magnitude surveys

Geophysical Survey Report

Thorpe Bank Solar Farm, Thorpe Thewles, Teesside

For

RPS Group

Magnitude Surveys Ref: MSNZ728

OASIS ID: magnitud1-411843

January 2021

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Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c.35.5ha area of land at Thorpe Bank Solar Farm, Thorpe Thewles, Teesside (NZ394242). A fluxgate gradiometer survey was successfully completed across the majority of the survey area with c.0.3ha not surveyed due to the presence of a mature bean crop. The geophysical survey has primarily detected anomalies relating to historic agricultural activity, characterised by former field boundaries, a footpath, and ridge and furrow ploughing regimes of multiple orientations. No anomalies suggestive of significant archaeological features were identified. Natural variations in the deposition of superficial material have also been identified. The impact of modern activity on the results is limited to the edges of the survey area. Some anomalies of undetermined anomalies have been detected, though an agricultural or natural origin is likely but not certain.

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1. Introduction

1.1. Magnitude Surveys Ltd (MS) was commissioned by RPS Group to undertake a geophysical survey on a c.35.5ha area of land at Thorpe Bank Solar Farm, Thorpe Thewles, Teeside (NZ394242).

1.2. The geophysical survey comprised of a quad-towed and hand carried GNSS-positioned fluxgate gradiometer survey. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK for its ability to detect a range of different features. The technique is particularly suited for detecting fired or magnetically enhanced features, such as ditches, pits, kilns, sunken earth houses, and industrial activity (David *et al.*, 2008).

1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David et al., 2008), the Chartered Institute for Archaeologists (CIfA, 2014) and the European Archaeological Council (Schmidt et al., 2015).

1.4. It was conducted in line with a WSI produced by MS (Magnitude Surveys, 2020).

1.5. The survey commenced on 10/08/2020 and took five days to complete.

2. Quality Assurance

2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society of Archaeological Prospection).

2.2. The directors of MS are involved in the cutting edge of research and the development of guidance/policy. Specifically, Dr. Chrys Harris has a PhD in archaeological geophysics from the University of Bradford, is a Member of CIfA and is the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter has an MSc in archaeological geophysics and is a Fellow of the London Geological Society, as well as a member of GeoSIG (CIfA Geophysics Special Interest Group); Dr. Kayt Armstrong has a PhD in archaeological geophysics from Bournemouth University, is a Member of CIfA, the Editor of ISAP News, and is the UK Management Committee representative for the COST Action SAGA; Dr. Paul Johnson has a PhD in archaeology from the University of Southampton, has been a member of the ISAP Management Committee since 2015, and is currently the nominated representative for the EAA Archaeological Prospection Community to the board of the European Archaeological Association.

2.3. All MS managers have relevant degree qualifications to archaeology or geophysics. All MS field and office staff have relevant archaeology or geophysics degrees and/or field experience.

3. Objectives

3.1. The objective of this geophysical survey was to assess the subsurface archaeological potential of the survey area.

4. Geographic Background

4.1. The survey area was located c.500m northwest of Thorpe Thewles, Teesside (Figure 1). A Gradiometer survey was undertaken across one arable field. The survey area was bounded by arable fields to the north and west, the A177 to the east, and Hell Hole Lane to the south (Figure 2). A total area of c.0.3ha in a neighbouring field to the south has not been surveyed due to the presence of a mature bean crop. The field was surveyed as two separate survey areas to allow for optimal data collection over the hilly terrain.

4.2. Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	The area consisted of ploughed arable land. The area sloped generally downwards towards the south from the north. A steep hill was present in the southern end of the survey area, along the western boundary sloping into an easterly valley. A steeper descent was located in the southern end of the area, sloping down towards the south.	The area was bounded to the north, west and south by hedgerows. The eastern edge of the survey area overlapped into Area 2. Two patches of undifferentiated grassland were located along the northern and southern boundaries. A small area located at the north-western end of the survey area was unsurveyable due to overgrown vegetation. Ploughing was present running in a north to south orientation.
2	The area consisted of ploughed arable land. The area sloped generally downwards towards the south from the north. A steep hill was present within the southern end of the survey area, sloping into an easterly valley, then another hill in the same orientation. A steeper descent was located in the southern end of the area, sloping down towards the south.	The area was bounded to the north and south by hedgerows. The survey area was bounded to the east by hedgerow and the A177. The area overlapped into Area 1 at the western boundary. Two patches of undifferentiated grassland were located along the northern and southern boundaries. Ploughing was present running in a north to south orientation.

4.3. The underlying geology comprises calcareous mudstone of the Roxby Formation across the north and south of the survey area, with a band of dolomitic limestone of the Seaham Formation across the centre. Superficial deposits consist of diamicton till, with a band of head clay, silt, sand and gravel in the southwest of the survey area (British Geological Survey, 2021).

4.4. The soils consist of slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (Soilscapes, 2021).

5. Archaeological Background

5.1. Awaiting background information (DBA or other) from client.

6. Methodology

6.1. Magnetometer surveys are generally the most cost effective and suitable geophysical technique for the detection of archaeology in England. Therefore, a magnetometer survey should be the preferred geophysical technique unless its use is precluded by any specific survey objectives or the site environment. For this site, no factors precluded the recommendation of a standard magnetometer survey. Geophysical survey therefore comprised the magnetic method as described in the following section.

6.2. Data Collection

6.2.1. Geophysical prospection comprised the magnetic method as described in the following table.

6.2.2. Table of survey strategies:

Method	Instrument	Traverse Interval	Sample Interval
Magnetic	Bartington Instruments Grad-13 Digital Three-Axis Gradiometer	1m	200Hz reprojected to 0.125m

6.2.3. The magnetic data were collected using MS' bespoke quad-towed cart system and hand-carried GNSS-positioned system.

6.2.3.1. MS' cart and hand-carried system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a multi-channel, multi-constellation GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The RTK GPS is accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

6.2.3.2. Magnetic and GPS data were stored on an SD card within MS' bespoke datalogger. The datalogger was continuously synced, via an in-field Wi-Fi unit, to servers within MS' offices. This allowed for data collection, processing and visualisation to be monitored in real-time as fieldwork was ongoing.

6.2.3.3. A navigation system was integrated with the RTK GPS, which was used to guide the surveyor. Data were collected by traversing the survey area along the longest possible lines, ensuring efficient collection and processing.

6.3. Data Processing

6.3.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to Historic England's standards for "raw or minimally processed data" (see sect 4.2 in David et al., 2008: 11).

<u>Sensor Calibration</u> – The sensors were calibrated using a bespoke in-house algorithm, which conforms to Olsen et al. (2003).

<u>Zero Median Traverse</u> – The median of each sensor traverse is calculated within a specified range and subtracted from the collected data. This removes striping effects caused by small variations in sensor electronics.

Projection to a Regular Grid – Data collected using RTK GPS positioning requires a uniform grid projection to visualise data. Data are rotated to best fit an orthogonal grid projection and are resampled onto the grid using an inverse distance-weighting algorithm.

Interpolation to Square Pixels – Data are interpolated using a bicubic algorithm to increase the pixel density between sensor traverses. This produces images with square pixels for ease of visualisation.

6.4. Data Visualisation and Interpretation

6.4.1. This report presents the gradient of the sensors' total field data as greyscale images, as well as the total field data from the lower sensors. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images of the gradient and total field at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plot (Figures 7, 10 and 13). XY trace plots visualise the magnitude and form of the geophysical response, aiding in anomaly interpretation.

6.4.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historic maps, LiDAR data, and soil and geology maps. Google Earth (2021) was consulted as well, to compare the results with recent land usages.

6.4.3. Geodetic position of results - All vector and raster data have been projected into OSGB36 (ESPG27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively.

7. Results

7.1. Qualification

7.1.1. Geophysical results are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is inherently subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency, it is often not possible to classify all anomaly sources. Where possible an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of comparing excavated results with the geophysical reports. MS actively seek feedback on their reports as well as reports of further work in order to constantly improve our knowledge and service.

7.2. Discussion

7.2.1. The geophysical results are presented in consideration with historic maps and satellite imagery (Figure 4).

7.2.2. The fluxgate gradiometer survey has responded well to the environment of the survey area. The geophysical survey has primarily detected anomalies related to agricultural activity. Natural variations were identified as a widespread scattering of discrete anomalies, which likely relate to the variations in texture and composition of the sands and gravels. The topography of the survey area has led to concentrated 'zones' of superficial deposits, as well as sinuous concentrations following the contours of the small valleys crossing the area (see Section 4.3). Modern interference is limited to ferrous material at field edges, concentrated at the northern and eastern boundaries.

7.2.3. No anomalies suggestive of significant archaeological features have been identified within the survey area.

7.2.4. Agricultural activity has been identified across the survey area in the form of extensive ridge and furrow cultivation, a former trackway, as well as multiple field boundaries which cross the survey area. The majority of these former boundaries have been co-located with those depicted on historic mapping, whilst some (mainly oriented southwest-northeast) parallel anomalies likely represent unmapped boundaries (Figure 4). These unmapped boundaries also align with mapped boundaries located beyond the survey area, further reinforcing that these could be earlier divisions within the survey area.

7.2.5. Some discrete and linear anomalies of undetermined origins have been identified within the survey area. These anomalies do not appear to relate to any other identified or known features, though it is likely that they have either agricultural or natural origins due to the concentration of both in this area. It has not been possible to clarify further from this survey.

7.3. Interpretation

7.3.1. General Statements

7.3.1.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.

7.3.1.2. **Ferrous (Spike)** – Discrete ferrous-like, dipolar anomalies are likely to be the result of isolated modern metallic debris on or near the ground surface.

7.3.1.3. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentrated deposition of discrete, dipolar ferrous anomalies and other highly magnetic material.

7.3.1.4. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures along the edges of the field have been classified as 'Magnetic Disturbance'. These magnetic 'haloes' will obscure the response of any weaker underlying features, should they be present, often over a greater footprint than the structure they are being caused by.

7.3.1.5. **Undetermined** – Anomalies are classified as Undetermined when the anomaly origin is ambiguous through the geophysical results and there is no supporting or correlative evidence to warrant a more certain classification. These anomalies are likely to be the result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally not ferrous in nature.

7.3.2. Magnetic Results - Specific Anomalies

7.3.2.1. **Agricultural** (**Mapped Field Boundaries**) – A total of seven strong and weak, positively enhanced anomalies curvilinear and linear anomalies were located across the survey area (Figures 6, 9 and 12). Four of these anomalies run in a roughly east to west orientation and three of these anomalies run in a north to south orientation. These anomalies co-locate with the locations of former field boundaries depicted on historic mapping (Figure 4) and are characteristic of an infill of material within a ditch.

7.3.2.2. **Agricultural (Mapped Footpath)** – A linear concentration of positively enhanced anomalies, which crosses the survey area on a northwest-southeast alignment, has been detected [**1a**]. These anomalies are indicative of a spread of magnetically enhanced material, which likely relates to a footpath depicted in this location on historic mapping (Figure 4).

7.3.2.3. **Agricultural (Unmapped Field Boundaries) –** Eight linear and three curvilinear, positively enhanced anomalies [**1b** & **2a**] were identified within the survey area. These anomalies are similar in magnetic signal to the former field boundaries previously discussed (see Section 7.3.2.1), however these anomalies are not depicted on historic mapping (Figure 4). The anomalies may represent earlier or unmapped field boundaries.

7.3.2.4. **Ridge & Furrow (Trend)** – Linear and curvilinear parallel anomalies, following multiple alignments, have been detected throughout the survey area (Figures 5, 8 and 11). These anomalies are indicative of ridge and furrow cultivation, with spacing between the anomalies ranging from c.2m to c.10m apart. The variation in spacing is suggestive of different phases of activity within the survey area, with wider spacing generally considered to be of an earlier date, though this is not always the case. These trends also largely appear to respect the identified mapped and unmapped boundaries. Though, two cultivation directions appear to cross one another in the northern end of the survey area, respecting either the mapped or unmapped boundaries.

7.3.2.5. **Agricultural (Trend) –** A series of parallel linear anomalies have been detected crossing the survey area in the north-south orientation. These linear trends are characteristic of modern ploughing activity.

7.3.2.6. **Natural** – Amorphous zones of discrete anomalies have been located throughout the survey area, these are most explicit within the total field data (Figure 3). These anomalies are indicative of localised concentrations of superficial deposits which follow the topography. A particularly dense region of these anomalies is located within the south-western section of the survey area, which likely relates to a band of head clay, silt, sand and gravel (see Section 4.3). Multiple sinuous bands of positively enhanced anomalies have been identified following the valleys within the survey area. These anomalies are likely produced by a flow of water and exacerbated by the seasonally wet soils.

7.3.2.7. **Undetermined** – Located within the centre of the survey area multiple strong, positively enhanced, discrete anomalies have been identified (Figure 9). Additionally, an inversely dipolar discrete anomaly [**1c**] (Figures 11 & 12), was detected in the western extent of the survey area. These anomalies may be indicative of pit features of undetermined date, potentially relating to the extensive agricultural activity within this area, though with no clear relationship to other identified features it is not possible to interpret these further. Several linear or curvilinear, weak anomalies were also detected across the survey area which may also relate to agricultural activity, particularly [**1d**] (Figure 6) which runs parallel to the field boundary, though these anomalies may also relate to natural processes identified on the site (see Section 7.3.2.6).

8. Conclusions

8.1. A fluxgate gradiometer has successfully been undertaken across the survey area. The geophysical survey has detected a range of different types of anomalies of agricultural and natural origins. No anomalies suggestive of significant archaeological activity have been identified. Natural variations have been recorded within the survey area as concentrated deposits of superficial deposits following the topography of the survey area. Modern interference is limited to the boundaries of the field.

8.2. Agricultural activity has been identified across the survey area in the form of former field boundaries, both mapped and unmapped, a mapped footpath, as well as ridge and furrow cultivation. Historic ploughing regimes have been identified following multiple orientations, with modern ploughing also detected across the survey area.

8.3. Some anomalies of undetermined origins have been identified, these likely relate to agricultural activity or natural variations, though a clear interpretation has not been possible since they do not appear to relate to other identified features.

9. Archiving

9.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.

9.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to the any dictated time embargoes.

10. Copyright

11. References

British Geological Survey, 2021. Geology of Britain. [Stockton-on-Tees, County Durham] http://mapapps.bgs.ac.uk/geologyofbritain/home.html/]. [Accessed 12/08/2021].

Chartered Institute for Archaeologists, 2014. Standards and guidance for archaeological geophysical survey. CIfA.

David, A., Linford, N., Linford, P. and Martin, L., 2008. Geophysical survey in archaeological field evaluation: research and professional services guidelines (2nd edition). Historic England.

Google Earth, 2021. Google Earth Pro V 7.1.7.2606.

Magnitude Surveys, 2020. Written Scheme of Investigation for a Geophysical Survey of Hell Hole Farm, Thorpe Thewles, Teesside. Magnitude Surveys Ltd.

Olsen, N., Toffner-Clausen, L., Sabaka, T.J., Brauer, P., Merayo, J.M.G., Jorgensen, J.L., Leger, J.M., Nielsen, O.V., Primdahl, F., and Risbo, T., 2003. Calibration of the Orsted vector magnetometer. *Earth Planets Space* 55: 11-18.

Schmidt, A. and Ernenwein, E., 2013. Guide to good practice: geophysical data in archaeology. 2nd ed., Oxbow Books, Oxford.

Schmidt, A., Linford, P., Linford, N., David, A., Gaffney, C., Sarris, A. and Fassbinder, J., 2015. Guidelines for the use of geophysics in archaeology: questions to ask and points to consider. EAC Guidelines 2. European Archaeological Council: Belgium.

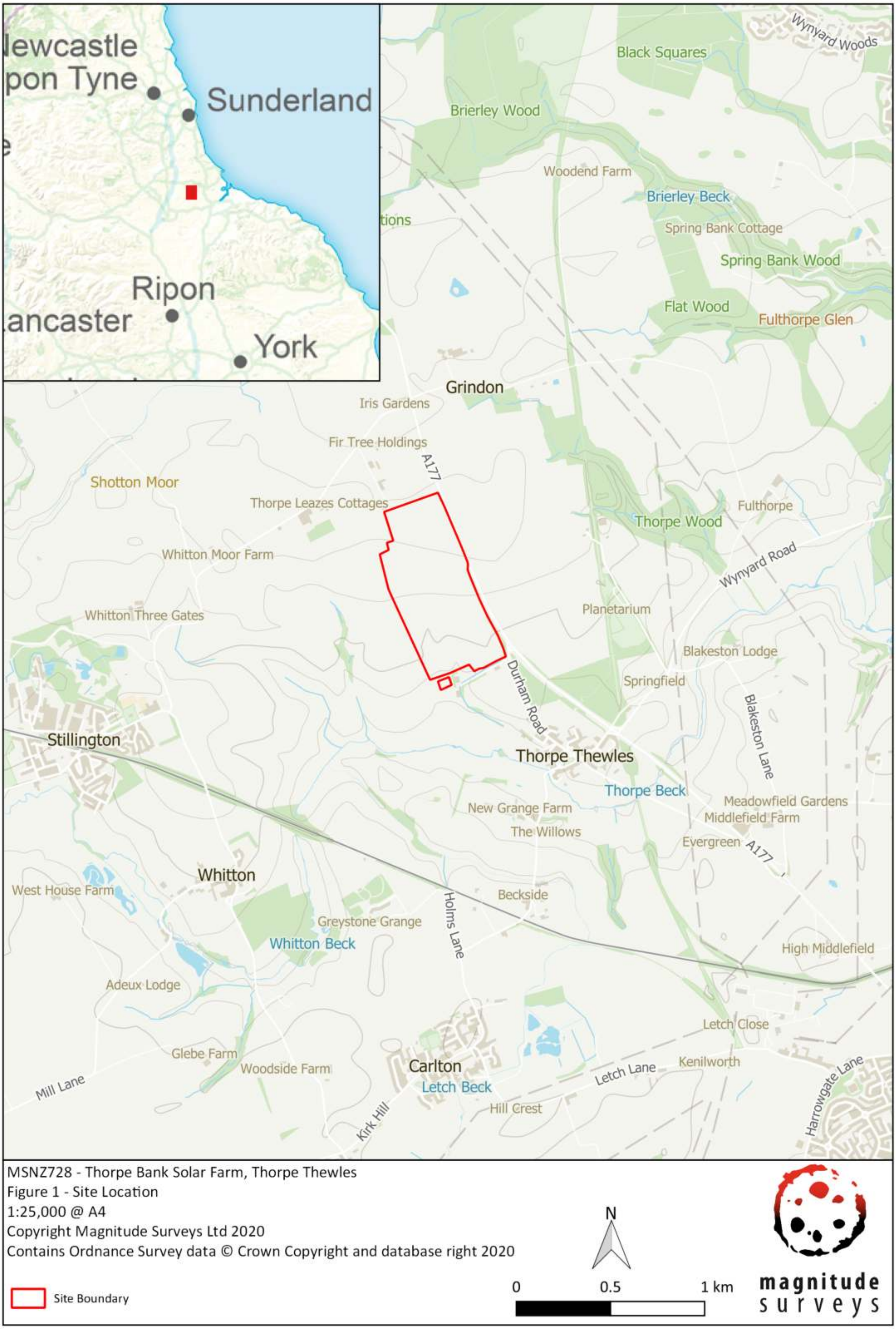
Soilscapes, 2021. [Stockton-on-Tees, County Durham]. Cranfield University, National Soil Resources Institute [http://landis.org.uk]. [Accessed 12/08/2021].

12. Project Metadata

MS Job Code	MSNZ728
Project Name	Thorpe Bank Solar Farm, Thorpe Thewles, Teesside
Client	RPS Group
Grid Reference	NZ394242
Survey Techniques	Magnetometry
Survey Size (ha)	35.5ha (Magnetometry)
Survey Dates	2020-08-10 to 2020-08-14
Project Lead	Dr. Chrys Harris MCIfA
Project Officer	Lauren Beck BA
HER Event No	TBC once report sent to HER
OASIS No	magnitud1-411843
S42 Licence No	N/A
Report Version	1.0

13. Document History

Version	Comments	Author	Checked By	Date
0.1	Initial draft for Project Lead to Review	DW	LB	20 August 2020
0.2	Draft for Director Approval	DW	PSJ	21 August 2020
0.3	Corrections from Director, Initial Draft to Client	LB	PSJ	21 August 2020
1.0	Issued as Final	LB	PSJ	06 January 2021



MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles

Figure 1 - Site Location

1:25,000 @ A4

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MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 2 - Location of Survey Areas
1:10,000 @ A3

Survey Extent
Unsurveyable

N

0 200 400 600 m

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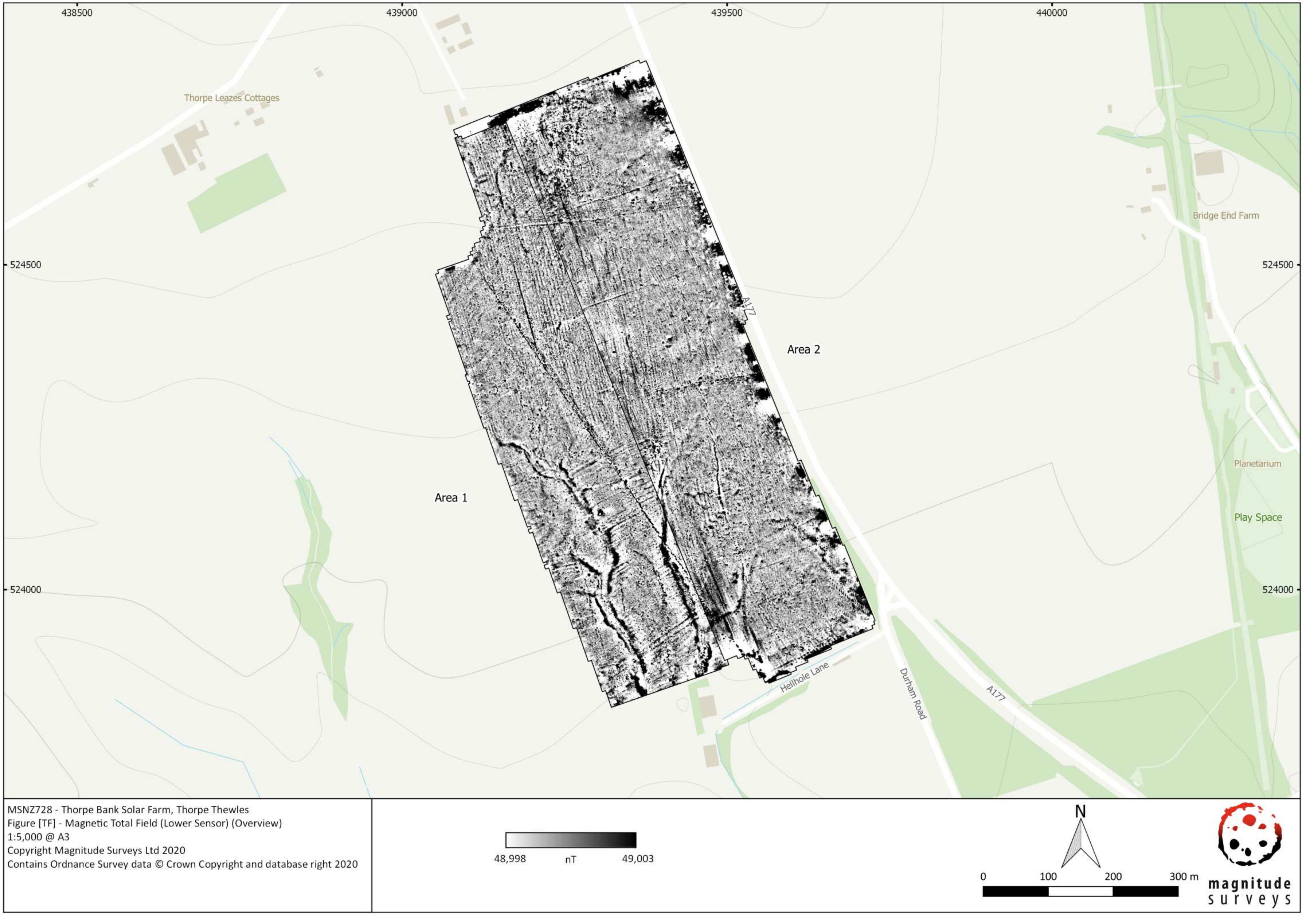

MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure [TF] - Magnetic Total Field (Lower Sensor) (Overview)
1:5,000 @ A3

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MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 4 - Magnetic Interpretation Over Historic Maps and Satellite Imagery (Overview)
1:5,000 @ A3

- Agricultural (Strong)
- Agricultural (Weak)
- Agricultural (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Agricultural (Trend)
- Ridge and Furrow (Trend)
- Ferrous (Spike)

N

0 100 200 300 m

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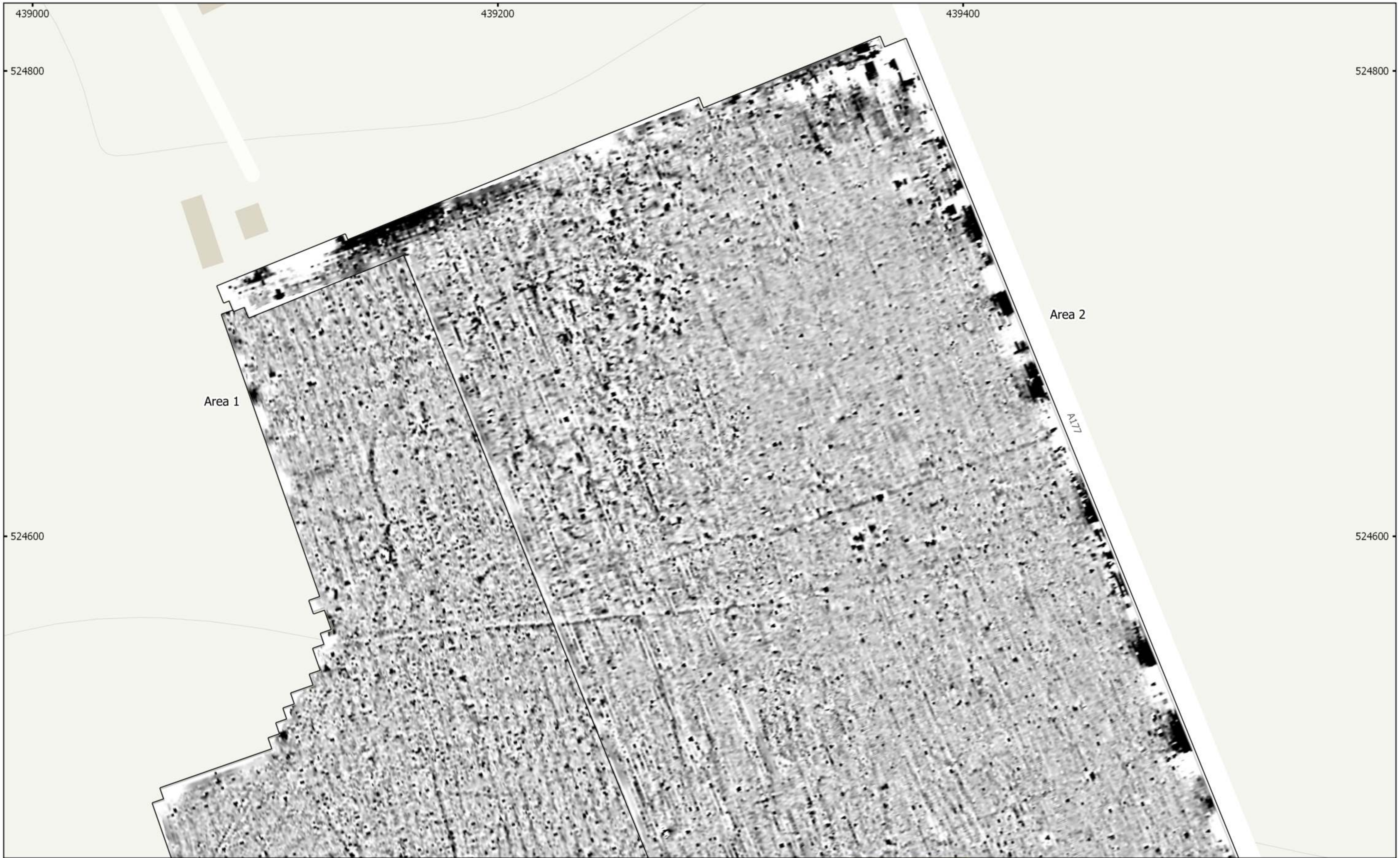
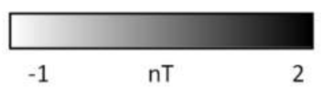
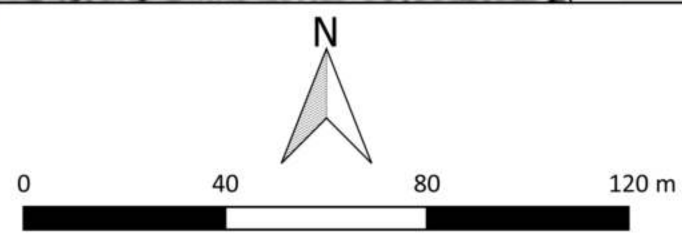


MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 5 - Magnetic Gradient (North)
1:1,500 @ A3





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MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 6 - Magnetic Interpretation (North)
1:1,500 @ A3

Agricultural (Strong)
Agricultural (Weak)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)
Agricultural (Trend)
Ridge and Furrow (Trend)
Ferrous (Spike)

N

0 40 80 120 m

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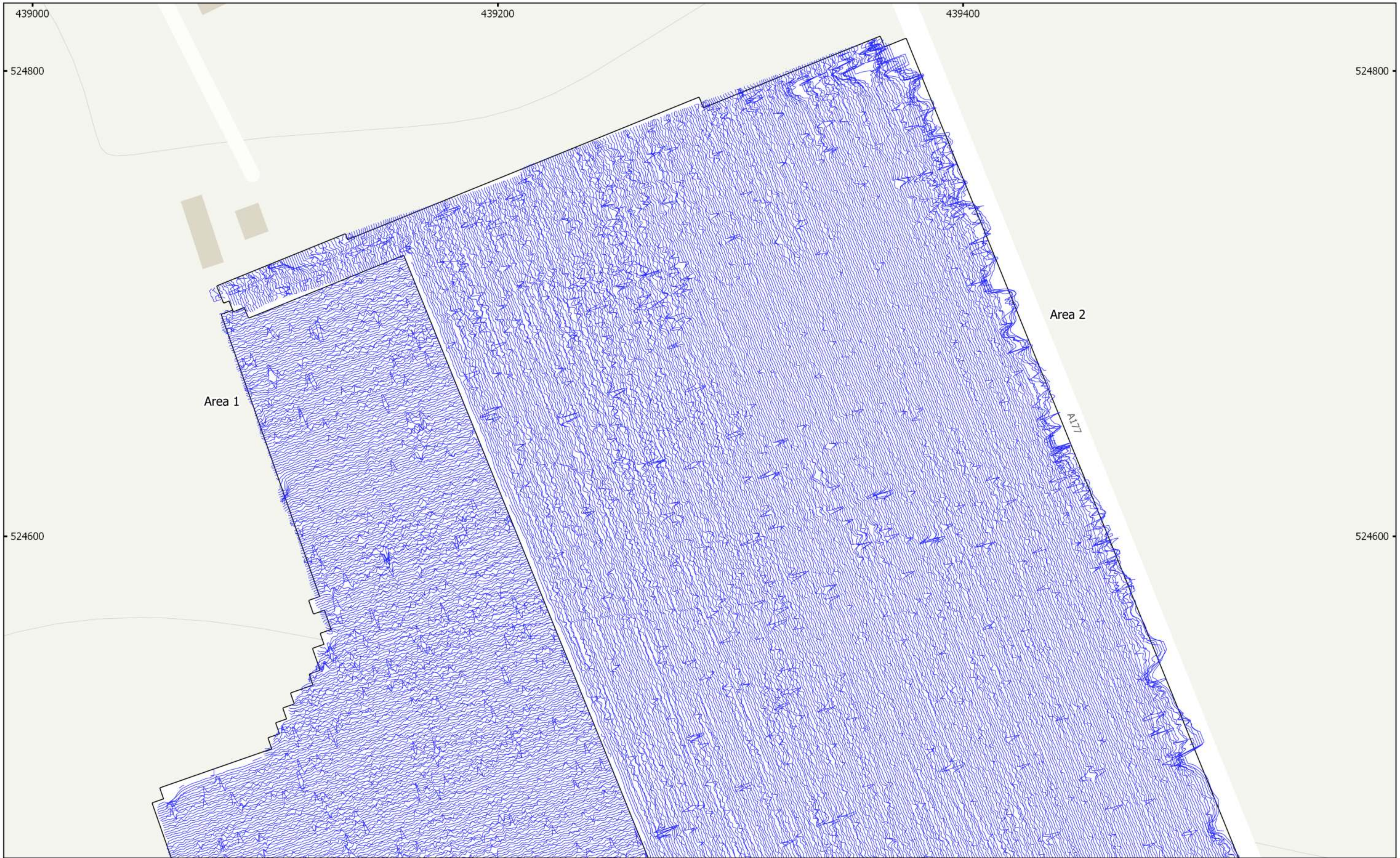
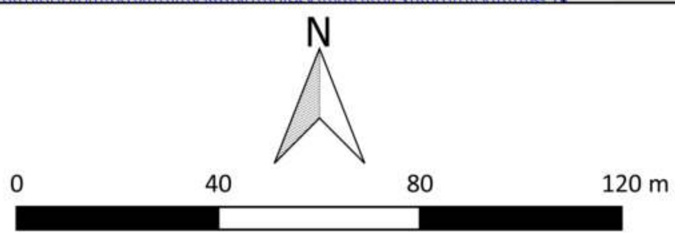


MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 7 - XY Trace Plot (North)
30nT/cm at 1:1,500 @ A3



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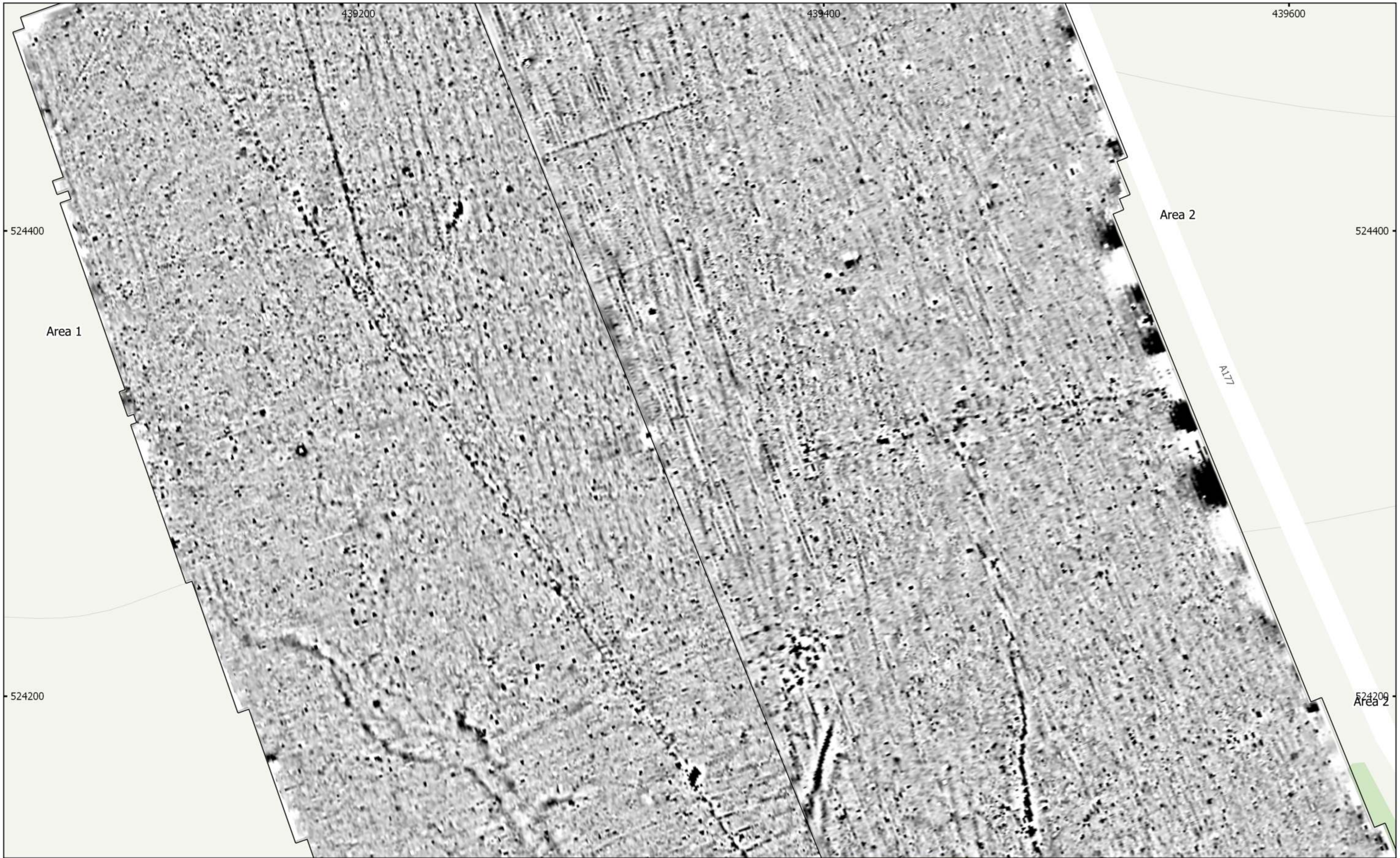
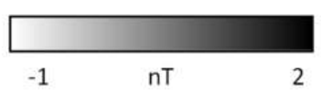
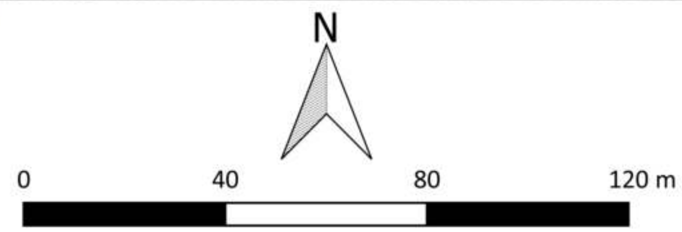


MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 8 - Magnetic Gradient (Centre)
1:1,500 @ A3





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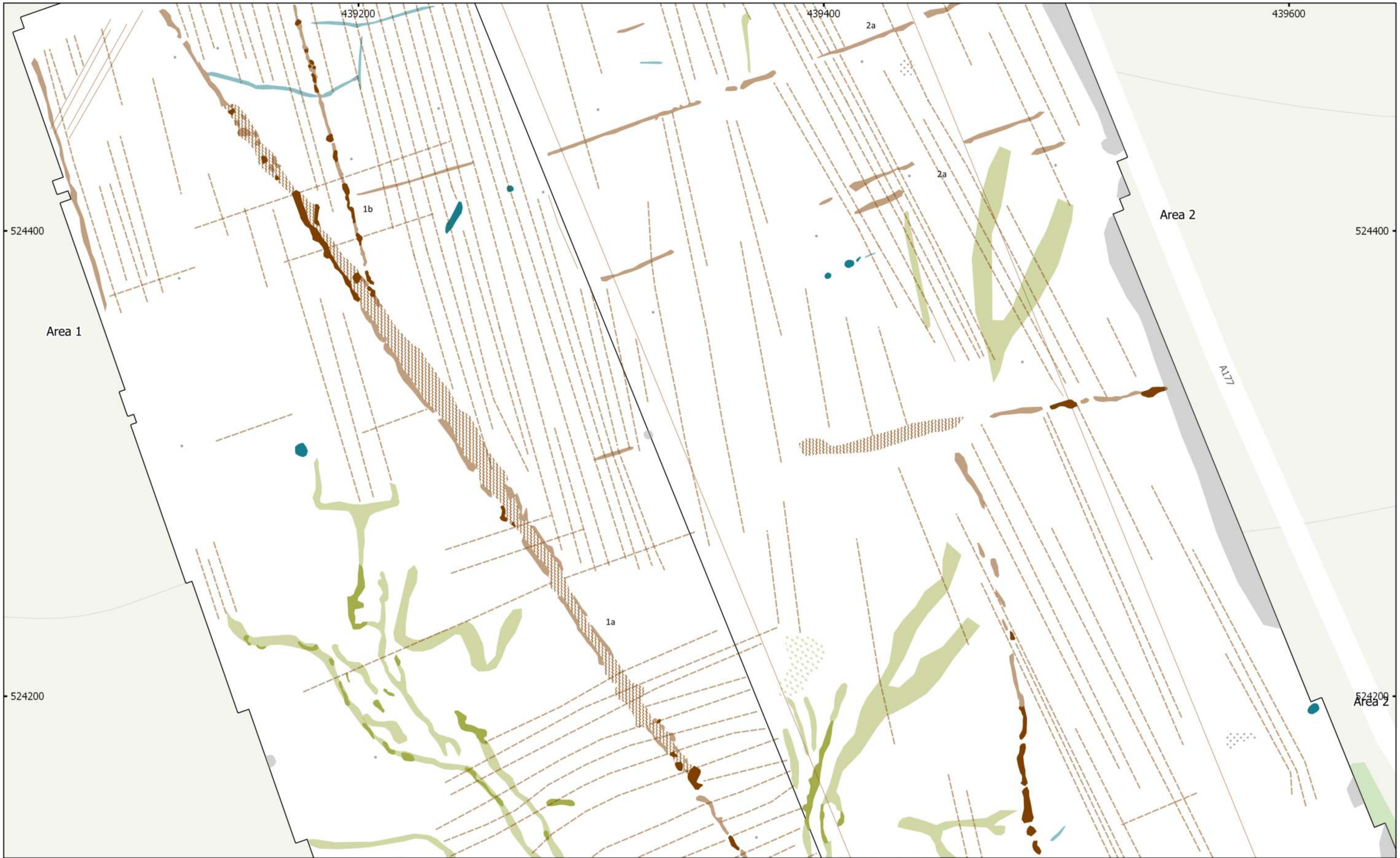
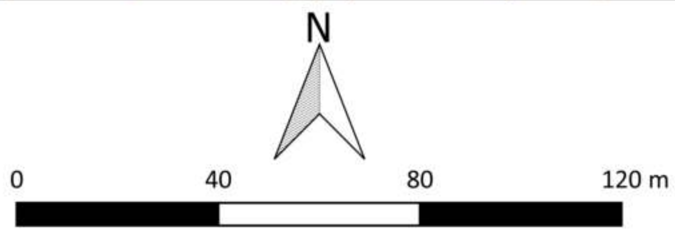


MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 9 - Magnetic Interpretation (Centre)
1:1,500 @ A3



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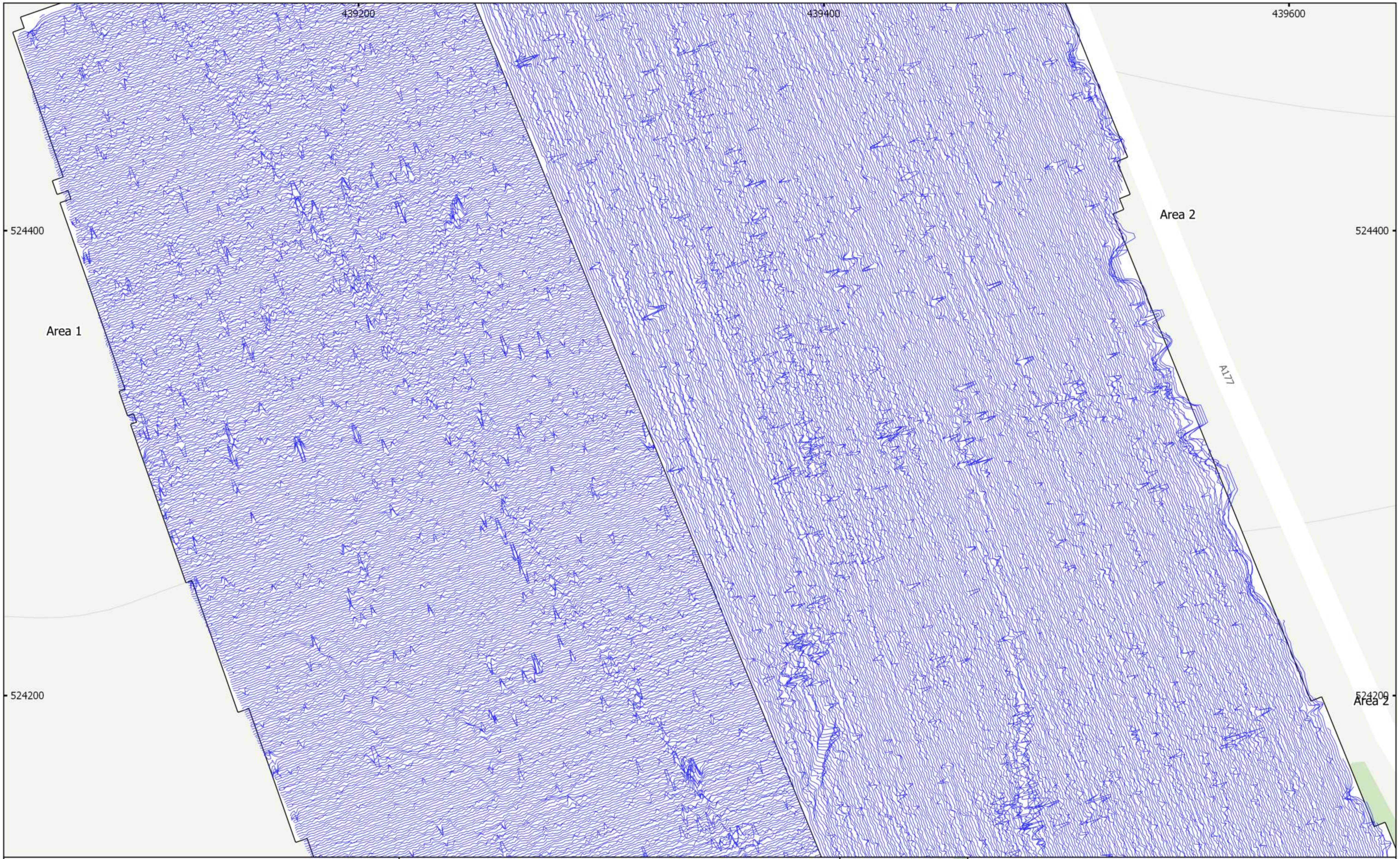
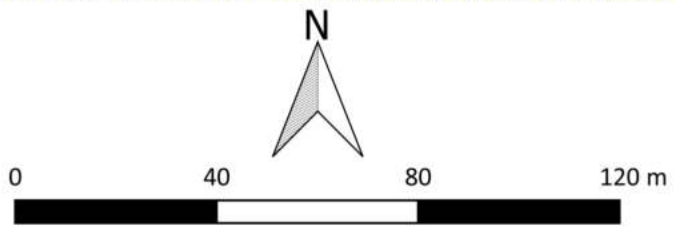


MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 10 - XY Trace Plot (Centre)
30nT/cm at 1:1,500 @ A3



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MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 11 - Magnetic Gradient (South)
1:1,500 @ A3

-1 nT 2

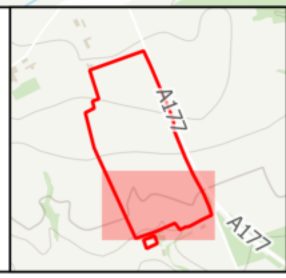
N

0 40 80 120 m

magnitude surveys

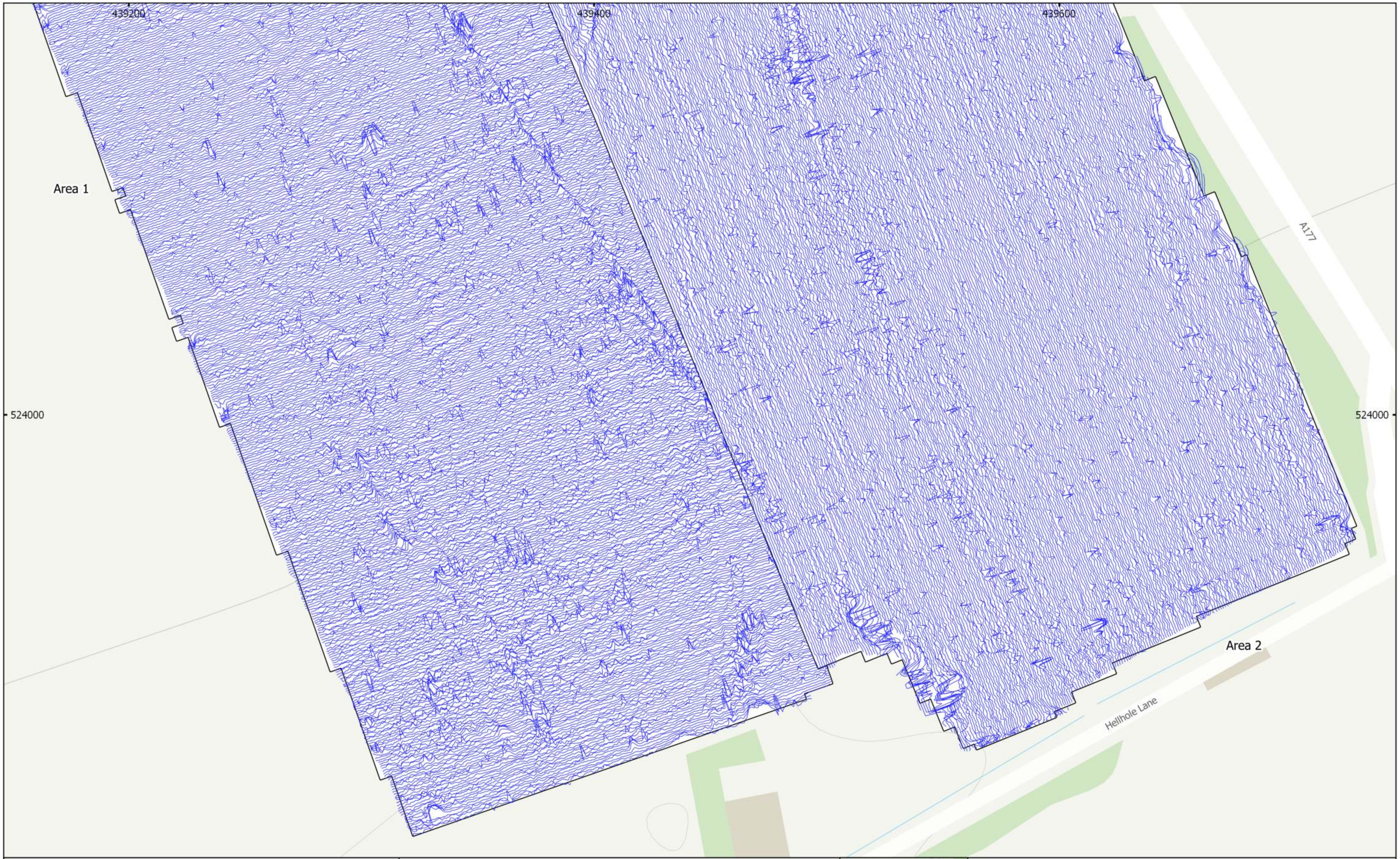
MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 12 - Magnetic Interpretation (South)
1:1,500 @ A3

Agricultural (Strong)
Agricultural (Weak)
Agricultural (Spread)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)
Agricultural (Trend)
Ridge and Furrow (Trend)
Ferrous (Spike)



N
0 40 80 120 m

magnitude surveys



MSNZ728 - Thorpe Bank Solar Farm, Thorpe Thewles
Figure 13 - XY Trace Plot (South)
30nT/cm at 1:1,500 @ A3

N

0 40 80 120 m

magnitude surveys