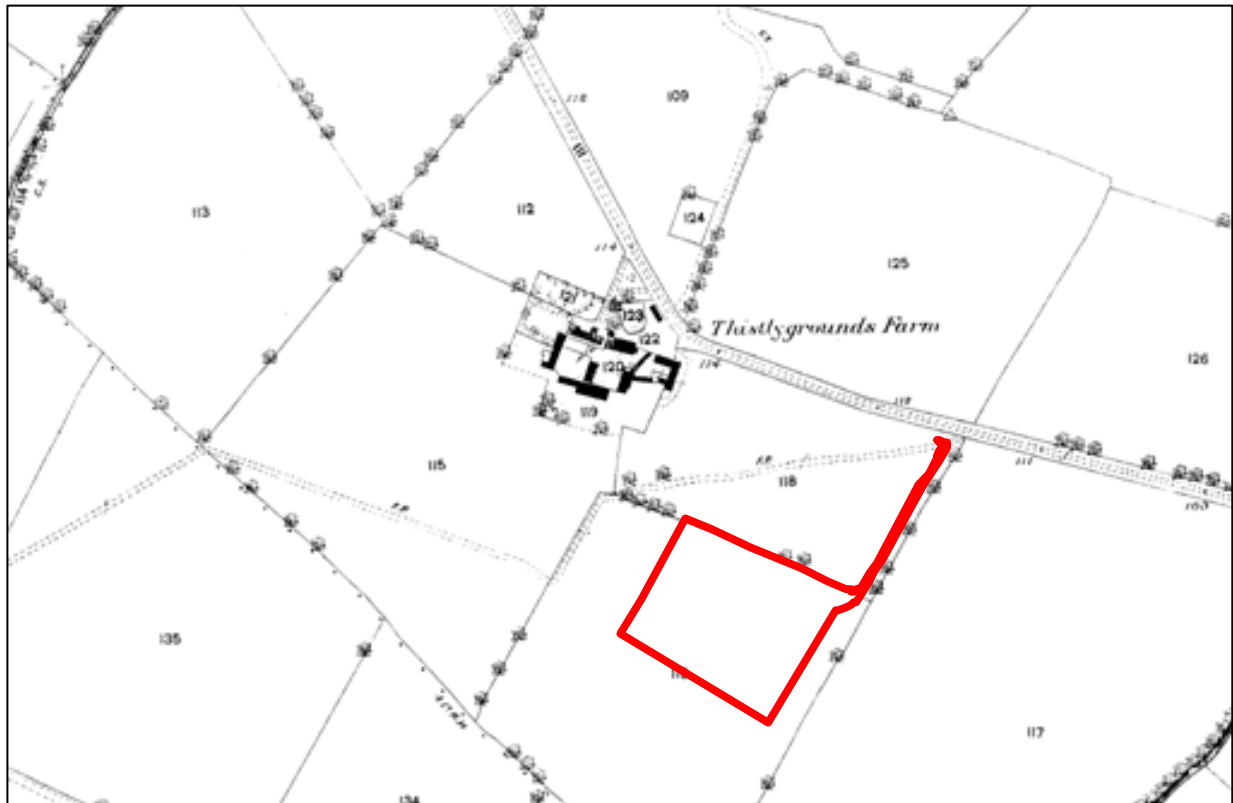


ARCHAEOLOGICAL EVALUATION REPORT:
GEOPHYSICAL SURVEY BY MAGNETOMETRY ON LAND AT EYEWORTH LODGE FARM, EYEWORTH,
BEDFORDSHIRE

NGR: TL 2572 4391
AAL Site Code: EYLF 14
Museum Accession Number: BEDFM 2014.07
OASIS Reference Number: allenarc1-174879



Report prepared for Ian Pick Associates

By
Allen Archaeology Limited
Report Number AAL2014026

March 2014



Allenarchaeology



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Executive Summary

- A geophysical survey by magnetometry was undertaken by Allen Archaeology Limited for Ian Pick Associates on a c.1.8ha area at Eyeworth Lodge Farm, Bedfordshire to support a planning application for the construction of proposed broiler units.
- The site is located in agricultural land southeast of the farm and south of Northfield Road, centred on NGR TL 2572 4391. There is sparse evidence for later prehistoric activity in the vicinity of the site, and earthworks indicative of medieval settlement and agriculture have been recorded in the area.
- The survey did not identify any anomalies of potential archaeological interest. Running west-northwest to east-southeast across the site were a series of parallel positive anomalies that most likely represent modern field drains. Along the northeastern and southeastern borders of the site were areas of magnetic noise that relate to detritus accumulating around the current field boundaries.
- The survey suggests that the site has always been either disused or agricultural land, and as such the construction of broilers is likely to have a negligible effect on the archaeological resource.

1.0 Introduction

- 1.1 A geophysical survey using magnetometry was undertaken by Allen Archaeology Limited for Ian Pick Associates on land at Eyeworth Lodge Farm, Eyeworth, Bedfordshire to support a planning application for the construction of proposed broiler units.
- 1.2 The site works and reporting conform to current national guidelines, as set out in '*Geophysical Survey in Archaeological Field Evaluation*' (English Heritage 2008), '*The Use of Geophysical Techniques in Archaeological Evaluations*' (IFA Paper 6), the Institute for Archaeologists '*Standard and guidance for archaeological geophysical survey*' (IfA 2010), and a specification prepared by this company (AAL 2014).
- 1.3 The documentary archive for this scheme will be deposited with Bedford Museum within 12 months from completion of the report, where it will be stored under the museum accession code BEDFM 2014.07.

2.0 Site Location and Description

- 2.1 Eyeworth is located in the administrative district of Central Bedfordshire Council, approximately 20km east-southeast of central Bedford. Eyeworth Lodge Farm is c.1.8km south of the village, with the site located in agricultural land southeast of the farm and south of Northfield Road, centred on NGR TL 2572 4391.
- 2.2 The site is situated on a bedrock geology of Gault Formation Mudstone, with no superficial deposits of recorded (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>).

3.0 Planning Background

- 3.1 The proposed development entails the construction of new broiler units and associated access on former agricultural land at Eyeworth Lodge Farm, for which a planning application has not yet been submitted. During pre-planning consultation the Archaeologist at Central Bedfordshire Council advised for a programme of archaeological evaluation by trial trenching prior to determination of the application, in order to provide further information concerning the archaeological potential of the proposed development area, and to allow the planning authority to establish appropriate measures to mitigate the effect of the proposed development upon the archaeological resource. Prior to undertaking these works, the client has opted to commission a programme of geophysical survey in order to inform any subsequent trial trenching that may be necessary.
- 3.2 The approach adopted is consistent with the recommendations of the current National Planning Policy Framework (NPPF), with the particular chapter of relevance being '*Chapter 12: Conserving and enhancing the historic environment*' (Department for Communities and Local Government 2012).

4.0 Archaeological and Historical Background

- 4.1 A search of the Central Bedfordshire Historic Environment Record (hereafter CBHER) was undertaken for a 500m radius from the centre of the site to inform the archaeological setting of the proposed development area.
- 4.2 There is only limited evidence for archaeological activity predating the medieval period in the vicinity of the site. A late Iron Age cheek piece has been found c.500m to the east (Hertfordshire Historic Environment Record Reference 2842) and cropmarks to the north of the site represent possible enclosures and linear features of later prehistoric date, although these have not been tested by excavation (CBHER References 16844 and 16845). The place name Eyeworth however derives from Old English and Anglian elements meaning 'island enclosure' and suggesting an area of land surrounded by marsh. In the Domesday Book of 1086, land was held in Eyeworth by William Speke and Adeliza de Grandmesnil. The lands of William Speke included a mill (Williams and Martin 2002).
- 4.3 Approximately 300m to the south-southeast, aerial photography has identified a series of rectilinear enclosures representing the site of Odeseth Grange, which was granted to the monastery of Warden by Richard I in the late 12th century (CBHER Reference 3913). Scatters of medieval pottery and building material have been recovered during fieldwalking of the area. To the north of Eyeworth Lodge Farm, are further cropmarks indicative of medieval ridge and furrow agriculture (CBHER Reference 8018).
- 4.4 The only other CBHER entry recorded in the study area is the site of a possible Dovecote, as suggested by field names on the 1865 post-Enclosure map, to the east of Eyeworth Lodge Farm (CBHER Reference 3900).

5.0 Methodology

- 5.0.1 The geophysical survey consisted of a detailed gradiometer survey of the entire development site, totalling approximately 1.8 hectares.
- 5.0.2 The fieldwork was carried out over a period of one working day, Monday 10th March 2014, by a team of two experienced geophysicists. The site was divided into 30m by 30m grids, established on site with reference to local fixed boundaries and accurately tied into the National Grid with Ordnance Survey base mapping using a Leica GS08 Net rover receiving RTK corrections.
- 5.0.3 The survey was undertaken using a Bartington Grad601-2 Dual Fluxgate Gradiometer with an onboard automatic DL601 data logger. This instrument is a highly stable magnetometer which utilises two vertically aligned fluxgates, one positioned 1m above the other. This arrangement is then duplicated and separated by a 1m cross bar. The 1m vertical spacing of the fluxgates provides for deeper anomaly detection capabilities than 0.5m spaced fluxgates. The dual arrangement allows for rapid assessment of the archaeological potential of the site. Data storage from the two fluxgate pairs is automatically combined into one file and stored using the onboard data logger.
- 5.0.4 Data collection was undertaken in a zigzag traverse pattern, using a sample interval of 0.25m and a traverse interval of 1m.

5.0.5 The fieldwork and reporting were carried out in accordance with the procedures in 'Geophysical Survey in Archaeological Field Evaluations' (English Heritage 2008) and 'The Use of Geophysical Techniques in Archaeological Evaluations: IfA Paper 6' (Gaffney et al. 2002).

5.1 Summary of Survey Parameters

5.1.1 Fluxgate Magnetometers

Instrument 1:	Bartington Grad601-2 Dual Fluxgate Gradiometer
Sample interval:	0.25m
Traverse interval:	1.00m
Traverse separation:	1.00m
Traverse method:	Zigzag
Resolution:	0.01 nT
Processing software:	Terrasurveyor 3.0.23
Surface conditions:	Short grass crop
Area surveyed:	1.8 ha
Date surveyed:	Monday 10 th March 2014
Data interpretation:	Robert Evershed

5.2 Data Collection and Processing

5.2.1 The grids were marked out using pre-programmed coordinates on the Leica GS08 Net rover. The collection of magnetic data using a north – south traverse pattern is preferable for a magnetic survey, as enhancements to the magnetic field caused by buried features is mapped increasingly stronger the closer the traverse direction can get to a magnetic north – south direction (Breiner 1999). On this occasion magnetic data was collected on a north-northeast – south-southwest alignment due to the orientation of the survey grids and the field. Data was collected by making successive parallel traverses across each grid in a zigzag pattern. Several key points of the survey grids were accurately tied into the National Grid with Ordnance Survey base mapping using a Leica GS08 Net rover receiving RTK corrections.

5.2.2 The data collected from the survey has been analysed using the current version of Terrasurveyor 3.0.23. The resulting data set plots are presented with positive nT/m values and high resistance as black and negative nT/m values and low resistance as white.

The data sets have been subjected to processing using the following filters:

- De-stripe
- Clipping
- De-staggering

5.2.3 The de-stripe process is used to equalise underlying differences between grids or traverses. Differences are most often caused by directional effects inherent to magnetic surveying instruments, instrument drift, instrument orientation (for example off-axis surveying or heading errors) and delays between surveying adjacent grids. The de-stripe process is used with care however as it can sometimes have an adverse effect on linear features that run parallel to the orientation of the process.

5.2.4 The clipping process is used to remove extreme data point values which can mask fine detail in the data set. Excluding these values allows the details to show through.

- 5.2.5 The de-staggering process compensates for data correction errors caused by the operator commencing the recording of each traverse too soon or too late. It shifts each traverse forward or backwards by a specified number of intervals.
- 5.2.6 Plots of the data are presented in processed linear greyscale (smoothed) with any corrections to the measured values or filtering processes noted, and as separate simplified graphical interpretations of the main anomalies detected.

6.0 Results

- 6.1 Across the entirety of the site, running roughly west-northwest to east-southeast were a series of parallel positive anomalies [1]. These produced readings that generally ranged from 1-4nT/m, although some peaked as high as 8nT/m. These most likely represent modern field drains.
- 6.2 Along the northeastern and southeastern borders of the site were areas of magnetic noise, producing readings of -20 – 40nT/m, with some spikes as high as +/-100nT/m. These areas represent modern waste/detritus accumulating along the field boundaries.
- 6.3 Scattered randomly throughout the site are a number of strong and weak dipolar responses [3]. The characteristic dipole response of pairs of positive and negative 'spikes' suggest near surface ferrous metal or other highly fired material in the ploughsoil.

7.0 Discussion and Conclusions

- 7.1 The survey did not identify any anomalies of potential archaeological interest.
- 7.2 The survey suggests that the site has always been either disused or agricultural land, with the only features noted being probable land drainage, and as such the proposed development is likely to have a negligible effect on the archaeological resource.

8.0 Effectiveness of Methodology

- 8.1 The non-intrusive evaluation methodology employed was appropriate to the scale and nature of the site surveyed, and has identified a negligible archaeological potential for the proposed development area. Magnetometry surveying was the prospection technique best suited to the identification of archaeological remains on the site. Other techniques would have required justification and may have proved too time consuming or cost-prohibitive.

9.0 Acknowledgements

- 9.1 Allen Archaeology Limited would like to thank Ian Pick Associates for this commission and Mr Peter Kendal for access to the land.

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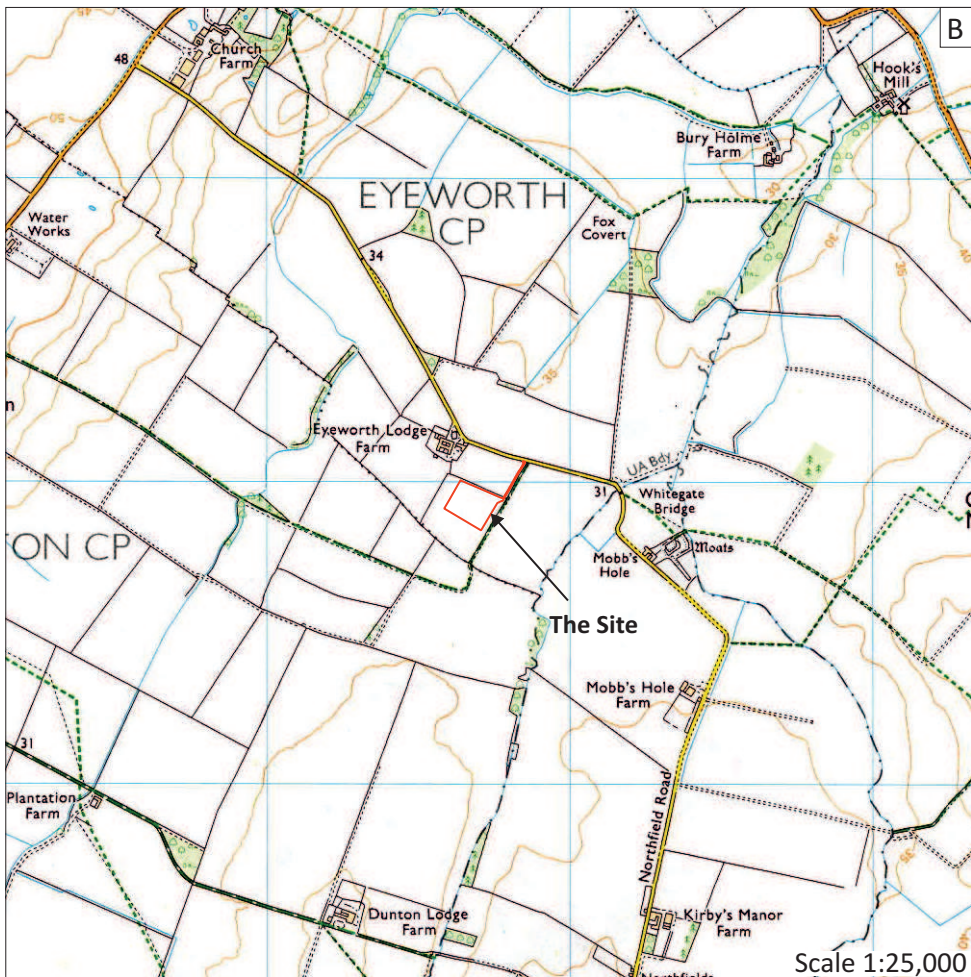
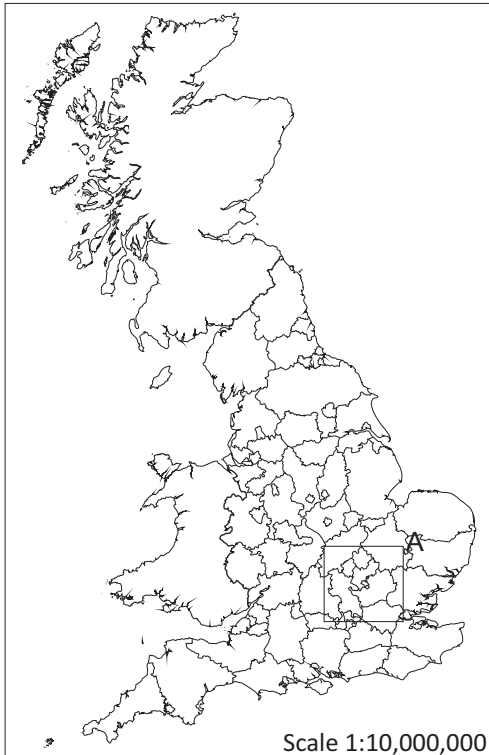


Figure 1: Site location outlined in red
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Drawn by	R Evershed
Date	17/03/2014

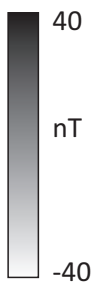
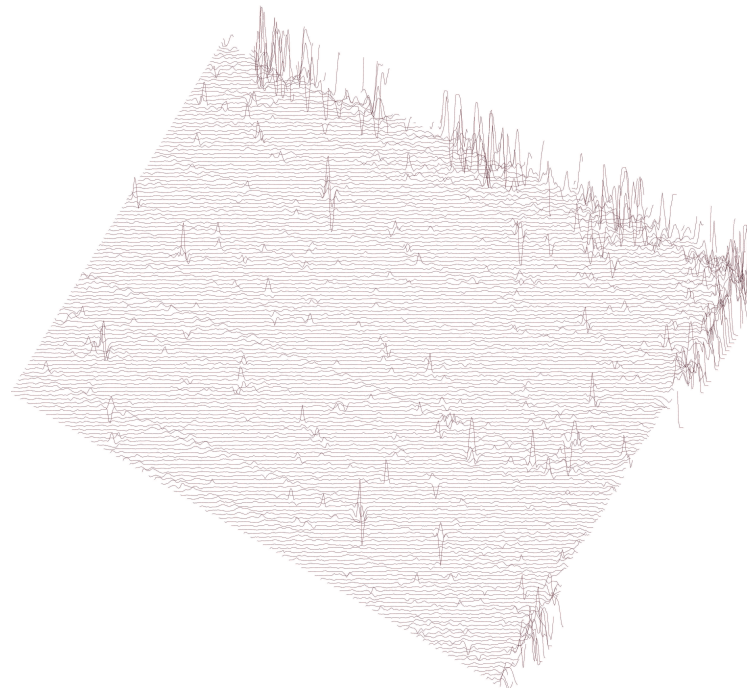
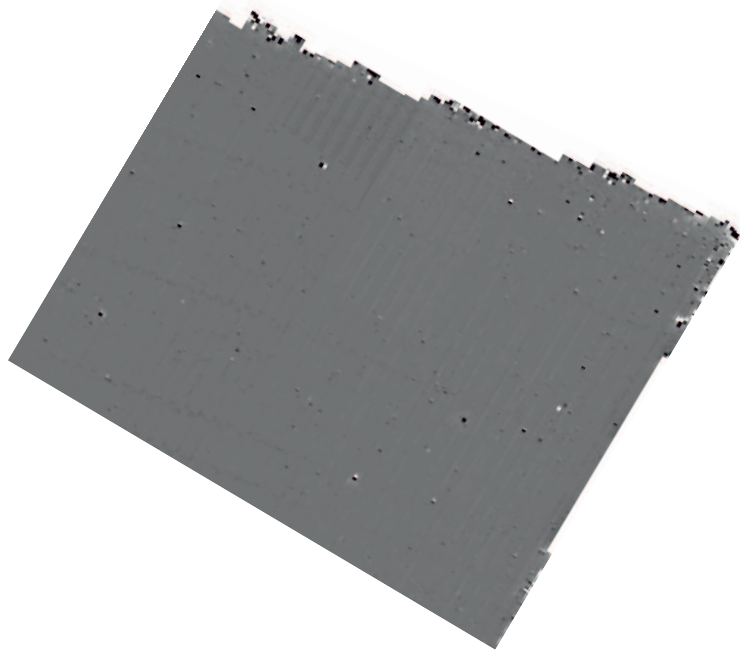
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Raw data (clipped to +/- 40 nT)

Trace Plot (ZMT and clipped to +/- 25nT)



25nT



Site Code	EYLF 14
Scale	1:2,000 @ A4
Drawn by	Robert Evershed
Date	17/03/14

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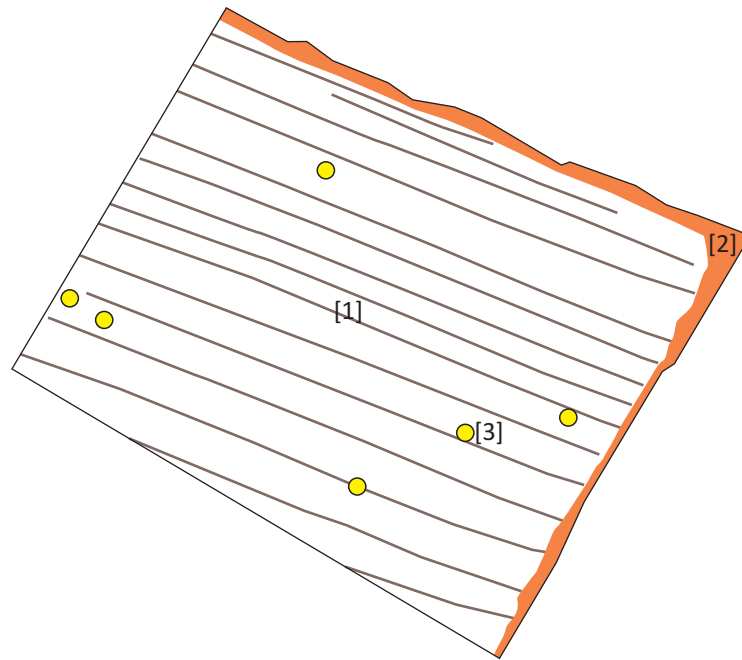
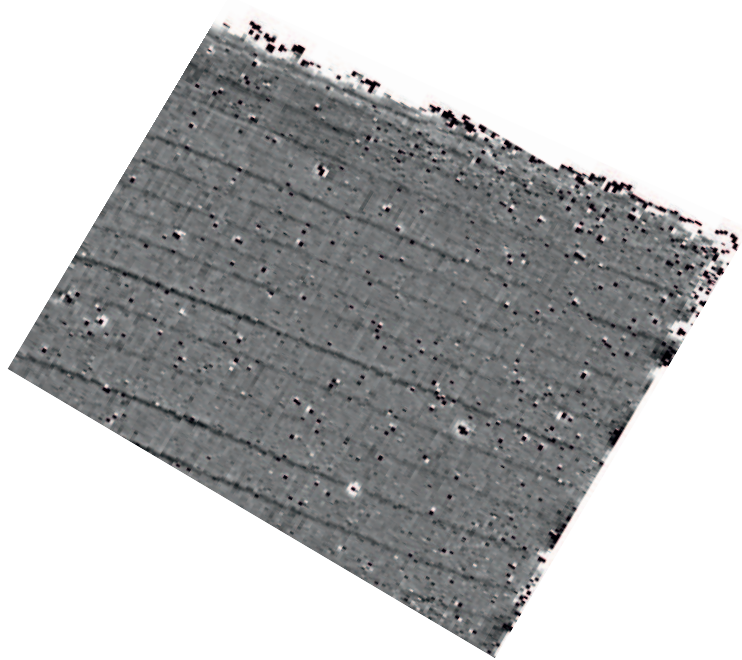
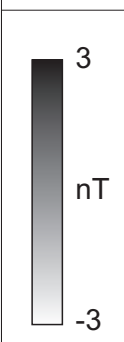
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Figure 2: Greyscale raw data and processed trace plot





Processed (ZMT and clipped to +/- 3 nT)

Interpretation of Survey Results



 Positive magnetic anomaly/field drain

 Area of magnetic noise

 Examples* of individual dipolar responses
Indicative of ferrous or highly fired material
*smaller responses omitted for clarity

Site Code	EYLF 14
Scale	1:2,000 @ A4
Drawn by	Robert Evershed
Date	17/03/14

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Figure 3: Processed greyscale plot of survey area with interpretation



Site Code	EYLF 14
Scale	1:2,000 @A4
Drawn by	Robert Evershed
Date	17/03/14

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Figure 4: Processed greyscale plot in real space



Positive magnetic anomaly/field drains



Area of magnetic noise



Examples* of individual dipolar responses

Indicative of ferrous or highly fired material
*smaller responses omitted for clarity

Site Code	EYLF 14
Scale	1:2,000 @A4
Drawn by	Robert Evershed
Date	17/03/14

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Figure 5: Interpretation plot in real space



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