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Archaeology Section
Lancaster County Council

ELI 411

SLI 3523

41032

SITE SUMMARY SHEET

95 / 143 The Roses, Toynton All Saints, Lincolnshire

395 634

NGR: TF ~~372~~ 639 (Approximate)

Location, topography and geology

Toynton All Saints is a small village lying just south and east of the A16 road and midway between the towns of Horncastle and Skegness, Lincolnshire. The site under investigation lies on the southern outskirts of the village, south east of Toynton All Saints school. The field is east of the road that bisects the village and is under permanent pasture. The soils are thought to be stagno-gleys of the Wickham 2 association formed over drift which overlies clays and mudstones.

Archaeology

In 1958 a complete Toynton decorated jug was discovered in the field once known as the Roses and this led to excavations over the subsequent 6 years by a Mrs Rudkin and Miss Arliss (Healey, 1984). A kiln was investigated and archaeomagnetic samples suggested an operational date of AD 1275-1300.

Aims of Survey

A gradiometer survey was carried out in two areas (A and B) along the street frontage with the following aims: 1. identifying the old excavation trenches, 2. investigating whether any additional kilns are present and 3. defining the nature of any other associated archaeological features. The geophysical survey forms part of a wider archaeological assessment being carried out by **Lindsey Archaeological Services (LAS)** in advance of proposed residential development.

Summary of Results *

In Area A the gradiometer survey has identified an area of disturbance thought to be associated with the old excavations and also several anomalies that are indicative of kiln-like features. These appear to be confined to the central area of the survey block, though scanning indicated that other industrial type anomalies extend some 30 metres further east. In Area B there is one anomaly that is characteristic of a kiln, though the presence of a water trough did hinder the survey. In both survey areas there are other anomalies of archaeological potential and scanning indicated several responses of interest in the remainder of the field.

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

Healey, R.H., 1984

Toynton All Saints: Decorated Jugs from the Roses Kiln in N. Field & A. White (eds)
A Prospect of Lincolnshire 1984

SURVEY RESULTS

95 / 143 The Roses, Toynton All Saints, Lincolnshire

1. Survey Area

- 1.1 Two areas, A and B, totalling approximately 0.5 ha, were surveyed in detail using a fluxgate gradiometer as shown in Figure 1 at a scale of 1:1250. Subsequently, the entire field was rapidly scanned in an attempt to identify any additional kiln sites.
- 1.2 The survey grid was set out by **Geophysical Surveys of Bradford** and details of the tie-ins have been lodged with the client. Grid pegs were left *in situ* in order to assist with the relocation of the survey areas. It should be noted that the boundaries of the field around Area B are different to those shown on the maps provided.

2. Display

- 2.1 The gradiometer results are displayed as X-Y traces, dot density plots and greyscale images at a scale of 1:500 (Figures 2 to 5). These display formats are discussed in the *Technical Information* section at the end of the text.
- 2.2 Summary interpretation plots are shown in Figures 3 and 5 at a scale of 1:500, and in Figure 6 at a scale of 1:1250, together with the results of the scanning.

3. General Considerations - Complicating factors

- 3.1 The presence of small pylons supporting overhead electricity cables in both areas and a water trough in Area B, resulted in zones of magnetic interference. These may have masked any anomalies of archaeological interest. In addition, wire fences, buildings and parked vehicles added to the noise levels on the periphery of the survey areas.

4. Results of Area A, 80m by 40m (Figures 2 and 3)

- 4.1 Immediately east of the electricity pylon (Section 3.1) there is an area of ground where there are clear earthworks that are suggestive of past ground disturbance. It was felt that these are likely to be the positions of Mrs Rudkin's trenches and this was confirmed by the present landowner's son (Mr Mackinder *pers comm*). The results of the gradiometer survey also show this to be a magnetically disturbed area; the anomalies are typical of those normally associated with backfilled trenches, wasters and kiln debris. Additional magnetic noise is due to the pylon, a small transformer and a support wire. All three of these will have produced distorting anomalies and as a consequence it is difficult to be certain of the origin of some of the responses in the immediate vicinity of the pylon. However, there is little doubt that at least 10 metres away, there are numerous responses that are the result of the old trenches and probably undisturbed archaeological features. It is believed that within the detailed survey area there may be three unexcavated kiln-type features. These are highlighted on the interpretation (Figure 3).

- 4.2 The magnetic anomalies associated with the pottery production are confined to the central region of Area A. There are a few peripheral ditch and pit like responses but these are mainly south of the kilns. The street frontage, both north and south of the kilns, would seem to be devoid of major features. However, it should be noted that a narrow 2 to 3 metre wide strip adjacent to the road was not covered by the detailed survey because of modern disturbances.

5. Results of Area B, 40m by 40m (Figures 4 and 5)

- 5.1 The pylon and water trough referred to above (Section 3.1) dominate the results from this area. However, immediately north of the trough is a very strong anomaly that has all the characteristics of a kiln. In particular the double peak, visible in the X-Y traces, is typical of the response associated with an intact structure. The two peaks are thought to correspond with the outer walls of the kiln.
- 5.2 Apart from the probable kiln anomaly, there are several other responses of archaeological potential. Some correspond with topographic hollows and suggest the presence of silted or partially infilled ditches. The strength of some of the linears suggest a highly magnetic fill, probably containing wasters or occupation debris.

6. Results of Scanning (Figure 6)

- 6.1 Following the detailed survey, the remainder of the field was rapidly scanned with the gradiometer in an attempt to indicate other areas of major archaeological potential. In this mode of operation, readings are not recorded, but the surveyor notes areas of magnetic anomalies by observing the instruments LCD. Since kilns and waster heaps produce anomalies typically in the order of 50 to 100 nT in strength, compared with background noise levels of 1 to 2nT, it is relatively easy to 'scan out' such features. Sometimes it is possible to differentiate between an intact kiln and a waste heaps, but usually a detailed survey is necessary.
- 6.2 The scanning at Toynton revealed three main areas of kiln type responses (see Figure 6). The anomalies of most interest are to the east of Area A, where possibly two or three addition kilns were noted within a band of noise that extended some 30 metres. A second area of potential, though slightly more confused, lies to the south-east of Area A, near to a former pond. It is possible that the pond may be responsible for some of the disturbance, but one or two kilns may be present. The third area of noise, perhaps due to workshops, or similar, rather than actual kilns, is located in the north-eastern corner of the survey.
- 6.3 Whilst the main aim of the scanning was to locate potential kiln-type responses, other anomalies, typical of pits and ditches were noted throughout the field, particularly in central area. Many were associated with topographic features. The eastern half of the site appeared quieter; this coincides with an area of possible ridge and furrow visible on the ground.

7. Conclusions

- 7.1 The magnetometer survey has successfully identified the general location of Mrs Rudkin's excavation trenches and probably located four additional kiln-like features. It is possible that the scanning indicates another four kilns, making a total of eight, though more detailed work would be necessary to confirm this interpretation. The results also indicate numerous other anomalies that appear archaeological in origin. However, there may be a lack of major archaeological features along the street frontage to the north and south of the kilns in Area A, in the area of particular interest to the developer.

Project Co-ordinator: J Gater
Project Assistants: K Hamilton, A Shields and D Weston

Start of Survey: 7th December 1995
Date of Report: 20th December 1995

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 pairing 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".

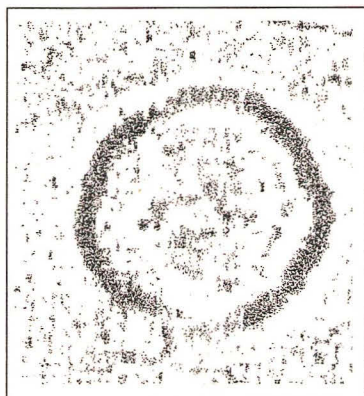
(c) Magnetic Susceptibility

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.

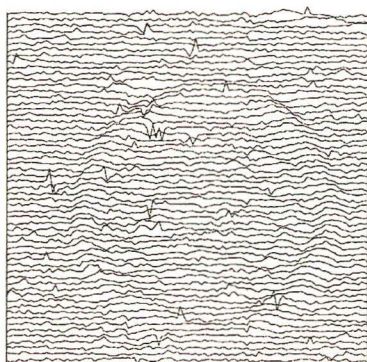
Display Options

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) Dot-Density



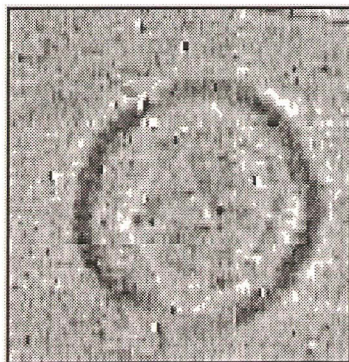
In this display, minimum and maximum cut-off levels are chosen. Any value that is below the minimum cut-off value will appear white, whilst any value above the maximum cut-off value will appear black. Any value that lies between these two cut-off levels will have a specified number of dots depending 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.



(b) 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 individual anomalies. Results are produced on a flatbed plotter.

Display Options cont'd



(c) Grey-Scale

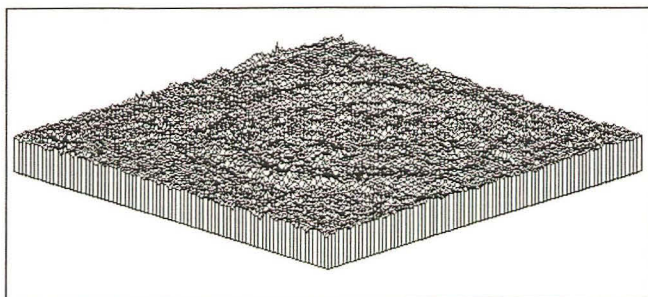
This format divides a given range of readings into a set number of classes. These classes have a predefined arrangement of dots or shade of grey, the intensity increasing with value. This gives an appearance of a toned or grey scale.

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.



(d) Contour

This display format is commonly used in cartographic displays. Data points of equal value are joined by a contour line. Closely packed contours indicate a sharp gradient. The contours therefore highlight an anomalous region. The range of contours and contour interval are selected manually and the display is then generated on the computer screen or plotted directly on a flat bed plotter / inkjet printer.

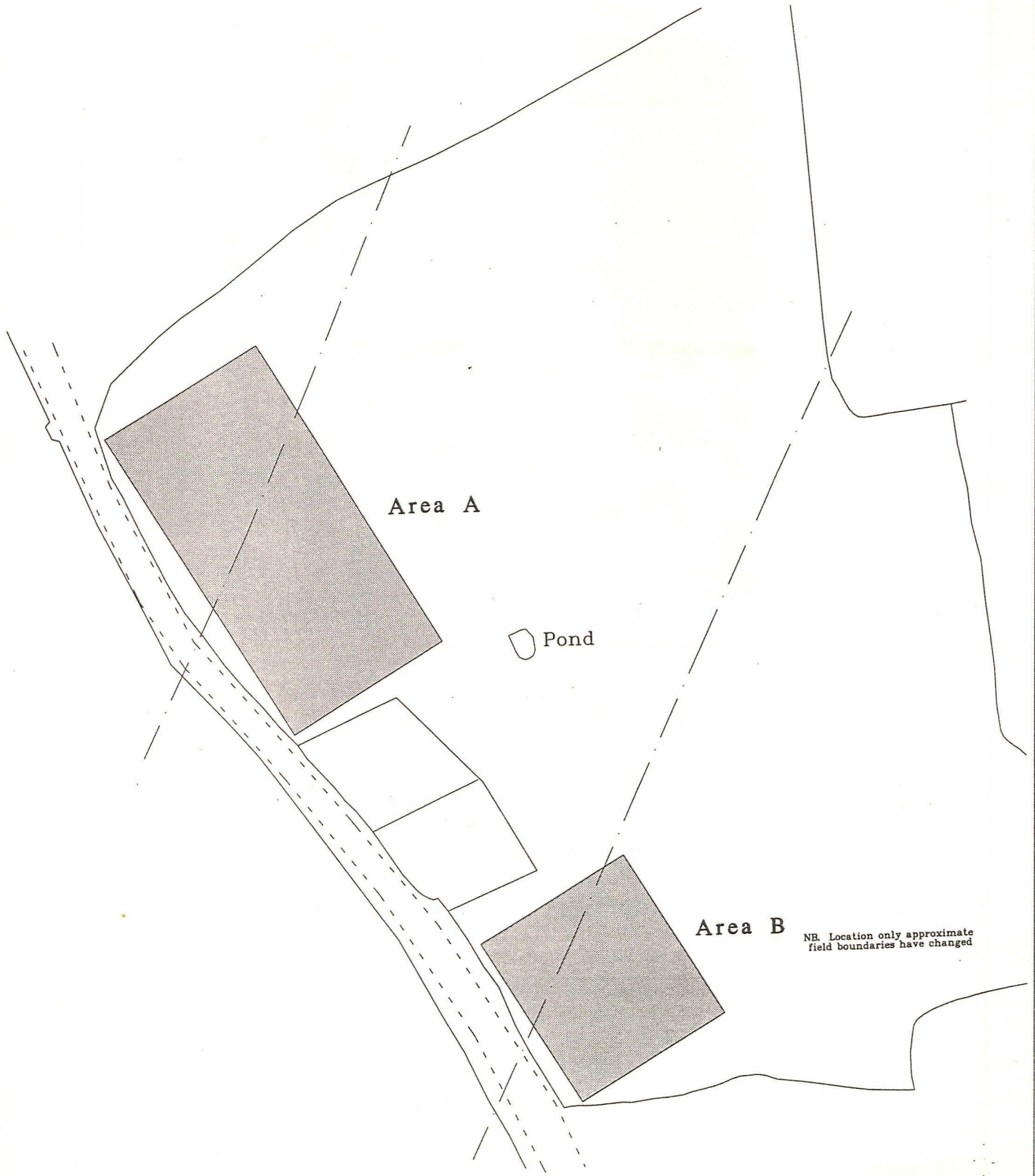


(e) 3-D Mesh

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 (b) above).

THE ROSES, Toynton All Saints

Sketch Location Plan



Overhead Cables

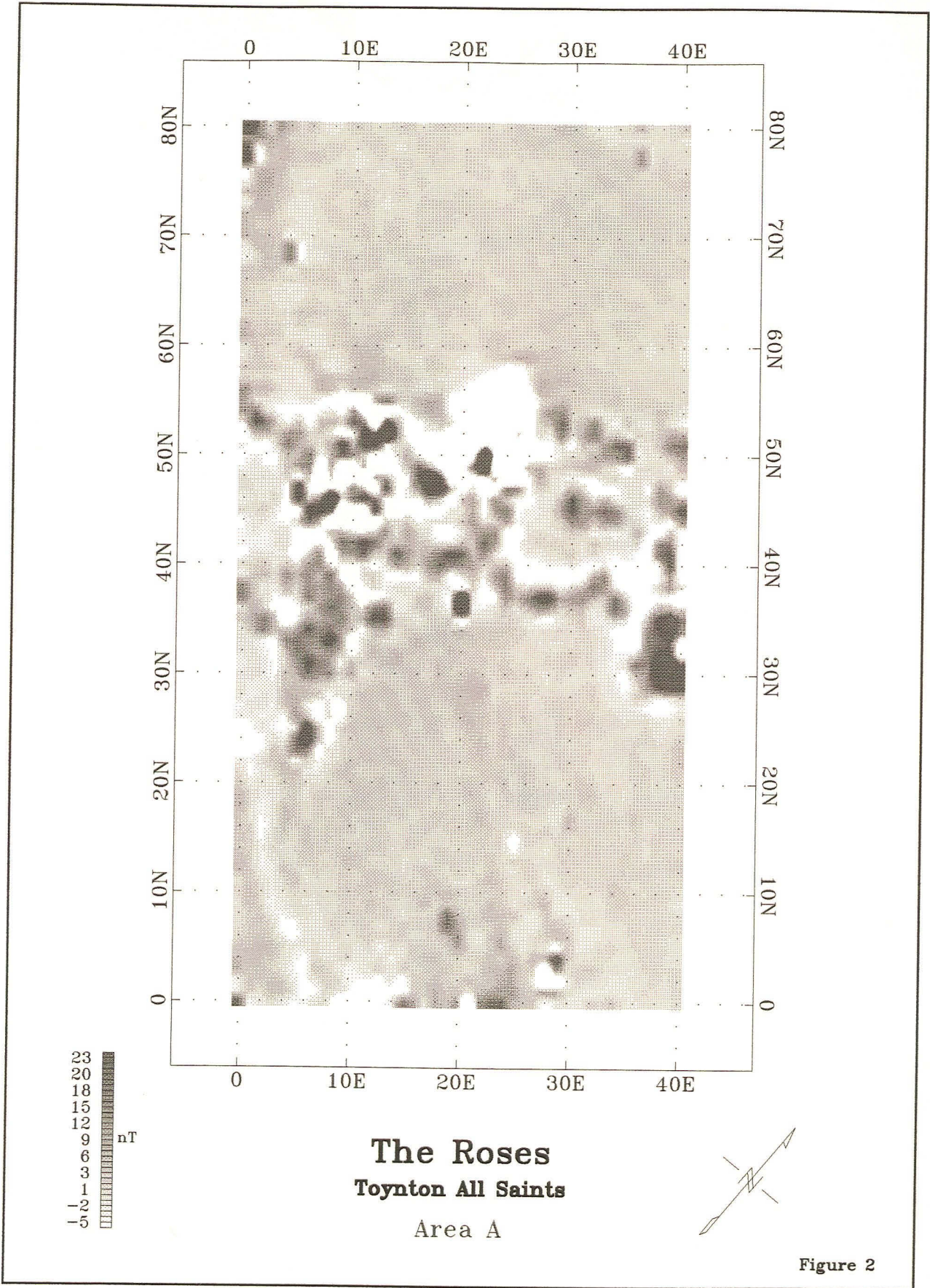


1:1250

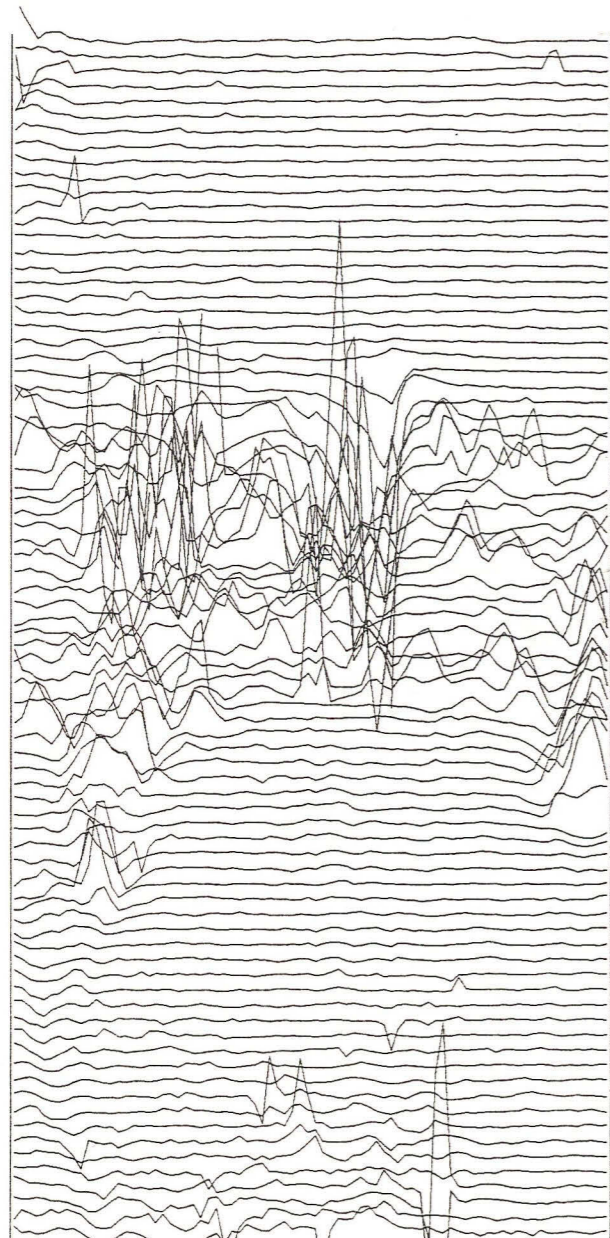


Survey Area

Figure 1



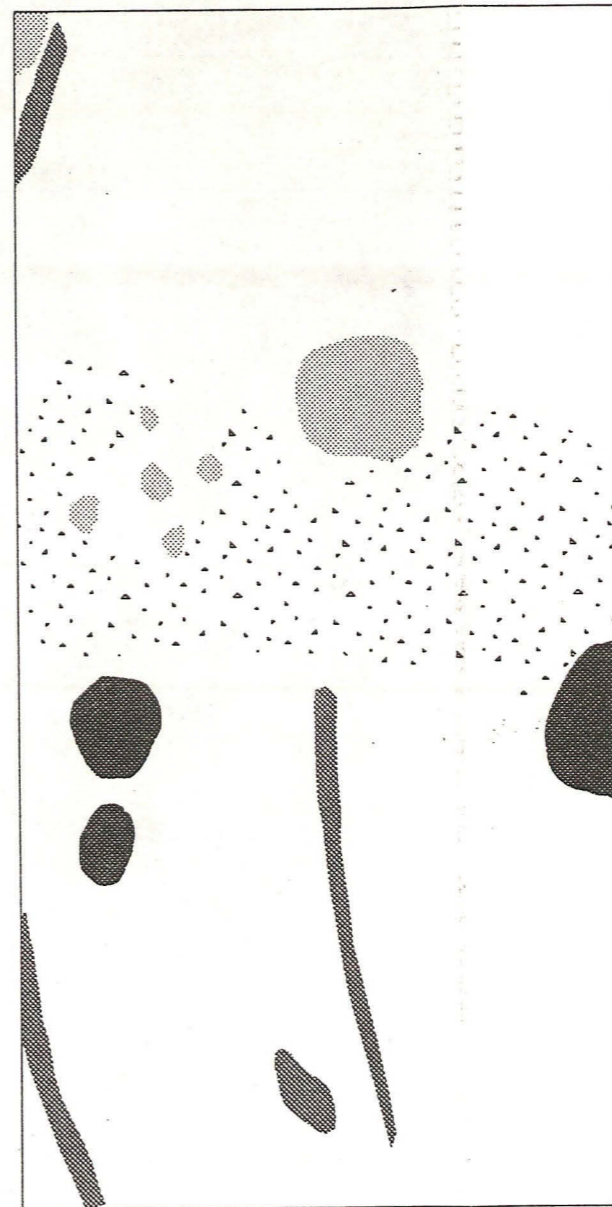
THE ROSES
Toynton All Saints
Area A







50 nT



10.0
nT
0.1



-  ?Kilns
-  ?Other Archaeological Features
-  Ferrous
-  ?Kiln Debris/Wasters

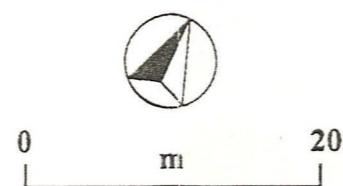


Figure 3

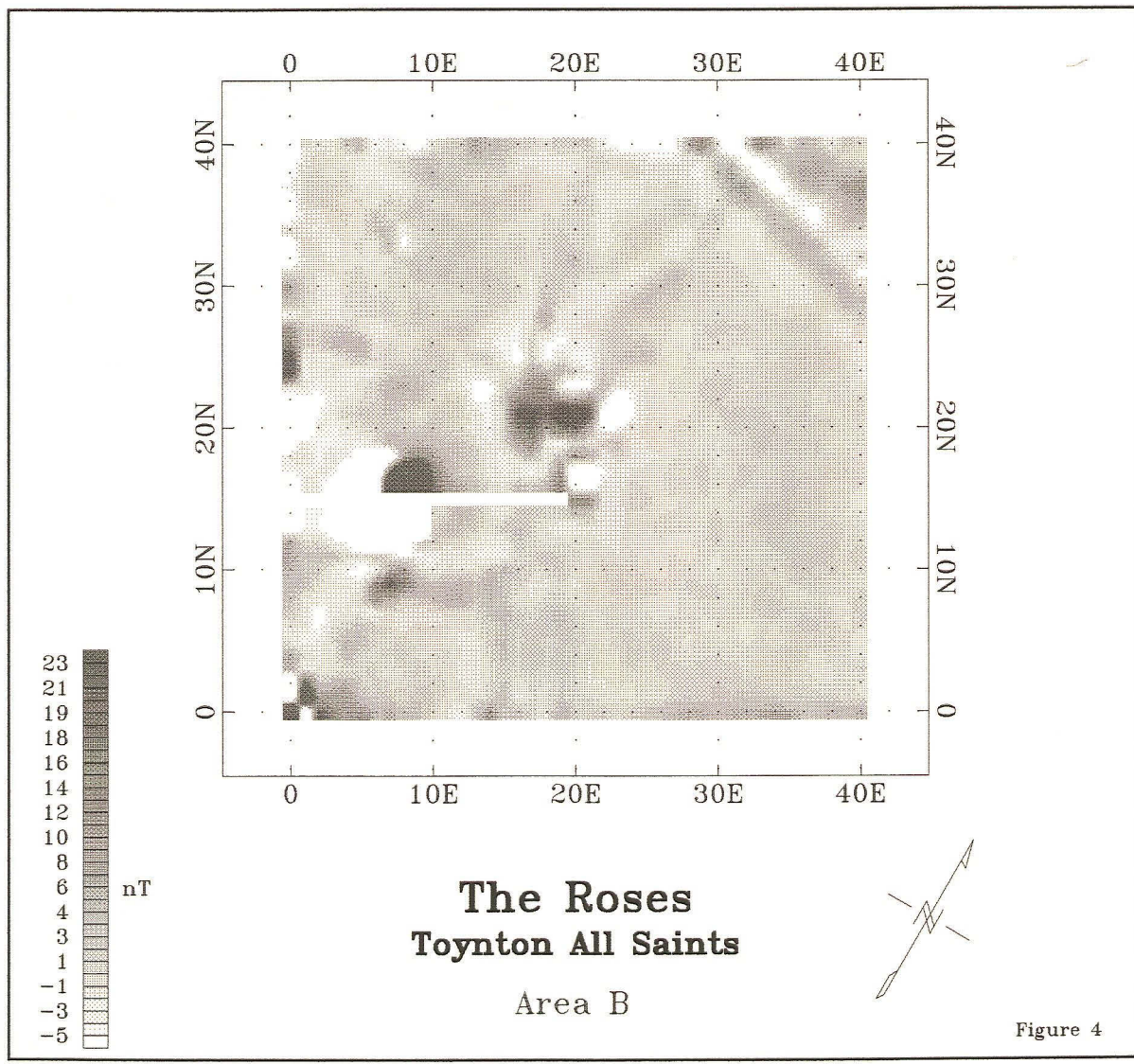
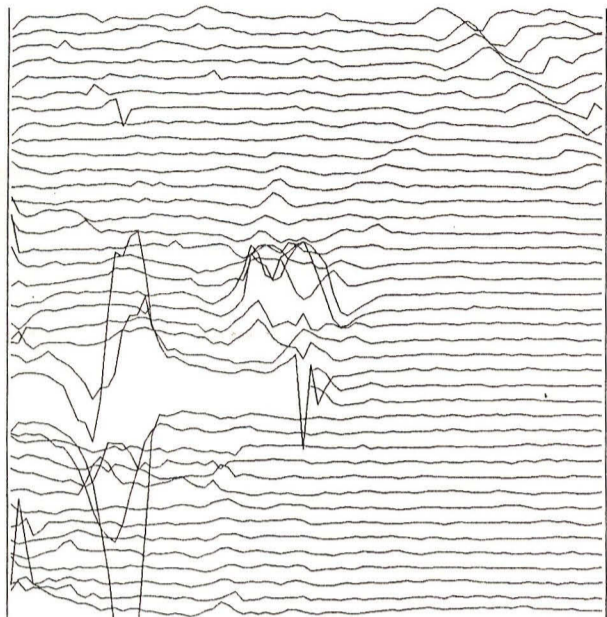
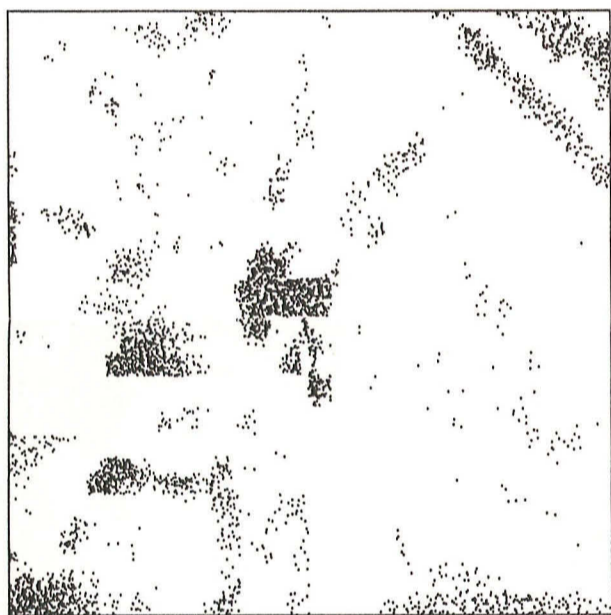


Figure 4

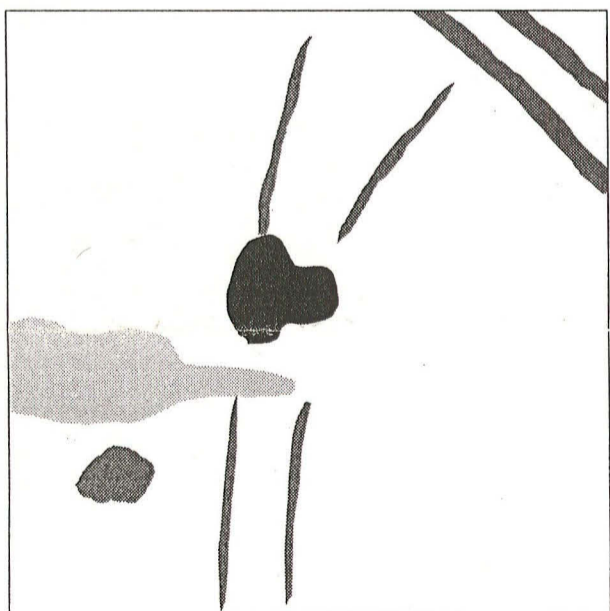
THE ROSES
Toynton All Saints
Area B






50 nT



10.0
nT
0.1



-  ?Kiln
-  ?Other Archaeological Features
-  Ferrous

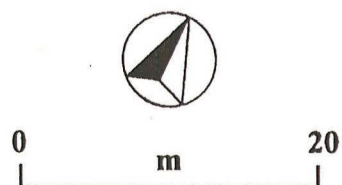
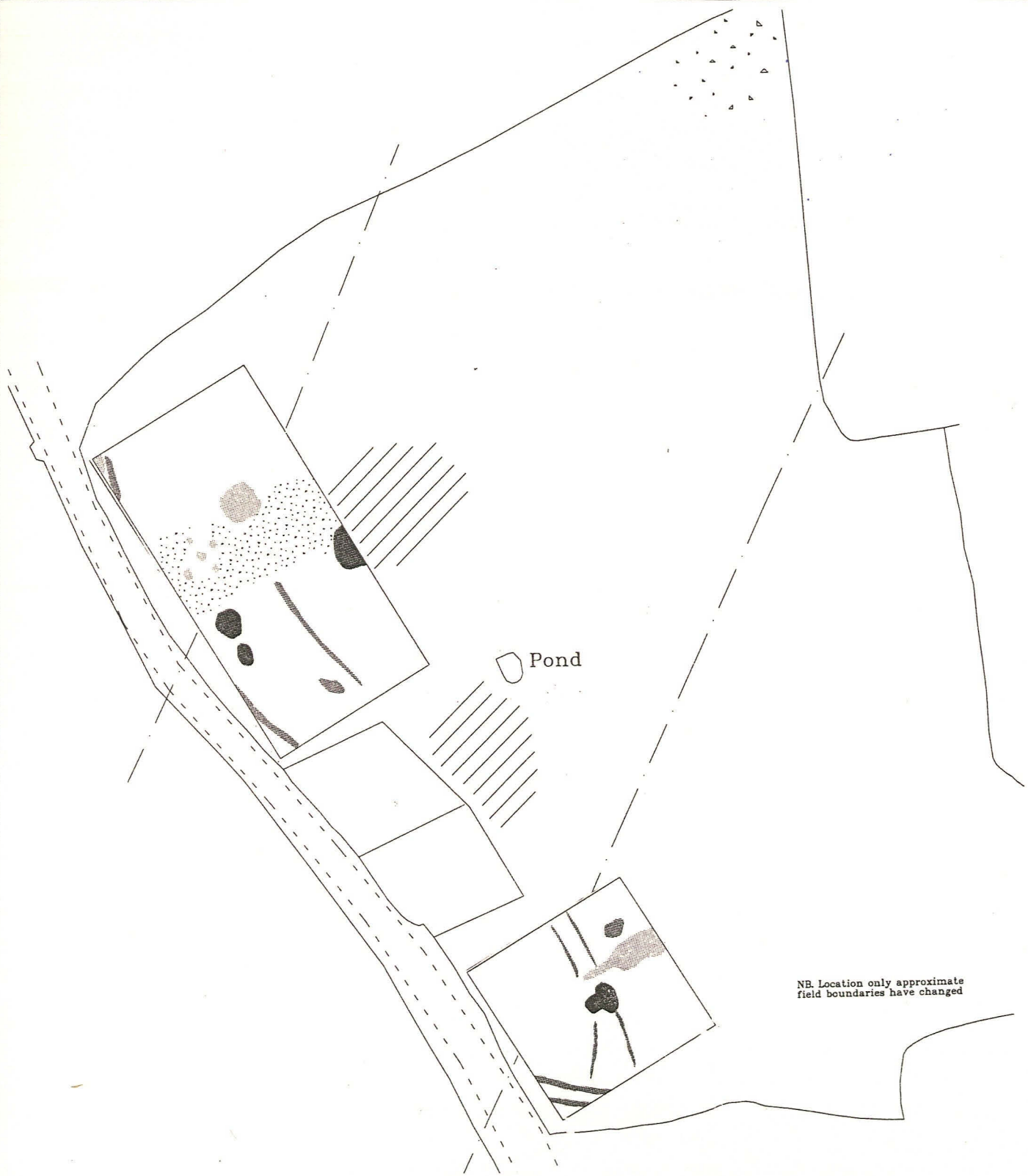


Figure 5

The geophysics on site
B are facing the wrong
way - North has been
placed into wrong
direction.

THE ROSES, Toynton All Saints Summary Interpretation Diagram



NB. Location only approximate
field boundaries have changed







	Overhead Cables		Ferrous		?Kilns		?Kilns/Wasters		?Workshops
									
1:1250									

Figure 6