

Archaeological Field Unit

# A15 Werrington to Glinton Upgrading: An Archaeological Desktop

T Reynolds

1994

**Cambridgeshire County Council**

Report No A28

*Commissioned By Cambridgeshire County Council Department of Transport*

# **A15 Werrington to Glinton Upgrading : An Archaeological Desktop**

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1994

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*Report No A28*

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## NON-TECHNICAL SUMMARY

*Proposals for upgrading the A15 between Werrington and Glington (TF159 038 - TF154 053) along a new route have led to the need for archaeological investigations. This desktop comprises the first component of the investigation. It includes documentary research, cartographic study, fieldwalking and geophysical survey. The area for the proposed development is generally well researched, by the Fenland Project, the Welland Valley Project, and the Nene Valley Research Committee, with a rich prehistoric and Romano-British landscape being known. The immediate route of the new road, however, is less well known documented and mapped examples of archaeological remains along it are rare. Fieldwalking failed to identify clear concentrations of material that might represent sites. Geophysical survey has identified a number of anomalies which may have archaeological significance and these will require examination by evaluation trenching. Additional trenching along the route would be advisable to confirm the lack of archaeological remains in areas where geophysical survey did not identify anomalies. Evaluation trenching, if successful in identifying surviving archaeological remains, may lead to a further stage of excavation or suggestions of mitigating measures to reduce the impact of the development on archaeology.*

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## **1 INTRODUCTION**

The applicants, Cambridgeshire County Council Department of Transportation, approached Cambridgeshire Archaeology (both the County Archaeologist's Office and Archaeological Field Unit) for a preliminary study of impact of the development proposals on surviving archaeology after a landscape and environmental statement prepared by Scott Wilson Kirkpatrick Consulting Engineers. The proposals are for a regrading of the A15 between Werrington and Glinton on a new route. The new route runs from existing roundabouts at Werrington (TF159038) and Glinton (TF154053), between these points it runs on a line west of the present A15 and arcs across it c.300m south of the present Glinton roundabout (*Figure 1*). The civil parishes affected are Peterborough (formerly Werrington parish) and Glinton. This desktop comprises an initial investigation based upon cartographic and documentary searches, fieldwalking of the route and geophysical survey to produce recommendations for further works in the area.

## **2 IMPACT OF THE DEVELOPMENT PROPOSALS**

The proposal is for construction of a new road with associated slip roads and access points which can be highly destructive of archaeological remains. Construction will involve the removal of large amounts of topsoil and subsoil along the route and affect adjoining areas as a result of the need for embankments, services and construction camps. An additional hazard may be the dumping of materials along the route.

## **3 PLANNING POLICIES AFFECTING ARCHAEOLOGICALLY SENSITIVE AREAS**

### **3.1 National**

Department of the Environment Planning Policy Guidance Note 16 (PPG16)

Para. 6. Archaeological remains should be seen as a finite and non-renewable resource, in many cases highly fragile and vulnerable to damage and destruction.

Para. 8. Where nationally important remains, whether scheduled or not, and their settings, are affected by proposed development there should be a presumption in favour of their physical preservation.

Para. 13. If physical preservation *in situ* is not feasible, an archaeological excavation for the purposes of 'preservation by record' may be an acceptable alternative. From the archaeological point of view this should be seen as a second best option.

Para. 25. requires local planning authorities to request a prospective developer to arrange for an archaeological field evaluation before deciding upon a planning application on any site where important archaeological remains may exist. This evaluation may lead to requirements for preservation of all, or parts, of the site, or for further archaeological work.

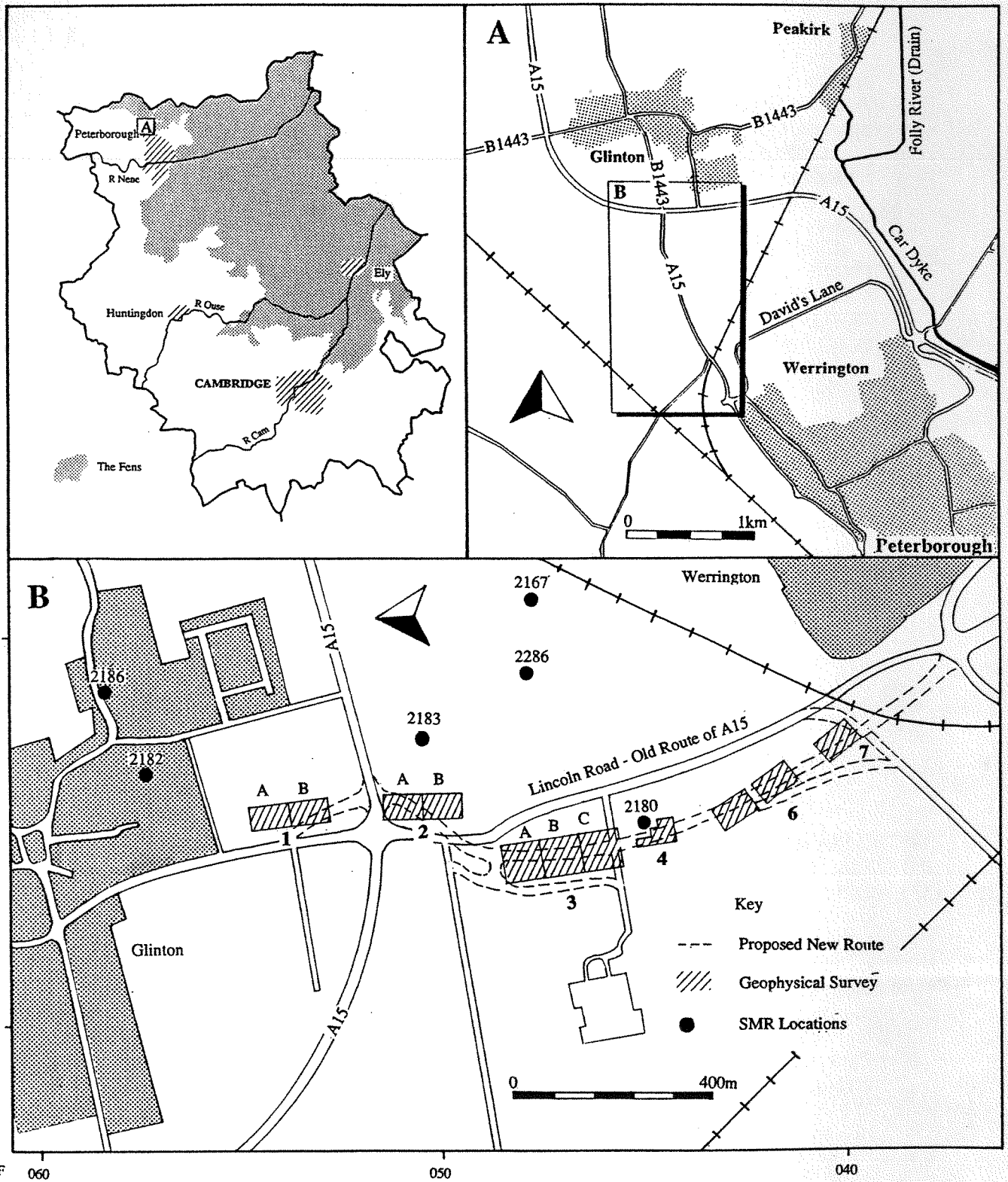


Figure 1 Location Map

### **3.2 Cambridgeshire County Council Guidelines**

#### **Structure Plan**

Policy P14/2 'All County road schemes in rural areas will be planned, designed and executed to minimise undesirable effects on ... the landscape and will incorporate tree planting, landscaping, and creative conservation measures where appropriate'.

Policy P14/12 'The local planning authorities will exercise their powers of development control to preserve scheduled monuments and other important archaeological sites in the County'.

Policy P14/13 'Where there is no overriding case for the preservation of an archaeological site, opportunities will be sought prior to the granting of planning permission, for excavation and recording of the site'.

Cambridgeshire County Council Archaeology Section has also produced guidelines for roadschemes specifically:

#### **Phase 1 (Route Selection, Pre-Public Consultation/Planning Application)**

Desktop assessment of known archaeological sites.

Assessments of aerial photographs.

Site visits to evaluate condition of known sites.

Fieldwalking of the proposed route.

Landscape historical summary.

Liason with the DTP planners and engineers.

Recommendations for route alterations avoiding important sites which require preservation - field evaluation may be necessary.

Requirements for further work, where damage to archaeological remains cannot be avoided, in consultation with County Archaeology Office.

#### **Phase 2 (After Route Selection)**

Detailed site evaluation - earthwork survey, fieldwalking, trial trenching, geophysical survey.

Recommendations to engineers on known sites of high potential.

Excavation or preservation of newly identified sites of importance.

Sample excavation of other archaeological sites and features.

Post-excavation analysis, conservation of artefacts and publication of results.

#### **Phase 3 (During Construction Work)**

Provision for recording brief as necessary during soil stripping operations and construction works.

## **4 GEOLOGICAL AND TOPOGRAPHICAL BACKGROUND**

### **4.1 General Character**

The area of the new road is generally flat, lying c.10m above ordnance datum. The land use is arable in the northern part of the route, with pasture to the south. Hedgerows within the affected area are believed to date to the post-enclosure period. The southern part of the routeway is bounded by the northwestern fringes of Peterborough (Werrington), the remaining route is rural. Drainage runs into the Welland and Maxey Cut via the Brook Drain to the west and the Folly River to the east.

## 4.2 Geology

The area is underlain by Jurassic deposits, including Oxford Clay and Kelleway Sands which form a band to the west of the route, from Geological Sheet 158 of the British Geological Survey the route itself is underlain by 2nd Terrace River Gravels. The southwestern part of the route immediately north of the railway runs close to and may overlie Oxford Clay.

## 4.3 Soils

The soils of the area fall into two main groups:

Alongside the railway and parallel to the road are well-drained calcareous fine loam soils, whilst in a band between the road and the railway are seasonally waterlogged clayey soils.

# 5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

## 5.1 General Archaeological Background

The Welland Valley has been subject to relatively intensive archaeological study through the work of the Welland Valley Project (1971-78) and the Fenland Project (1976 - Present). This is a response both to the richness of the archaeological landscape in the area and the growth of Peterborough, its environs and the associated extraction of aggregates. The archaeological work has been published in detail (Hall 1987; Pryor et al. 1985; Simpson et al. 1993 & various editions of *Durobrivae*) and need not be repeated here except to emphasise that the route of the road falls within an area of varied archaeological remains from many periods ranging from the Mesolithic to the medieval period. Excavations at Flag Fen and Maxey are of particular importance. The quality of the remains and of the work upon them creates an environment in which any development proposals for the area must provide archaeological input through the use of PPG16, and that this work should include interpretation involving the broader regional context. Additionally, there are specific research issues which have arisen from the previous work. Important among these are the identification of early (Mesolithic) habitation and activity sites, the locating and excavation of settlements for the people using the ritual monuments of the valley in the Neolithic and Bronze Age, identification of Iron Age settlement and landuse patterns that might be related to centres such as Stonea Camp and Borough Fen 'hillforts' and how these give way to the more organised landscape of the Romano-British period. The digging of canals, notably Car Dyke, was a significant development in the Roman period and the dating and function of these and their associated settlement sites needs consideration, particularly with respect to their role in the local economy. Following this period, the impact of the Anglo-Saxons on the landscape and parallels for the settlement at Maxey should be investigated and the subsequent development of the Saxon landscape into the succeeding medieval one also requires further attention, especially in the light of changes to the watertable and drainage. These research goals are further elaborated in Fenland Research (1992)



## 5.2 Archaeology and history in the development area

There are no prehistoric materials recovered from the route of the road prior to the Iron Age. The Iron Age material that has been recovered is clearly associated with subsequent Roman developments, as is seen at SMR no.s 596, 02195 & 02182. Although there is no cropmark evidence, it is clear that the route of the development runs across an area which, in the late Iron Age and Roman periods was subject to farming based on small farmsteads which probably served larger centres such as Durobrivae and the settlement at Werrington (Mackreth 1988). The proximity of Car Dyke may have facilitated the development of this area.

The Iron Age phase of the excavated site at Werrington (Mackreth 1988) has no clear evidence for cereal production and it is suggested that the area was pasture-land. Some evidence of cloth-making and the smelting of copper-alloy is present at the site. It was only c.1Km from the fen edge at that time and so could represent one component of a multi-focal economy.

The Roman use of the same area shows an increase in complexity with construction of a stone building and an increase in sites along the route documented by surface scatters. All the scatters are quite discrete and so perhaps suggest the location of small hamlets within a broader rural environment.

There is little evidence for Saxon occupation along the route, except for a scatter of Saxon pottery at Glington. This, plus the evidence of continuity, if somewhat shifted, of occupation at Maxey suggests that Saxon settlement of the area was successful and that such sites should be sought within the bounds, or on the edges of, existing settlement. In Werrington a mid-Saxon site lies at TF17700390, while a possible grubenhuis is located at TF16640390. During the medieval period, the area was subject to strip farming, as can be seen from the effects of furrows on the excavated site at Werrington (Mackreth 1988). The lands of Glington were enclosed in 1820.

## 6 METHODOLOGY

This present report is the result of four stages of investigation, following the Archaeology Section guidelines noted above. The stages are designed to develop an information base by working from the known archaeological resource to the unknown.

The first stage is investigation of the records held in the County Sites and Monuments Record (SMR). The SMR is a computer and map based database providing information, in varying degrees of accuracy, on known sites and findspots in the County. The data used here (*Figure 1* & Section 7) is based upon that presently available and should not be seen as a definitive list, as further remains may be discovered by further fieldwork.

The second stage of investigation is a documentary and cartographic search drawing together historical data and checking references on the SMR. Such a study enables a picture of the landscape as it develops through time to be drawn up.

The third stage of investigation is preliminary walk over of the fields to identify surface scatters and plan sampling of these by further fieldwalking. The subsequent fieldwalking is then targetted to answer specific questions such as the time range of material present, key in surface data with subsurface evidence, and provide landscape monitoring.

The fourth stage is geophysical survey. This is a non-invasive examination of the subsurface to identify archaeological features which may then be subject to further, specific, investigation in later work.

## 7 GAZETTEER

The following SMR entries lie within a c. 0.5Km band along the proposed route, presented here running from south to north (*Figure 1*).

SMR No.	Description
596	Roman Settlement, excavated between 1961-65, includes stone building, pits and ditches with substantial amounts of pottery.
02195	A finds scatter of Iron Age and Roman pottery.
02180	Roman metalwork and pottery, possibly from a midden of a small farmstead.
02167	A scatter of Roman pottery, mostly Nene Valley Ware.
02286	Line of a possible Roman road, identifiable as a low ridge running across the field (but not visible on available APs).
02183	A dark patch with associated Roman sherds and 'occupation debris'.
02182	Pottery scatters, with subsets a, Anglo-Saxon b, Roman, & c, Iron Age

## 8 RESULTS

### 8.1 Fieldwalking Results

Fieldwalking was undertaken firstly by Dr T Reynolds as a preliminary walk-over to identify areas where gridded walking could be undertaken and to identify scatters of material which could suggest the location of sites. This failed to identify any surface material of antiquity and no locations for gridded work were recommended.

A second stage of fieldwalking was undertaken by S. Macaulay and P. Stevens, when again, all available ploughed fields were examined but once again surface finds were very rare. A few sherds of well-fired Roman pottery were discovered in the field identified as 4 in the geophysical survey (*Figure 1*), but were not collected. Conditions were poor due to ground waterlogging and poor weather but this second walking phase confirmed the lack of material on the field surfaces by which to place trenches or to date plough-damaged features.

The southern part of the route, being pasture, was not walked.

## 8.2 Geophysical Survey Results

A total of seven fields were investigated using gradiometry. The fields were numbered from north to south and the full results are presented in Appendix 1. There were considerable problems with waterlogging in the central part of the route - fields 3, 4 & 5. The significant results of the survey are:

- Field 1. A possible kiln and several possible pits.
- Field 2. A series of ditch and pit-type anomalies.
- Field 3. A single pit-type anomaly.
- Field 4. Several possible pits.
- Field 5. No anomalies.
- Field 6. Two possible ditches and a possible pit.
- Field 7. No anomalies.

## 9 DISCUSSION

Given the richness of the Welland Valley archaeological landscape, the lack of evidence along the proposed route is striking. The lack of surface materials, whilst not ruling out subsurface features, is disappointing. The suggestion by geophysical survey that one of their responses in field 1 might be a kiln is rendered unlikely by the lack of any surface materials, sherds, wasters, kiln furniture, etc.

The other geophysical anomalies identified seem to be isolated responses rather than part of an integrated system of landscape features, which again suggests that the subsurface archaeology in the area is poor. An alternative possibility, however, is that the conditions of survey and subsurface chemistry rendered the technique less successful than would otherwise be expected on terrace gravels.

The 'features' identified are 'floating' in the landscape and cannot be identified as part of any particular period system, further work to test these features and blank areas of the geophysical survey is essential to be sure that archaeological remains have been acceptably accounted for prior to road construction.

## 10 RECOMMENDATIONS

It is proposed to undertake further investigation of the route by evaluation trenching. Two components need to be tested in this way; firstly the anomalies identified by geophysical survey need to be exposed and sampled for dating, function, quality and state of preservation data. Secondly, the areas where geophysical survey failed to show any evidence need to be assessed to make sure that the absence of response is real, once again, features exposed should be hand-excavated to sample them for contextual data. It is suggested that a 2% sample of the 'blank' areas are investigated.

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## 12 ACKNOWLEDGEMENTS

*The author wishes to thank Ian Aldridge of the Dept. of Transportation, Cambridgeshire County Council, and Tony Hurley of the County Archaeologist's Office for their assistance and the latter for discussions and a site visit.*

*I would also like to thank Stephen Macaulay and Paul Stevens for site work, Caroline Gait, Jenn Goode and Malin Holst for work on illustration.*



## SITE SUMMARY SHEET

93/137 A15 Werrington to Glinton

NGR: TF 166 030 to 153 060

### Location, topography and geology

The sites under investigation lie along the A15 trunk road in Cambridgeshire, NNW of Peterborough between the villages of Werrington and Glinton. All the fields are flat but the ground cover at the time of survey varied and is detailed in the main body of the report. The underlying geology consists primarily of river terrace sands and gravels.

### Archaeology

Although there is no known archaeology within the evaluation corridor, there are several archaeological sites in the surrounding region. These include a castle and the remains of a Roman building to the west and the line of a Roman canal to the east.

### Aim of Survey

The work outlined in this report forms part of a wider evaluation being carried out by *Cambridgeshire Archaeology (CA)* in advance of proposed improvements to the A15 trunk road. A number of sites along the road corridor were investigated using gradiometry, with the aim of locating any anomalies of archaeological interest.

### Summary of Results\*

Several ditch- and pit-type anomalies were detected in Area 2. These may reflect former field systems or possible settlement. Four other survey areas also yielded anomalies that might be of archaeological interest. However, most of these latter anomalies tend to be ephemeral and occur in isolation; thus natural, modern or agricultural origins for these responses cannot be ruled out.

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

## SURVEY RESULTS

### 93/137 A15 Werrington to Glinton

#### 1. Survey Areas (Figure 1)

1.1 Seven areas, totalling 7.3ha were investigated using gradiometry. The survey blocks are numbered consecutively from north to south (Areas 1-7). For display purposes some of the survey areas are subdivided. The approximate location of the survey areas is given in Figure 1 at a scale of 1:10000.

1.2 The survey grids were laid out by *Geophysical Surveys of Bradford (GSB)* using baselines established and tied in by *CA*.

#### 2. Display

2.1 The results are displayed in two formats :- X-Y trace and dot density plot. These display formats are discussed in the *Technical Information* section, at the end of the text.

2.2 Data plots and detailed interpretations are produced at 1:500 for each survey block (Figures A1-G2).

#### 3. General Considerations - Complicating factors

3.1 The ground conditions varied between sites. *Areas 6 and 7* were under short pasture, which is ideal for survey. *Area 1* was in a ploughed field; however the weather conditions at the time of survey were good (*i.e.* dry) and thus the collection of data was not significantly hindered. The ground cover in *Area 2* was half stubble and half ploughed and the line between the two is visible in the results.

3.2 *Area 3* had been deeply ploughed and torrential rain had made the ground extremely muddy. Consequently walking with the gradiometer - and therefore data collection - was extremely difficult and this is reflected in the noise levels of the data-set. Similar problems were encountered in *Areas 4 and 5*. Although these areas had been harrowed they were extremely boggy and, in places, completely waterlogged. For this reason a part of *Area 4* was considered unsuitable for survey.

#### 4. Results

*Area 1 (Figures A1-3). 60m by 200m divided into two display blocks 1A and 1B.*

4.1 The majority of the responses in this area are ferrous in nature and are likely to be the product of modern ferrous debris scattered in the topsoil.

4.2 An isolated, very strong anomaly in the southern half of the survey may represent a kiln. Its position, relatively close to a group of ditch-type anomalies in Area 2 (Section 4.4 below) might support an archaeological interpretation. However, one would normally expect such structures to be directly associated with other features and industrial debris. Since there is no evidence in the gradiometer data for such related activity, a modern origin for this anomaly cannot be ruled out.

4.3 Several pit-type anomalies are tentatively highlighted on the interpretation, though they could equally be the product of more deeply buried ferrous material.

*Area 2 (Figures B1-3). 60m by 200m, divided into two display blocks 2A and 2B.*

4.4 Several anomalies of archaeological interest are noted in this area. They consist of both ditch- and pit-type responses and are mostly confined to the northern edge of the grid. They may represent former field systems or, possibly settlement. However, most of the anomalies are weak and this may suggest that the features they represent have poor magnetic enhancement and therefore lie some distance from any possible core settlement.

4.5 The change in ground cover between the stubble and the ploughed land is visible as a faint linear trend in the centre of the grid.

4.6 A band of noise along the southern edge of the survey is caused by a track. Elsewhere, stray "iron-spikes" were detected.

*Area 3 (Figures C1-9). 100m by 300m, split into three display blocks 3A-3C.*

4.7 Most of the responses in this data-set are attributed to modern ferrous material in the topsoil. The strong ferrous anomaly in the northwestern corner of the area is thought to be caused by an adjacent pipe.

4.8 A single possible pit-type anomaly is indicated on the interpretation for Area 3B. However, given the lack of a wider archaeological context for this response, a modern or natural origin cannot be ruled out.

4.9 Hints of several linear trends are thought to have an agricultural origin.

*Area 4 (Figures D1-2). Originally 60m by 100m, the area available for survey was limited by waterlogging.*

4.10 In addition to the characteristic "iron spikes", there is a cluster of strong responses in the southern half of this block. The anomalies are generally of ferrous type and are likely to have a modern origin. There are hints of a possible linear arrangement for some of these responses and they could represent part of a dismantled fenceline.

4.11 Several possible pit-type responses were detected but, given the prevalence of ferrous disturbance noted above, an archaeological interpretation for these anomalies is tentative.

4.12 A faint linear trend in the data is attributed to agricultural effects.



*Area 5 (Figures E1-2). 60m by 100m.*

4.13 No anomalies of archaeological significance were found in this area, with all the anomalies reflecting scattered ferrous debris in the topsoil.

*Area 6 (Figures F1-2). 60m by 100m.*

4.14 Two weak short ditch-type anomalies might have archaeological significance, though given the lack of a wider context, this interpretation remains inconclusive. A possible pit-type response was also detected, but this could be the product of more deeply buried ferrous material.

4.15 There are suggestions of two perpendicular linear trends in the data which are presumed to have an agricultural origin.

*Area 7 (Figures G1-2). 60m by 100m.*

4.16 All the anomalies noted in this area are of ferrous-type, reflecting presumed modern ferrous material in the topsoil.

## 5. Conclusions

Five out of the seven sites investigated have revealed anomalies of possible archaeological interest. The most convincing of these are found in Area 2, where a complex of ditch- and pit-type responses might suggest former field systems or the periphery of a settlement. Most of the remaining archaeological-type anomalies are weak and poorly defined; given this fact and the lack of a wider archaeological context, a natural, modern or agricultural origin for these responses is equally feasible.

**Project Co-ordinator** D Shiel & C Stephens

**Project Assistants:** Dr C Adam, J Gater, N Nemcek & A Shields.

**Geophysical Surveys of Bradford**

4th January 1994

## 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.

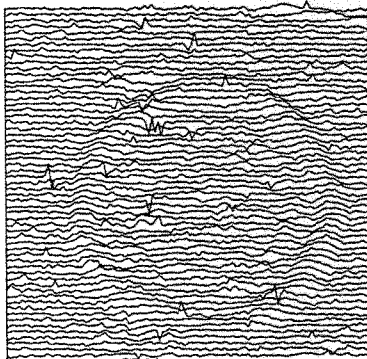
## Display Options

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



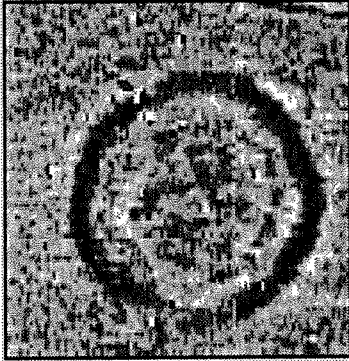
In this display, minimum and maximum cut-off levels are chosen. Any value that is below the minimum cut-off value will appear white, whilst any value above the maximum cut-off value will appear black. Any value that lies between these two cut-off levels will have a specified number of dots depending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

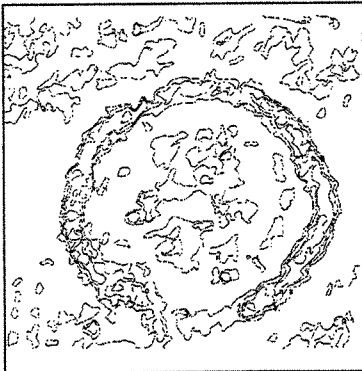
## Display Options cont'd



### (c) Grey-Scale

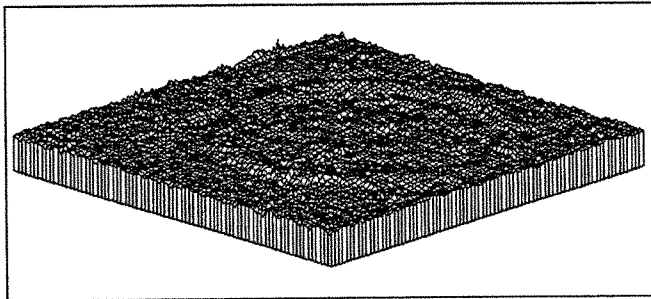
This format divides a given range of readings into a set number of classes. These classes have a predefined arrangement of dots or shade of grey, the intensity increasing with value. This gives an appearance of a toned or grey scale.

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

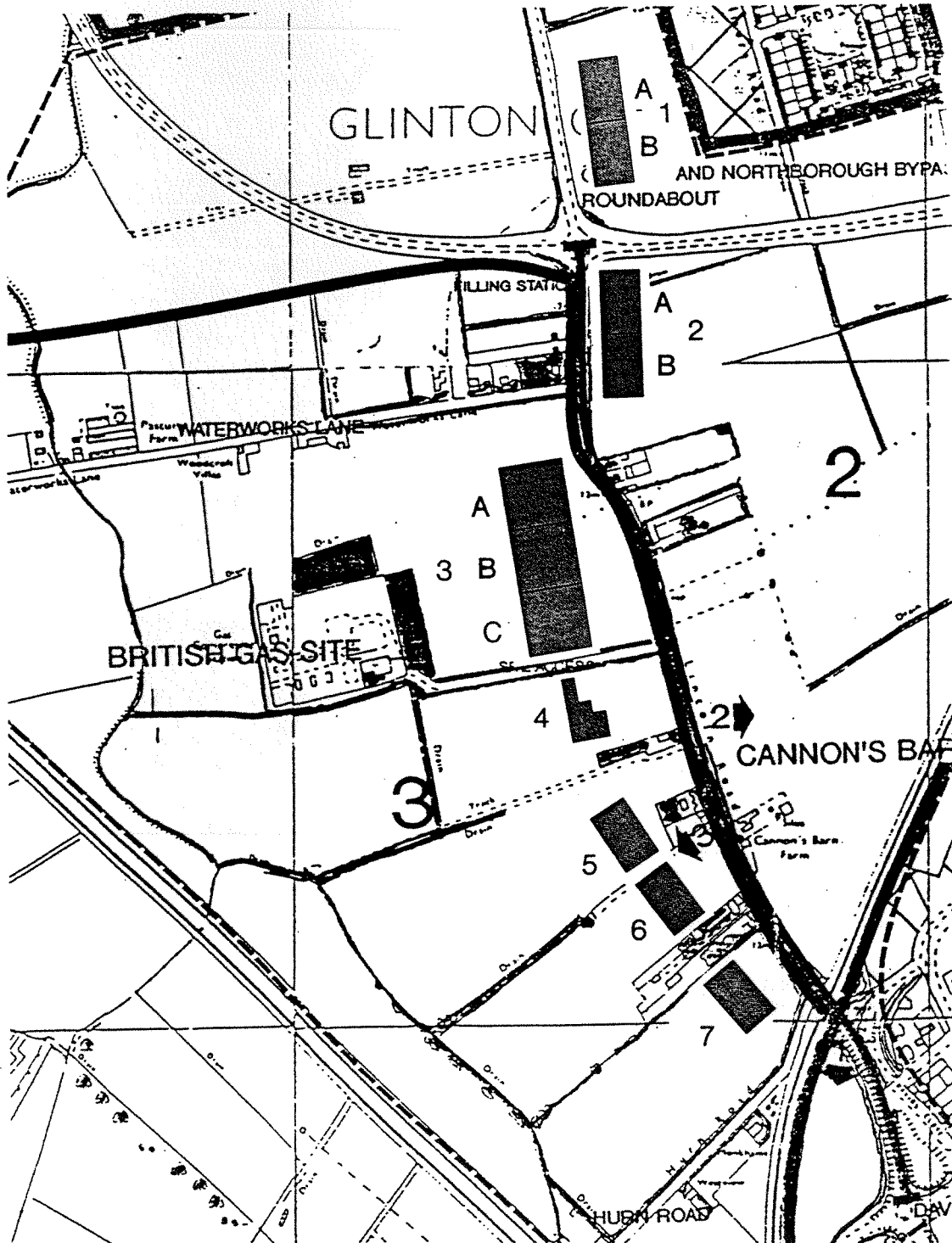
This display format is commonly used in cartographic displays. Data points of equal value are joined by a contour line. Closely packed contours indicate a sharp gradient. The contours therefore highlight an anomalous region. The range of contours and contour interval are selected manually and the display 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).

# A15 WERRINGTON - GLINTON Location Diagram



BASED UPON THE ORDNANCE  
SURVEY MAP WITH THE PERMISSION  
OF THE CONTROLLER OF HMSO  
CROWN COPYRIGHT



1:10000

Figure 1

# A15 WERRINGTON - GLINTON Area 1

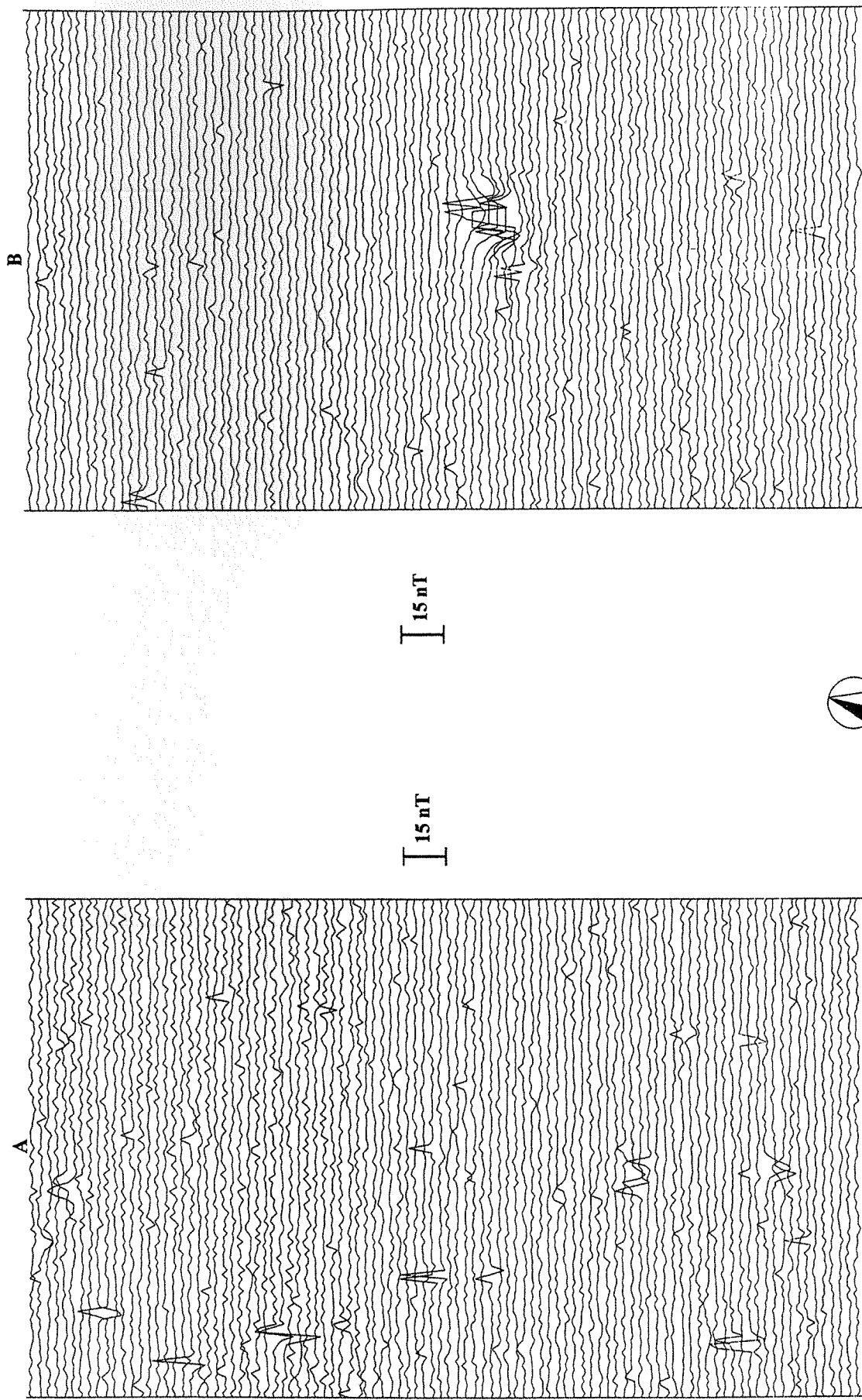


Figure A1

# A15 WERRINGTON - GLINTON Area 1

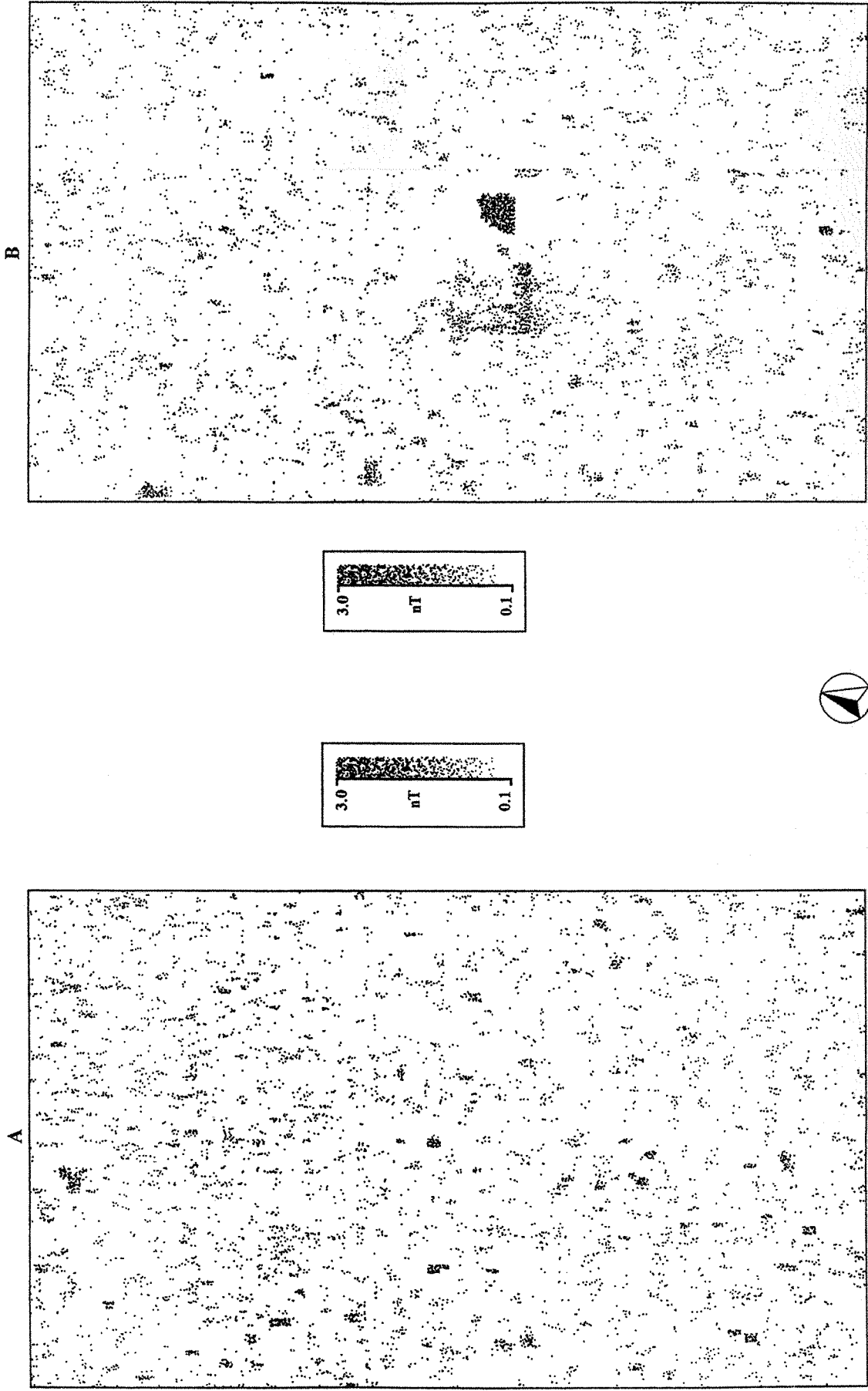


Figure A2

# A15 WERRINGTON - GLINTON Area 1

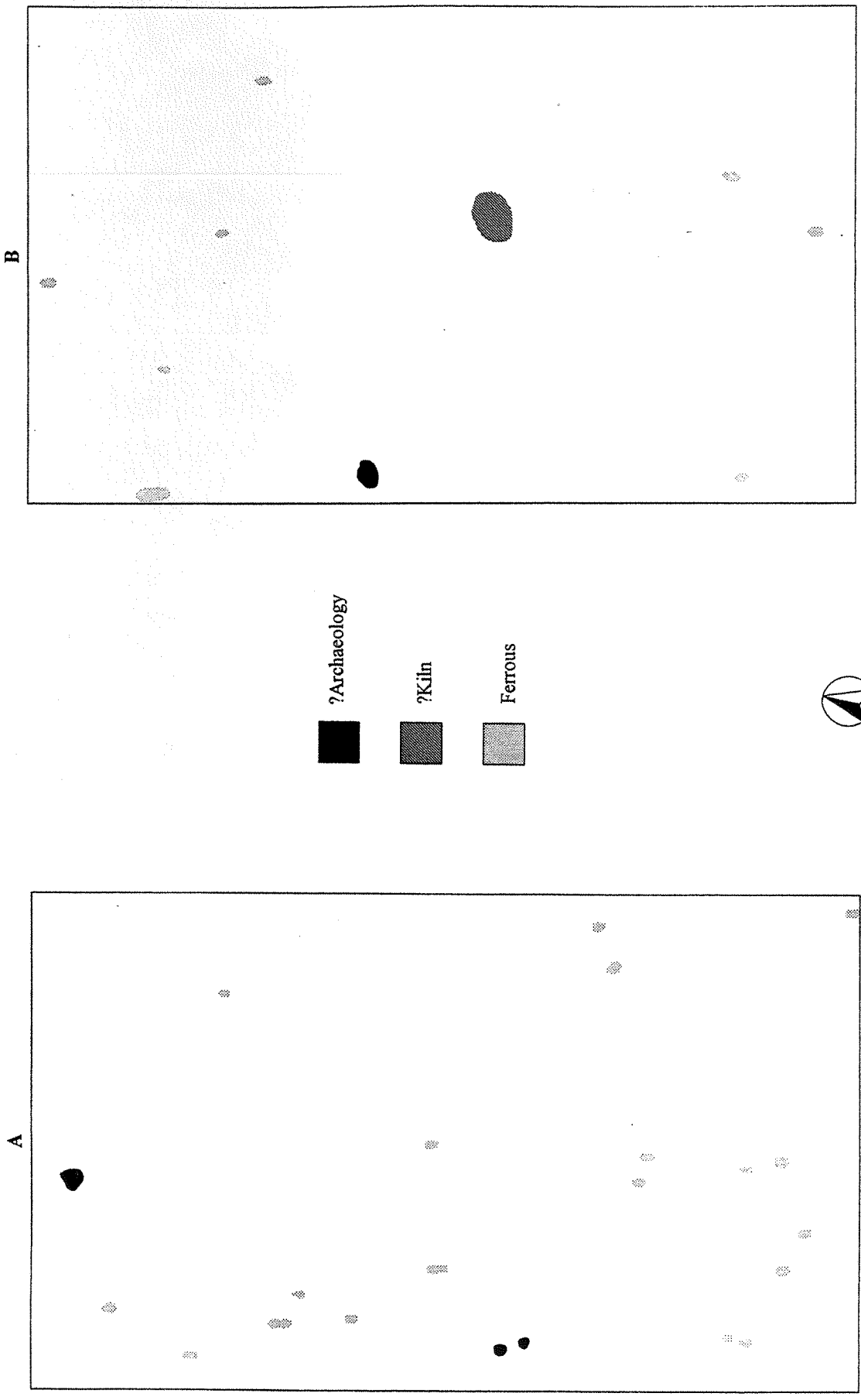


Figure A3



# A15 WERRINGTON - GLINTON Area 2

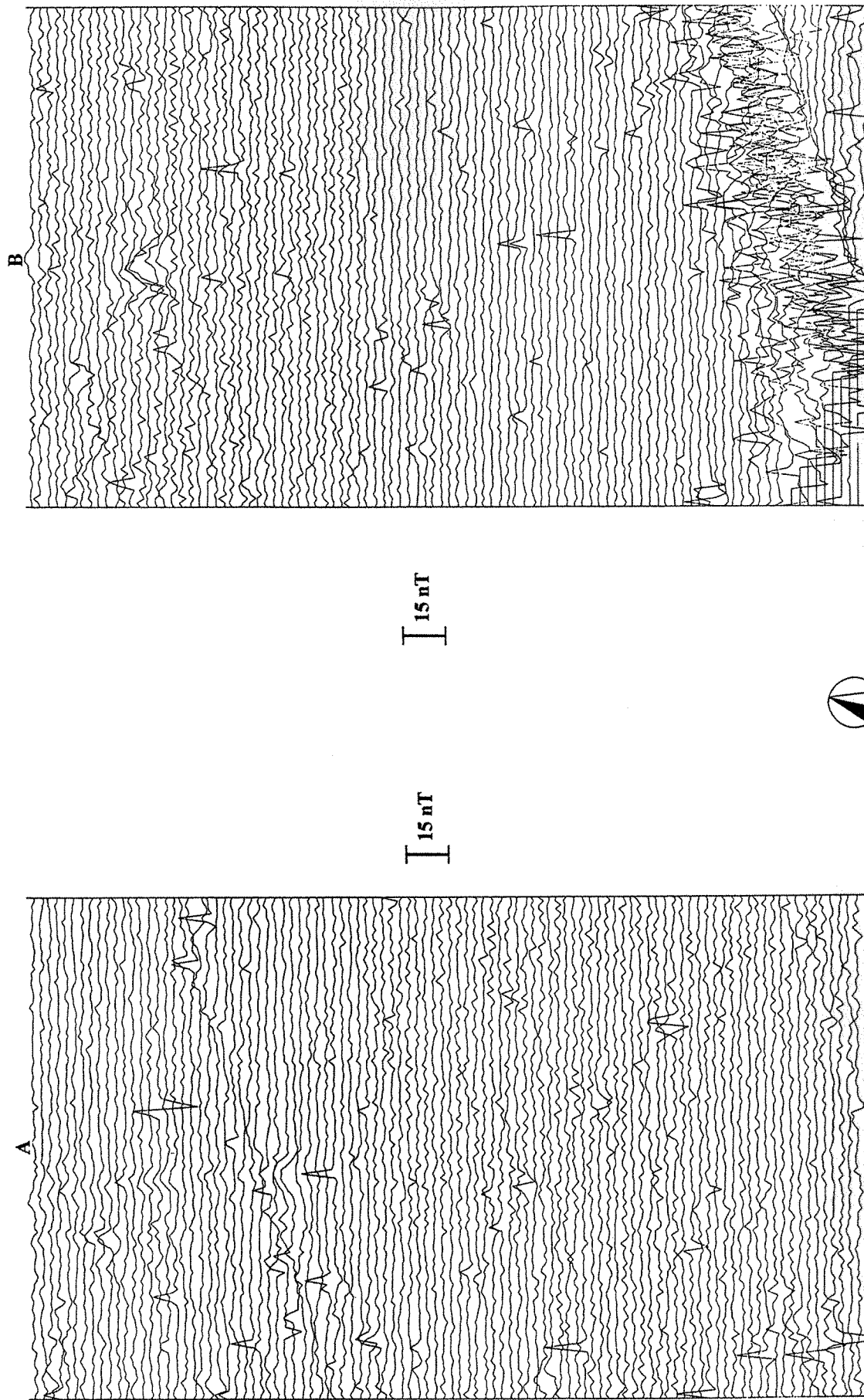


Figure B1

# A15 WERRINGTON - GLINTON Area 2

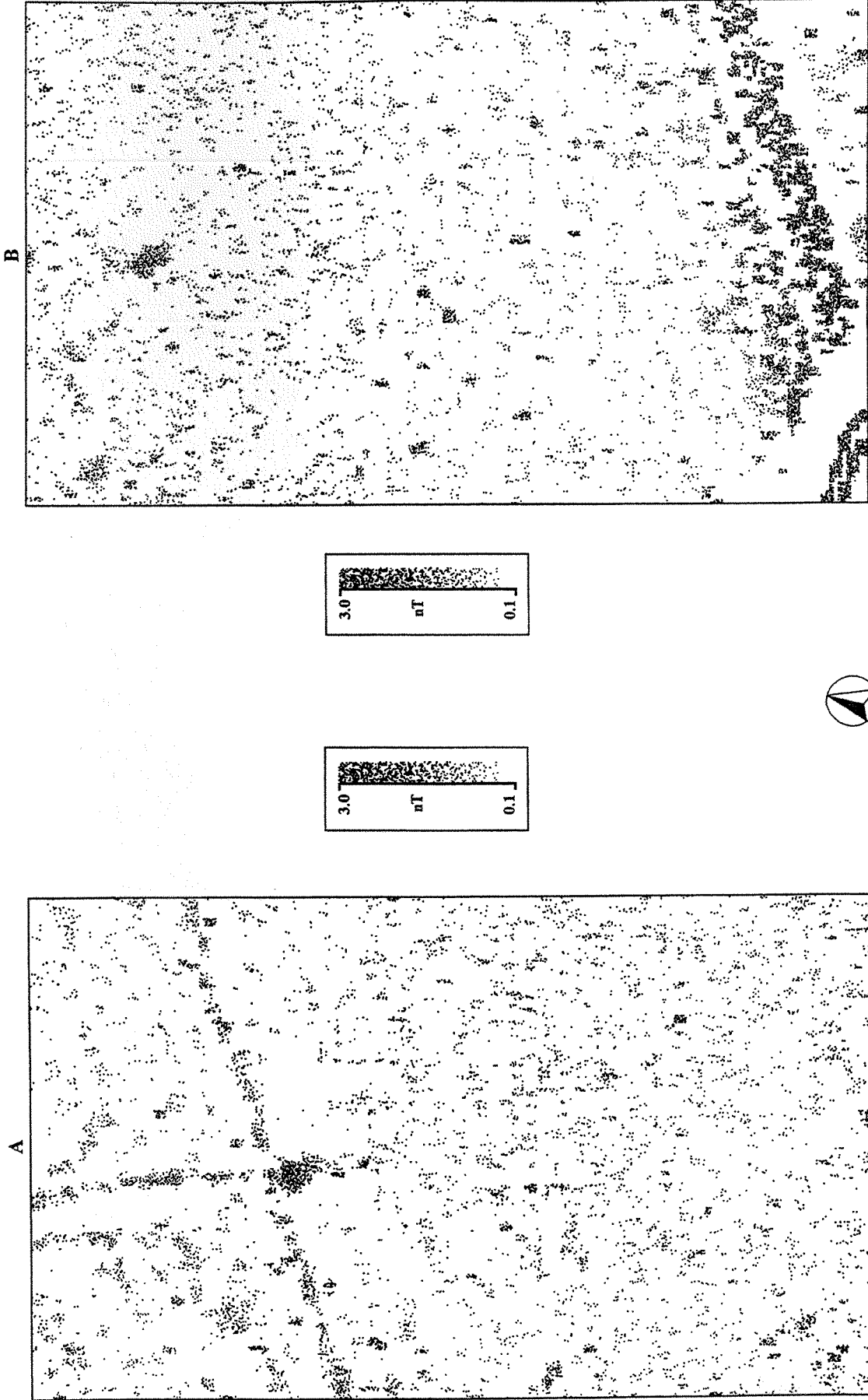


Figure B2

# A15 WERRINGTON - GLINTON Area 2

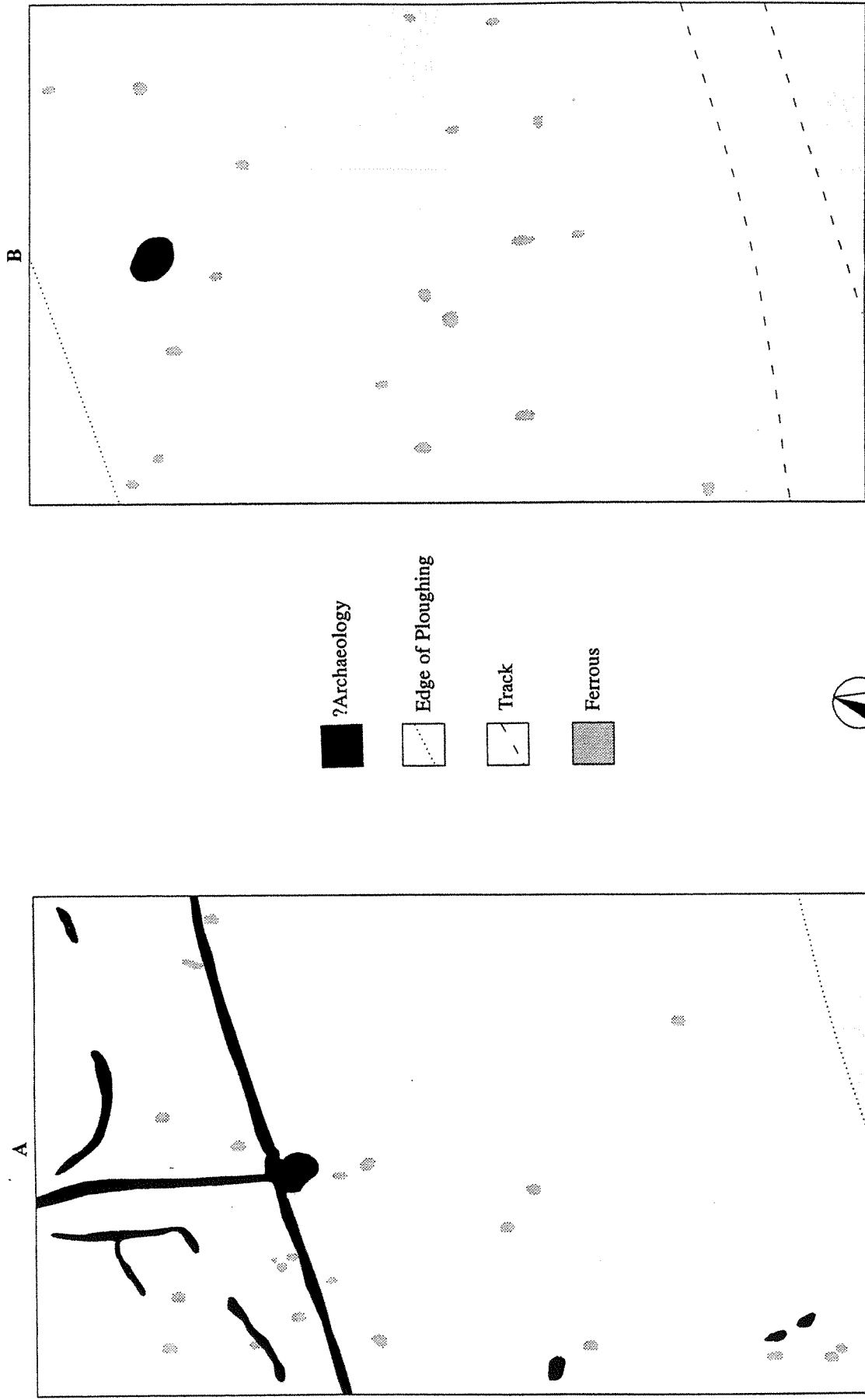
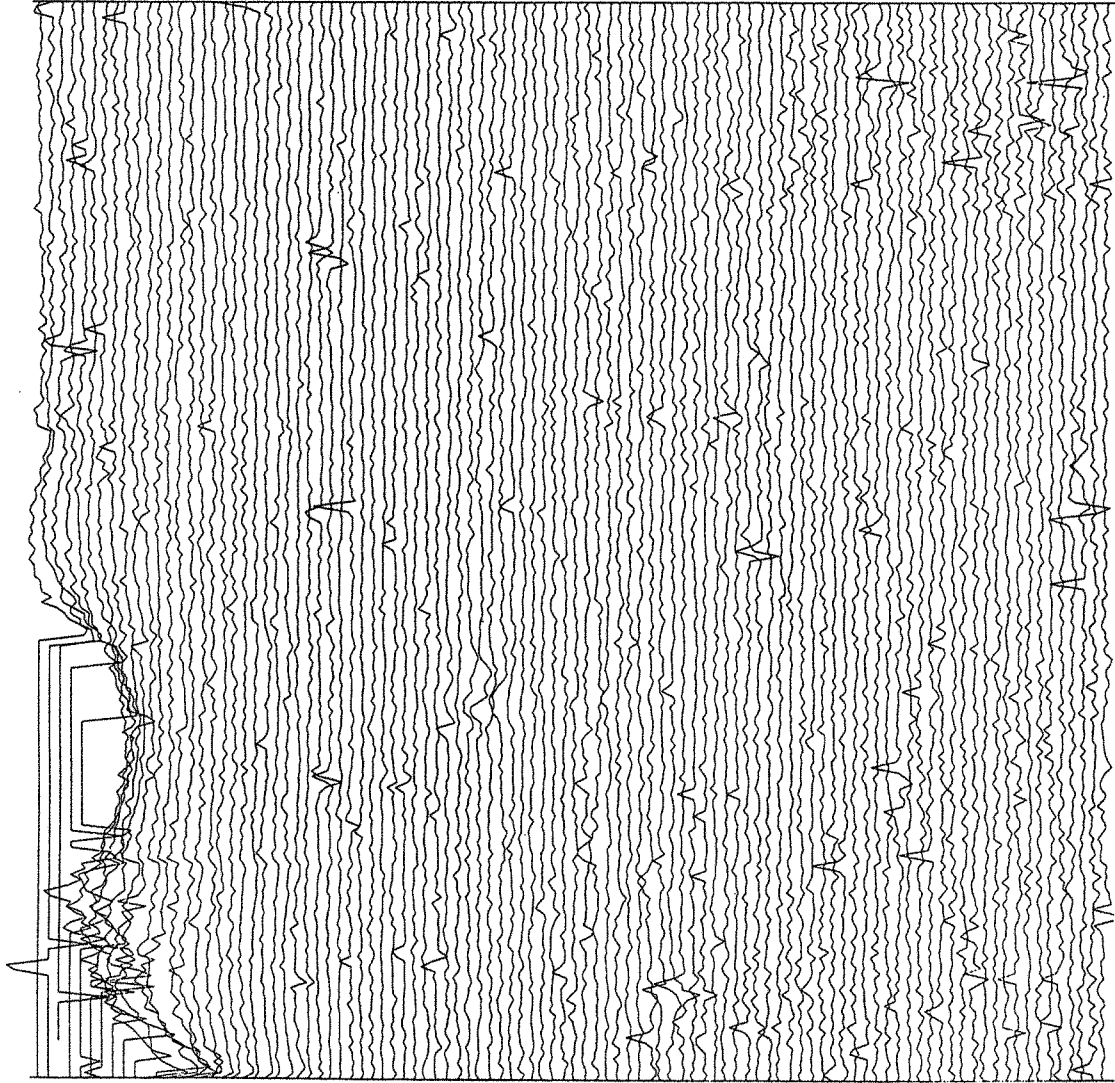


Figure B3

**A15 WERRINGTON - GLINTON**  
**Area 3A**

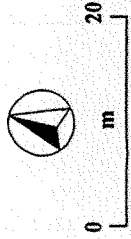
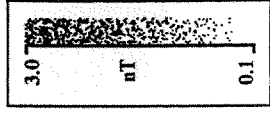


15 nT



0 20  
m

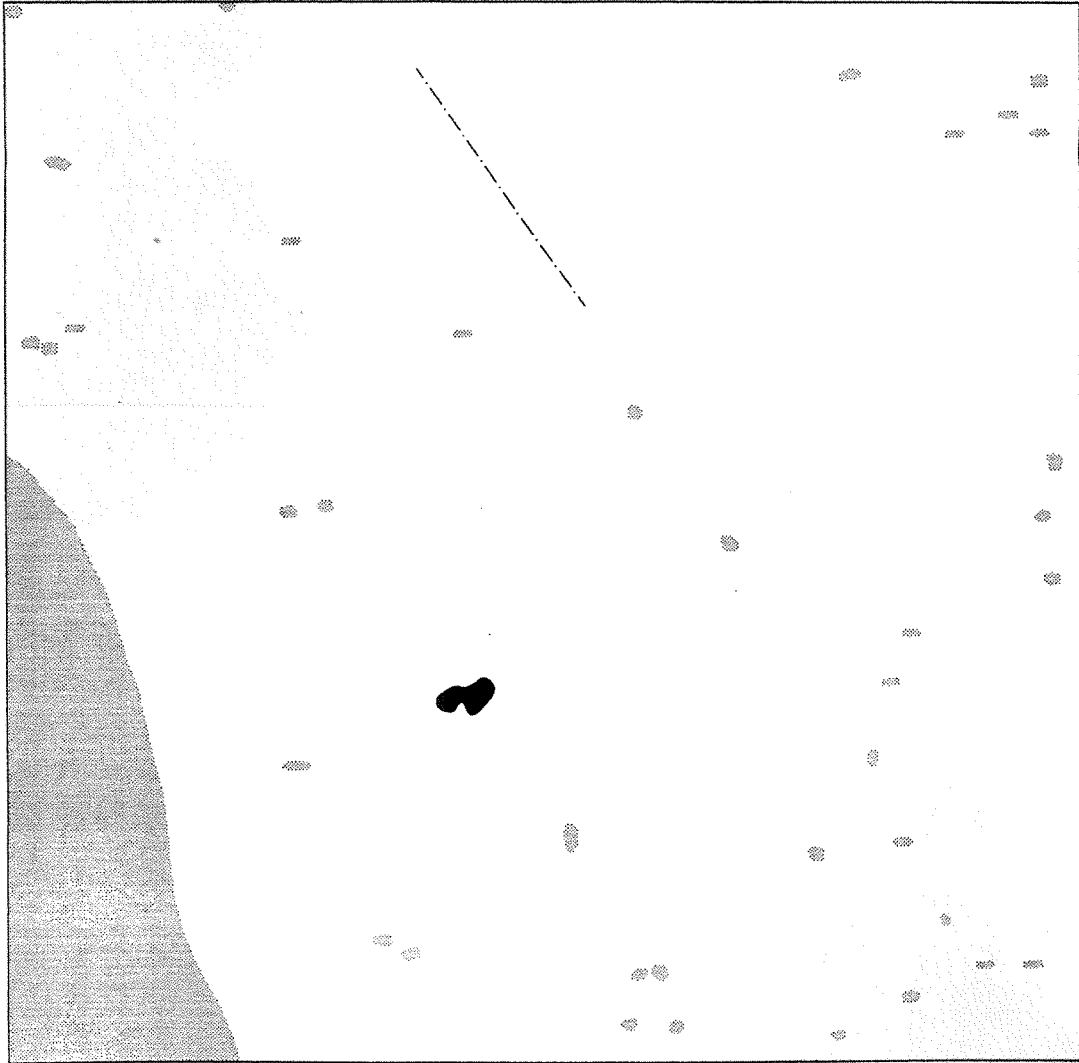
**A15 WERRINGTON - GLINTON  
Area 3A**



**Figure C2**

# A15 WERRINGTON - GLINTON

## Area 3A



- ?Archaeology
- ?Agriculture
- Ferrous

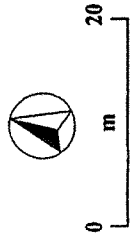
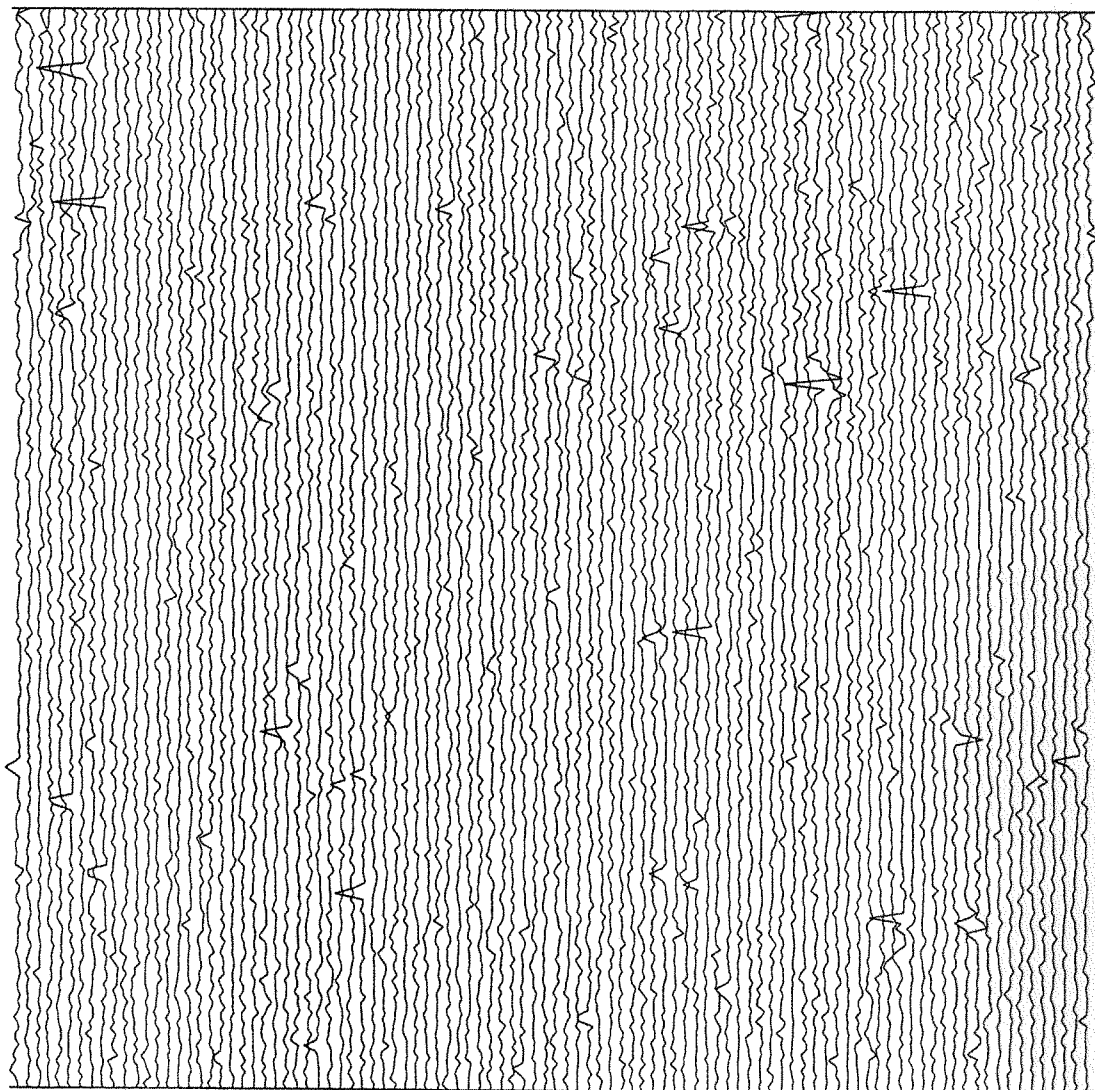


Figure C3

**A15 WERRINGTON - GLINTON**  
**Area 3B**



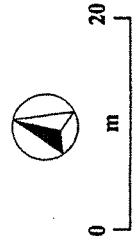
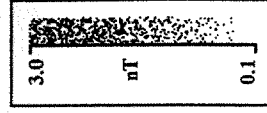
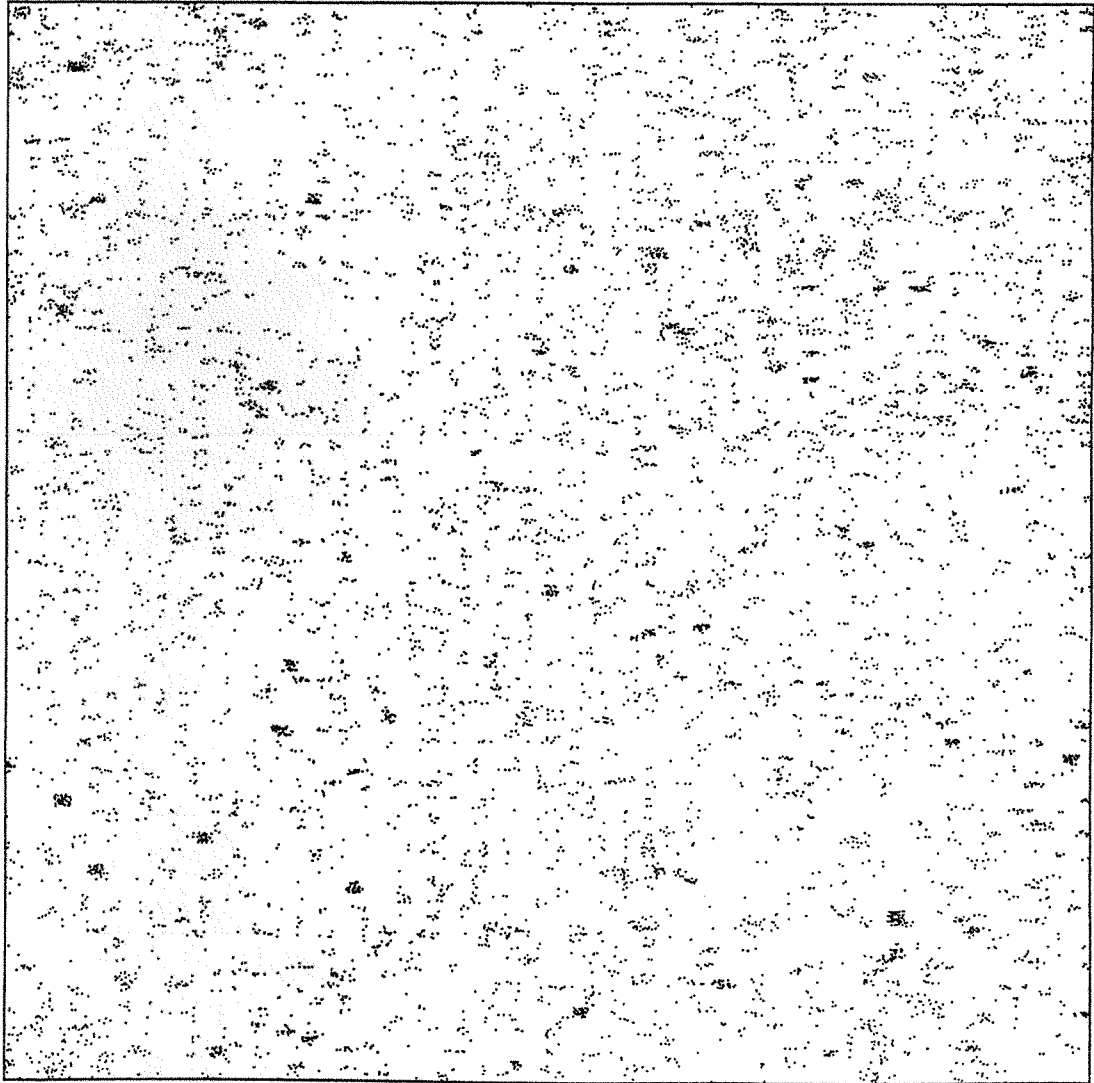
15 nT



0 m 20

Figure C4

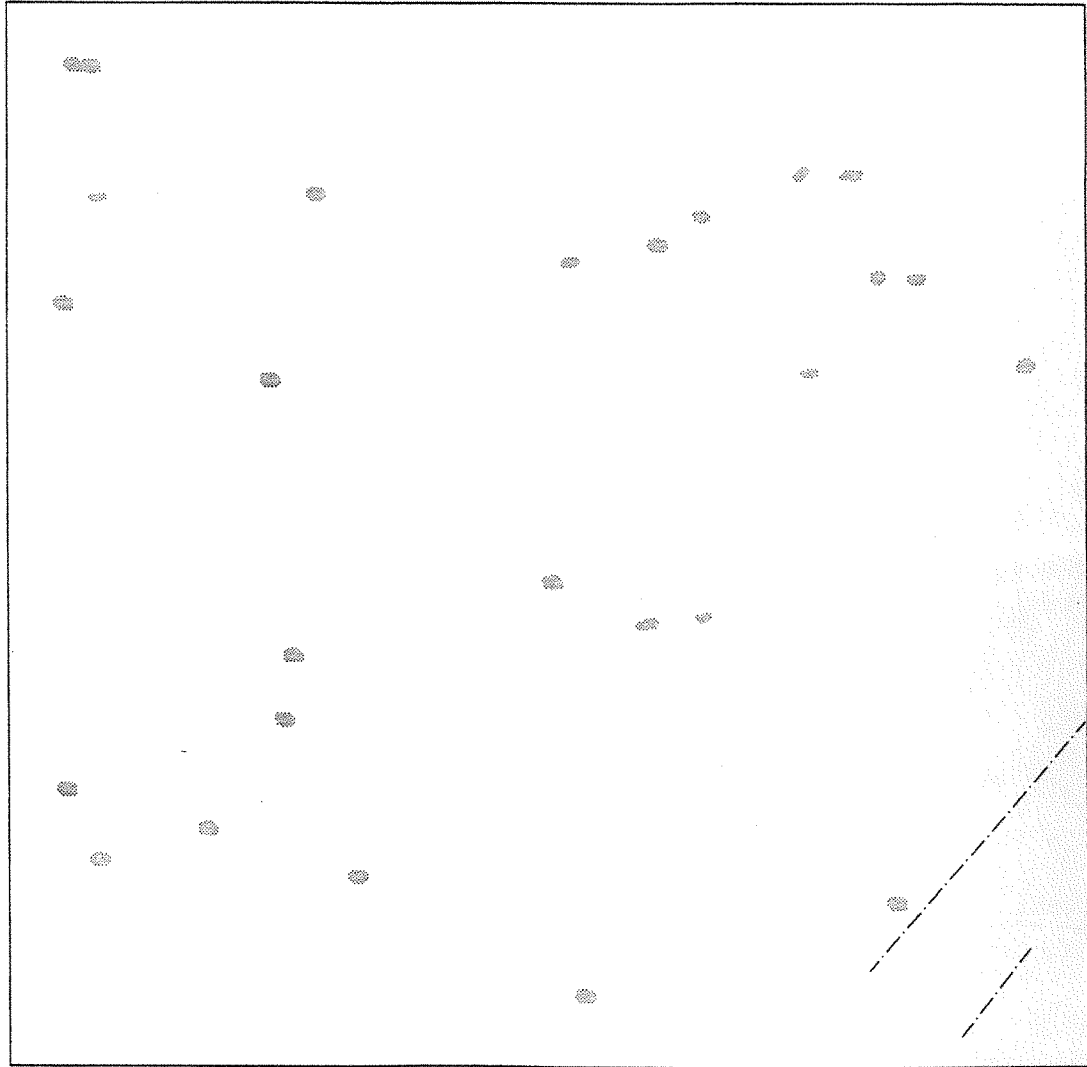
**A15 WERRINGTON - GLINTON**  
**Area 3B**



**Figure C5**



# A15 WERRINGTON - GLINTON Area 3B



? Agriculture

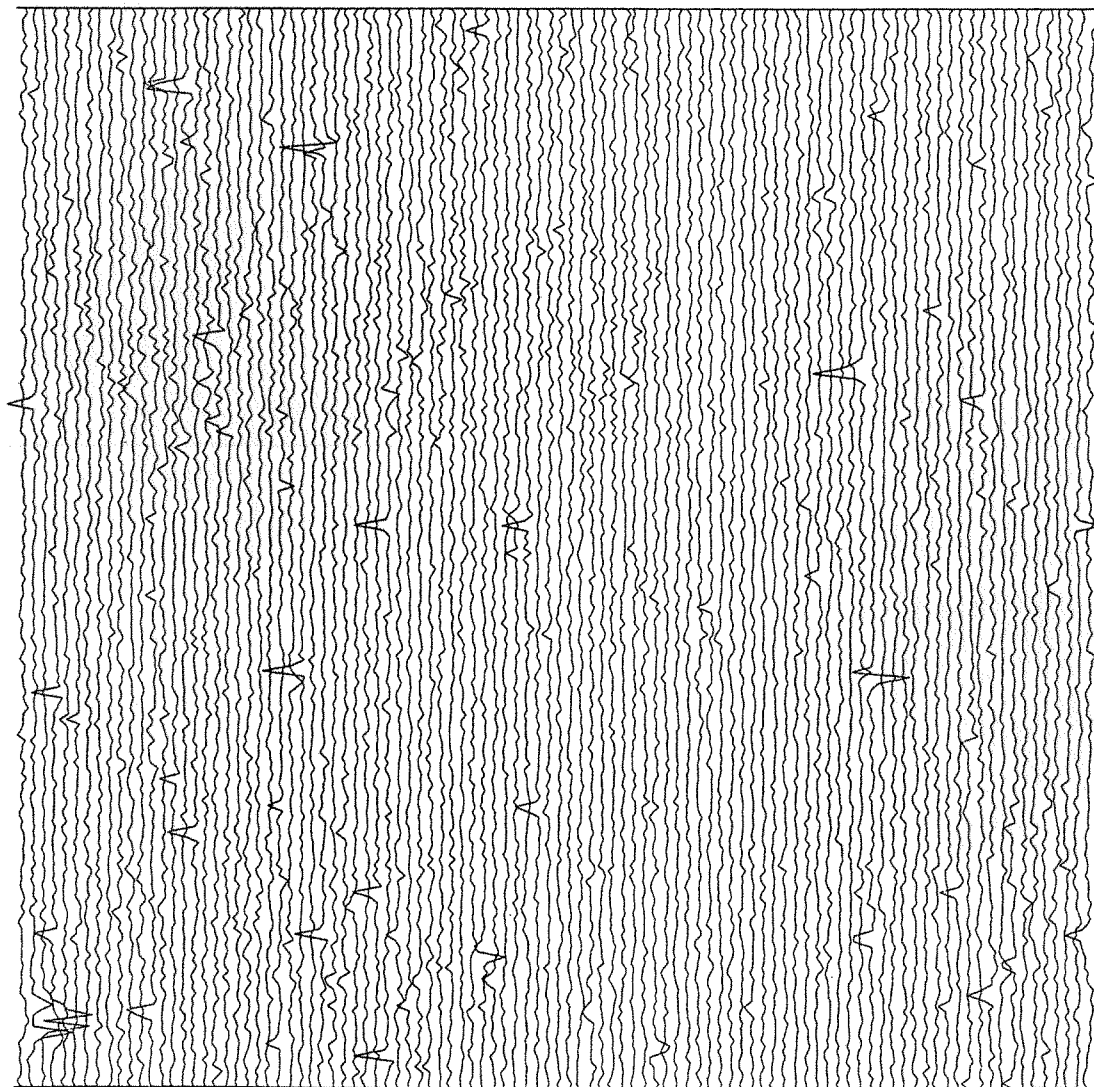
Ferrous



0 20  
m

Figure C6

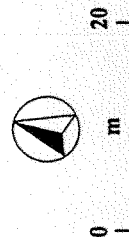
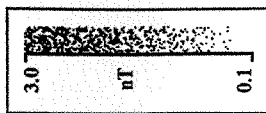
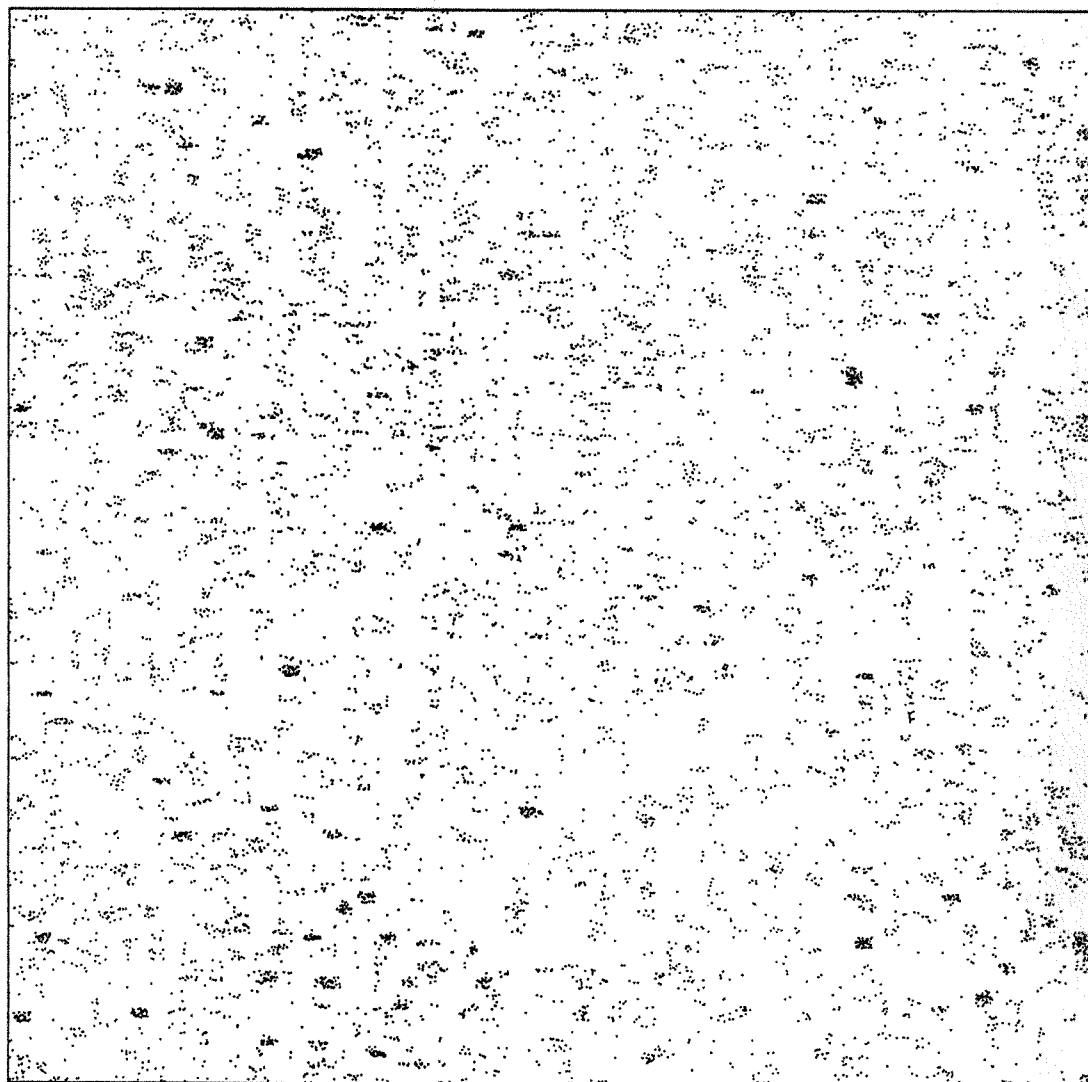
**A15 WERRINGTON - GLINTON**  
**Area 3C**



I 15 nT

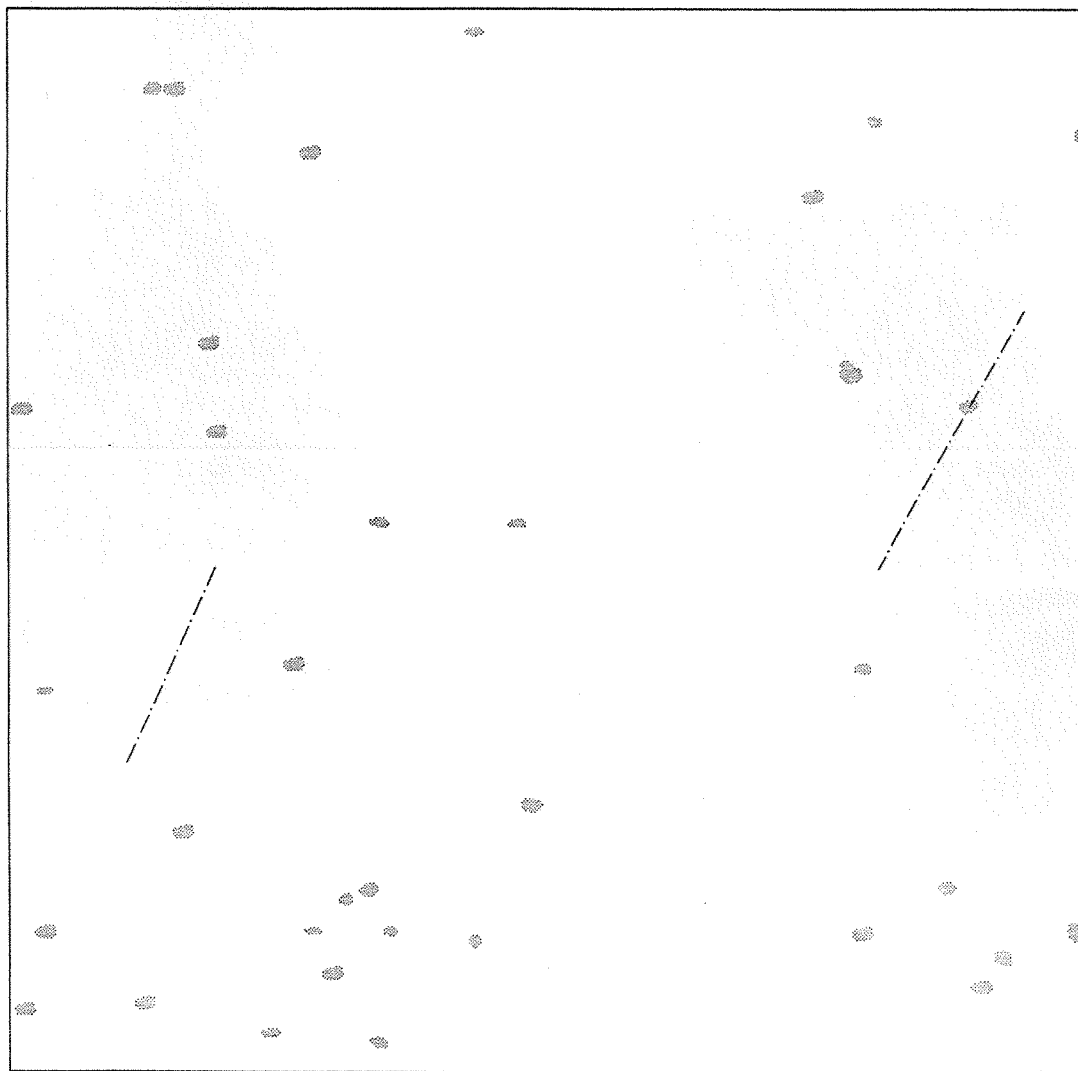


**A15 WERRINGTON - GLINTON**  
**Area 3C**



**Figure C8**

# A15 WERRINGTON - GLINTON Area 3C



? Agriculture

Ferrous

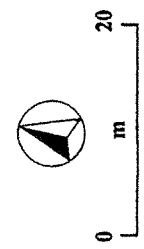


Figure C9

# A15 WERRINGTON - GLINTON Area 4

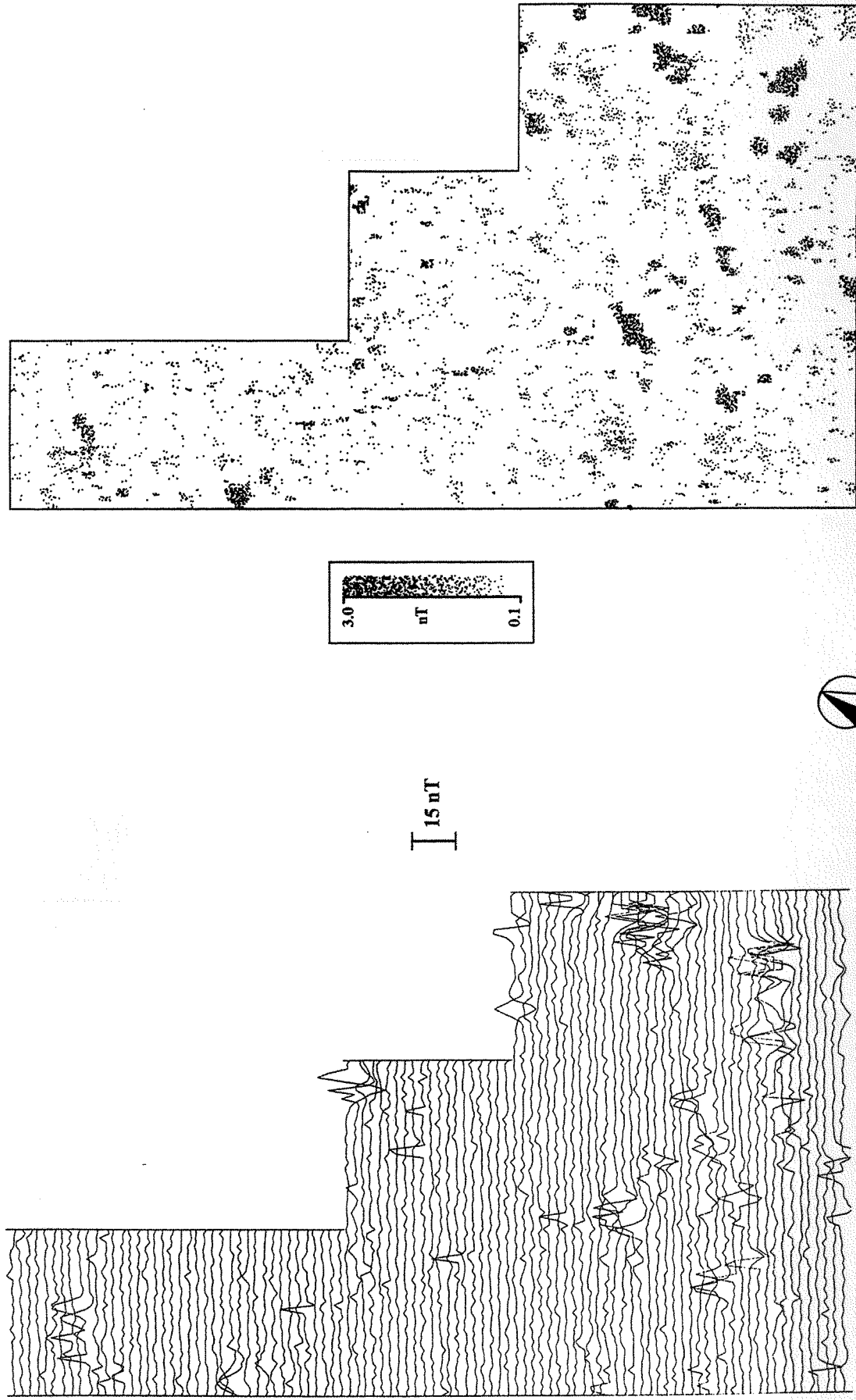
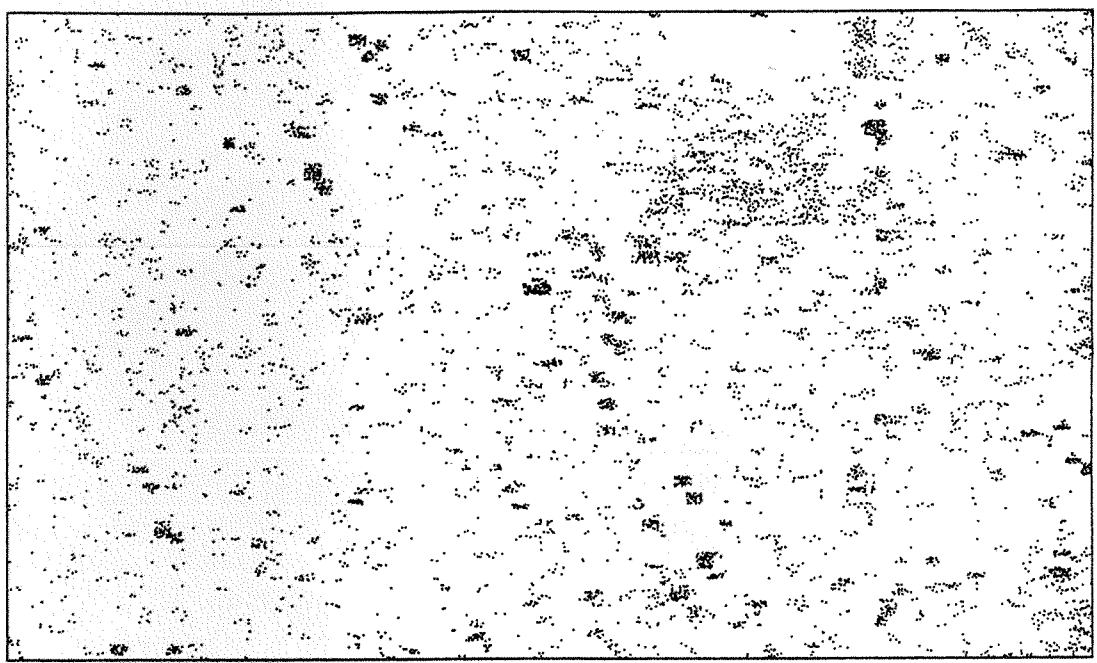
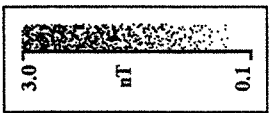
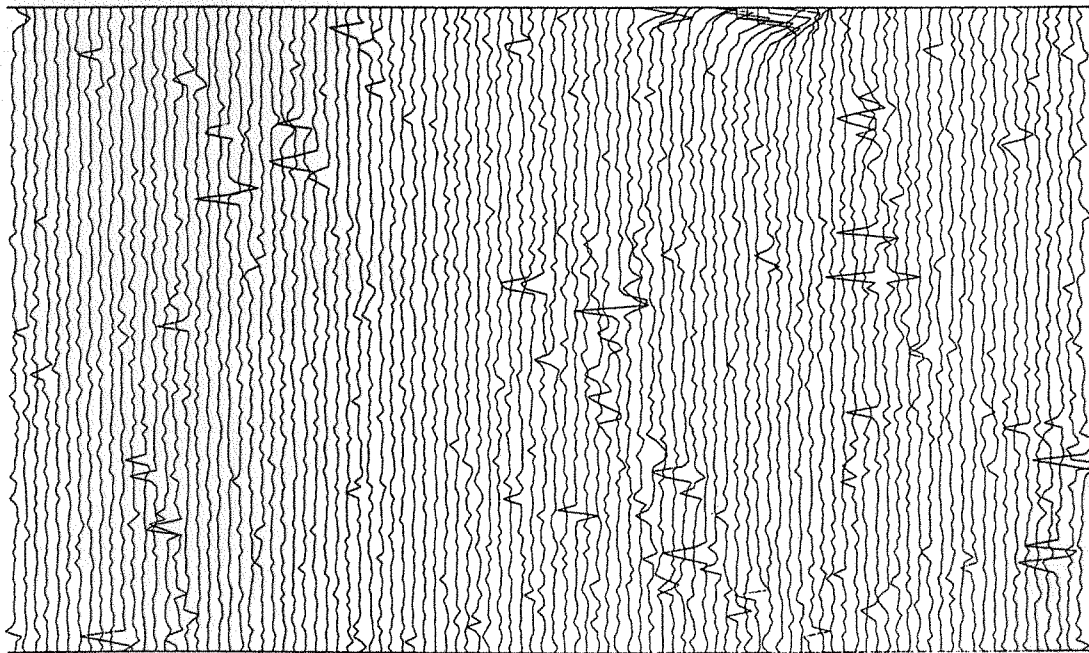


Figure D1

**A15 WERRINGTON - GLINTON**  
**Area 5**



15 nT

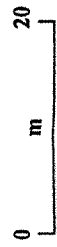


Figure E1

**A15 WERRINGTON - GLINTON**  
**Area 6**

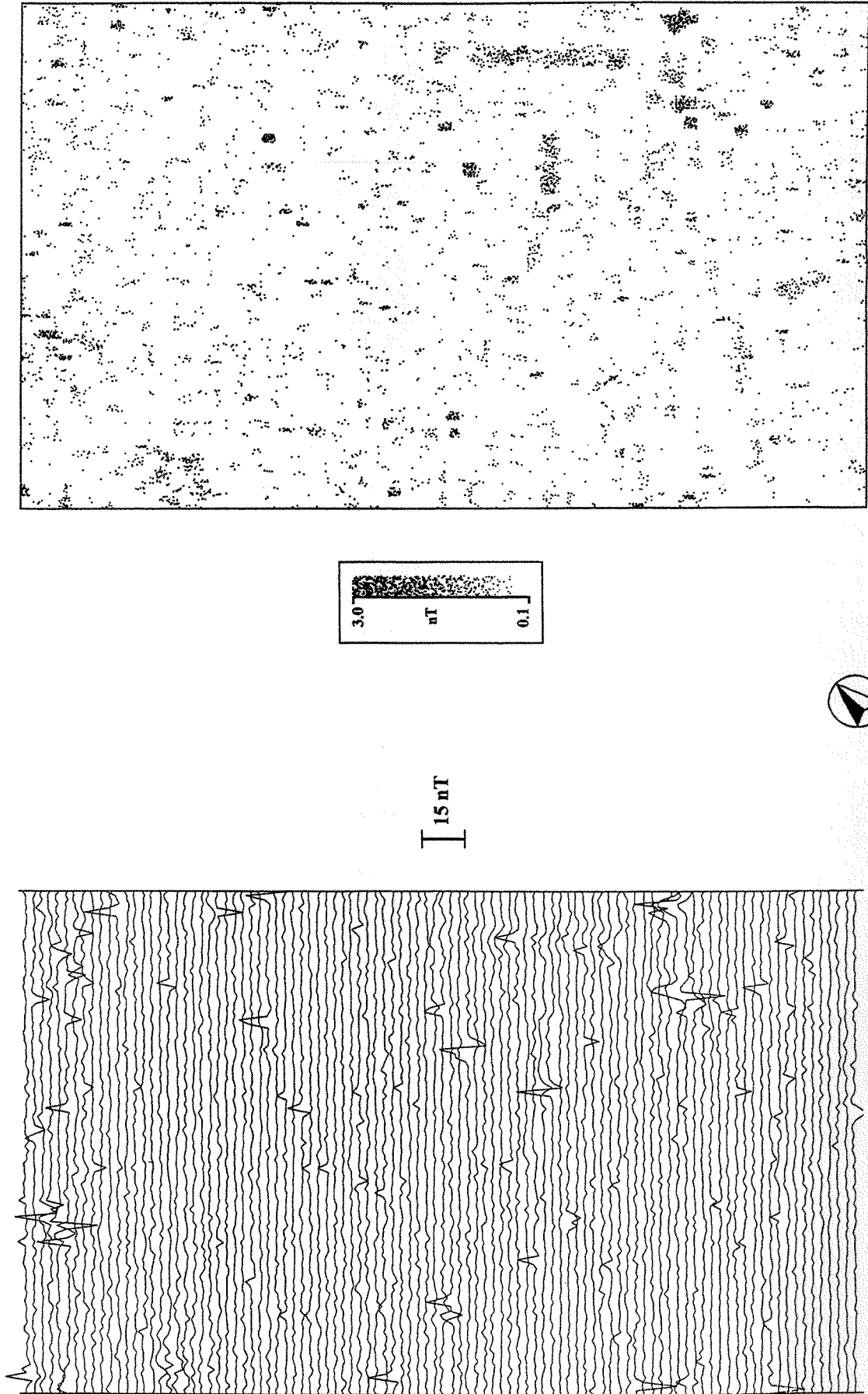


Figure F1

**A15 WERRINGTON - GLINTON**  
**Area 7**

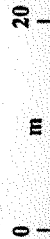
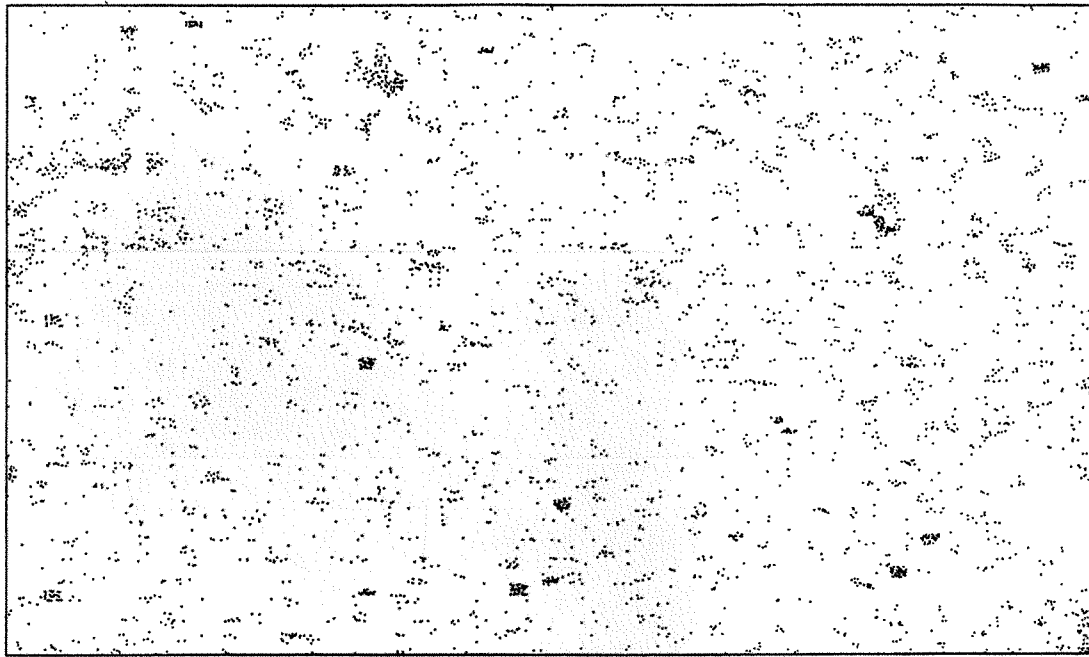
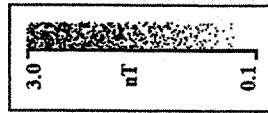
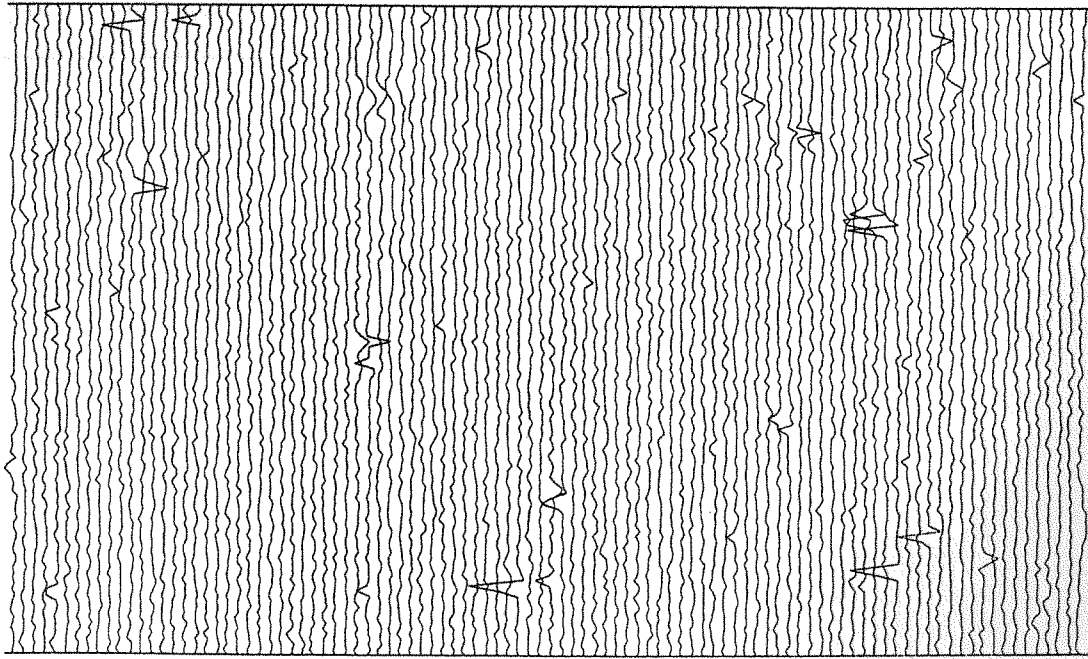


Figure G1





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