



INDEX DATA	RPS INFORMATION
Scheme Title A1 Dishforth to North of Leeming Improvements	Details Rep:- Geophysical Survey
Road Number A1	Date 1994
Contractor Anderson Ward GSB Partners.	
County N. Yorks	
OS Reference SE37.	
Single sided <input checked="" type="checkbox"/> Double sided A3 31 Colour <input type="radio"/>	

SITE SUMMARY SHEET

94/10 A1 Dishforth to North of Leeming Improvements

NGR: Various, see text

Location and geology

All areas surveyed for this contract lie adjacent to the present A1 trunk road, in a section between Dishforth and to the north of Leeming. The survey areas are underlain by Triassic and Permian sandstones. The drift geology is mostly glacial sand and gravels. The soils at all of the survey areas are Argillic brown earths.

Archaeology

A desktop study undertaken by **Anthony Walker and Partners (AWP)** has detailed the archaeological potential for this section of the proposed road upgrading. The geophysical survey work which is reported here focuses on a number of archaeologically sensitive areas identified by AWP. The archaeological features and sites noted for examination include pit alignments, linear and circular features and artefact scatters identified by recent fieldwalking.

Aims of Survey

The general aims of the geophysical work, as defined in the specification set out by AWP include -

1. to provide a detailed area survey of any buried archaeological features and deposits, subject to the limitations of available techniques, within the survey areas;
2. to provide information about the nature and possible interpretation of anomalies revealed by the survey;
3. to identify, as far as possible, any areas which are not responsive to geophysical survey techniques and which therefore require the application of other methods to determine the nature and extent of sub-surface archaeological features and deposits.

Aims specific to each survey area will be described in the results section of the report.

Summary of Results *

It was decided that fluxgate gradiometry would be used to achieve the aims stated above. Many of the surveyed areas have produced archaeological type anomalies, although the interpretation is often difficult due to the weakness of the anomalies. The strongest, and most clear archaeological anomalies, are in the vicinity of the Roman fort at Healam Bridge.

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

SURVEY RESULTS

94/10 A1 Dishforth to North of Leeming Improvements

1. Survey Areas (Figure 1)

1.1 A series of gradiometer surveys was undertaken at specific points along the A1 Dishforth to the north of Leeming section. These locations were chosen by AWP on the basis of previous desktop studies and fieldwork. In all cases the areas were subjected to a 50% sample utilising a scheme agreed with AWP. Where necessary a greater percentage was surveyed after evaluation of the initial results.

1.2 In all cases the 20m grid at the survey locations was accurately positioned using an EDM by staff of AWP.

1.3 The general position of the surveys can be seen in Figure 1.

2. Display

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

2.2 Summary interpretations based on AWP maps are reproduced at 1:1000. Data plots are also reproduced at the same scale.

2.3 Letters in parentheses in the text refer to anomalies highlighted on the relevant summary interpretation diagram i.e. Figures 2-14.

3. General Considerations - Complicating factors

3.1 Ground conditions were generally good at the sites, with the fields largely being level, covered by low vegetation and free of obstacles.

3.2 Archaeological interpretation of the gradiometer data has proved difficult for a number of reasons. Firstly there is a general spread of ferrous type anomalies that may be the product of small ferrous objects in the topsoil or even small magnetic stones. These anomalies can be very weak and can be difficult to differentiate from archaeological pit type anomalies. Secondly, the anomalies are often isolated with little archaeological context. In such cases the interpretation can only be tentative at best.

4. Results

4.A1 Area A1(/ 2/ 3) (Figures 2, 3 and A1.1-6)

4.A1.1 NGR : SE 356728, SE 357729, SE 355733. This area lies east of a known cropmark enclosure and ritual landscape. The brief was to establish whether the known archaeology extended into the survey area.

4.A1.2 For ease of display the data have been divided into three parts.

4.A1.3 **Area A1(A)**. The data from this survey area indicate few anomalies of archaeological potential. Although there are a few minor lengths of possible ditch and an occasional pit type anomaly, the majority of the highlighted anomalies are likely to be due to small pieces of ferrous material. These are thought to be present in the topsoil and are presumed to be largely modern in date.

4.A1.4 **Area A1(B)**. The results from this section again indicate a high proportion of ferrous type material. However, the southern portion of the survey area contains a number of possible archaeological anomalies (A). These are all pit type and there are no suggestions of linear features.

4.A1.5 **Area A1(C)**. Two weak linear anomalies have been identified in this area. However, the greatest number of anomalies are ferrous type.

4.A1.6 In summary, the majority of the anomalies in this area are likely to be ferrous in nature. A concentration of pit type anomalies has been found in the southern portion of Area A1(B); however, there is a lack of context for these anomalies and their interpretation must remain in doubt.

4.A4 Area A4 (Figures 4 and A4.1)

4.A4.1 **NGR : SE 368732**. This 'L' shaped sample is situated east of the present road and Area A3. It lies on the opposite side of the A1 to the previous sample and the aim was to see if a ditch or other features associated with the above mentioned archaeology (see Section 4.A1.1) extended into this area.

4.A4.2 Small ferrous type anomalies can be seen throughout the data set. Only four likely archaeological anomalies have been located. The most interesting of these anomalies lies on the southern edge of the grid. However, there is some uncertainty in the interpretation of this anomaly due to its location.

4.A5 Area A5/12 (Figures 4 and A5.2)

4.A5.1 **NGR : SE 367735**. This area is situated to the north of Area A4; the same comments about the known archaeology apply.

4.A5.2 The data set collected at Area A5/12 is, by comparison with the previous areas, unusual. In the central part of the survey is a series of anomalies that indicate a concentration of potential archaeological features. While some of the features could be lengths of ditch, the more striking anomalies appear to represent lines of pits (B). The interpretation of the latter is puzzling due to the abrupt change in direction part way through the grid. Although modern causes, such as a grubbed out hedgeline, cannot be totally disregarded, it is difficult to envisage causes for all three alignments. It was noticed that, at the time of the survey, the central portion of the survey area was relatively wet; it is possible that the pit type anomalies may relate to an attempt to drain this area.

4.A5.3 A number of pit like anomalies can be seen in the northern part of the survey area. The largest of these lies at the extremity of the grid.

4.A7 Area A7 (Figures 5 and A7.1)

4.A7.1 **NGR : SE 364741**. The same general archaeological comments apply to this sample as described above.

4.A7.2 Three categories of anomaly are presented in this survey. As in the other areas, there is a background of ferrous type responses. Supplementary to these anomalies is the broad ferrous disturbance at the northern edge of the area, which is likely to be due to modern ferrous material beyond the edge of the grid. Finally there are two lengths of ditch type anomalies. Both of these linear anomalies are very weak, and they may extend beyond the limits shown on the interpretation.

4.A8 Area A8 (Figures 6 and A8.1 to A8.4)

4.A8.1 **NGR : SE 359745.** This area is situated further north, and west of the A1. A known enclosure complex is likely to be disturbed by the proposed road improvements. The aim of the survey was to determine the extent of the archaeology within the proposed disturbance.

4.A8.2 A linear anomaly (C) orientated approximately east-west was recorded within one of the sample blocks. This anomaly corresponds to a field boundary visible on Ordnance Survey maps, which has now been removed. Elsewhere concentrations of ferrous responses were detected, which are likely to be due to modern debris.

4.A9 Area A9 (Figures 7 and A9.1-2)

4.A9.1 **NGR : SE 359753.** This area is situated on the eastern side of the A1. Two pit alignments are known to exist to the west, and the aim of the survey was to establish whether or not they, or any features associated with them, extend to the east of the road.

4.A9.2 Two magnetically weak linear responses were recorded in this area that may be archaeologically significant. A single pit anomaly was also recorded, though this may have been produced by ferrous debris. Substantial quantities of such material were also identified within the survey area.

4.A10 Area A10 (Figures 8 and A10.1-2)

4.A10.1 **NGR : SE 354760.** This area is in the south western quadrant of the junction of the A1 and A61 roads. An enclosure complex is known to exist to the south, there are barrows to the west, and a concentration of worked flint extends partly over the area. The aim of the survey was, therefore, to identify the nature and extent of any features associated with the known archaeology within the area.

4.A10.2 Several pit responses were detected, which may be associated with the archaeology described above. There is a curiously shaped anomaly (D) within the northern block of this sample. It is noted that this is very weak and is likely to be non-archaeological. As with the previous area, signals from ferrous debris are also abundant.

4.A11 Area 11/13 (Figures 9 and A11.1 - A11.12)

4.11A.1 **NGR : SE 357762.** This area is east of the A1, close to Area A10. A concentration of artefacts had been recovered during the fieldwalking programme, and the aim of the survey was to identify any features associated with it.

4.A11.2 **Area A11(A)/13.** A group of pit like responses and various strong ditch type anomalies were recorded in this area. However, the strongest of the anomalies form an archaeologically incoherent shape (E). Although they may indicate strongly enhanced ditch fills, it is possible that they may be naturally occurring pockets of magnetic gravel.

4.A11.3 **Area A11(B).** No anomalies of archaeological potential were noted in this sample.

4.A11.4 **Area A11(C)**. A 'T' shaped response recorded at the western extremity of block A11(C) appears to have been produced by a pair of intersecting ditches (F). A weak ditch anomaly was also detected in the northeastern corner of the same survey block. A single pit type anomaly was also found.

4.A11.5 **Area A11(D)**. The majority of the anomalies noted in this sample are likely to be ferrous in nature.

4.A11.6 **Area A11(E)**. No anomalies of archaeological interest have been noted in this sample.

4.A11.7 **Area A11(F)**. Several weak linear trends have been identified in the larger part of block A11(F). These are considered to be due to recent cultivation processes or remains of ridge and furrow. The majority of the anomalies found in this sample are ferrous in nature.

4.B1 Area B1 (Figures 10 and B1.1-4)

4.B1.1 **NGR : SE 343797**. Situated in the central portion of the improvements and to the east of the A1, known archaeology around this area consists of an enclosure complex, a ring ditch, and a square earthwork. The aim of the survey was to establish the presence and extent of archaeological anomalies.

4.B1.2 **Area B1(A)**. Numerous pit responses (G), some of them very broad have been recorded in the northern part of block B1. Although they coincide with an earthwork noted by AWP, their interpretation is still uncertain. They may indicate the remains of unenclosed settlement, but the possibility of naturally occurring pockets of magnetic gravel cannot be dismissed. In the southwestern corner of the area the corner of a possible enclosure may have been detected.

4.B1.3 **Area B1(B)**. A single, weak linear response (H) running parallel with the A1 was recorded in block B1(B). A few small pit type responses have been interpreted as of archaeological interest, although they are less numerous than the ferrous anomalies.

4.B2 Area B2 (Figures 11 and B2.1-2)

4.B2.1 **NGR : SE 341799**. This area is immediately north of Area B1 and the same comments about the known archaeology apply.

4.B2.2 A number of linear responses were recorded in this area. Those oriented approximately north-south are considered to reflect a pattern of field drainage or cultivation trends. Superimposed on the above responses are two linear anomalies (I and J) that may be archaeologically significant.

4.C15 Area C15 (Figures 12 and C15.1-4)

4.C15.1 **NGR : SE 330824**. A large complex of enclosures and ditches has been identified from aerial photographs to the west of the A1 and near to this sample. The aim of the survey was to establish whether or not the archaeology extends to the east of the A1 and into this area.

4.C15.2 **Area C15(A)**. Two linear responses have been identified, one (K) running parallel to the A1 and the second (L), weaker anomaly forming a 'L' shape. Clusters of pit like anomalies have been identified in the western part of the area. It is uncertain if they are associated with the complex recorded on aerial photographs to the west of the A1.

4.C15.3 **Area C15(B)**. The strongest response detected in the southern extreme of C15 is due to an adjacent track and field boundary.

4.C15.4 Elsewhere in the area is a series of possible ditches. While it is not possible to place a clear archaeological interpretation on these linear anomalies it is likely that some of the presumed ditches may be associated with field drainage.

4.C16 Area C16 (Figures 13 and C16.1-2)

4.C16.1 **NGR : SE 331821**. This area is immediately south of Area C15, and the same comments about the known archaeology apply.

4.C16.2 Many pit type responses are recorded in the western part of the survey area. This is a trend that has been seen in Area C15. There are some faint linear anomalies that are aligned approximately north south and appear to indicate a former trackway (M). There is the usual background of ferrous type anomalies and an area of generally disturbed magnetic readings (N) is also present. The latter may be the result of relatively recent dumping or possibly the product of a former stream channel.

4.C17 Area C17 (Figures 14 and C17.1-2)

4.C17.1 **NGR SE 324837**. The aim of the survey in this area was to determine whether a cemetery or any other features of significance are present north of the Healam Beck on the east side of the A1. An area greater than the original 50% sample was surveyed at this site, the results incorporate Areas 17, 19 and 20 as designated by AWP.

C.17.2 Archaeological anomalies have been found throughout the width of this sample. The anomalies are consistently much stronger than those found elsewhere in this assessment, and are on par with those found to the south of this sample and described in an earlier report (GSB Report No. 93/121). The previous results have demonstrated the presence of a Roman fort and associated settlement and it is suggested that the archaeological features found in this sample are likely to be of a similar type. There is no reason to believe that the results indicate the presence, or otherwise, of a cemetery. At the northern end of the survey is a curious series of anomalies (O); although they may relate to former ridge and furrow, their strength and confined area argues against this. The exact interpretation of these anomalies must remain in doubt.

4.C18 Area C18 (Figures 14 and C18.1-2)

4.C18.1 **NGR : SE 323838**. This area is immediately north of Area C17, and the same comments about the known archaeology apply. An area greater than the original 50 % sample was surveyed at this site, the results amalgamate Areas 18 and 21 as designated by AWP.

4.C18.2 Initial survey over the 40 x 40m block closest to the present road position identified some very strong anomalies (P). These were thought to be associated with the presumed continuation of the Roman settlement found to the south. An additional survey area to the east has revealed weaker anomalies (Q) associated with ridge and furrow, which is visible on the surface. While both the anomalies associated with the presumed Roman remains and the agricultural practices are roughly in the same alignment, the differing strength of the anomalies suggests different causes.

4.C18.3 An extremely weak anomaly (R) has been noted, although it's interpretation is far from clear.

5. Conclusions

5.1 The gradiometer surveys at the various sites have revealed a number of possible archaeological anomalies. In a number of cases the anomalies are very weak and the exact interpretation of many of them is debatable. The areas containing the clearest anomalies are in the northern part of the project, close to the Roman fort at Healam Bridge.

Project Co-ordinator: Dr C F Gaffney

Project Assistants: Dr C Adam, S Gaffney, J Gater, Dr S Ovenden, N Nemcek, D Shiel, A Shields, C Stephens and A Wilson

March 1994

Reference

Geophysical Survey of Bradford ' 93/121 A1 Trunk Road - Healam Bridge' Report No. 93/121

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".

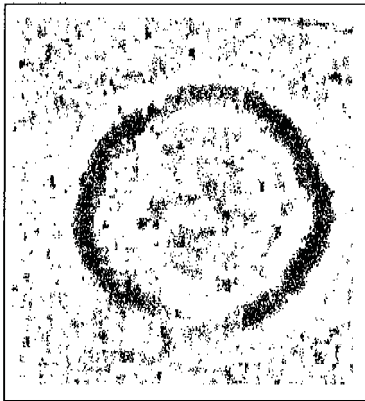
(c) Magnetic Susceptibility

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.

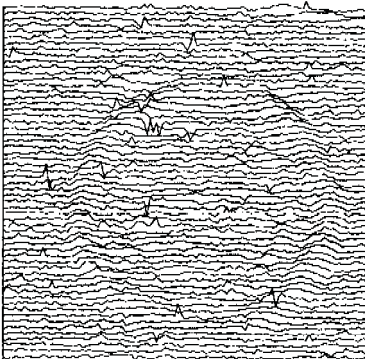
Display Options

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



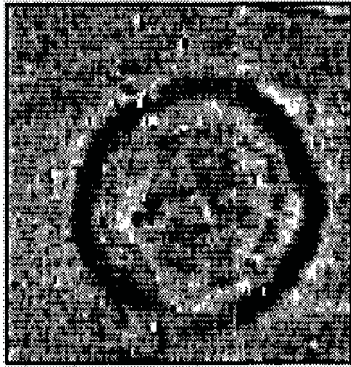
In this display, minimum and maximum cut-off levels are chosen. Any value that is below the minimum cut-off value will appear white, whilst any value above the maximum cut-off value will appear black. Any value that lies between these two cut-off levels will have a specified number of dots depending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

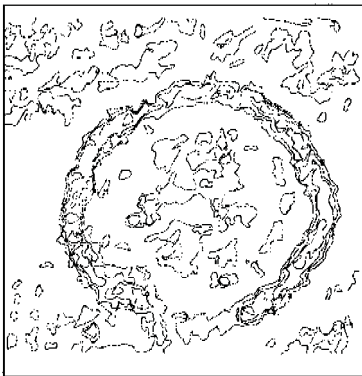
Display Options cont'd



(c) Grey-Scale

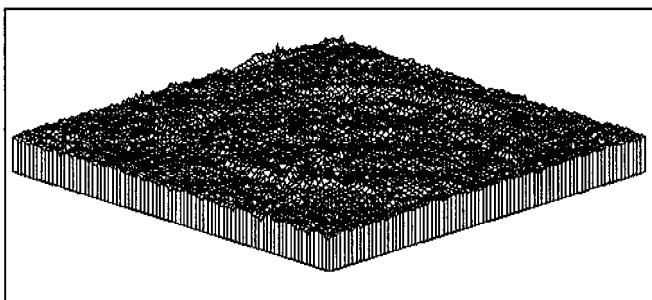
This format divides a given range of readings into a set number of classes. These classes have a predefined arrangement of dots or shade of grey, the intensity increasing with value. This gives an appearance of a toned or grey scale.

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).

A1 DISHFORTH TO NORTH OF LEEMING Location of Survey Areas



1:50000



Approximate
Location of Survey Areas

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

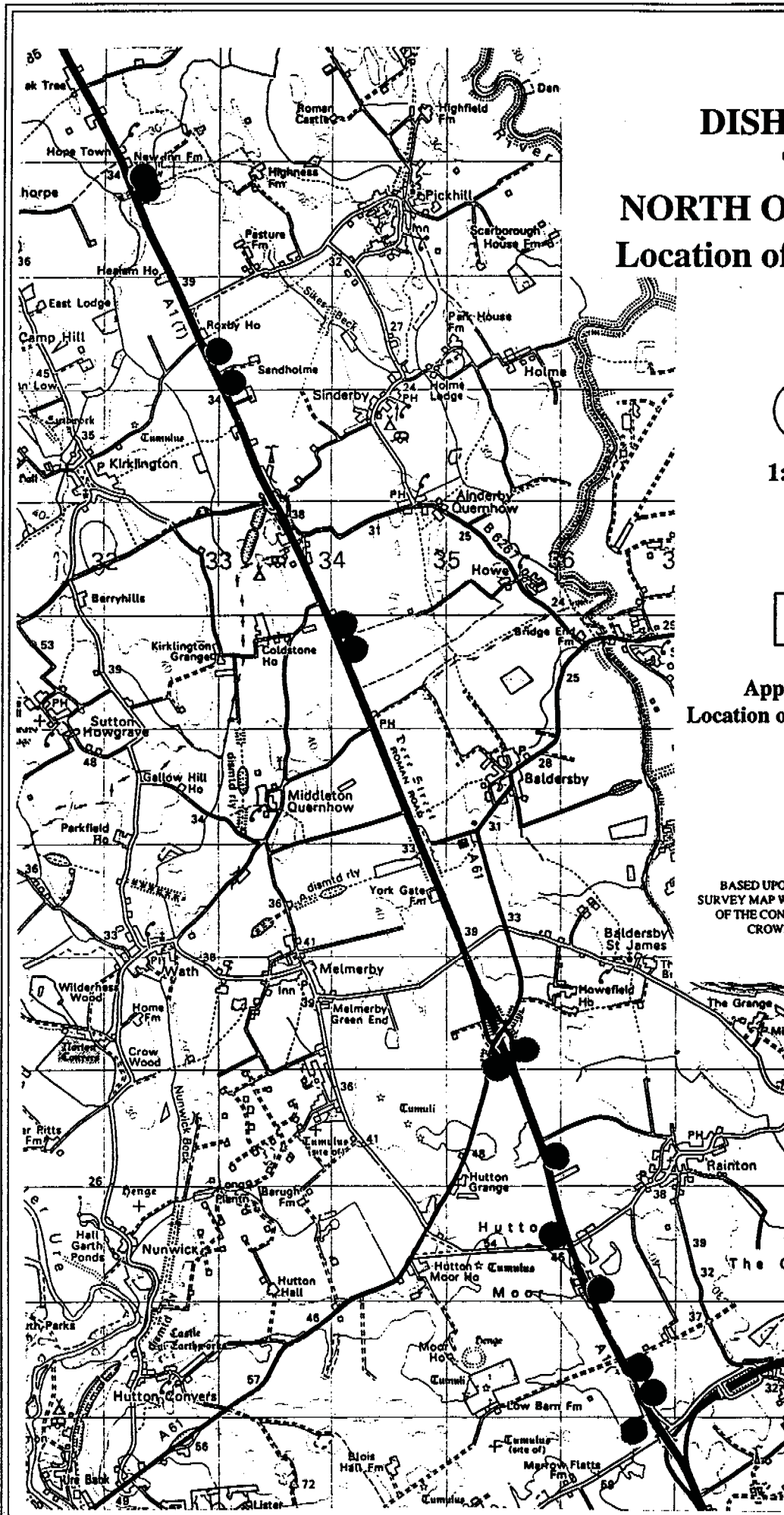


Figure 1

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LHEMING

TITLE: Interpretation of Area A1A

Based on a plan supplied by
Anthony Walker and Partners

ORIGINAL AT A3

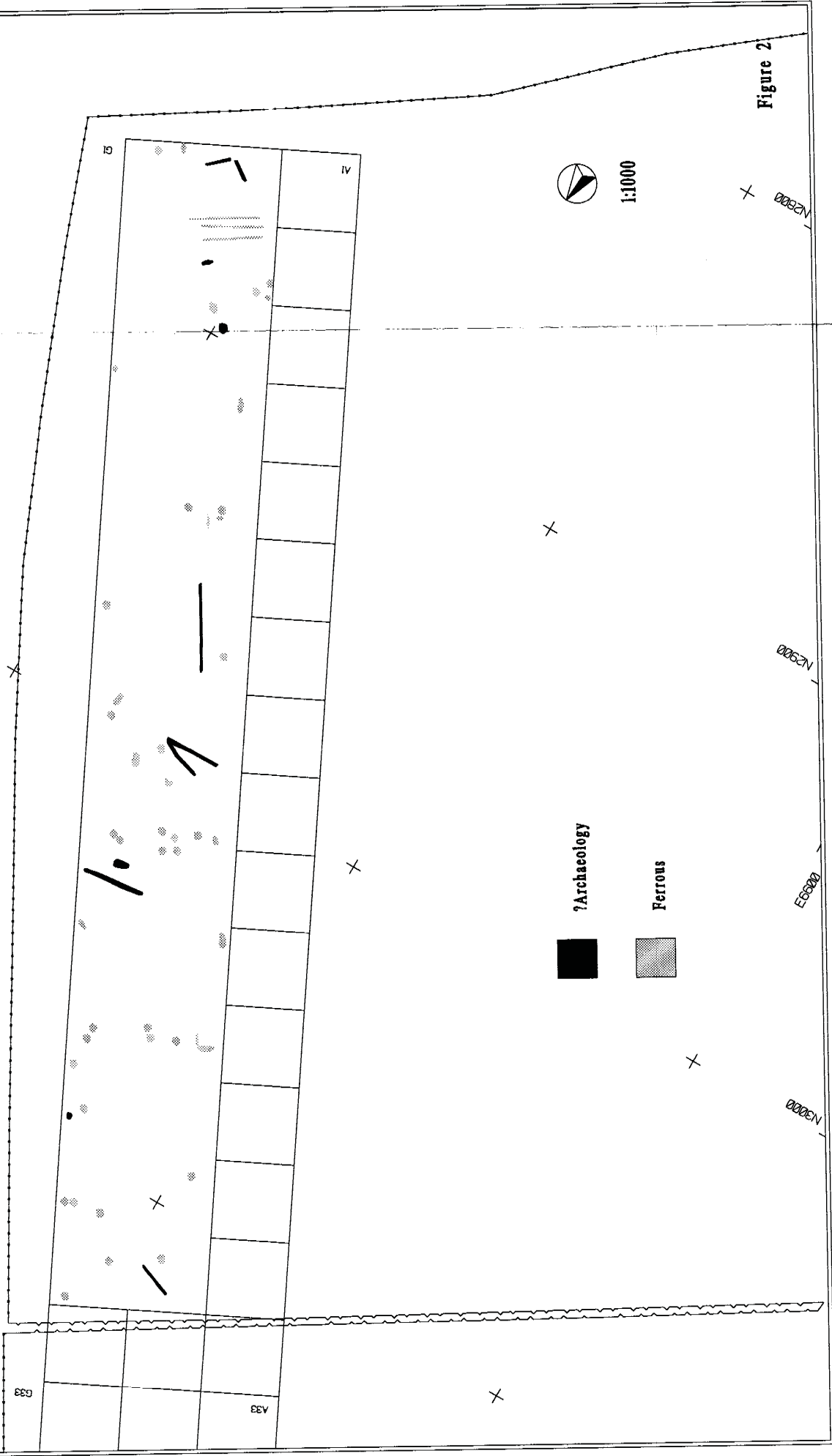


Figure 2

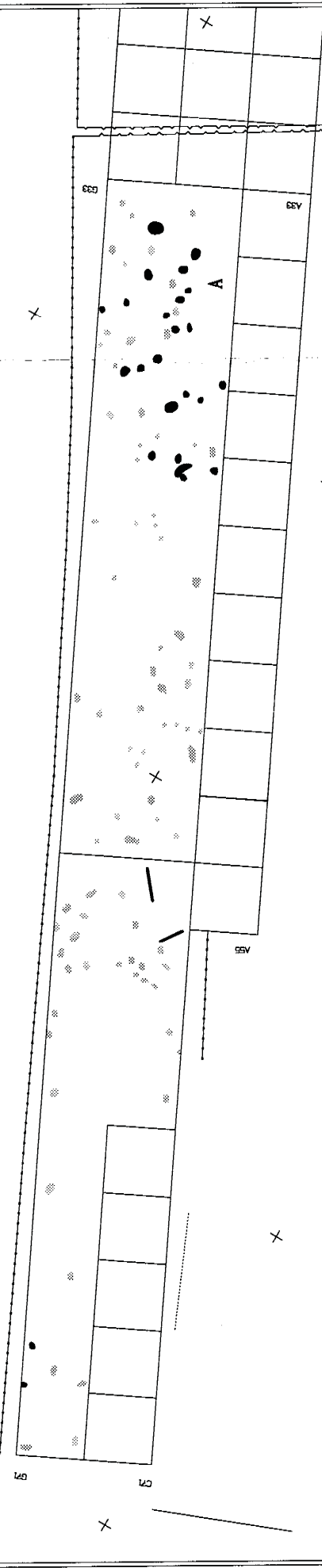
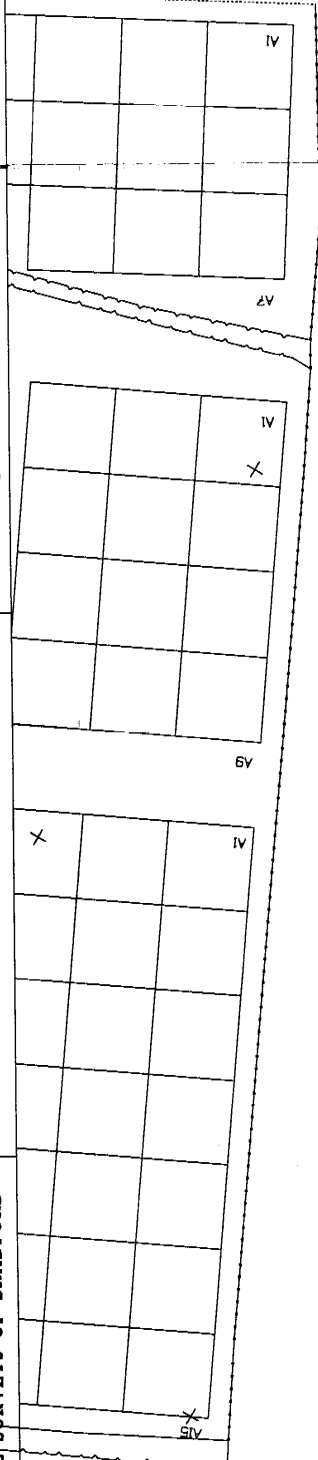
GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEEMING

TITLE: Interpretation of Areas A1B & A1C

Based on a plan supplied by
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ORIGINAL AT A3



AREAS A1/2/3

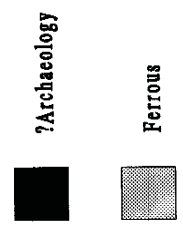


Figure 3

NS400
EB400
NS300
EB300
NS200
EB200
NS100
EB100

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEEMING

TITLE: Interpretation of Areas A5/12 & A4

Based on a plan supplied by
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1:1000

ORIGINAL AT A3



?Archaeology



Ferrous

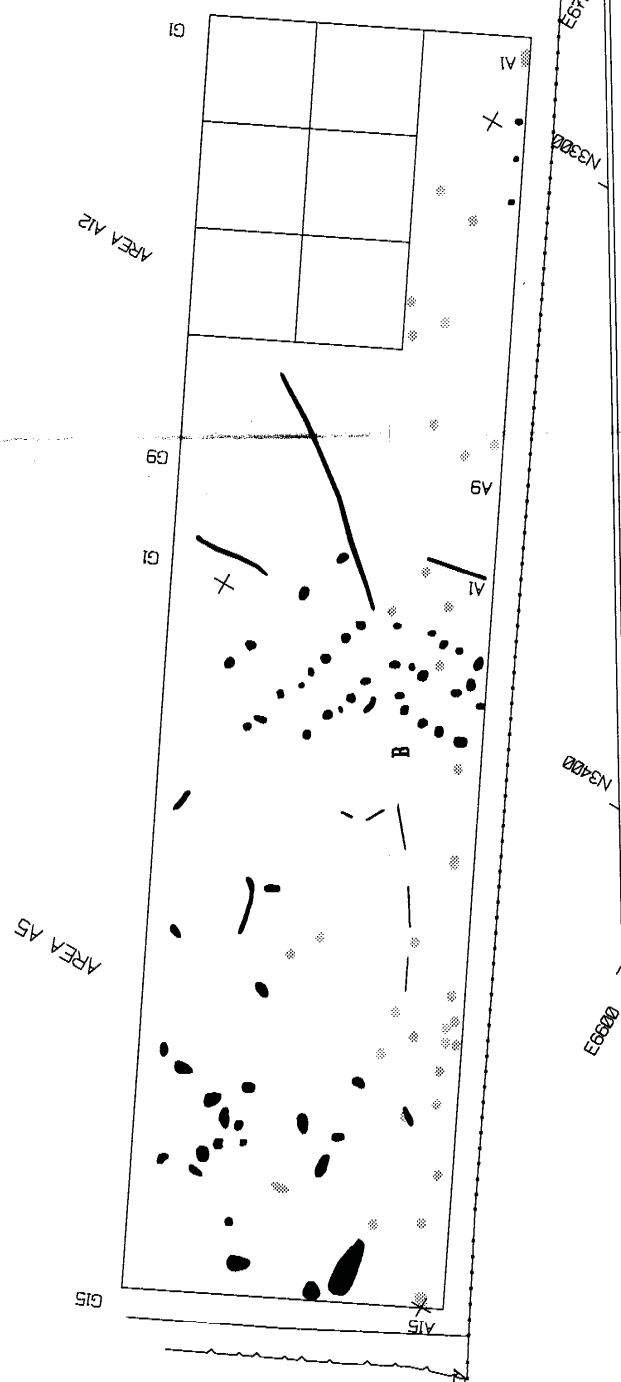
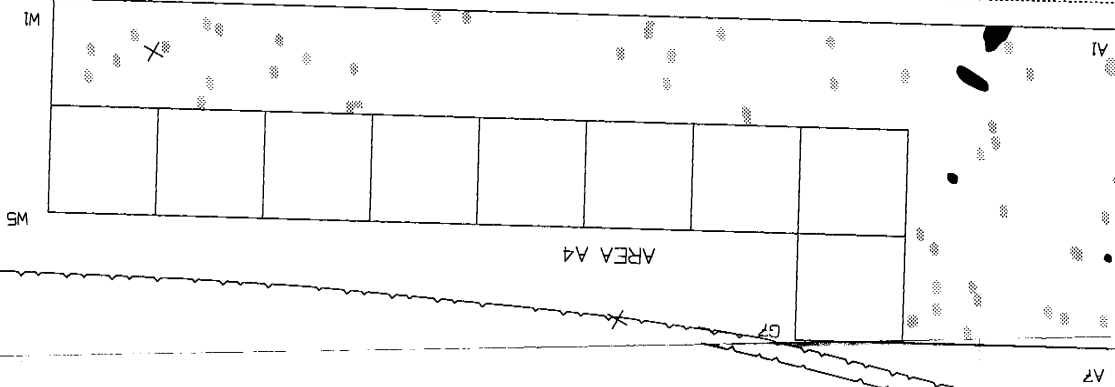


Figure 4

E6700
N3300
N3400
E6800

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEEMING

TITLE: Interpretation of Area A7

Based on a plan supplied by
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ORIGINAL AT A3

X



1:1000

X

X

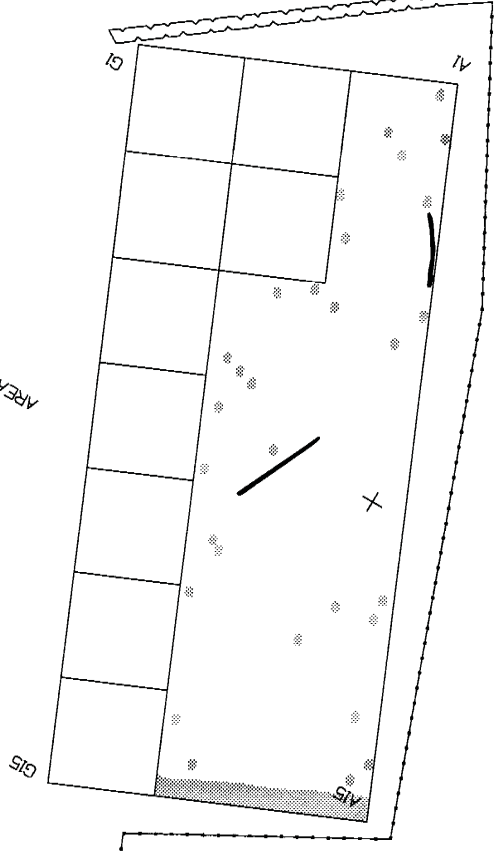
?Archaeology



Ferrous



AREA A7



X

X

X

X

X

E6200
N4100

N4100

E6300

N3900

Figure 5

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEEMING

TITLE: Interpretation of Area A8

Based on a plan supplied by
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ORIGINAL AT A3

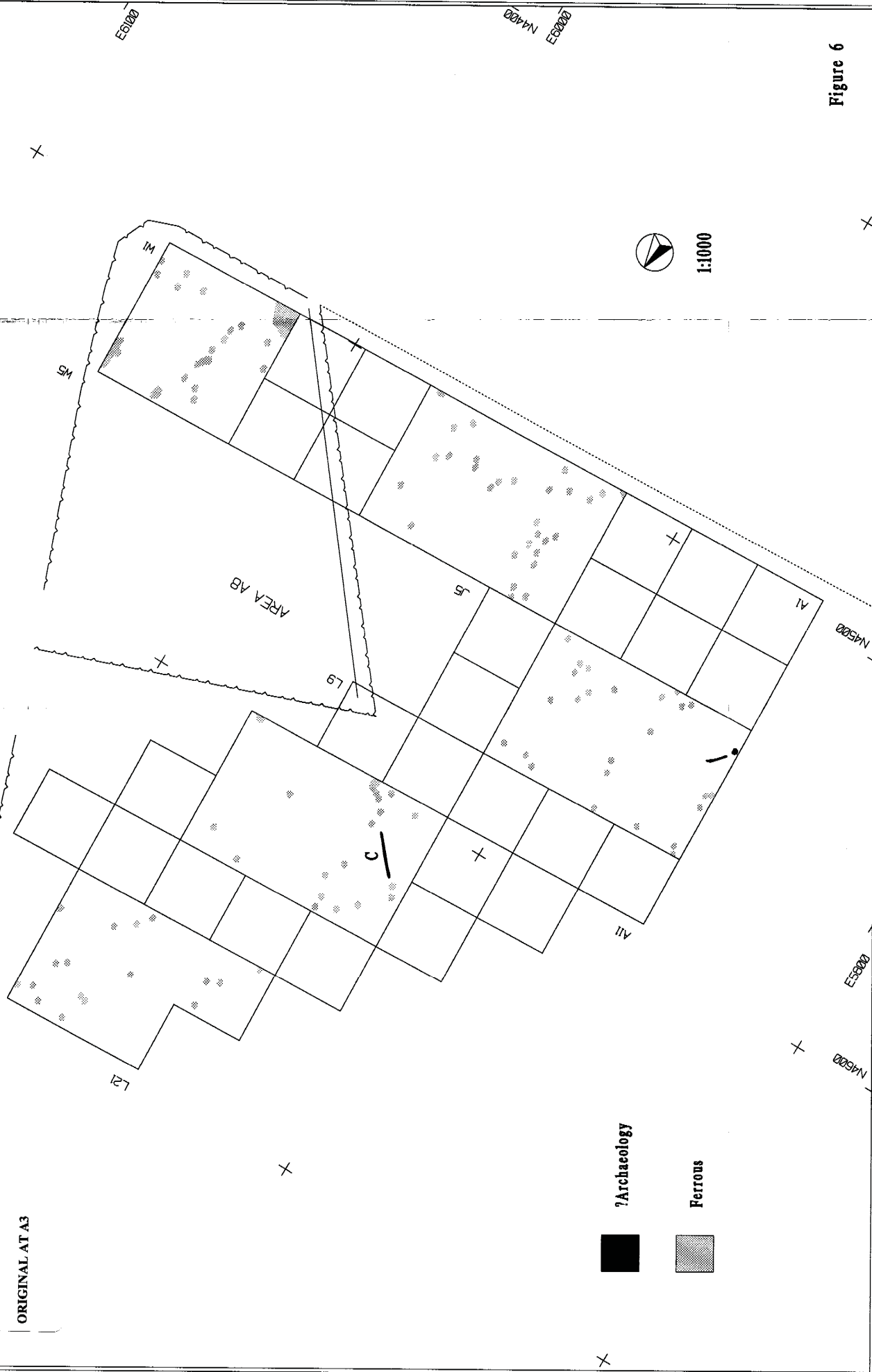


Figure 6

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEEMING

TITLE: Interpretation of Areas A5/12 & A4

Based on a plan supplied by
Anthony Walker and Partners



1:1000

ORIGINAL AT A3



?Archaeology



Ferrous



Figure 4

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEEMING

TITLE: Interpretation of Area A9

Based on a plan supplied by
Anthony Walker and Partners

ORIGINAL AT A3



1:1000

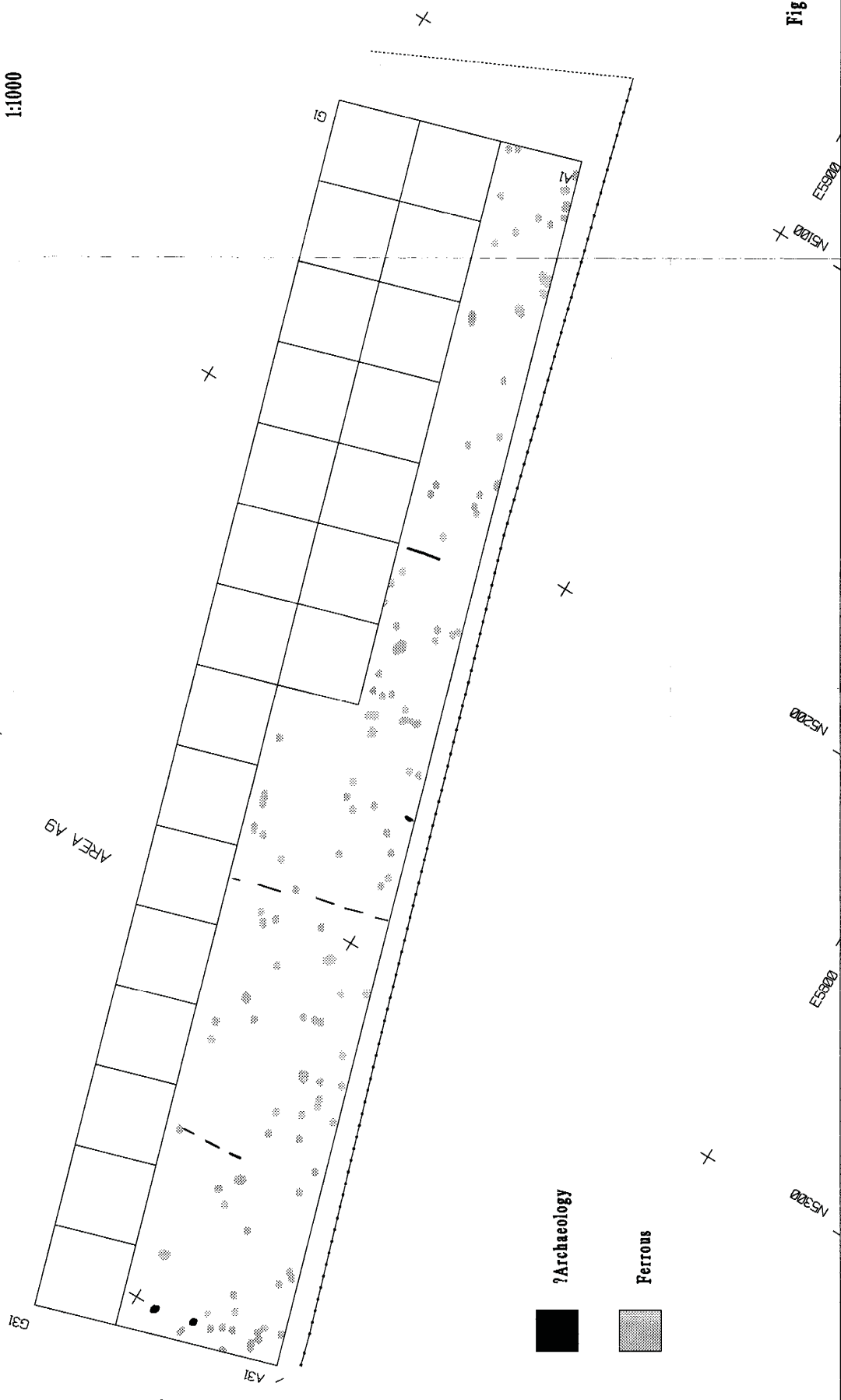


Figure 7

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEBMING

TITLE: Interpretation of Area A10

Based on a plan supplied by
Anthony Walker and Partners

ORIGINAL AT A3

N6100

N6000

N5900



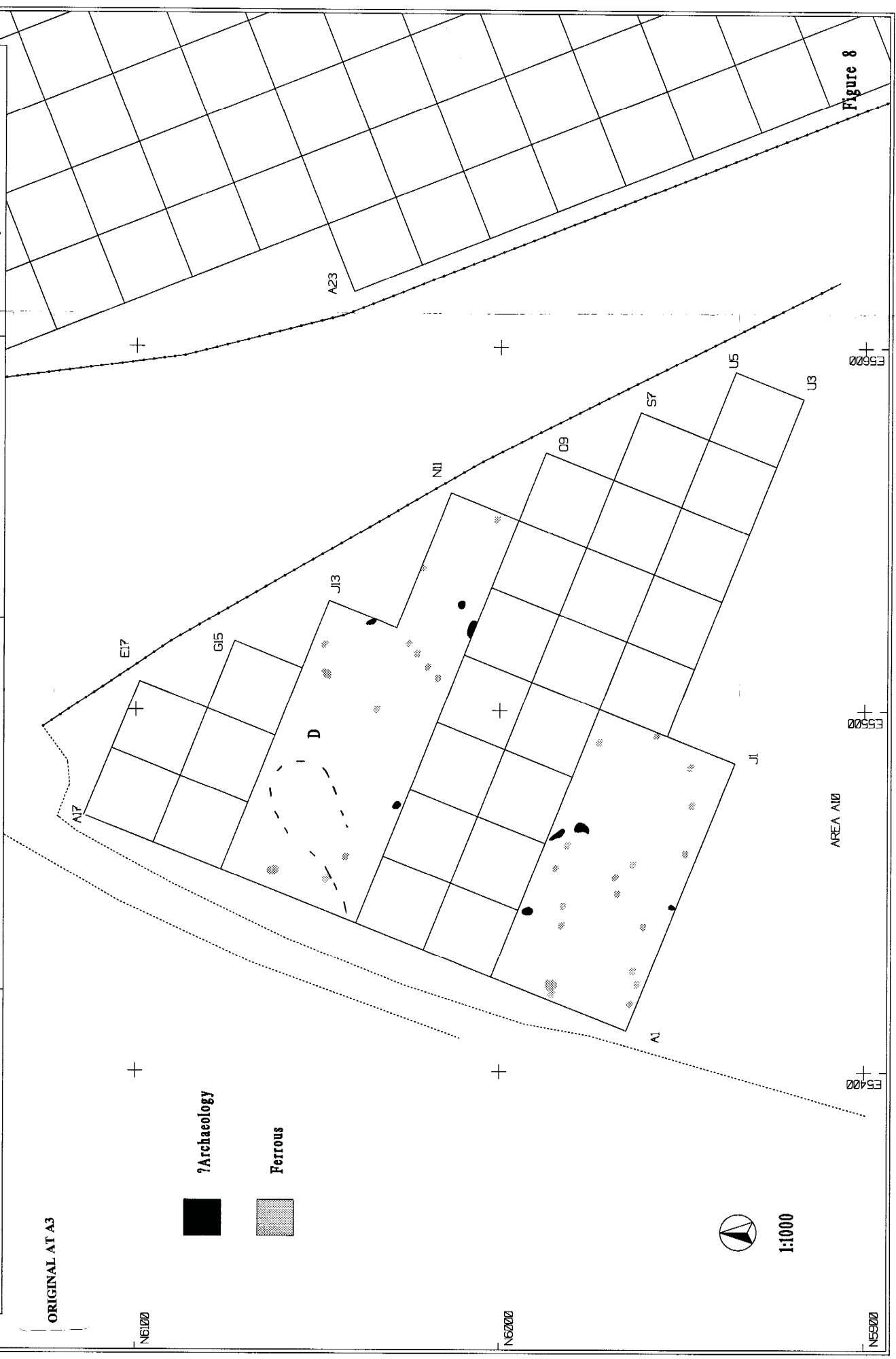
?Archaeology



Ferrous



1:1000






AREA A10

Figure 8

GEOPHYSICAL SURVEYS OF BRADFORD
PROJECT: A1 DISHFORTH TO NORTH OF LEBMING
TITLE: Interpretation of Area A11
 Based on a plan supplied by
 Anthony Walker and Partners

Figure 9
ORIGINAL AT A3

Archaeology 
Ploughing 
Ferrous 



1:1500

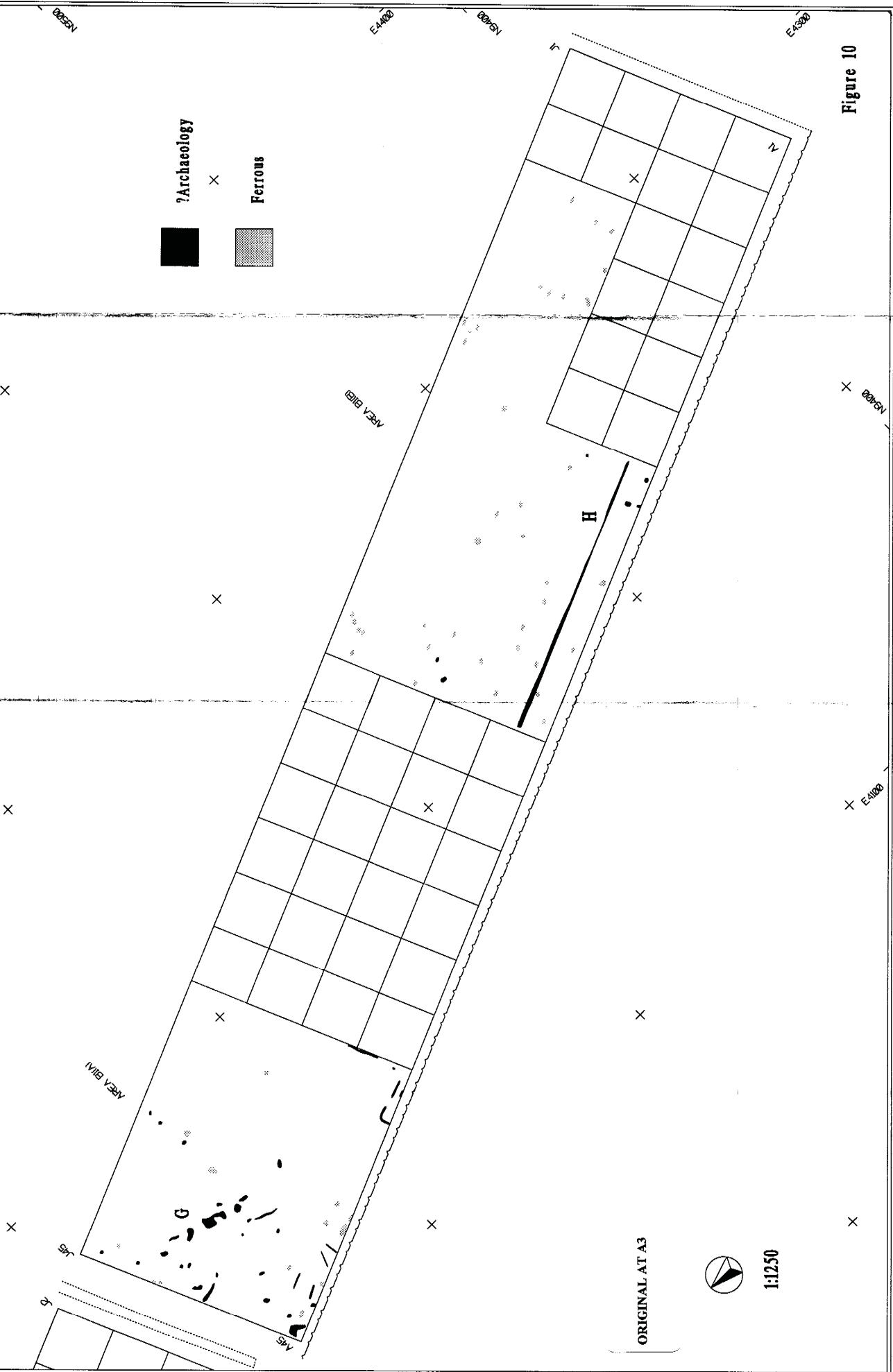


GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEBMING

TITLE: Interpretation of Areas B1A & B1B

Based on a plan supplied by
Anthony Walker and Partners



?Archaeology
X
Ferrons

Figure 10

ORIGINAL AT A3



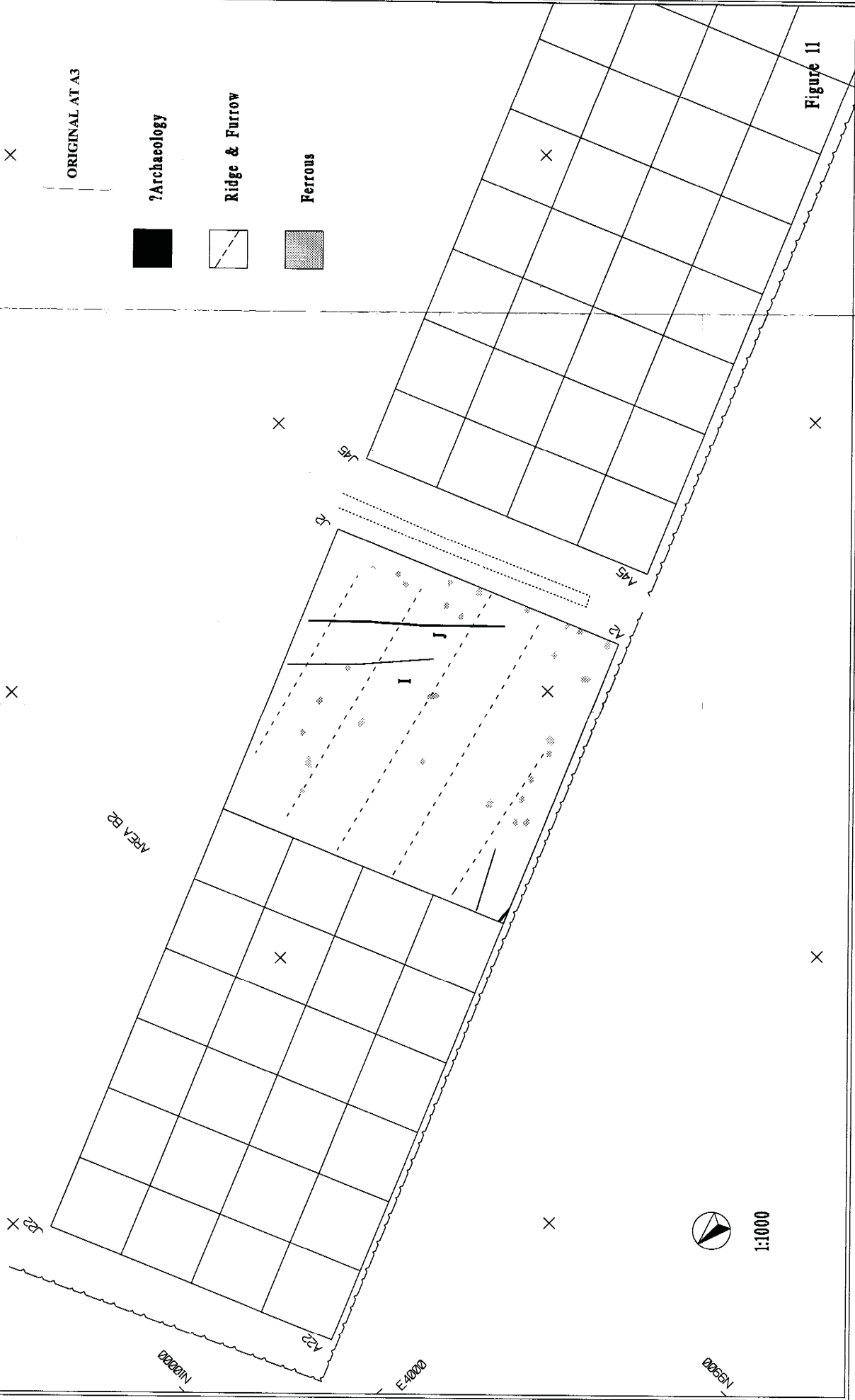
1:1250

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEEMING

TITLE: Interpretation of Area B2

Based on a plan supplied by
Anthony Walker and Partners



ORIGINAL AT A3

Archaeology

Ridge & Furrow

Ferrous

Figure 11

1:1000



GEOPHYSICAL SURVEYS OF BRADFORD
 PROJECT: A1 DISHFORTH TO NORTH OF LEEMING
 TITLE: Interpretation of Area C15
 Based on a plan supplied by
 Anthony Walker and Partners

Figure 12



1:1000



ORIGINAL AT A3

Archaeology



Ferrous



AREA C15A

AREA C15B

T

K

A31

J31

E3000

E2900

N2400

N2300

N2200

A17

A1

J1

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LEEMING

TITLE: Interpretation of Area C16

Based on a plan supplied by
Anthony Walker and Partners

ORIGINAL AT A3

?Archaeology

Disturbed

Ferrous



1:1000

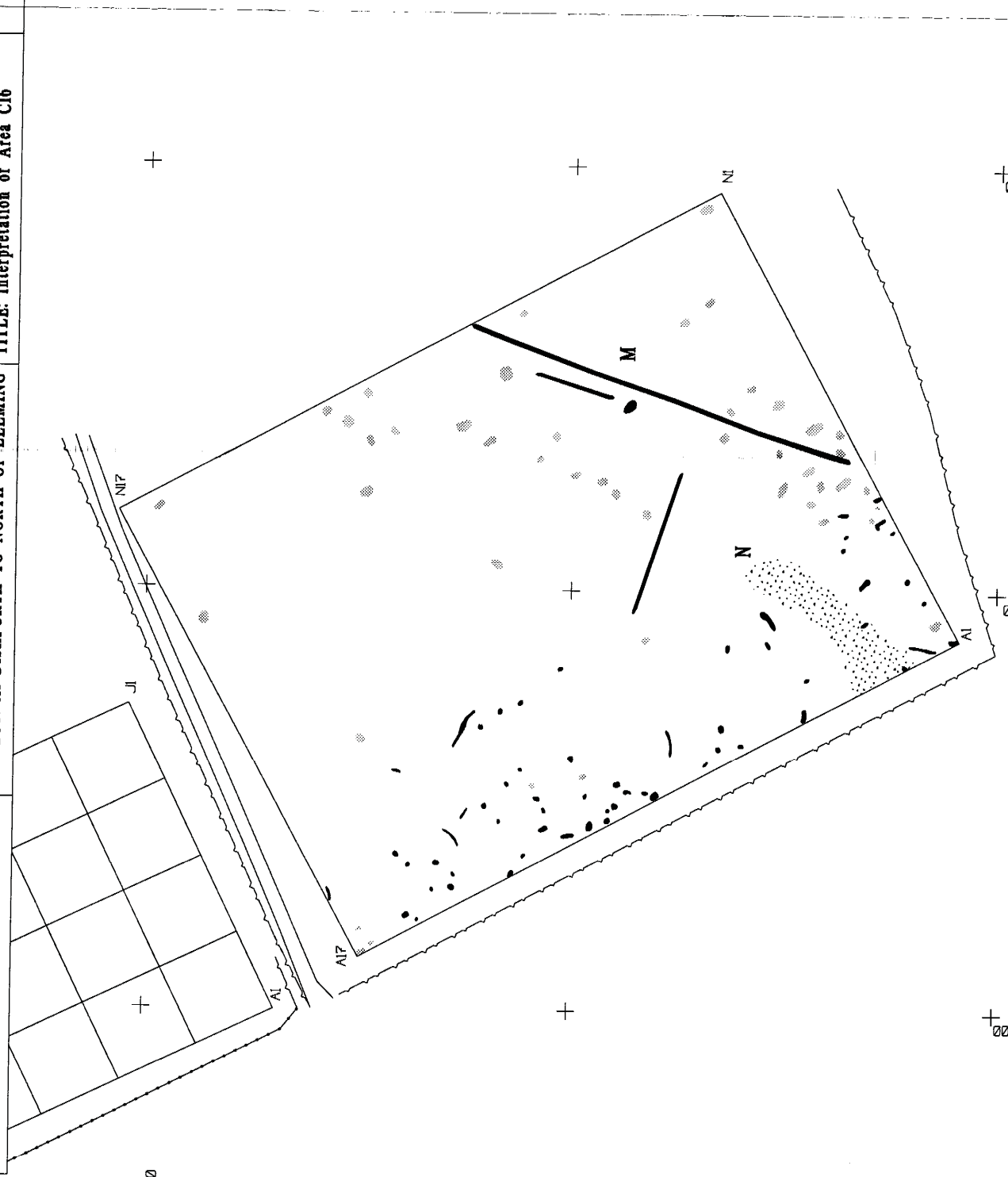


Figure 13

E3300

E3200

E3100

E3000

N2200

N2100

N2000

GEOPHYSICAL SURVEYS OF BRADFORD

PROJECT: A1 DISHFORTH TO NORTH OF LBEEMING

TITLE: Interpretation of Areas C17 & C18

Based on a plan supplied by
Anthony Walker and Partners

ORIGINAL AT A3



E2200

E2300

E2400

E2500

Figure 14

**A1 DISHFORTH TO NORTH OF LEMING
Area A1 (A)**

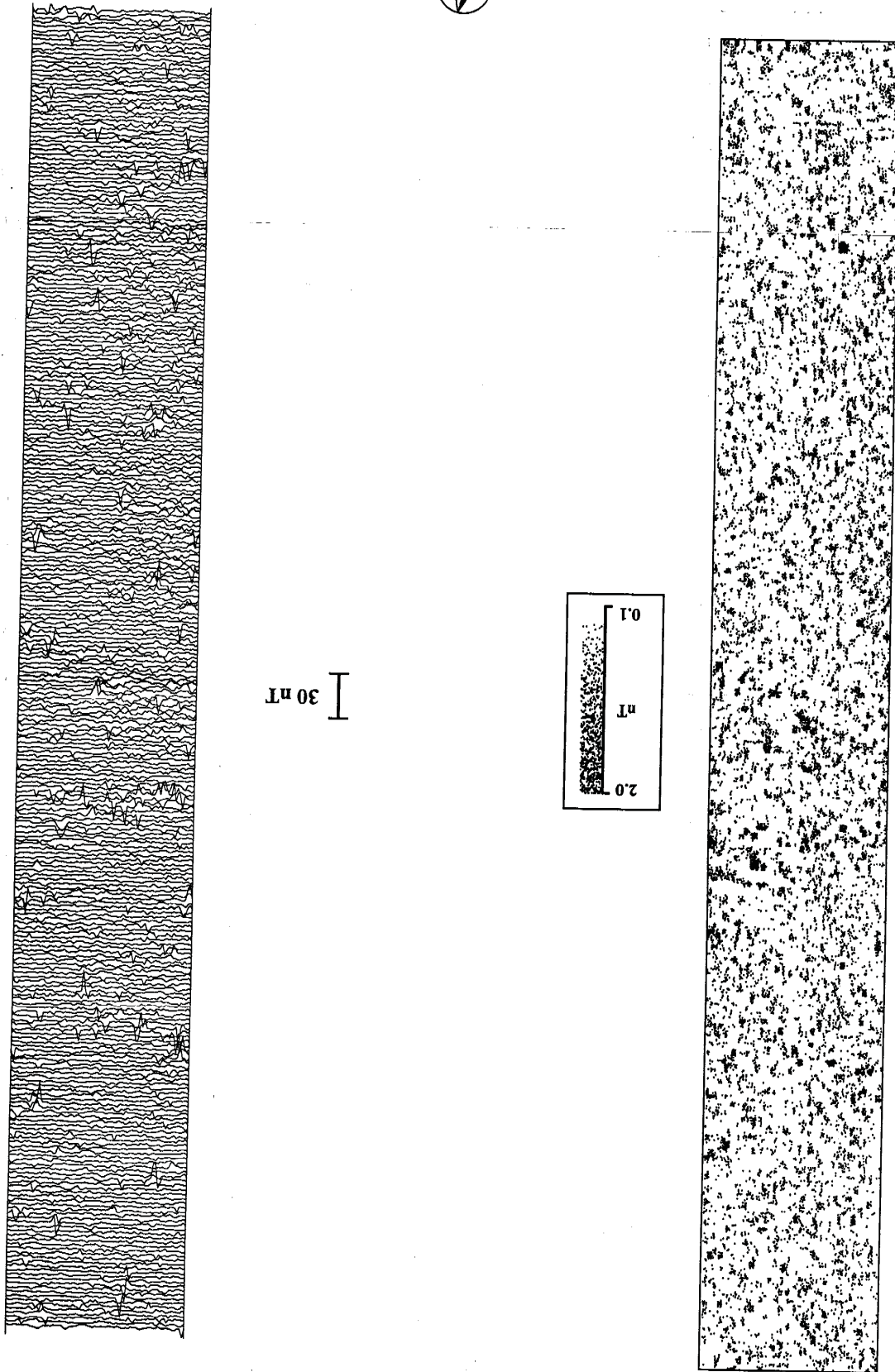


Figure A1.1

Area A1 (A)
A1 DISHFORTH TO NORTH OF LEMMING

ORIGINAL AT A3

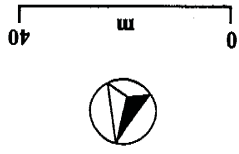
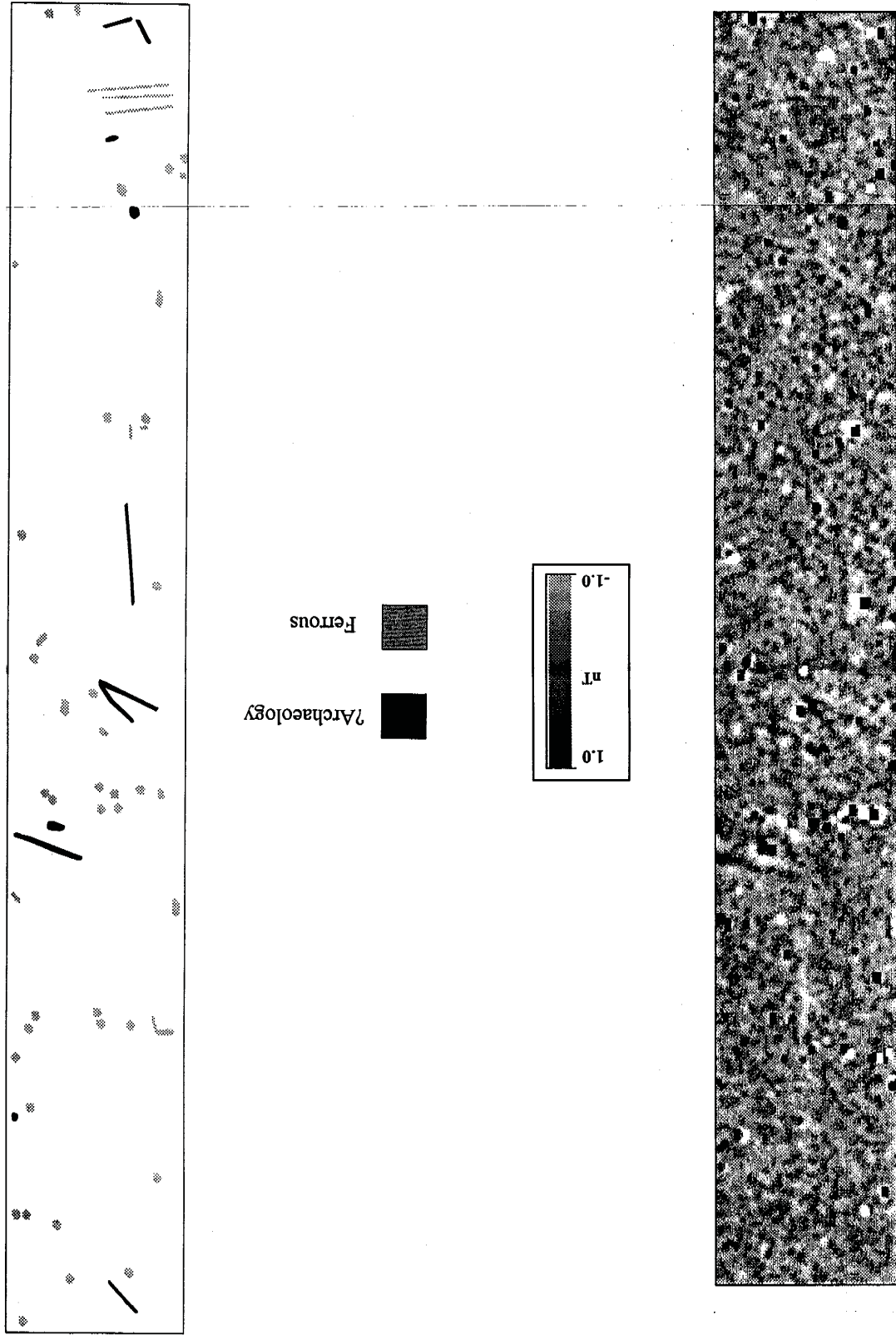


Figure A1.2

A1 DISHFORTH TO NORTH OF LEEMING

Area A1 (B)

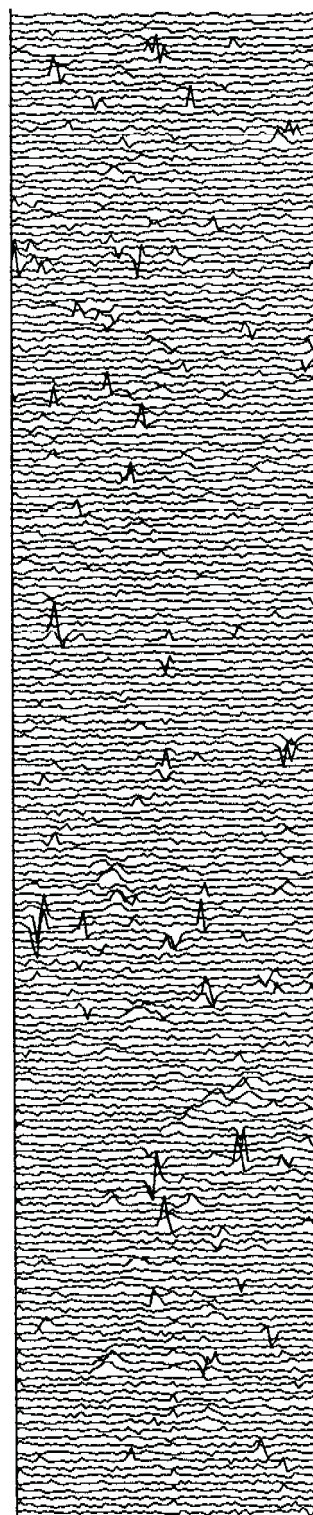
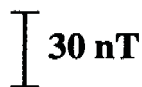
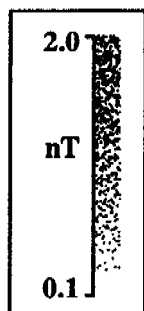
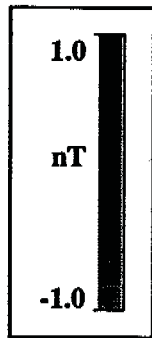
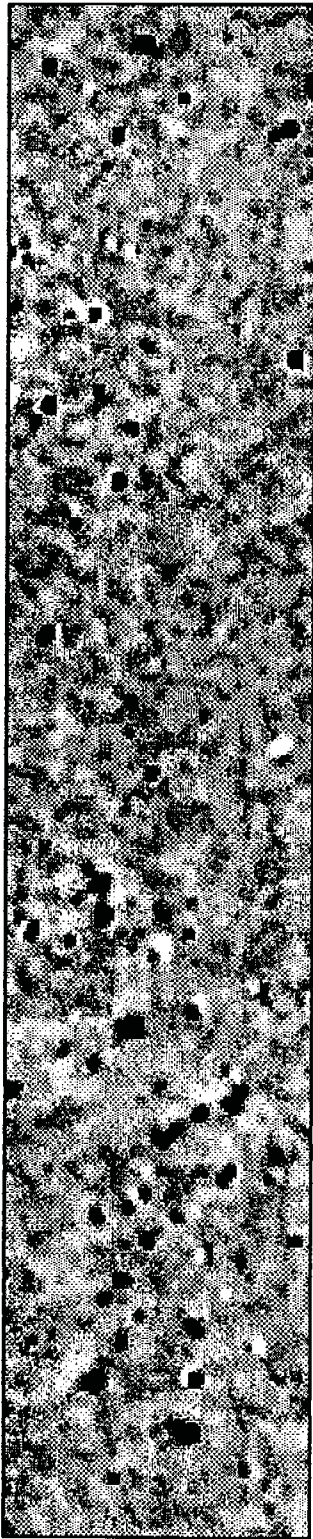


Figure A1.3

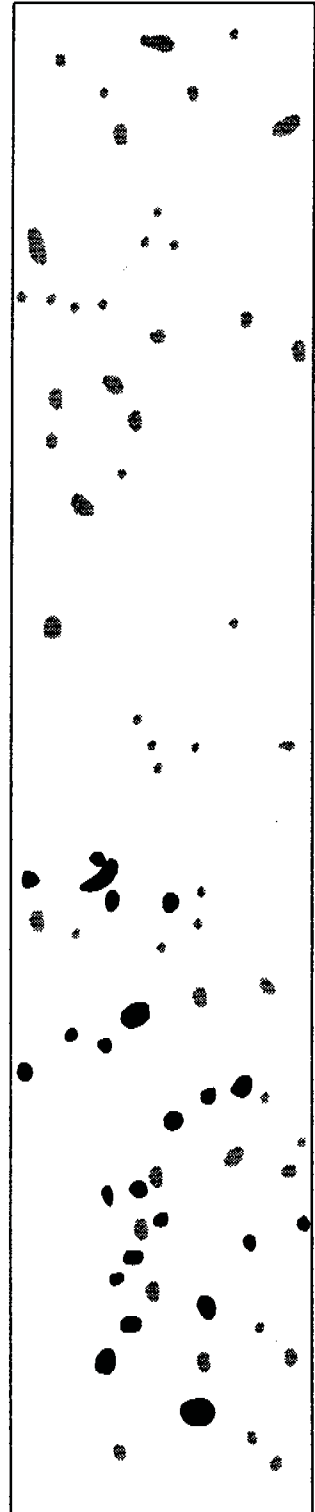
A1 DISHFORTH TO NORTH OF LEEMING

Area A1 (B)



 ?Archaeology

 Ferrous



0 40
 m

Figure A1.4

A1 DISHFORTH TO NORTH OF LEEMING

Area A1 (C)

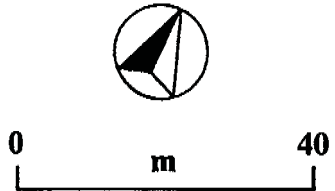
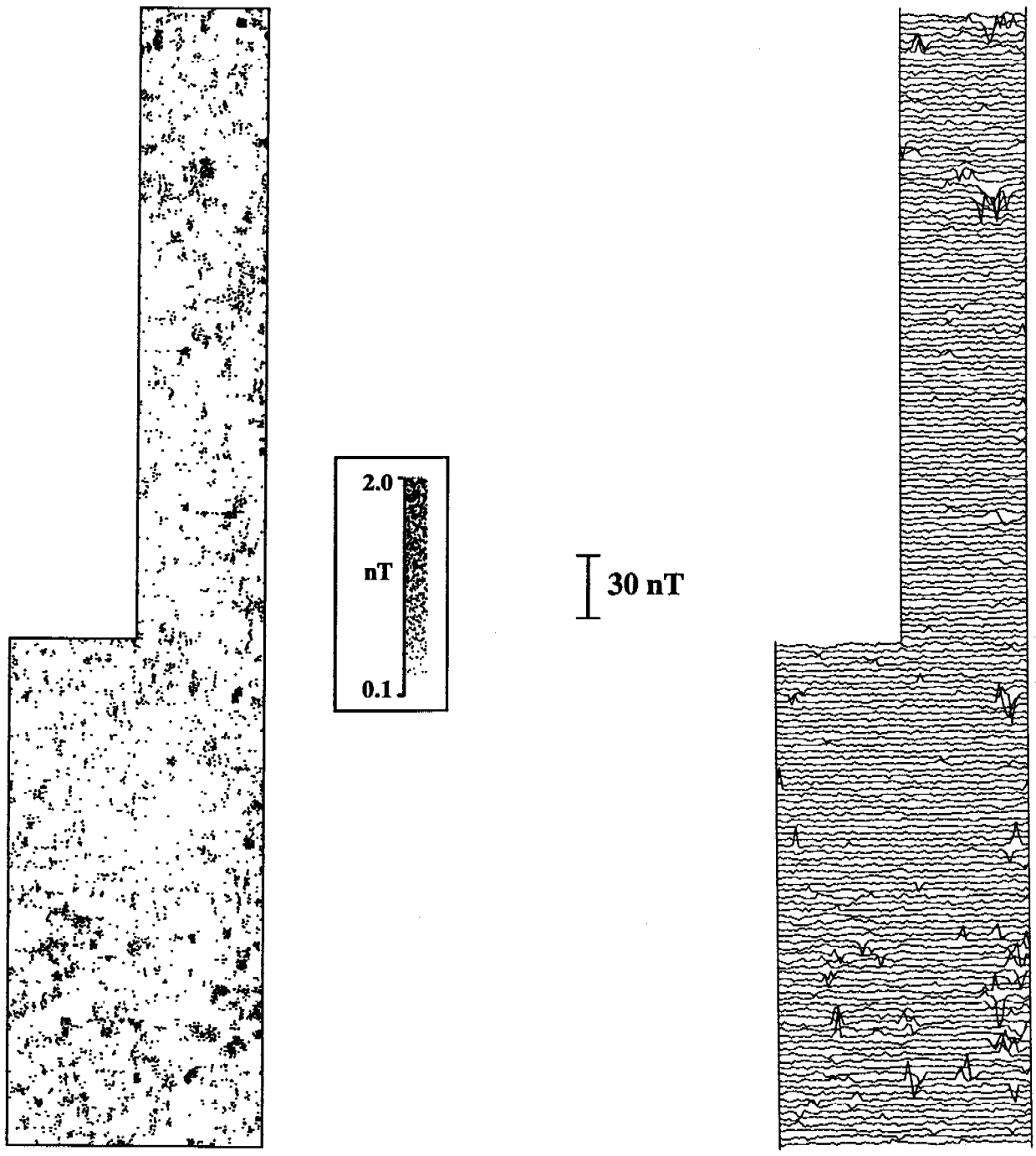
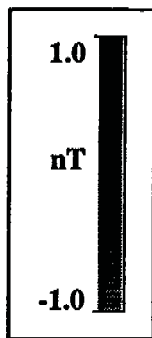
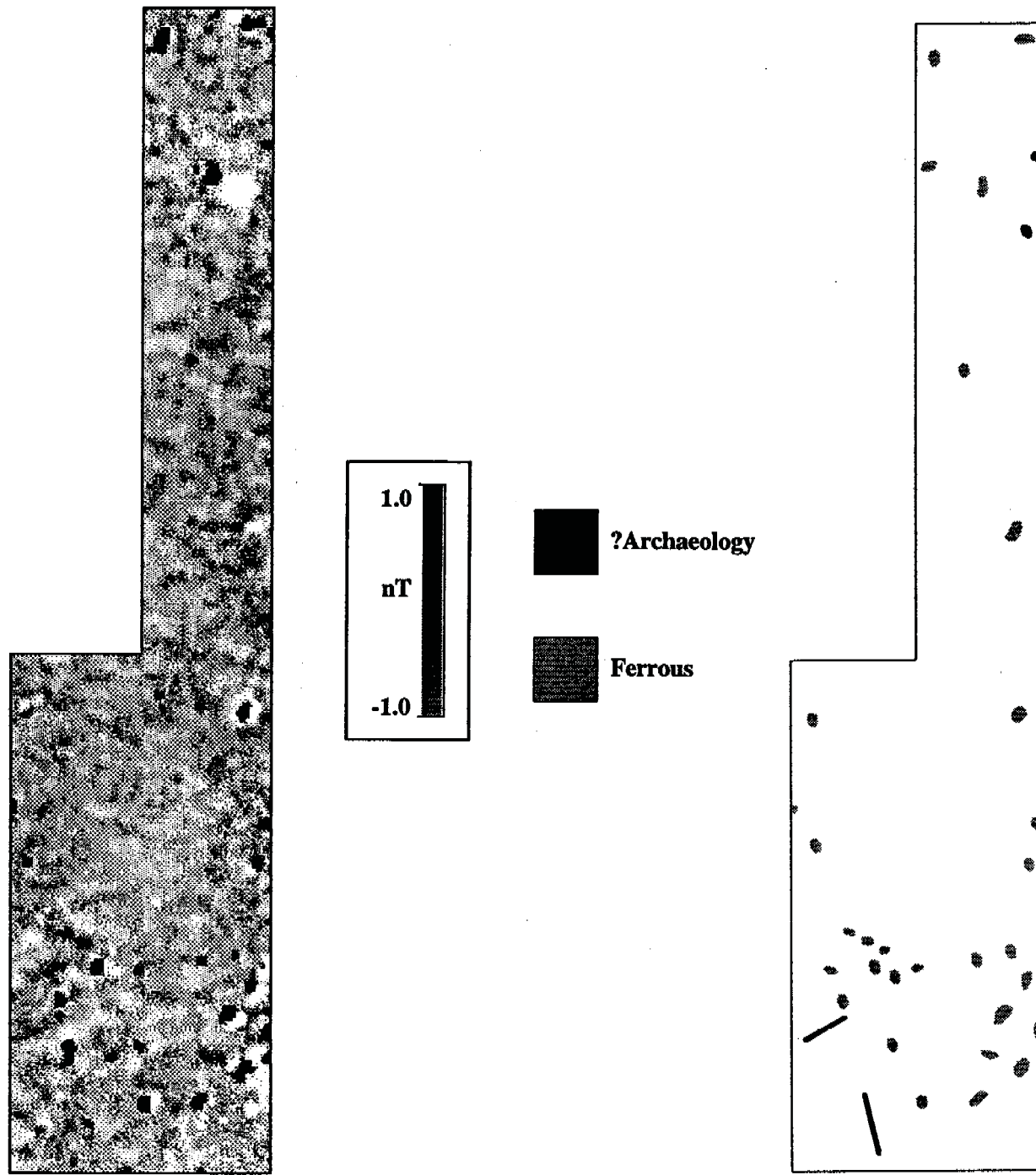




Figure A1.5

A1 DISHFORTH TO NORTH OF LEEMING

Area A1 (C)



-  ?Archaeology
-  Ferrous

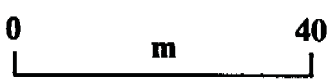
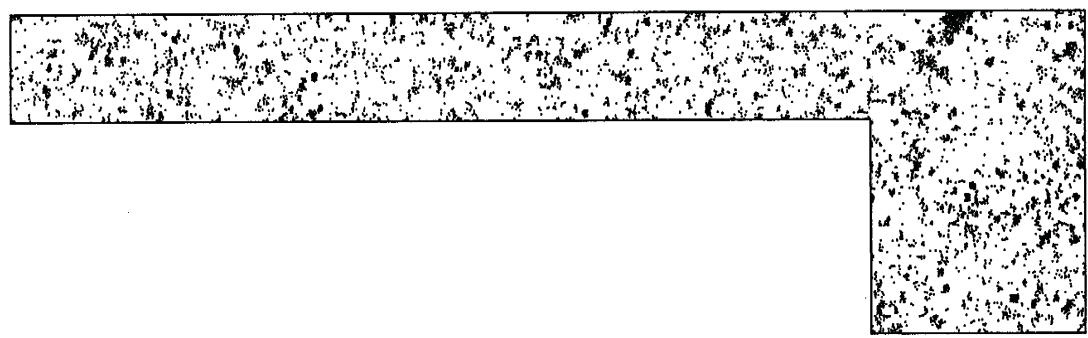
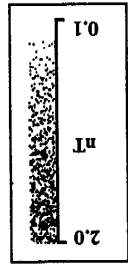
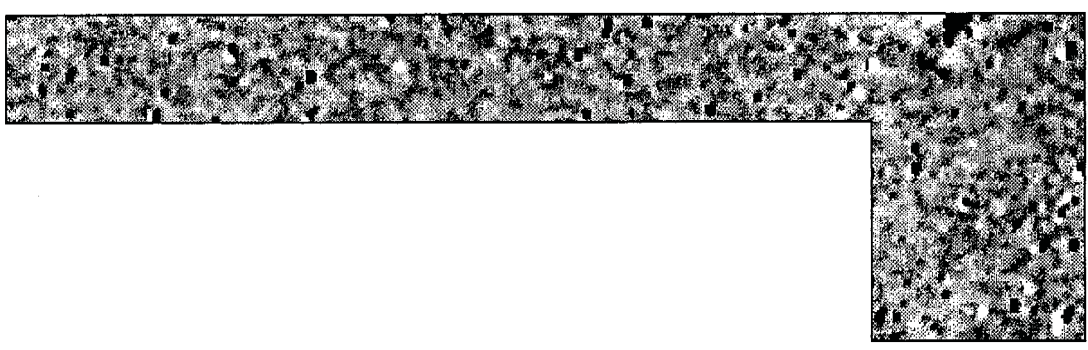
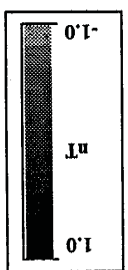
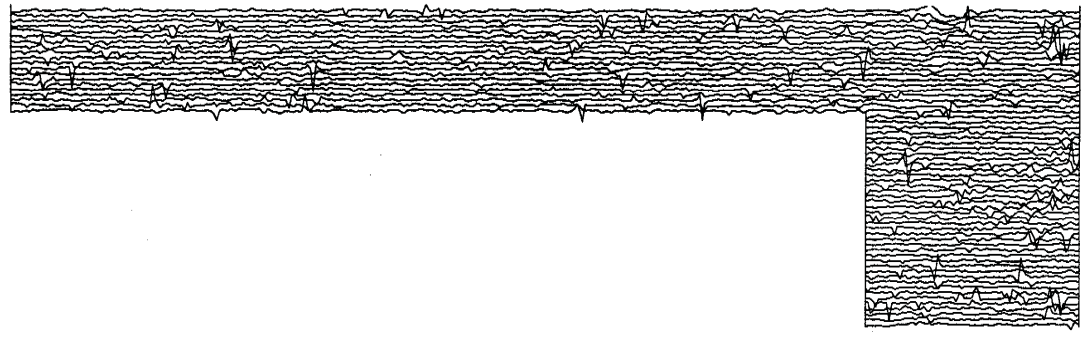


Figure A1.6

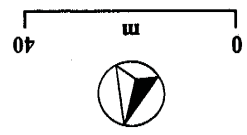
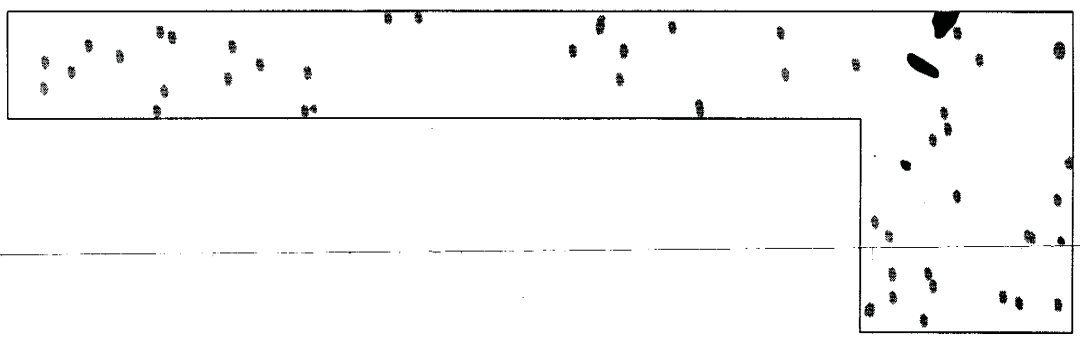
**A1 DISHFORTH TO NORTH OF LEMING
Area A4**



30 nT



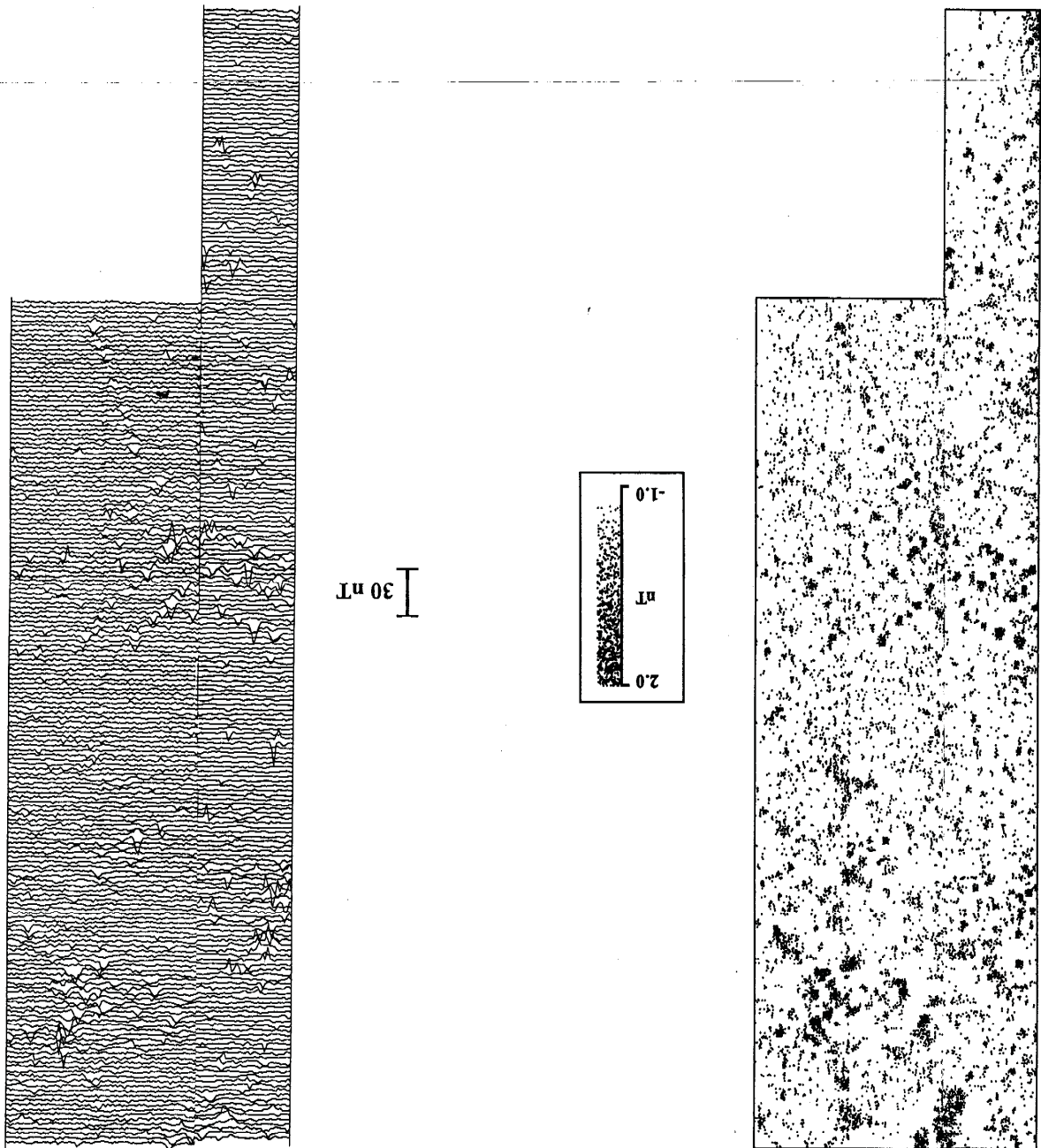
Archaeology
Ferrous



ORIGINAL AT A3

Figure A4.1

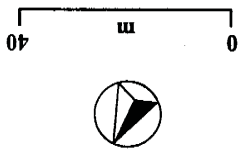
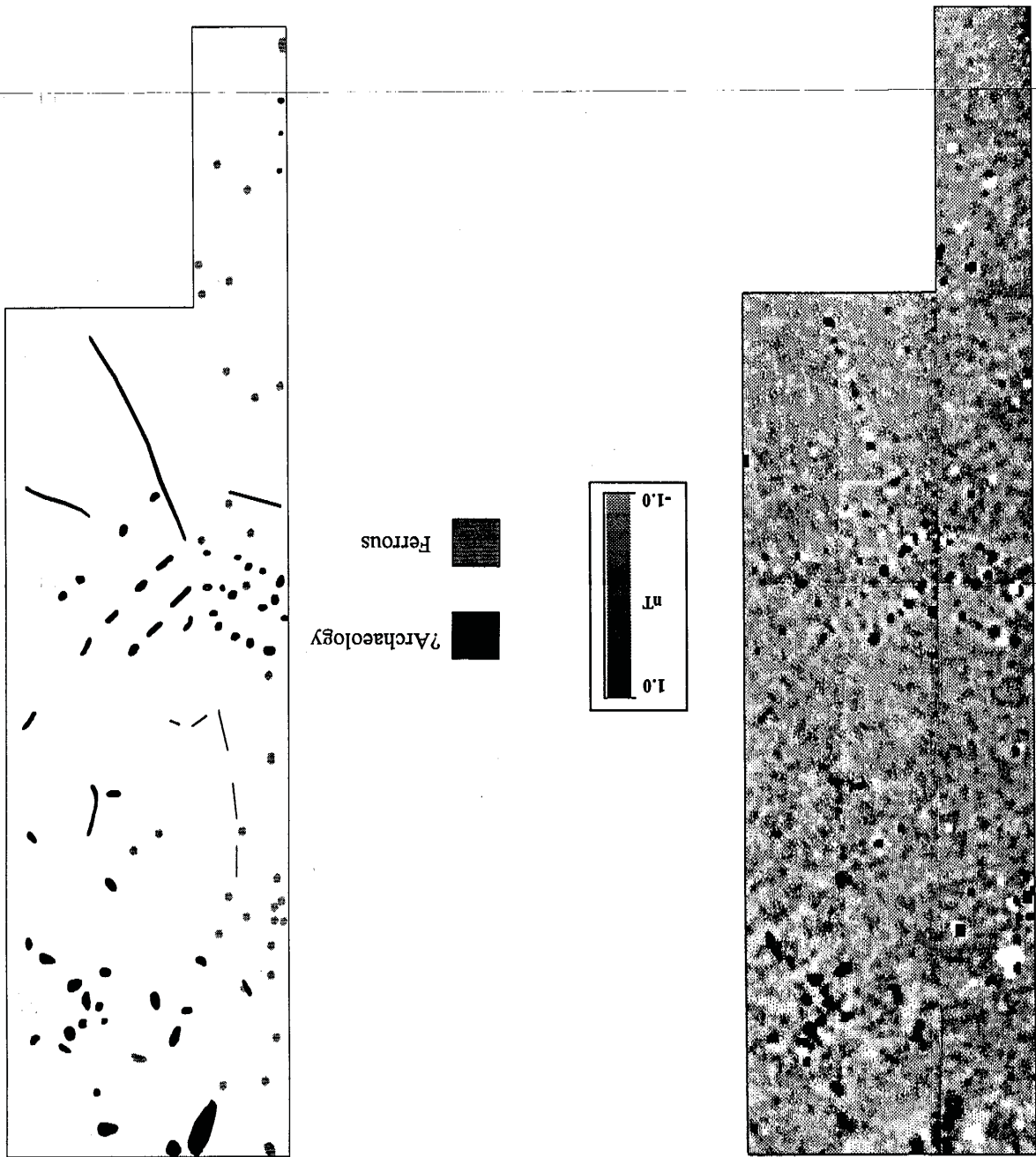
**AI DISHFORTH TO NORTH OF LEMING
Area A5 / 12**



ORIGINAL AT A3

Figure A5.1

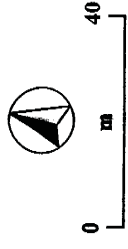
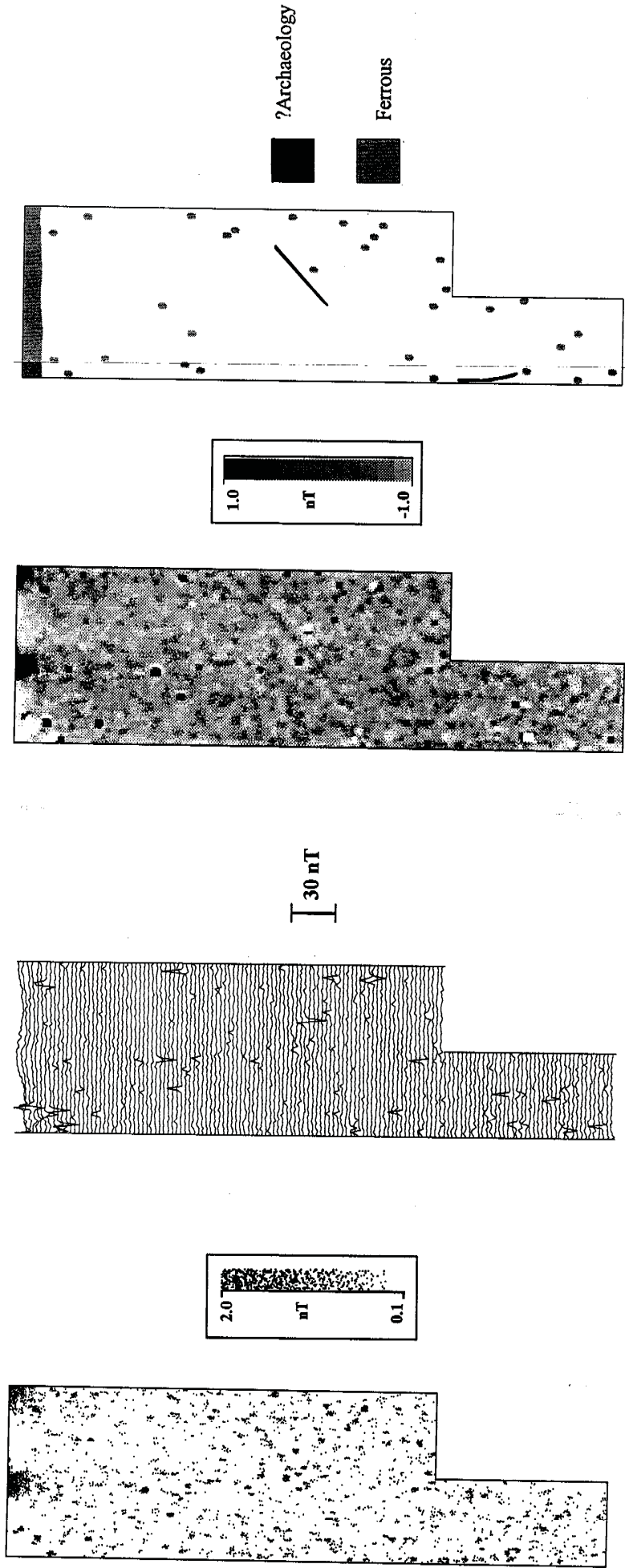
Area A5 / 12
A1 DISHFORTH TO NORTH OF LEMING



ORIGINAL AT A3

Figure A5.2

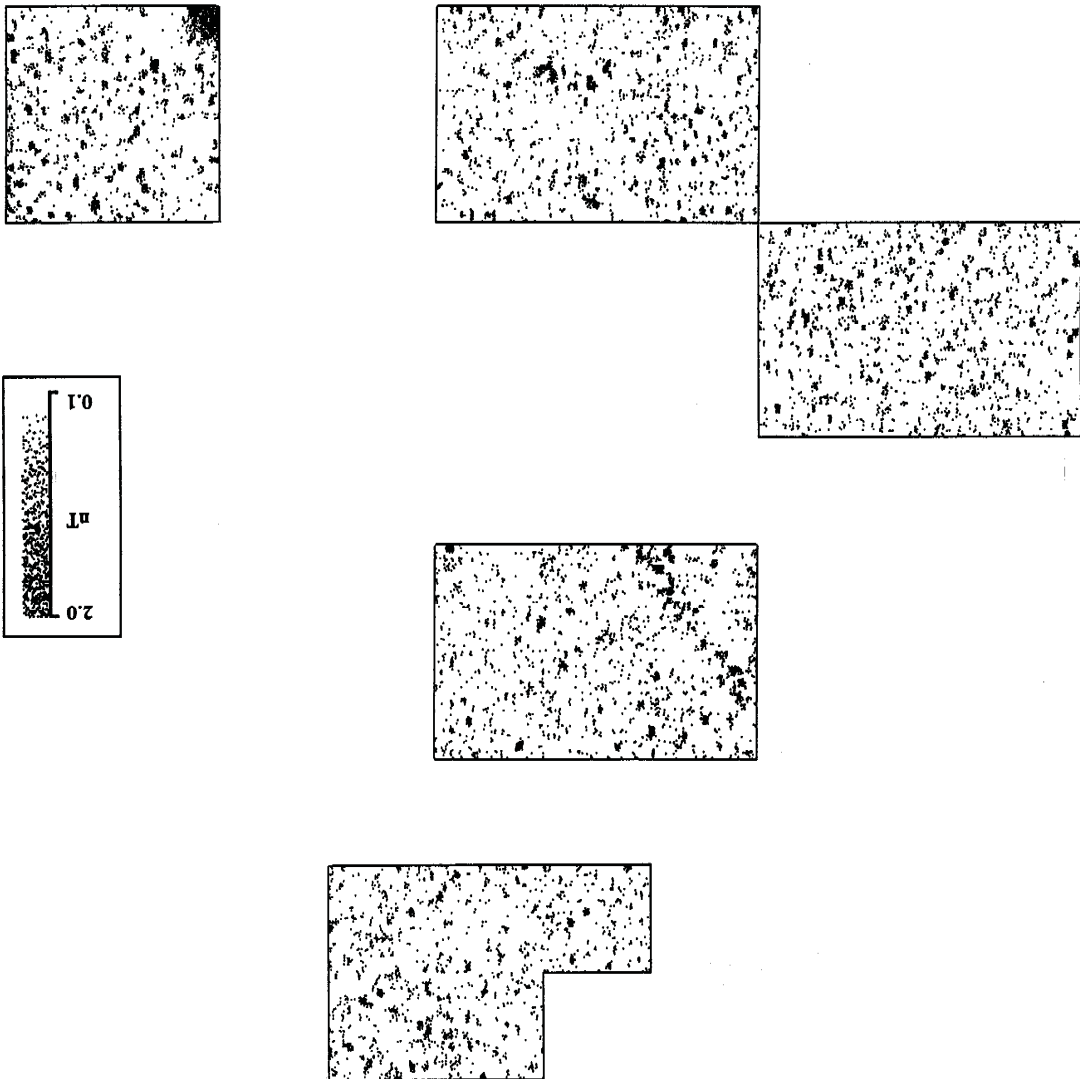
A1 DISHFORTH TO NORTH OF LEEMING Area A7



ORIGINAL AT A3

Figure A7.1

**A1 DISHFORTH TO NORTH OF LEMING
Area A8**

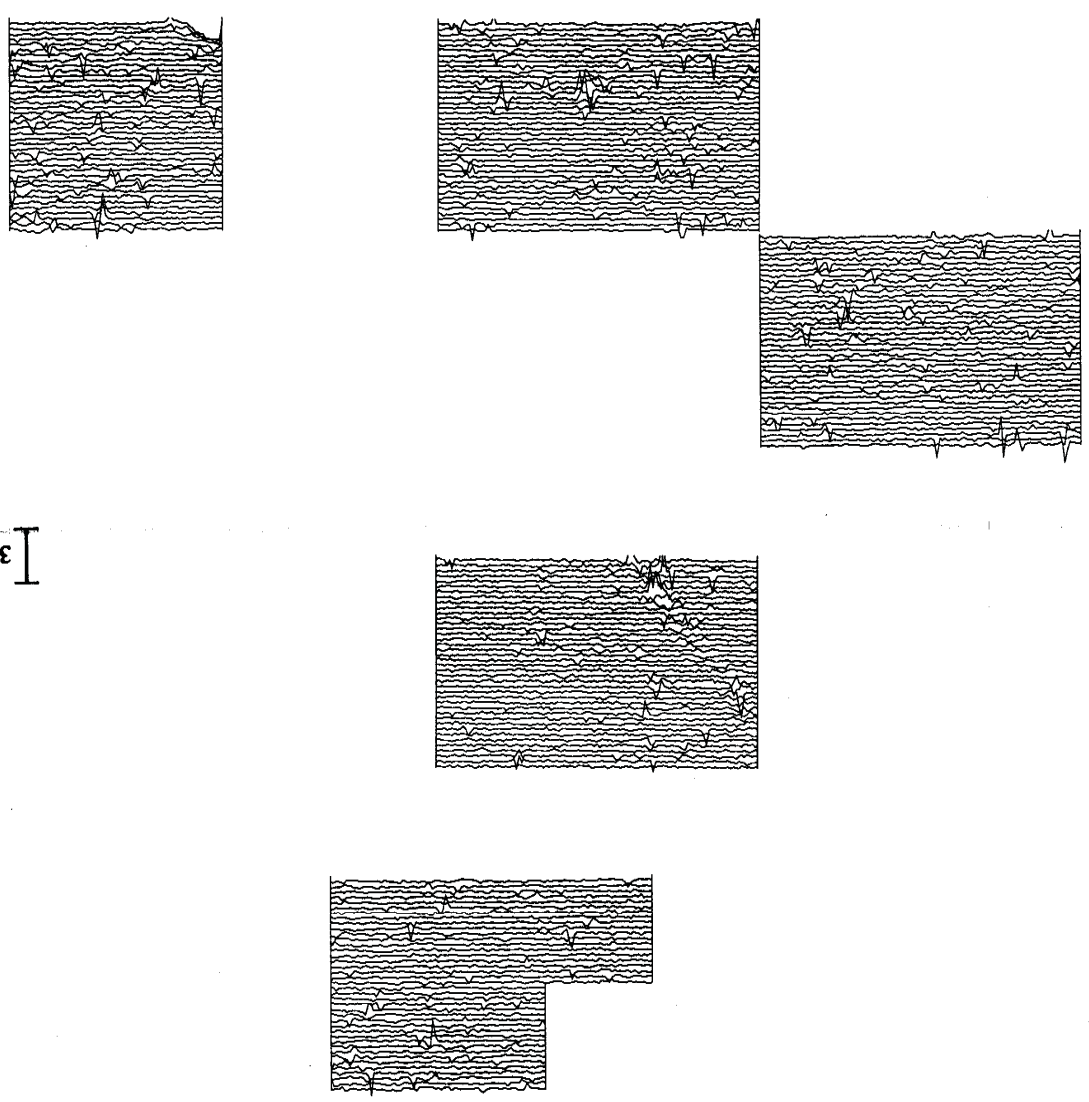
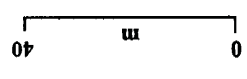


0 m 40

ORIGINAL AT A3

Figure A8.1

ORIGINAL AT A3

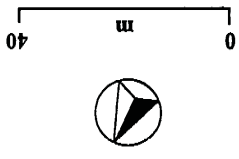
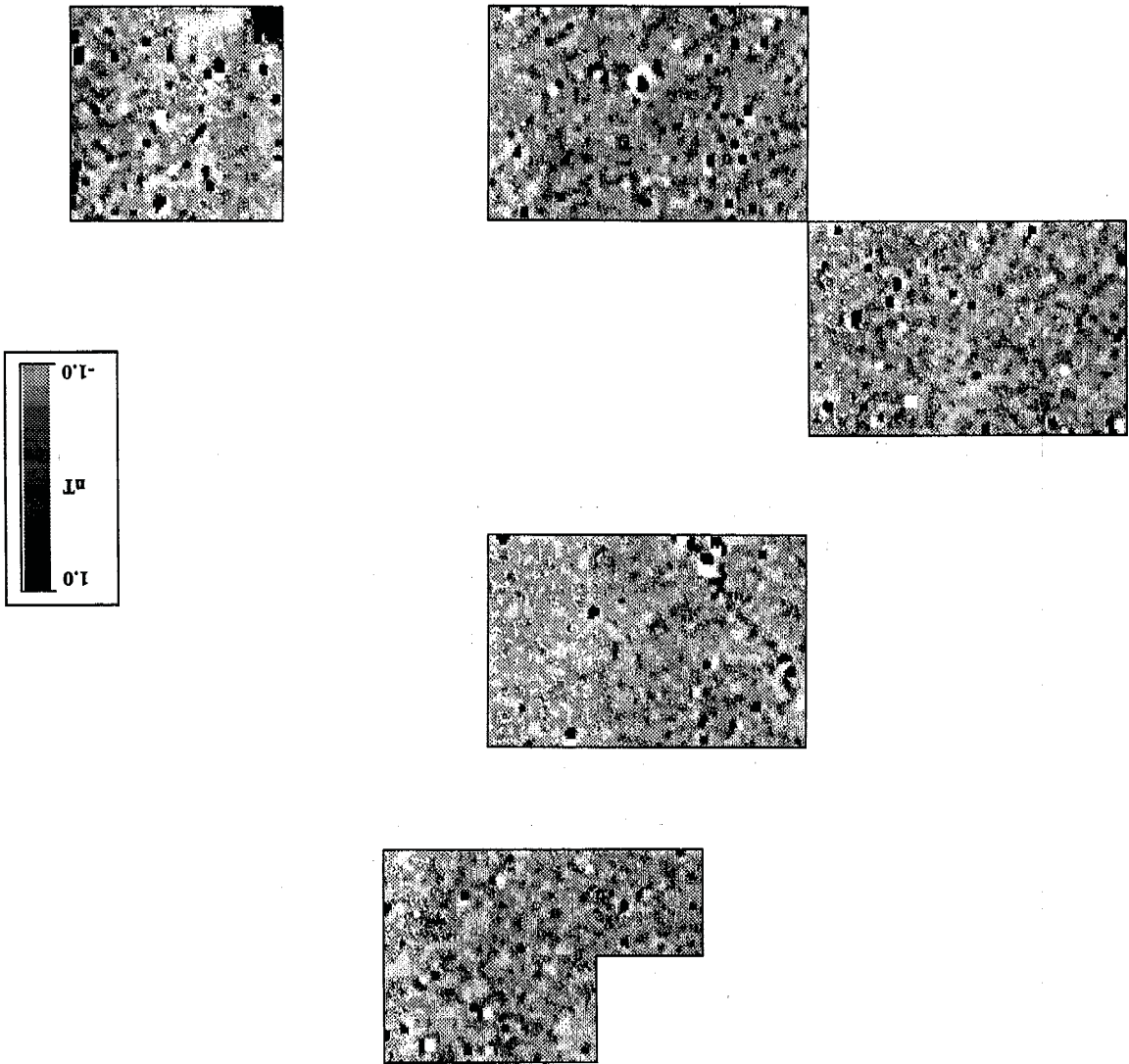


30 NT

**A1 DISHFORTH TO NORTH OF LEMING
Area A8**

Figure A8.2

**A1 DISHFORTH TO NORTH OF LEMING
Area A8**



ORIGINAL AT A3

Figure A8.3

A1 DISHFORTH TO NORTH OF LEMING Area A8

Archaeology
Fertous

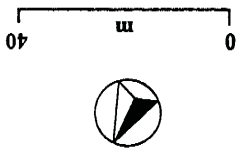
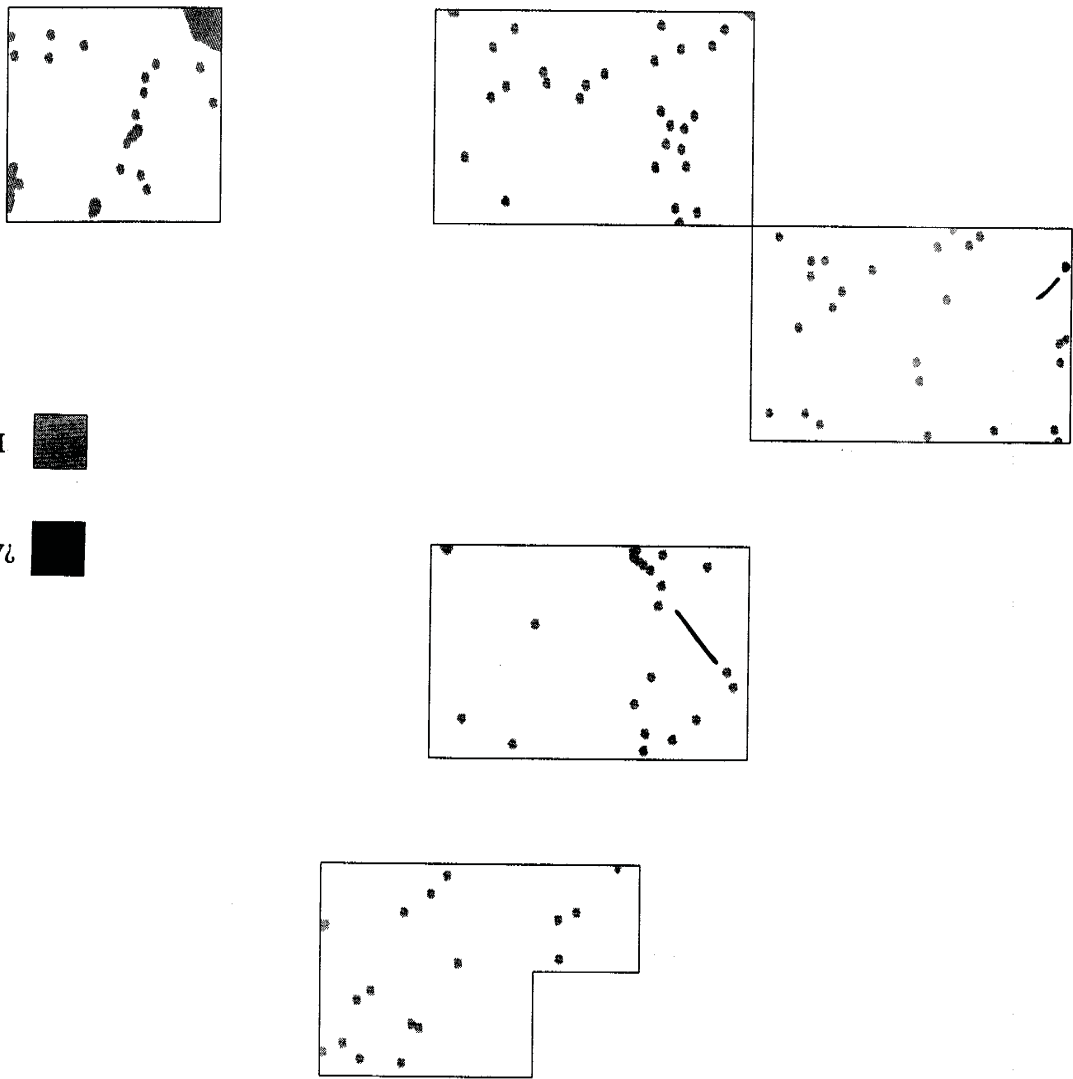
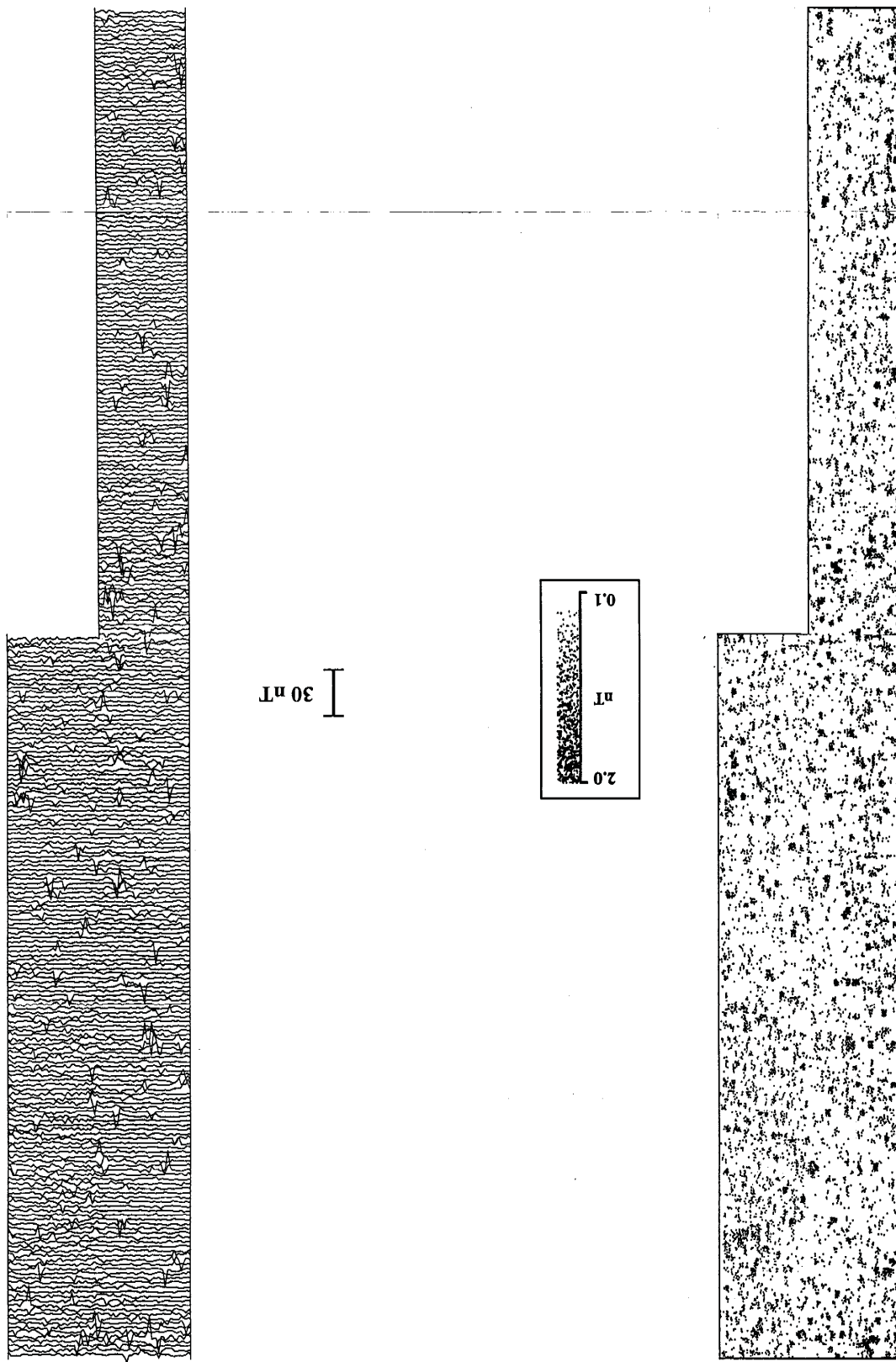


Figure A8.4

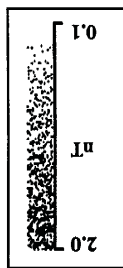
0 m 40



Figure A9.1



30 nT



Area A9
A1 DISHFORTH TO NORTH OF LEMING

A1 DISHFORTH TO NORTH OF LEMING Area A9

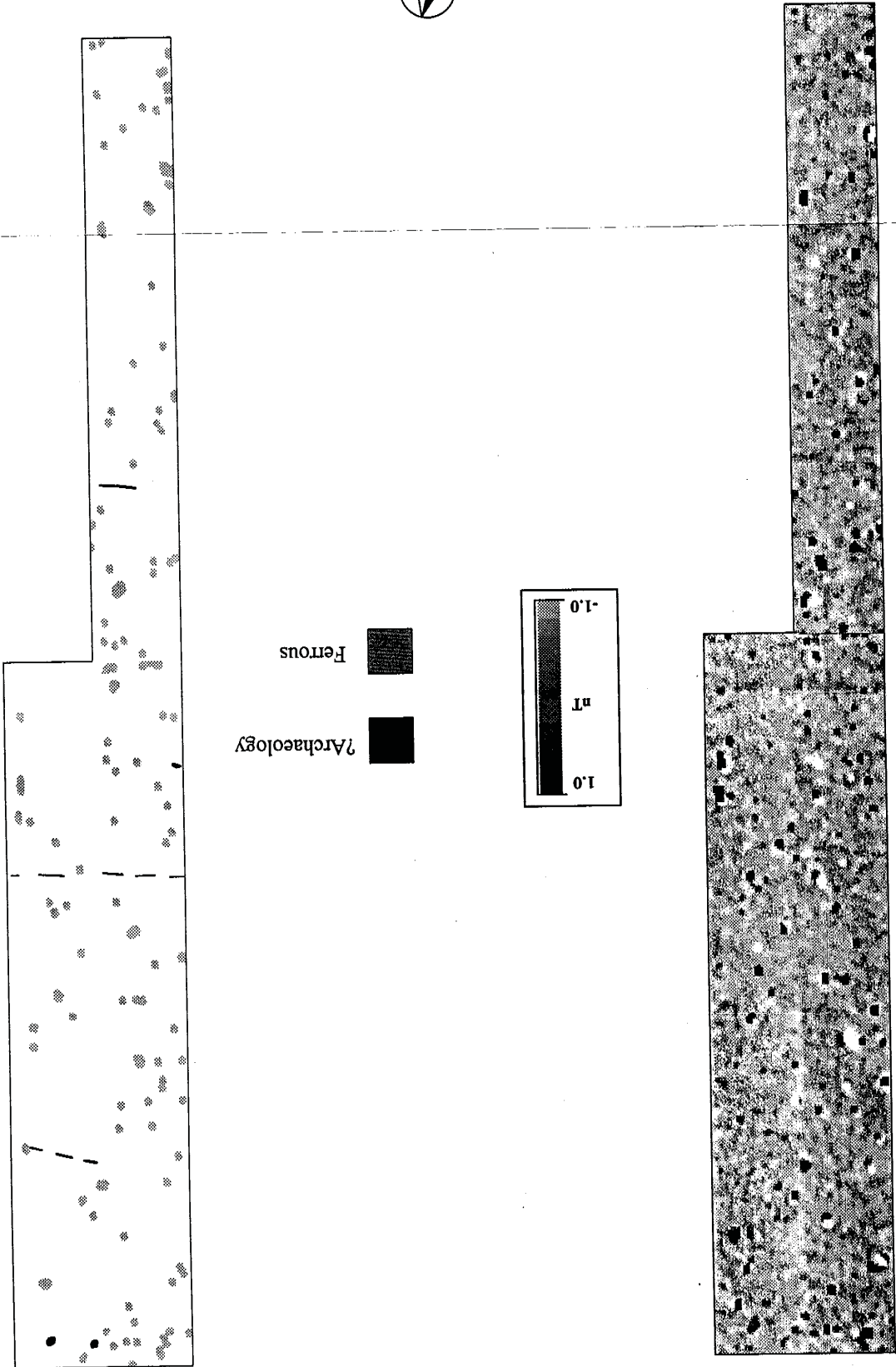
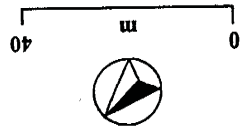
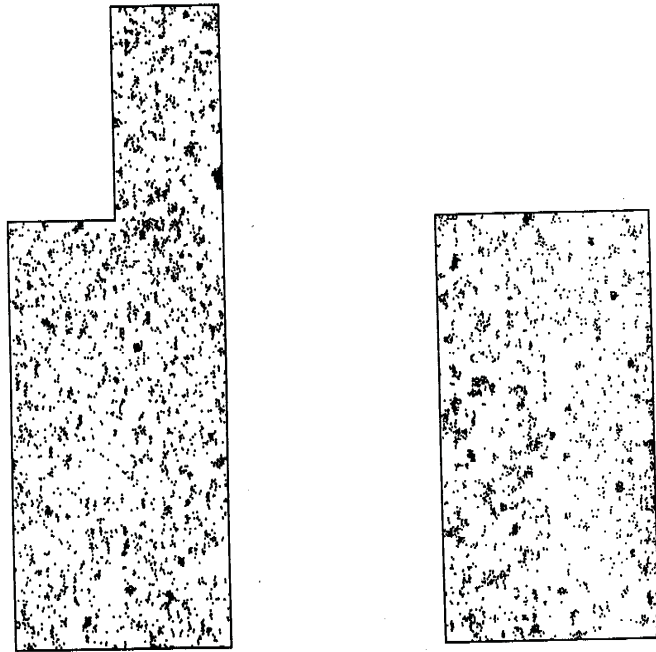
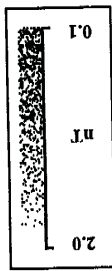
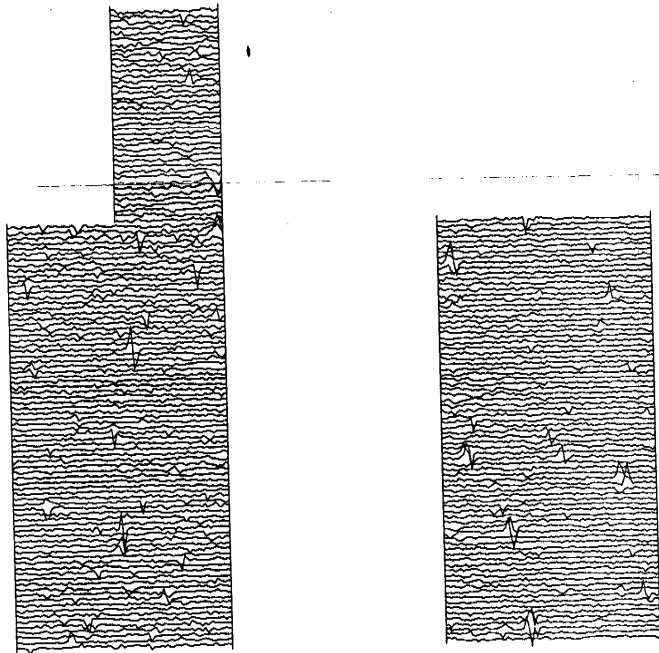


Figure A9.2

ORIGINAL AT A3



30 NT



Area A10
A1 DISHFORTH TO NORTH OF LEMING

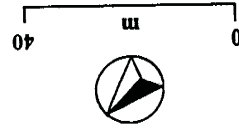
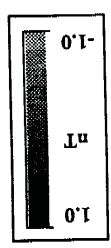


Figure A10.2

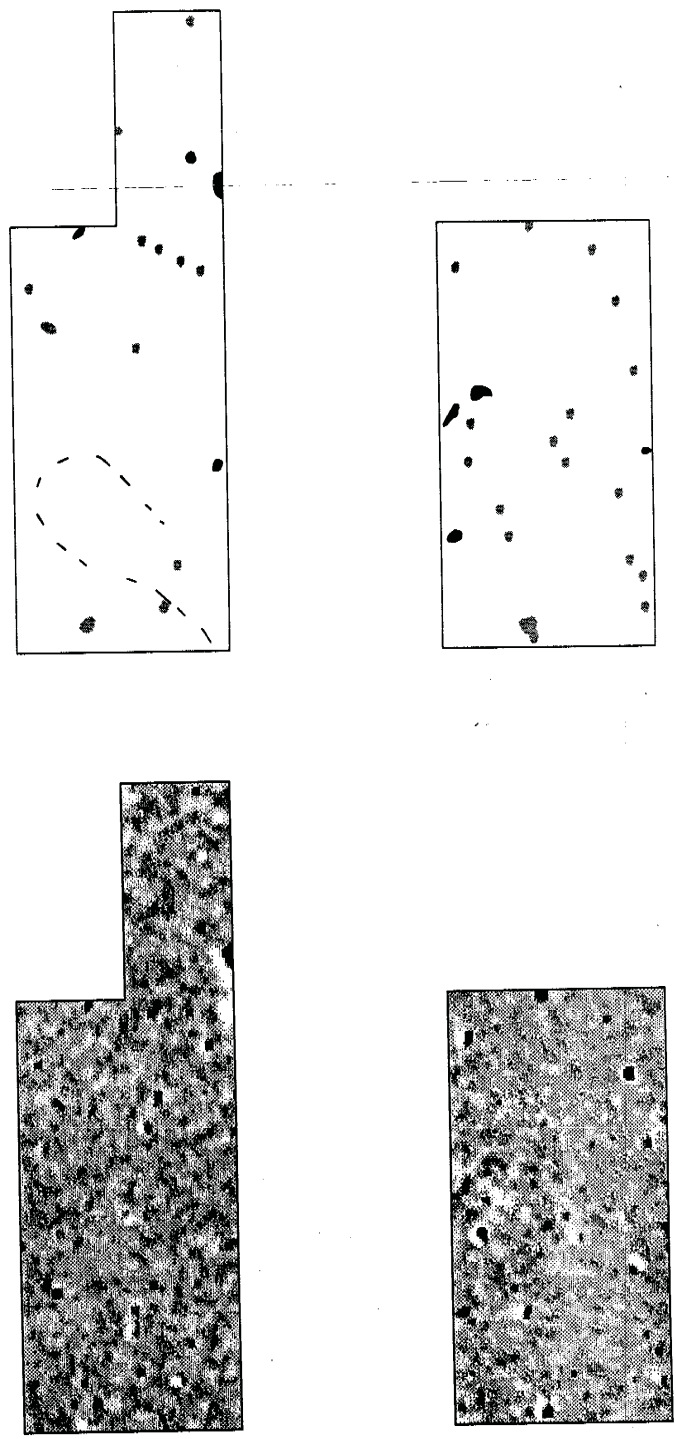
Archaeology

Ferrous



Area A10

A1 DISHFORTH TO NORTH OF LEMING



A1
DISHFORTH TO NORTH OF LEEMING
Area A11 (A) / 13

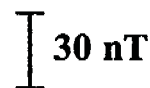
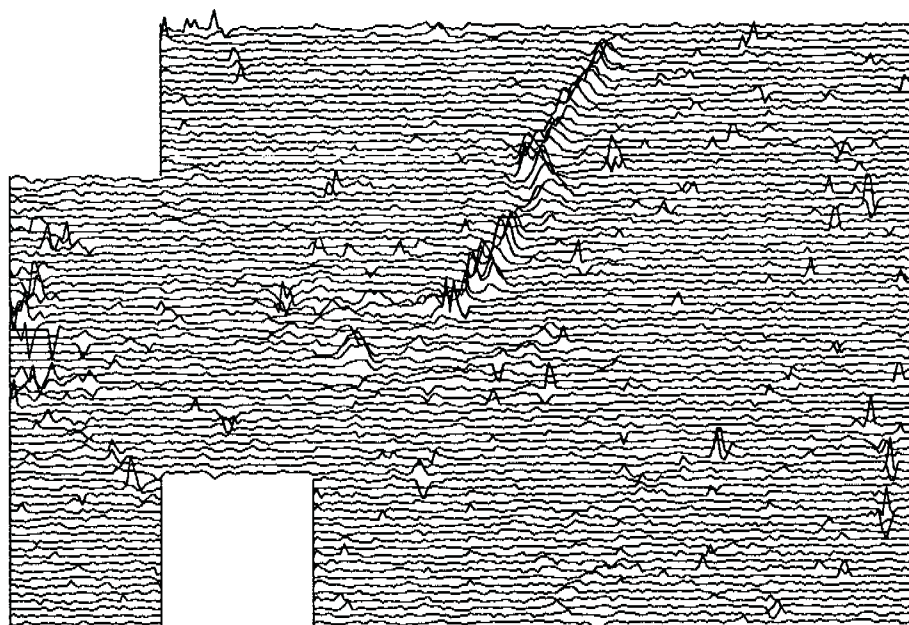
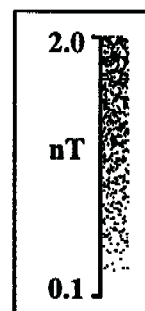
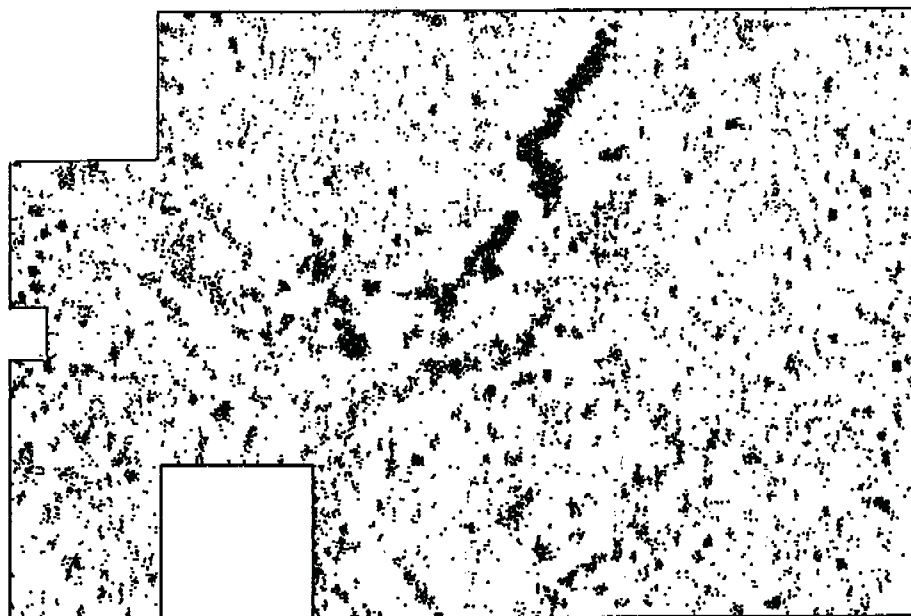


Figure A11.1

A1
DISHFORTH TO NORTH OF LEEMING
Area A11 (A) / 13

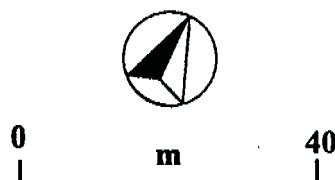
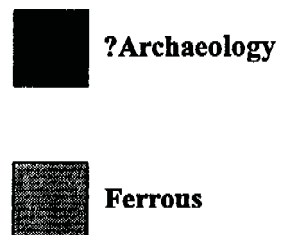
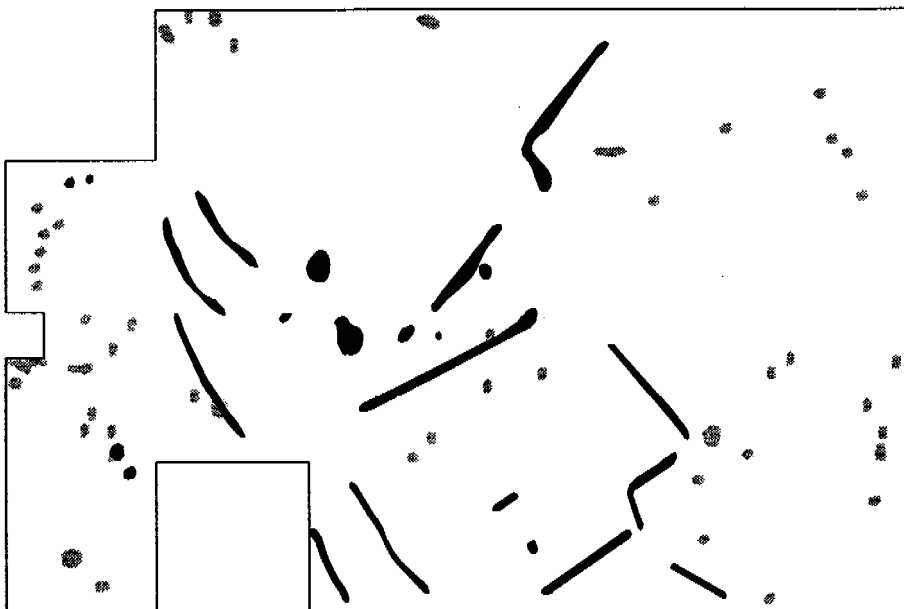
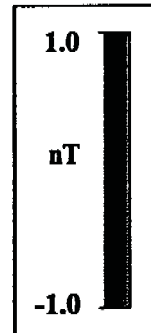
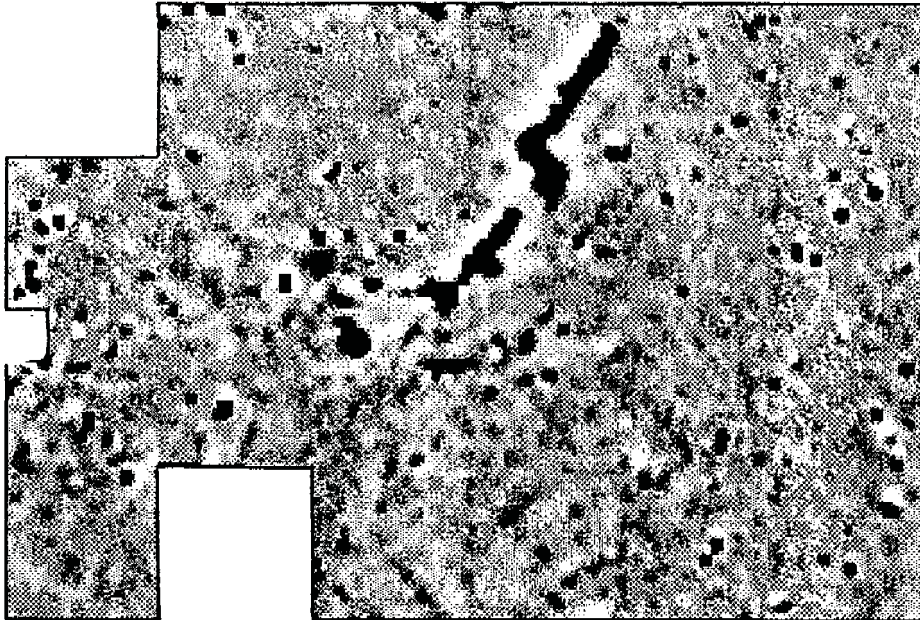


Figure A11.2

A1 DISHFORTH TO NORTH OF LEEMING Area A11 (B)

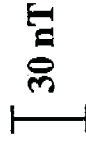
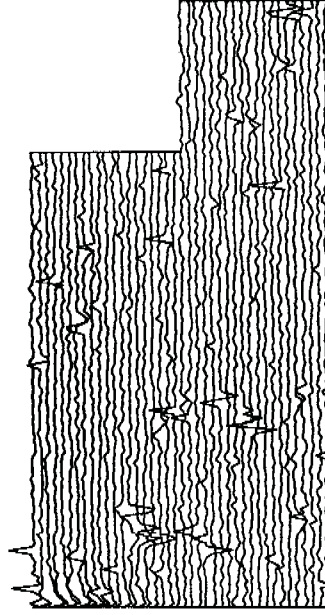
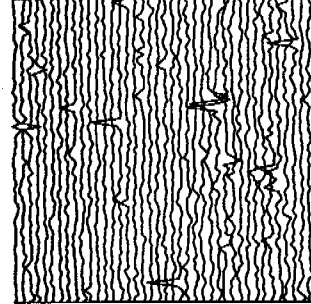
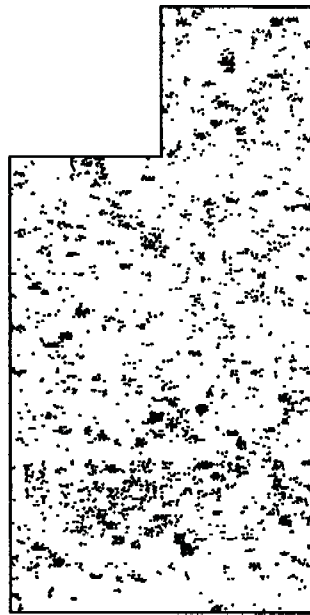
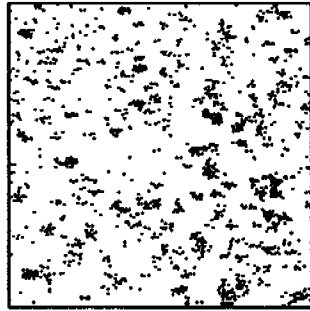
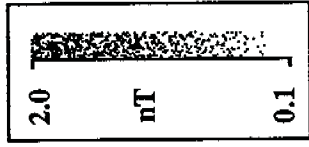


Figure A11.3

A1 DISHFORTH TO NORTH OF LEEMING

Area A11 (B)

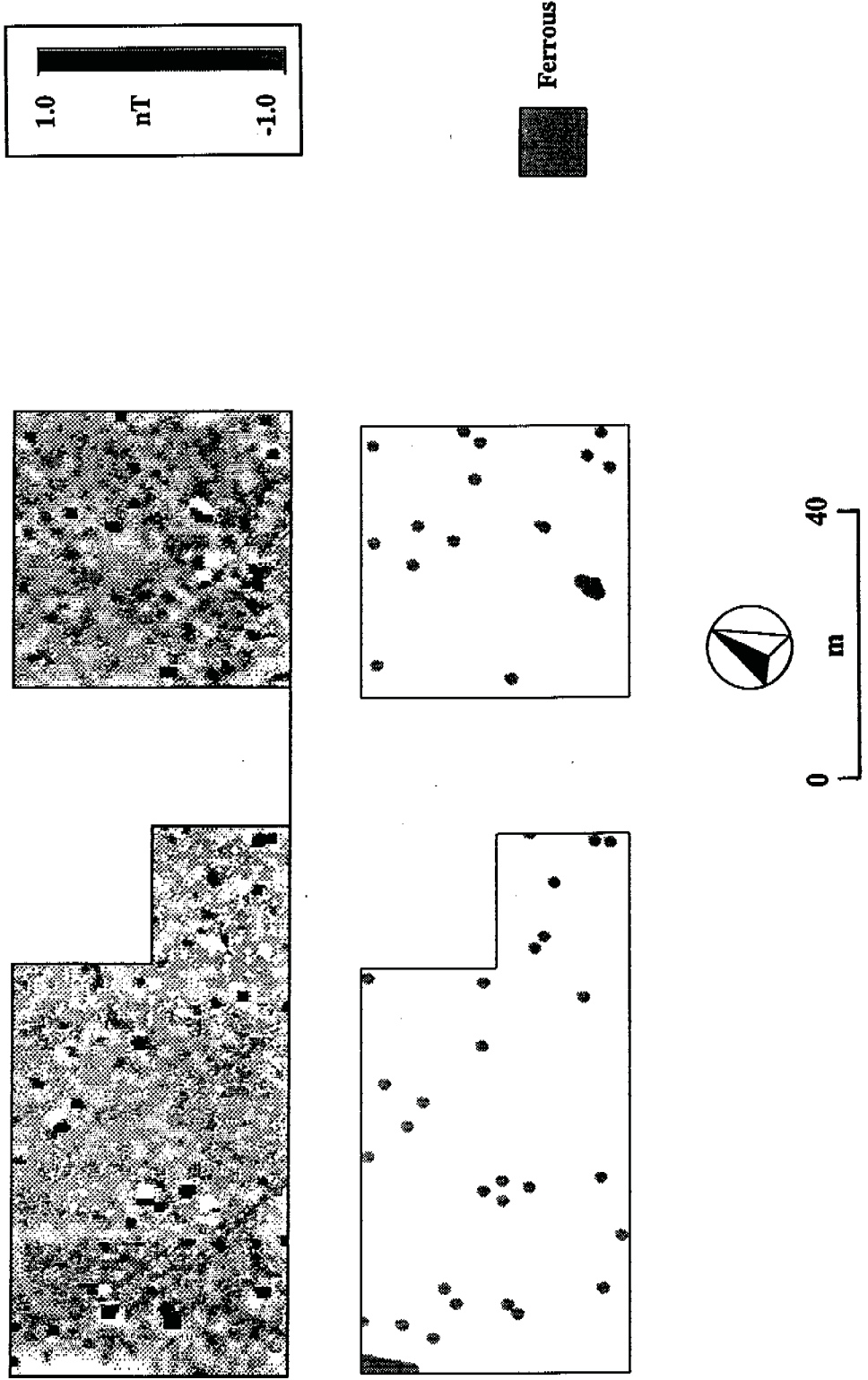


Figure A11.4

A1 DISHFORTH TO NORTH OF LEEMING Area A11 (C)

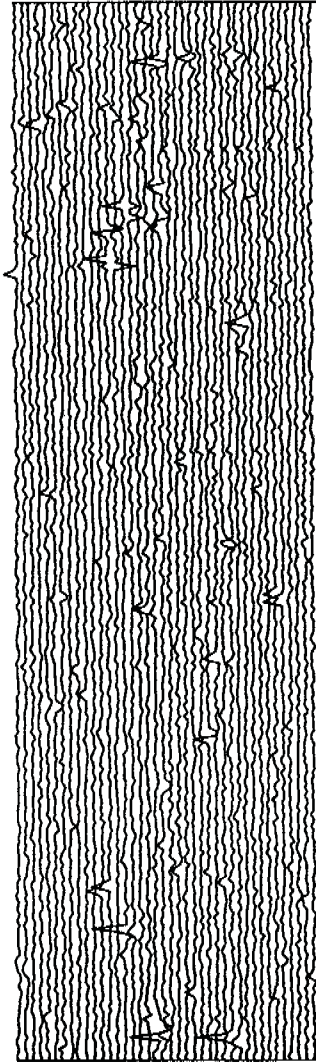
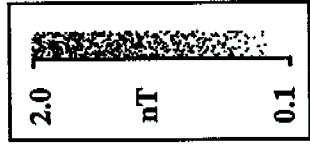
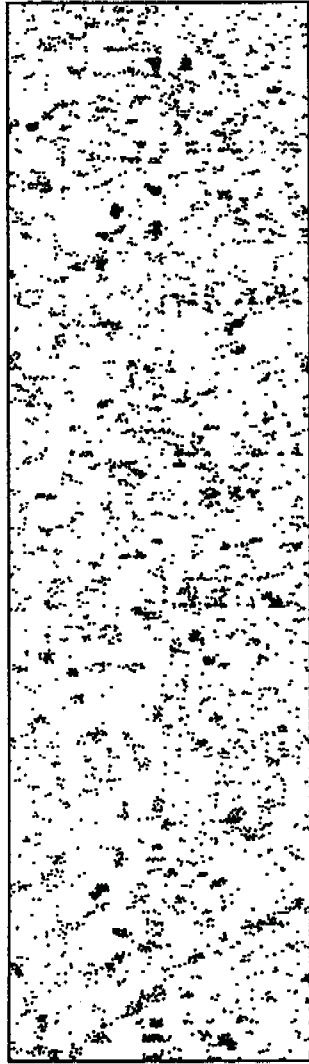


Figure A11.5

A1 DISHFORTH TO NORTH OF LEEMING Area A11 (C)

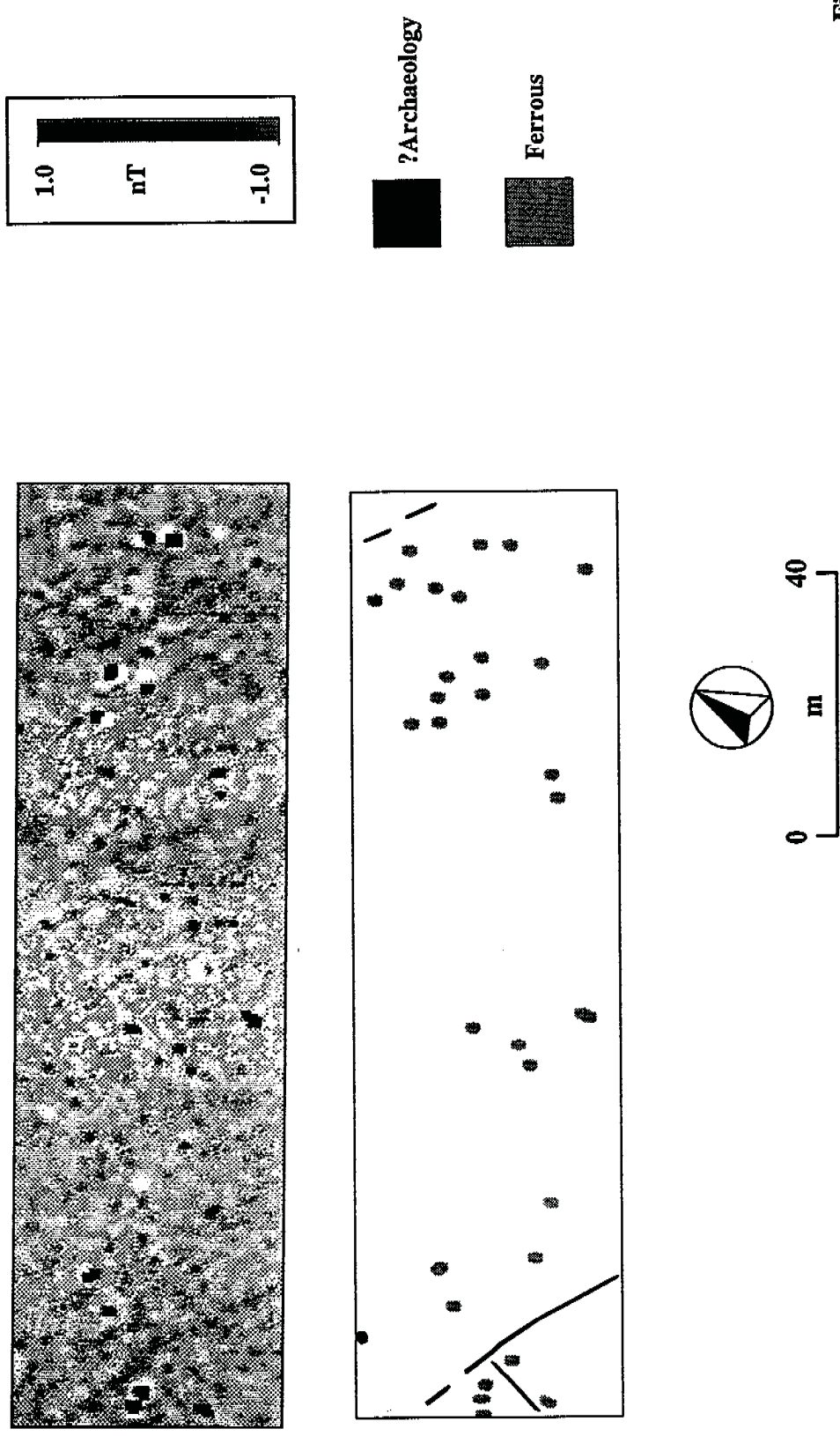


Figure A11.6

A1 DISHFORTH TO NORTH OF LEEMING Area A11 (D)

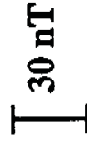
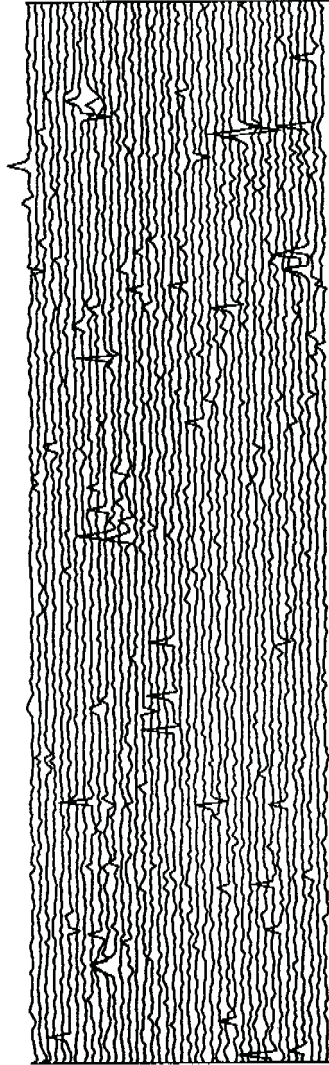
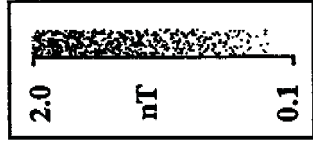
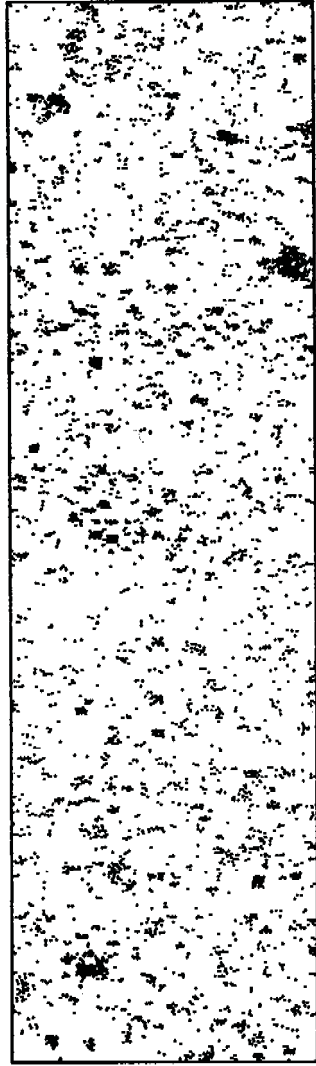


Figure A11.7

A1 DISHFORTH TO NORTH OF LEEMING Area A11 (D)

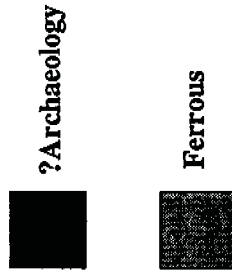
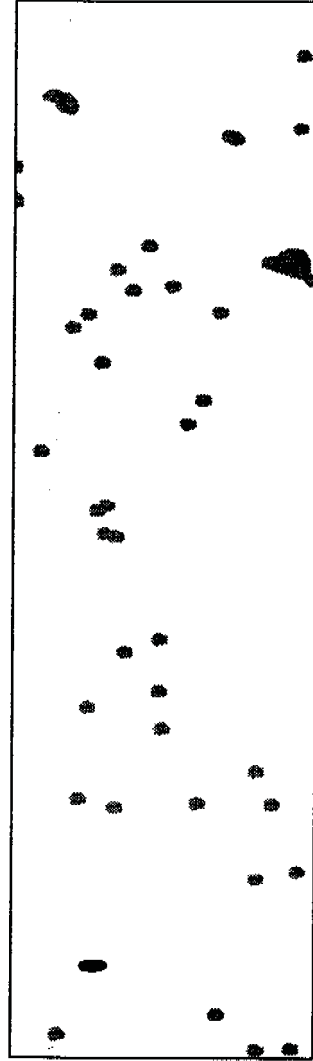
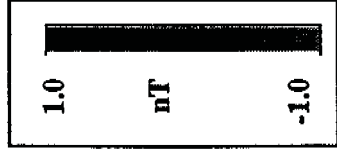


Figure A11.8

A1 DISHFORTH TO NORTH OF LEEMING Area A11 (E)

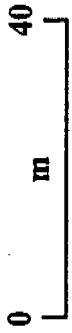
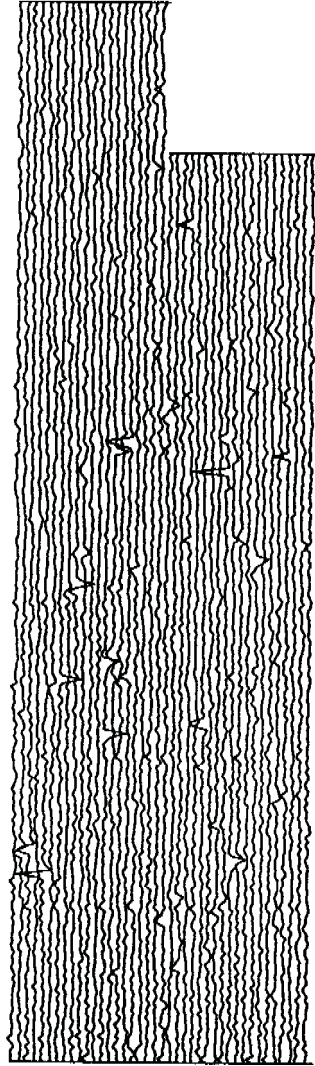
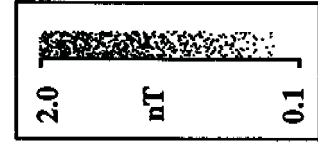


Figure A11.9

A1 DISHFORTH TO NORTH OF LEEMING Area A11 (E)

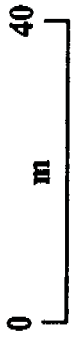
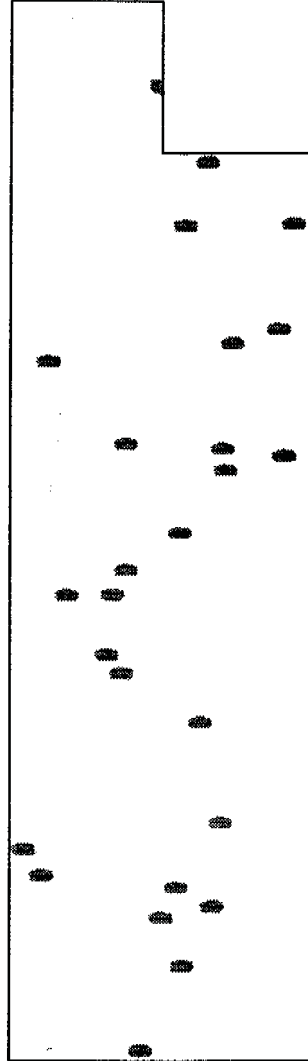
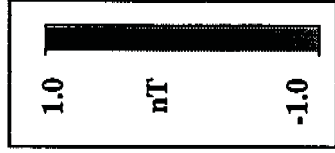


Figure A11.10

A1 DISHFORTH TO NORTH OF LEEMING Area A11 (F)

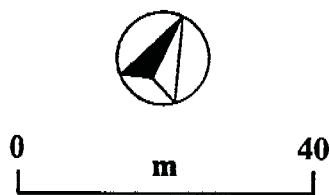
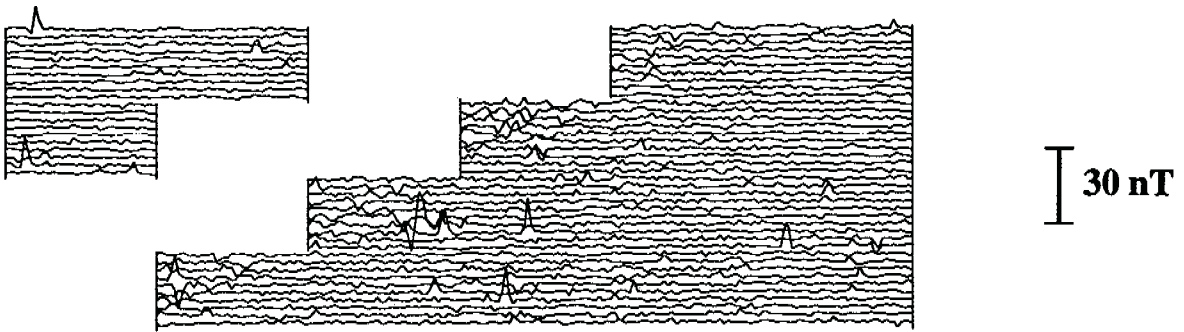
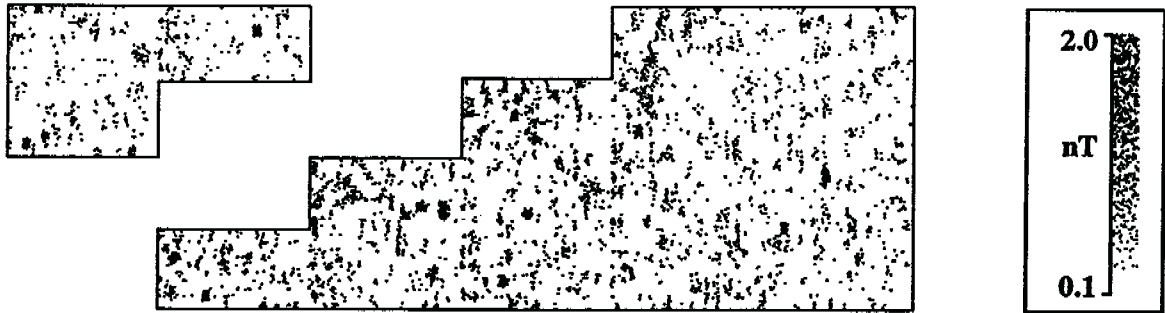


Figure A11.11

A1 DISHFORTH TO NORTH OF LEEMING

Area A11 (F)

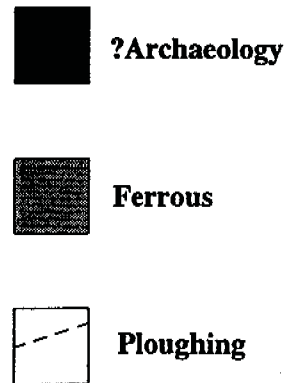
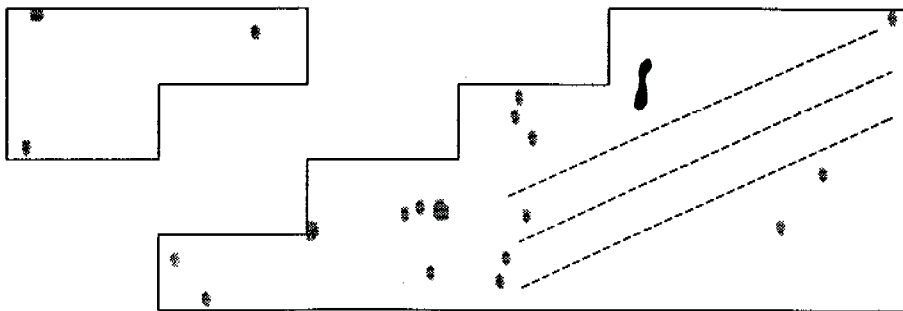
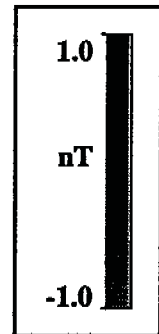


Figure A11.12

A1 DISHFORTH TO NORTH OF LEEMING

Area B1 (A)

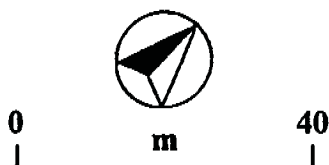
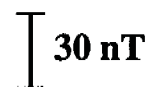
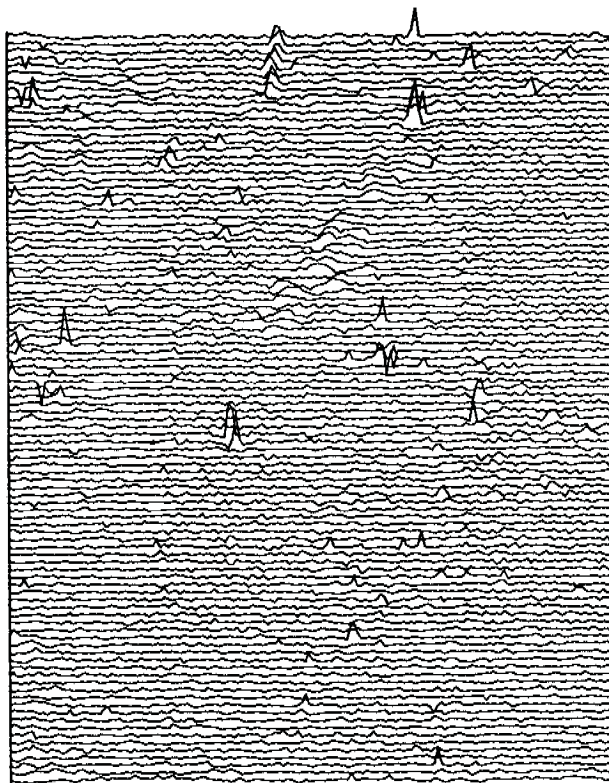
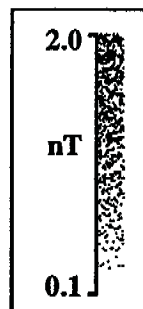


Figure B1.1

A1 DISHFORTH TO NORTH OF LEEMING

Area B1 (A)

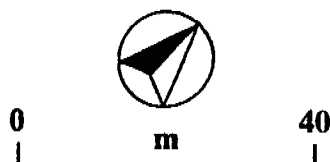
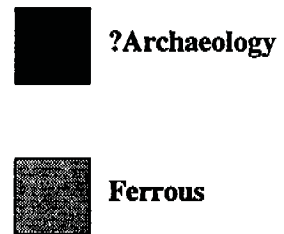
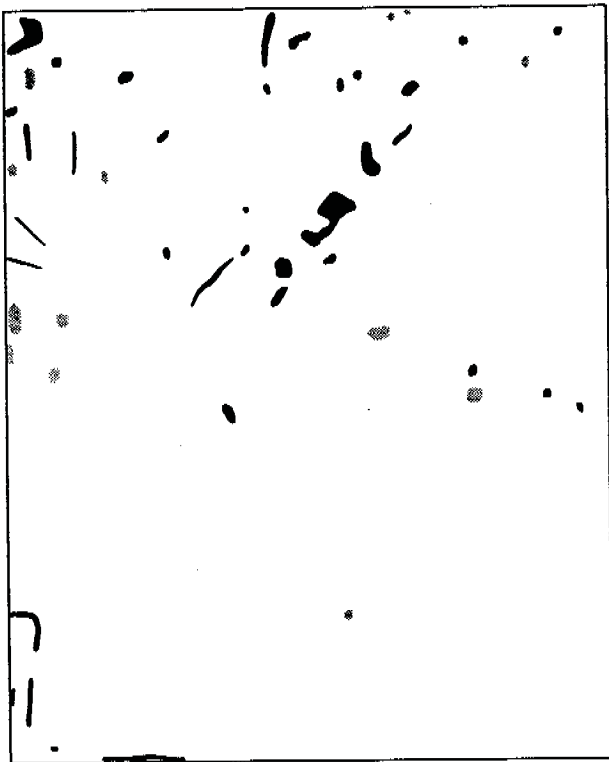
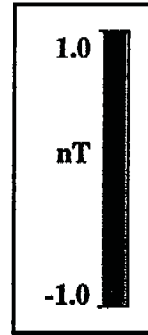
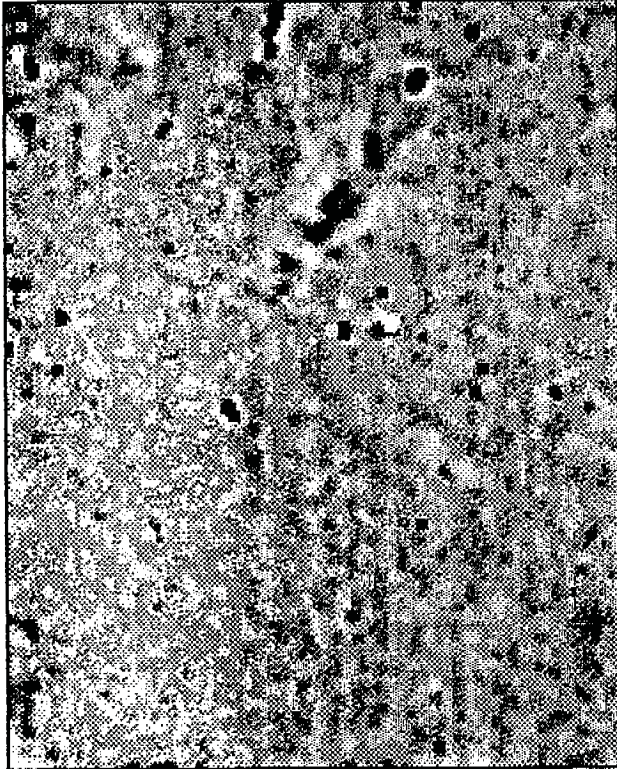
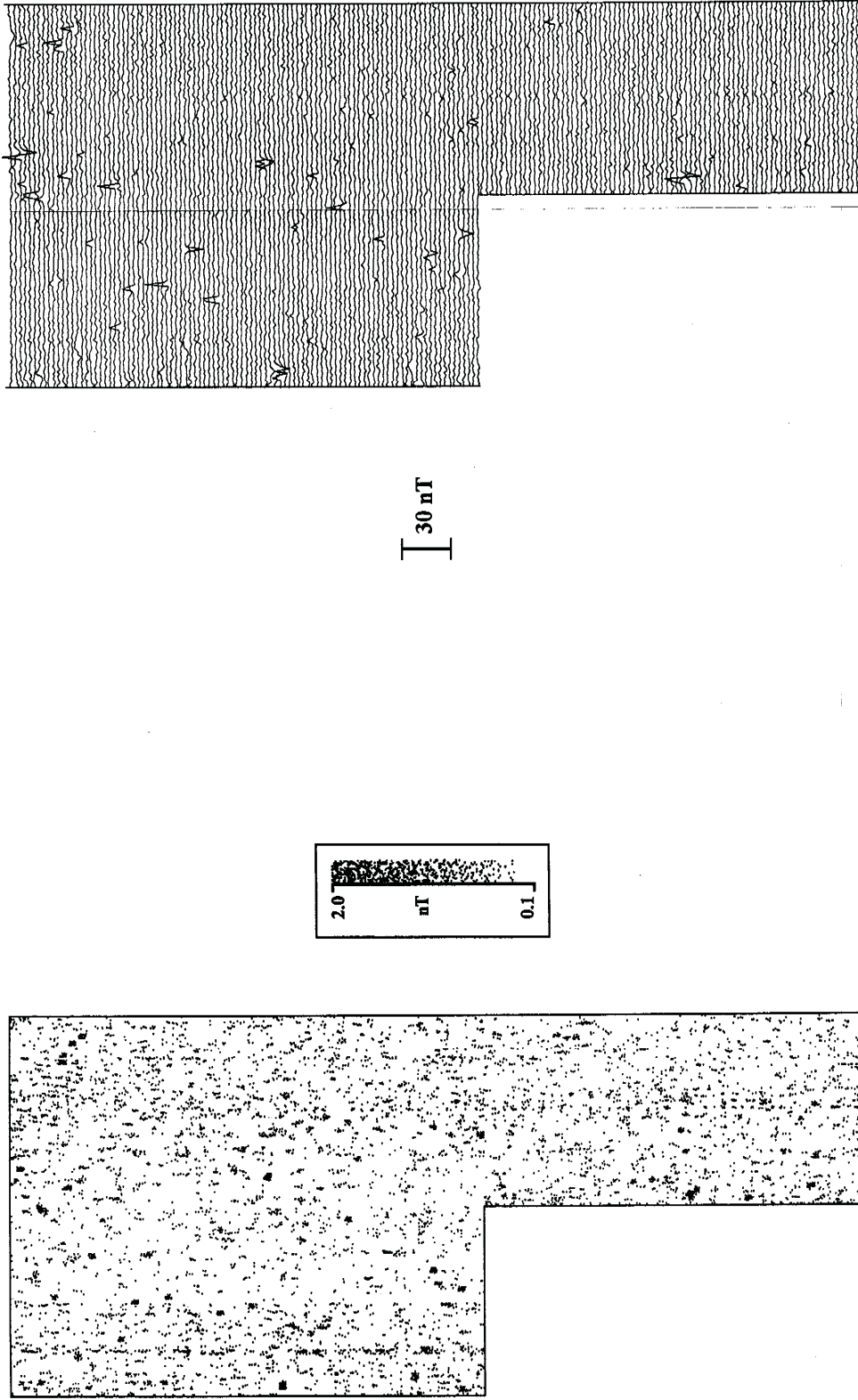


Figure B1.2

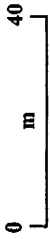
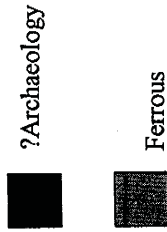
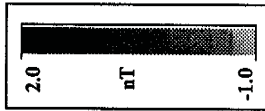
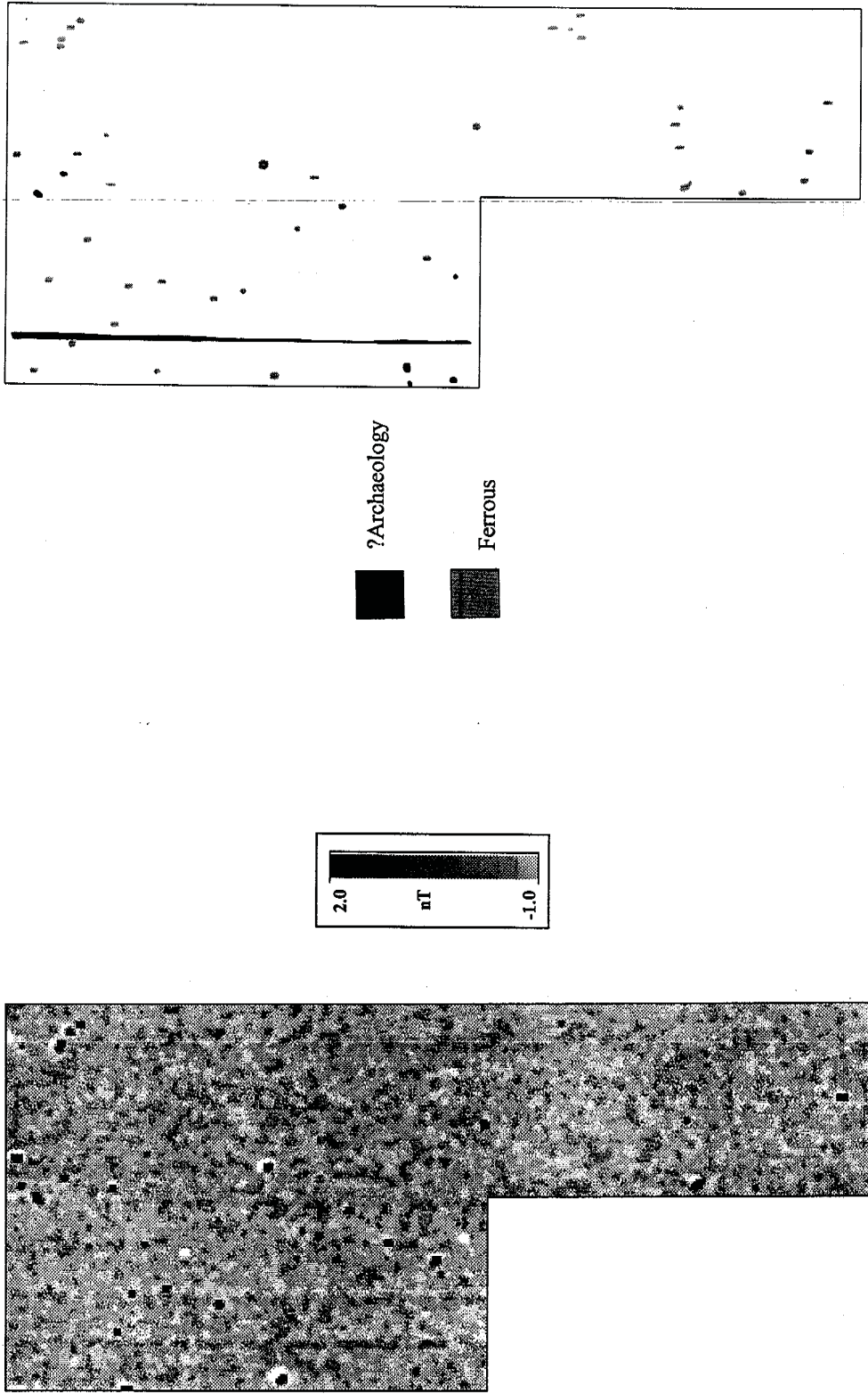
**A1 DISHFORTH TO NORTH OF LEEMING
Area B1 (B)**



ORIGINAL AT A3

Figure B1.3

A1 DISHFORTH TO NORTH OF LEEMING Area B1 (B)



ORIGINAL AT A3

Figure B1.4

A1 DISHFORTH TO NORTH OF LEEMING

Area B2

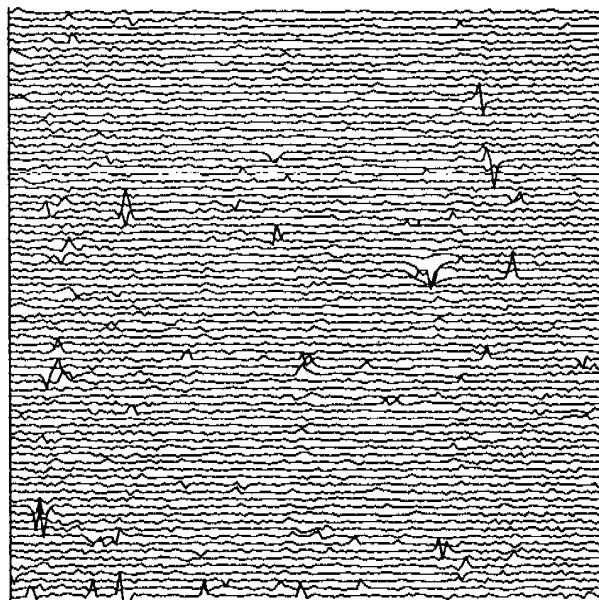
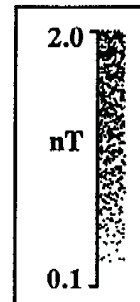
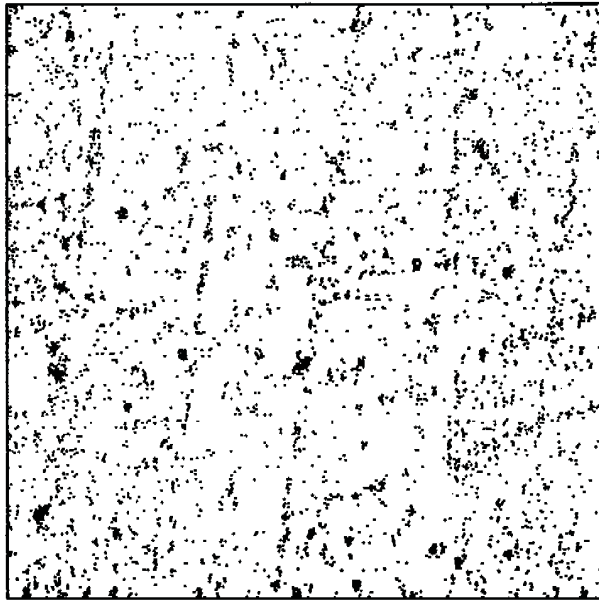


Figure B2.1

A1 DISHFORTH TO NORTH OF LEEMING

Area B2

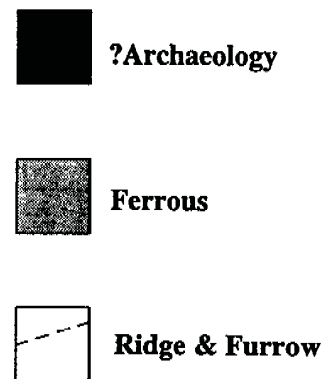
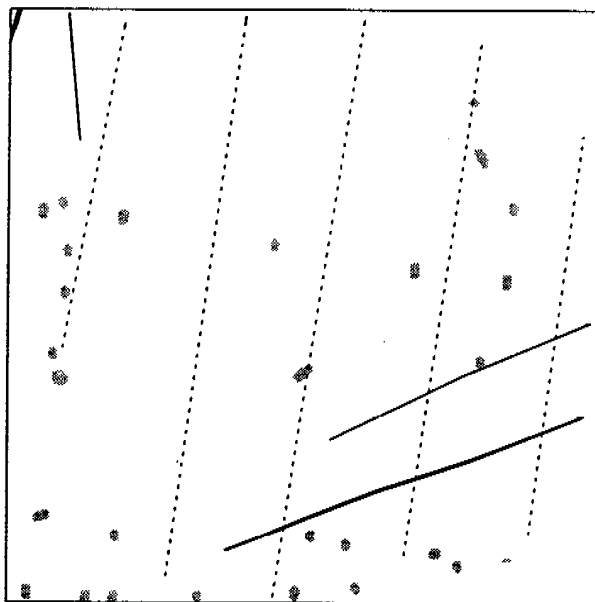
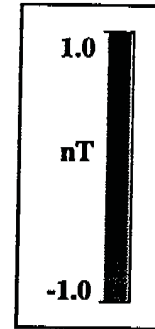
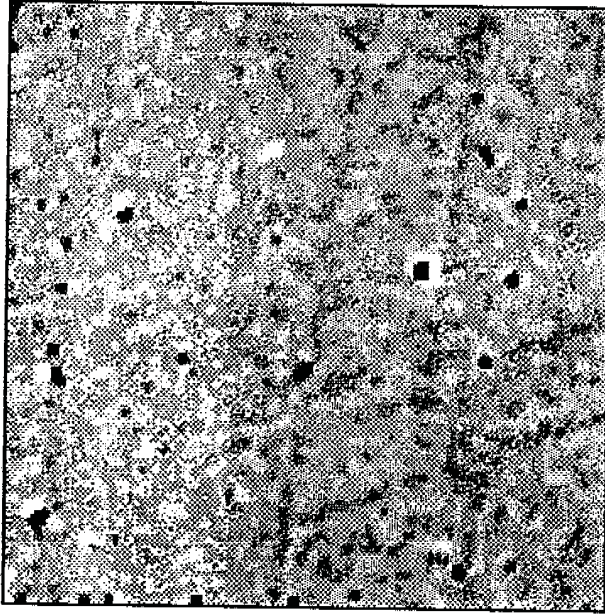


Figure B2.2

A1 DISHFORTH TO NORTH OF LEEMING

Area C15 (A)

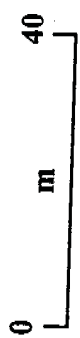
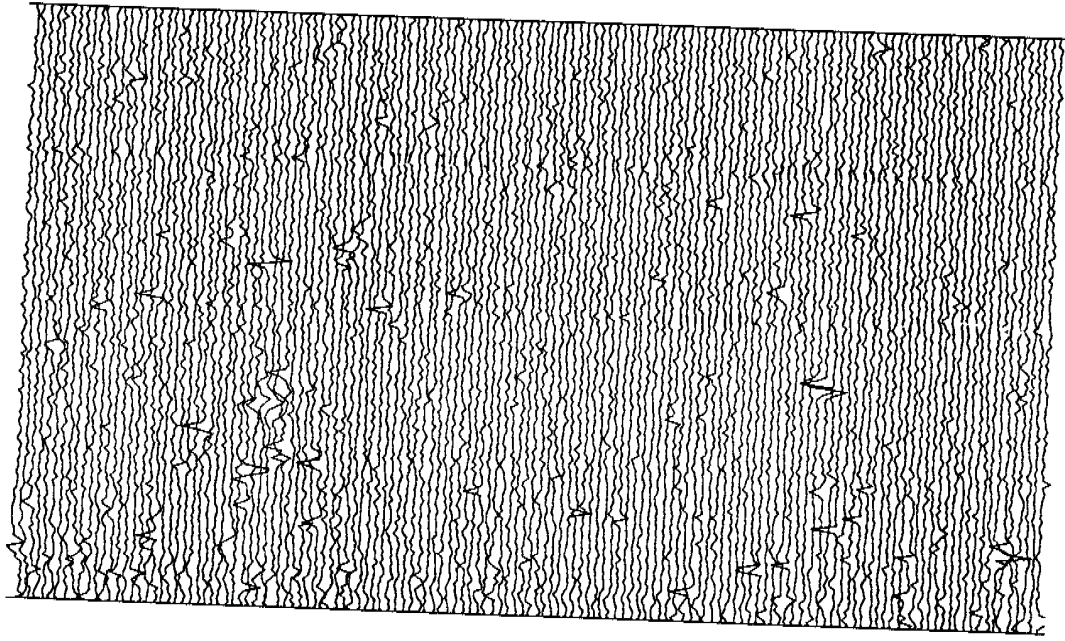
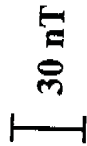
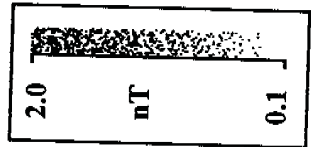
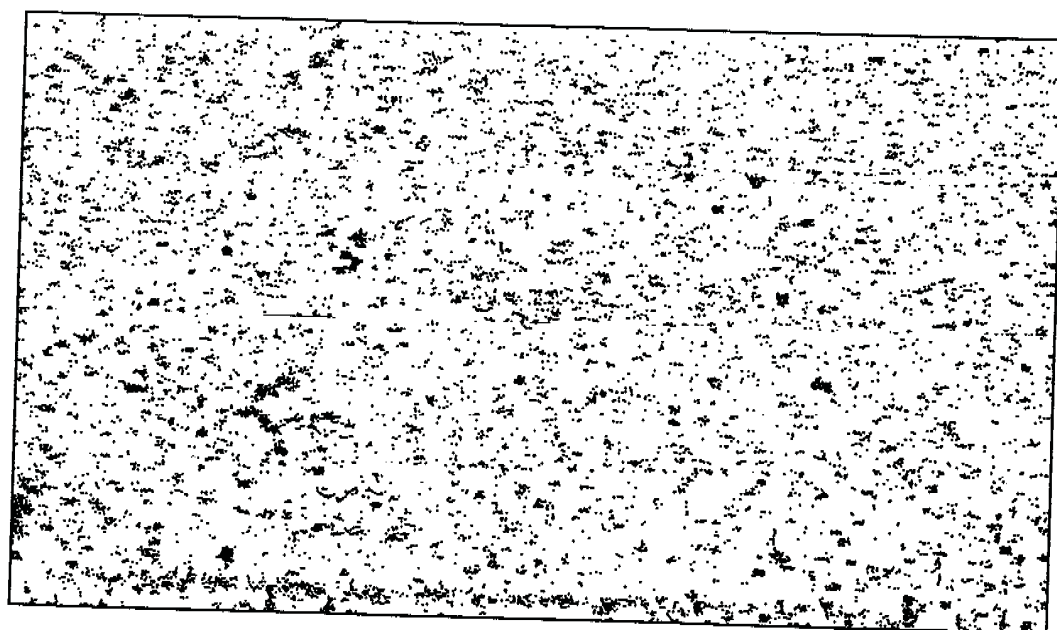


Figure C15.1

A1 DISHFORTH TO NORTH OF LEEMING

Area C15 (A)

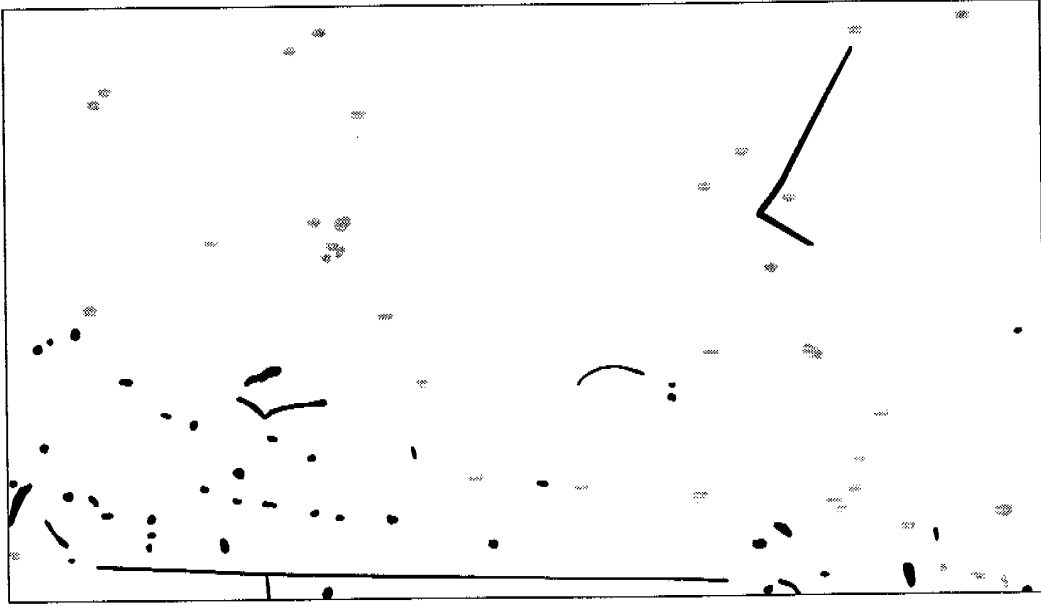
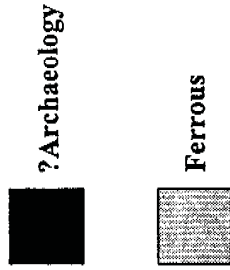
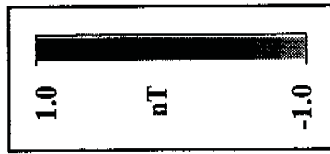
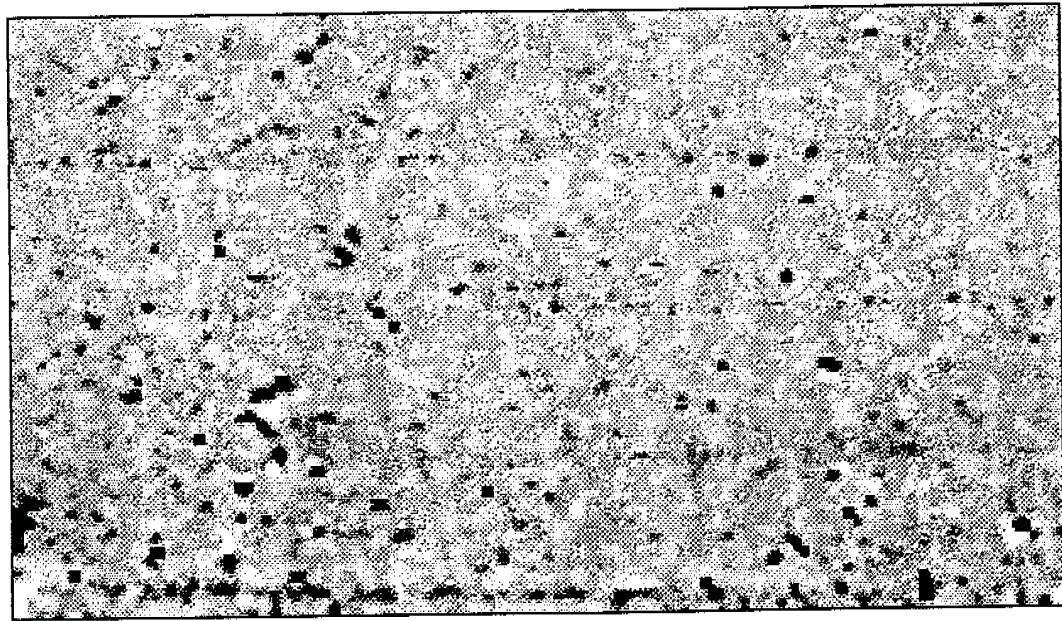


Figure C15.2

A1 DISHFORTH TO NORTH OF LEEMING

Area C15 (B)

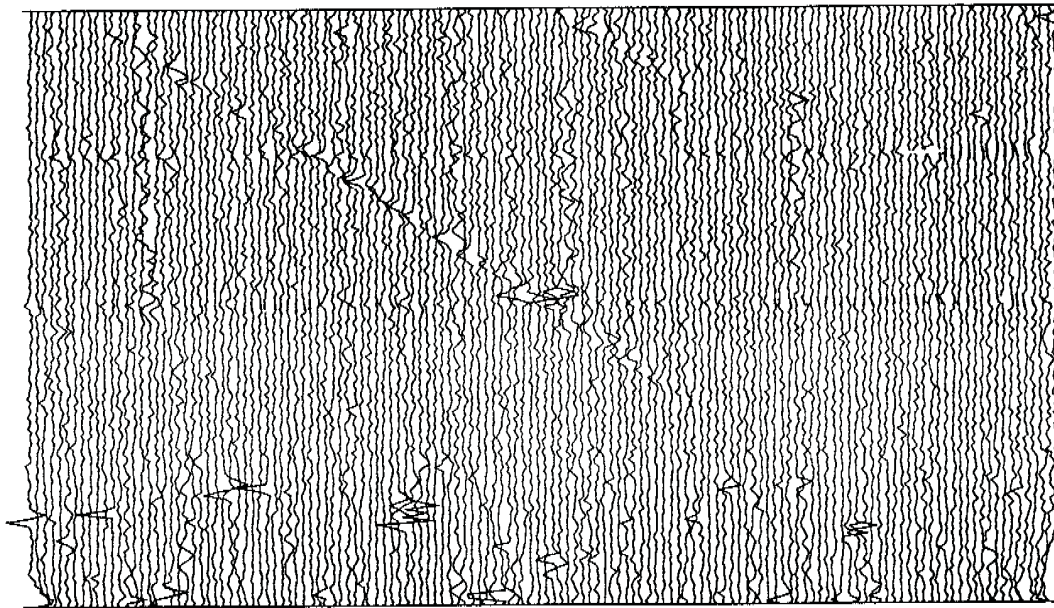
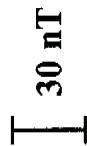
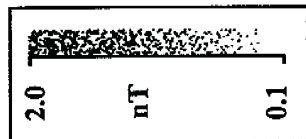
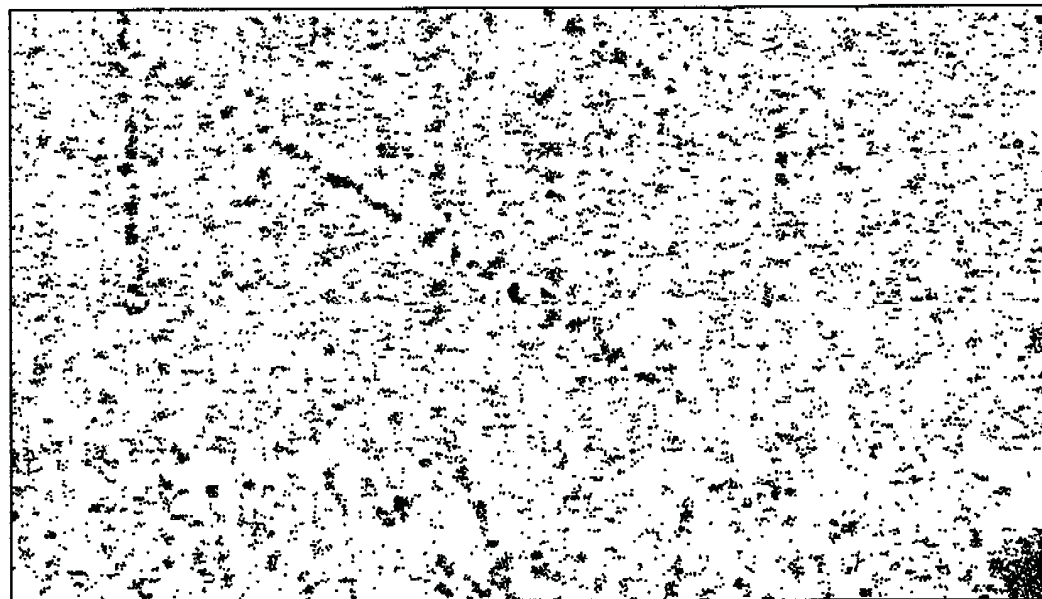


Figure C15.3

A1 DISHFORTH TO NORTH OF LEEMING

Area C15 (B)

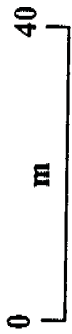
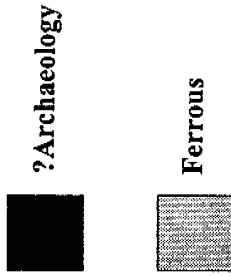
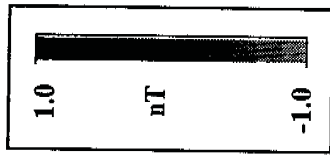
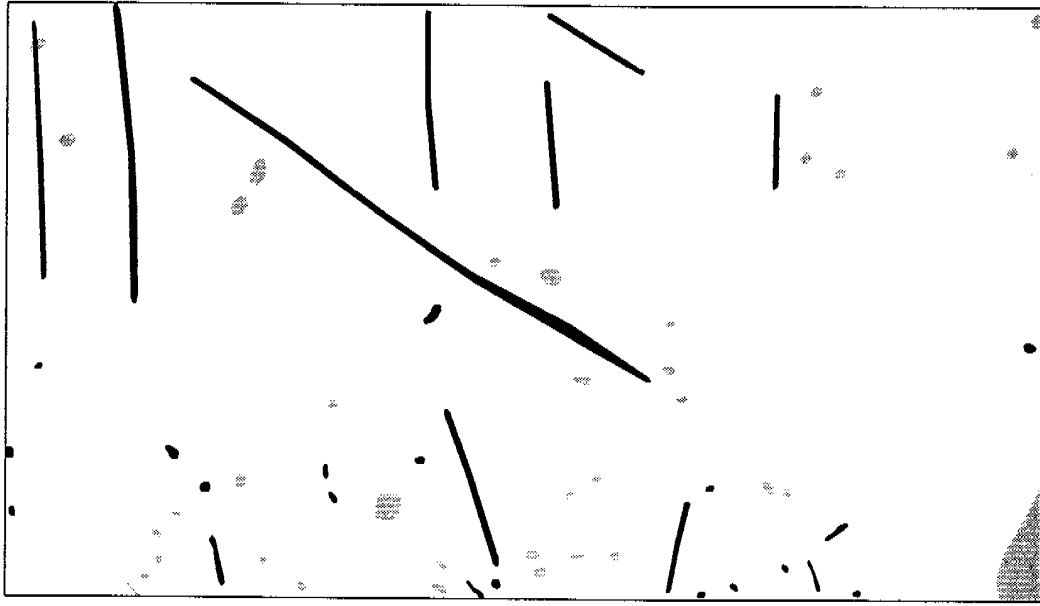
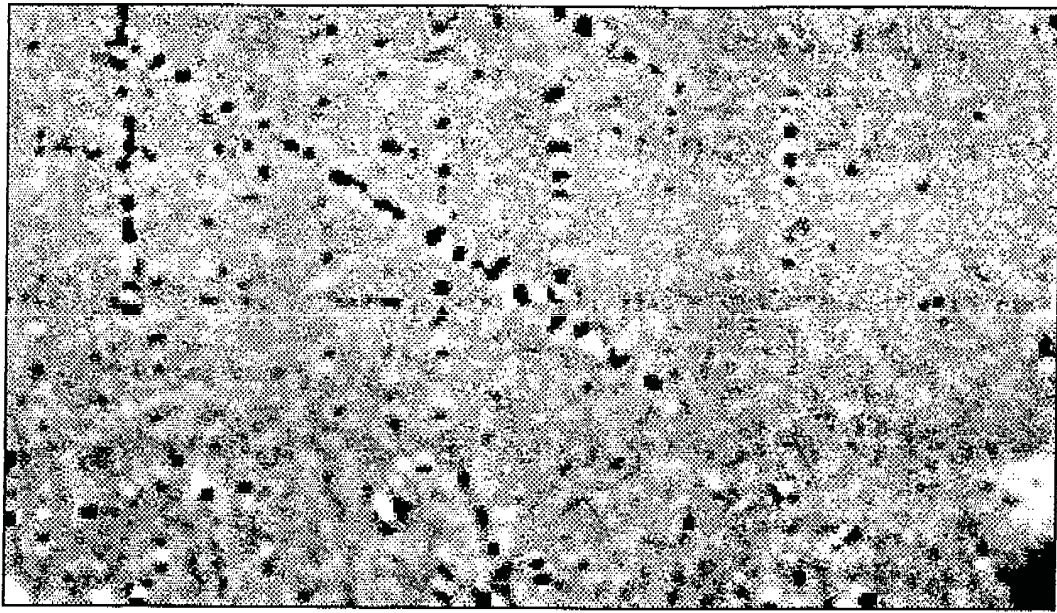
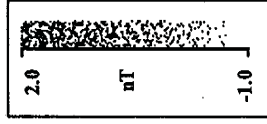
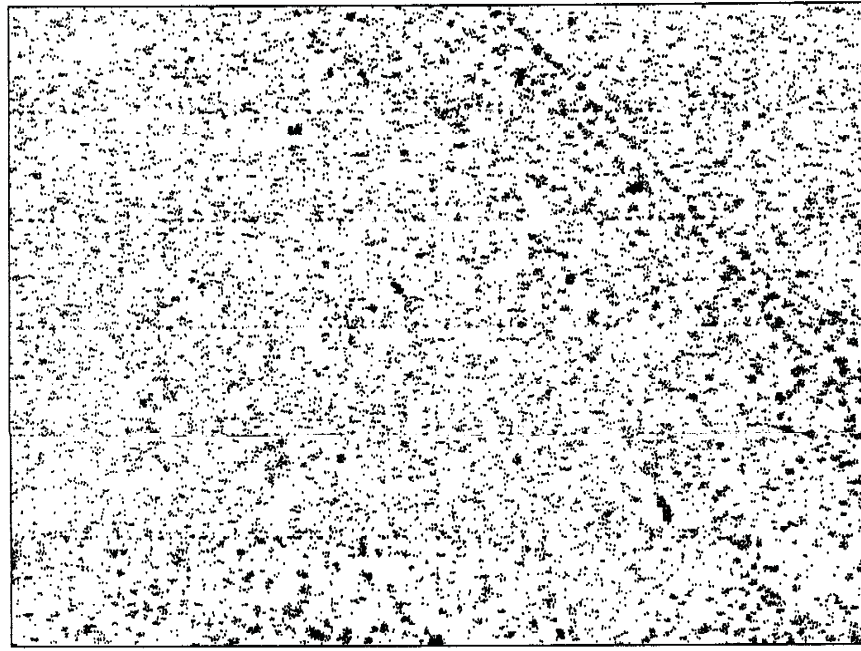
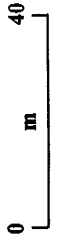
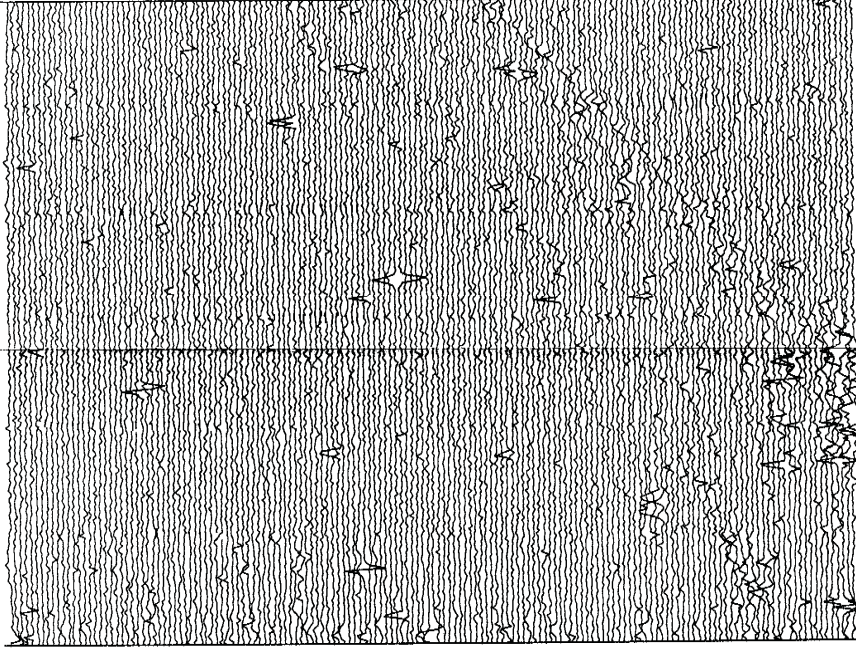


Figure C15.4

**A1 DISHFORTH TO NORTH OF LEEMING
Area C16**



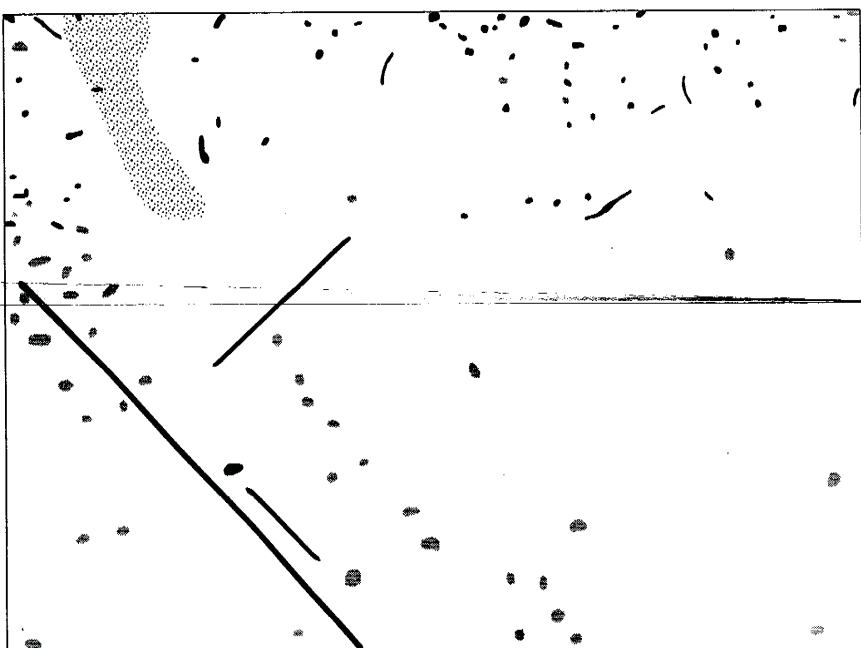
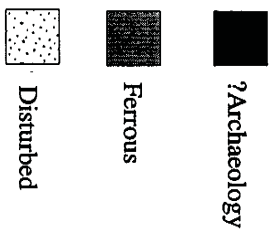
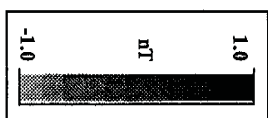
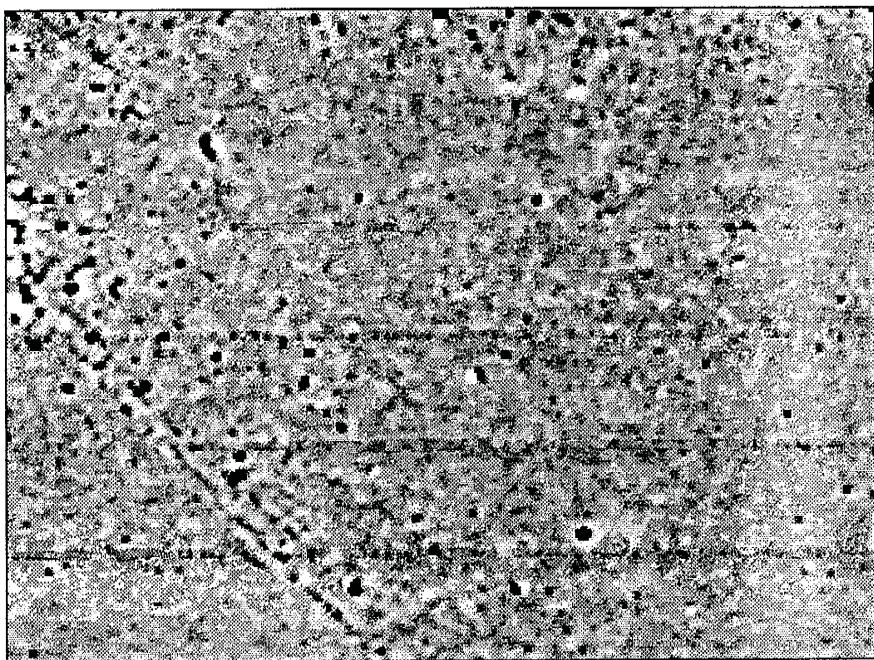
30 nT



ORIGINAL AT A3

Figure C16.1

A1 DISHFORTH TO NORTH OF LEMMING Area C16



ORIGINAL AT A3

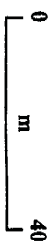


Figure C16.2

A1 DISHFORTH TO NORTH OF LEEMING

Area C17 / 19 / 20

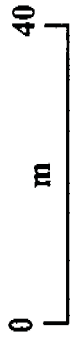
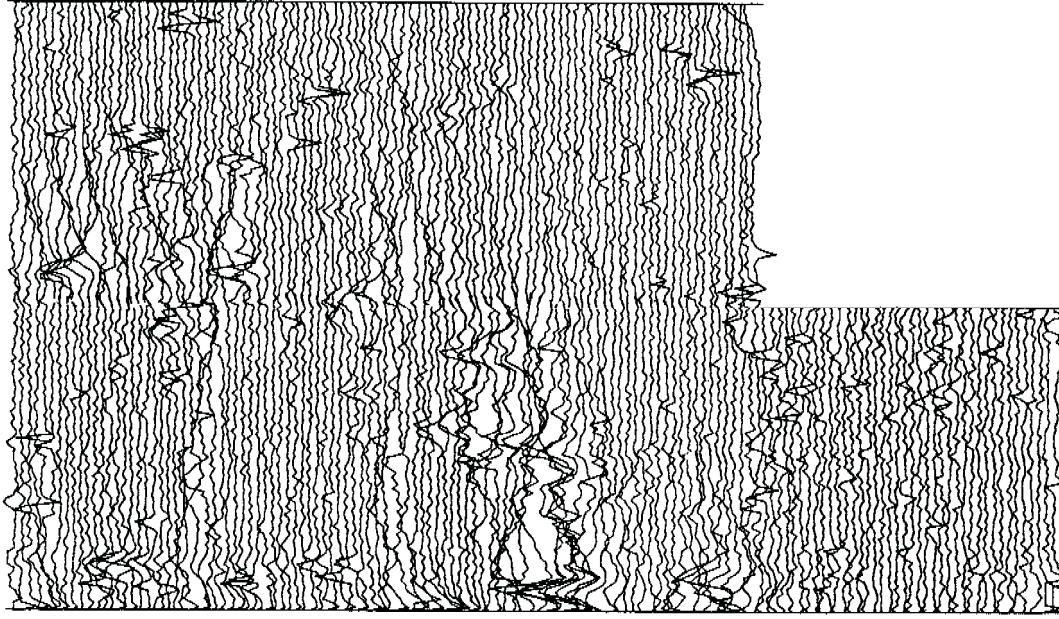
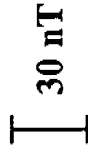
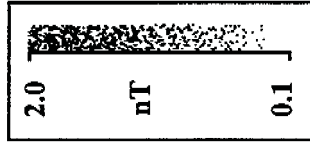


Figure C17.1

A1 DISHFORTH TO NORTH OF LEEMING

Area C17 / 19 / 20

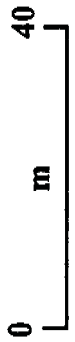
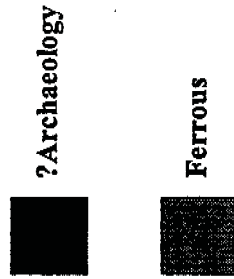
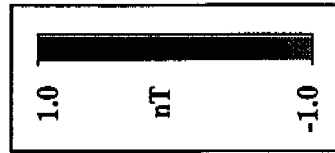
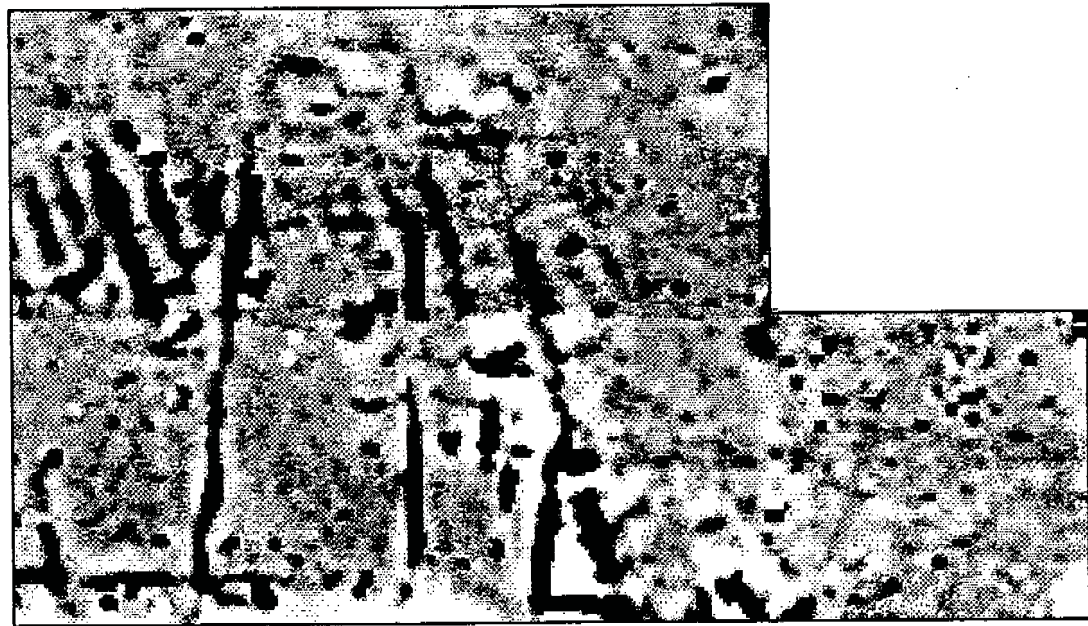


Figure C17.2

A1 DISHFORTH TO NORTH OF LEEMING

Area C18 / 21

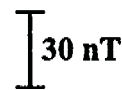
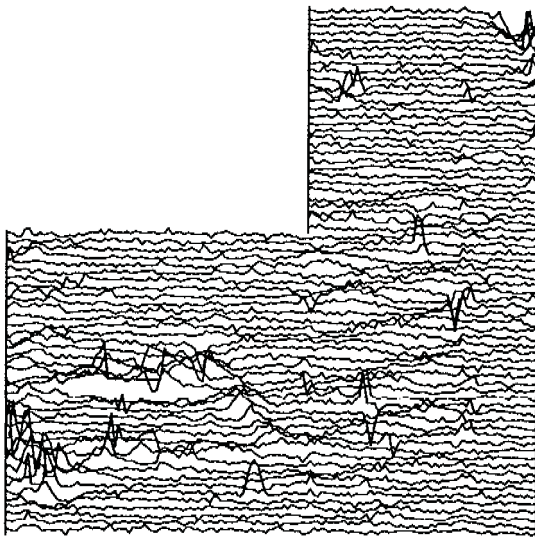
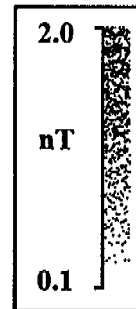
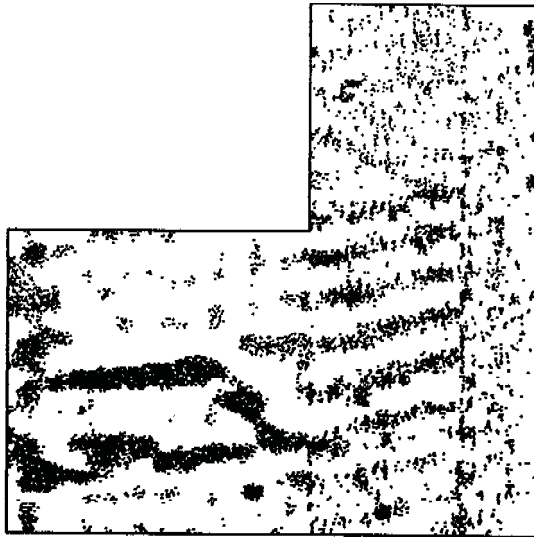
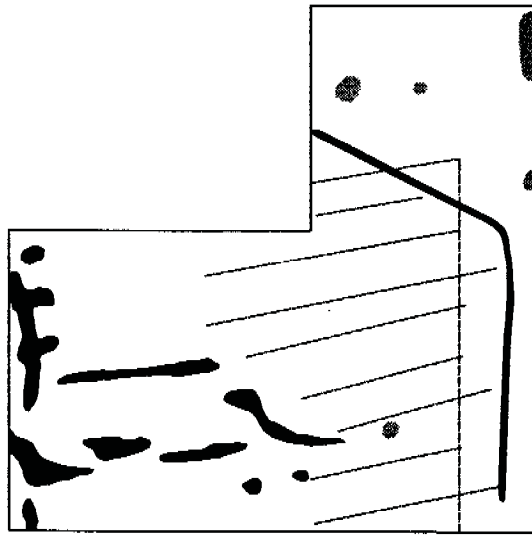
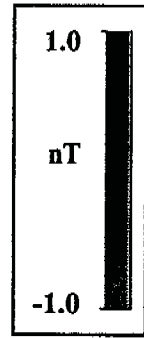
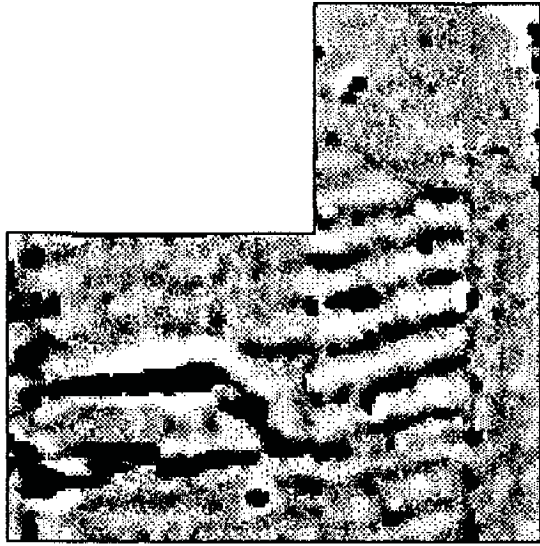





Figure C18.1

A1 DISHFORTH TO NORTH OF LEEMING

Area C18 / 21



-  ?Archaeology
-  Ferrous
-  Ridge & Furrow

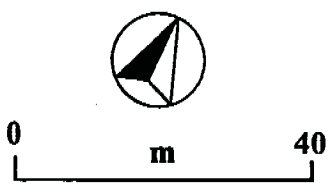


Figure C18.2