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A55 LLANFAIRPWLLGWYNGYLL to BRYNGWRAN

NANT TURNPIKE to BRYNGWRAN

(GEOPHYSICAL SURVEY)

REPORT NO. 147

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

A55 ANGLESEY STAGE 2

NANT TURNPIKE TO WEST OF BRYNGWRAN

GEOPHYSICAL SURVEY (G1295)

G1399

prepared for ASH Consulting Group
by D. Hopewell
illustrations by H. Flook
February 1995

Gwynedd Archaeological Trust Report No. 147

A55 LLANFAIRPWLLGWYNGYLL to BRYNGWRAN

NANT TURNPIKE to BRYNGWRAN

GEOPHYSICAL SURVEY

1. INTRODUCTION

The proposed route runs broadly parallel with and south of the existing A5, bypassing the villages of Gwalchmai and Bryngwran and some smaller settlements.

An initial Archaeological Assessment has been carried out along the line of the proposed route and the findings presented in two reports (GAT report nos. 71 and 103). A Grade One Watching Brief (continual archaeological presence) was carried out on 76 engineering test pits along the road corridor. The findings were presented in GAT report no. 116.

Gwynedd Archaeological Trust was commissioned by ASH Consulting Group, environmental consultants for the Welsh Office, to carry out a geophysical survey of seven areas of potential archaeological significance along the proposed line of the road.

2. METHODOLOGY

2.1 Aims

The aim of the survey was to identify any magnetic anomalies of potential archaeological significance within selected areas of the road corridor. The fieldwork was carried out by GAT staff between 8 February and 13th February 1995.

2.2 Technical Summary

A Geoscan Research FM36 fluxgate gradiometer was used for the survey. The designated areas were first assessed by generalised scanning and then surveyed in detail in 20m x 20m grids. Readings were taken at 0.25m intervals with a traverse width of 1m giving 1600 readings per grid. The data was then transferred to computer for processing and display using the Geoplot 2.01 program.

2.3 Display

The results are displayed in the report as:

i) X-Y traces which show the data as a series of line graphs.

ii) Dot-density plots, where the data is represented by varying the number of randomly scattered dots with the magnitude of each reading.

iii) Interpretation diagrams, where the information from the survey is summarised.

iv) 1:2500 location maps.

Plots are derived from unenhanced data where possible although, in some cases, filtering or compression is necessary to display low intensity features. Any such treatments are described in the individual site descriptions.

2.4 Survey Conditions

Several weeks of unusually wet weather had caused a degree of water-logging in all of the survey areas. This was particularly problematic around sites areas 1a, 2a and 3a where certain areas were impassable due to standing water. Strong winds, heavy rain and sleet during the survey introduced some additional noise into the data.

3.0 SURVEY RESULTS AND RECOMMENDATIONS

Seven areas of potential archaeological interest were originally designated for gradiometer survey, however one site (site 1a) was found to be unsuitable for further survey because of the water-logged conditions. Six areas, totalling 2.36 ha, were surveyed in detail, and the results are presented below. Individual anomalies of note within each survey area have been assigned letters which are shown on the interpretation diagrams.

Site 7: Field and stone near Afon Caradog

An area of 120m x 40m was surveyed, the location and results are shown on Figs 1, 2 and 3. The X-Y trace shows low pass filtered data. This process removes high frequency noise, allowing large, low magnitude anomalies to be viewed more clearly.

The double linear anomaly (A, Fig. 3c) towards the centre of the survey area is visible on the ground as a ploughed out field bank. A ditch associated with the boundary was presumably also detected here. The feature is in total 9m wide, representing a substantial boundary and is in rough alignment with the field margin to the south-south-west.

A similar 7m wide anomaly (B, Fig. 3c) at the west of the survey area is not visible on the ground. This is not quite parallel to anomaly A and is not in alignment with any surviving field boundaries.

A further faint double linear anomaly (C, Fig. 3c) can be seen to cross anomaly B and probably represents another ploughed out bank and ditch.

High responses D (Fig. 3c) were due to the proximity of wire fence.

Ferrous responses E and F (Fig. 3c) are typical 'iron spikes' caused by buried pieces of iron.

Recommendations: *Several linear anomalies, possibly ploughed out field boundaries, were detected. These features are of interest as they are very close together and not all aligned with the modern field margins. The presence of a parish boundary stone in the vicinity suggests that they may not be simple field boundaries. Trial trenching across the line of the anomalies is recommended in order to further assess their significance.*

Site 8: Well and field near Holy Rood church

An area of 60m x 40m was surveyed although dummy readings were entered where the field sloped towards a stream at its north-east corner (Figs. 4 and 5).

Low frequency responses of geological origin were observed across the whole of the surveyed area. Nothing of archaeological interest was identified.

Recommendations: *No anomalies of archaeological significance were identified but low frequency natural responses could have masked low magnitude features. Trial excavation in the vicinity of the well is recommended.*

Site 13: Standing stone near Tre'r Gof

An area of 40m x 40m was surveyed around the standing stone (Figs. 6 and 7). A pronounced ridge of igneous rock runs across the centre of the site. Dummy readings were entered where the rock had been quarried away forming a steep scoop that was unsuitable for survey. The responses were noisy across the whole of the site, particularly in the region of the outcrop (A, Fig. 7c). The trace plot shows data low-pass filtered to minimise the effects of background noise.

A strong linear response (B, Fig. 7c) was detected running diagonally from the eastern corner of the site. This could be seen on the ground as a slight water filled depression and may be a ploughed out field boundary.

Recommendations: *The area around the stone was very noisy and provided little useful data. One anomaly, best interpreted as a ploughed out field boundary, was identified. This feature should be investigated by trial excavation. Limited trial excavation should be conducted around the base of the stone to ascertain the archaeological status of the stone.*

Site 1a: Circular features near Bodhenlli

Several weeks of unusually wet weather rendered this site unsuitable for detailed survey. The ground was totally waterlogged and standing water was present across the whole of the area designated for survey. Rapid scanning revealed the presence of anomalies of possible archaeological interest but it was not possible to continue with a detailed survey.

Recommendations *The anomalies detected by scanning need to be further examined by geophysical survey and trial excavation.*

Sites 2a and 3a: Mound and stone west of Cefncwmwd

A 120m x 60m area was originally designated for survey. The south-western edge of the field including the area around site 2a was waterlogged and had been severely disturbed by cattle and vehicles to a depth of about 0.5m. This area of 20m x 80m was not suitable for survey. The rest of the area was surveyed and the location and results are presented in Figs 8, 9 and 10.

The data for the dot density plot was compressed allowing both high and low magnitude features to be visible at the same time.

The extensive anomalies (A, Fig. 10c) at the north-west of the area are geological in origin and are strong enough to mask archaeological features. A ploughed out field bank, visible on the ground, was not detected in this area.

Anomaly B (Fig. 10c) just to the south of the geological feature is best viewed on the X-Y trace. This is visible on the ground as a low mound. The magnetic response from this feature is comparable with that of a number of burnt mounds surveyed in Shetland and Orkney (Hunter and Dockrill, 1990).

The ferrous responses (C, Fig. 10c) at the far south-east of the site are due the proximity of the fence line.

The remaining ferrous response (D, Fig. 10c) is a typical 'iron spike' caused by a piece of buried iron.

Recommendations *A typical burnt mound response was identified in this area beneath the recumbent stone (site 3a). Burnt mound site 2a and its environs were not surveyed as much of the area was under water. The north-western end of the survey area was very noisy, effectively masking any potential archaeological responses.*

The positive result from the geophysical survey, and the identification of 3a as another burnt mound requires that sites 2a and 3a are re-classified as Category B in importance (See GAT Report No. 103 for a definition). Total excavation of the burnt mounds is recommended. In addition, further geophysical survey combined with trial trenching is recommended to identify the limits of the archaeology around the mounds.

Site 4a: Circular feature near Cefncwmwd

An area of 40m x 40m was surveyed, the location and results are shown on Figs. 11 and 12.

A very strong anomaly (A, Fig. 12c) consistent with an iron pipe was detected at the north-east of the site. No further features were identified.

Recommendations: *Although no archaeological anomalies were identified by the geophysical survey, the overall level of background noise may have prevented the identification of archaeological features. A trial trench across the line of the feature is recommended to ascertain its archaeological significance.*

Site 7a: Circular feature near Cefncwmwd

An irregular area comprising 19 20m x 20m grids was surveyed (Figs 11, 13, 14 and 15). The surveyed area slopes from west to east. The magnetic responses were generally noisy as the topsoil was shallow and the bedrock close to the surface. The presence of two ferrous pipelines (A and B, Fig. 15c)) rendered certain areas unsuitable for survey.

A faint linear anomaly (C, Fig. 15c) crosses the upper part of the survey area. This may be of archaeological interest, but considering its association with a broad band of increased noise (D, see below), a natural/pedological origin cannot be ruled out.

A broad curvilinear band of increased noise (D and E, Fig. 15c) crosses the upper half of the survey area. A small rock outcrop was observed in this area so it can be assumed that this anomaly is of geological origin.

Recommendation: *One faint, possibly archaeological anomaly was detected in this area. A trial trench cut across the feature should be sufficient to identify its archaeological potential. This does not relate directly to the feature originally noted on aerial photographs, and so this feature should also be investigated by trial trenching.*

4.0 SUMMARY

A number of anomalies of archaeological interest were identified, the principal ones being linear features at 7a, and the identification of 3a as a burnt mound. This latter identification requires the re-classification of sites 2a and 3a from Class E to Class B, and recommendations are made for full excavation of these sites. Most of the sites exhibited fairly high levels of background noise, and it should be noted with this level of background noise a gradiometer survey cannot be expected to identify all archaeological features in a given area. It is therefore recommended that trial excavation is carried out on all sites to assist archaeological interpretation.

5.0 BIBLIOGRAPHY

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Gwynedd Archaeological Trust, Report No 103, *A5 Anglesey Improvements - Stage 2 - A5114 Nant Turnpike to West of Bryngwran, Modified Preferred Route from Llangristiolus to N of Bodhenlli. Archaeological Assessment*

Gwynedd Archaeological Trust, Report No 116, *A5 Anglesey Improvements Stage 2 - A5114 Nant Turnpike to West of Bryngwran, Ground Investigation - Trial Trenches Archaeological Attendance (G1240)*

Hunter, J.R. and Dockrill, S.J., 1990 'Recent Research into Burnt Mounds on Fair Isle, Shetland and Sanday, Orkney', in V. Buckley (ed) *Burnt Offerings: International Contributions to burnt mound archaeology,* 62-68

LIST OF FIGURES

LIST OF FIGURES

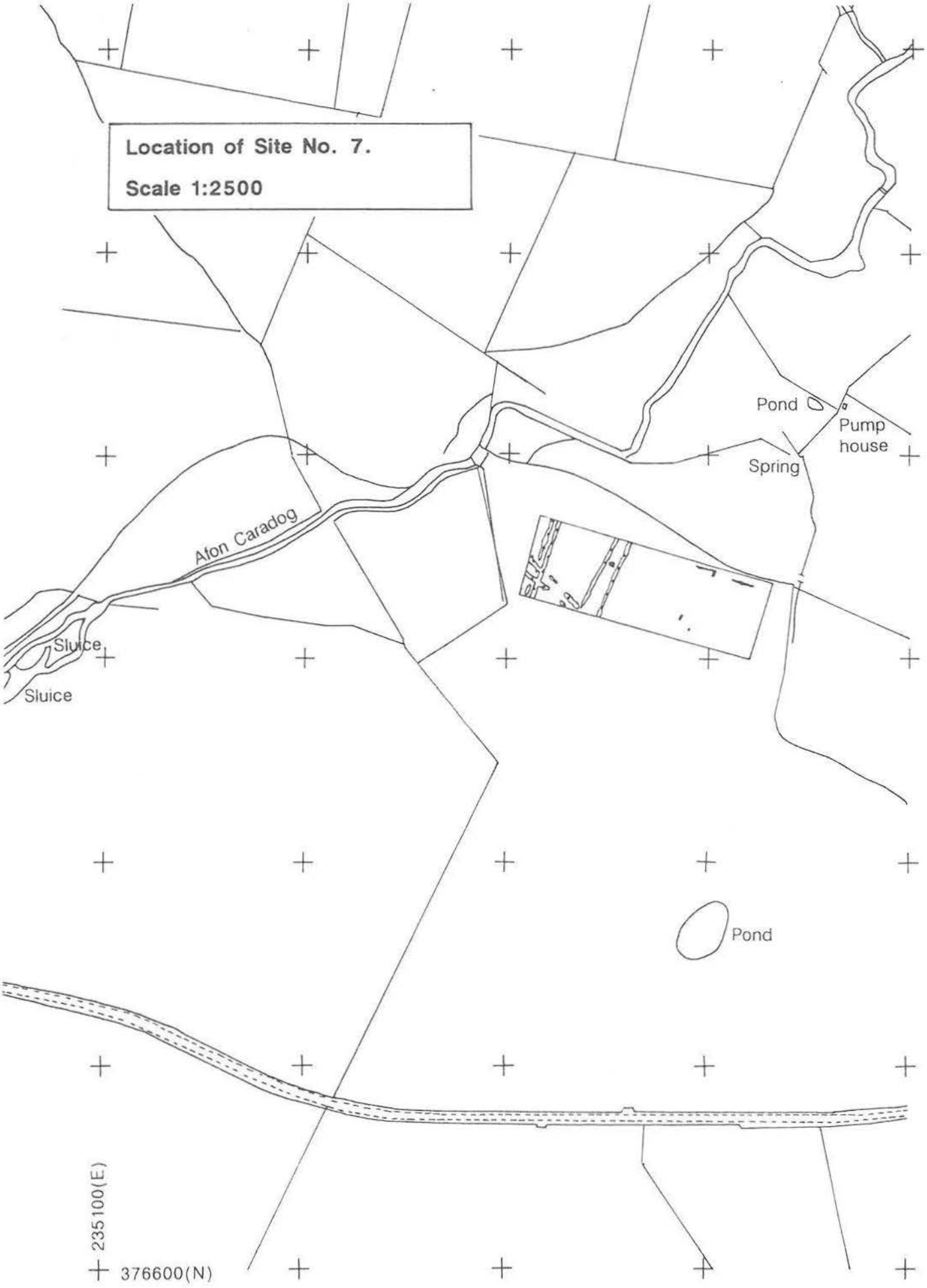
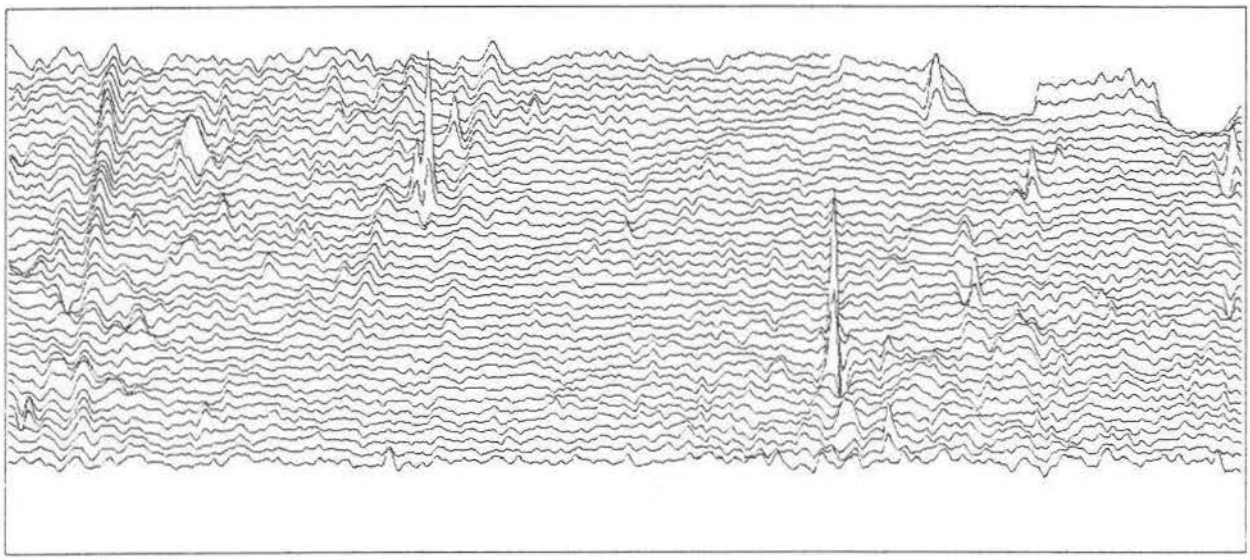

Location of Site No. 7.
Scale 1:2500
Pond
Pump house
Spring
Afon Caradog
Sluice
Sluice
Pond
235100(E)
376600(N)

Fig. 1

Site	Field & stone nr Afon Caradog
Site No.	7
Trace Plot	a.
Dot-Density Plot	b.
Interpretation Diagram	c.
Resolution (Trace)	15.3nT/cm

0 50m



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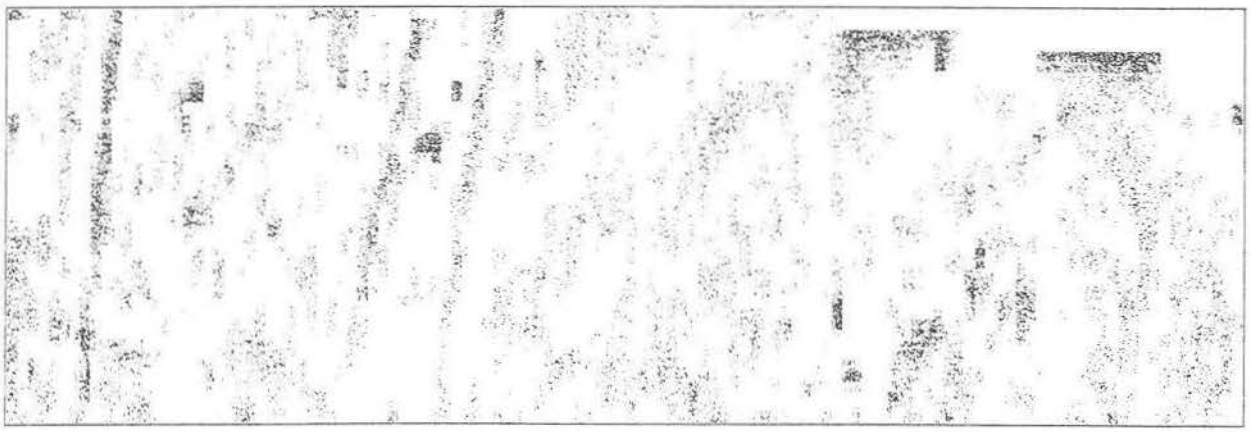
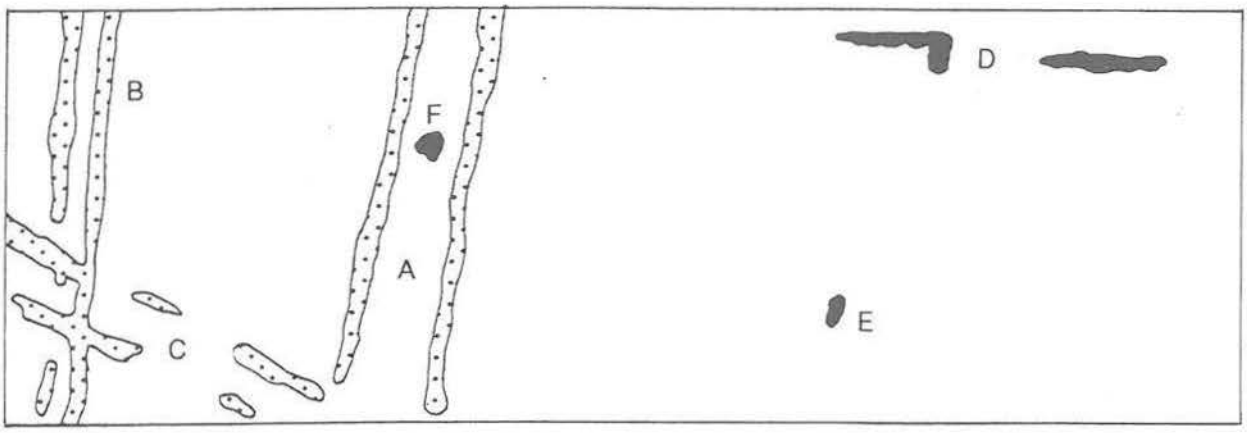


b.

Fig. 2



c.

0 50m

Geology

Ferrous

Archaeology

Area of increased noise

Fig 3

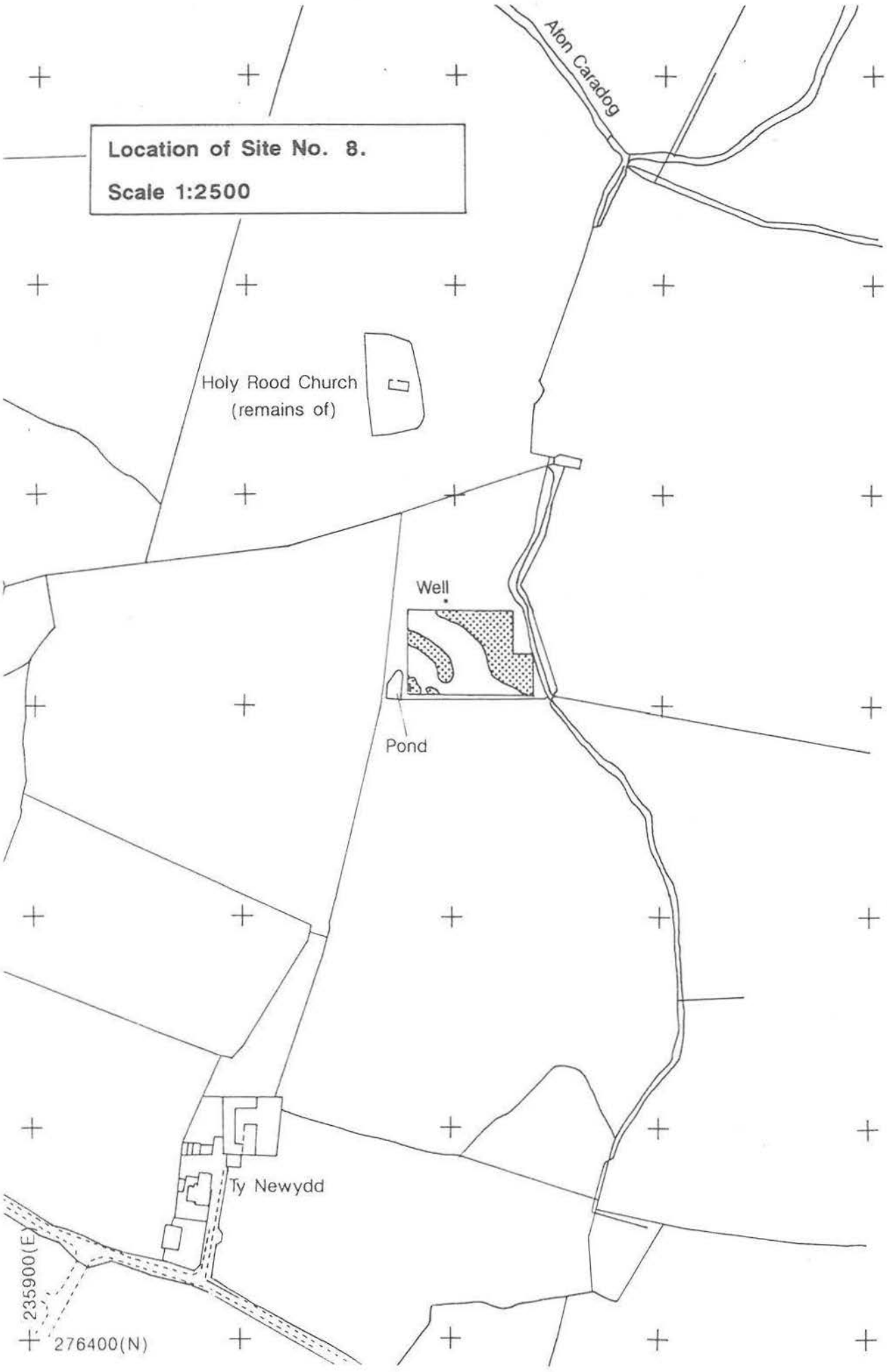
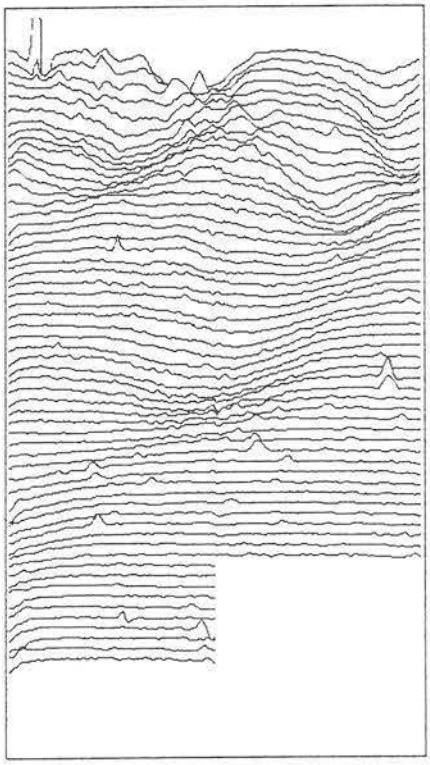

Location of Site No. 8.
Scale 1:2500
Afon Caradog
Holy Rood Church
(remains of)
Well
Pond
Ty Newydd
235900(E)
276400(N)

Fig. 4

Site	Well & field nr Holy Rood Church
Site No.	8.
Trace Plot	a.
Dot-Density Plot	b.
Interpretation Diagram	c.
Resolution (Trace)	246nT/cm

0 50m



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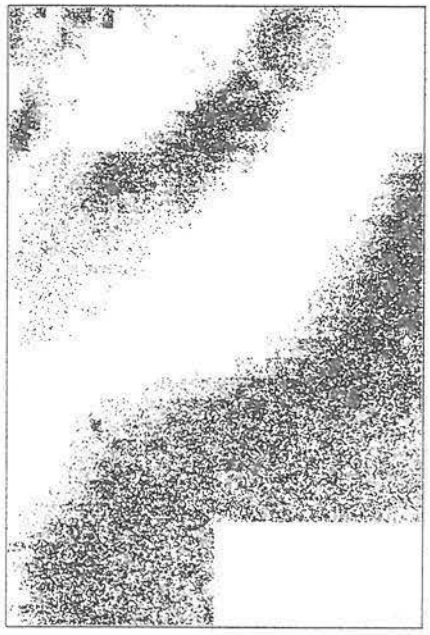

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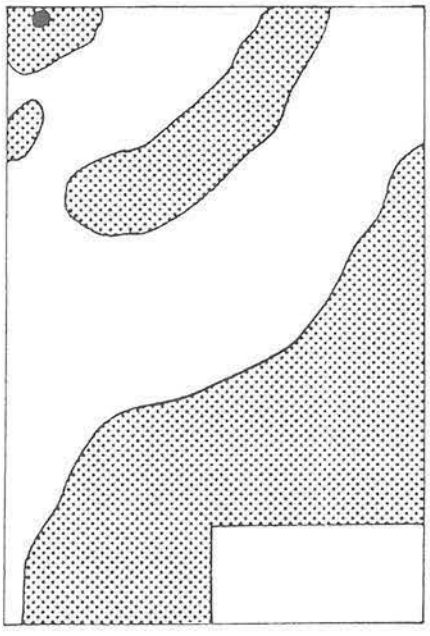


c.

Geology

Ferrous

Archaeology

Area of increased noise

Fig. 5

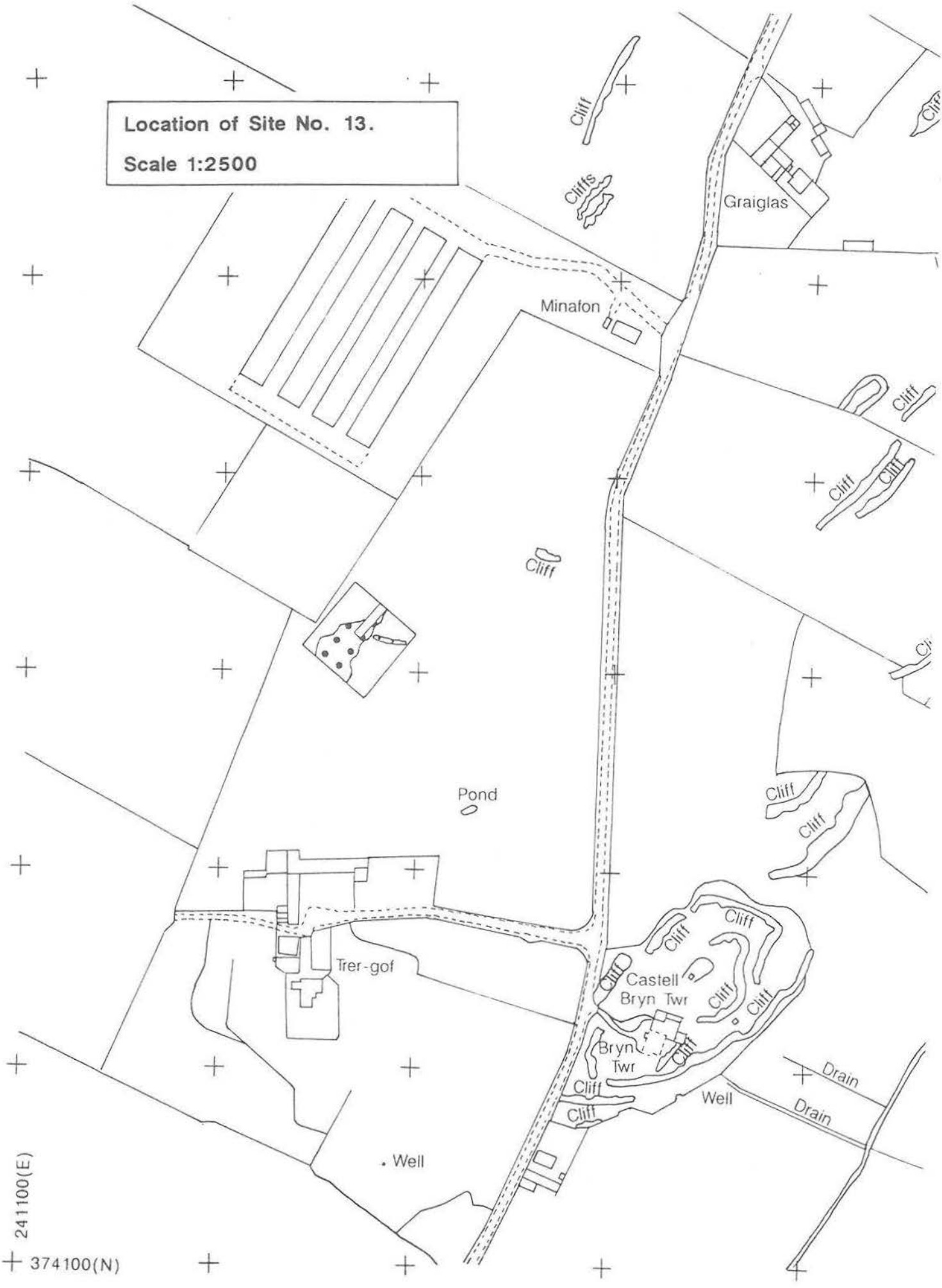
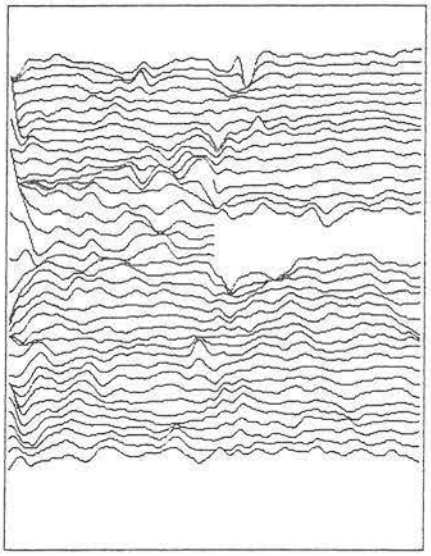

Location of Site No. 13.
Scale 1:2500
Cliff
Cliffs
Graiglas
Minafon
Cliff
Cliff
Cliff
Cliff
Pond
Cliff
Cliff
Trer-gof
Cliff
Cliff
Cliff
Castell
Bryn Twr
Cliff
Cliff
Bryn
Twr
Cliff
Cliff
Cliff
Well
Drain
Drain
Well
241100(E)
374100(N)

Fig.6

Site	Standing stone nr Trer-gof
Site No.	13.
Trace Plot	a.
Dot-Density Plot	b.
Interpretation Diagram	c.
Resolution (Trace)	15.3nT/cm



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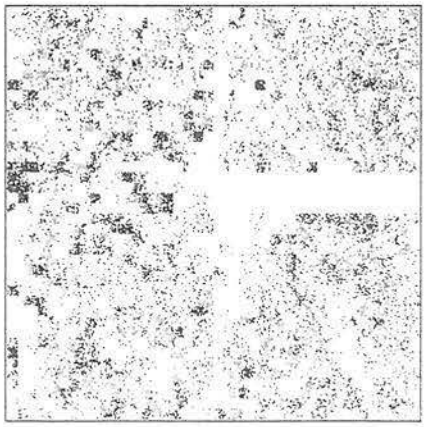

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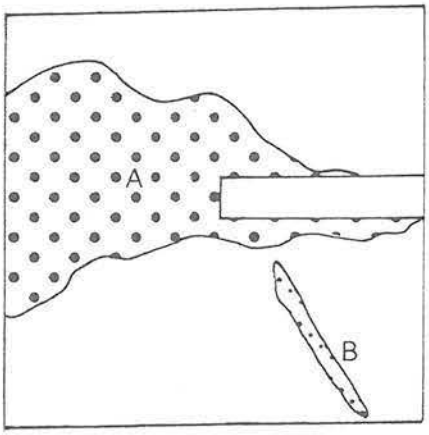


c.

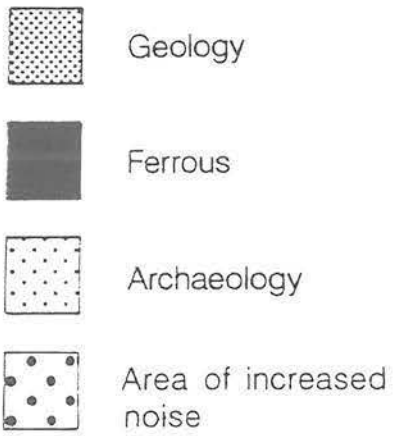


Fig. 7

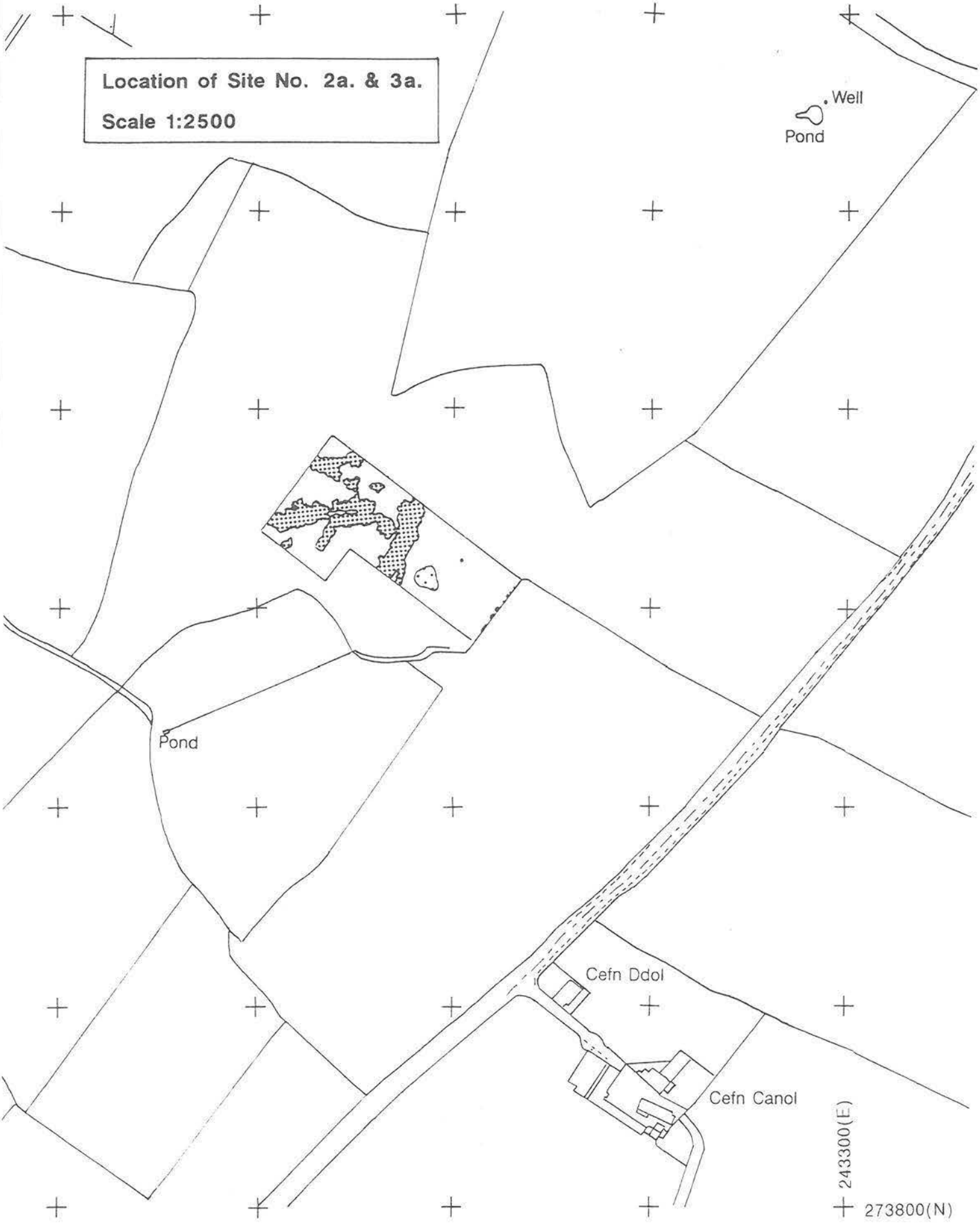
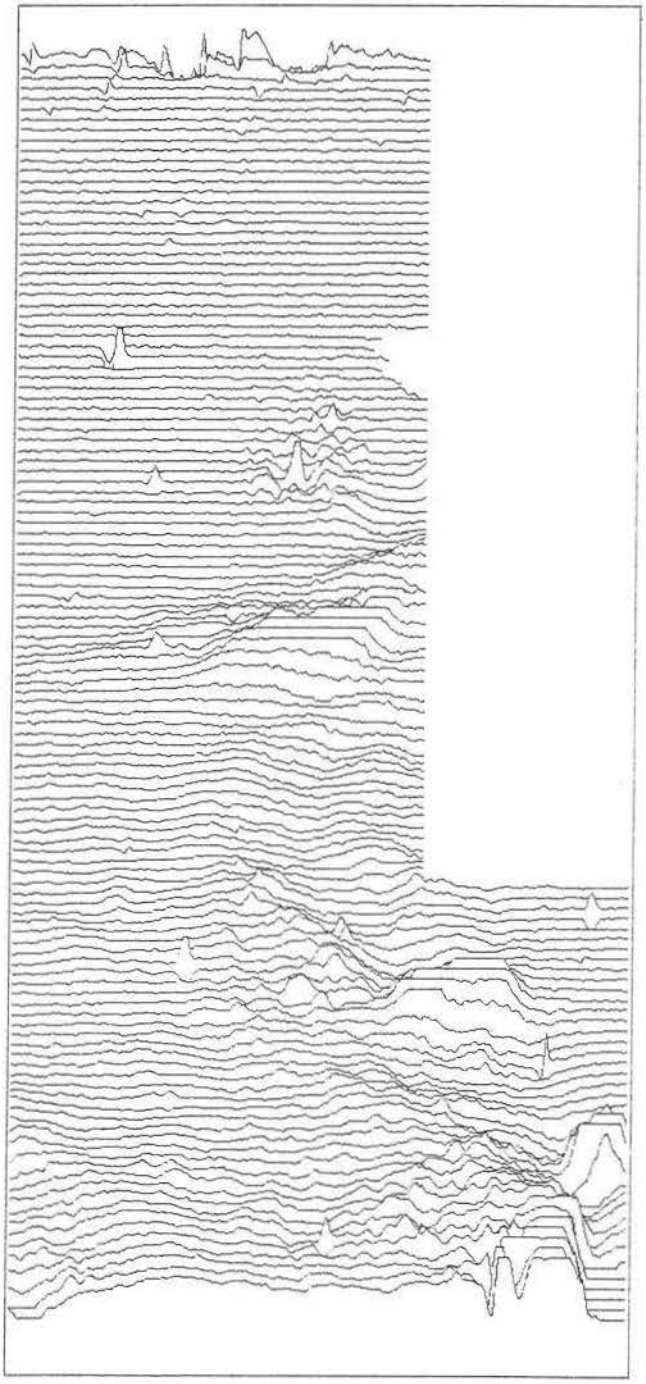
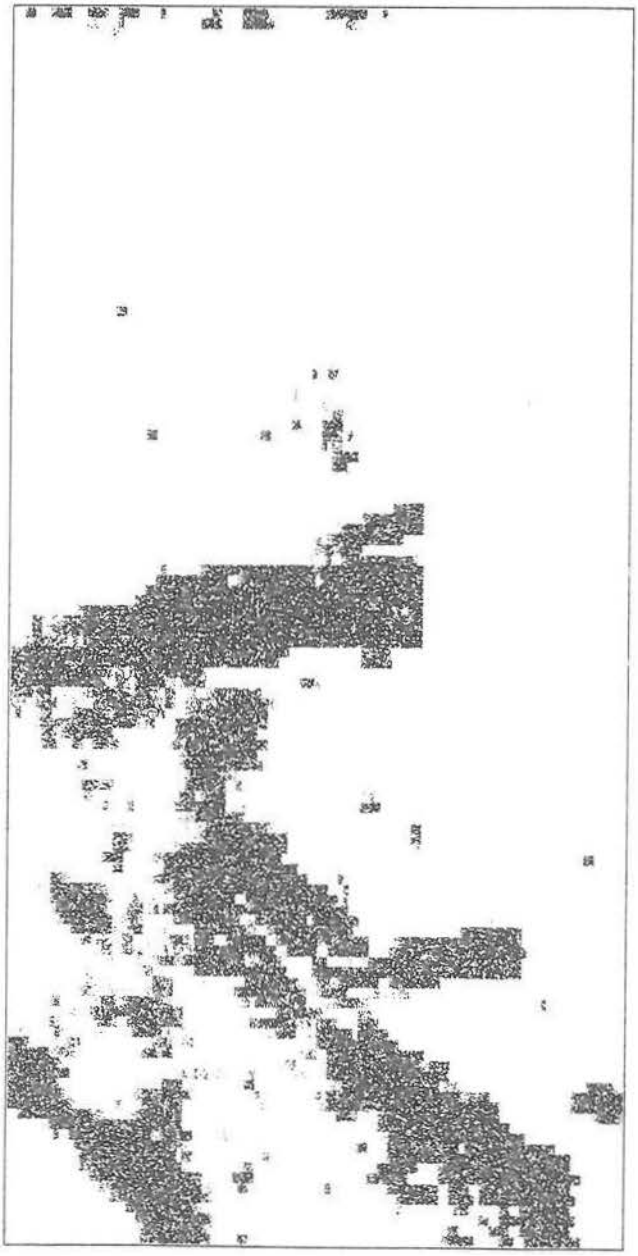

Location of Site No. 2a. & 3a.
Scale 1:2500
Well
Pond
Pond
Cefn Ddol
Cefn Canol
243300(E)
273800(N)

Fig.8

Site	Mound & Stone W. of Cefncwmwd
Site No.	2a. and 3a.
Trace Plot	a.
Dot-Density Plot	b.
Interpretation Diagram	c.
Resolution (Trace)	113nT/cm



a.



b.

Fig. 9

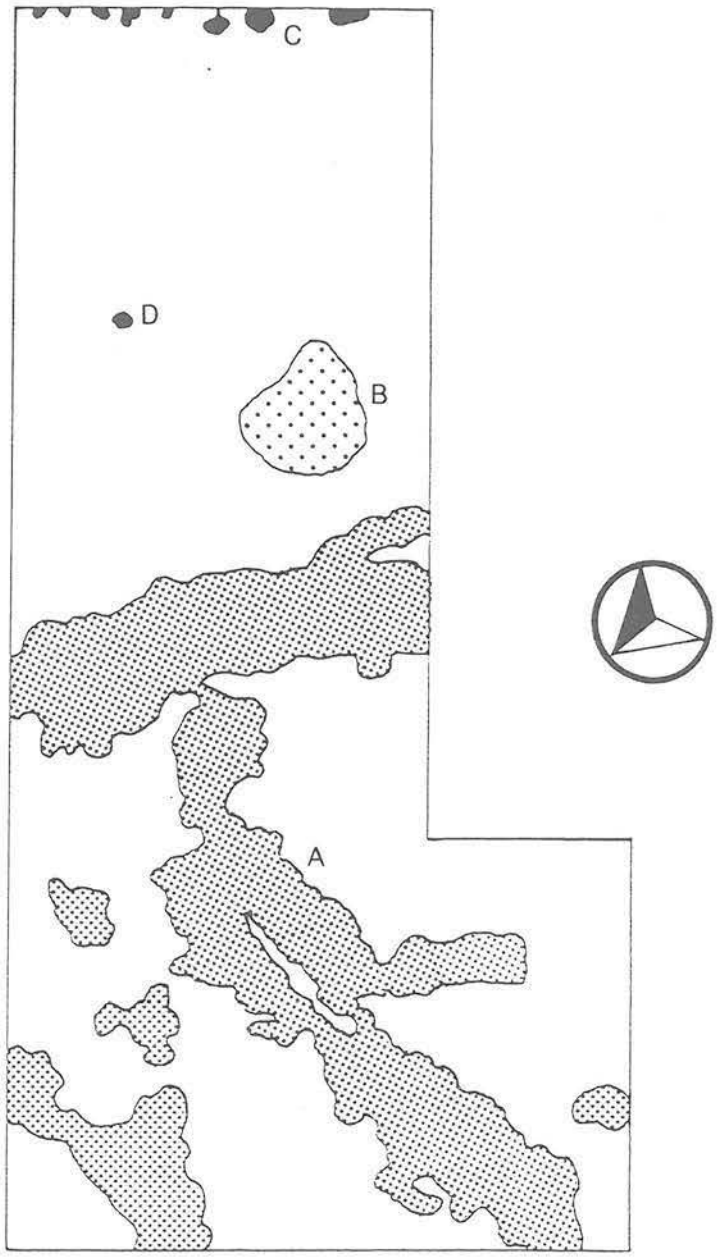

C
D
B
A
c.
0
50m
Geology
Ferrous
Archaeology
Area of increased noise

Fig. 10

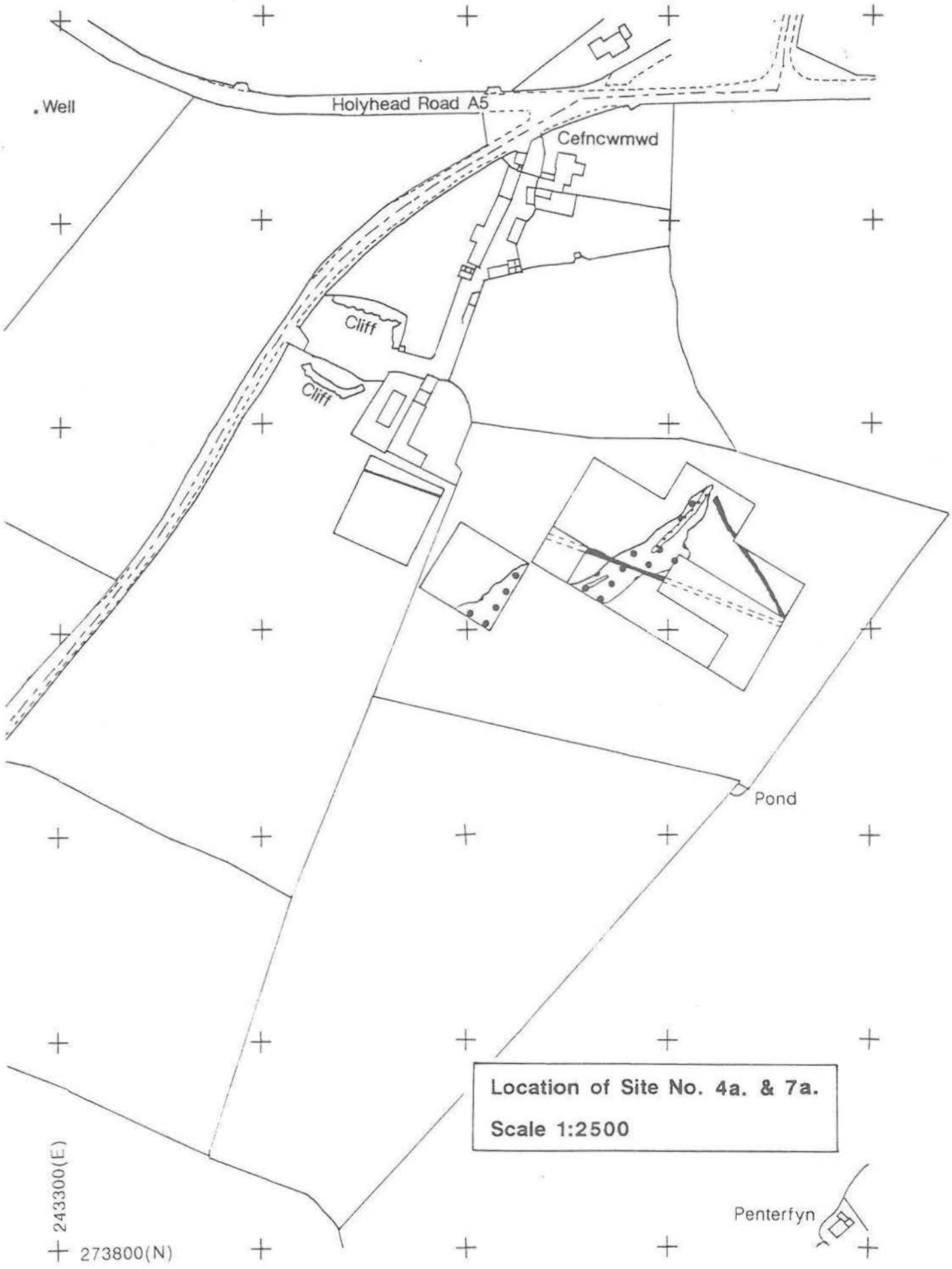
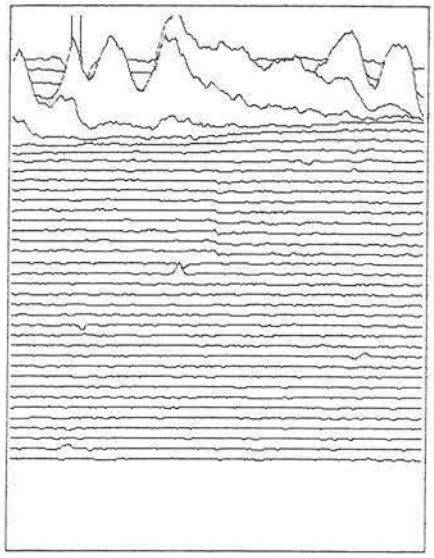

Well
Holyhead Road A5
Cefncwmwd
Cliff
Cliff
Pond
Location of Site No. 4a. & 7a.
Scale 1:2500
243300(E)
273800(N)
Penterfyn

Fig. 11

Site	Circ. feature nr Cefncwmwd
Site No.	4a.
Trace Plot	a.
Dot-Density Plot	b.
Interpretation Diagram	c.
Resolution (Trace)	305nT/cm

0 50m



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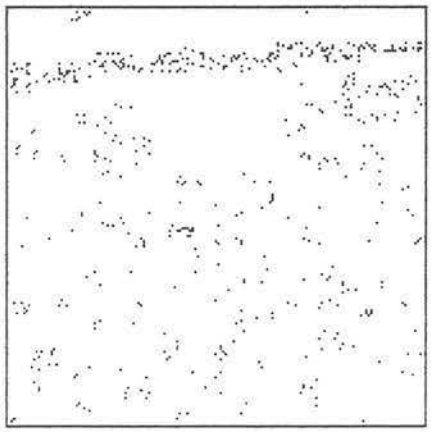

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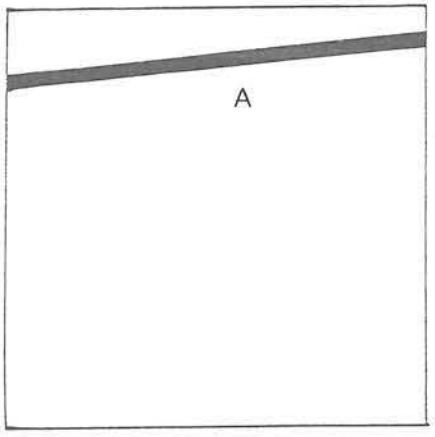

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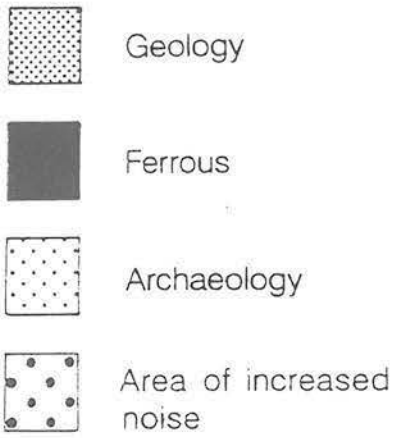
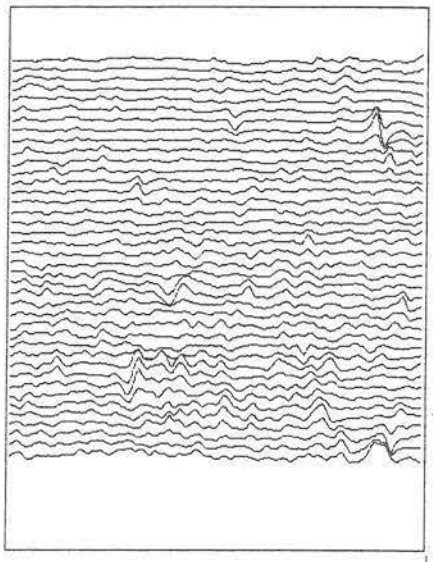


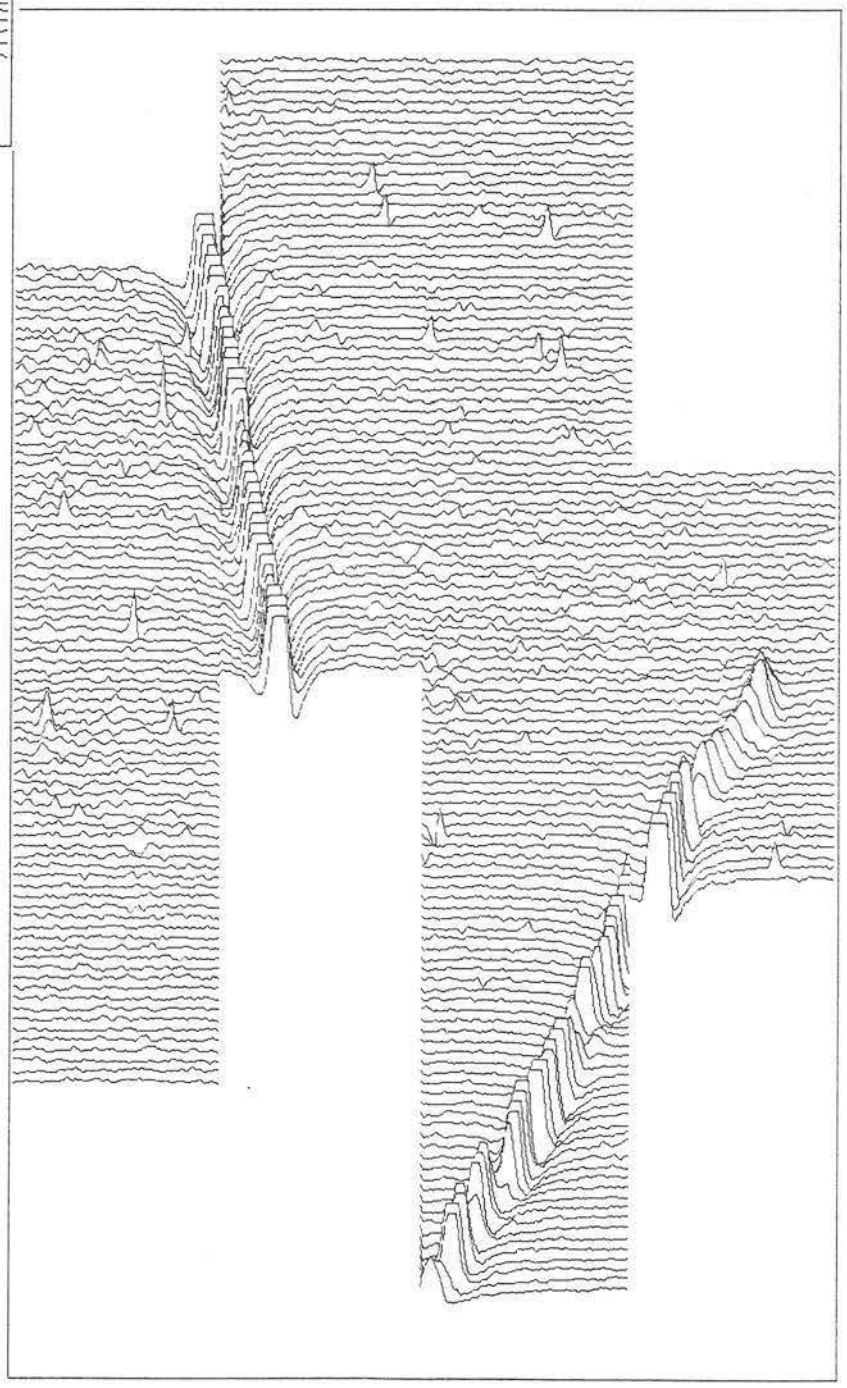
Fig. 12

Site	Circular feature nr Cefncwmwd
Site No.	7a.
Trace Plot	a.
Dot-Density Plot	b.
Interpretation Diagram	c.
Resolution (Trace)	i) 89.6nT/cm
	ii) 40.7nT/cm

0 50m

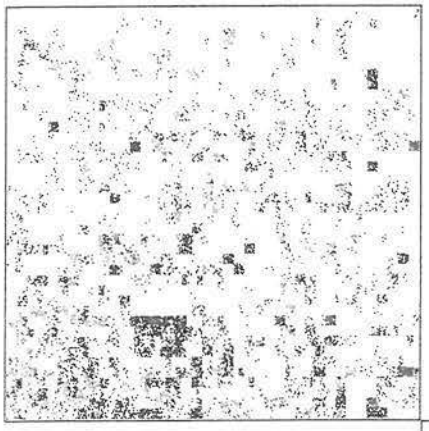


a. ii)



a. i)

Fig. 13



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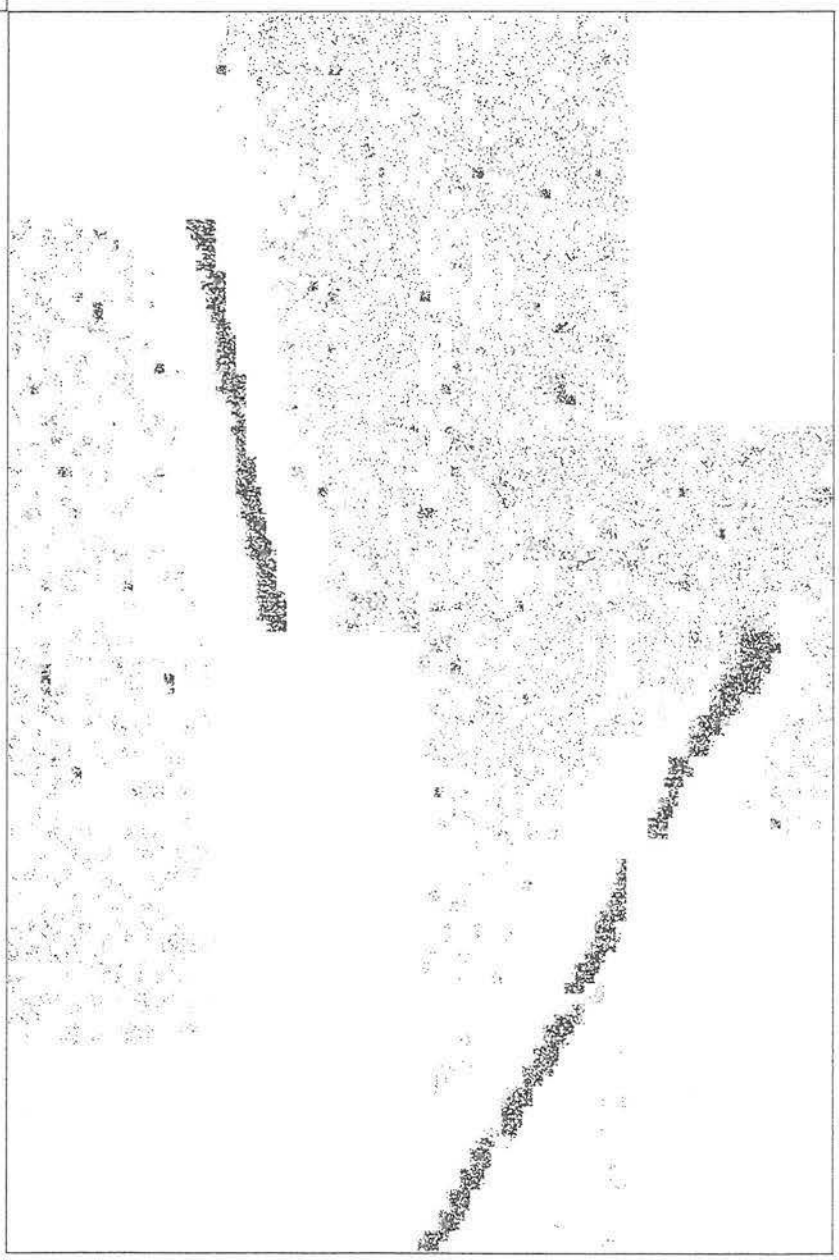

b.

Fig. 14

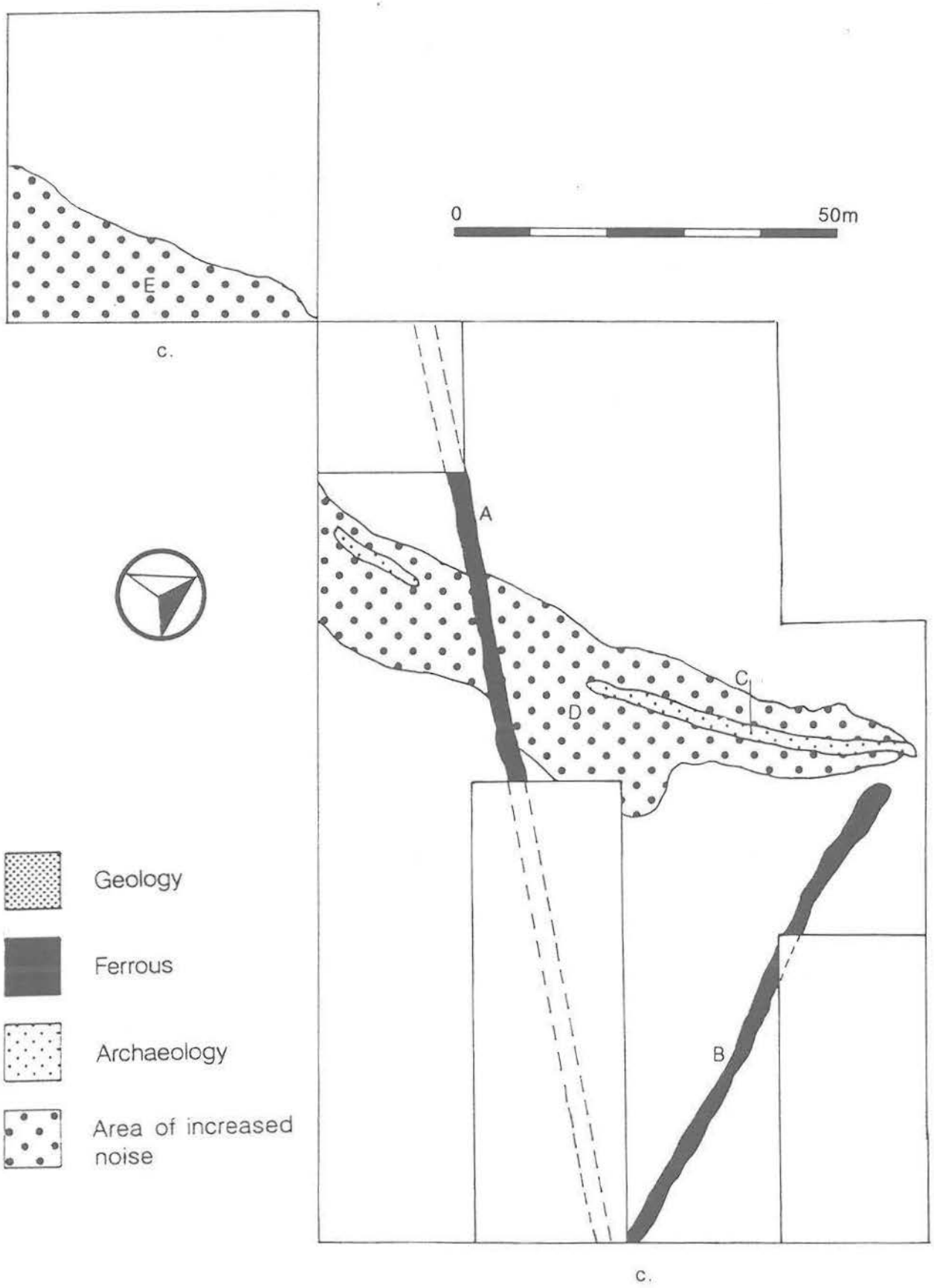
0
50m
E
c.
A
C
D
B
c.
Geology
Ferrous
Archaeology
Area of increased noise

Fig. 15