REPORT ON GEOPHYSICAL SURVEY

COMPTON

Report number 93/82

Work commissioned by :

ROYAL COMMISSION ON THE HISTORICAL MONUMENTS OF ENGLAND

GEOPHYSICAL SURVEYS of Bradford

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SITE SUMMARY SHEET

93 / 82 Compton

NGR: SU 132 519

Location, topography and geology

The main area under investigation lies immediately to the south of Compton village, approximately 18 km south of Devizes, Wiltshire. The site is bounded to the east by the A345 road which follows the valley of the River Avon. The geology comprises alluvium overlying chalk. The survey area lies on either side of a lane, and occupies pasture fields.

The second area under investigation lies immediately to the east, limited by the A345 road to the west and the River Avon to the east. This field was also under pasture with substantial remains of ridge and furrow.

Archaeology

The sites lies within an area of known Roman and Medieval activity. The **Royal Commission on the Historic Monuments of England (RCHME)** have recorded earthworks over several hectares.

Aims of Survey

Gradiometer and resistance surveys were carried out to try to locate building remains and areas of domestic activity within the earthwork complex. It was also hoped to establish the eastern limit of anthropogenic activity where subsequent ridge and furrow cultivation has hidden possible earlier features.

Summary of Results *

Within the primary survey area gradiometry has located several ditch-type anomalies which may be significant. Resistance survey has located some areas of increased resistance that may relate to the remains of buildings and others which appear to have a modern origin.

No anomalies of archaeological interest were detected in the area surveyed to the east of the A345 road.

*** It is essential that this summary is read in conjunction with the detailed results of the survey.**

SURVEY RESULTS

93 / 82 Compton

1. Survey Area (Figure 1)

1.1 Within the primary survey area 0.88 ha of gradiometry and 0.64 ha of resistance were undertaken as indicated on Figure 1, at a scale of 1:1250, while gradiometry covering an area 0.32 ha, was carried out in Area B.

1.2 The location of the survey areas is shown in Figure 1 at a scale of 1:1250.

1.3 The survey grid was set out by **Geophysical Surveys of Bradford** and tied in by staff from **RCHME**.

2. Display

2.1 The results are displayed as X-Y traces, dot density plots and grey scale images. These display formats are discussed in the *Technical Information,* at the end of the report.

2.2 Figure 2 shows a simplified interpretation of the magnetic and resistance data for Area A in relation to the earthwork plan provided by **RCHME**.

2.3 The data are displayed at a scale of 1:500 with interpretation diagrams at the same scale.

2.4 Letters and numbers in parentheses refer to specific magnetic and resistance anomalies, respectively, discussed in the text.

3. General Considerations - Complicating factors

3.1 Ground conditions were suitable for both gradiometry and resistance, the area being gently undulating with short pasture.

3.2 The presence of fences, telegraph poles and water troughs has created areas of magnetic disturbance which will have masked any weaker anomalies associated with archaeological features.

4. Area A

4.1 Results of Gradiometer Survey

4.1.1 The data are magnetically disturbed, particularly along the northern edge of Area A2. This increased noise is almost certainly due to the lane, a storage hut and fencing, and possibly made up ground associated with the aforementioned structures.

4.1.2 Telegraph poles, water troughs and iron railings around trees have caused areas of magnetic disturbance across the site. A pipe (P) pipe crosses the north west corner of Area A1. In addition, there are several isolated ferrous responses across the site which are almost certainly due to modern ferrous debris in the topsoil.

4.1.3 There is a noticeable change in the noise levels, indicated by shading (A) on the interpretation diagram, Figure A4. This area of increase response appears to be bounded by the earthwork, particularly in the south east corner, as seen in Figure 2. This perhaps suggests a drop in the level of domestic activity towards the dried up stream.

4.1.4 Several of the surviving earthworks are apparent in the magnetic data as topographic effects and these are indicated on the interpretation diagram.

4.1.5 There are a number of linear responses across the site which appear to be archaeologically significant, suggesting ditches. However, it is difficult to formulate a precise archaeological interpretation for these anomalies. Some of the anomalies are parallel to surviving earthworks, for example (B), and are probably associated with them. Other anomalies do not show any correlation and interpretation remains tentative.

4.2 Results of Resistance Survey

4.2.1 The area of high resistance near the hut (1), is most likely to be due to made up ground associated with the hut. To the south of (1) there is a concentration of discrete high resistance responses (2) and (3) which may be of archaeological interest. Although it is difficult to formulate a precise interpretation, it is possible that they relate to structural platforms, modern or ancient.

4.2.2 Two areas of high resistance, (4), are associated with trees surrounded by iron railings. The high resistance is probably a combination of compaction and low moisture levels.

4.2.3 In the southwest of the survey area there is a broad diffuse area of increased resistance. Within this area there are discrete areas of higher resistance. The anomaly at (5) coincides with a raised platform clearly visible in the earthwork survey, see Figure 2. This is thought to be associated with the remains of a modern building.

4.2.4 Leading from anomaly (5) there are two linear high resistance responses (6) which suggest drainage features associated with the former building. A sharp drop in the resistance (7) coincides with a visible bank, as indicated on the plan, and is believed to represent a river terrace.

4.2.5 There is a broad area of low resistance (8) in the west of the survey area. This coincides with an earthwork but the low response suggests a lack of stone material or consolidation. It is likely that this represents a quarry scoop. However, it may simply be due to natural variations in the topsoil.

4.2.6 A linear low resistance response in the west of Area A1 coincides with a trench associated with the pipe detected in the gradiometer survey.

5. Area B

5.1 The data are dominated by a strong response from a telegraph pole towards the centre of the survey area and there are several, more discrete ferrous type responses.

5.2 Three possible pit like responses have been detected and these are indicated on the interpretation plan. However, interpretation is tentative as these anomalies could simply be due to more deeply buried ferrous material.

6. Conclusions

6.1 Within Area A both gradiometry and resistance survey have located anomalies of possible archaeological interest, although there is little direct correlation with the earthwork survey.

6.2 No anomalies of clear archaeological significance were located by the gradiometer survey to the east of the A345.

6.3 Similar magnetic responses where recorded at Chisenbury Warren (**Geophysical Surveys of Bradford** Report No. 93/47) where few obvious ditches were recorded, but broad changes in the background level of magnetic response were noted. In the results for the resistance survey at Chisenbury Warren, no obvious building remains were apparent, but responses from possible building debris were located. It is possible that some of the discrete high resistance responses represent similar material.

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Project Assistants: S Lancaster, D Shiel, A Shields and C Stephens

3rd September 1993
Geophysical Surveys of Bradford

TECHNICAL INFORMATION

The following is a description of the equipment and display formats used in **GEOPHYSICAL SURVEYS OF BRADFORD** reports. It should be emphasised that whilst all of the display options are regularly used, the diagrams produced in the final reports are the most suitable to illustrate the data from each site. The choice of diagrams results from the experience and knowledge of the staff of **GEOPHYSICAL SURVEYS OF BRADFORD.**

All survey reports are prepared and submitted on the basis that whilst they are based on a thorough survey of the site, no responsibility is accepted for any errors or omissions.

Magnetic readings are logged at 0.5m intervals along one axis in 1m traverses giving 800 readings per 20m x 20m grid, unless otherwise stated. Resistance readings are logged at 1m intervals giving 400 readings per 20m x 20m grid. The data are then transferred to portable computers and stored on 3.5" floppy discs. Field plots are produced on a portable Hewlett Packard Thinkjet. Further processing is carried out back at base on computers linked to appropriate printers and plotters.

Instrumentation

(a) Fluxgate Gradiometer - Geoscan FM36

This instrument comprises of two fluxgates mounted vertically apart, at a distance of 500mm. The gradiometer is carried by hand, with the bottom sensor approximately 100-300mm from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is conventionally measured in nanoTesla (nT) or gamma. The fluxgate gradiometer suppresses any diurnal or regional effects. Generally features up to one metre deep may be detected by this method.

(b) Resistance Meter - Geoscan RM4 or RM15

This measures the electrical resistance of the earth, using a system of four electrodes (two current and two potential.) Depending on the arrangement of these electrodes an exact measurement of a specific volume of earth may be acquired. This resistance value may then be used to calculate the earth resistivity. The "Twin Probe" arrangement involves the paring of electrodes (one current and one potential) with one pair remaining in a fixed position, whilst the other measures the resistance variations across a fixed grid. The resistance is measured in Ohms and the calculated resistivity is in Ohm-metres. The resistance method as used for area survey has a depth resolution of approximately 0.75m, although the nature of the overburden and underlying geology will cause variations in this generality. The technique can be adapted to sample greater depths of earth and can therefore be used to produce vertical "pseudo sections".

(c) Magnetic Susceptibility

Variations in the magnetic susceptibility of subsoils and topsoils occur naturally, but greater enhanced susceptibility can also be a product of increased human/anthropogenic activity. This phenomenon of susceptibility enhancement can therefore be used to provide information about the "level of archaeological activity" associated with a site. It can also be used in a predictive manner to ascertain the suitability of a site for a magnetic survey. The instrument employed for measuring this phenomenon is either a field coil or a laboratory based susceptibility bridge. For the latter 50g soil samples are collected in the field.

Display Options

The following is a description of the display options used. Unless specifically mentioned in the text, it may be assumed that no filtering or smoothing has been used to enhance the data. For any particular report a limited number of display modes may be used.

(a) X-Y Plot

This involves a line representation of the data. Each successive row of data is equally incremented in the Y axis, to produce a stacked profile effect. This display may incorporate a hidden-line removal algorithm, which blocks out lines behind the major peaks and can aid interpretation. Advantages of this type of display are that it allows the full range of the data to be viewed and shows the shape of the indiviual anomalies. Results are produced on a flatbed plotter.

(b) Dot-Density

In this display, minimum and maximum cut-off levels are chosen. Any value that is below the minimum cut-off value will appear white, whilst any value above the maximum cut-off value will appear black. Any value that lies between these two cut-off levels will have a specified number of dots depending on the relative position between the two levels. The focus of the display may be changed using different levels and a contrast factor (C.F.). Usually the C.F. = 1, producing a linear scale between the cut-off levels. Assessing a lower than normal reading involves the use of an inverse plot, This plot simply reverses the minimum and maximum values, resulting in the lower values being presented by more dots. In either representation, each reading is allocated a unique area dependent on its position on the survey grid, within which numbers of dots are randomly placed. The main limitation of this display method is that multiple plots have to be produced in order to view the whole range of the data. It is also difficult to gauge the true strength of any anomaly without looking at the raw data values. This display is much favoured for producing plans of sites, where positioning of the anomalies and features is important.

(c) Contour

This display joins data points of an equal value by a contour line. Displays are generated on the computer screen or plotted directly on a flat bed plotter / inkjet printer.

(d) 3-D Mesh

This display joins the data values in both the X and Y axis. The display may be changed by altering the horizontal viewing angle and the angle above the plane. The output may be either colour or black and white. A hidden line option is occasionally used (see (a) above).

(e) Grey-Scale

This format divides a given range of readings into a set number of classes. These classes have a predefined arrangement of dots or shade of grey, the intensity increasing with value. This gives an appearance of a toned or grey scale.

Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. While colour plots can look impressive and can be used to highlight certain anomalies, grey-scales tend to be more informative.

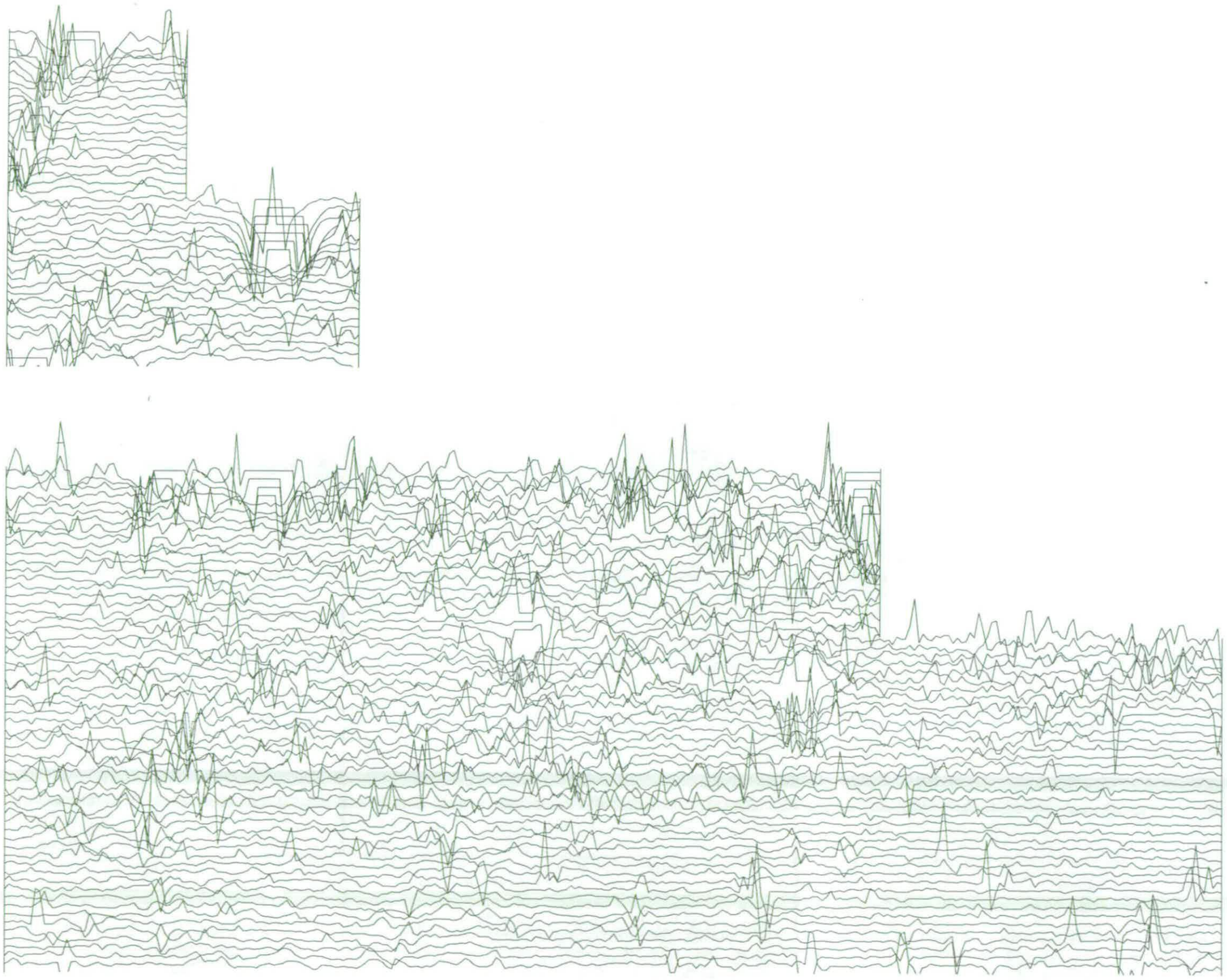
GEOPHYSICAL SURVEYS OF BRADFORD	PROJECT: COMPTON	TITLE: Location Diagram	Reproduced from plan provided by RCHME

Figure 1

GEOPHYSICAL SURVEYS OF BRADFORD	PROJECT: COMPTON	TITLE: Summary Interpretation	Reproduced from plan provided by RCHME

Figure 2

COMPTON
Area A
Magnetic Data



20nT

0 m 20

Figure A1

COMPTON
Area A
Magnetic Data

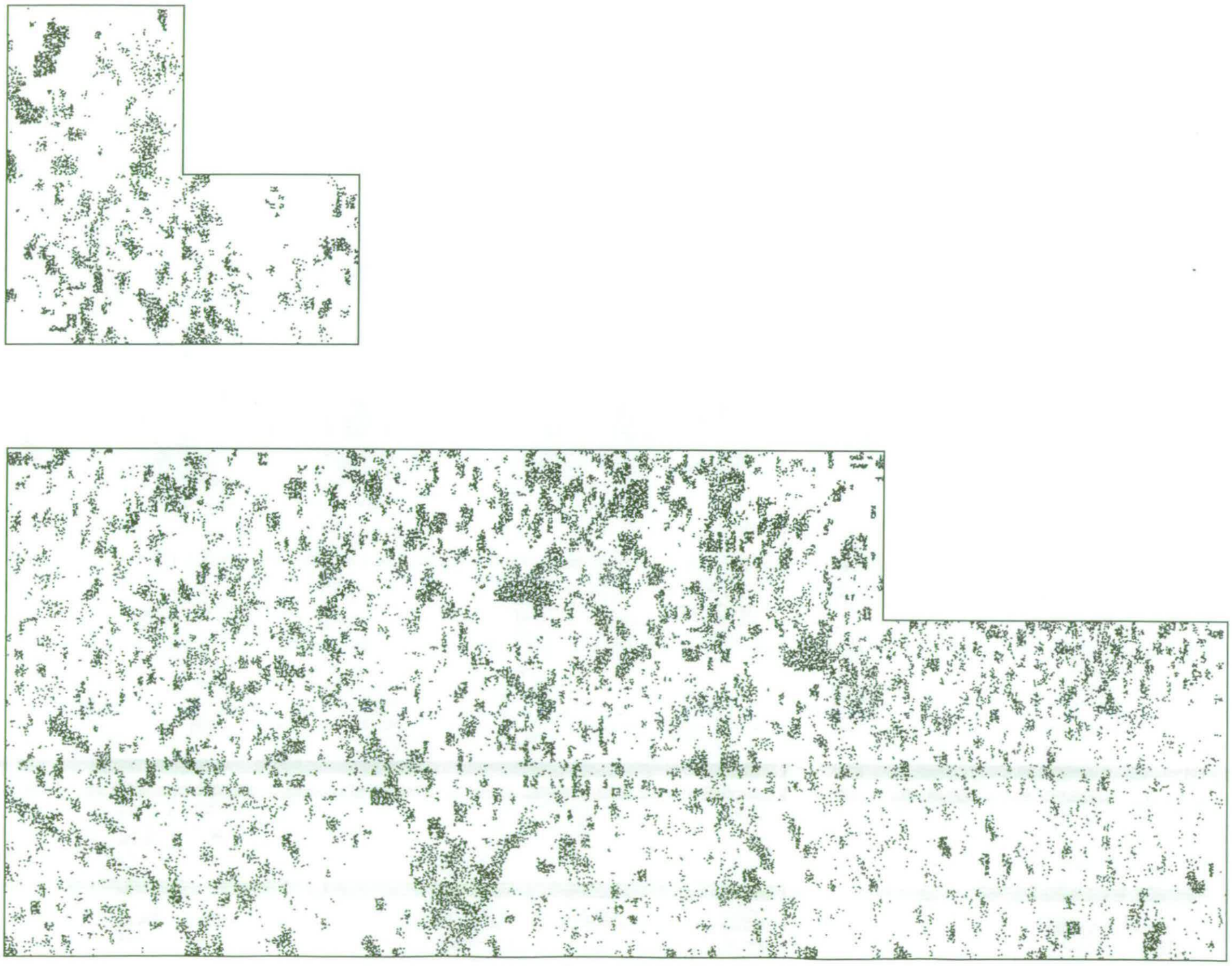


Figure A2

COMPTON
Area A
Magnetic Data

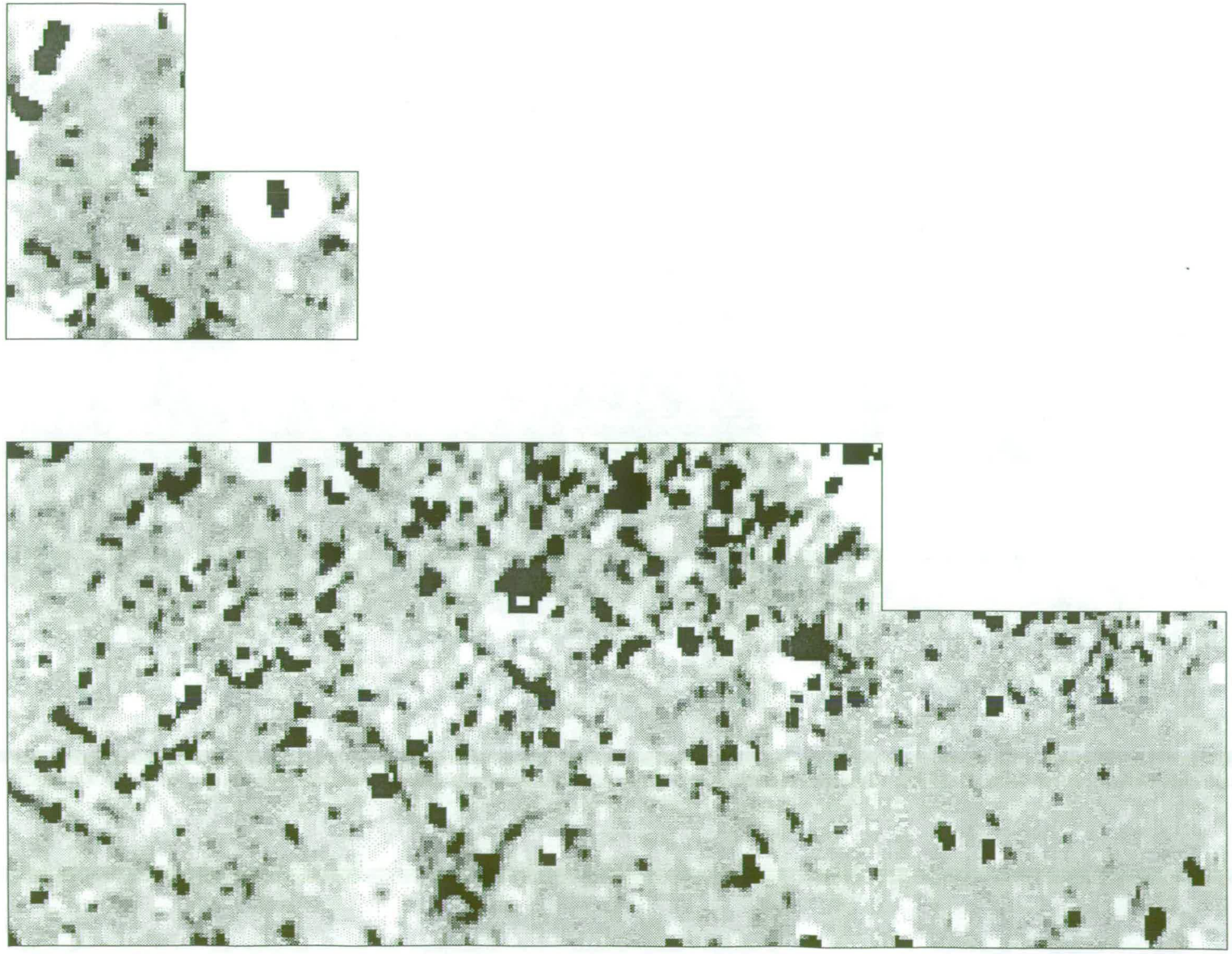


Figure A3

COMPTON
Area A
Magnetic Data

Topographic Effects

? Archaeology

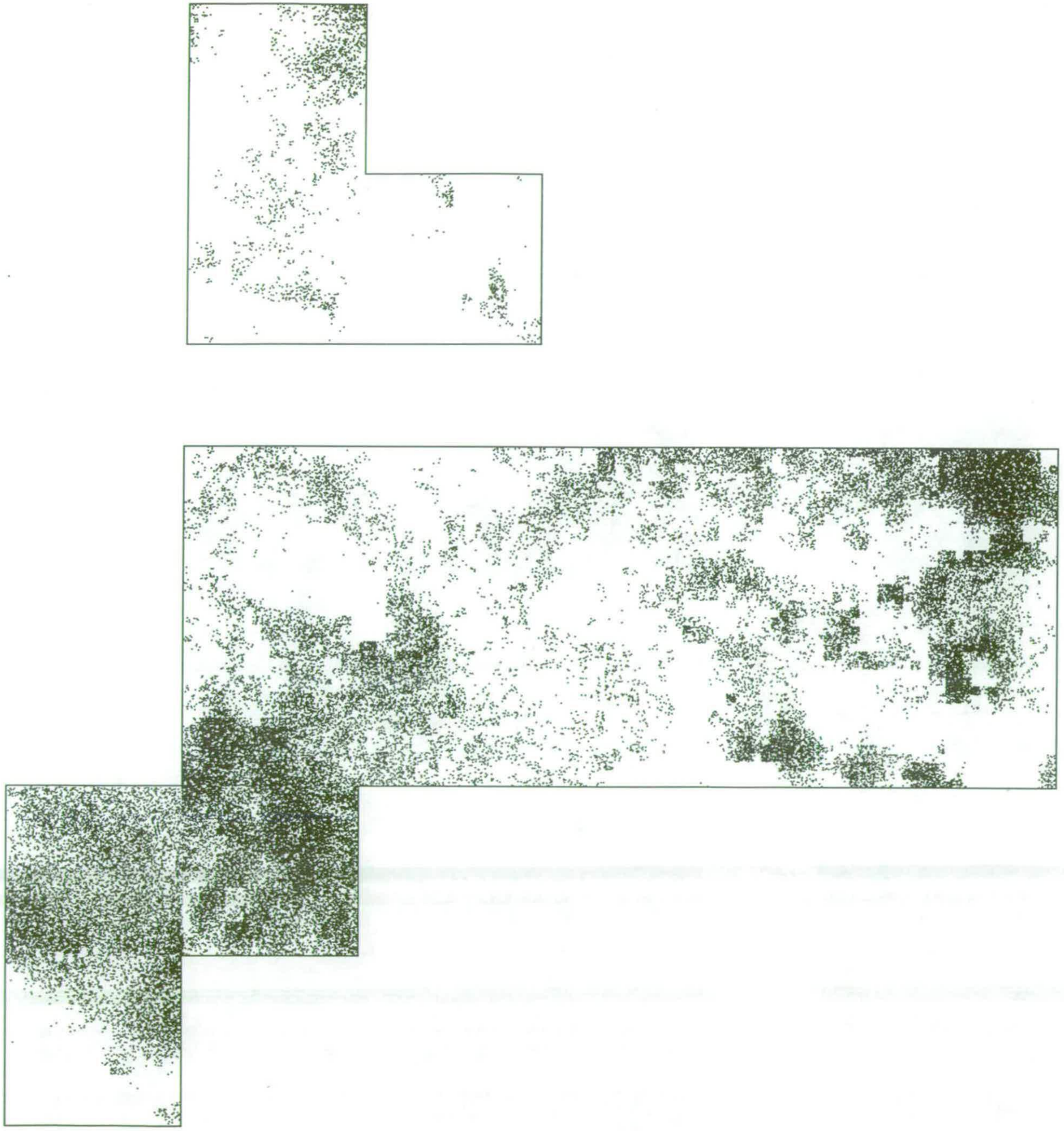
Area of Increased Response

Ferrous

0 m 20

Figure A4

COMPTON
Area A
Resistance Data



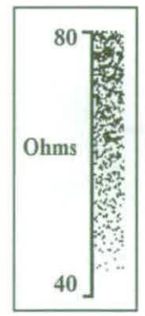
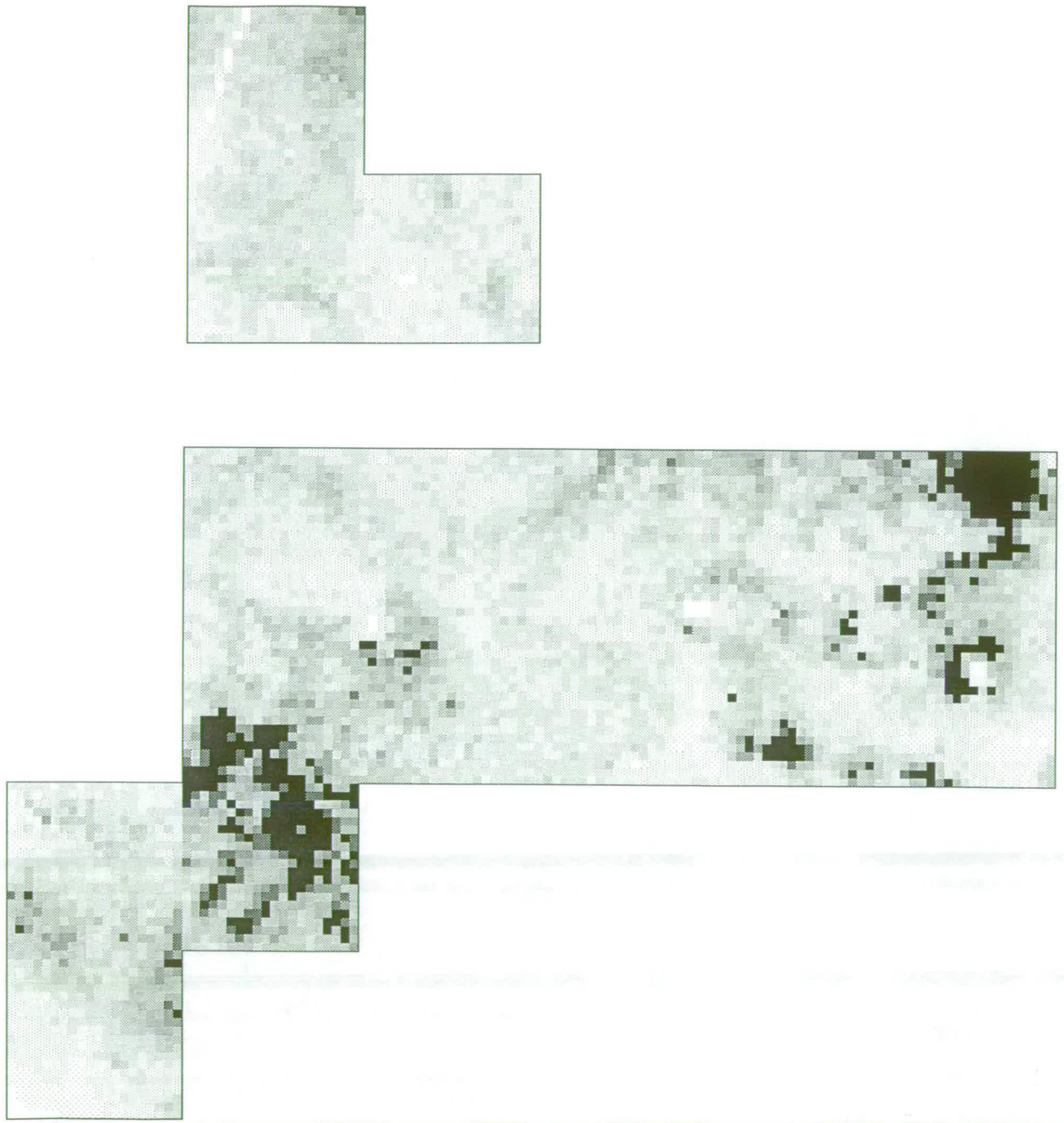


Figure A5

COMPTON
Area A
Resistance Data



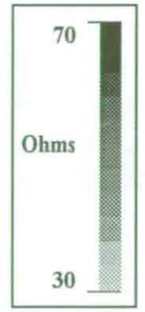
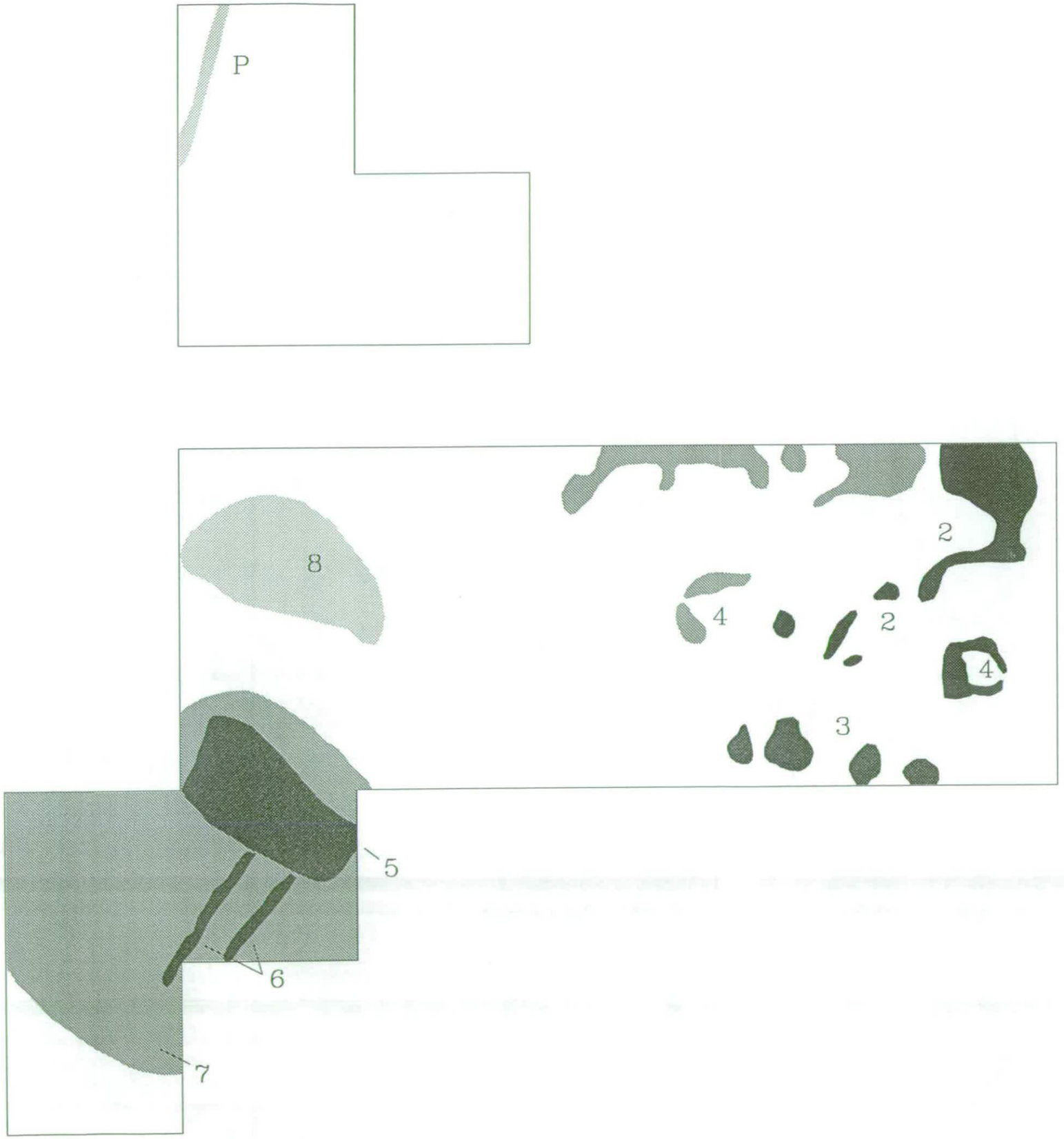


Figure A6

COMPTON
Area A
Resistance Data



High Resistance

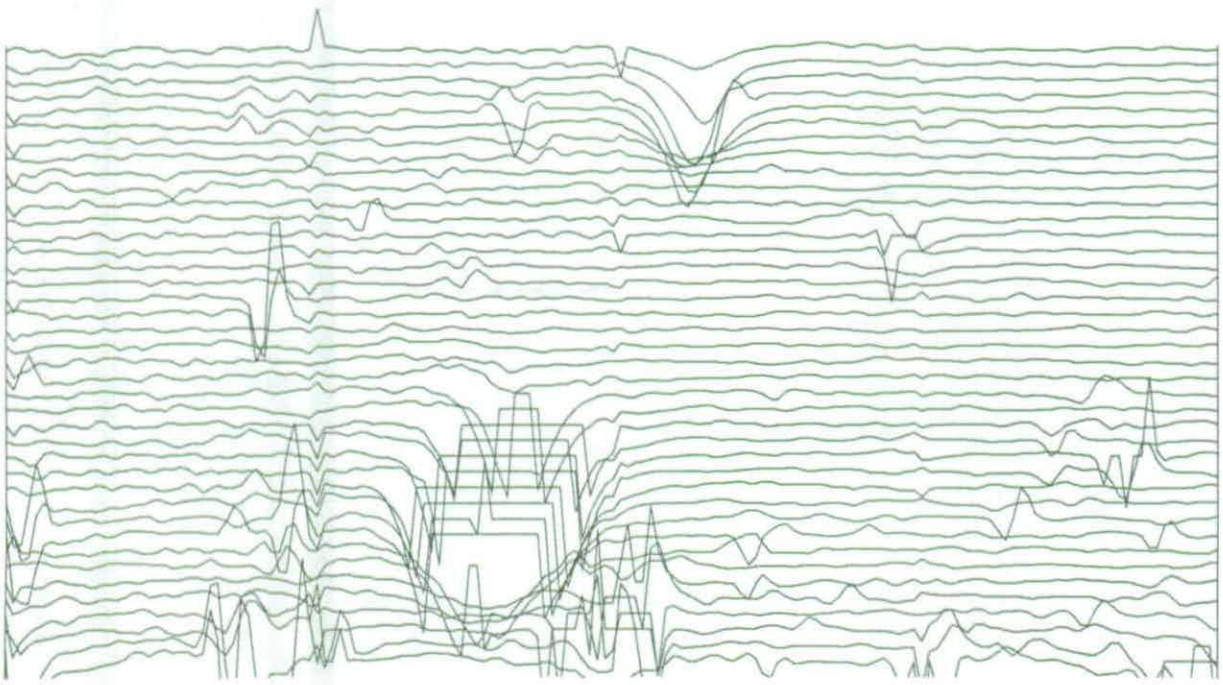
Higher Resistance

Low Resistance

0 m 20

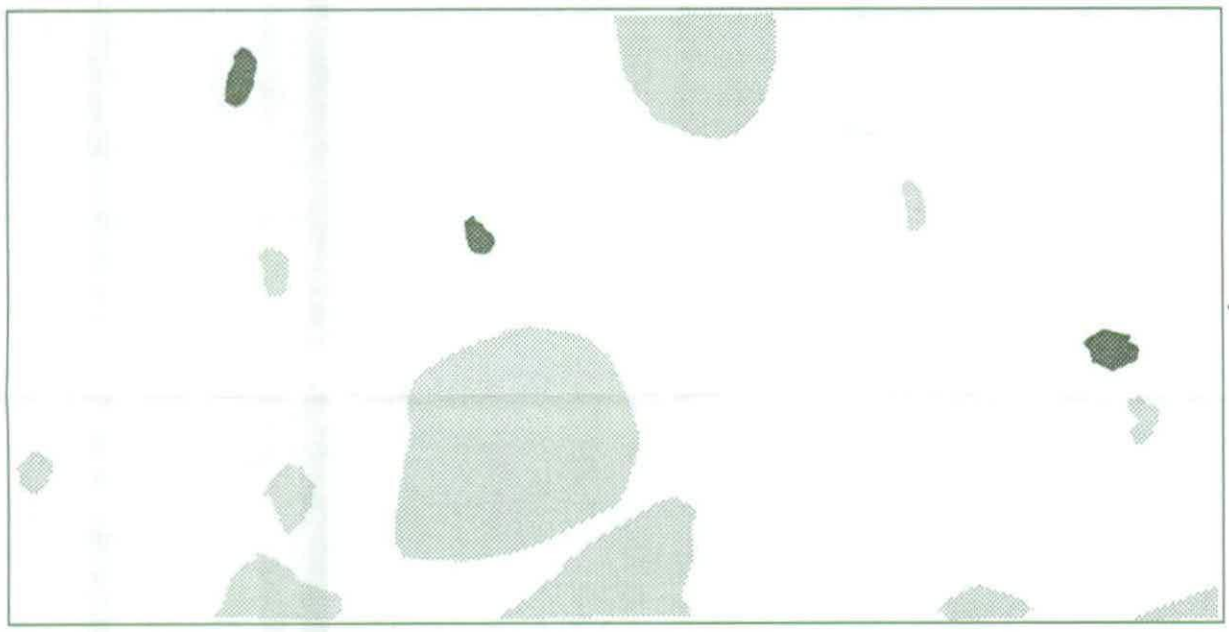
Figure A7

COMPTON
Area B
Magnetic Data



15 nT

2.0
nT
0.1

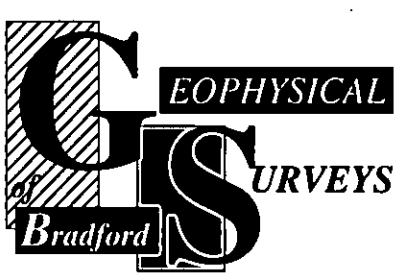


??Archaeology

Ferrous

0 m 20

Figure B1



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