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Land east of Thorp Arch Trading Estate
Walton
West Yorkshire

Geophysical Survey

Report no. 2370

July 2012

Client: West Yorkshire Archaeology Advisory Service

Land east of Thorp Arch Trading Estate
Walton
West Yorkshire

Geophysical Survey

Summary

A magnetometer survey was carried out on land east of Thorp Arch Trading Estate in order to gain a better understanding of a cropmark site which is protected as a scheduled ancient monument. The results will inform the West Yorkshire Archaeology Advisory Service about the archaeological potential of the site. Linear, rectilinear and discrete anomalies, interpreted as potentially archaeological in origin, have been identified throughout the site confirming and enhancing the cropmark data. However the responses are fragmentary and on varying alignments making interpretation difficult. Overall it can be said that the geophysical survey has confirmed the presence of archaeological features consistent with (probably) more than one phase of activity although it is still difficult to establish the precise nature of this activity. Extending the survey to the north, to more fully cover the cropmarks, and to the west towards Moat House, would probably help in establishing a better understanding of the site and its immediate surroundings.

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Report Information

Client:	West Yorkshire Archaeology Advisory Service
Address:	Registry of Deeds, Newstead Road, Wakefield, West Yorkshire, WF1 2DE
Report Type:	Geophysical survey
Location:	Walton
County:	West Yorkshire
Grid Reference:	SE 458 462
Period(s) of activity: represented	Multi-period?
Report Number:	2370
Project Number:	3659
Site Code:	WRP11
OASIS ID:	archaeol11-131509
Planning Application No.:	n/a
Museum Accession No.:	n/a
Date of fieldwork:	March 2012
Date of report:	July 2012
Project Management:	Alistair Webb BA MIfA
Fieldwork:	David Harrison BA MSc MIfA
	Alex Harrison BSc
Report:	David Harrison and Alistair Webb
Illustrations:	David Harrison
Photography:	Alex Harrison
Research:	n/a

Authorisation for distribution: ----------

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1 Introduction

Archaeological Services WYAS (ASWYAS) was commissioned by Ian Sanderson, Principal Archaeologist of the West Yorkshire Archaeology Advisory Service (WYAAS) to undertake a geophysical (magnetometer) survey on land south-east of Walton, West Yorkshire (see Fig. 1). The land is protected as a scheduled ancient monument (List Entry No. 1003801, Scheduled Monument No. WY 1195) and includes numerous cropmarks interpreted as indicative of possible early medieval and/or later settlement. A Section 42 Licence was obtained prior to the survey (see Appendix 4) which was carried out on March 9th 2012.

Site location, topography and land-use

The site is situated approximately 4km south-east of Wetherby and 250m to the east of Thorp Arch Trading Estate, centred at SE 4580 4620, on the edge of the river terrace, slightly elevated above the flood plain of the Wharfe at approximately 10m above Ordnance Datum (aOD). The scheduled area covers 4.5 hectares (see Fig. 2) of which the survey covered 4.3 hectares in two fields. Field 1 was under stubble from a crop of an oil seed rape (see Plate 1) whilst Field 2 was under short pasture (see Plate 2). A mound of manure restricted survey to the south of Field 1.

Geology and soils

The underlying geology comprises limestone of the Brotherton Formation with superficial deposits of till in the south and glaciofluvial deposits (sand and gravel) in the north (BGS 2012). The soils are classified in the Bishampton 1 association, which are characterised as deep fine loams with slowly permeable subsoils (SSEW 1983).

2 Archaeological background

The site was originally identified from air photographs and has been described as a settlement site. Several cropmarks interpreted as linear and rectilinear ditches, one of which was interpreted as forming a sub-rectangular enclosure have been identified (see Fig. 2). English Heritage identified the site as containing a large single aisled building, possible signifying the remains of a Saxon Hall of the Yeavering Type, and on the basis of this interpretation the site has been scheduled.

The site lies on the edge of slightly higher ground just above the flood plain of the Wharfe and just across the river from the Roman fort and henge monuments at Newton Kyme, which lies immediately south of the river (see Fig. 1). The Roman road (Margary 1973; 417, Road No. 280) from Newton Kyme to Aldborough is located 500m to the west of the survey area.

Immediately to the west of the proposed survey area is the site of Moat House, a circular moated site and farm building of uncertain date (HER no. 6839).

3 Aims, Methodology and Presentation

The general objective of the geophysical survey was to provide information about the nature and possible interpretation of any magnetic anomalies identified in the scheduled area and to therefore determine the presence/absence and extent of any buried archaeological features. The results of the survey will help inform the West Yorkshire Archaeology Advisory Service.

In order to achieve these aims detailed (recorded) magnetometer survey was carried out across the scheduled area. The survey covered approximately 4.3 hectares.

Magnetometer survey

Bartington Grad601 magnetic gradiometers were used during the survey taking readings at 0.25m intervals on zig-zag traverses 1m apart within 30m by 30m grids so that 3600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Geoplot 3 (Geoscan Research) software was used to process and present the data. Further details are given in Appendix 1.

Reporting

A general site location plan, incorporating the Ordnance Survey map, is shown in Figure 1. Figure 2 is a large scale (1:2000) site location plan showing the greyscale magnetometer data and cropmark detail. The processed and minimally processed data, together with interpretation graphics of the survey results are presented in Figures 3, 4 and 5 at a scale of 1:1000.

Further technical information on the equipment used, data processing and survey methodologies are given in Appendix 1 and Appendix 2. Appendix 3 describes the composition and location of the site archive. The Section 42 Licence is included in Appendix 4.

The geophysical survey methodology, report and any recommendations comply with guidelines outlined by English Heritage (David *et al.* 2008) and by the Institute for Archaeologists (IfA 2010). All figures reproduced from Ordnance Survey mapping are with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The figures in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All figures are presented to most suitably display and interpret the data from this site based on the experience and knowledge of Archaeological Services staff.

4 Results

Ferrous Anomalies

As with the majority of surveys carried out in a rural, agricultural, setting numerous ferrous anomalies, individual 'spikes', have been recorded. These anomalies are typically caused by ferrous (magnetic) debris, either on the ground surface or mixed in with the plough-soil. Little importance is normally attached to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as ferrous debris is common on rural sites, often being present as a consequence of manuring or tipping/infilling. There is no obvious clustering to these anomalies on this site and they are consequently not considered to be archaeologically significant.

Some larger 'iron spike' anomalies and broader areas of magnetic disturbance can be attributed to surface features and/or to modern activity. A north-south aligned linear band of magnetic disturbance, **A**, to the west of the survey area, is caused by traversing across a track, the metalling of which is thought to cause the disturbance here. A broad area of disturbance, **B**, in the south-western corner of the survey area is due to a spread of modern magnetic material in the topsoil. Patches of magnetic disturbance around the periphery of the site are due to the proximity of magnetic material in the field boundaries and are of no archaeological significance.

Geological Anomalies

Across all parts of the site numerous discrete anomalies, characterised as localised areas of magnetic enhancement, have been identified. The majority of these anomalies (see below) are interpreted as being geological in nature being due to variations in the superficial stony clay and sandy clay tills which overly the bedrock across almost the whole of the survey area.

However, it should be noted that the incidence of archaeological activity (see below), particularly in the central part of the site in Field 1, raises the possibility that some of the discrete anomalies could be caused by archaeological activity rather than by geological variation. For this reason those anomalies closest to probable archaeological features have been ascribed a potentially archaeological origin.

Agricultural Anomalies

A negative linear trend anomaly, **C**, aligned south-west/north-east at the northern end of Field 1, corresponds to a former field boundary depicted on the first edition Ordnance Survey map (1849).

Across the centre of Field 1 a series of linear trends, aligned north/south, indicate the direction of a recent ploughing regime.

?Archaeological Anomalies

A second negative linear trend anomaly, **D**, aligned north-west/south-east, intersects the former boundary, **C**, and may also be a former boundary feature that pre-dates the first edition mapping. At its eastern end this feature intersects, and aligns with, an extant field boundary. To the north-east of **D** are a cluster of linear and discrete anomalies that extend in a 40m wide band on a north-west/south-east alignment – a vague linear trend seems to mark the northern extent of this cluster. Negative linear trend anomalies at right angles to the possible boundary feature, **D**, are suggestive of ridge and furrow ploughing. The presence and extent of several large discrete anomalies (areas of magnetic enhancement) raises the possibility that there may also be other (possibly structural?) features associated with this area of medieval or post-medieval agricultural activity, although it is possible that these features may be due to variation in the superficial deposits.

The remainder of the linear and curvilinear anomalies that have been identified are interpreted as having archaeological potential. There is a degree of uncertainty, particularly with those anomalies that either appear to intersect with, or are at right angles to, the former field boundary, **C** (see above). Unless stated otherwise these anomalies are interpreted as being caused by infilled features, predominantly ditches or gullies. The anomalies are on several different alignments possibly suggesting different phases of activity (see below).

In the east of the survey area a linear anomaly, **E**, extends the full length of the site on a north-west/south-east alignment. It appears to intersect with, and is at right angles to, the mid-19th century field boundary, **C**, raising the possibility that it too might be an (unmapped), post-medieval boundary. However, extending east at right angles from **E** are two more linear anomalies, **F** and **G**, and a third, **H**, extends to the west for 75m before turning through 90˚ at its western end, perhaps forming an enclosure or field, and continues to the south for 20m before fading out completely. A weak curvilinear anomaly, **I**, may locate a small corral or perhaps a roundhouse. Adjacent discrete anomalies could hint at occupational activity at this location although a geological explanation for these anomalies is also considered plausible.

Crossing **H** at an oblique angle, and extending on a north-west/south-east alignment across most of the width of the site, is a discontinuous anomaly, **J**. The anomaly becomes increasingly fragmented to the east of the survey area. Running parallel to **J** at the western end of the survey area is another linear ditch type anomaly, **K**, which extends west beyond the modern track. A small rectangular enclosure, defined by anomaly **L**, is appended to the south of **J**. It is not clear whether the curvilinear anomaly, **M**, in the north-western corner of the site is associated with the ditch and enclosure, anomalies **J** and **L**.

Forty metres to the south of **J** is another discontinuous linear ditch type anomaly, **N**. This feature is aligned broadly north-west/south-east but is aligned slightly oblique to **J**. Two other ditches, anomalies **O** and **P**, extend from **N** to the south. Unfortunately the presence of the

manure heap crucially restricted survey around the intersection of these three features. A discontinuous linear alignment of anomalies, **Q**, running broadly parallel with **N**, has been interpreted as geological but these features could have archaeological potential and it does, in part, manifest as a cropmark.

5 Discussion and Conclusions

The geophysical survey has identified numerous linear, curvilinear and discrete anomalies across the whole survey area. Broadly speaking the magnetic results correspond with the cropmark data although the survey has added more detail and more fully defined the majority of the cropmarks. Unfortunately many of the anomalies are discontinuous and the position of the manure heap prohibited survey across the most densely cropmarked part of the site. This has had the overall effect of producing a rather fragmentary picture and makes a confident interpretation of the data difficult. The differing alignments of the anomalies also makes it difficult to draw any definite conclusions. However, the anomalies can be split into four different groupings based on their basic alignments. No inferences should be drawn as to the relative phases of activity based on the geophysical data.

At the northern end of the site anomalies indicative of ridge and furrow ploughing can be clearly identified. This cultivation is obviously delimited to the south by a linear feature, either a ditch or former headland. The alignment of the cultivation strips and the boundary feature are at odds with the 19th century and modern field layout. Four large areas of enhanced magnetic response might also be indicative of activity associated with the medieval cultivation and occupation of this part of the site.

Partly overlying this area of agricultural activity are a series of linear ditch type anomalies. These features are more clearly aligned with a relict boundary (also identified as a magnetic anomaly) which is shown on the first edition Ordnance Survey mapping. These features are oblique to the ridge and furrow cultivation strips and would seem to indicate a separate, probably later, phase of land division.

In the central part of the site a linear ditch type feature on a third different alignment is intermittently identified crossing the site. A small rectangular enclosure is clearly appended to the southern side of this ditch and part of a possible circular feature has also been identified.

Forty metres to the south yet another linear feature on a slightly different alignment to the features to the north has been located. Two intersecting ditches from the south may indicate a large enclosure or field.

Overall it can be said that the geophysical survey has confirmed the presence of archaeological features consistent with (probably) more than one phase of activity. However, it is still difficult to establish the precise nature of this activity. Certainly extending the survey

to the north, to more fully cover the cropmarks, and to the west towards Moat House, would help in establishing a better understanding of the site and its immediate surroundings.

The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by direct investigation of sub-surface deposits.

Appendix 1: Magnetic survey - technical information

Magnetic Susceptibility and Soil Magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haemetite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected. The magnetic susceptibility of a soil can also be enhanced by the application of heat and the fermentation and bacterial effects associated with rubbish decomposition. The area of enhancement is usually quite large, mainly due to the tendency of discard areas to extend beyond the limit of the occupation site itself, and spreading by the plough. An advantage of magnetic susceptibility over magnetometry is that a certain amount of occupational activity will cause the same proportional change in susceptibility, however weakly magnetic is the soil, and so does not depend on the magnetic contrast between the topsoil and deeper layers. Susceptibility survey is therefore able to detect areas of occupation even in the absence of cut features. On the other hand susceptibility survey is more vulnerable to the masking effects of layers of colluvium and alluvium as the technique, using the Bartington system, can generally only measure variation in the first 0.15m of ploughsoil.

Types of Magnetic Anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

Methodology: Magnetic Susceptibility Survey

There are two methods of measuring the magnetic susceptibility of a soil sample. The first involves the measurement of a given volume of soil, which will include any air and moisture that lies within the sample, and is termed volume specific susceptibility. This method results in a bulk value that it not necessarily fully representative of the constituent components of the sample. For field surveys a Bartington MS2 meter with MS2D field loop is used due to its speed and simplicity. The second technique overcomes this potential problem by taking into account both the volume and mass of a sample and is termed mass specific susceptibility. However, mass specific readings cannot be taken in the field where the bulk properties of a soil are usually unknown and so volume specific readings must be taken. Whilst these values are not fully representative they do allow general comparisons across a site and give a broad indication of susceptibility changes. This is usually enough to assess the susceptibility of a site and evaluate whether enhancement has occurred.

Methodology: Gradiometer Survey

There are two main methods of using the fluxgate gradiometer for commercial evaluations. The first of these is referred to as ***magnetic scanning*** and requires the operator to visually identify anomalous responses on the instrument display panel whilst covering the site in widely spaced traverses, typically 10m apart. The instrument logger is not used and there is therefore no data collection. Once anomalous responses are identified they are marked in the field with bamboo canes and approximately located on a base plan. This method is usually employed as a means of selecting areas for detailed survey when only a percentage sample of the whole site is to be subject to detailed survey.

The disadvantages of magnetic scanning are that features that produce weak anomalies (less than 2nT) are unlikely to stand out from the magnetic background and so will be difficult to detect. The coarse sampling interval means that discrete features or linear features that are parallel or broadly oblique to the direction of traverse may not be detected. If linear features are suspected in a site then the traverse direction should be perpendicular (or as close as is possible within the physical constraints of the site) to the orientation of the suspected features. The possible drawbacks mentioned above mean that a ‘negative’ scanning result should be validated by sample detailed magnetic survey (see below).

The second method is referred to as ***detailed survey*** and employs the use of a sample trigger to automatically take readings at predetermined points, typically at 0.25m intervals, on zig-zag traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation. Detailed survey allows the visualisation of weaker anomalies that may not have been detected by magnetic scanning.

During this survey a Bartington Grad601 magnetic gradiometer was used taking readings on the 0.1nT range, at 0.25m intervals on zig-zag traverses 1m apart within 30m by 30m square

grids. The instrument was checked for electronic and mechanical drift at a common point and calibrated as necessary. The drift from zero was not logged.

Data Processing and Presentation

The detailed gradiometer data has been presented in this report in XY trace and greyscale formats. In the former format the data shown is ‘raw’ with no processing other than grid biasing having been done. The data in the greyscale images has been interpolated and selectively filtered to remove the effects of drift in instrument calibration and other artificial data constructs and to maximise the clarity and interpretability of the archaeological anomalies.

An XY plot presents the data logged on each traverse as a single line with each successive traverse incremented on the Y-axis to produce a ‘stacked’ plot. A hidden line algorithm has been employed to block out lines behind major ‘spikes’ and the data has been clipped. The main advantage of this display option is that the full range of data can be viewed, dependent on the clip, so that the ‘shape’ of individual anomalies can be discerned and potentially archaeological anomalies differentiated from ‘iron spikes’. Geoplot 3 software was used to create the XY trace plots.

Geoplot 3 software was used to interpolate the data so that 3600 readings were obtained for each 30m by 30m grid. The same program was used to produce the greyscale images. All greyscale plots are displayed using a linear incremental scale.

Appendix 2: Survey location information

The site grid was laid out using a Trimble VRS differential Global Positioning System (Trimble 5800 model). The accuracy of this equipment is better then 0.01m. The survey grids were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if co-ordinates are measured off hard copies of the mapping rather than using the digital co-ordinates.

Archaeological Services WYAS cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party

Appendix 3: Geophysical archive

The geophysical archive comprises:-

- an archive disk containing compressed (WinZip 8) files of the raw data, report text (Microsoft Word 2000), and graphics files (Adobe Illustrator CS2 and AutoCAD 2008) files; and
- a full copy of the report.

At present the archive is held by Archaeological Services WYAS although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (i.e. available for consultation in the West Yorkshire Historic Environment Record).

Appendix 4: Section 42 Licence

ENGLISH HERITAGE

YORKSHIRE & THE HUMBER

Mr Samuel Harrison
Archaeological Services WYAS
PO Box 30
Nepshaw Lane
South Morley
Leeds
LS27 0UG

Direct Dial: 01904 601990
Direct Fax: 01904 601999

Our refs: AA/21268/5
SL00023831

2 March 2012

Dear Mr Harrison

Ancient Monuments and Archaeological Areas Act 1979 (as amended) section 42 - licence to carry out a geophysical survey

SETTLEMENT SITE REVEALED BY AERIAL PHOTOGRAPHY NEAR MOAT HOUSE, WALTON, LEEDS, WEST YORKSHIRE
Case No: SL00023831
Monument no: WY1195, NH List no 1003801

I refer to your application dated 24 January 2012 to carry out a geophysical survey at the above site.

English Heritage is empowered to grant licences for such activity and I can confirm that we are prepared to do so as set out below.

By virtue of powers contained in section 42 of the 1979 Ancient Monuments and Archaeological Areas Act (as amended by the National Heritage Act 1983) English Heritage hereby grants permission for geophysical survey of SETTLEMENT SITE REVEALED BY AERIAL PHOTOGRAPHY NEAR MOAT HOUSE, WALTON, LEEDS, WEST YORKSHIRE, for the areas shown on the map that accompanied your application. This permission is subject to the following conditions.

1. The permission shall only be exercised by Samuel Harrison of Archaeological Services WYAS (or his nominated representative) and by no other person. It is not transferable to another individual.

2. The permission shall commence on 5 March 2012 and shall cease to have effect on 5 March 2013.

3. A full report summarising the results of the geophysical survey and their interpretation shall be sent in hard copy to Emma Penny at the office address below and electronic (pdf) format to emma.penny@english-heritage.org.uk, copied to Paul.Linford@english-heritage.org.uk no later than 3 months after the completion of the survey.

4. The enclosed questionnaire shall be completed and appended to the survey report. For convenience an electronic version of this questionnaire can be downloaded from http://www.englishheritage.org.uk/professional/advice/advice-by-topic/heritagescience/archaeological-science/geophysics/

5. A copy of the report shall also be sent (in their preferred format) to the local Historic Environment Record (HER). The local HER's contact details can be found at http://www.heritagegateway.org.uk/gateway/chr/default.aspx.

6. A record signposting your investigation shall be made with the Archaeology Data Service using their online OASIS Data Collection form no later than 3 months after completion of the survey. Please see http://oasis.ac.uk/ for details or contact oasis@english-heritage.org.uk for information and training.

This letter does not carry any consent or approval required under any enactment, bye-law, order or regulation other than section 42 of the 1979 Act (as amended).

You are advised that the person nominated under this licence to carry out the activity should keep a copy of this licence in their possession in case they should be challenged whilst on site.

Yours sincerely

Keith Miller
Ancient Monuments Inspector
E-mail: Keith.Miller@english-heritage.org.uk

cc
Yvonne Luke, English Heritage Field Advisor, 15 Westville Avenue, Ilkley, West Yorks, LS29 9AH. Email: yvonne.luke@english-heritage.org.uk

Ian Sanderson, Principal Archaeologist, West Yorkshire Archaeological Advisory Service, Registry of Deeds, Newstead Road, Wakefield, WF1 2DE. Email: isanderson@wyjs.org.uk

ENGLISH HERITAGE

YORKSHIRE & THE HUMBER

Enclosure:

English Heritage Geophysical Survey Database Questionnaire

Survey Details

Name of Site: SETTLEMENT SITE REVEALED BY AERIAL PHOTOGRAPHY NEAR MOAT HOUSE, WALTON, LEEDS, WEST YORKSHIRE

County: WEST YORKSHIRE

NGR Grid Reference: SE 4565 4620

Start Date: 9TH MARCH 2012 **End Date:** 9TH MARCH 2012

Geology at site: THE UNDERLYING GEOLOGY COMPRISES LIMESTONE OF THE BROTHERTON FORMATION WITH SUPERFICIAL DEPOSITS OF TILL IN THE SOUTH AND GLACIOFLUVIAL DEPOSITS (SAND AND GRAVEL) IN THE NORTH.

Known archaeological Sites/Monuments covered by the survey:

SCHEDULED MONUMENT NO. WY 1195

Archaeological Sites/Monument types detected by survey:
FIELD SYSTEMS
ENCLOSURES
RIDGE AND FURROW CULTIVATION (MEDIEVAL/POST MEDIEVAL)

Surveyor:
ARCHAEOLOGICAL SERVICES (WYAS)

Name of Client, if any:
WEST YORKSHIRE ARCHAEOLOGY ADVISORY SERVICE

Purpose of Survey:
RESEARCH

Location of:

a) Primary archive, i.e. raw data, electronic archive etc:
ARCHAEOLOGICAL SERVICES (WYAS)
PROJECT NO. 3659
SITE CODE. WRP

b) Full Report:
ARCHAEOLOGICAL SERVICES (WYAS)
PROJECT NO. 3659
SITE CODE. WRP

WEST YORKSHIRE HER

Technical Details

(Please fill out a separate sheet for each survey technique used)

Type of Survey: MAGNETOMETER

Area Surveyed, if applicable: 4.3

Traverse Separation, if regular: 1.0M

Reading/Sample Interval: 0.25M

Type, Make and model of Instrumentation: BARTINGTON GRAD601

For Resistivity Survey:

Probe configuration: N/A

Probe Spacing: N/A

Land use at the time of the survey : ARABLE / GRASSLAND - PASTURE

Additional Remarks (Please mention any other technical aspects of the survey that have not been covered by the above questions such as sampling strategy, non standard technique, problems with equipment etc.):

Bibliography

BGS, 2011. http://maps.bgs.ac.uk/geologyviewer/ (Viewed 26th June 2012)

David, A., N. Linford, P. Linford and L. Martin, 2008. *Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines (2nd edition)* English Heritage

IfA, 2010. *Standard and Guidance for archaeological geophysical survey*. Institute for Archaeologists

Soil Survey of England and Wales, 1983, Soils of Northern England, Sheet 1.

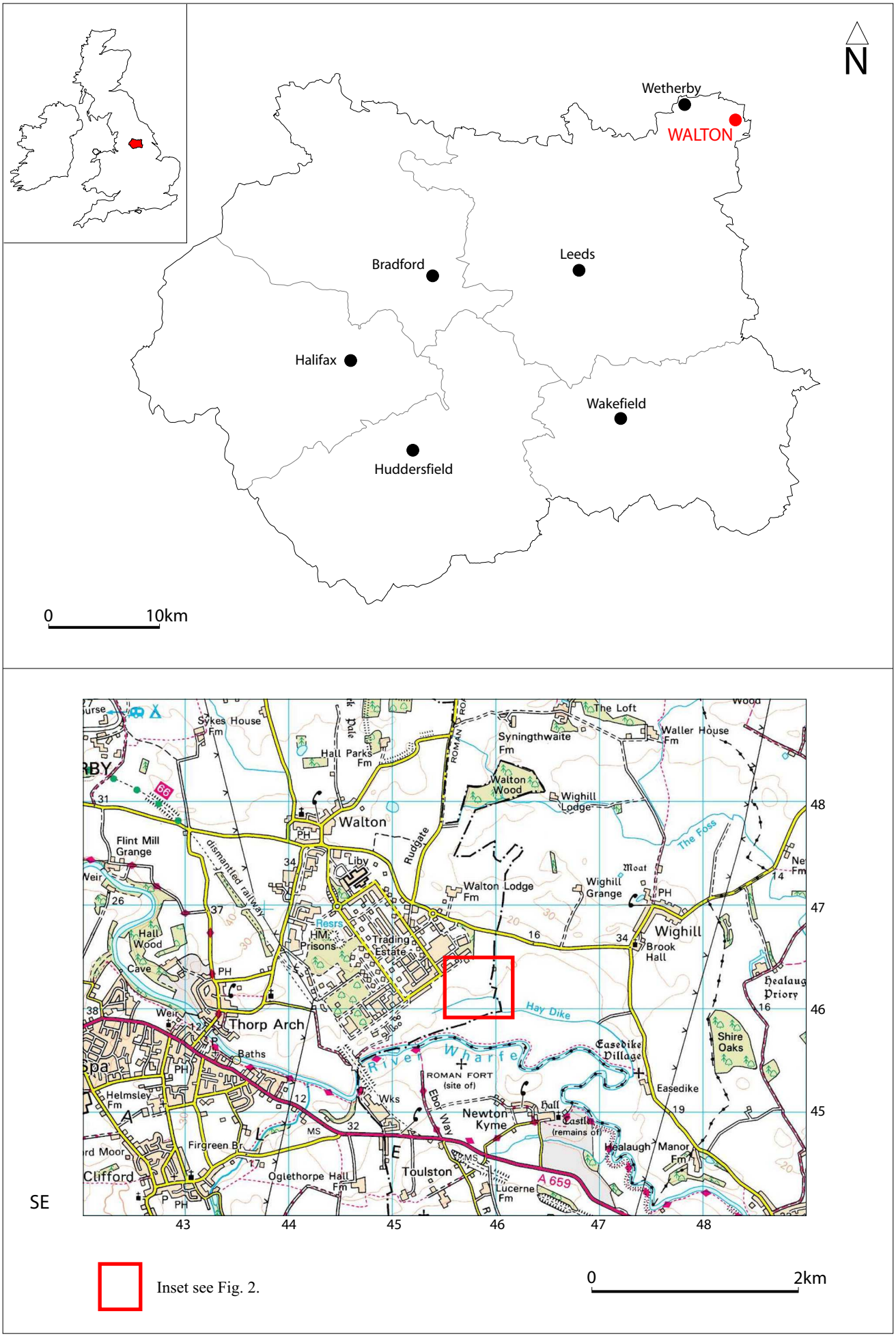

Fig. 1. Site location

	SCHEDULED AREA
	CROPMARK DETAIL
	LOCATION AND DIRECTION OF PLATES
	AREA UNSUITABLE FOR SURVEY

N

MOAT HOUSE

FIELD 1

FIELD 2

1

2

2.0

-1.0

nT

4455 00

4460 00

4460 00

© ASWYAS 2012.
Archaeological Services W Y A S
PO Box 30, Nepshaw Lane South, Morley, LS27 0UG
Tel: 0113 383 7500 Fax:0113 383 7501

0 80m

Fig. 2. Site location showing greyscale magnetometer data and cropmark detail (1:2000 @ A3)

N

2.0

-1.0

nT

4462 00

4457 00

4460 00

1100

Track

Drain

Hay Dike

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0 40m

Fig. 3. Processed greyscale magnetometer data (1:1000 @ A3)

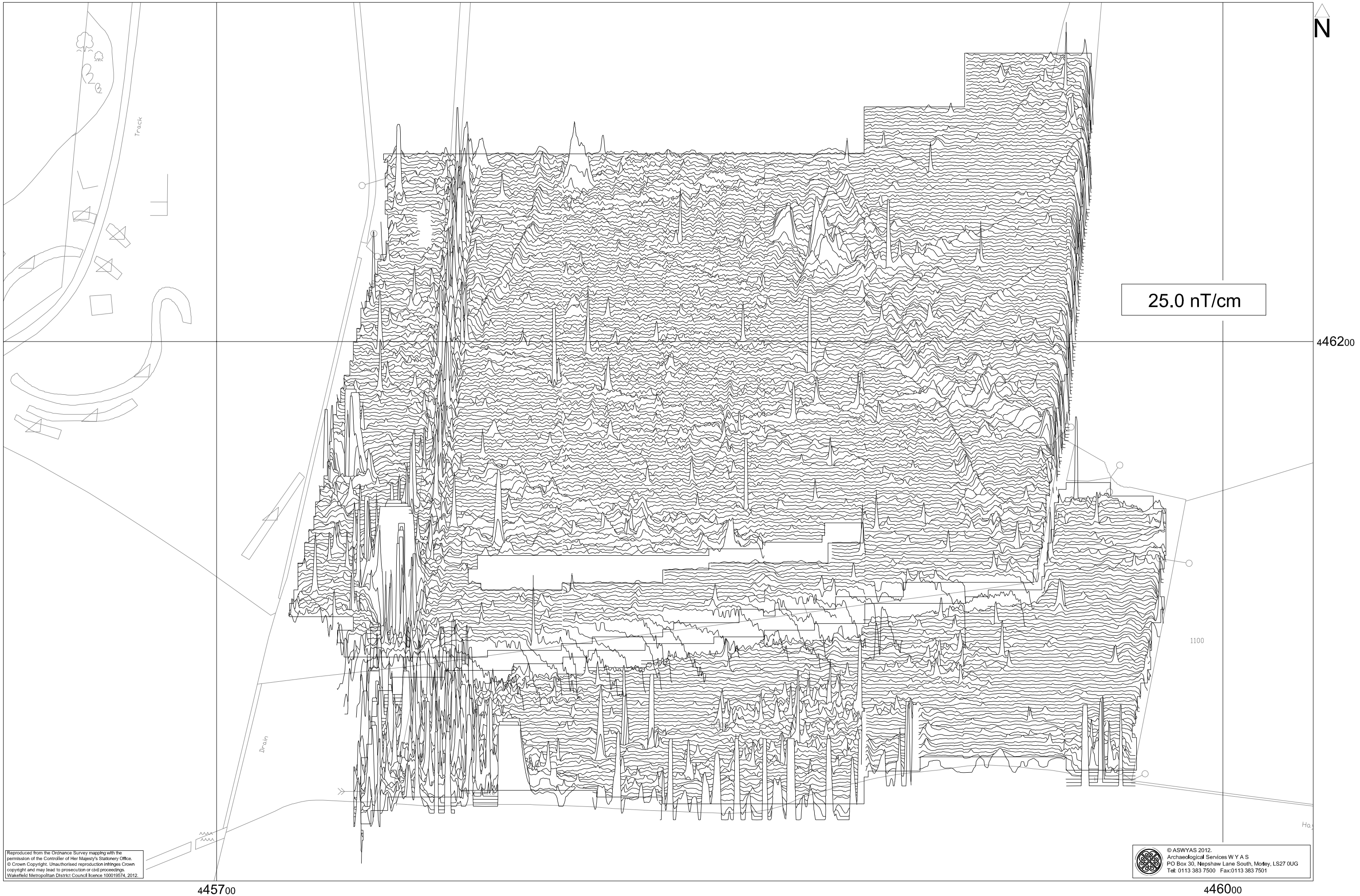

Fig. 4. XY trace plot of minimally processed magnetometer data (1:1000 @ A3)

TYPE OF ANOMALY		INTERPRETATION
•	DIPOLAR ISOLATED	FERROUS MATERIAL
	MAGNETIC DISTURBANCE	FERROUS MATERIAL
	LINEAR TREND	RIDGE AND FURROW
	LINEAR TREND	MODERN PLOUGHING
	LINEAR TREND	POST MEDIEVAL BOUNDARY FEATURE
	MAGNETIC ENHANCEMENT	GEOLOGY
	MAGNETIC ENHANCEMENT	ARCHAEOLOGY?
	MAGNETIC ENHANCEMENT	ARCHAEOLOGY

N

4462 00

4457 00

4460 00

0 40m

Fig. 5. Interpretation of magnetometer data (1:1000 @ A3)

Plate 1. General view of Field 1 with manure mound to the left and Moat House to the right, looking west

Plate 2. General view of Field 2, looking south-west