

ARCHAEOLOGICAL GEOPHYSICAL SURVEY

**SK3 HOLTON BM SOLAR PV FARM
HALESWORTH AIRFIELD
SPARROWHAWK ROAD
HOLTON, SUFFOLK**

CENTRED ON NGR: TM 39900 79500

SCC HER: HLN 014

**REPORT PREPARED FOR
ESSEX COUNTY COUNCIL ARCHAEOLOGICAL FIELD UNIT
ON BEHALF OF
ESCO NRG LTD AND REN ENERGY LTD**

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DECEMBER 2012**

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 Methodology	2
6.0 Results	3
7.0 Conclusions	4
8.0 Acknowledgements	5
9.0 References	5

Illustrations

Fig. 1: Location of site 1:50000

Fig. 2: Location of site, survey & proposed Solar Farm (Fig. 2B) 1:5000/1:10000

Figs. 3 - 14: Trace, Greyscale and interpretive images 1:1250

Appendix 1

OASIS form – essexcou1-139029

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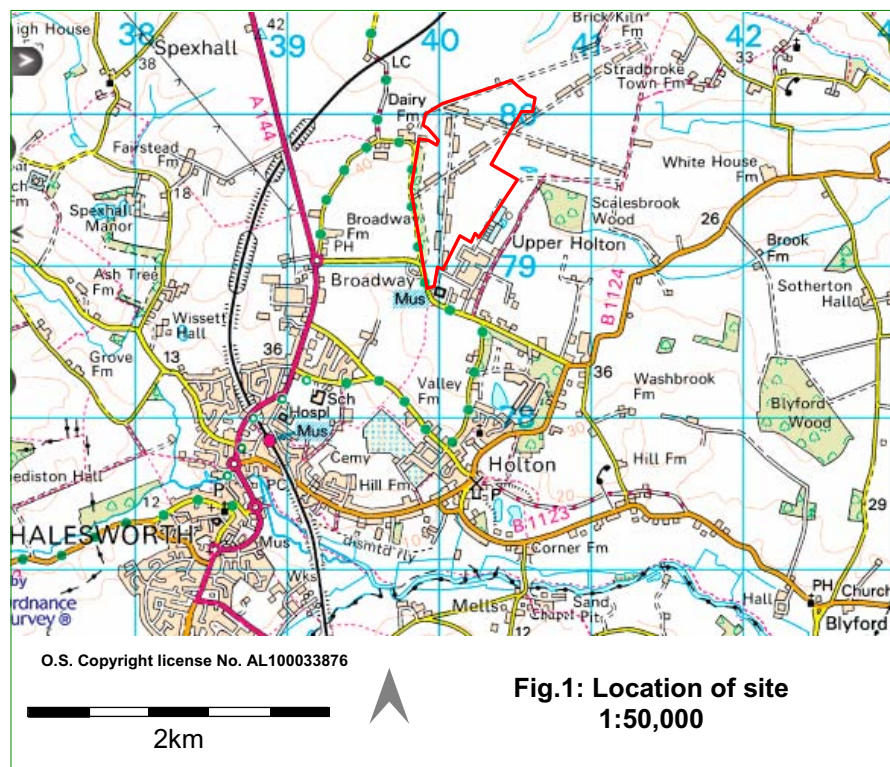
Non-technical summary

A fluxgate gradiometer survey was undertaken on land at former Halesworth Airfield, Holton, Suffolk. The site is proposed for the development of a Solar Farm.

The majority of recorded magnetic variation clearly or probably relates to the former use of the site as an airfield and an earlier agricultural landscape comprising:

- Residual traces of removed runways and associated features, including services, dispersal areas, possible remains of landing lights etc and miscellaneous ferrous-rich materials or objects. It is possible that some services relate to more recent use, particularly a probable buried electricity cable in the eastern part of the site.
- Pre-war time field boundaries and buildings. The survey recorded two linear anomalies that might relatively recent boundaries, though it should be noted that these are not depicted on O.S. Maps. As such, a potential earlier origin should not be totally discounted.
- Weak variation in the north-western part of the site probably indicates natural processes.
- Slight traces of probable cultivation.

With reference to the survey results it is therefore concluded that there is limited potential for archaeological remains to lie within the proposed development area.



1.0 Introduction

Acting for ESCO NRG Ltd and REN Energy Ltd, Essex County Council Field Archaeology Unit (ECC FAU) commissioned a fluxgate gradiometer survey on land at the former Halesworth Airfield, Upper Holton, Suffolk (centred on NGR: TM 39900 79500). The site is proposed for the development of a solar farm.

The fieldwork and reporting was carried out in accordance with a written scheme of investigation (WSI) (ECC FAU, 2012). The WSI responds to a brief issued by the Suffolk County Council Archaeological Service Conservation Team (SCCAS/CT) for a programme of geophysical survey and archaeological monitoring within the proposed development. The project has been given the Suffolk County Council Historic Environment Record event number HLN 014 and an OASIS project record has also been completed for the work with the unique reference code essexcou1-139029 (see Appendix 1).

2.0 Location and description (Figs. 1 – 2)

The proposed Solar PV farm, which encompasses an area of approximately 25ha within the former Halesworth Airfield, is situated to the immediate north of Upper Holton and to the east of Dairy Farm. The A144, which follows the line of Roman Stane Street, lies to the west of the site.

For the most part, the site is open arable land that encompasses some wholly or partially surviving runways. Approximately 20ha of land adjacent to two runways were targeted for geophysical survey. The northern, SE – NW aligned, runway survives intact and contains a number of turkey rearing sheds, whereas the c.N – S aligned runway has recently been almost completely removed (with the exception of the mid area that serves as a service road).

3.0 Geology and topography

The underlying solid geology of the site comprises sand (Crag Group). Superficial deposits over the site comprise chalky till of the Lowestoft Formation.

The magnetic response of archaeological remains within these geologies is typically variable (English Heritage, 2008).

The site occupies predominately level ground at c.40m Above Ordnance Datum (AOD).

4.0 Archaeological context (Extract from WSI)

While no known archaeological sites are recorded within the proposed Solar PV farm, a number of cropmark sites and some Iron Age remains have been recorded nearby. In addition, Stane Street, a major Roman road, runs just to the west of the site, raising the potential for roadside settlement and other related activity to be present nearby.

Halesworth airfield was built as a Class A bomber base. Construction of its three runways, two hangars and accommodation for 3000 personnel began in 1942, becoming operational by July of that year. Initially the 56th Fighter Group of the United States 8th Army Air Force was stationed there, leaving in April 1944 to be replaced by the 489th Bomb Group. In June 1945 Royal Air Force Bomber Command assumed control of the base before it was handed over to the Royal Navy in early August to be used as an advanced flying training base, HMS Sparrowhawk. The airfield closed for flying in February 1946.

5.0 Methodology

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

5.1 Gradiometry is a non-intrusive scientific prospecting technique; used to determine the presence/absence of some classes of sub-surface archaeological remains (e.g. pits, ditches, kilns, and occasionally stone walls). By scanning the soil surface, geophysicists identify areas of varying magnetic susceptibility and can interpret such variation by presenting data, measured in units of nanoTesla (nT), in various graphical formats and identifying images that share morphological affinities with diagnostic archaeological remains.

The technique records anomalous magnetic variation within buried archaeological and other remains; therefore an absence of magnetic variation would predispose detection by gradiometry.

5.2 The survey was undertaken using Bartington Grad-601 Dual Fluxgate Gradiometers on 21st – 23rd November 2012. The zigzag traverse method was used, where readings were taken at 0.25m intervals along 1.0m wide traverses.

The survey was fixed using Differential Global Positioning Satellites employing a Topcom GSR-1; greyscale images have been geo-referenced to an Autocad drawing of the site.

The data sets were processed using *ArcheoSurveyor V.2.0*. Raw data was de-striped to eliminate slight variations caused by zigzag traversing and clipped to reduce the distorting effects of extremely high or low readings induced by metal objects/features.

The results were plotted as trace, greyscale and interpretive images (Figs. 3 – 14).

5.3 Character, interpretation and presentation of anomalies (Figs. 6, 10, 14)

Potential cultivation is highlighted as orange lines, known or suspected recent boundaries/buildings as yellow, service as blue lines and suggested examples of natural responses as green.

Anomalies considered to reflect modern ferrous-rich features and objects are highlighted in blue on the interpretive images. These are characterised magnetically as dipolar ‘iron spikes’, often displaying strong positive and/or negative responses. Examples include those deposited along existing or former boundaries (e.g. wire fencing), services and scatters of horseshoes, ploughshares etc across open areas. Ferro-enhanced (fired) materials such brick and tile (sometimes introduced during manuring or land drain construction) usually induce a similar, though predominately weaker response. Concentrations of such anomalies will often indicate rubble spreads, such as would be used to backfill ponds or redundant ditches, or indicate the blurred footprints of demolished structures.

6.0 Results and discussion (Figs. 3 - 14)

6.1 Areas A, B & C (Figs. 3 – 6)

The survey recorded:

- a) Strong magnetic variation in Areas A & B that clearly relates to residual debris within (and immediately adjacent to) the site of a recently removed runway (Fig. 6: zones 1 & 2, highlighted blue).
- b) Buried services, for the most part probably associated with the former airfield, although it is possible that some might serve existing (or recently demolished) turkey rearing sheds (blue lines). Some align with former boundaries or tracks as shown on historic maps (Fig. 6A), including strong linear anomalies recorded in Area C.
- c) Traces of pre-airfield field boundaries (yellow lines, see also Fig. 6A). As discussed above, a number appear to correspond to former boundaries. Clearest examples are highlighted as solid lines, whilst more ephemeral traces are flagged as dashed lines. An isolated N-S aligned weak linear anomaly was detected in the central part of Area 1 (3: dotted yellow line). It is speculated that this might signify a relatively recent field

boundary (albeit not recorded on historic maps). This hypothesis makes reference to a possible association with a former building given that it extends towards the latter (zone of high readings: 4, highlighted yellow).

- d) Scatters of discrete and grouped magnetically stronger anomalies (highlighted blue). On agricultural land these typically signify miscellaneous ferrous rich objects such as ploughshares, horseshoes and brick/tile fragments (the latter potentially introduced during manuring or land drainage construction). However, on this site, it is likely that elements of these relate to airfield activity/features. For example, a spread of moderately strong anomalies in the north west corner of Area A occur over the site of a former aircraft 'pan' dispersal point (5, more distinct on Fig. 5, see also Fig. 6B). No clear traces of a second dispersal point were recorded to the south of 5. Additionally, very strong discrete anomalies were detected to the immediate west of the former runway. It is hypothesised that these include residual traces of runway lights etc.
- e) Weak linear anomalies that possibly reflect cultivation (dotted orange lines).
- f) Suggested natural responses (highlighted green).

6.1.1 Area D (Figs. 7 – 10)

The survey recorded:

- a) Residual traces of a partially removed runway and adjacent service at the western edge of the survey (Fig. 10: highlighted blue/blue line). A probable buried electricity cable (that extends towards an electricity sub station) was recorded in to the northern part of the survey area (blue line).
- b) Recently removed boundaries, as depicted on historic maps (solid yellow lines, see also Fig 10A). The alignment of an ephemeral linear anomaly in the northern part of the survey appears to respect known former boundaries, suggesting contemporaneity (dotted yellow line, 6). A zone of high readings in this area corresponds to a former building (7, see also Fig 10A).
- c) Discrete, magnetically strong anomalies of likely modern origin, as discussed above (highlighted blue)

6.1.2 Area E (Figs. 11 - 14)

The survey recorded:

- a) Former boundaries and strong variation over the site of a former building (Fig. 14: 8 - highlighted yellow, see also Fig. 14A).
- b) A buried service that extends across the northeast corner of the survey area (blue line).
- c) Slightly denser scatters of strong anomalies that probably relate to two dispersal areas (9 & 10: highlighted blue, see also Fig. 14B). High readings were also recorded along/within the edge of the recently removed runway and also along the edge of the intact runway (highlighted blue).
- d) A random scatter of scatter of strong/moderately strong anomalies, as discussed above (highlighted blue).

7.0 Conclusions

The majority of recorded magnetic variation clearly or probably relates to the former use of the site as an airfield and an earlier agricultural landscape comprising:

- Residual traces of removed runways and associated features, including services, dispersal areas, possible remains of landing lights etc and miscellaneous ferrous-rich materials or objects. It is possible that some services relate to more recent use, particularly a probable buried electricity cable in Area D.
- Pre-wartime field boundaries and buildings. The survey recorded two linear anomalies that might represent relatively recent boundaries, though it should be noted that these are not depicted on O.S. Maps. As such, a potential earlier origin should not be totally discounted.
- Weak variation in Area A, probably indicative natural processes.
- Slight traces of probable cultivation.

With reference to the survey results it is therefore concluded that there is limited potential for archaeological remains to lie within the proposed development area.

8.0 Acknowledgements

Pre-Construct Geophysics would like to thank Essex County Council Field Archaeology Unit for this commission.

9.0 References

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

ECC FAU. 2012 *Sk3 Holton Bm Solar Pv Farm, Holton Airfield, Sparrowhawk Road, Holton Suffolk*. Written Scheme of Investigation for a Geophysical Survey and Archaeological Monitoring. ECC FAU.

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

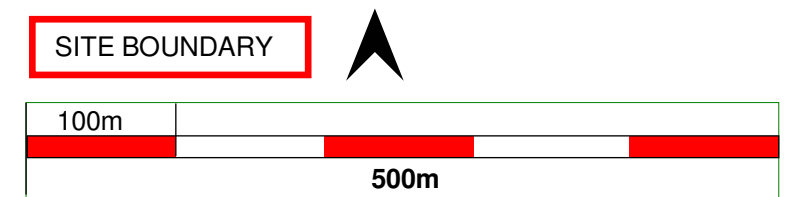
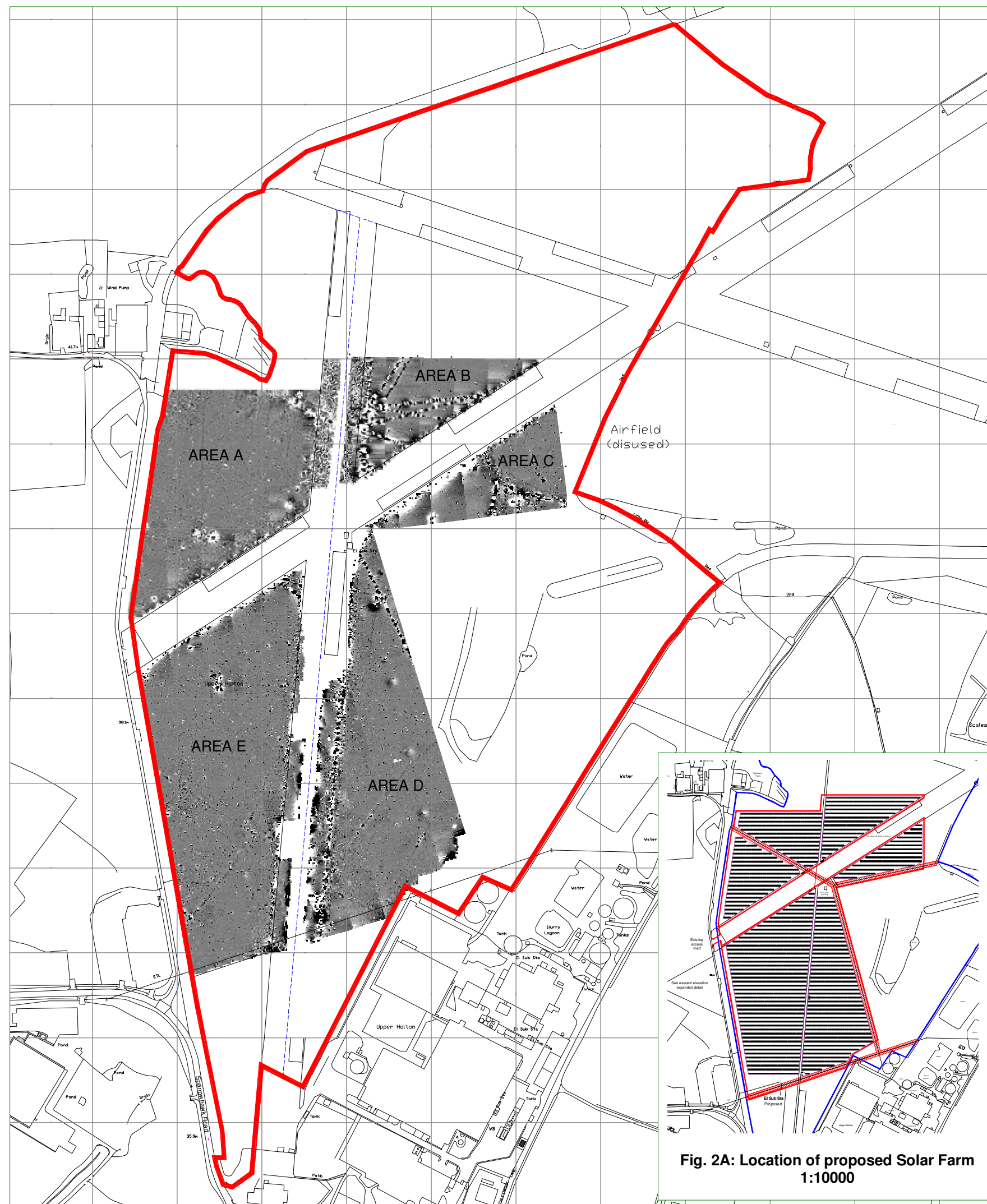


Fig. 2: Location of site, survey
& proposed Solar Farm (Fig. 2A)

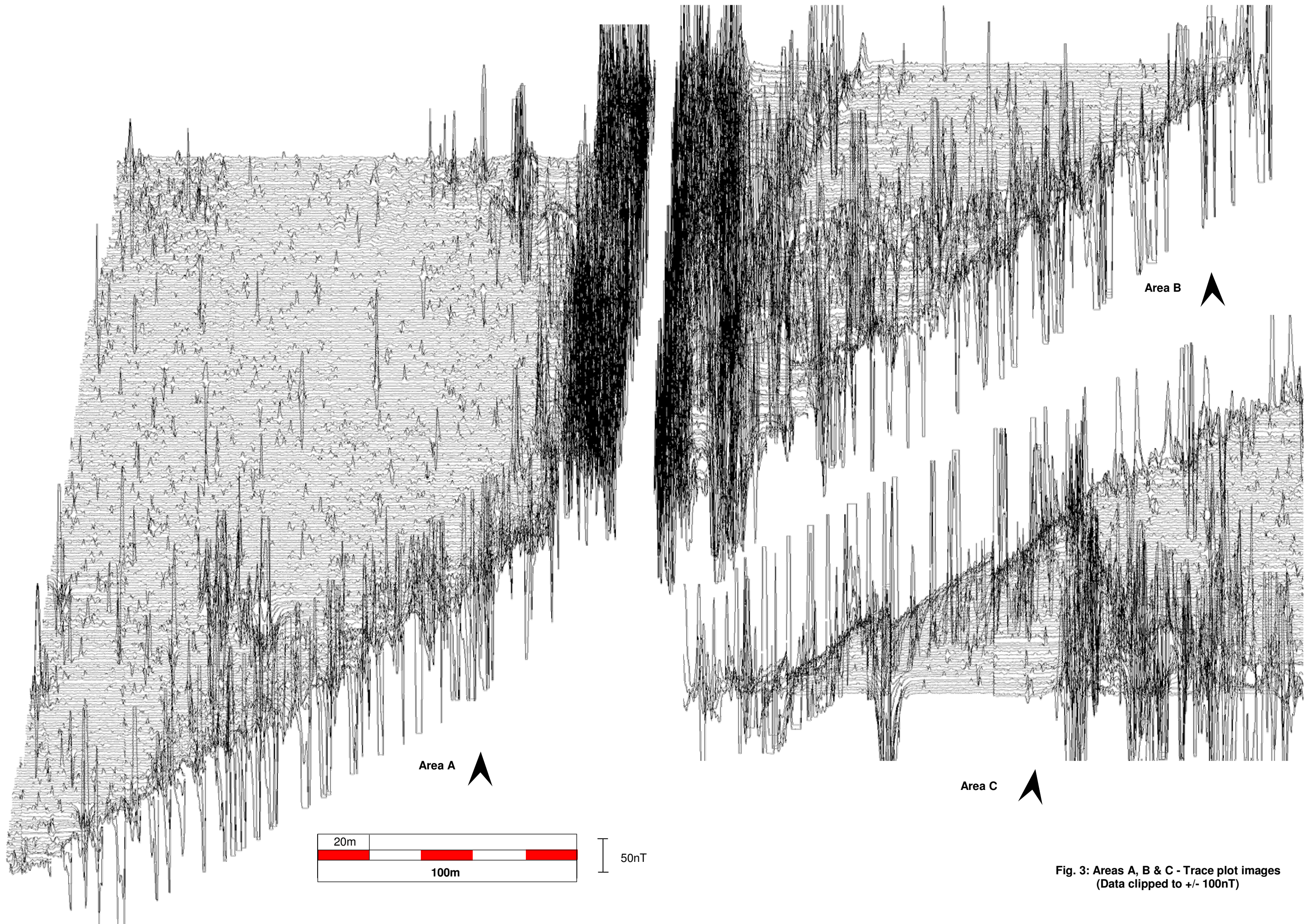


Fig. 3: Areas A, B & C - Trace plot images
(Data clipped to +/- 100nT)

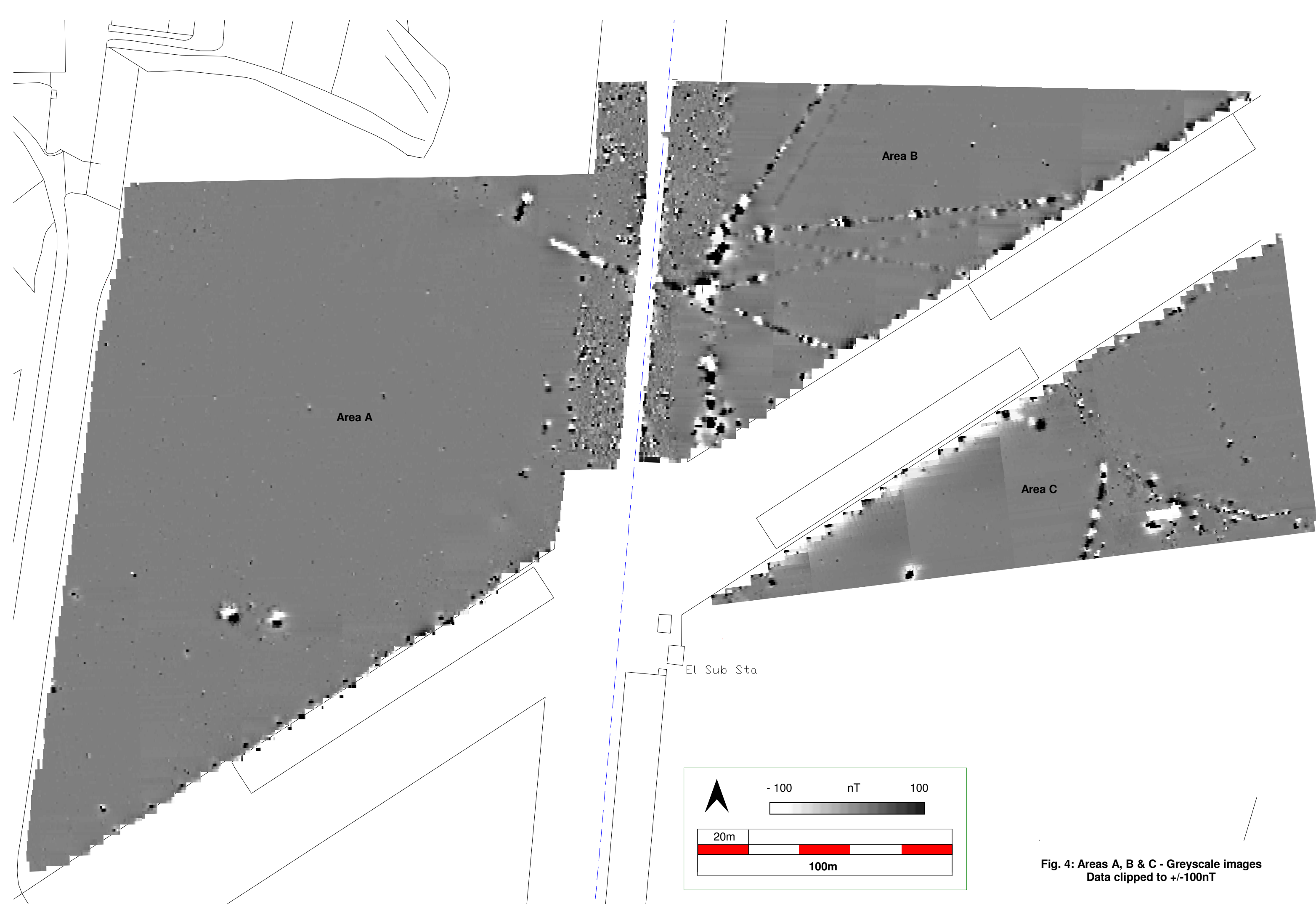
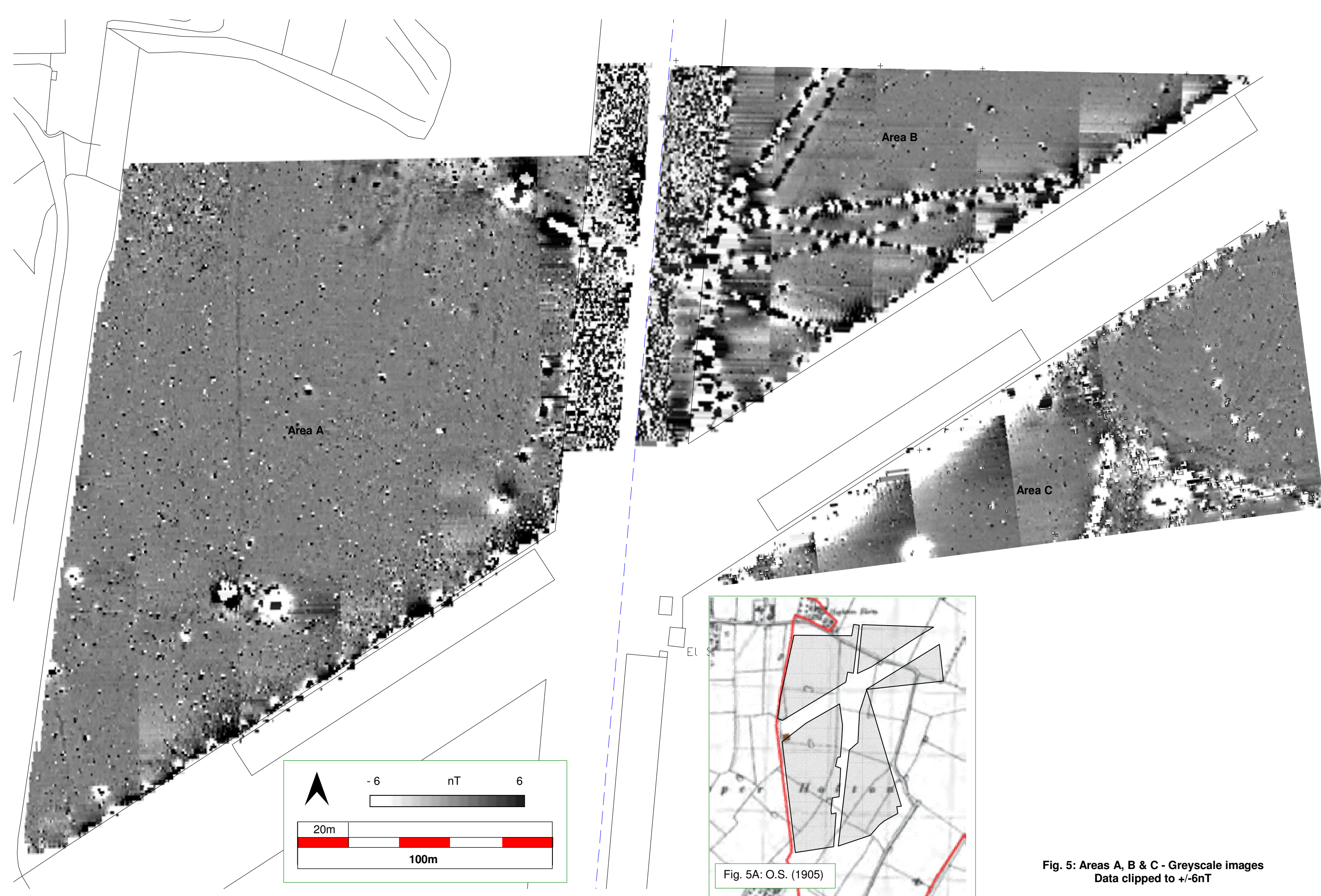
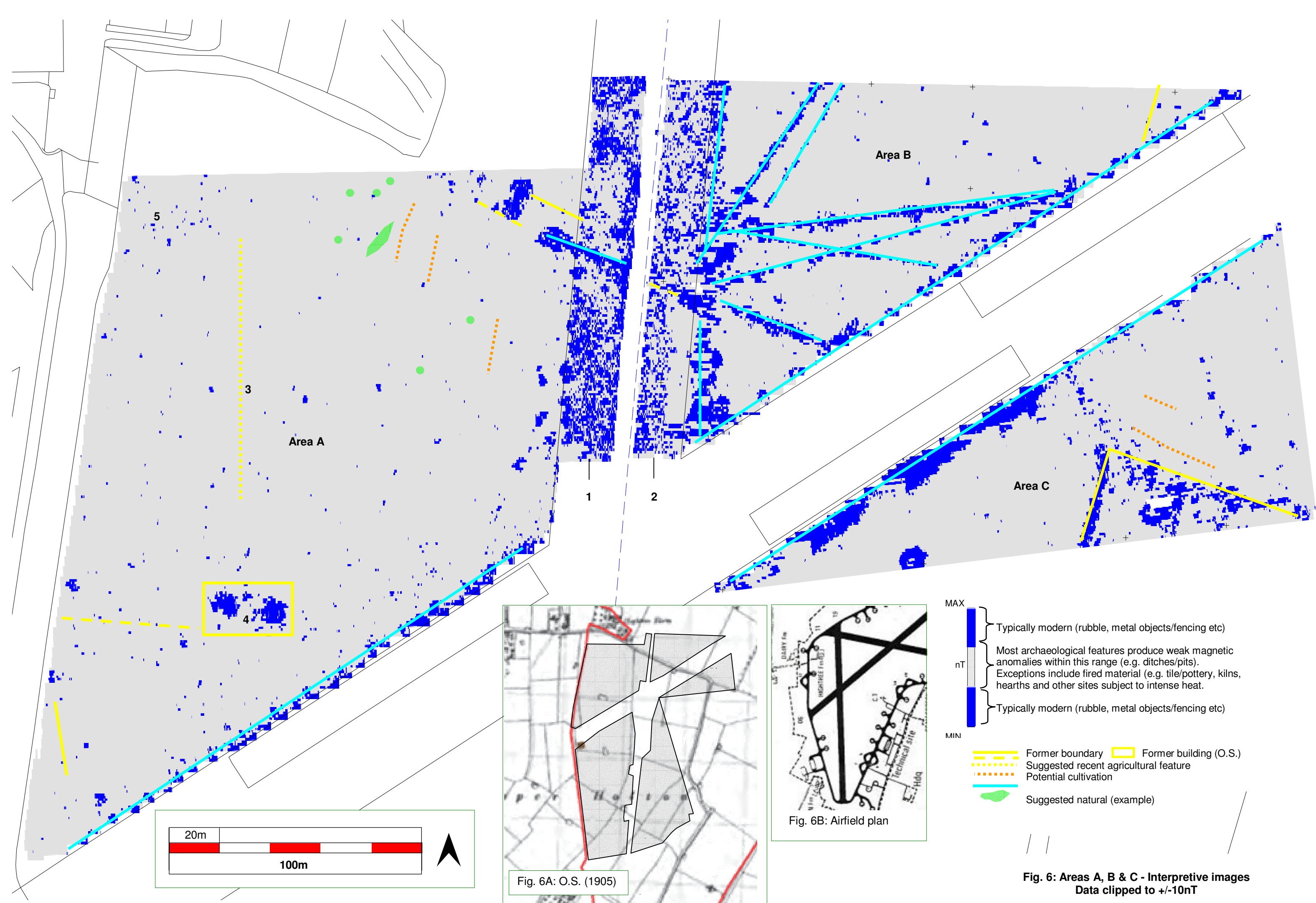


Fig. 4: Areas A, B & C - Greyscale images
Data clipped to +/-100nT





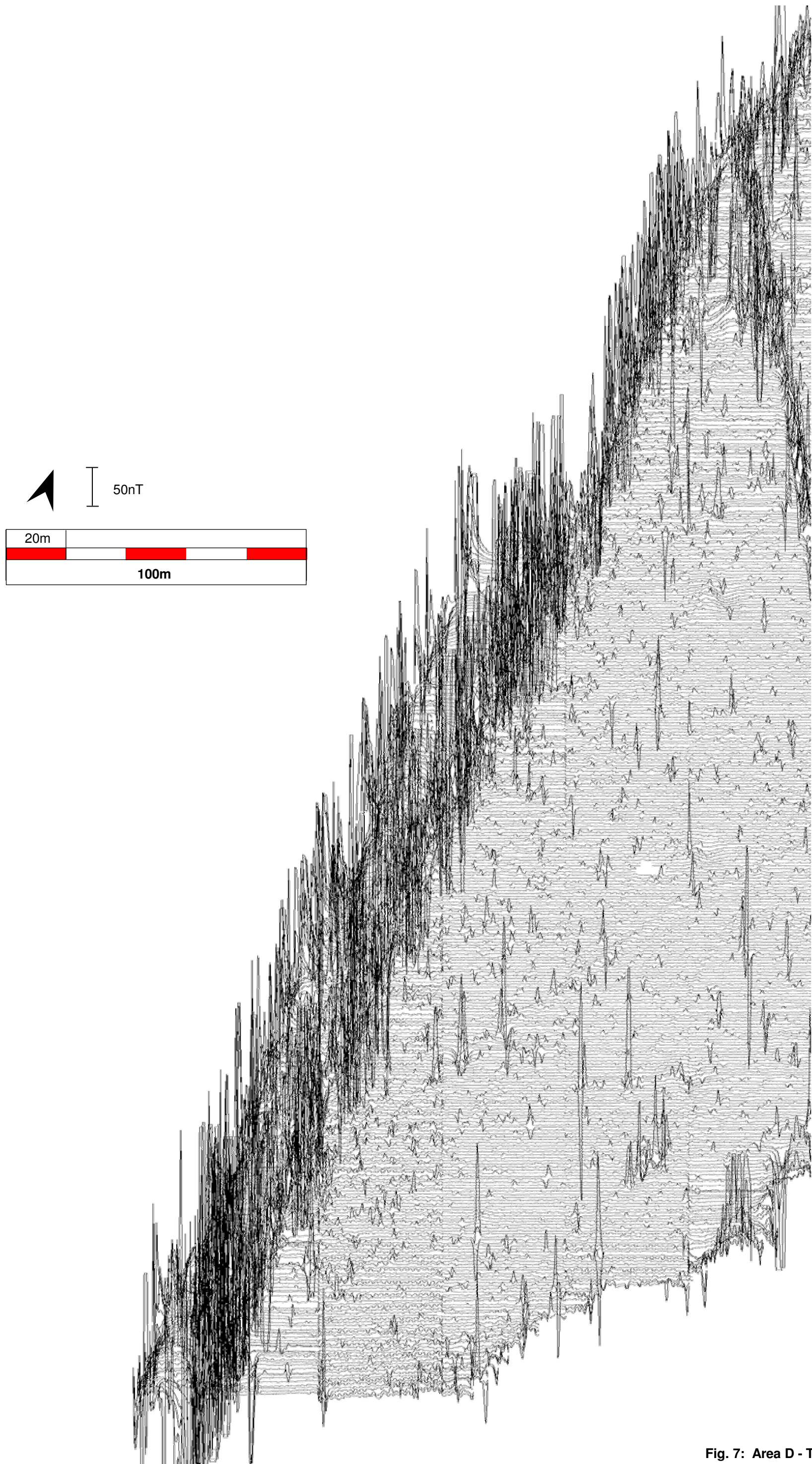


Fig. 7: Area D - Trace plot image
(Data clipped to ± 100 nT)

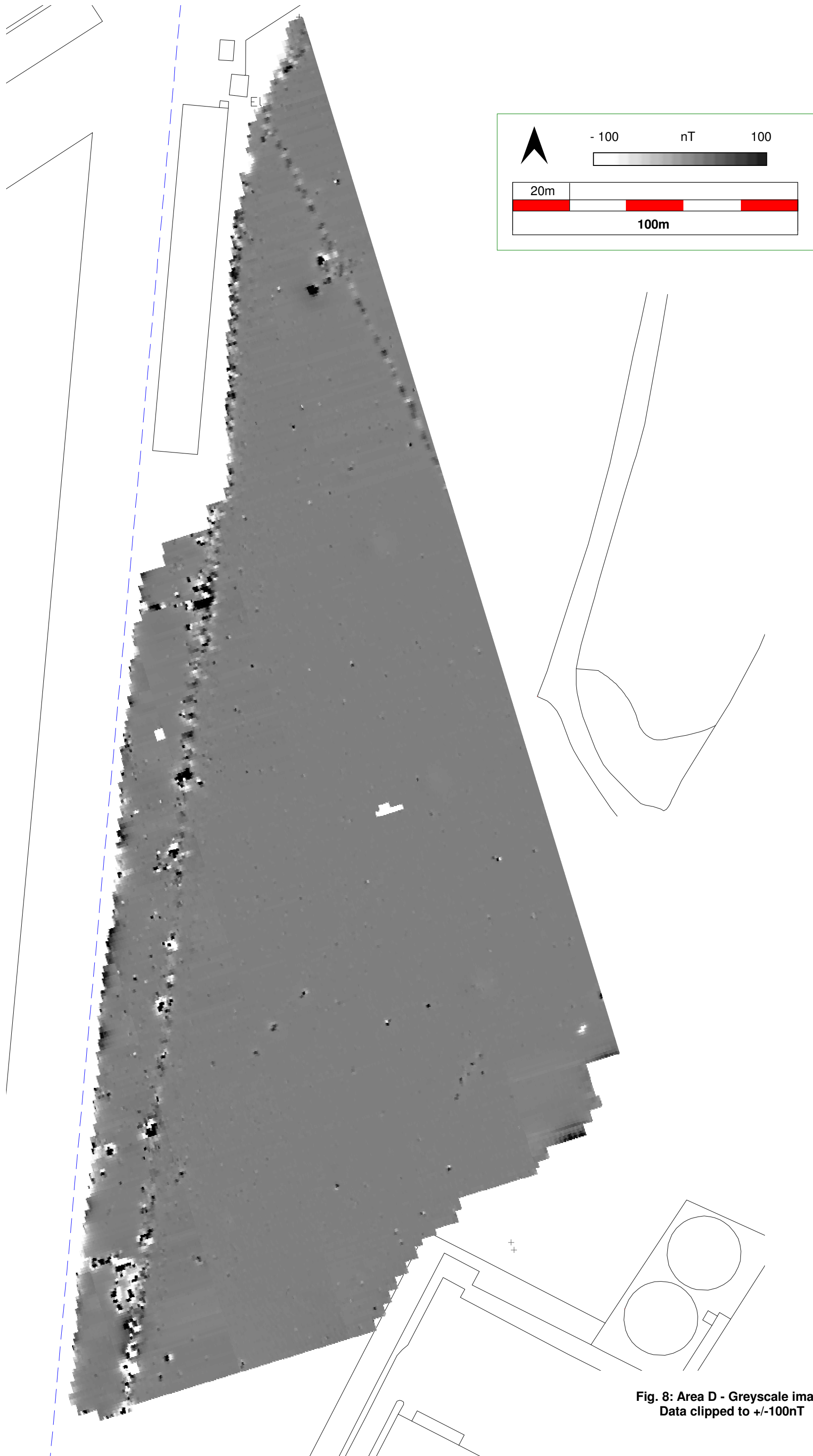


Fig. 8: Area D - Greyscale image
Data clipped to ± 100 nT

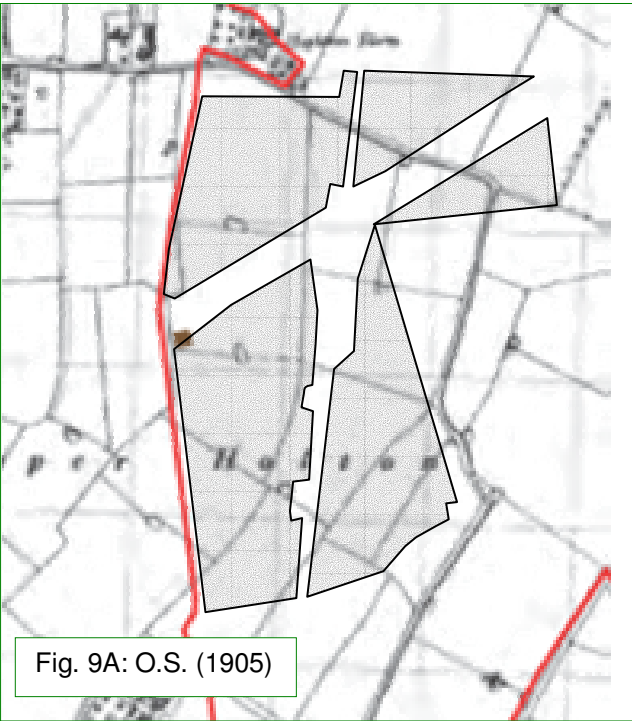
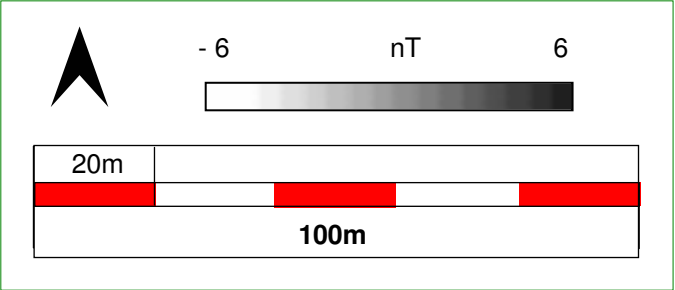
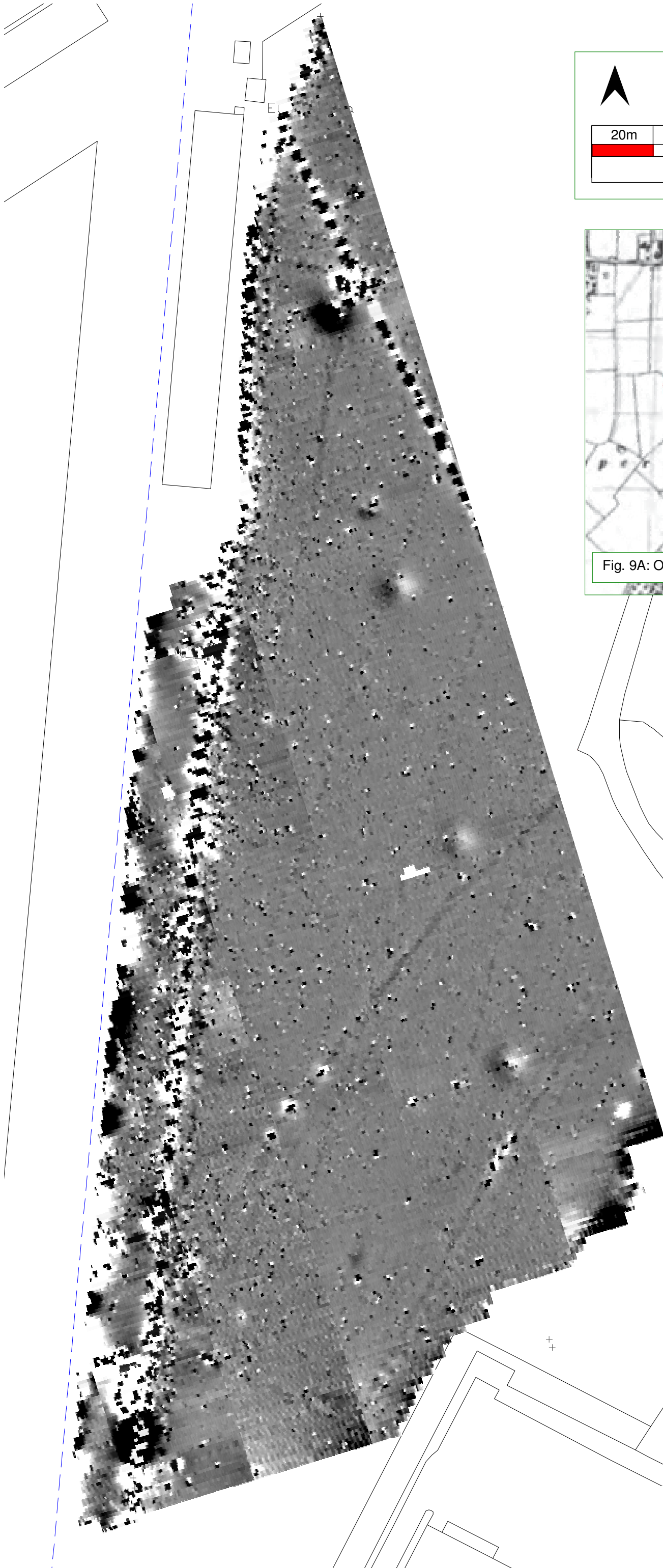


Fig. 9: Area D - Greyscale image
Data clipped to +/-6nT

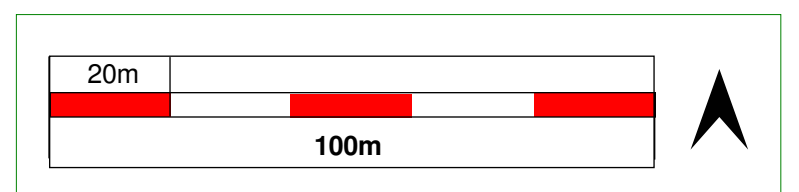
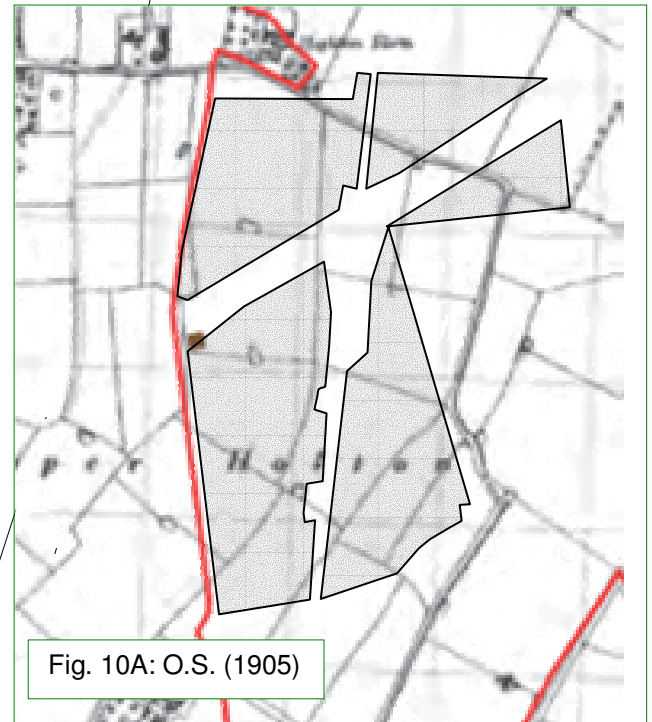
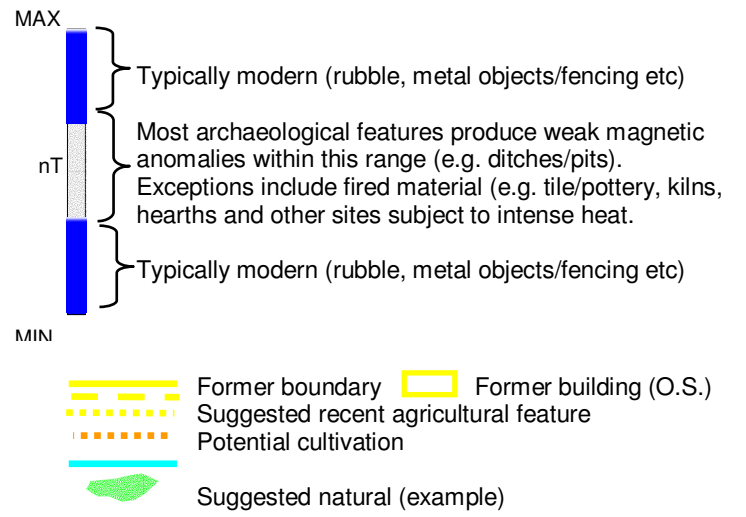
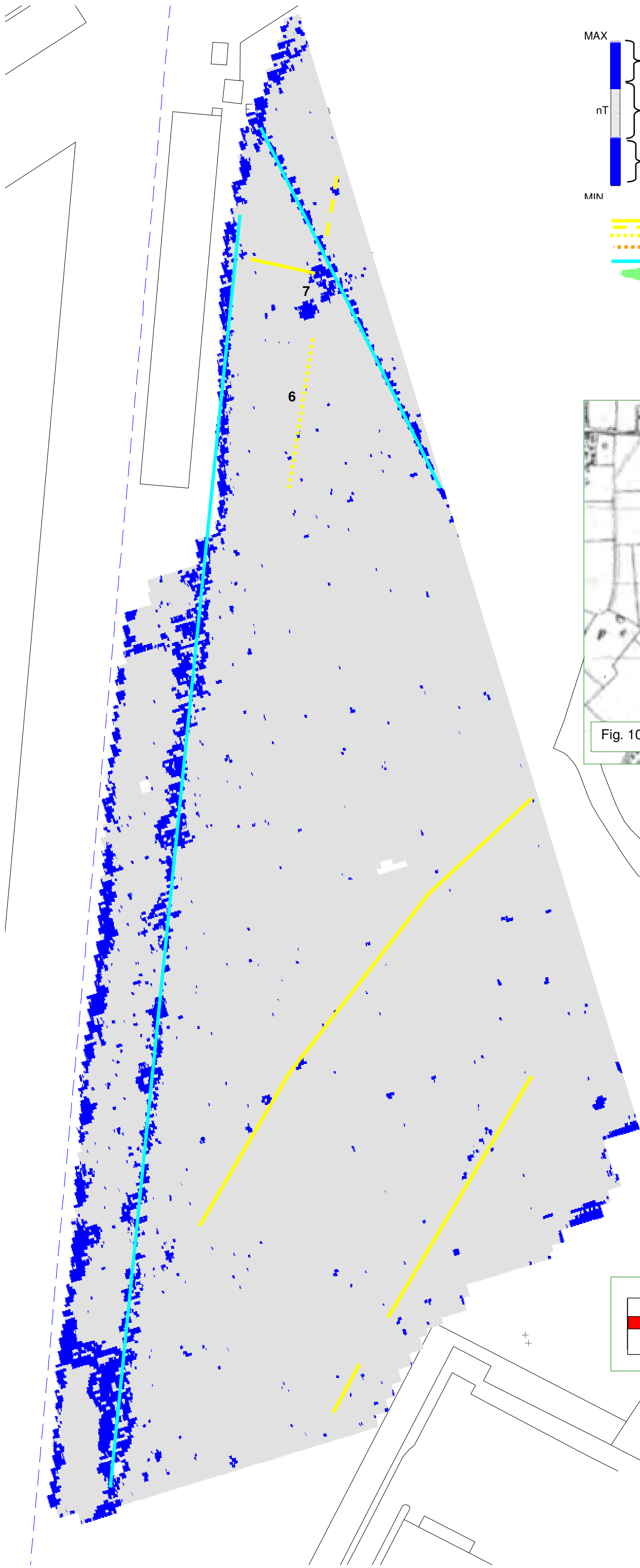


Fig. 10: Area D - Interpretive image
Data clipped to +/-10nT

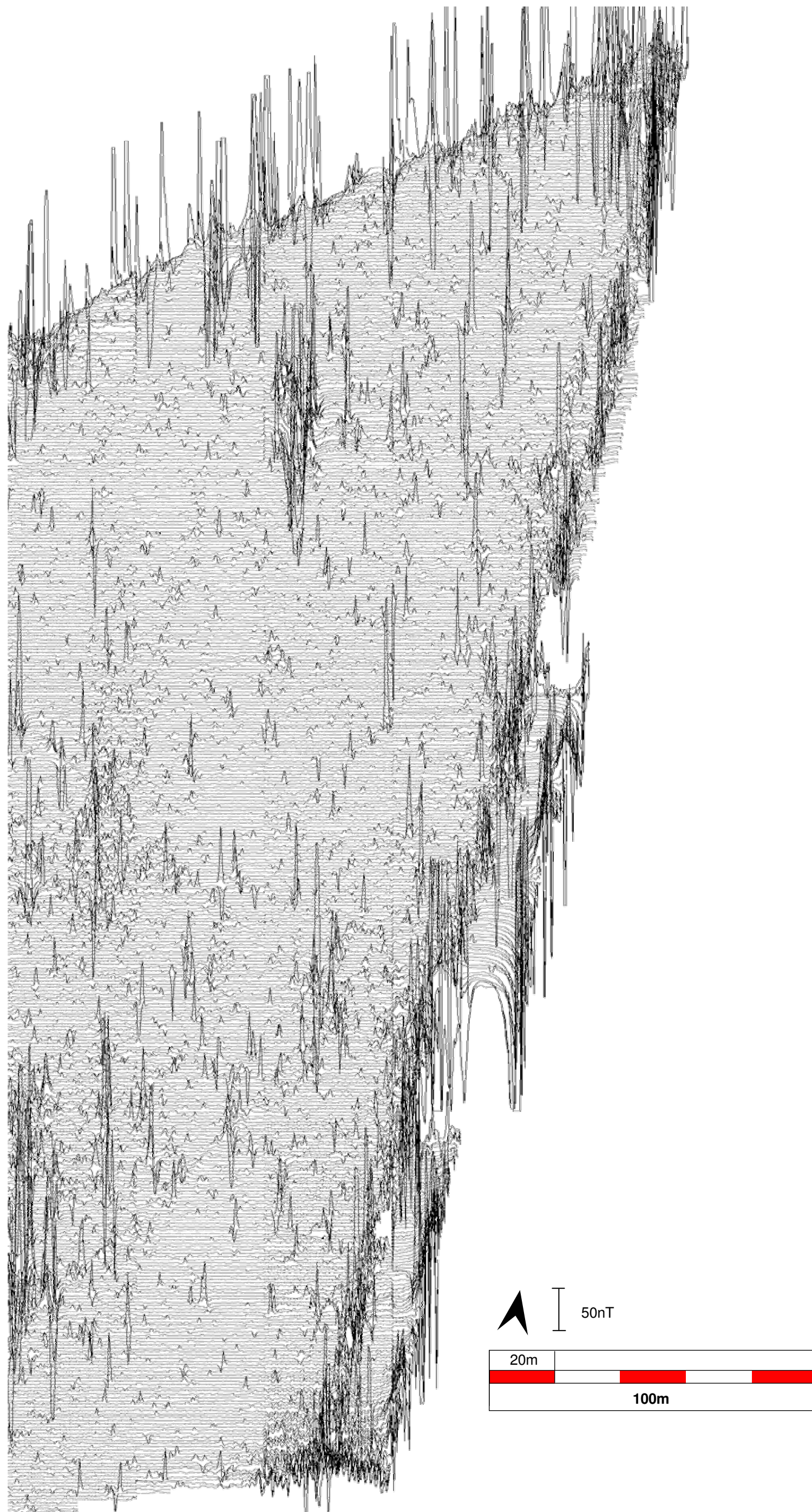


Fig. 11: Area E - Trace plot image
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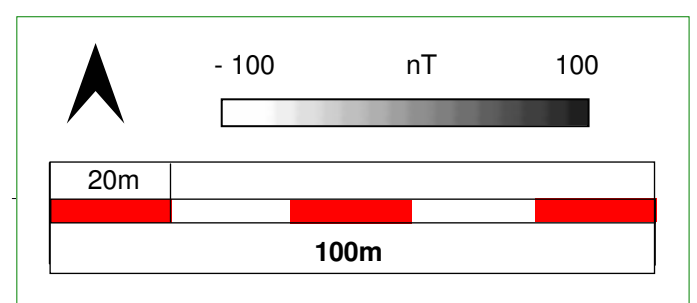
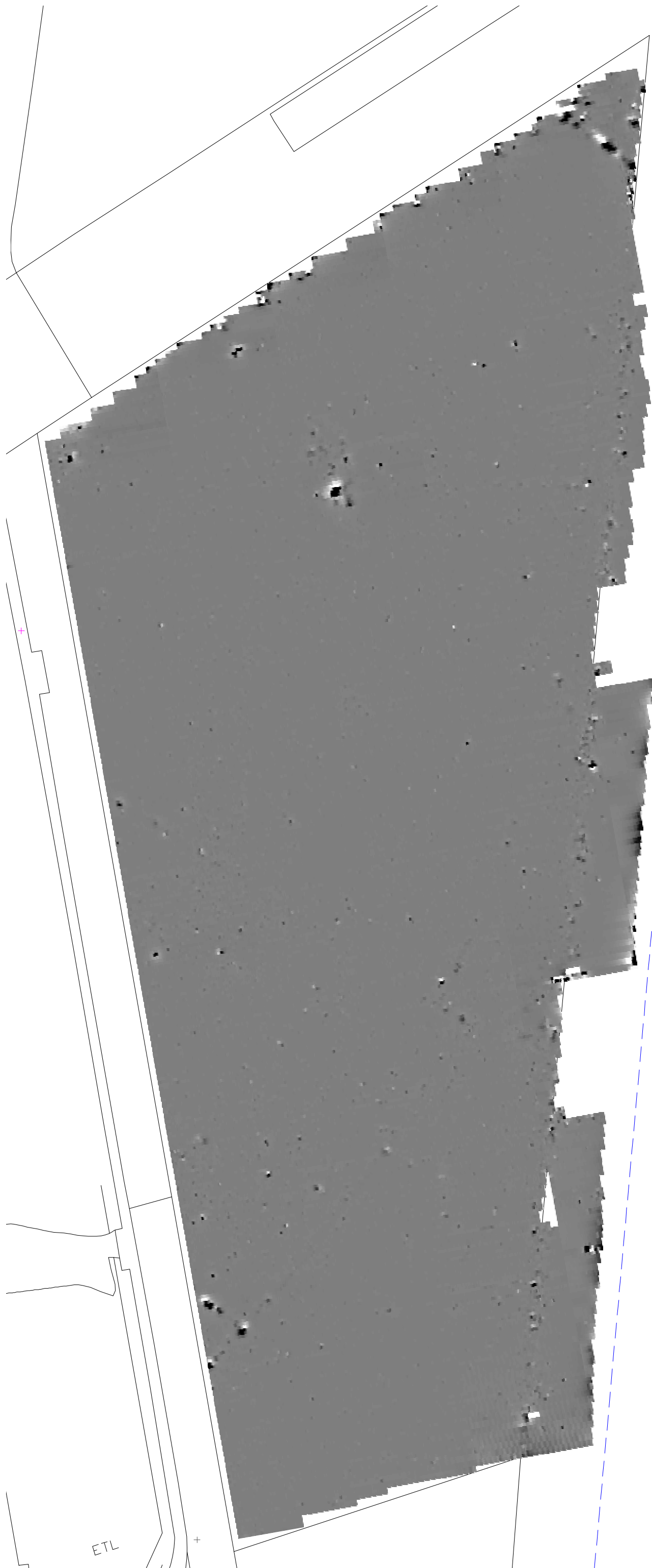


Fig. 12: Area E - Greyscale image
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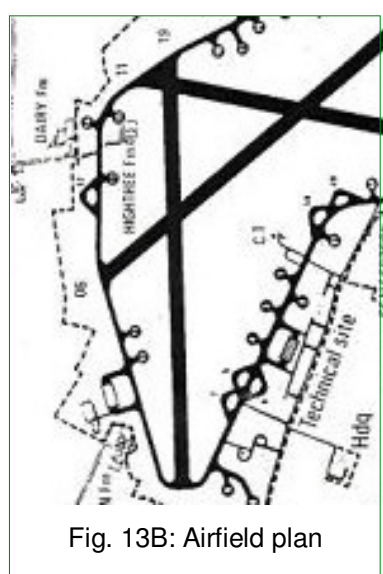
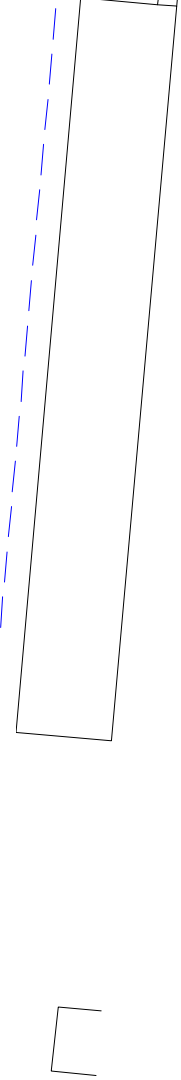
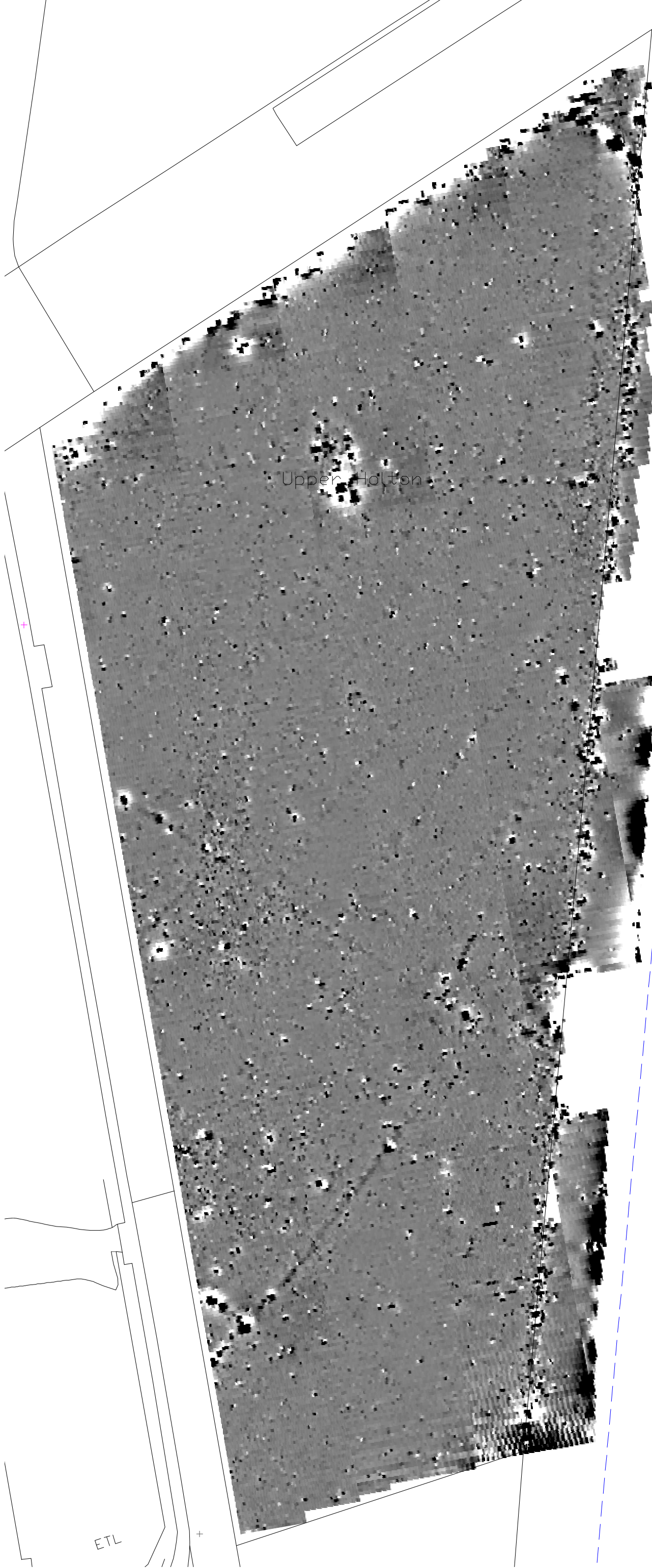


Fig. 13B: Airfield plan

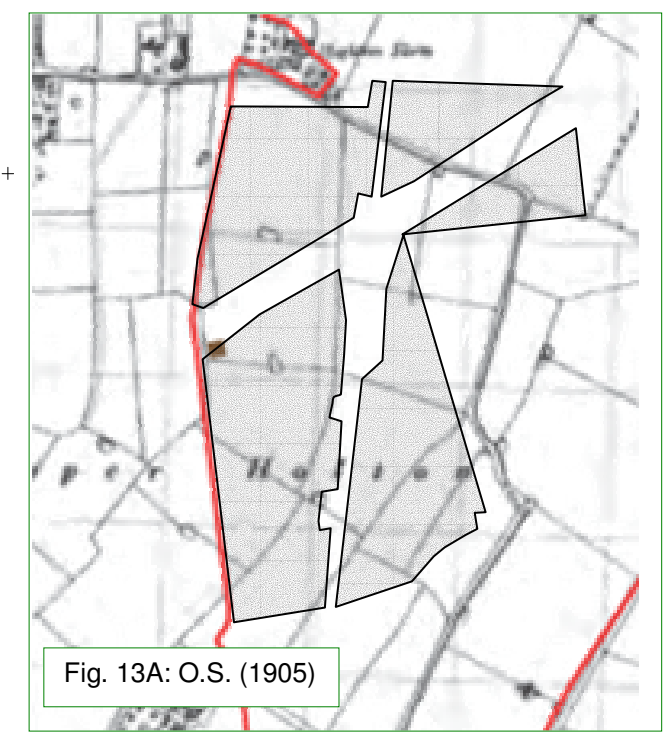


Fig. 13A: O.S. (1905)

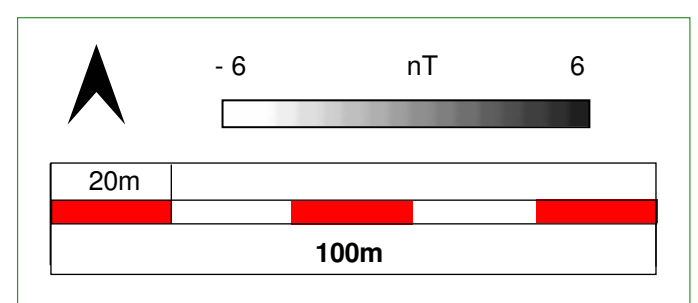


Fig. 13: Area E - Greyscale image
Data clipped to +/-6nT

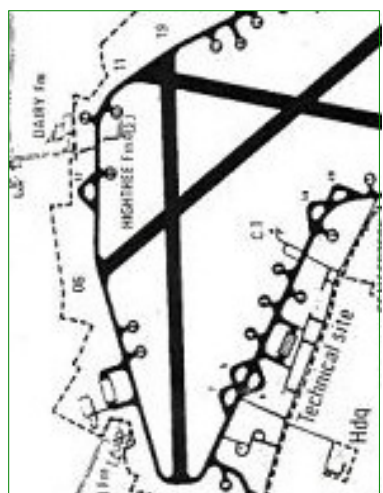
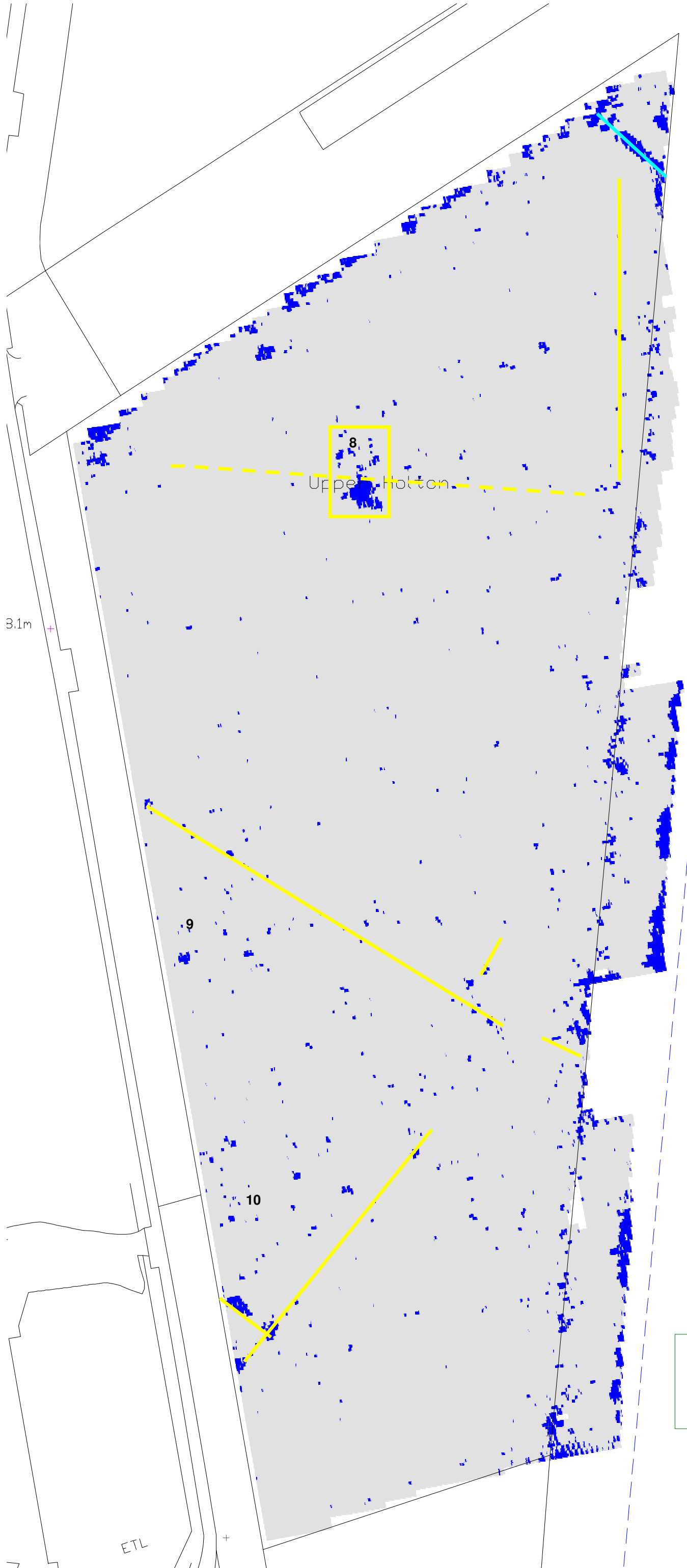


Fig. 14B: Airfield plan

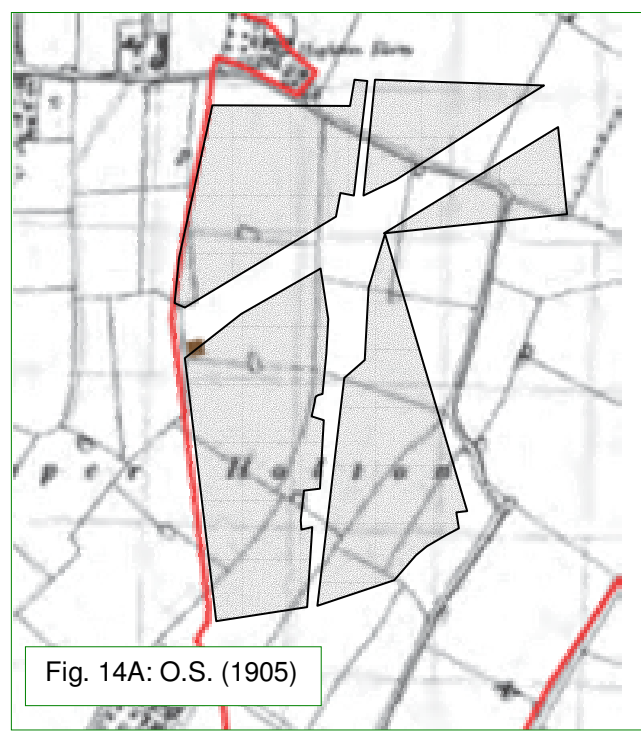


Fig. 14A: O.S. (1905)

- Former boundary
- Former building (O.S.)
- Suggested recent agricultural feature
- Potential cultivation
- Suggested natural (example)

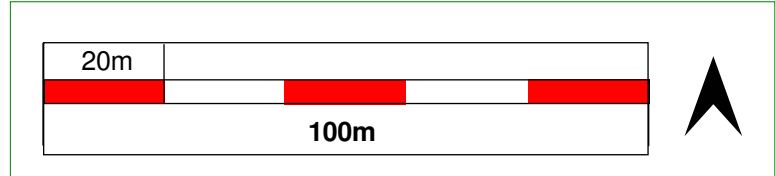
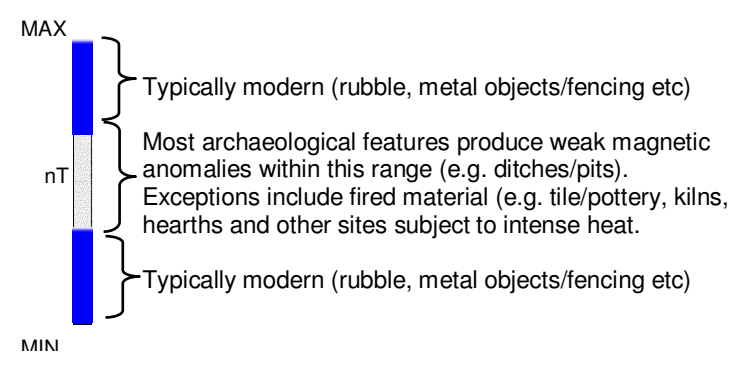


Fig. 14: Area E - Interpretive image
Data clipped to +/-10nT

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OASIS ID: essexcou1-139029

Project details

Project name	Holton Airfield - Geophysics
Short description of the project	Holton Airfield - Geophysicscal survey
Project dates	Start: 18-11-2012 End: 12-12-2012
Previous/future work	No / Not known
Any associated project reference codes	HLN014 - HER event no.
Type of project	Field evaluation
Site status	None
Monument type	LINEAR FEATURES Uncertain
Monument type	AIRFIELD FEATURES Modern
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Solar Farm
Prompt	Planning condition
Position in the planning process	Not known / Not recorded
Solid geology (other)	Crag Group - Sand
Drift geology (other)	Lowestoft Formation - Diamicton
Techniques	Magnetometry

Project location

Country	England
Site location	SUFFOLK WAVENEY HOLTON Holton/Halesworth Airfield
Study area	25.00 Hectares
Site coordinates	TM 39900 79500 52 1 52 21 37 N 001 31 25 E Point

Project creators

Name of Organisation	Pre Construct Geophysics Ltd
Project brief originator	Suffolk County Council Archaeological Service
Project design originator	Essex County Council Field Archaeology Unit
Project director/manager	Essex County Council Field Archaeology Unit

Project supervisor	David Bunn (Pre Construct Geophysics Ltd)
Type of sponsor/funding body	Developer

Project archives

Physical Archive Exists?	No
Physical Archive recipient	n/a
Digital Archive recipient	n/a
Digital Contents	"none"
Digital Media available	"Geophysics"
Paper Archive Exists?	No
Paper Archive recipient	n/a

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	ARCHAEOLOGICAL GEOPHYSICAL SURVEY. SK3 HOLTON BM SOLAR PV FARM.
Author(s)/Editor(s)	Bunn, D.
Date	2012
Issuer or publisher	PC Geophysics Ltd
Place of issue or publication	PC Geophysics Ltd
Description	A4 Grey Lit report including illustrations
Entered by	ECC Field Archaeology Unit (fieldag@essex.gov.uk)
Entered on	11 December 2012

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