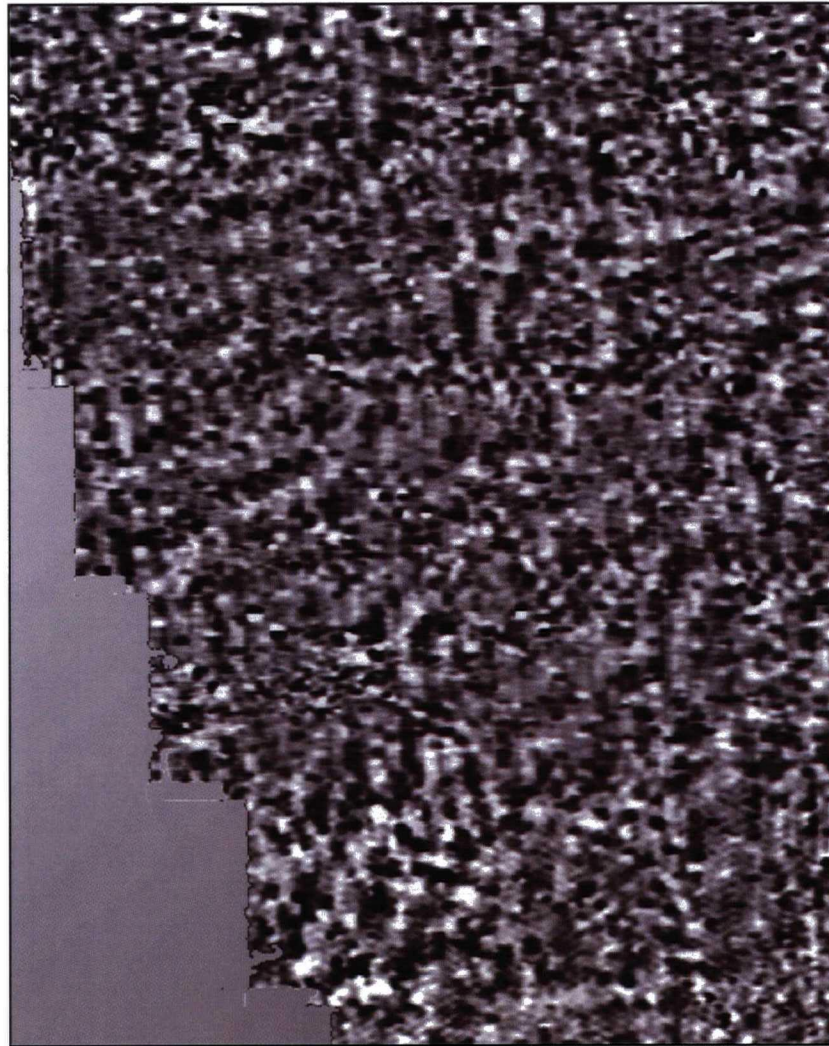


The Landscape Research Centre

A fluxgate gradiometer survey report



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| SNY | 12647 |
| ENY | 4474 |
| CNY | 8257 |
| Parish | 3086 |
| Rec'd | 28/3/09 |

Riseborough Hagg Farm,
North Yorkshire

on behalf of Moorland Exploration Ltd

10th March 2009

Rec'd 25/3/09

E4474

3086 parish

512647

C8257

M/2009/0044/fuL

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Report information

| | |
|-------------------------------|-----------------------------------|
| Client | Moorland Exploration Ltd |
| Report type | Fluxgate gradiometer survey |
| Parish | Middleton |
| County | North Yorkshire |
| Central grid reference | SE 7614575 8354923 |
| Report number | LRC 108 |
| Site code | 507 |
| Date of Fieldwork | 05/03/2009 to 09/03/2009 |
| Date of report | 10/03/2008 |
| 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) carried out a fluxgate gradiometer survey on behalf of Moorland Exploration Ltd, over an area to the north-east of Riseborough Hagg Farm, Riseborough, North Yorkshire. The ground conditions were difficult (see Figure 5 and Figure 6), and the magnetic susceptibility of the clay soil was low, thus only a few anomalies were detected, none of which could be assigned a definite archaeological origin. These included 12 probable field drains and 4 possible features.

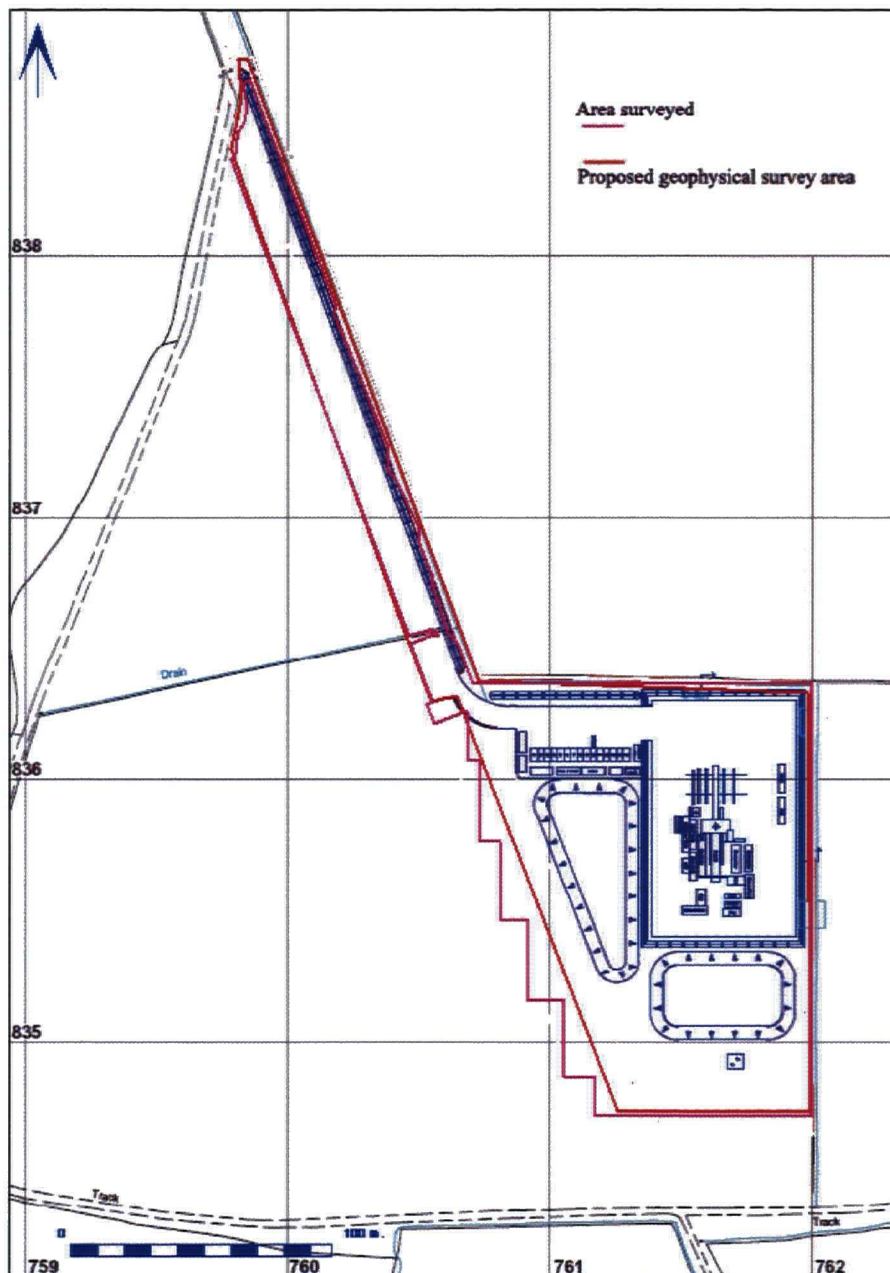


Figure 1 The extent of the area covered by the geophysical survey (in magenta) against the proposed survey area (in red)

Methodology

The survey was undertaken in accordance with a methods statement agreed with North Yorkshire County Council (Landscape Research Centre Ltd, 2009).

The main part of the surveyed area was conducted using a Bartington Grad 601-2 fluxgate gradiometer. The zigzag traverse method of survey was used. The survey was carried out by taking readings every 25cm along the traverse (walking) axis and every metre along the grid axis (thus 3600 readings for each 30m by 30m grid). The sensitivity of the machine was set to detect magnetic variation in the order of 0.1 nanoTesla (nT). Part of the area along the north-eastern boundary was also surveyed using a Foerster

Ferex 4.032 DLG fluxgate gradiometer array. This machine allows a higher resolution of data collection, and takes readings every 10cm along the traverse axis and every 50cm along the grid axis (thus taking 18000 readings in an equivalent 30m grid). This machine collects samples at 0.2 nT sensitivity. Unfortunately it was not possible to survey any more of the area with the higher resolution machine because the sticky nature of the underlying clay meant that the wheels of the cart used to push the array became so clogged that they were interfering with data collection.

The data from both machines 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 2000 and Adobe Photoshop 6 for further image manipulation.

The field surveyed is currently under an arable regime, and has been given a site number of 507 in the LRC numbering system. Apart from the underlying soil conditions (sticky clay) there were no obstacles encountered during the survey. The area surveyed had a maximum length of 419.9m and a maximum width of 145.8m by 15m, with 2.135 Ha surveyed using the Bartington instrument and 0.132 Ha surveyed using the Foerster magnetometer, giving a total of 2.267 Ha.

Gradiometer results and interpretation

The results of the survey are displayed as a greyscale images (see Figure 2 and Figure 3). An interpretative plan has been superimposed onto the greyscale data in Figure 4. The survey data indicates both positive and negative magnetic anomalies (lighter and darker areas in the greyscale image). The black and white areas in the greyscale images are dipoles (iron spikes), which indicate the presence of iron objects. These are generally found in the topsoil, and although they could indicate 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.

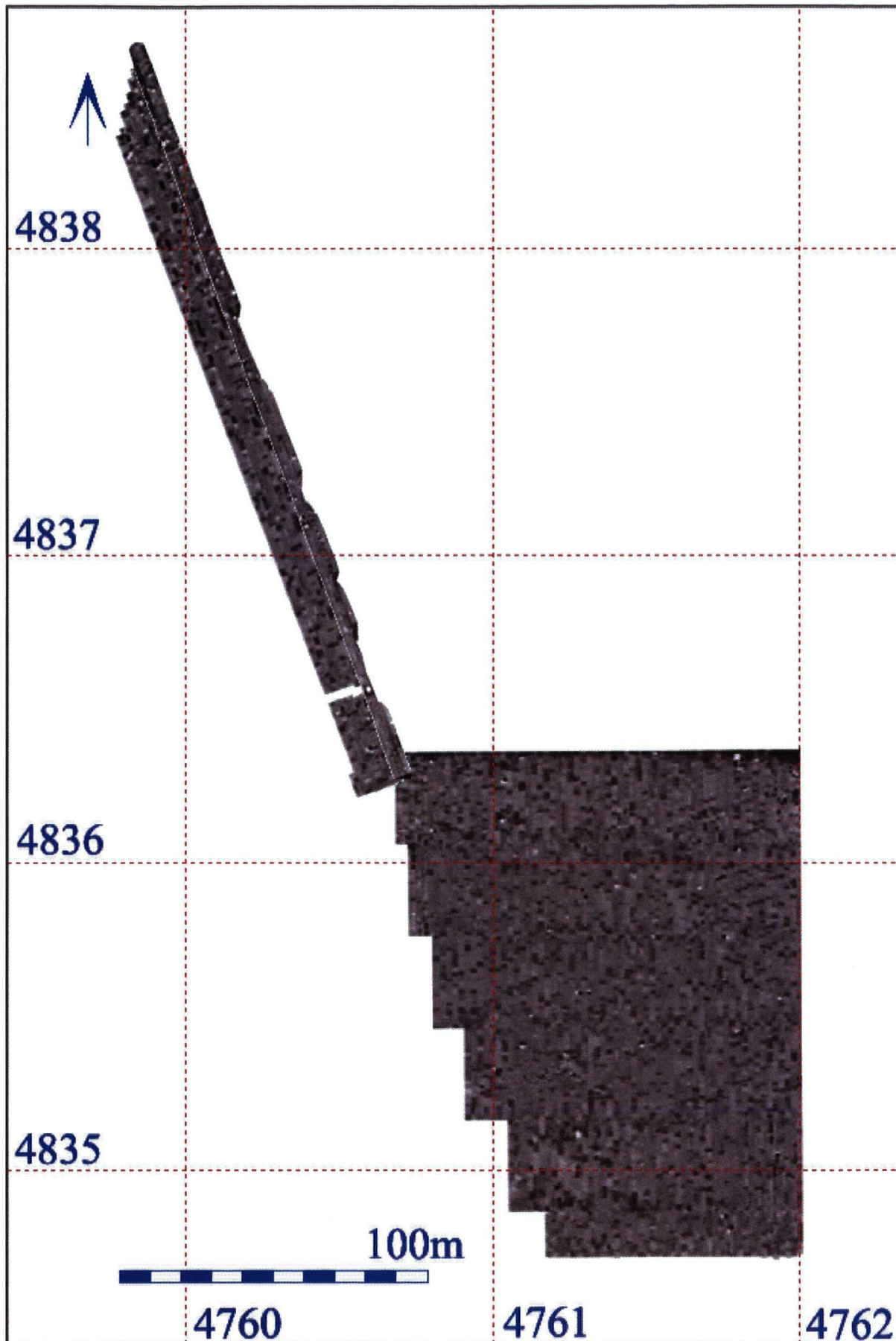


Figure 2 A greyscale image of the magnetic data

A scattering of darker negative “blips” can be seen in the survey data, particularly in the southern area (see Figure 3). These are almost certainly caused by the condition of the underlying ground conditions and could relate to subtle differences in the underlying clay. In some cases they form narrow linears, and here they probably indicate the presence of field drains (the location of these are indicated by the straight black lines on Figure 4).

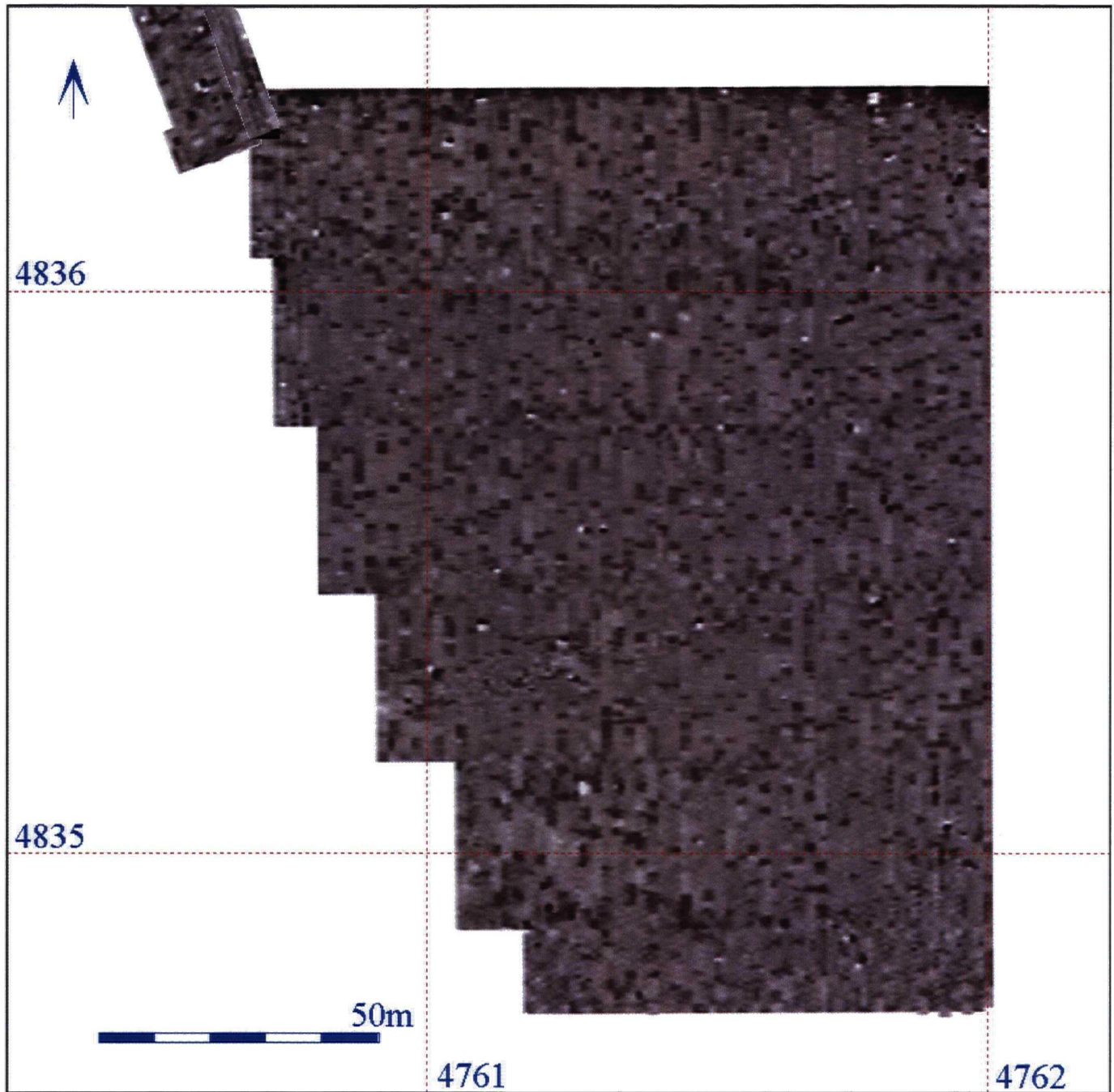


Figure 3 Greyscale plot of the southern area

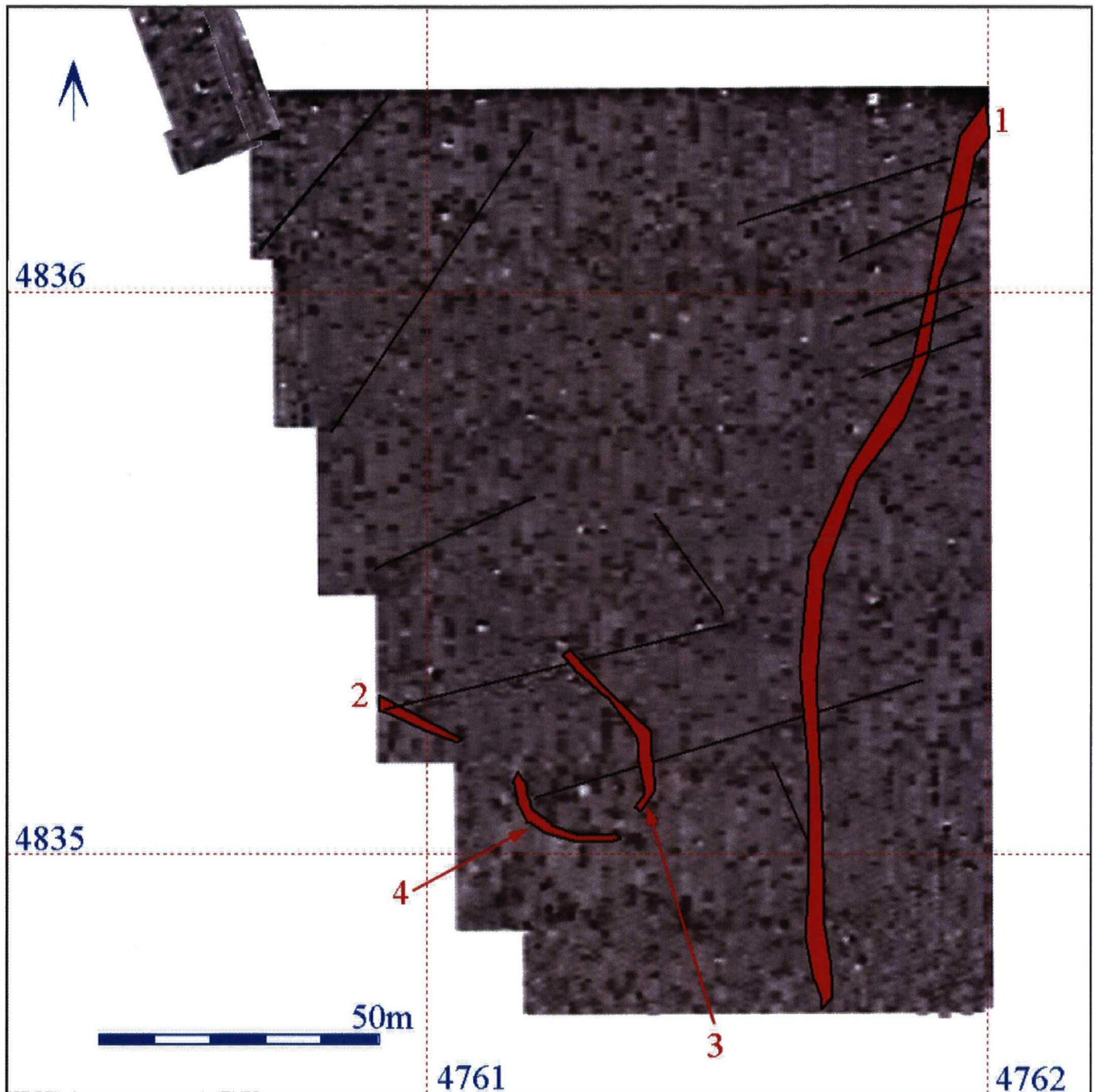


Figure 4 Greyscale plot of the southern area with superimposed interpretation

Apart from the field drains, only four anomalies were present, and all of these were very faint and difficult to interpret. Anomaly 1 extends across the surveyed area, heading into the north-east corner. Its sinuous nature indicates that it could be an old stream channel, alternatively, it could be an older drainage ditch. The other three anomalies are difficult to interpret, and could relate to natural or geological features.

Conclusions

In conclusion, it can be stated that because of the general low magnetic susceptibility of the clay soil, combined with the difficult walking conditions (see Figure 5 and Figure 6), no features of obvious archaeological significance were encountered.



Figure 5 Plough ruts near the southern end of the survey



Figure 6 Soft clay

Additional information

In a short discussion with the farmer, he indicated that the field was criss-crossed with field drains.

References

Landscape Research Centre Ltd (2009) LRC_Mag_methods_Riseborough_Gas_exp.pdf

Survey report by James Lyall MA (Hons), MSc

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10th March 2009