PLANIT
restoring balance

Report on a fluxgate gradiometer survey carried out over land at Eastfield, Feoffee Common Lane, Barmby Moor, East Riding of Yorkshire

Date: 9 March 2020

Table of Contents

1 Table of figures

2 Report information

Client	Planit UXB Ltd
Report type	Fluxgate gradiometer survey
Place	Barmby Moor
County	East Riding of Yorkshire
Central grid reference	SE 76323 50364
Report number	GB 082
Site code	Site 1685
Date of fieldwork	03/03/2020
Date of report	08/03/2020
Fieldwork personnel	James Lyall & Andy Beaumont
Report by	James Lyall MA (Hons), MSc
Produced by	Geophiz.biz

3 Summary

3.1.1 James Lyall (of Geophiz.biz) was engaged by Planit UXB Ltd to undertake a fluxgate gradiometer survey over land at Eastfield, Feoffee Common Lane, Barmby Moor, in the East Riding of Yorkshire. The survey detected a number of services, some field drains and a large area of alluvial action. There were no obvious anomalies of potential archaeological origin.

4 Methodology

4.1 Technique

4.1.1 The survey was conducted using a *Sensys* MXPDA 5 probe fluxgate gradiometer. The machine logs data at 10cm intervals along a 50cm traverse, so 20 readings per square metre are achieved. The machine uses a GPS to locate each swath, so no grids are required.

4.1.2 The sensitivity of the machine was set to detect magnetic variation in the order of 0.1 nanoTesla (nT).

4.1.3 Survey in the field, report production and archiving were conducted and prepared using the most up to date guidelines, as laid out in David et al (2008) and Schmidt (2013). The survey grid location was logged using a Trimble R8 RTK GPS system.

4.1.4 The data from the magnetometer has been downloaded using Sensys DLMGPS software, and processed and presented using G-Sys (a proprietary Geographic Database Management program which can also display, process and present digitised plans and images). This report was produced using Microsoft Word 2010 and Adobe Photoshop 7 for further image manipulation. All maps have north pointing to the top of the page, and Google Earth images are used for some of the background map locations.

4.2 Area surveyed

4.2.1 The site requested for survey was composed of a grassed area known as Eastfield to the east of Feoffee Common Lane, bounded by hedges and wire fences. The site is located some 1.8km to the north-west of Barmby Moor (see Figure 1 and Figure 3 for location maps). A total of 1.61 ha was surveyed.

Figure 1 Area surveyed (shaded in red) on a Google Earth background, with Barmby Moor to the south-east

5 Geology

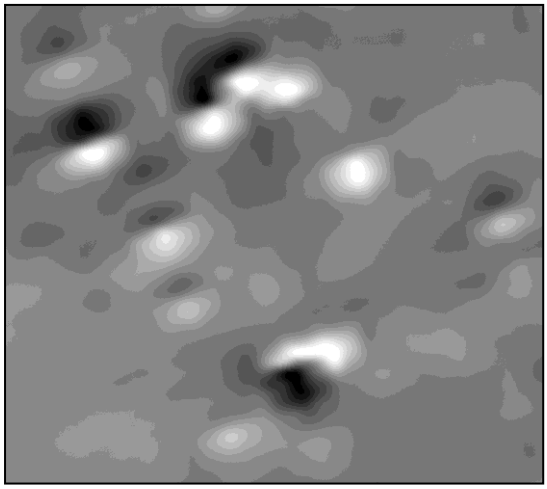
5.1.1 The underlying solid geology is part of the Mercia Mudstone Group. This is a sedimentary bedrock formed approximately 201 to 331 million years ago in the Triassic Period. Any superficial deposits are part of the Bielby Sand Member, comprising a gravelly, silty sand.

(source http://mapapps.bgs.ac.uk/geologyofbritain/home.html).

6 Gradiometer results and interpretation

6.1 Magnetic anomalies

6.1.1 Features discovered by magnetic survey techniques are referred to as "anomalies", defined as such because they are different from the background magnetic norm. All magnetic survey plots relating to the current survey are plotted with a scale of +-5 nanoTesla (nT).



6.1.2 The large and small black and white areas in the greyscale images (see Figure 2) are dipoles (iron spikes), which indicate the presence of iron or steel objects. These are generally found in the topsoil, and although they could signify the presence of archaeological objects, it is much more likely that they relate to more modern detritus, such as broken ploughshares, iron horseshoes, shotgun cartridges etc.

Figure 2 Dipolar anomalies in magnetic data

6.2 Interpretation and discussion of anomalies

6.2.1 The survey data is plotted as a greyscale image on Figure 4 (with a larger scale version on Figure 8) and as a digitised interpretation of anomalies on Figure 7. The magnetic return from the site was generally medium to good, and a number of anomalies were detected.

6.3 Modern anomalies

6.3.1 The most obvious anomalies attributed to modern activity are the very high readings caused by the wire fence around the garden and the field boundaries. Some areas near the boundaries could not be surveyed due to the presence of trees and bushes.

6.3.2 The very high readings in the north-western corner of the surveyed area are caused by the presence of two storage barns.

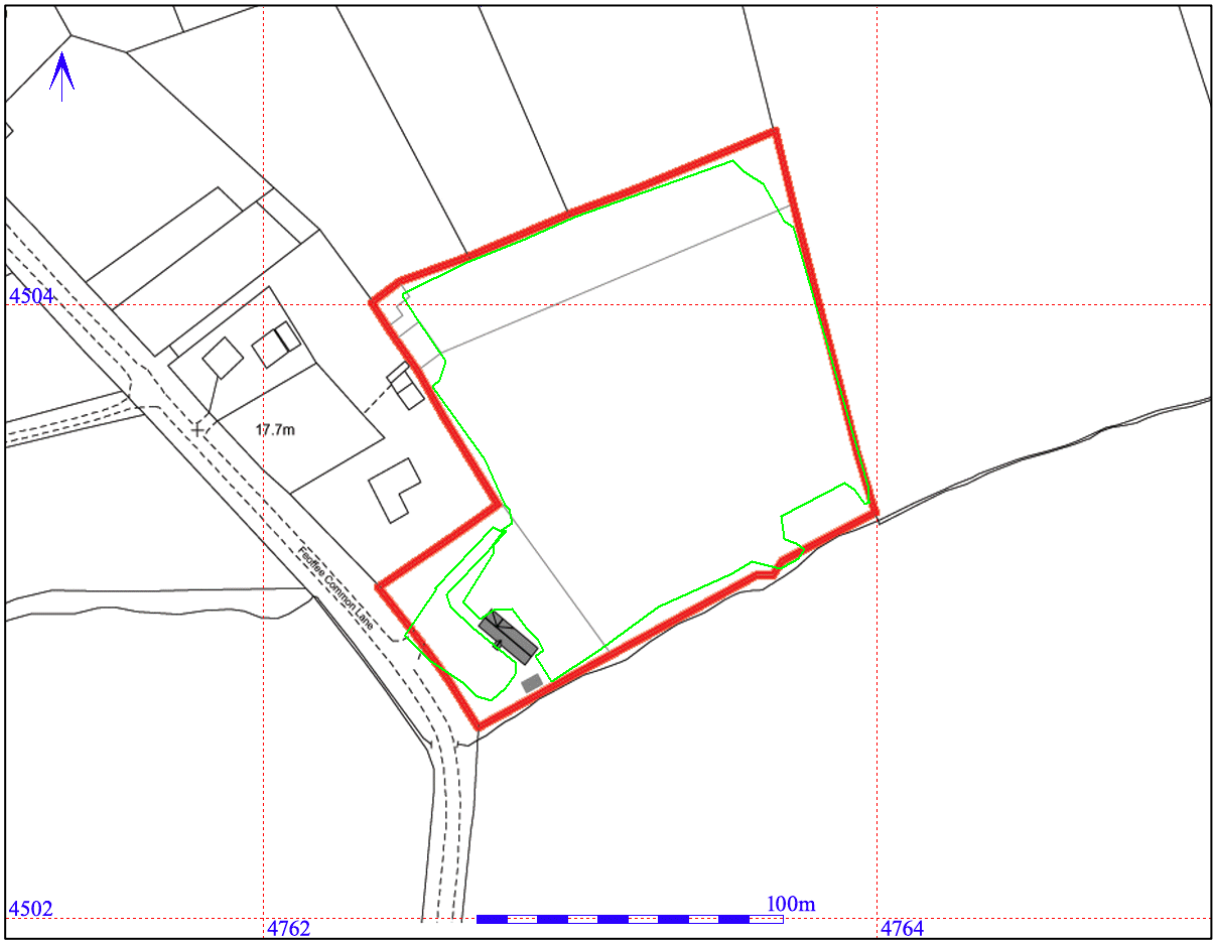


Figure 3 Area requested for survey (in red) with surveyed area (in green)

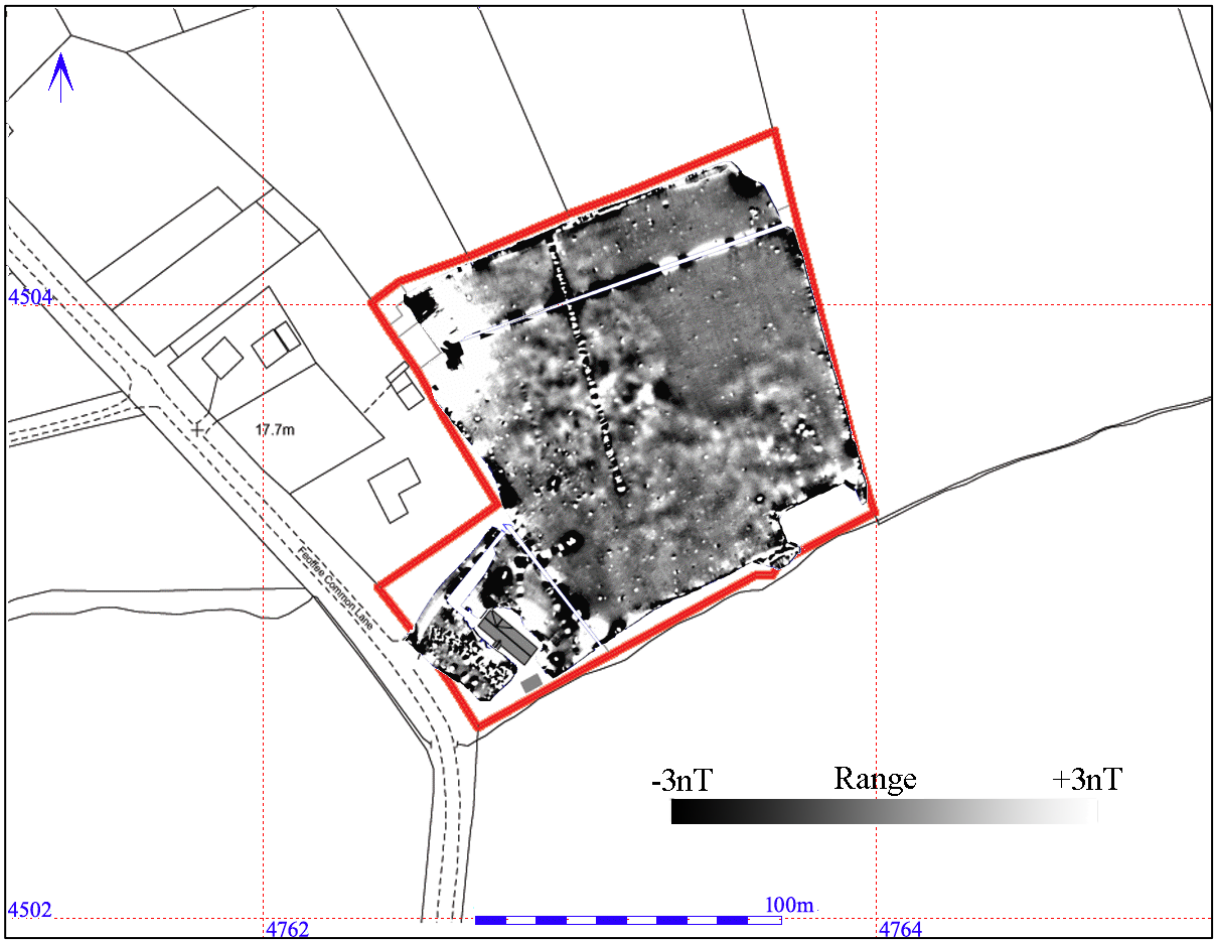


Figure 4 Greyscale image superimposed on Ordnance Survey grid

6.3.3 Anomaly 1 (coloured magneta on Figure 7) is a linear spread of dipolar signals, and it is caused by the presence of a laid hardcore drive.

6.3.4 Anomaly 2 is a very strongly magnetic linear anomaly, and extends northwards from a drain cover. It merges with similar anomaly 3 and may be part of the same drainage system. Anomaly 3 heads out into the field and ends here where another drain cover is to be found.

Figure 5 two drain covers in the survey area

6.3.5 Anomaly 4 is another very strong linear anomaly, almost certainly and iron pipe, leading from the centre of the field to the north. It appears to stop here in the middle of the field, but is only a short distance away from the previously mentioned drain cover, and may be connected to this by a non-magnetic pipe.

6.3.6 Anomalies 5 and 6 (coloured blue on Figure 7) are different in character to the other anomalies detected in this survey, as they are much weaker magnetic signals. The faint black and white magnetic signature is characteristic of clay pipe field drains, although it is unusual that only two were detected. The fact that field drains are required in this field was not lost on the two surveyors, who had to wade through some very deep waterlogged areas (see Figure 6).

Figure 6 One of the waterlogged areas found across the site

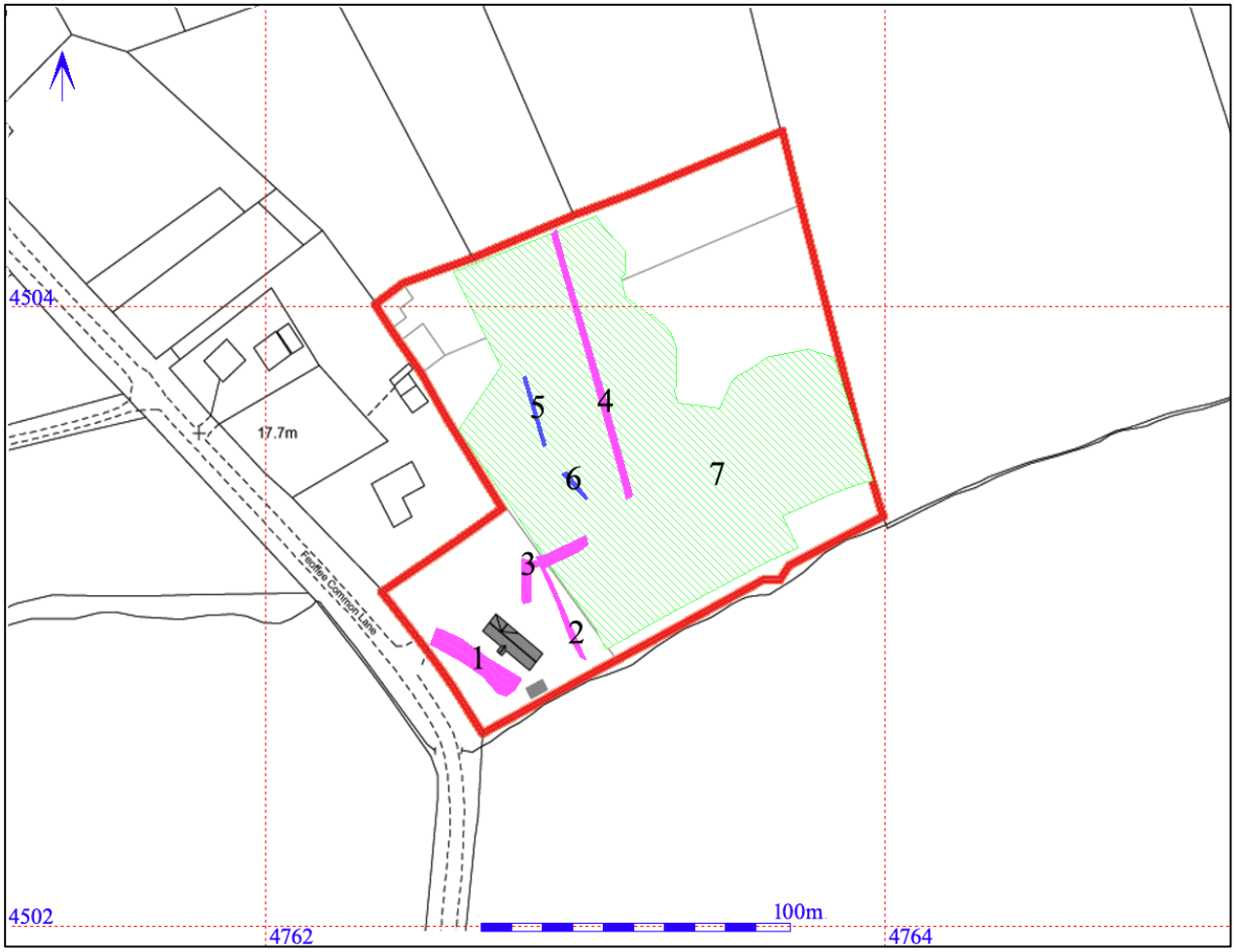


Figure 7 Interpreted anomalies, numbered 1 to 7

6.4 Anomalies of alluvial origin

6.4.1 Much of the area is covered by what appears to be a mottled effect. This type of magnetic signature normally indicates that the field has been the subject of some form of alluvial action in the past.

7 Conclusions

7.1.1 In conclusion, it can be stated that the geophysical survey was successful in identifying seven anomalies, all of which are interpreted as being of either modern or alluvial origin. Six of the anomalies relate to the presence of either modern drains of earlier field drains. The only other anomaly relates to a large are probable alluvial activity.

8 Bibliography

David, A. et al, 2008. Geophysical Survey in Archaeological Field Evaluation (2nd edition)**.** English Heritage Publishing.

Schmidt, A. 2013. Geophysical Data in Archaeology: A Guide to Good Practice (2nd edition).

9 Appendix One – A3 geophysical survey plot

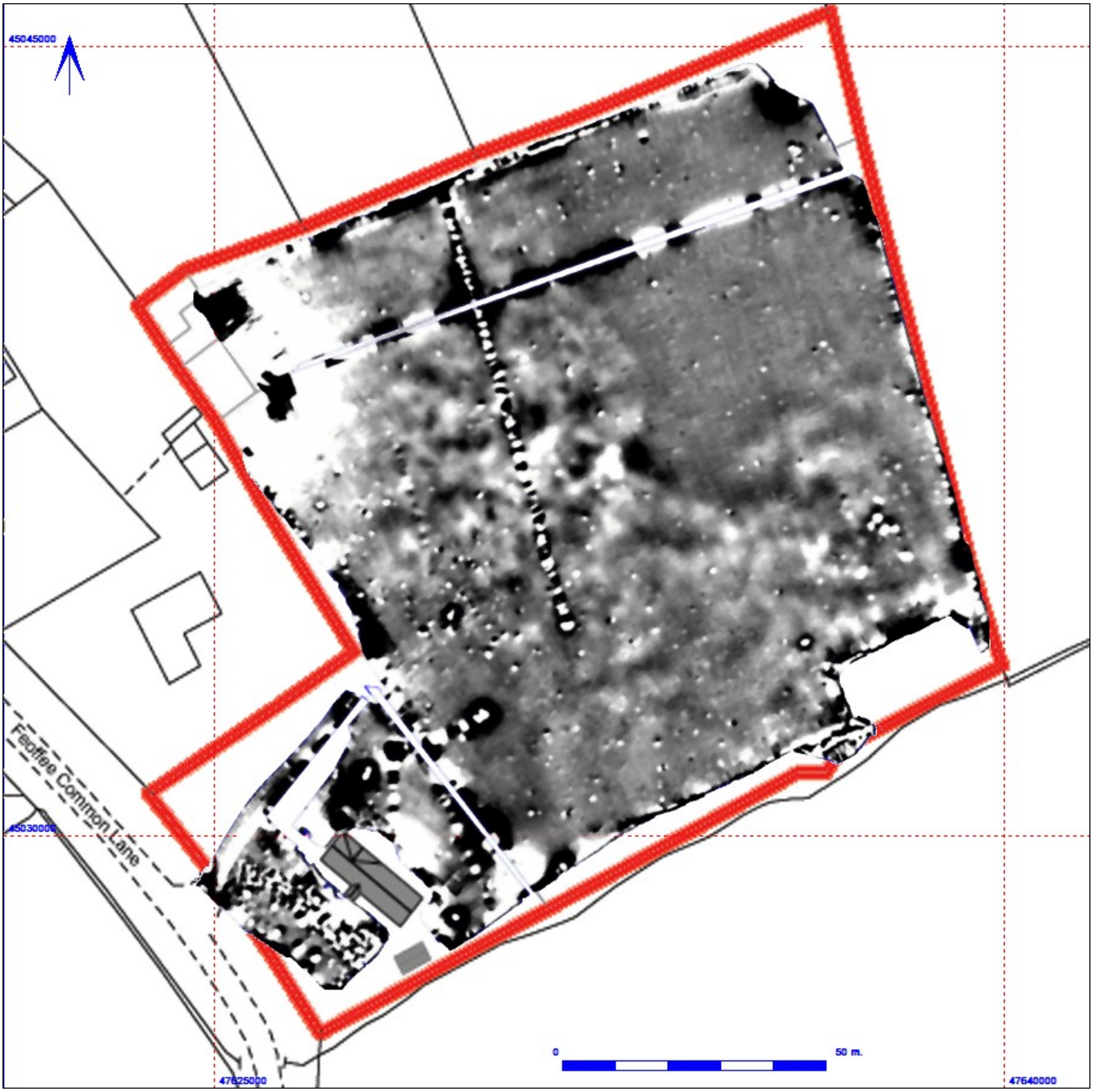


Figure 8 Geophysical survey plotted as a greyscale image