Archaeology Wales

Land at Penhesgyn (Field 3), Anglesey

Geophysical Survey

By

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Andrew Shobbrook

Report No. 1643

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Geophysical Survey

Prepared For: Anglesey County Council

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Non-Technical Summary

This report results from work carried out during the 10th and 11th of January 2018 by Archaeology Wales Ltd (AW) for Anglesey County Council in association with the proposed development of a gypsy and traveller site on land at Penhesgyn, Anglesey, LL59 5RY. It draws on the results of a magnetometer survey of Field 3. Fields 1 and 2 were surveyed during the 29th and 30th of August 2017 (see Garcia Rovira 2017).

The geophysical survey was undertaken with the aim of determining the nature and extent of any buried archaeological features within the proposed development area. The work was undertaken using a Bartington Grad601 gradiometer.

An examination of the archaeological background indicates that the area is rich in prehistoric activity. A number of Neolithic axes as well as pits and enclosures of prehistoric and Roman date are recorded within 1km of the development site.

The geophysical survey identified three negative linear anomalies running WNW/ESE, two small crescent features at the centre of the field and a large anomaly which might reflect the remains of a large pit. Furthermore, a number of parallel lines were identified and interpreted as the results of ploughing.

The work was carried out to the Standard and Guidance set out by the Chartered Institute for Archaeologists for Archaeological Geophysical Survey (2014) and completed in accordance with Geophysical Survey in Archaeological Field Evaluation (English Heritage 2008). The archiving of the geophysical data will follow guidance laid down in Geophysical Data in Archaeology: A Guide to Good Practice 2nd edition (Schmidt 2002).

1. Introduction

1.1 Location and scope of work

In January 2018, Archaeology Wales Ltd (AW) carried out a geophysical survey on land at Penhesgyn, Anglesey and centred at SH 53589 74321 (Figure 1). The work was carried out at the request of Anglesey County Council in association with the proposed development of a gypsy and traveller site at land of Penhesgyn (LL59 5RY) centred on SH 53589 74324.

An examination of the archaeological background indicates that the area is rich in prehistoric activity. A number of Neolithic axes as well as pits and enclosures of prehistoric and Roman date are recorded within 1km of the development site. GAPS recommended a two-stage programme of archaeological investigations, encompassing a geophysical survey and trial trenching. This report summarises the results obtained during stage one of these investigations in Field 3. Field 1 and 2 were surveyed in August 2017.

The purpose of the proposed programme of works is to provide the local the planning authority with the information that they have requested from the client in response to their planning application, the requirements for which are set out in Planning Policy Wales (revised edition 9, November 2016), Section 6.5, and TAN24.

All work was undertaken to the standards and guidance set by the Chartered Institute for Archaeologists (2014). AW is a Registered Organisation with the CIfA.

1.2 Site description

The site is located to the northeast and southeast of Penhesgyn Recycle Centre, and it is composed of three large fields. These are defined as open fields currently used for agricultural purposes and grazing. The topography of Field 1 and Field 2 gradually ascends from 65m AOD to the west and 72m AOD to the easternmost limits of these fields. Field 3 measures 2.5 hectares. The topography of this field descends from 75 AOD to the northeast extreme of the development to 65 AOD to the southwest. This field is currently used for grazing.

The underlying geology is defined by the Central Anglesey Shear Zone and Berw Shear Zone, including schist and mica formed in the Cambrian and Ediacaran Periods. The superficial soils are characterised as Till, Devensian Diamicton formed in Ice Age conditions (BGS 2017).

1.3 Archaeological and Historical Background

The surrounding area to the site is rich in prehistoric activity. The following finds have been recorded within 1km of the development area:

- During a programme of strip-map-record located 200m NE from Field 1 (see Figure 1), GAT revealed three pits, one of which contained a flint tool of Neolithic date (see Cooke 2011).

- Three Neolithic axes are recorded as findspots in the HER less than 1km SE from the development site. A further axe is recorded NE of the site.

- Aerial photography has revealed the existence of a hut group at Llansadwrn. This hut group may be dated to late prehistoric and Roman chronologies (see Smith 1996). A circular enclosure as well as a rectangular enclosure have been recorded within the same field, less than 1km SE from the development site.

- A cist burial site was recorded in 1937 in a field located less than 700m SE from the development site (see Smith 2003).

Furthermore, four scheduled monuments have been documented in the vicinity of the development area. These are: Bryn Eryr earthwork (AN100), Dinas Cadnant hillfort (AN048) and two standing stones, Ty-Wyn (AN073) and Pen-y-Maen (AN072).

It is also significant to note that Penhesgyn Hall and other associated features of post-medieval age are located immediately below the southern boundary of Field 3.

2. Aims and Objectives

2.1 Geophysical Survey

The geophysical survey was undertaken in order to:

- Locate any features of likely archaeological significance within the area of proposed development.
- Provide sub-surface data to inform any future on-site works – (archaeological evaluation).

3. Methodology

3.1 Geophysical Survey

A Bartington Grad601 gradiometer was used to undertake the survey. Previous research has shown that fired, or cut and backfilled archaeological features such as kilns and hearths, ditches and pits often have an anomalously higher magnetic susceptibility than the surrounding subsoil due to burning and biological processes. Differences in magnetic susceptibility within the subsoil and archaeological features can be detected as changing magnetic flux by an instrument such as a gradiometer. Data from this may be mapped at closely

spaced regular intervals, to produce an image that may be interpreted to locate buried archaeological features (Clark, 1997; Aspinall *et al*, 2011).

Detailed survey was carried out in grids of 20m x 20m along parallel traverses spaced at 1m intervals, recording data points spaced at 0.25m intervals to a maximum instrument sensitivity of 0.1nT in accordance with English Heritage Guidelines. The survey mode was set to bi-directional (traverses walked alternately south-north/north-south). At regular intervals the data was downloaded in the field onto a laptop computer for storage and assessment. The location of the survey area was then surveyed using a submeter GPS.

3.2 Data Processing and Presentation

Following the completion of the detailed survey, processing and analysis took place using the Geoplot software package. After downloading, the results were plotted in 2D. The most typical method of visualising the data is as a greyscale image. In a greyscale, each data point is represented as a shade of grey, from black to white at either extreme of the data range. A number of standard operations (including destriping and despiking) were carried out to process the data. The mean level of each traverse of data was reduced to zero and all grids matched so that there were no differences between background levels. The data was then analysed using a variety of parameters and styles and the most useful of these were saved as *JPEG images and displayed using Adobe Illustrator software. The results of the survey were then overlaid onto a digital map of the study area. This was then used to produce interpretation figures.

All works were undertaken in accordance with the CIfA's *Standards and Guidance for a geophysical survey* (2014) and current Health and Safety legislation.

The on-site work was undertaken by Andrew Shobbrook and Richey Ostrowski, data processing by Andrew Shobbrook whilst the overall management of the project was undertaken by Irene Garcia Rovira, all of Archaeology Wales.

4. Geophysical Survey Results

4.1 Ground Conditions

The weather during the survey was largely dry, although during the first hours of the morning the field was frosted.

4.2 Survey Location and Summary

The assessment area was comprised of three fields. Field 1 and 2 were surveyed on the 29th and 30th of August 2017. Field 3 was surveyed on the 29th and 30th of January 2017.

Field 1 comprised 37 grids, and Field 2 comprised 21 grids, Field 3 comprised 55 full grids. As the fences bounding the site contained metallic elements, a sufficient distance was maintained to not overly impact on the results of the survey data. The survey of the southern region of the field was also constrained by the presence of overhead power cables and by other metallic objects such as disused gates and metallic remains related to previous agricultural activity on site. The survey detected high frequencies of ferrous anomalies throughout the field. However, an area of high readings was detected in the northernmost area of the field. This anomaly might be echoing the igneous nature of the underlying geology.

4.3 Results of the Survey (Figure 7)

The data has been compressed and then clipped so that the range is, -4nT to 4nT, -8nT to 8nT, -10nT to 10nT, and -40nT to 33nT.

The interpretation of the data is as follows:

Orange – A series of roughly parallel linear anomalies running NE/SW interpreted as the imprint of ploughing. A number of these lines were observed during the survey at ground level.

Yellow – possible negative remains:

Three linear features running on a WNW/ESE direction were detected during the survey. These may be interpreted as the existing field drains or other remains of archaeological origin.

Two crescent features located at the centre of the field may be interpreted as negative anomalies of archaeological origin.

A large anomaly was detected at the northernmost extreme of the field. This may be interpreted as a large pit.

5. Interpretation and Discussion

A number of anomalies were attributed to the imprint of ploughing. The signals from these sets of anomalies might be masking archaeological features.

Three linear features running on a WNW/ESE direction were detected during the survey. These may be interpreted as the existing field drains or other remains of archaeological origin.

Two crescent features located at the centre of the field may be interpreted as negative anomalies of archaeological origin.

A large anomaly was detected at the northernmost extreme of the field. This may be interpreted as a large pit.

Furthermore, immediately below it there is a large anomaly tentatively interpreted as geological in nature given the igneous nature of the underlying geology. This anomaly may be masking archaeological features located within the northernmost limit of Field 3.

No objects or prominent topographical features with the potential to influence the results were obtained during the survey and, it is therefore reasonable to assume that the results correspond, by large, to buried anomalies or potential archaeological nature.

6. Bibliography and References

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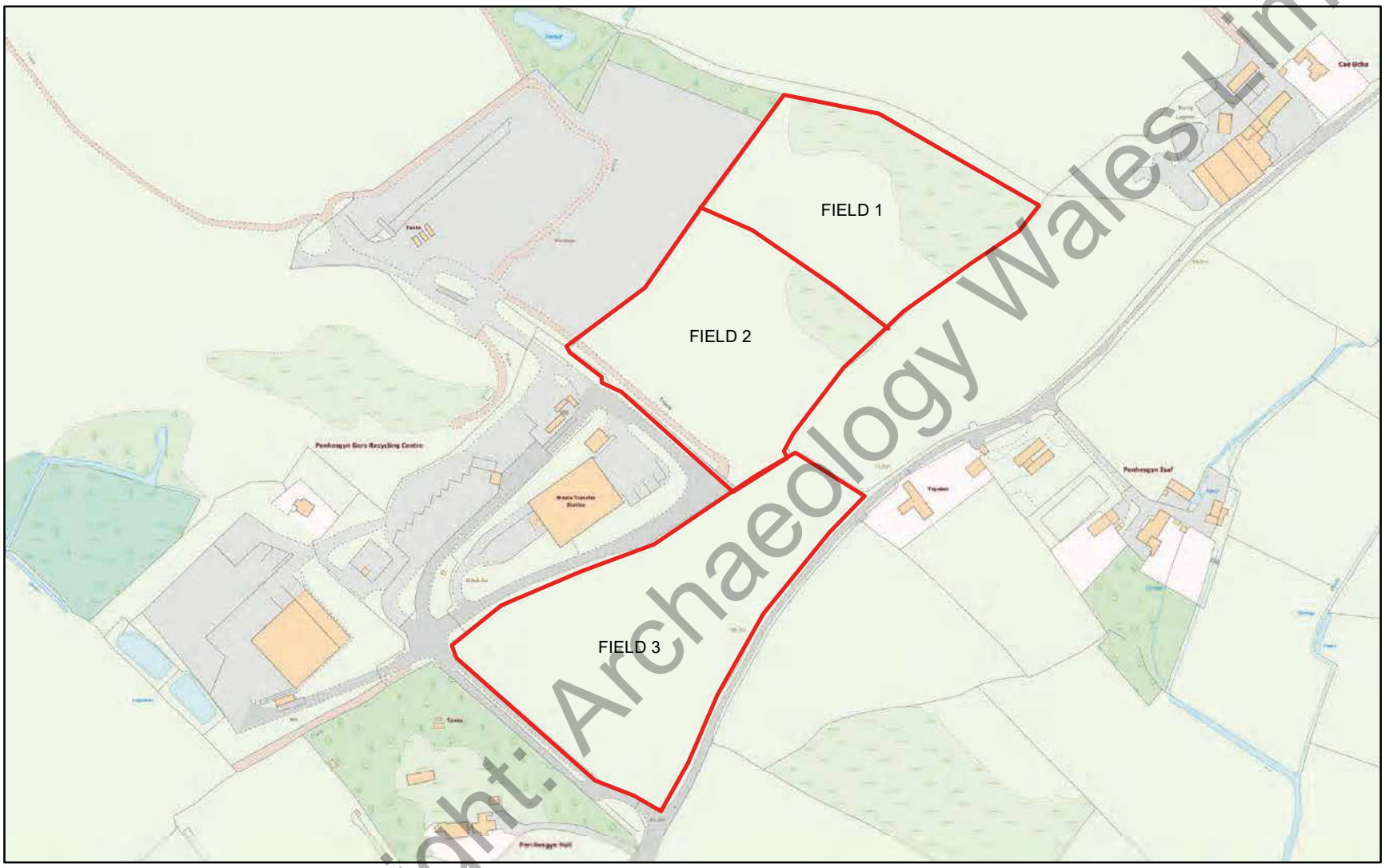


Figure 1.
Location of development site.

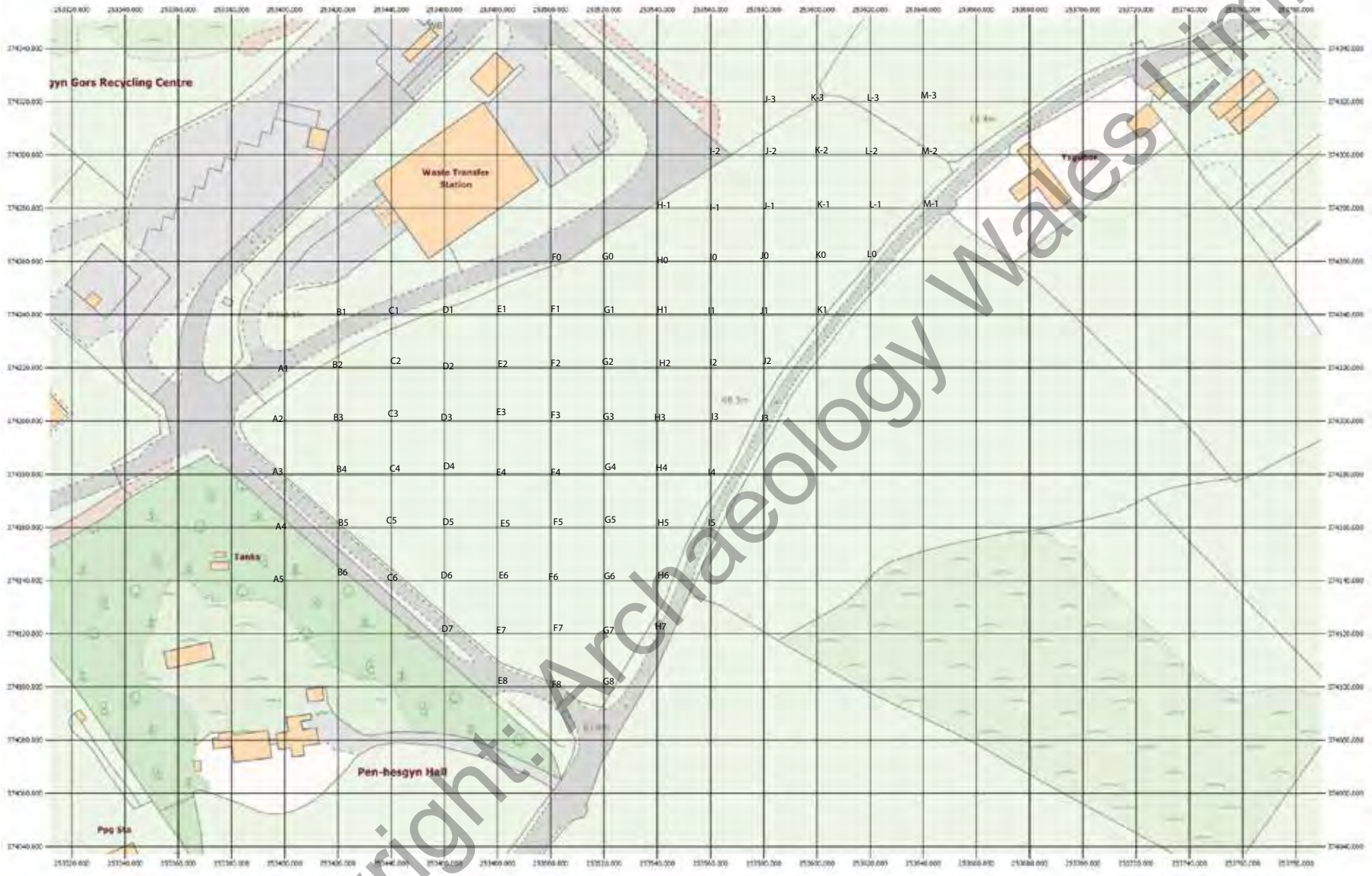


Figure 2.
Grid over Field 3..

Figure 3. Magnetometer survey results clipped at -44 +33nt

Figure 4. Magnetometer survey results clipped at -10 +10nt

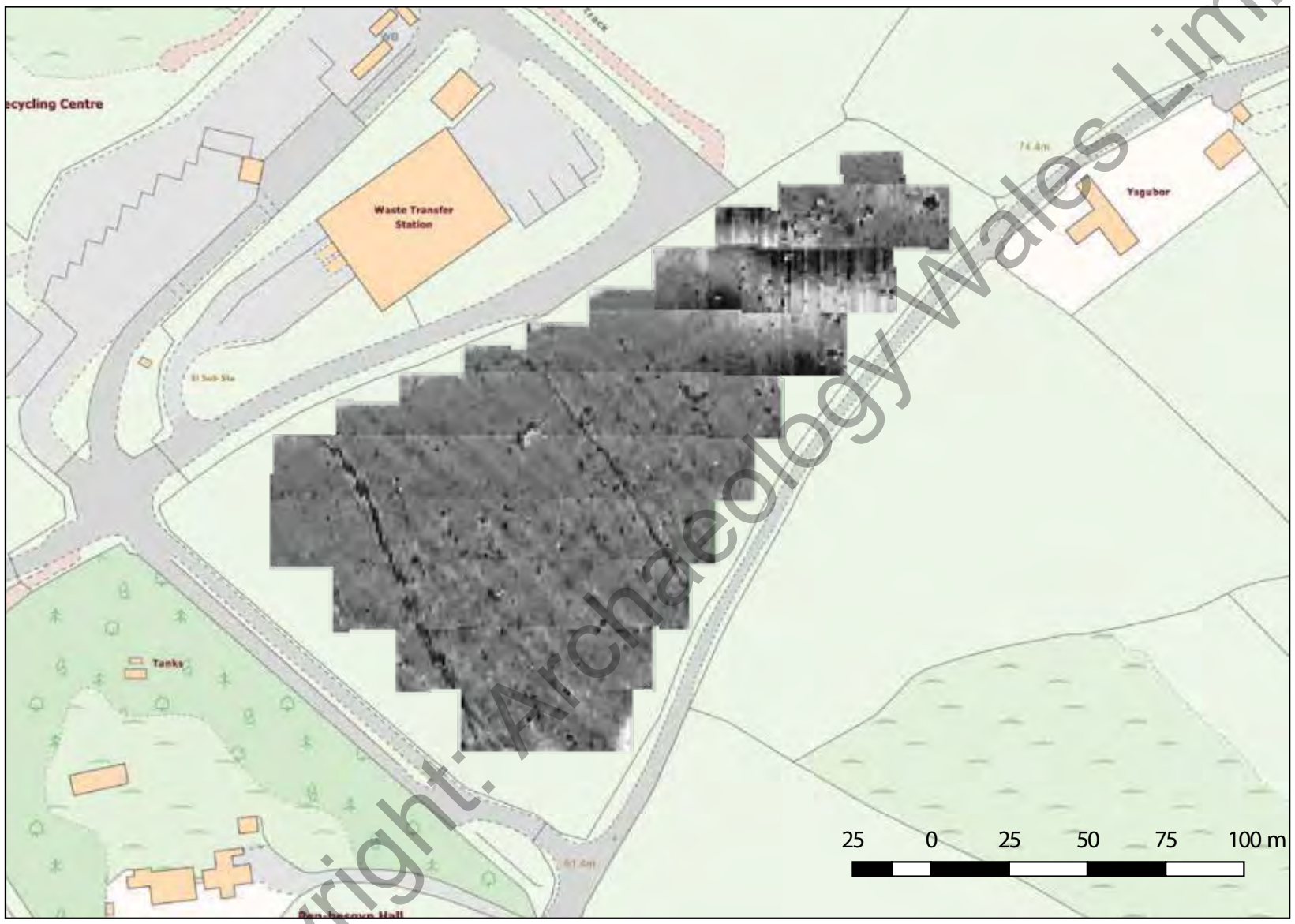
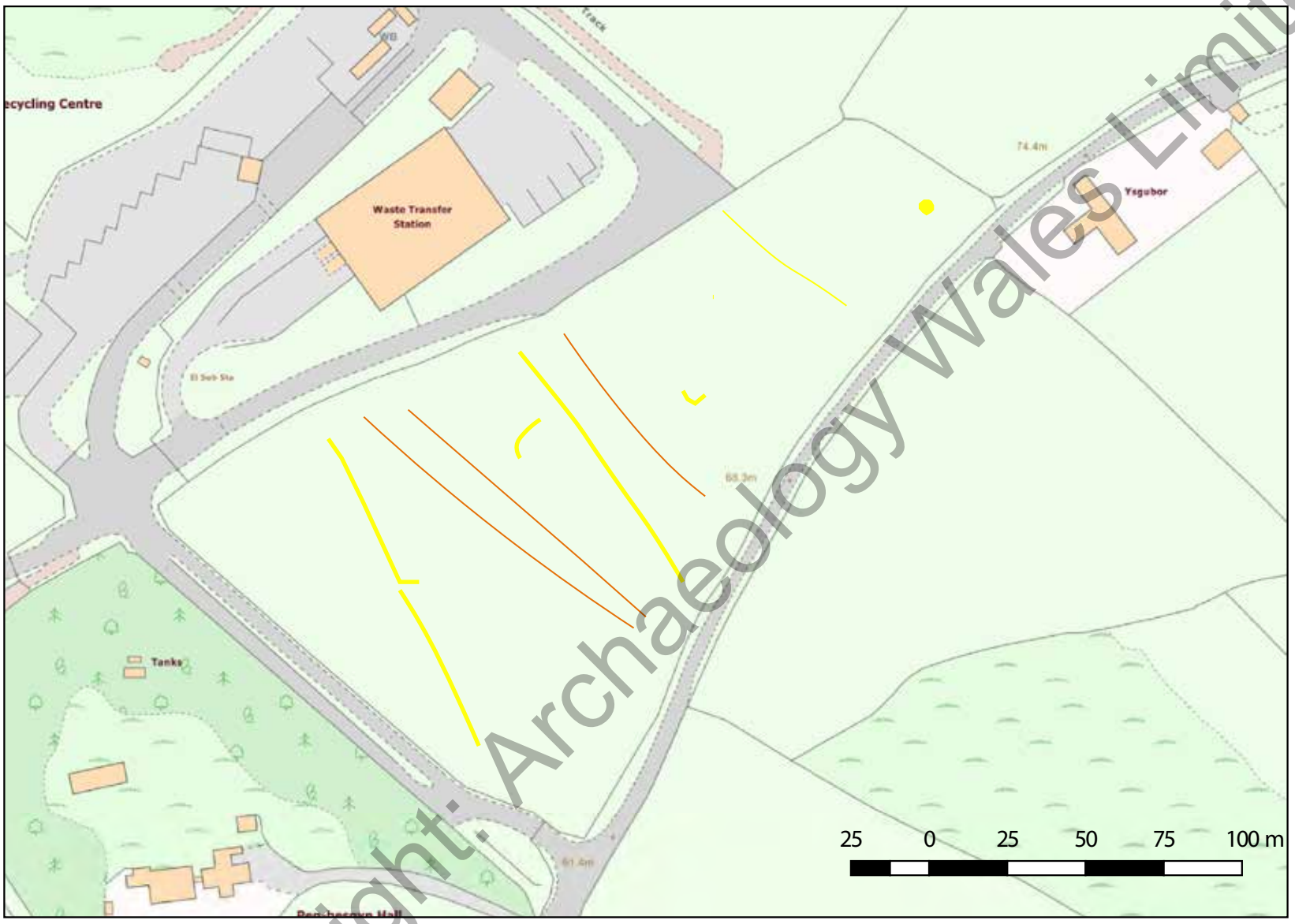


Figure 5. Magnetometer survey results clipped at -8 +8nt

Figure 6. Magnetometer survey results clipped at -4 +4nt



Negative anomalies

Geology

Figure 7. Interpretation of results.

Figure 8.
Magnetometer survey results clipped at -8nT to 8nT.

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Archaeology Wales

Land at Penhesgyn, Anglesey

Geophysical Survey

By

Irene Garcia Rovira

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Archaeology Wales

Land at Penhesgyn, Anglesey

Geophysical Survey

Prepared For: Anglesey County Council

Edited by: Mark Houliston	Authorised by: Mark Houliston
Signed: Mark Houlist	Signed: Mark Houlist
Position: Managing Director	Position: Managing Director
Date: 19/10/17	Date: 19.10.17

By

Irene Garcia Rovira

Report No. 1621

October 2017

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An examination of the archaeological background indicates that the area is rich in prehistoric activity. A number of Neolithic axes as well as pits and enclosures of prehistoric and Roman date are recorded within 1km of the development site.

The geophysical survey identified a series of parallel lines interpreted as geological in nature. Similarly, a number of anomalies were attributed to the imprint of ploughing. Three circular anomalies have been identified in Field 1 and one in Field 2, and a L-shape feature has been identified at the northern extremity of Field 1. These features might be of archaeological origin.

The work was carried out to the Standard and Guidance set out by the Chartered Institute for Archaeologists for Archaeological Geophysical Survey (2014) and completed in accordance with Geophysical Survey in Archaeological Field Evaluation (English Heritage 2008). The archiving of the geophysical data will follow guidance laid down in Geophysical Data in Archaeology: A Guide to Good Practice 2nd edition (Schmidt 2002).

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rectangular enclosure have been recorded within the same field, less than 1km SE from the development site.

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Furthermore, four scheduled monuments have been documented in the vicinity of the development area. These are: Bryn Eryr earthwork (AN100), Dinas Cadnant hillfort (AN048) and two standing stones, Ty-Wyn (AN073) and Pen-y-Maen (AN072).

It is also significant to note that Penhesgyn Hall and other associated features of post-medieval age are located immediately below the southern boundary of Field 3.

2. Aims and Objectives

2.1 Geophysical Survey

The geophysical survey was undertaken in order to:

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3. Methodology

3.1 Geophysical Survey

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Detailed survey was carried out in grids of 20m x 20m along parallel traverses spaced at 1m intervals, recording data points spaced at 0.25m intervals to a maximum instrument sensitivity of 0.1nT in accordance with English Heritage Guidelines. The survey mode was set to bi-directional (traverses walked alternately south-north/north-south). At regular intervals the data was downloaded in the field onto a laptop computer for storage and assessment. The location of the survey area was then surveyed using a submeter GPS.

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All works were undertaken in accordance with the CIfA's Standards and Guidance for a geophysical survey (2014) and current Health and Safety legislation.

The on-site work was undertaken by Irene Garcia Rovira, Victoria Green and Rowena Hart, data processing by Rowena Hart whilst the overall management of the project was undertaken by Irene Garcia Rovira, all of Archaeology Wales.

4. Geophysical Survey Results

4.1 Ground Conditions

The survey was undertaken after a period of persistent rain. The weather during the survey was largely dry.

The northern area of Field 2, and the NE corner of Field 1 were characterised by marshland. A survey of these areas was not possible as the land was heavily waterlogged.

4.2 Survey Location and Summary

The assessment area was comprised of three fields. Field 1 and 2 were surveyed on the 29th and 30th of August. Field 3 will be surveyed once access to the field is granted.

Field 1 comprised 37 grids, and Field 2 comprised 21 grids. As the fences bounding the site contained metallic elements, a sufficient distance was maintained to not overly impact on the results of the survey data.

4.3 Results of the Survey

The data has been compressed and then clipped so that the range is -2nT to 2nT, -4nT to 4nT and -8nT to 8nT.

The interpretation of the data is as follows:

Green – A series of roughly parallel linear anomalies. These are most likely geological features.

Blue – A series of roughly parallel linear anomalies running NE/SW interpreted as the imprint of ploughing. A number of these lines were observed during the survey at ground level.

Red – A number of rectilinear anomalies running NE/SW observed in Field 1, possibly waterpipes.

Orange – possible positive remains - Field 1 contains a possible archaeological feature, curvilinear in nature. Possibly the remnants of an enclosure. This feature is delimited by the following coordinates: E253581 N374450 on its easternmost extreme, and E253524 N374445 on its westernmost extreme. Field 2 contains a sub-oval feature located within the following coordinates: E253642 N374477.

Yellow – possible negative remains - Field 1 contains one circular anomaly interpreted as a possible archaeological feature centred on the following coordinates: E253575 N374367. Similarly, Field 2 contains two circular anomalies of possible archaeological origin centred between the following coordinates: E253647 N374454 and E253663 N374437.

5. Interpretation and Discussion

The geophysical survey identified a series of parallel lines interpreted as geological in nature. Similarly, a number of anomalies were attributed to the imprint of ploughing. The signals from both these sets of anomalies might be masking archaeological features.

Three circular anomalies have been identified in Field 1 and one in Field 2. While these anomalies may be of modern origin, the possibility of them being of archaeological origin should not be discarded.

An almost L-shape feature has been identified at the northern extreme of Field 1. This feature might be of archaeological origin.

No objects or prominent topographical features with the potential to influence the results were obtained during the survey and, it is therefore reasonable to assume that the results correspond, by large, to buried anomalies or potential archaeological nature. The sub-oval feature located in Field 2 (E253642 N374477) correlates to a marshy area.

6. Bibliography and References

Aspinall, A, Gaffney, C & Schmidt, A. 2011, *Magnetometry for Archaeologists.* Altamira, London

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Smith, G. 2003 Funerary and Ritual monument survey. West Gwynedd and

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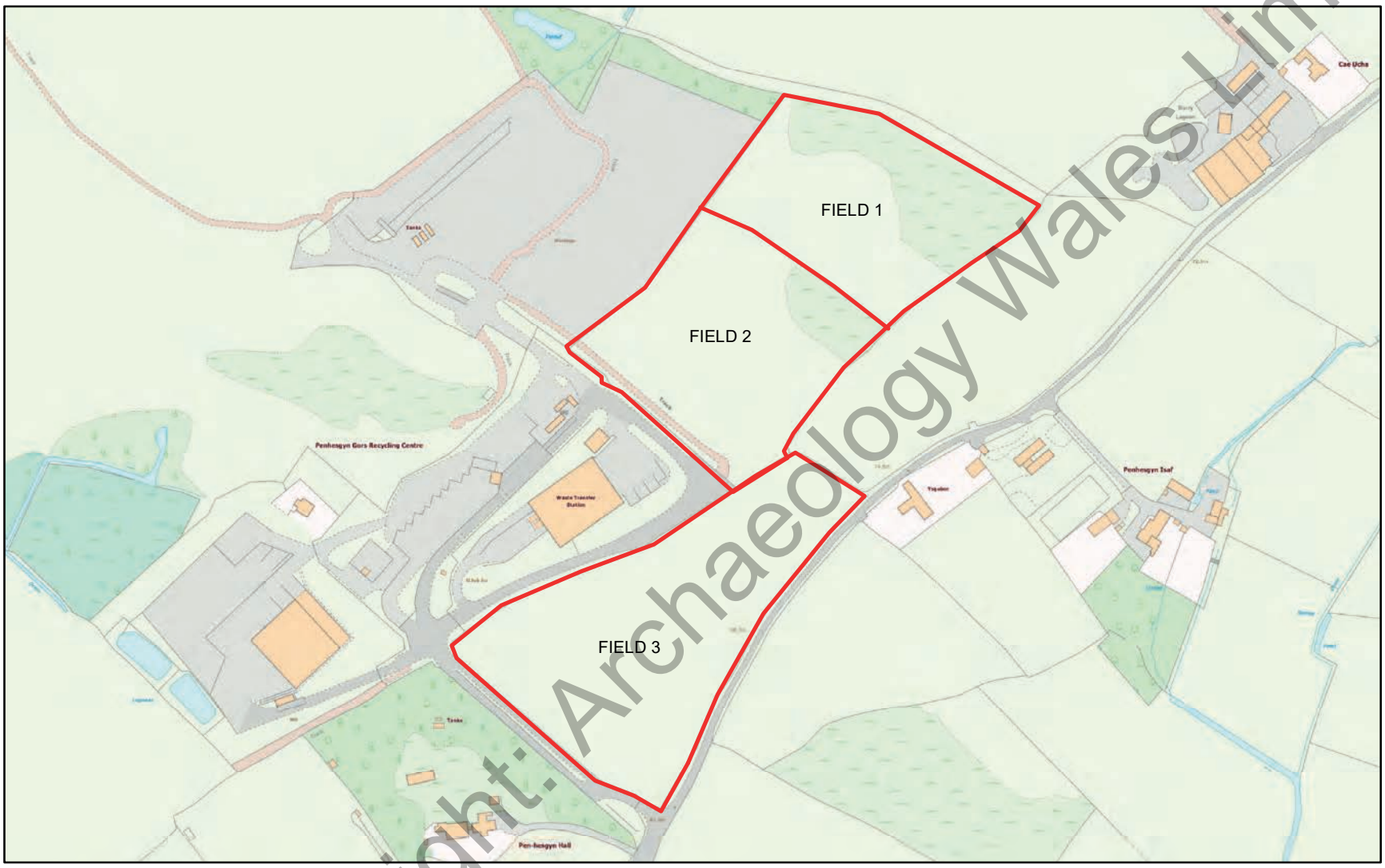

Figure 1.
Location of development site.

ARCHAEOLOGY WALES
Revealing the past, informing the future

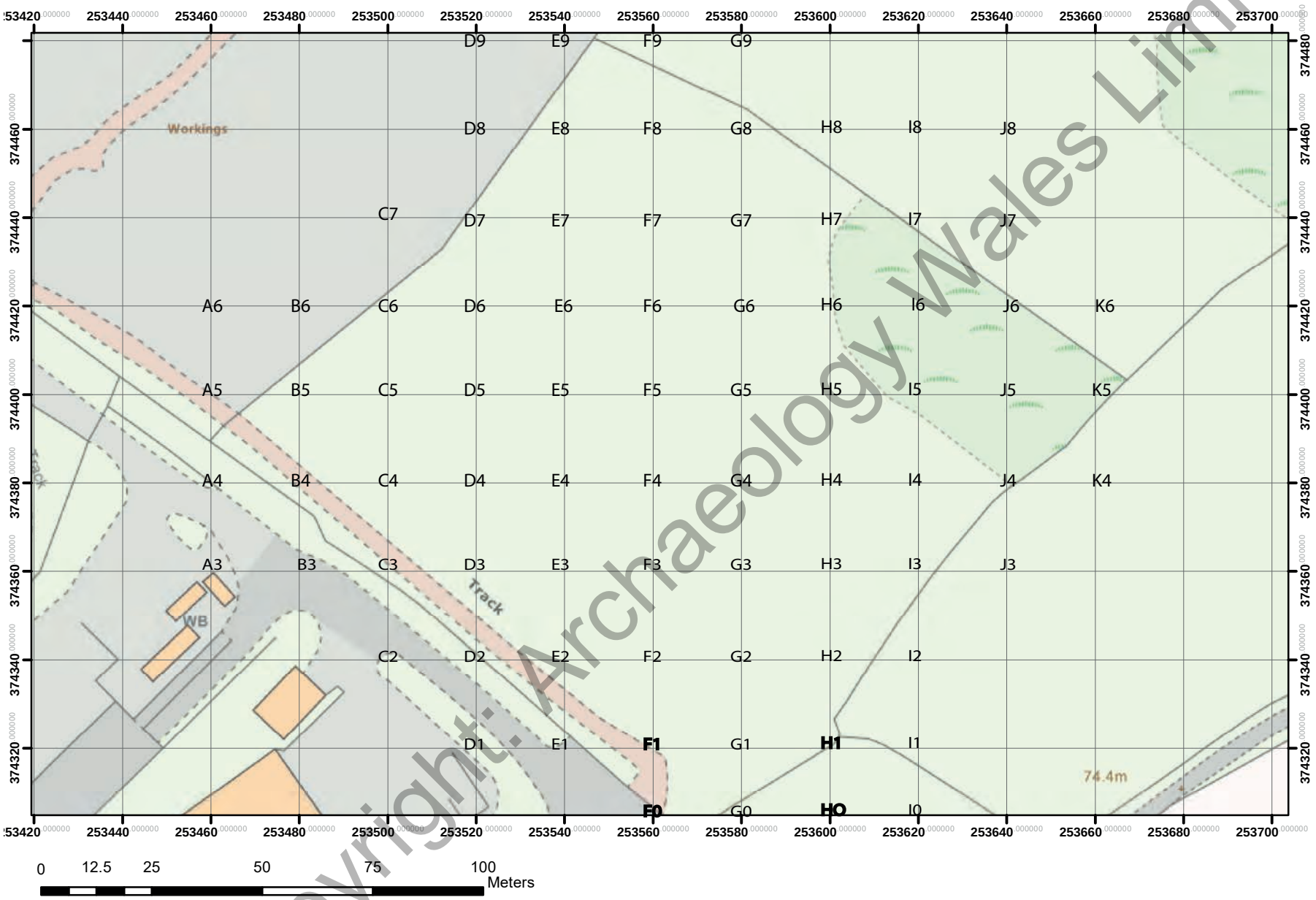

Figure 2.
Grid over Field 1.

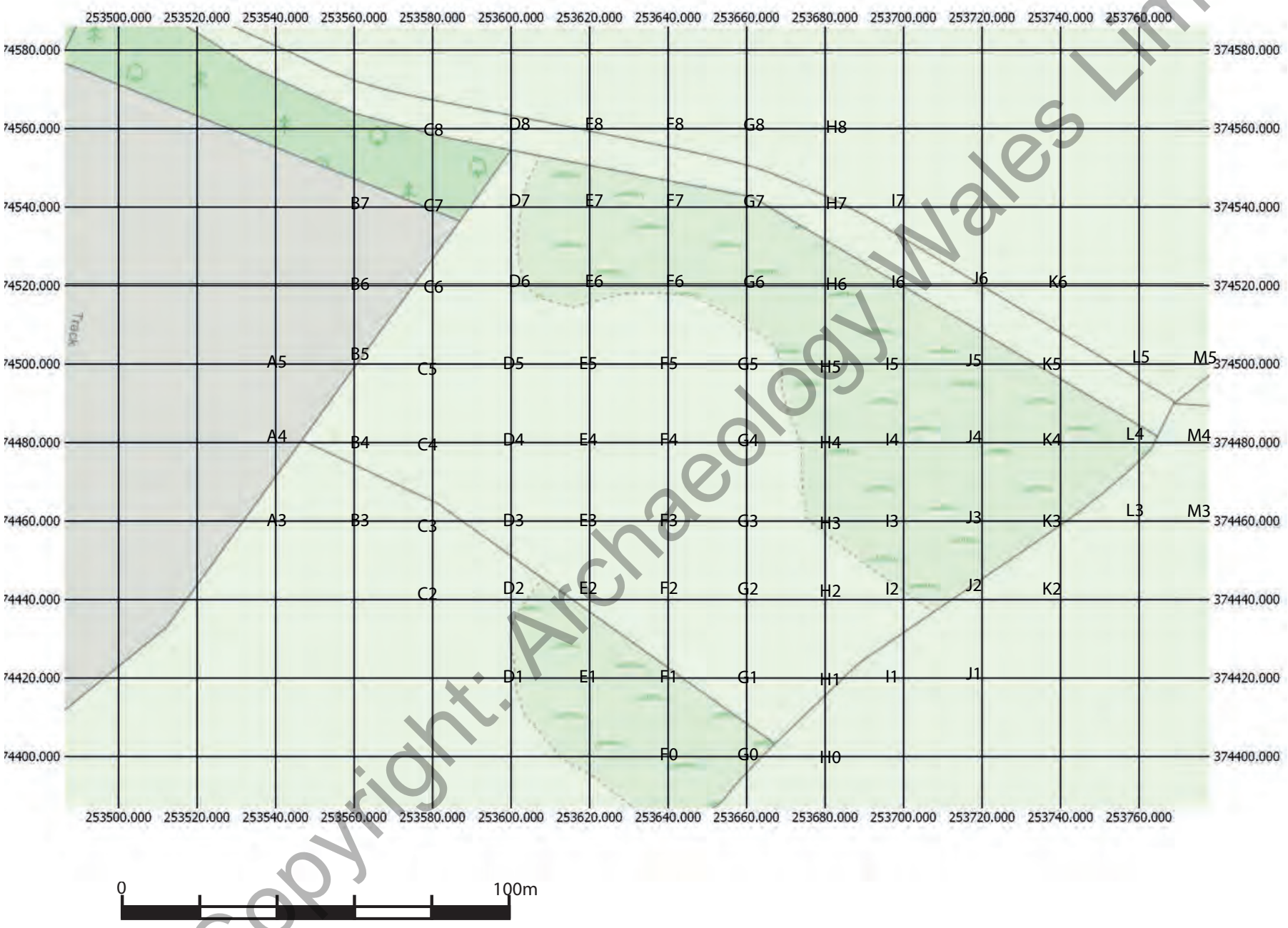

Figure 3.
Grid over Field 2.

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Revealing the past, informing the future

Figure 4. Magnetometer survey results clipped at -2nT to 2nT.

Figure 5. Magnetometer survey results clipped at -4nT to 4nT.

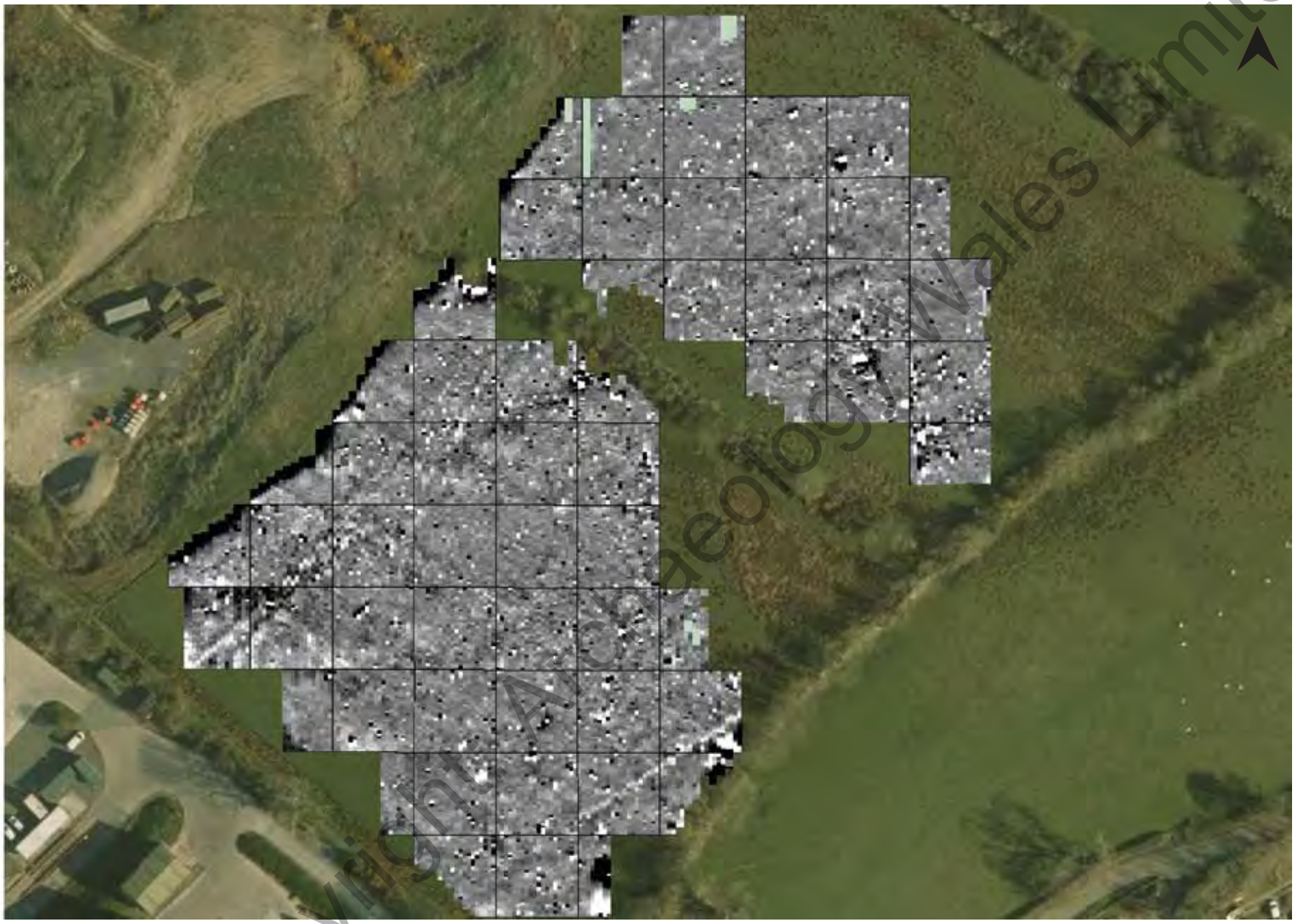


Figure 6. Magnetometer survey results clipped at -8nT to 8nT.

Figure 7. Magnetometer survey results clipped at -4nT to 4nT with interpretation (below).

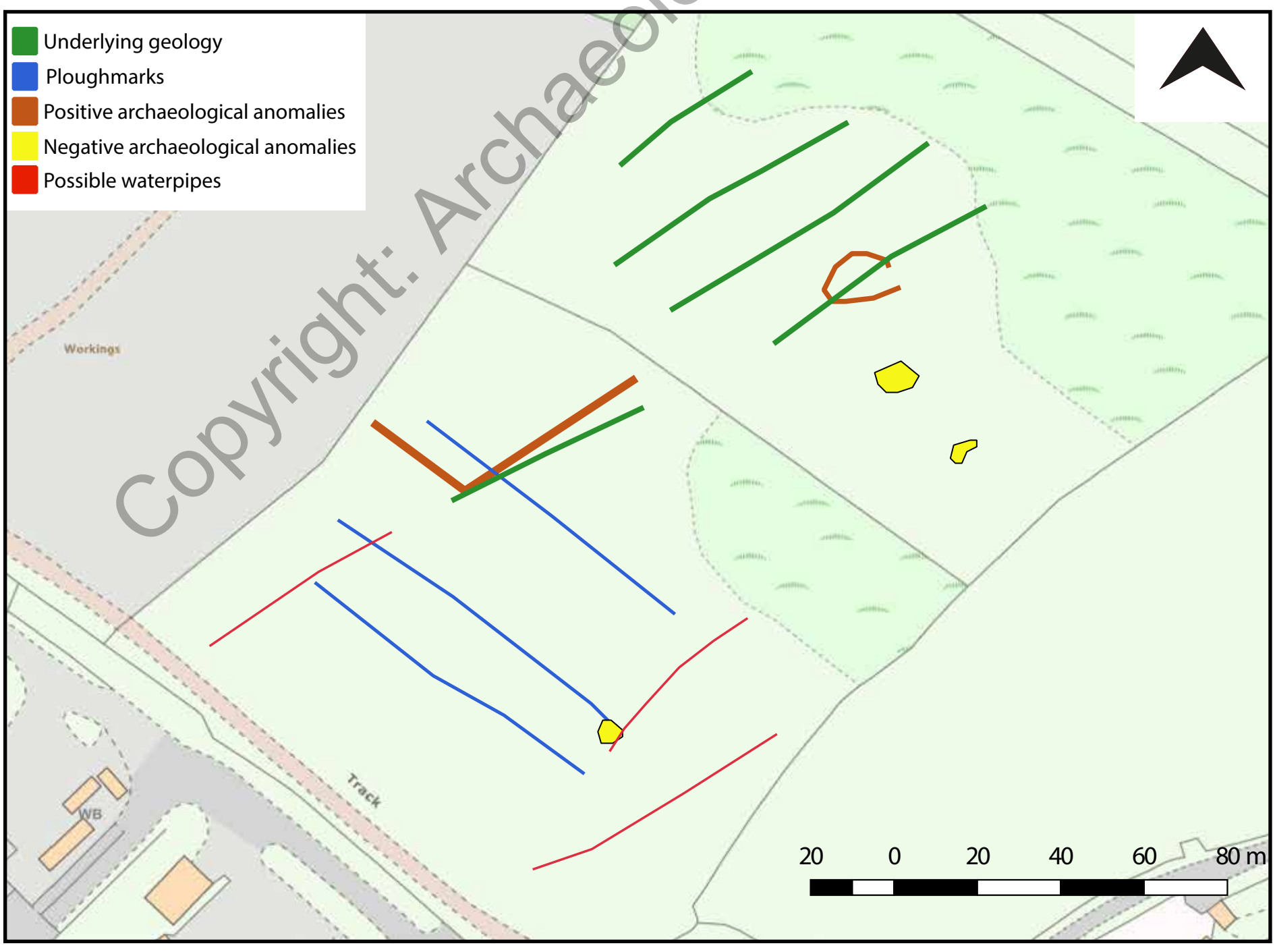
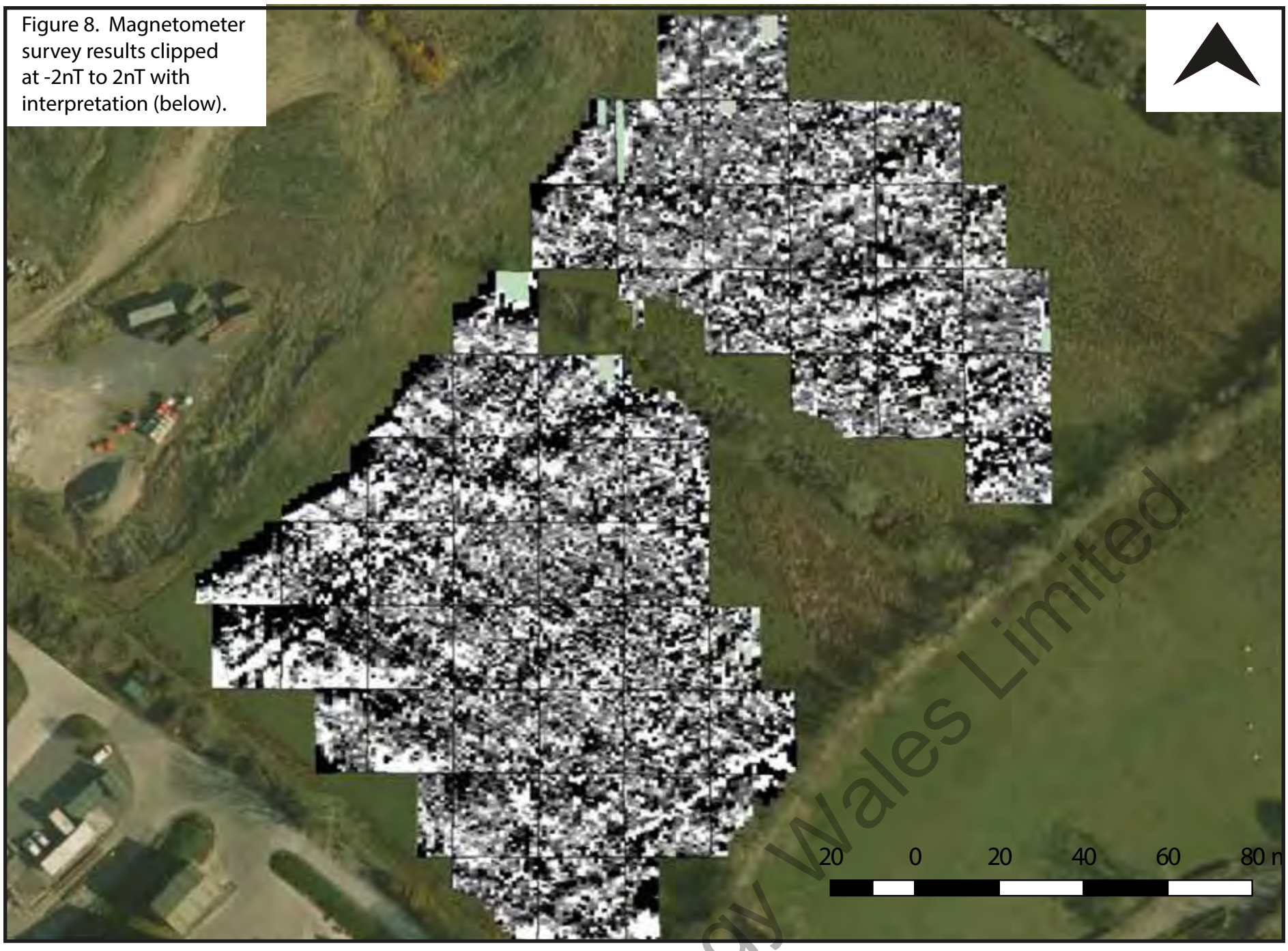
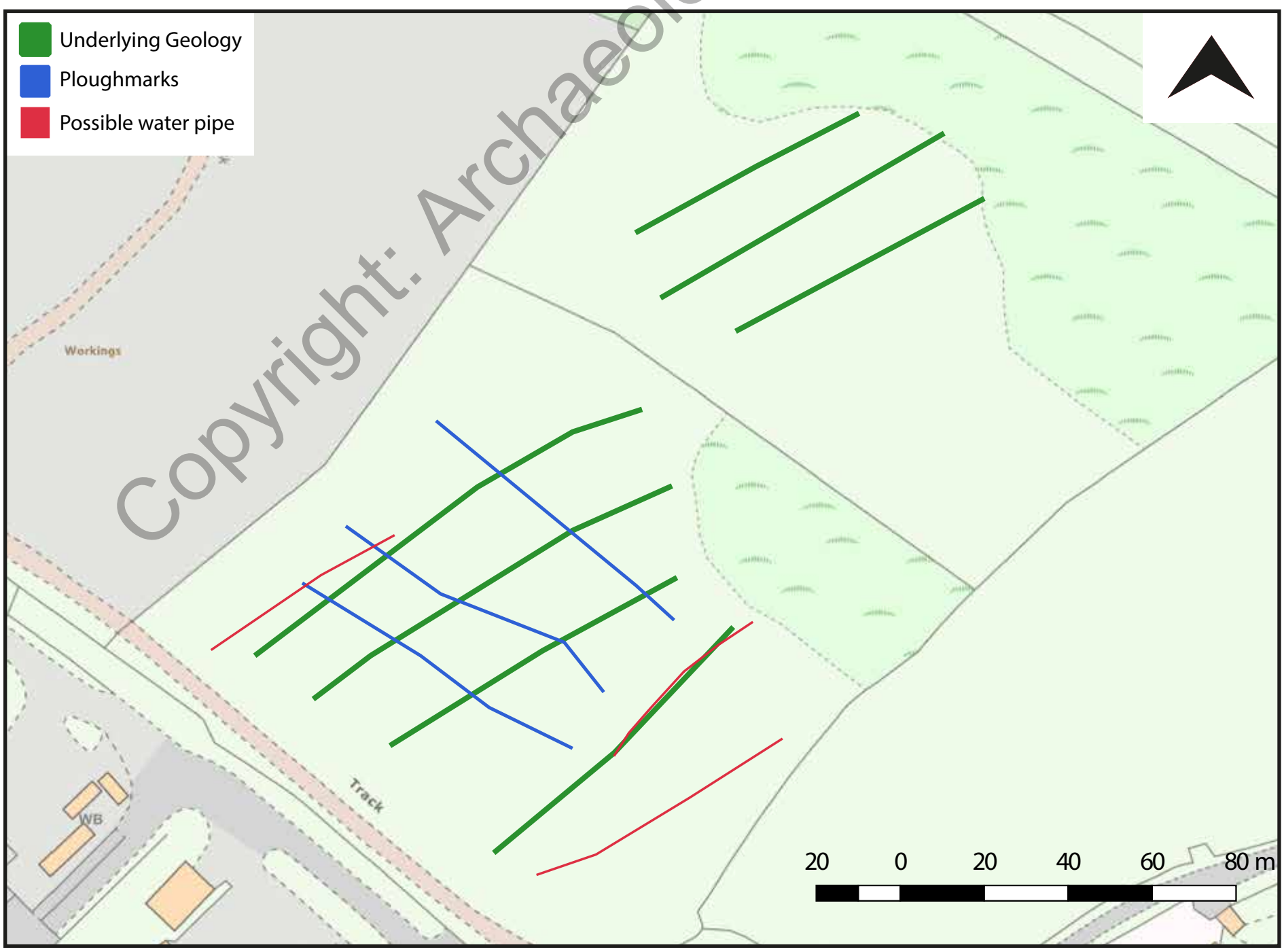


Figure 8. Magnetometer survey results clipped at -2nT to 2nT with interpretation (below).





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