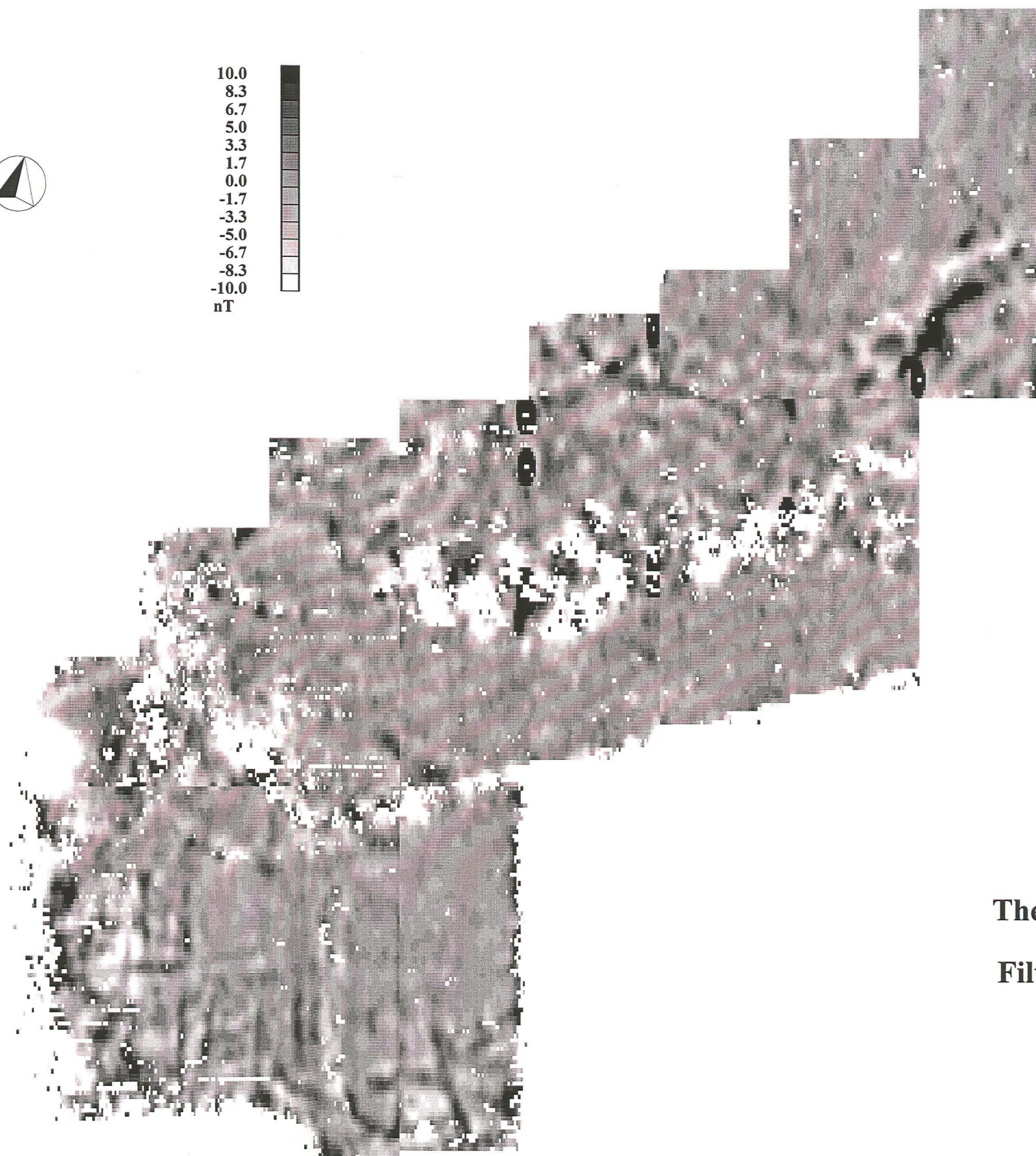
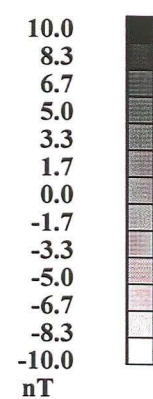
The Hoplands

Scale 1:2500

Figure 1



The Hoplands
Magnetometer Data



**The Hoplands
Filtered Data**

Scale 1:750

Figure 3



134
124
114
104
94
84
74
64
54
44
34
24
14
ohms



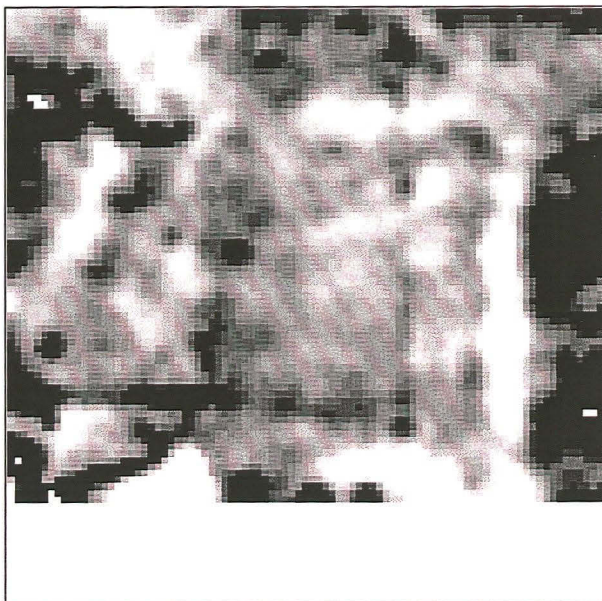
The Hoplands Resistivity Data

Scale 1:750

Figure 4



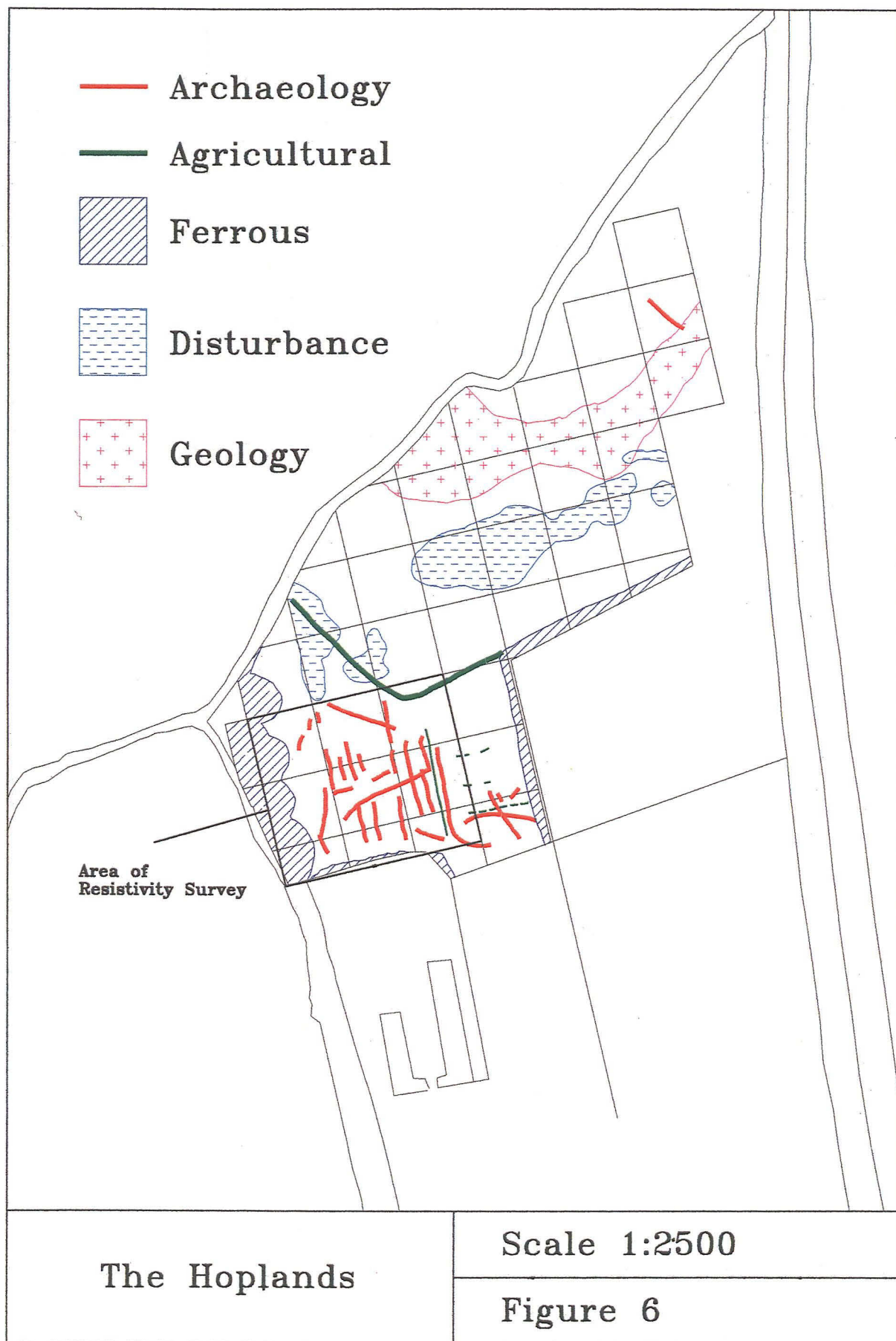
23.1
19.2
15.3
11.5
7.5
3.7
-0.2
-4.0
-7.9
-11.8
-15.7
-19.5
-23.4
ohms



The Hoplands Filtered Data

Scale 1:750

Figure 5



The Hoplands 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.

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/DI10***
- 3. Magnetic Susceptibility Meter - Bartington Ms2***

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 10m intervals along traverses 10m apart, data is again configured and analysed on a laptop computer.

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