

Sibley, Sally

From: Simmonds, Mark
Sent: 11 March 2015 07:12
To: _planningadvice
Subject: FW: H14-1071-14 Adjacent to Black House Farm
Attachments: Black House Farm Pode Hole geophysical survey report.pdf

Please scan to H14-1071-14 – 6ARC

Thank you

Mark

From: Paul Hage [<mailto:phage@sghconsulting.co.uk>]
Sent: 10 March 2015 09:36
To: Simmonds, Mark
Cc: jenny@jvgherbs.co.uk; stewart@mahermillard.co.uk
Subject: RE: H14-1071-14 Adjacent to Black House Farm

Mark,

Final geophysical report enclosed.

Regards

Paul Hage

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ARCHAEOLOGICAL GEOPHYSICAL SURVEY

**LAND AT BLACK HOUSE FARM
PODE HOLE, SPALDING
SOUTH HOLLAND**

SITE CENTRED AT NGR TF 19800 21960

**REPORT PREPARED
BY DAVID BUNN
DECEMBER 2014**

Contents

Non technical summary	1
1.0 Introduction	2
2.0 Location and description	2
3.0 Geology and topography	2
4.0 Archaeological context	2
5.0 Aims and objectives	3
6.0 Methodology	3
7.0 Results and discussion	4
8.0 Conclusions	4
9.0 Acknowledgements	5
10.0 References	5

Illustrations

Fig. 1: Location of site	1:50000
Figs. 2 - 5: Greyscale, trace and interpretive images	1:1250

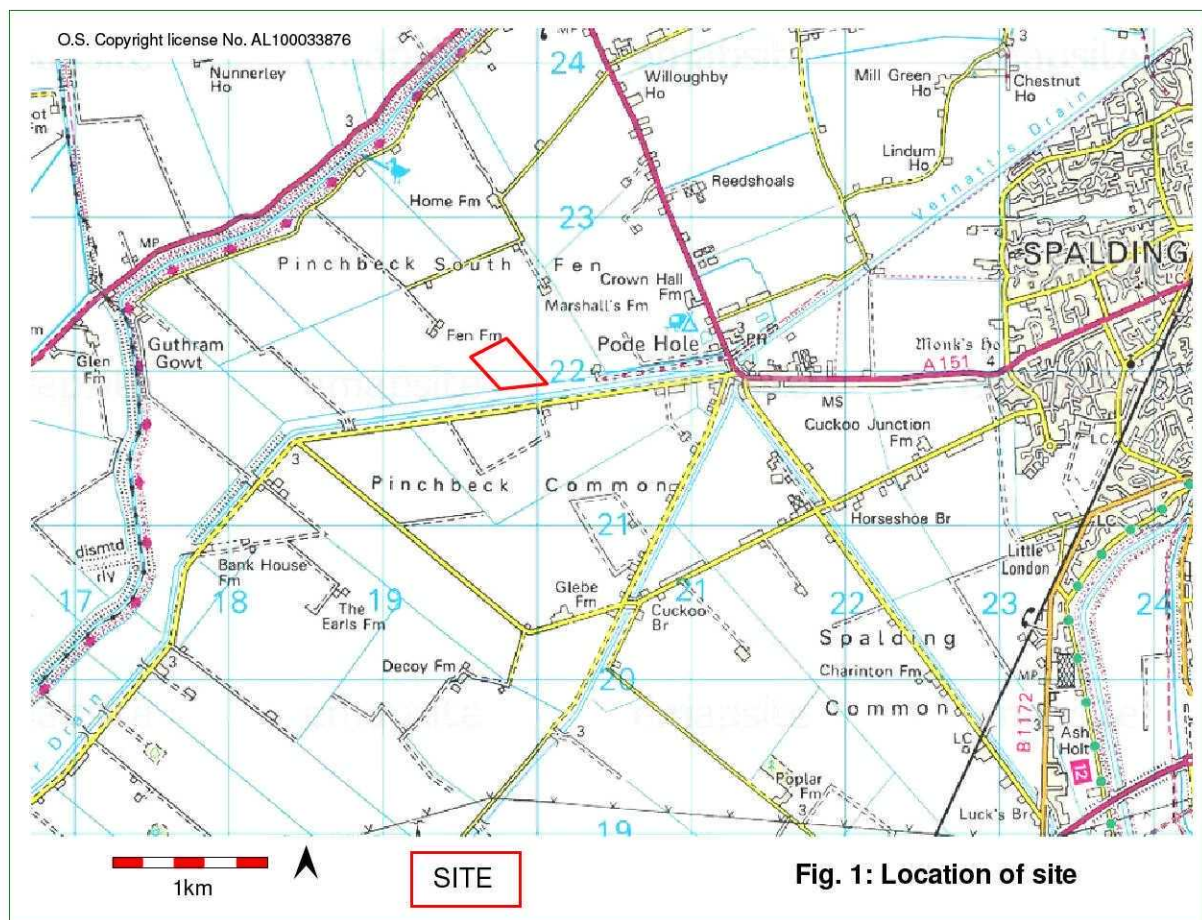
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Non-technical summary

On behalf of Maher Millard Construction Ltd, a fluxgate gradiometer survey was undertaken at Black House Farm, Pode Hole, Spalding, South Holland.

The survey has identified only limited indications of potential archaeological remains; a small number of discrete anomalies that could be pits or features containing burnt materials. Some linear anomalies exhibit some potential as ditches, but could equally be land drains. Land drains appear to be widespread in the southern part of the survey, and a gas pipeline extends across the southern edge of the site.

The backdrop of recorded variation relates to the palaeoenvironment; showing as tidal channels/creeks and pools.



1.0 Introduction

On behalf of Maher Millard Construction Ltd, Pre-Construct Geophysics undertook a fluxgate gradiometer survey on the site of a proposed horticultural development at Black House Farm, Pode Hole, Spalding, South Holland (approximately centred at NGR: TF 19800 21960).

The survey forms part of an archaeological evaluation that will inform a planning application to construct a large glasshouse, lagoon and ancillary features, including buildings and areas of hard standing (vehicle parking etc).

2.0 Location and description (Figs. 1 – 2)

Pode Hole lies c.2km to the west of Spalding. The c.9ha site at Black House Farm is situated to the west of the village and encompasses almost all two sub-rectangular arable fields (F 1 and F2, separated by an open drain). It is bounded to the south by Fourth Main District Drain. Two further drains, Counter Drain and The Delph, lie to the immediate south of (and are parallel with) Fourth Main District Drain. Open farmland lies beyond the western, northern and eastern boundaries.

3.0 Geology and topography

The solid geology of the area comprises mudstone (Oxford Clay Formation)¹. This is overlain by clay and silt (Tidal Flat Deposit) - superficial deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by shorelines.

The site is slightly undulated and lies at an elevation of c.3m AOD.

4.0 Archaeological context

There are no recorded archaeological resources within the site itself, although the site is situated within a rich archaeological landscape. This includes a widespread array of cropmarks, thought to date from at least the Roman period (Phillips, 1970). There are suggestions that associated features could extend into the site (but have not responded to aerial reconnaissance due to unresponsive crop cover).

The site lies close to the Iron Age and Roman coastline, where extensive evidence of salt-making has been identified. There are a number of known and suspected salt manufacturing sites (and ancillary features) within 500m of the site, including one possible Roman saltern within 100m of the northern boundary. The nearest Iron Age saltern lies c.800m to the west of the site (LHER ref: 20178). This was identified by the discovery of more than 100 sherds of 3rd-2nd century BC pottery that were ploughed out of a band of dark soil. Subsequent excavations established that the latter was associated with a natural channel cut by a series of gullies and pits.

Iron Age pottery has been recovered from Roman saltern sites in the area (LHER refs: 20173; 20180). This suggests that salterns identified as Roman may have been in semi-continuous use from the late Iron Age.

There is extensive evidence for salt production in close proximity to the site. Approximately 100m to the west of the site, deep ploughing exposed burnt soils associated with a scatter of 1st-2nd century AD pottery (LHER ref: 22414). A further saltern lies within 500m to the northwest of the site (LHER ref: 22411), where soil marks suggest that archaeological remains extend into the surrounding area. Pottery recovered within this area dates from the 2nd century AD. A third site has been tentatively identified c.150m north of the site in correlation with a scatter of Roman pottery, cropmarks and settlement activity (LHER refs: 22415; 20187).

Evidence of Roman salt-making has been recovered from more than 10 sites in the vicinity, with concentrations to the northeast of the site along Dozens Bank. There is also extensive evidence of settlement remains to the west and south (LHER refs. 22415; 22439).

There is little evidence of Saxon occupation within the area, which is limited to a small collection of pottery sherds found at Roman saltern sites (LHER refs: 23615; 20162; 20163).

5.0 Aims and objectives

The geophysical survey was undertaken to establish the presence/absence of magnetically anomalous archaeological features within the site area and, if recorded, define their extent in order to inform the requirement/non-requirement for further archaeological intervention.

6.0 Methodology

The survey methodology was based upon English Heritage guidelines: '*Geophysical Survey in Archaeological Field Evaluation*' (English Heritage, 2008).

6.1 Fluxgate Gradiometry is a non-intrusive scientific prospecting tool that is used to determine the presence/absence of some classes of sub-surface archaeological features (e.g. pits, ditches, kilns, and occasionally stone walls).

The use of gradiometry should help to establish the presence/absence of buried magnetic anomalies, which may reflect sub-surface archaeological features, and may therefore form a basis for a subsequent scheme of archaeological trenching.

The use of magnetic surveys to locate sub-surface ceramic materials and areas of burning, as well as magnetically weaker features is well established, particularly on large green field sites. The detection of anomalies requires the use of highly sensitive instruments; in this instance the Bartington 601 Dual Fluxgate Gradiometer. This is accurately calibrated to the mean magnetic value of each survey area. Two sensors mounted vertically and separated by 1m, measure slight, localised distortions of the earth's magnetic field, which are recorded by a data logger. It should be noted that only magnetically susceptible features (in comparison to the instrument calibration point) will resolve as magnetic anomalies.

It should be noted that this technique only records magnetic variation relative to natural background levels. As such, the magnetic response of archaeological remains will vary according to geology/pedology. Additionally, remains may be buried beyond the effective 1 - 2m range of the instrumentation (e.g. where sealed beneath alluvium).

The survey was undertaken by Gareth Ward Stevens and George Bunn November 2014. The zigzag traverse method of survey was used, with readings taken at 0.25m intervals along 1.0m wide traverses. A survey grid was established by Global Positioning Satellite using a Topcon GRS-1, with an accuracy of +/- 0.1m. Data sets were processed using *Terrasurveyor* 3.

A total of 7.67ha were surveyed (targeted to encompass areas most likely to be affected by the proposed development).

The raw data set is presented on Fig. 4 (clipped to +/-10nT to enhance resolution).

The 'Despike' function was applied to reduce the effect of extreme readings induced by metal objects, and 'Destripe' to eliminate striping introduced by zigzag traversing. The data set was clipped to +/- 20nT on the trace plot (Fig. 5) and +/-4nT on the processed greyscale image (Fig. 2).

6.3 Character, interpretation and presentation of magnetic anomalies (Fig. 3)

Anomalies in excess of +/-10nT are highlighted blue and/or pink on the interpretive images (Fig. 3). These are characterised magnetically as dipolar 'iron spikes', often displaying strong positive and/or negative responses, which reflect ferrous-rich objects (particularly apparent on stacked trace plots). Examples include those along current or former boundaries (e.g. wire fencing), services and random scatters of horseshoes, ploughshares etc across open areas. Fired materials such as brick and tile (the latter are often introduced during manuring or land drain construction) usually induce a similar though predominately weaker response, closer to

c $\pm$ 5nT. Concentrations of such anomalies often indicate rubble spreads, such as those associated with backfilled ponds/ditches and demolished buildings. It should be noted that fired clay associated with early activity has the same magnetic properties as modern ceramic rubble. Therefore, the interpretation of such variation must take into consideration the context in which it occurs.

Potential archaeological remains are highlighted red, land drains as purple and a service as a blue line; all recorded against a backdrop of predominately natural variation (greenscale).

7.0 Results and discussion (Figs. 2 - 5)

The survey recorded:

- a) An extensive array of land drains in F2, with further clearly defined examples in the south-eastern part of F1 (Fig. 3: purple lines). Other linear anomalies might similarly signify land drains (dotted purple lines), although an alternative origin as ditches cannot be discounted.
- b) A buried gas pipeline that extends across the southern edge of F2 (highlighted pink and blue/blue line).
- c) A backdrop of weak variation (almost completely within a range of $\pm$ 10nT: greenscale). The overwhelming majority is clearly of natural origin, related to the palaeoenvironment in the form of tidal channels/creeks and pools features. A number of discrete responses are relatively high (above 10nT: pink - examples circled); whereas an archaeological origin as pit/sites containing burnt materials cannot be completely discounted, their magnetic characteristics suggest these may merely reflect pockets of ferrous-rich natural deposits, such as concentrations of silt. Nevertheless, two circular examples have been flagged as potentially archaeological (red dots).
- d) A small number of isolated/grouped dipolar anomalies, including examples close to the drain that separates the two fields (highlighted pink and blue). Such responses typically reflect modern ferrous-rich debris (fragments of brick/land drains ploughshares etc). However, it is speculated that some may have been dredged out of the drain that separates the two fields, thus possibly related to early industrial activity.

8.0 Conclusions

The survey has identified only limited evidence of potential archaeological remains, in the form of a number of discrete anomalies that might conceivably indicate pits and/or sites of burning. Some linear anomalies exhibit potential as ditches. These might relate to the putative Roman cropmark array, although do not appear to reflect continuations of features identified by the latter into the site. Alternatively, these may signify land drains.

Other linear anomalies, particularly widespread in the southern field, undoubtedly signify land drains.

Strong readings were registered across and adjacent to a gas pipeline that extends across the southern edge of the site.

For the most part, the backdrop of recorded magnetic variation clearly relates to the palaeoenvironment in the form of tidal channels/creeks and pools.

9.0 Acknowledgements

Pre-Construct Geophysics would like to thank Maher Millard Construction Ltd. for this commission.

10.0 References

English Heritage. 2008 *Geophysical Survey in Archaeological Field Evaluation*. London, English Heritage.

Phillips, C. W. 1970. *The Fenland in Roman Times*. London: Royal Geographical Society Research Series 5.

¹http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html, 1:50,000. British Geological Survey, Keyworth.

²<http://www.heritagegateway.org.uk/Gateway/>

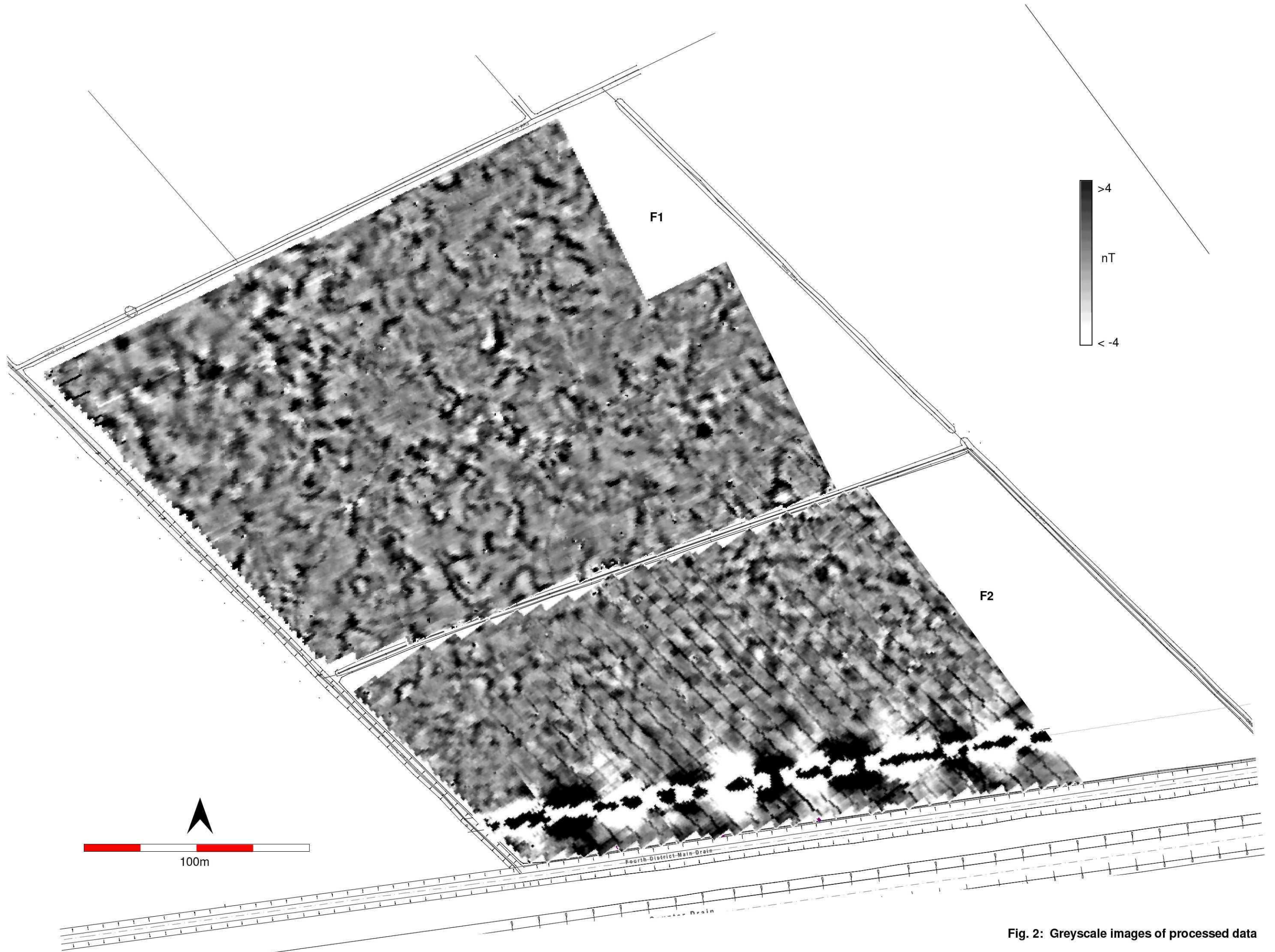


Fig. 2: Greyscale images of processed data

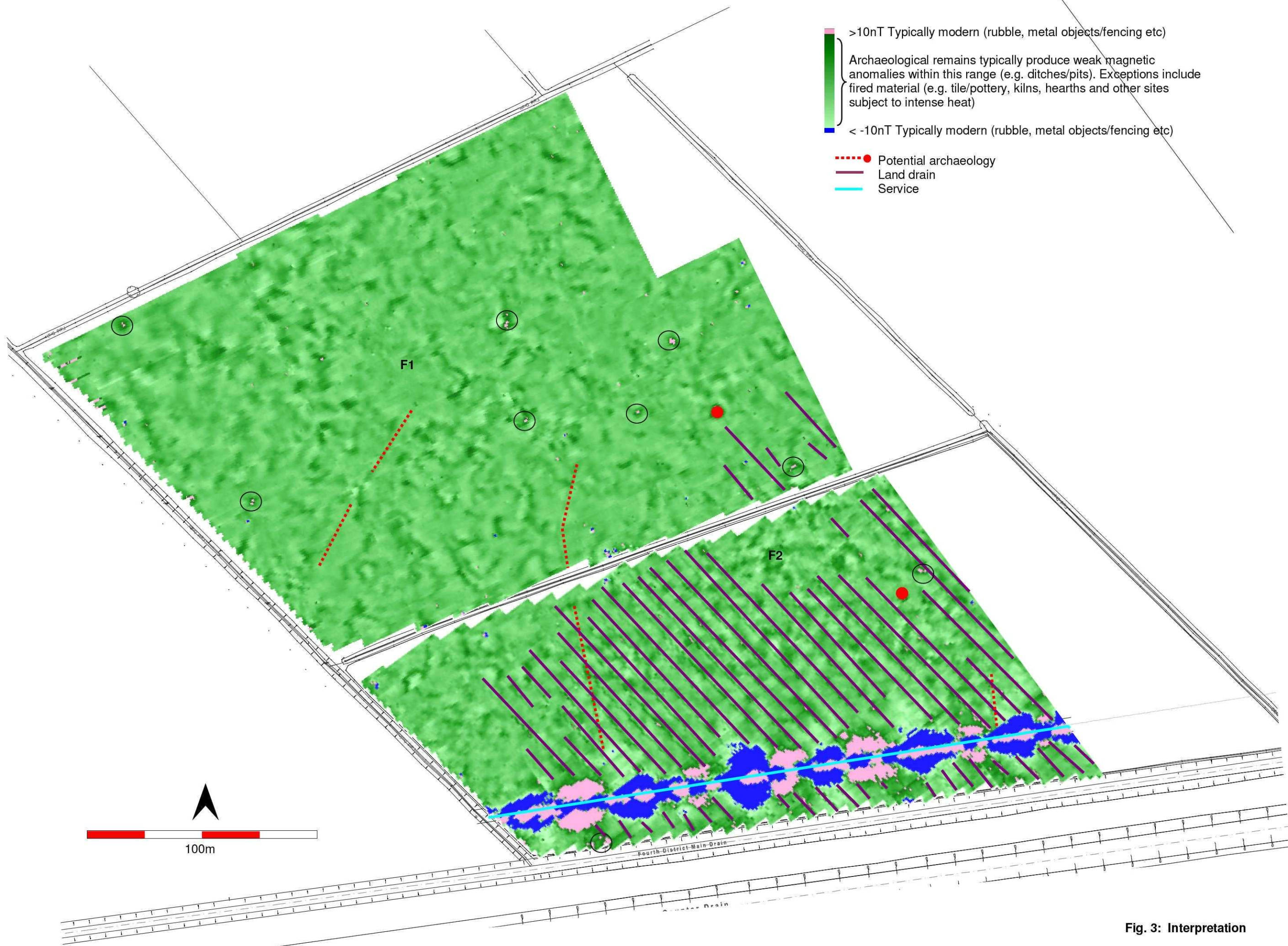


Fig. 3: Interpretation

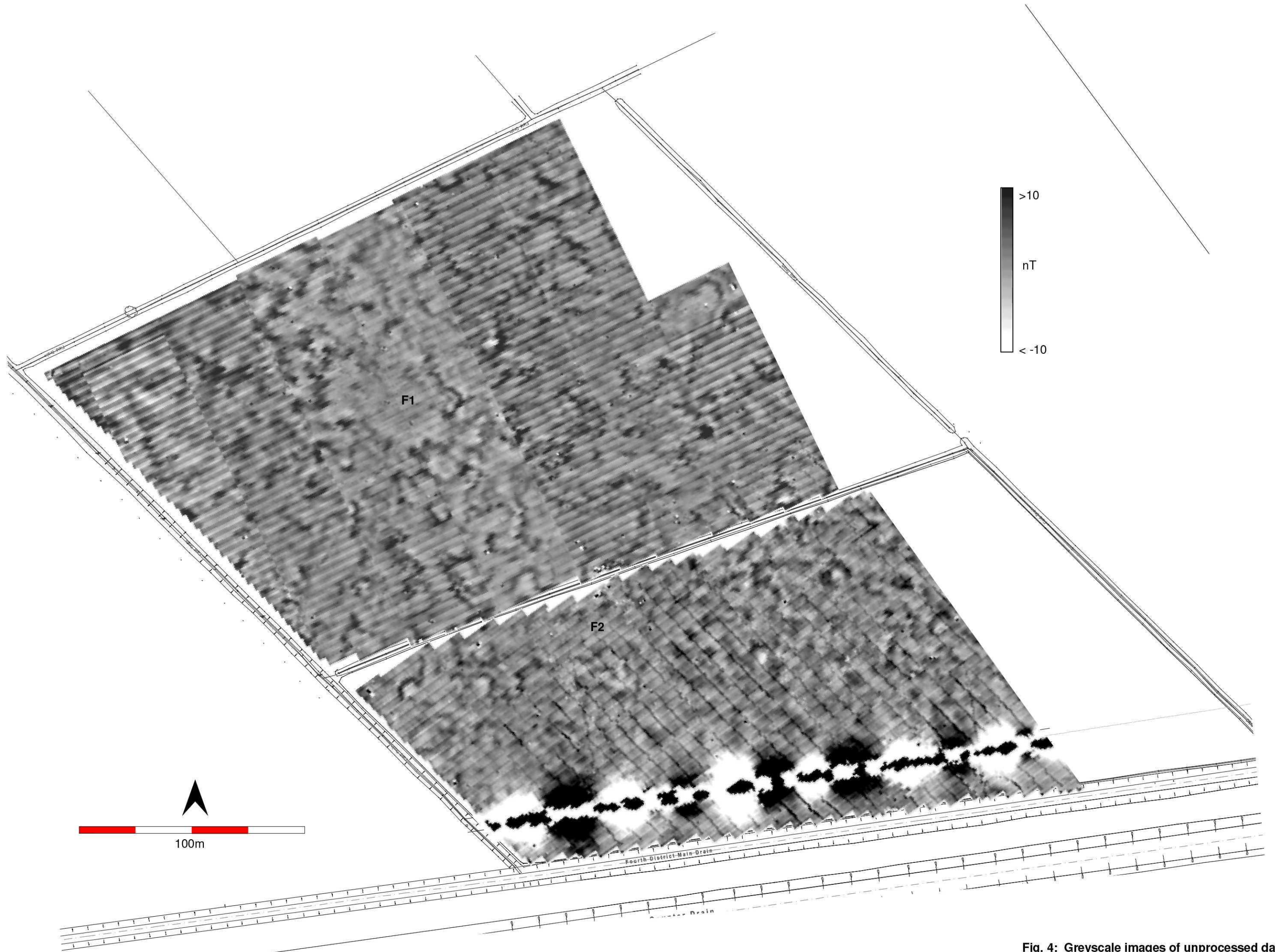


Fig. 4: Greyscale images of unprocessed data

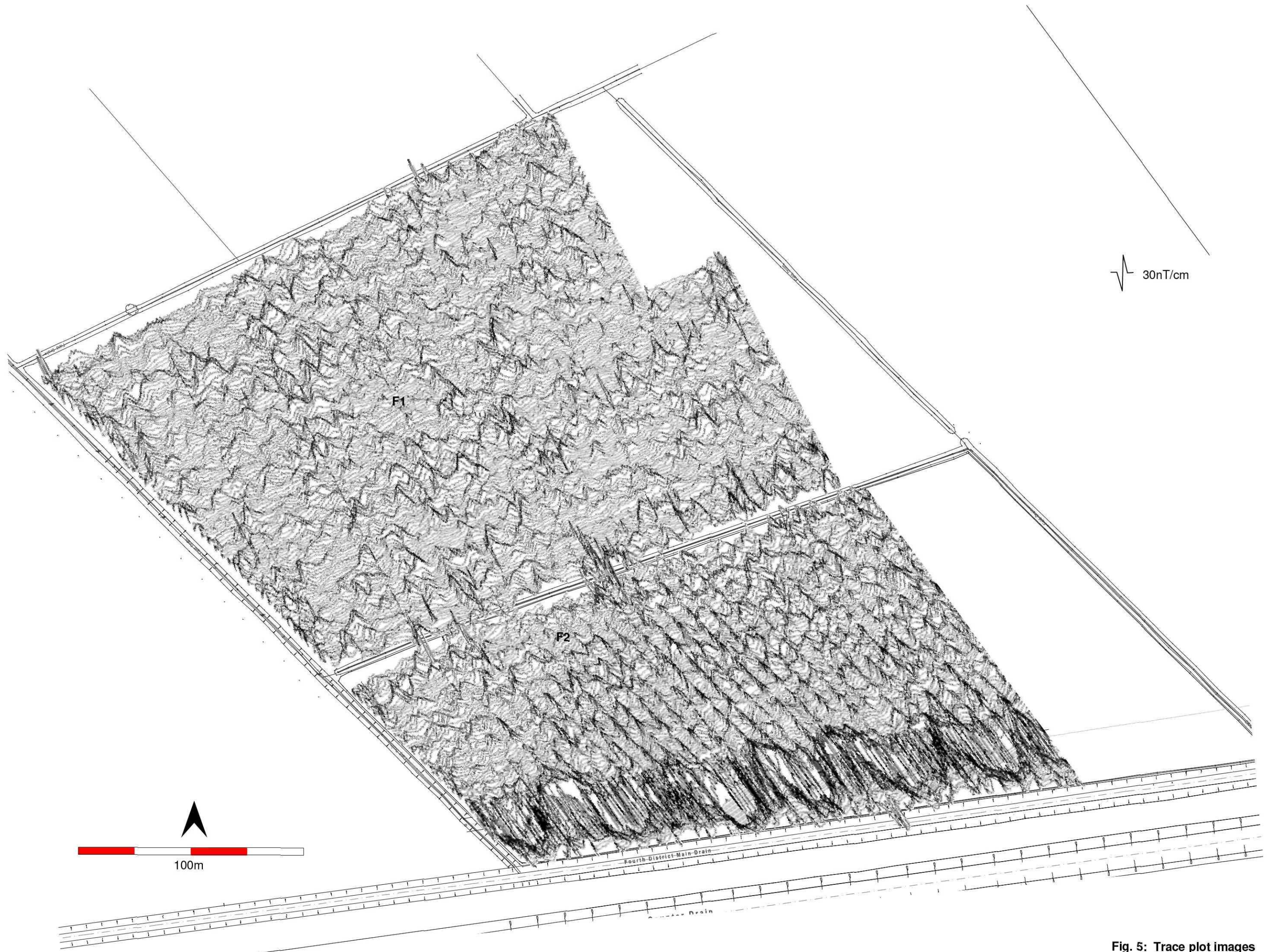


Fig. 5: Trace plot images