

The Landscape Research Centre

**Report on a fluxgate gradiometer survey
carried out at Wobbeck Lane, Melmerby, North
Yorkshire**



**on behalf of Julian Watson
to assess an area prior to potential housing
development**

November 2011

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Report information

Client	J. Watson
Report type	Fluxgate gradiometer survey
Parish	Melmerby
County	North Yorkshire
Central grid reference	SE 3351601 7670819
Report number	LRC 126
Site code	553
Date of Fieldwork	30/11/2011
Date of report	01/12/2011
Fieldwork personnel	James Lyall MA (Hons), MSc
Report by	James Lyall MA (Hons), MSc
Produced by	The Landscape Research Centre Ltd

Summary

The Landscape Research Centre Ltd (LRC) was engaged to undertake a fluxgate gradiometer survey to assess the potential archaeological impact of housing development in an area to the west of Wobeck Lane, Melmerby, North Yorkshire. The survey (designated LRC site 553, see Figure 1 for location) was undertaken on behalf of Julian Watson, specifically to try and isolate the position of a possible enclosure, noted on a 1933 photograph. Being clay, the magnetic response of the soils in the area was generally low to medium, and a number of modern disturbances were detected. No sign of the putative enclosure was present in the magnetic data.



Figure 1 Showing the location of the survey area (in red) to the south-west of Melmerby village (background from Google Earth)

Methodology

The survey was conducted using a *Foerster Ferex 4.032 DLG* fluxgate gradiometer 4-probe array (see Figure 3). This machine is capable of high resolution data collection, and takes readings every 10cm along the traverse axis and every 50cm along the grid axis (thus achieving 18000 readings per 30m square). The machine collects samples at a 0.2 nT sensitivity range. Because the cart uses a real time kinematic GPS to position itself, each data point of the survey has an inbuilt sub 2cm accuracy.

The data from the magnetometer has been processed and presented using G-Sys (an in-house developed Geographic Database Management program which can also display, process and present digitised plans and images). This report was produced using Microsoft Word 2003 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 background map location.



Figure 2 Showing metal fences

The field surveyed is currently under pasture for sheep. Obstacles included a wire fence down the centre of the main area (see Figure 2), and a chicken pen on the southern boundary.



Figure 3 The Foerster gradiometer in operation

Potential archaeology in the area

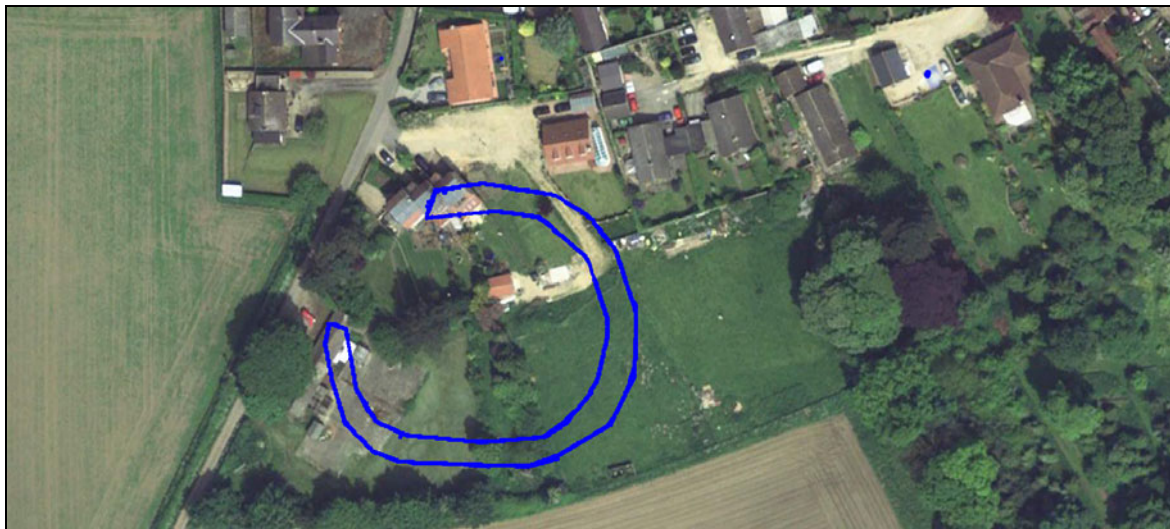


Figure 4 The location of a putative henge as plotted from a 1933 photograph (background from Google Earth)

The English Heritage online National Monuments Record (Pastscape) indicates a possible enclosure at this location, see http://www.pastscape.org.uk/hob.aspx?hob_id=1407675 for online details. The source of the data is an oblique aerial photograph, taken on the 6th June, 1933. The record states; "A sub-circular enclosure of uncertain date is visible as an earthwork on air photographs. It is centered at SE 3348 7671. The enclosure is formed by a 5-8m wide bank and has an internal diameter of c.62m. Its south side is slightly flattened."

There is no record of any earthworks in the 1854 1st Edition Ordnance survey map of the area (see Figure 5, where the location of the possible enclosure has been superimposed in blue). If the feature exists, its external diameter varies between 67 and 72m across.

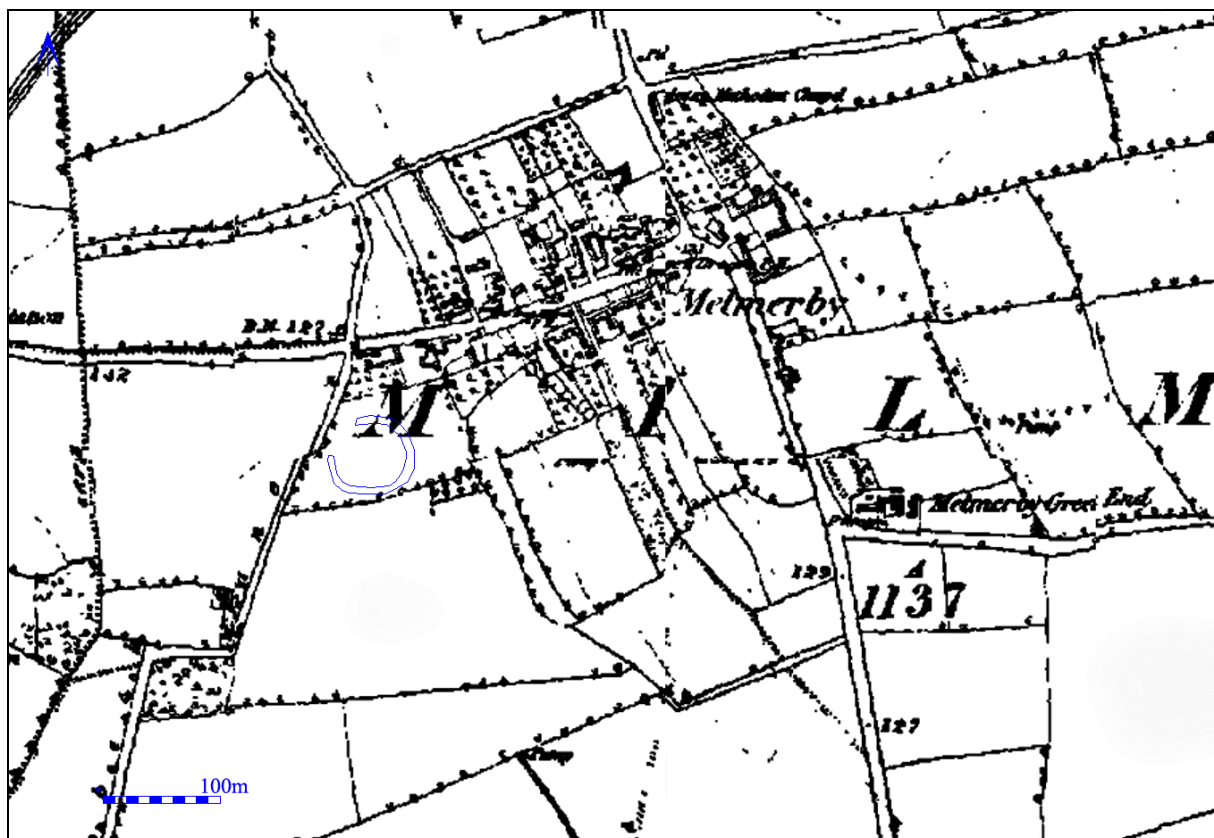


Figure 5 1st Edition Ordnance survey map with location of putative enclosure superimposed in blue

Gradiometer results and interpretation

The survey was divided up into 3 areas (A, B and C, see Figure 6), each of which displayed a completely different magnetic background. Each area had to be processed using different criteria in order to extract the maximum information possible (indicated by the different magnetic ranges for each area indicated on Figure 6).

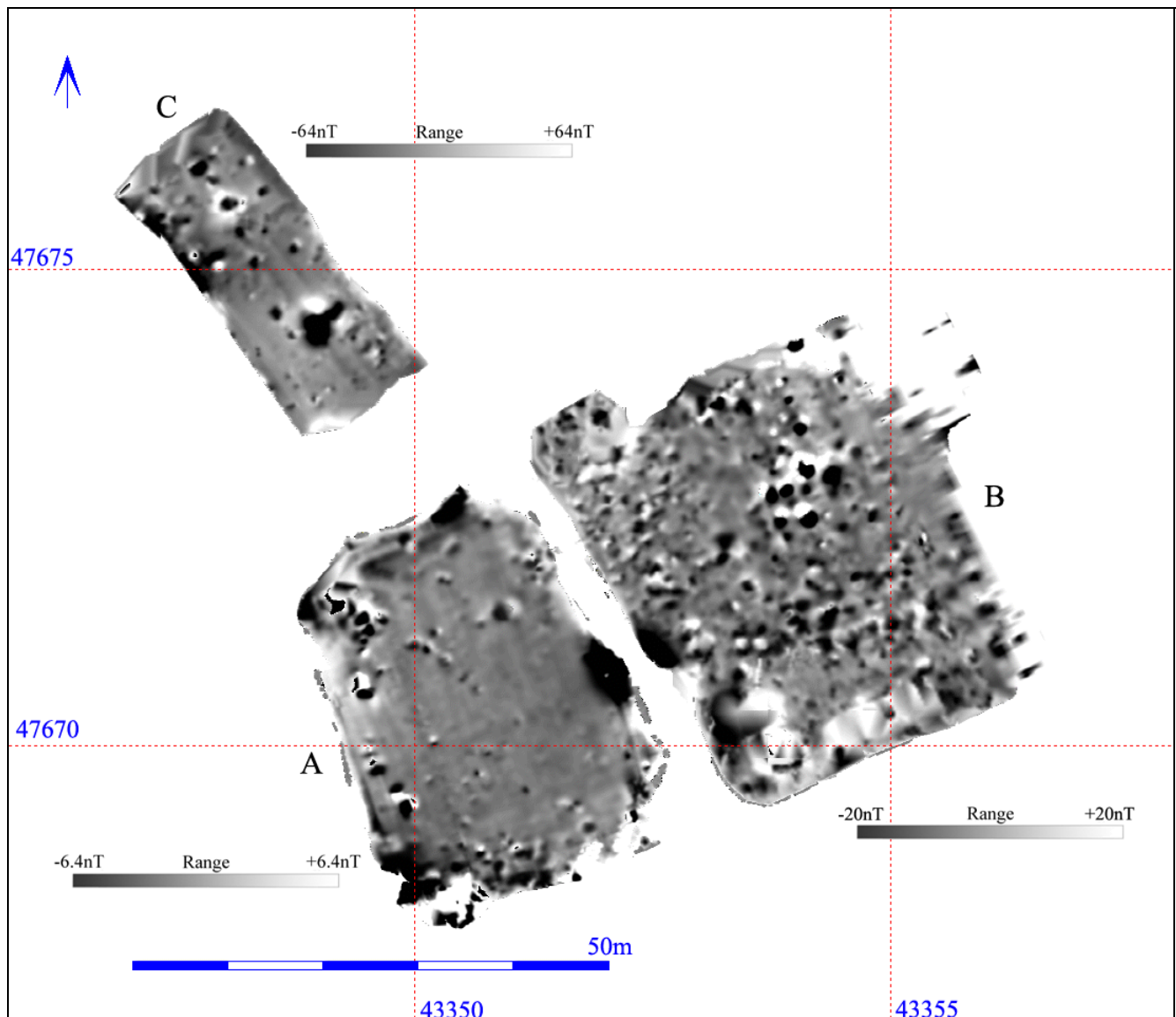


Figure 6 The magnetic survey results

The results of the survey are displayed as a greyscale image in Figure 6, with the interpretation superimposed onto the image in Figure 8. Features discovered by magnetic survey techniques are referred to as "anomalies", defined as such because they are different from the background magnetic norm.

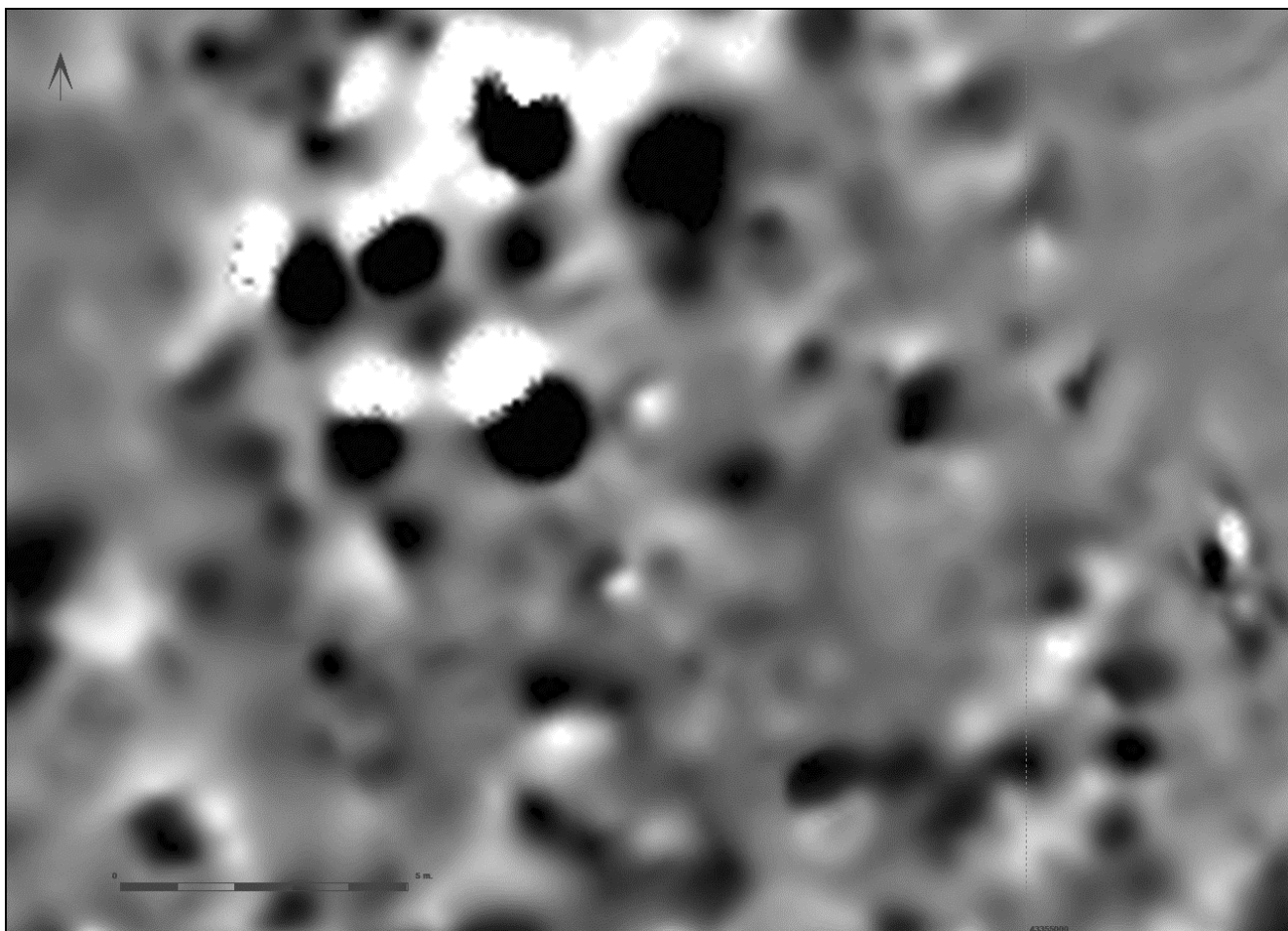


Figure 7 Dipolar anomalies in magnetic data

The large and small black and white areas in the greyscale images (see Figure 7) 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.

Area A

Area A was the south-western part of the survey, and contained the south-eastern quadrant of the potential circular enclosure (indicated in magenta on Figure 8). There was no magnetic evidence for this putative feature, despite this area being the least "noisy" in terms of dipolar activity. A single linear anomaly was noted (numbered 1, in red on Figure 8). It was a very slight feature, and could be either a remnant ploughmark or of modern origin.

Area B

Area B was the south-eastern area, and displayed a completely different magnetic background to Area A, being far more magnetically "noisy". The landowner had indicated why this would be the case, as this area had previously been stripped, and then topsoil replaced. There are far more dipoles in Area B, and their magnetic strength tends to mask any underlying features, should they be present. There were three anomalies worthy of discussion noted in this area, though all would appear to be modern in origin.

Anomaly 2 is a linear north-south aligned feature, consisting of a number of dipolar signals. It probably relates to a water pipe or drain leading to a major drain which is located to the south of the surveyed area. Equally anomaly 4 is modern, being a drain recently established, and currently a shallow depression in the field. Anomaly 3 is a curvilinear feature made up of a number of dipoles. It is unlikely to be a drainage feature, and may be a result of how the topsoil was replaced onto this part of the field.

Area C

Area C was the northernmost and smallest of the 3 areas, and was also dominated by the presence of dipoles. The largest of these (numbered 5 on Figure 8) relates to a now removed greenhouse. The dipolar disturbances in the north-west relate to a demolished extension. The curving feature would have passed directly under this anomaly, but again was not visible to the west of this in the magnetic data.

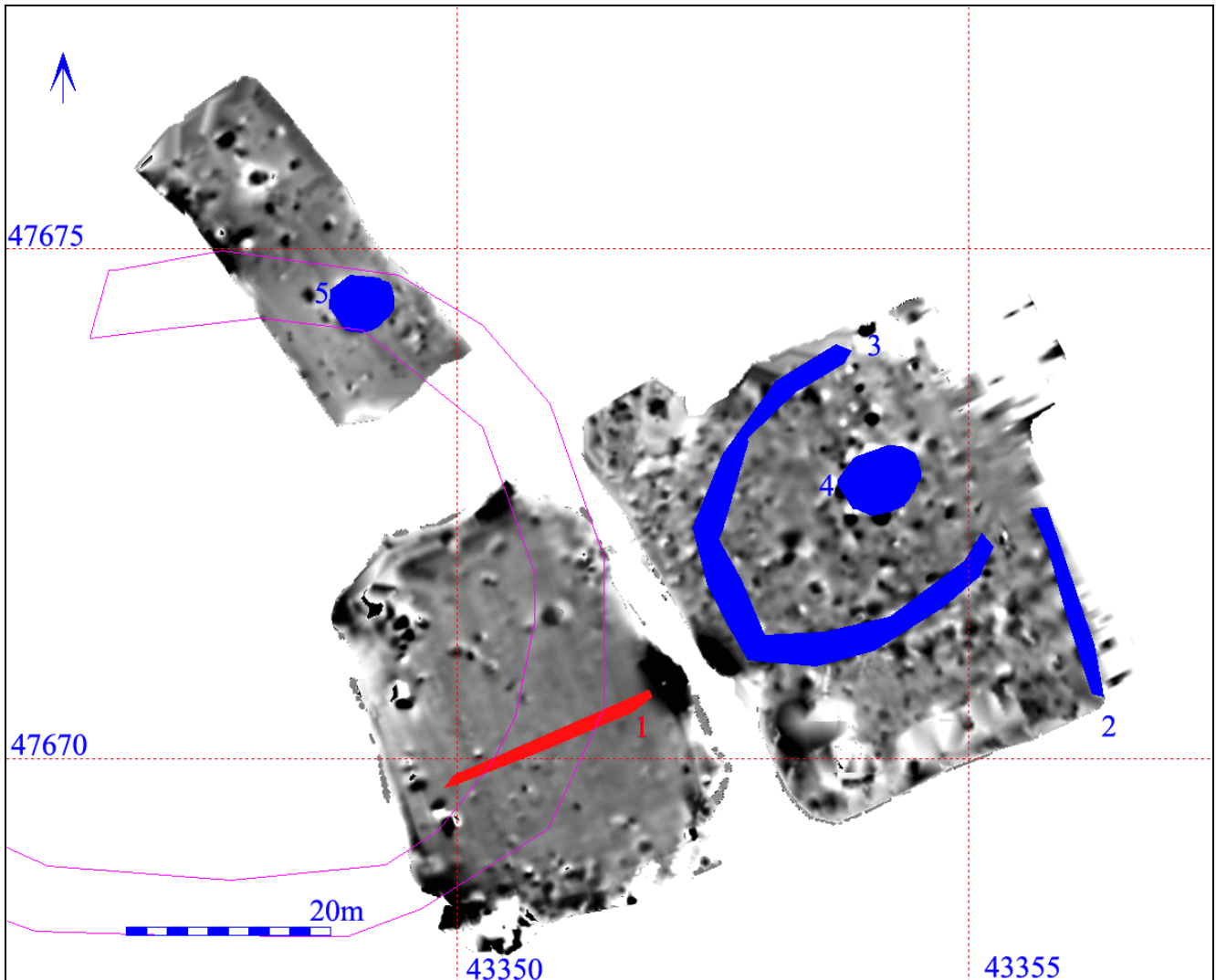


Figure 8 Showing interpreted features and putative earthwork location in relation to magnetic anomalies

Topographic survey

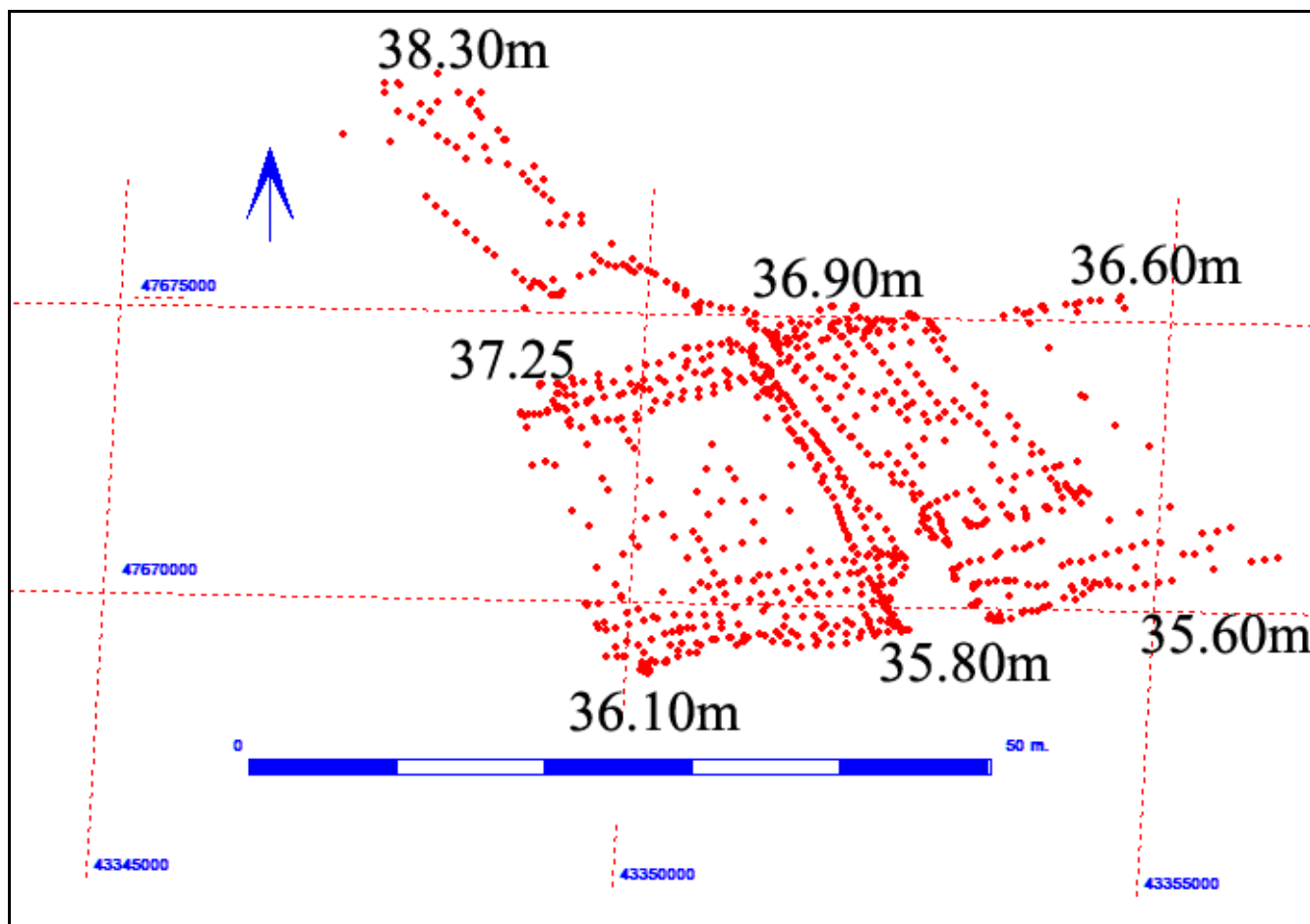


Figure 9 3D points collected during the magnetic survey

A topographic survey was conducted at the same time as the magnetic data collection. A total of 1298 points were collected, ranging in value from 35.59m AOD in the south-eastern corner to 38.41m AOD at the north-western limit of the surveyed area (see Figure 9).

Conclusions

In conclusion, it can be stated that the underlying clay geology provided a low magnetic contrast for the detection of infilled features. Apart from a single linear feature, all of the other anomalies could be explained by modern intervention. There was no magnetic evidence for the possible circular earthwork, although this does not preclude its existence, as it could be filled with a material similar to the surrounding subsoil, thus not showing magnetically.

On behalf of the Trustees

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1st December 2011