



**magnitude
surveys**

**Geophysical Survey Report
Eastern Way, Melksham, Wiltshire**

**For
ADAS**

Magnitude Surveys Ref: MSST2463

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**magnitude
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Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 2ha area of land at Eastern Way, Melksham, Wiltshire. A fluxgate gradiometer survey was successfully carried out across 1.5ha of the survey area, while 0.5ha could not be surveyed due to overgrown vegetation. The survey detected anomalies of possible archaeological origin in the form of curvilinear and linear anomalies possibly associated with ditch features containing magnetically enhanced fill. Anomalies of agricultural origin were detected in the form of historic ploughing regimes, while several other anomalies have been classified as undetermined due to a lack of distinct morphology or supporting contextual evidence. Modern interference is also visible along the field edges.

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1. Introduction

- 1.1. Magnitude Surveys Ltd (MS) was commissioned by ADAS to undertake a geophysical survey over a c. 2ha area of land near to Eastern Way, Melksham, Wiltshire (ST 9223 6425).
- 1.2. The geophysical survey comprised a hand-carried GNSS-positioned fluxgate gradiometer survey. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK due to 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 featured buildings (SFBs) 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, 2020), and the European Archaeological Council (Schmidt et al., 2015).
- 1.4. The survey was conducted in accordance with a Written Scheme of Investigation (WSI) produced by MS (Paine, 2026).
- 1.5. The survey commenced on 13 July 2026 and was completed the same day.

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 for Archaeological Prospection).
- 2.2. The Directors of MS are involved in cutting edge 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 was 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 CIfA; Dr Paul Johnson has a PhD in archaeology from the University of Southampton, is a Fellow of the Society of Antiquaries of London and a Member of CIfA, has been a member of the ISAP Management Committee since 2015, and is currently the Chair of the Archaeological Prospection Community of the European Archaeological Association.
- 2.3. All MS managers, field and office staff have degree qualifications relevant to archaeology or geophysics 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 immediately east of Melksham (Figure 1). A gradiometer survey was undertaken across two pasture fields. The survey area was bordered to the north and west by Sandridge Common Road and to the east and south by agricultural farmland (Figure 2). Of the c. 2ha survey area, 0.5ha could not be surveyed due to dense overgrown vegetation, resulting in a surveyed area of 1.5ha.

Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	Flat pasture	The survey area is bordered on all sides by hedges and wooden fences, with a borehole in the north of the area
2	Flat set-aside area with grass and overgrowth.	This area is bordered by a road on the north and western edges, and a hedge and fence to the east. This area is largely overgrown, with a ditch also in the lower eastern border
3	Flat set-aside area with grass and overgrowth.	The area is bordered by a road to the west and a hedge and fence to the east, while no physical boundary is present to the north. The ground is largely overgrown, with a ditch running along the lower eastern boundary.

- 4.2. The underlying geology of the survey area comprises mudstone of the Oxford Clay Formation with no superficial deposits recorded (British Geological Survey, 2026).
- 4.3. The soils consist of slowly permeable seasonally wet slightly acidic but base-rich loamy and clayey soils (Soilscapes, 2026).

5. Archaeological Background

- 5.1. The following is a summary of an Archaeological Desk-Based Assessment produced and provided by RSK ADAS Limited (Howard, 2025).
- 5.2. Prehistoric activity recorded nearby includes a Bronze Age pit recorded c. 460m southwest of the survey area.
- 5.3. A Roman ditch was identified c. 460m to the southeast of the survey area, with further ditches and a pit found c. 240m northeast of the survey area.
- 5.4. Medieval activity in the area consisted of a boundary bank c. 60m northwest of the survey area, Blackmore Farm with Medieval origins located c. 240m northeast, ridge and furrow c. 420–500m southwest of the survey area, and a Medieval ditch, pit and ironworking floors c. 390m southwest.
- 5.5. Post-Medieval ridge and furrow was recorded in most surrounding fields but not within the survey area.

- 5.6. Three Grade II listed buildings were recorded within the study area: 8 Church Lane, Blackmore House and the Church of St Andrew.
- 5.7. An undated bank was identified c. 460m west of the survey area.

6. Methodology

6.1. Data Collection

6.1.1. 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.

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

6.1.3. 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

6.1.4. The magnetic data were collected using MS' bespoke hand-carried GNSS-positioned system.

6.1.4.1. MS' 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.

6.1.4.2. 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.

6.1.4.3. 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.

6.2. Data Processing

6.2.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to the EAC and Historic England guidelines for 'minimally enhanced data' (see Section 3.8 in Schmidt *et al.*, 2015: 33 and Section IV.2 in David *et al.*, 2008: 11).

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

Zero Median Traverse – 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.

6.3.Data Visualisation and Interpretation

6.3.1. This report presents the gradient of the sensors' total field data as greyscale images (Figure 6), as well as the total field data from the lower sensors (Figure 3). 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 (Figure 8). XY trace plots visualise the magnitude and form of the geophysical response, aiding anomaly interpretation.

6.3.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historical maps, LiDAR data, and soil and geology maps. Google Earth (2026) was also consulted, to compare the results with recent land use.

6.3.3. Geodetic position of results – All vector and raster data have been projected into OSGB36 (EPSG:27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively. Figures are provided with raster and vector data projected against OS Open Data.

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 from further work, in order to constantly improve our knowledge and service.

7.2. Discussion

- 7.2.1. The geophysical results are presented in combination with satellite imagery and historical maps (Figure 4).
- 7.2.2. The fluxgate gradiometer survey was successfully completed across 1.5ha of the survey area, while 0.5ha could not be surveyed due to overgrown vegetation. The survey detected anomalies of archaeological, agricultural and undetermined origin. Magnetic disturbance was detected and attributed to extant field boundaries.
- 7.2.3. Curvilinear and linear anomalies of possible archaeological origin were identified in the northwest of the survey area (Figure 7), possibly related to ditch features with magnetically enhanced fill.
- 7.2.4. Agricultural activity was identified across the survey area as historical ploughing regimes, possibly related to Post-Medieval ploughing that was identified in neighbouring fields (See section 5.5).
- 7.2.5. Several anomalies of undetermined origin were detected; these lack sufficient morphology or context to allow a more specific classification.

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 dipolar anomalies are likely to be the result of isolated pieces of modern ferrous debris on or near the ground surface.
- 7.3.1.3. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures, typically including fencing, pylons, vehicles and service pipes, have been classified as 'Magnetic Disturbance'. These magnetic 'haloes' will obscure weaker anomalies relating to nearby features, should they be present, often over a greater footprint than the structure causing them.
- 7.3.1.4. **Undetermined** – Anomalies are classified as Undetermined when the origin of the geophysical anomaly is ambiguous and there is no supporting contextual evidence to justify 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 distinct from those caused by ferrous sources.

7.3.2. Magnetic Results - Specific Anomalies

- 7.3.2.1. **Archaeological Possible (Weak)** – Curvilinear and linear anomalies were identified in the northwest of Area 1, exhibiting weak magnetic enhancement and possibly representing ditch features with enhanced magnetic fill (Figures 6 & 7).
- 7.3.2.2. **Agricultural (Historical Ploughing)** – Several parallel linear anomalies exhibiting weak magnetic enhancement were identified within Area 1 (Figures 6 & 7). The anomalies are oriented north – south and are spaced c. 2 – 3m apart. Their morphology and regular tight spacing are characteristic of ridge and furrow cultivation indicative of Post-Medieval mechanised ploughing (see Section 5.5).
- 7.3.2.3. **Undetermined (Weak)** - Across the survey area, curvilinear and discrete anomalies were detected and categorised as undetermined due to a lack of contextual evidence (Figure 7). These anomalies do not correspond to any recorded features on historical mapping or satellite imagery.

8. Conclusions

- 8.1. A fluxgate gradiometer survey was successfully completed across 1.5ha of land at Eastern Way, Melksham, while 0.5ha could not be surveyed due to overgrown vegetation. The survey detected anomalies of archaeological, agricultural and undetermined origin. Magnetic disturbance was recorded and attributed to extant field boundaries.
- 8.2. Curvilinear and linear anomalies of possible archaeological origin were identified in the northwest of the survey area, possibly associated with ditch features containing magnetically enhanced fill.
- 8.3. Agricultural anomalies associated with historical ploughing regimes were identified.
- 8.4. Anomalies of undetermined origin were detected but lack clear morphology or context to allow a more definitive interpretation.

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 any dictated time embargoes.

10. Copyright

Copyright and intellectual property pertaining to all reports, figures and datasets produced by Magnitude Surveys Ltd is retained by MS. The client is given full licence to use such material for their own purposes. Permission must be sought by any third party wishing to use or reproduce any IP owned by MS.

11. References

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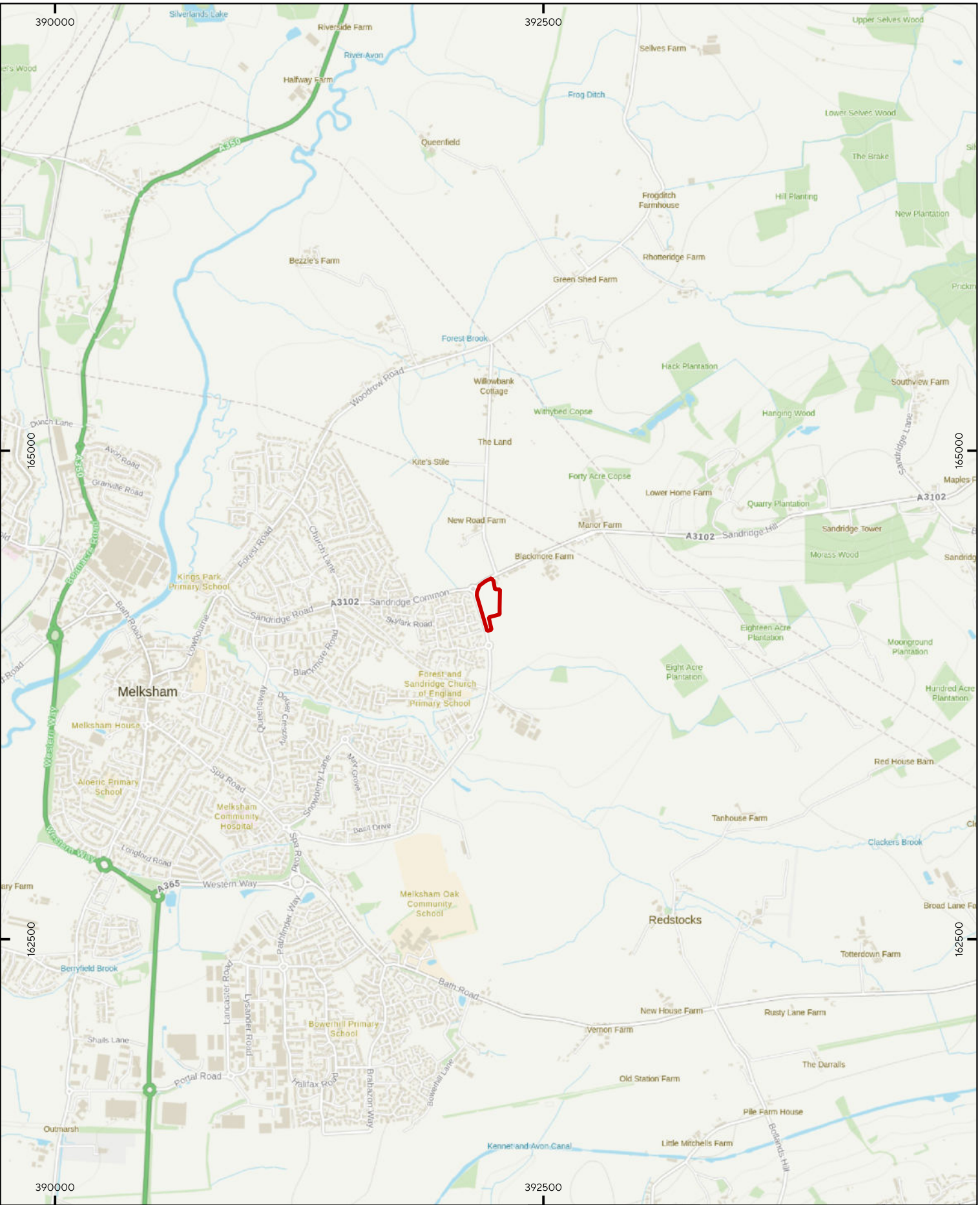
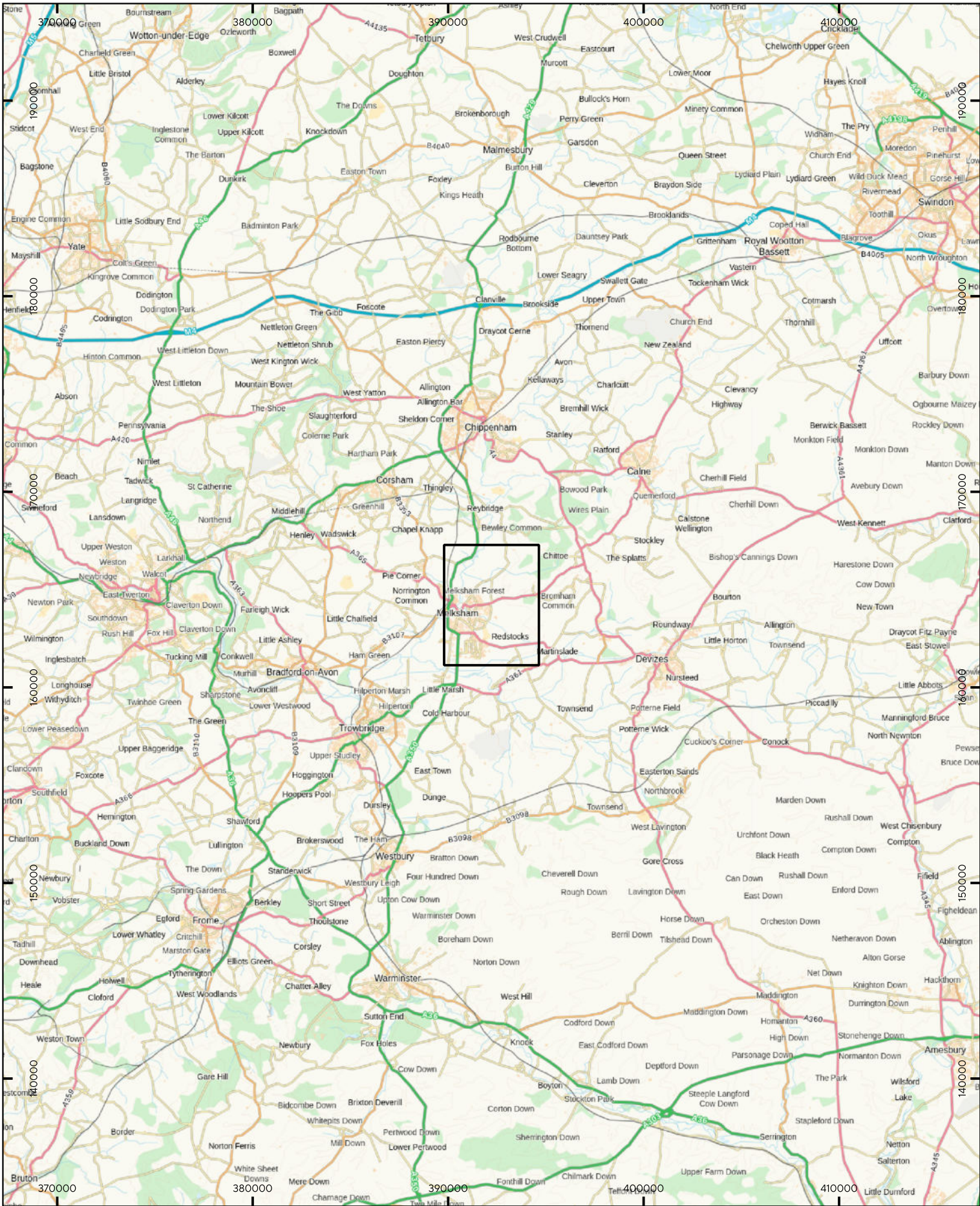
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12. Project Metadata

MS Job Code	MSST2463
Project Name	Eastern Way, Melksham, Wiltshire
Client	ADAS
Grid Reference	ST 9223 6425
Survey Techniques	Magnetometry
Survey Size (ha)	2ha (Magnetometry)
Survey Dates	2021-10-05 to 2021-10-15
Project Lead	Lucy Johnson BA
Project Officer	William Syson BA (Hons) MSc ACIfA
HER Event No	TBC
OASIS No	TBC
S42 Licence No	N/A
Report Version	0.3

13. Document History

Version	Comments	Author	Checked By	Date
0.1	first draft	SP	TF	29 July 2026
0.2	Sign Off Review	TF	LAG	29 July 2026
0.3	Sign Off	TF	LAG	05 August 2026



MSST2463 - Eastern Way, Melksham, Wiltshire
Figure 1 - Geophysical Survey Location
1:250,000 (County) | 1:25,000 (Town) @ A3
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 Geophysical Site Boundary

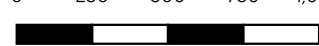




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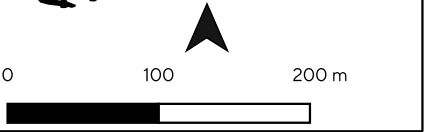
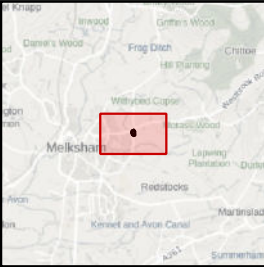
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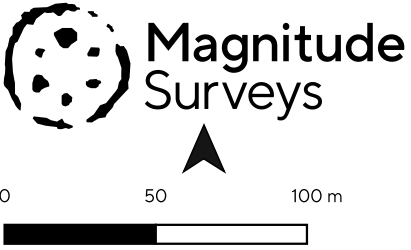
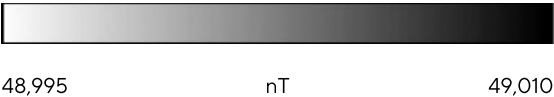
MSST2463 - Eastern Way, Melksham, Wiltshire
Figure 2 - Geophysical Survey Area (Area 1)
1:5,000 @ A3
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-  Geophysical Site Boundary
-  Survey Extent





MSST2463 - Eastern Way, Melksham, Wiltshire
Figure 3 - Magnetic Total Field (Lower Sensors) (Area 1)
1:2,500 @ A3
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MSST2463 - Eastern Way, Melksham, Wiltshire
Figure 4 - Historical Mapping and Satellite Imagery with Geophysical Interpretation (Area 1)
1:2,500 @ A3
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Historical mapping © CLS Data 2026: Ordnance Survey County Series, 1900s Composite
Satellite Imagery © Google 2026

Archaeological

 Possible

Undetermined



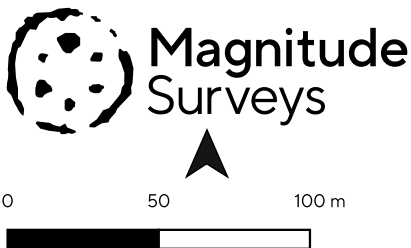
Agricultural

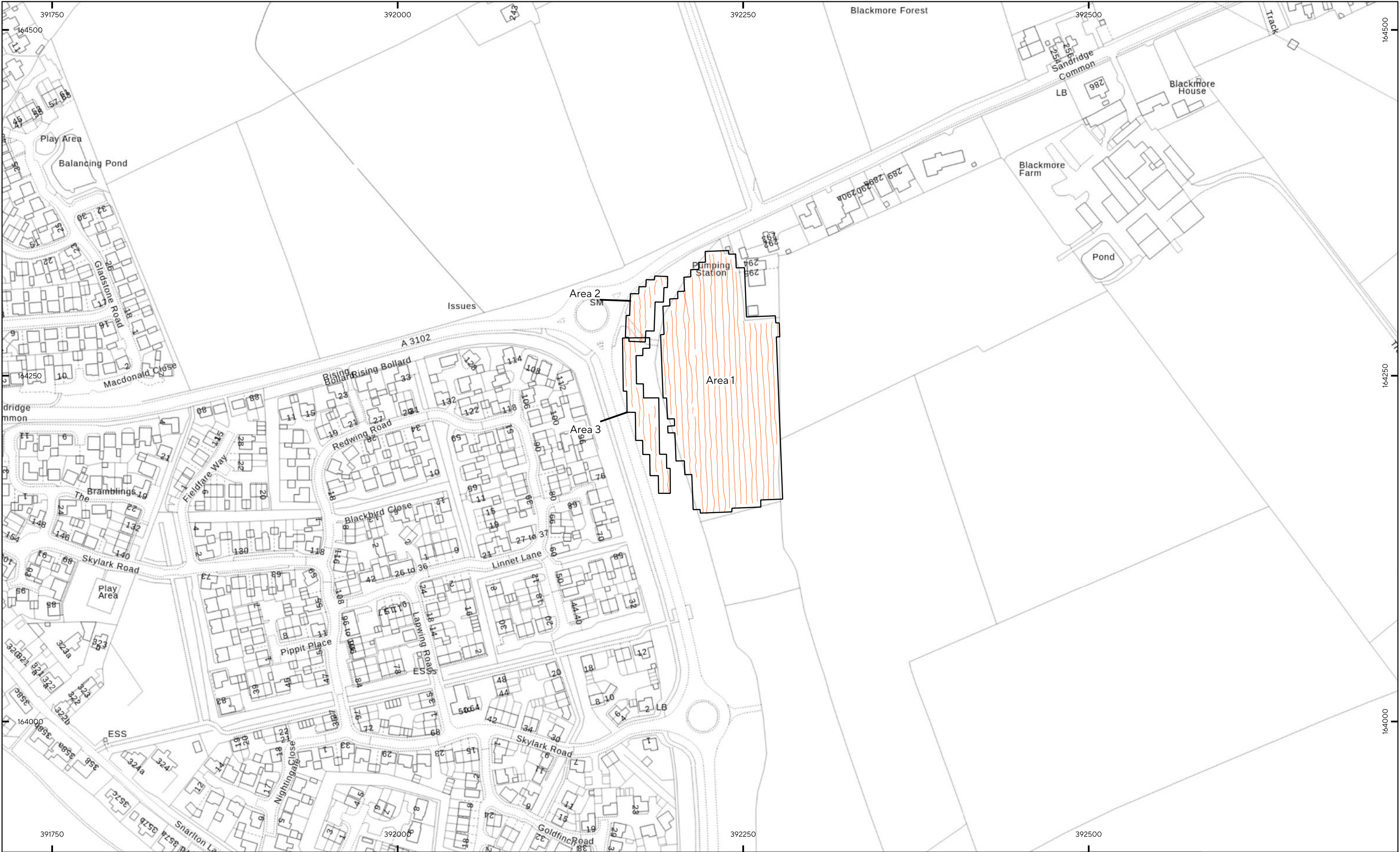
 Historical Ploughing

 Modern Ploughing

Magnetic Disturbance

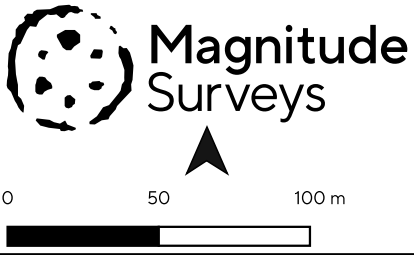






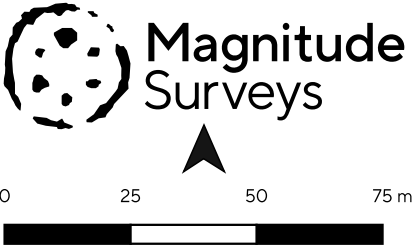
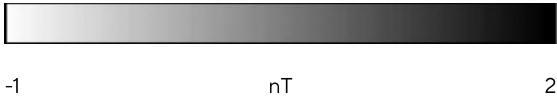
MSST2463 - Eastern Way, Melksham, Wiltshire
Figure 5 - GNSS Lines (Area 1)
1:2,500 @ A3
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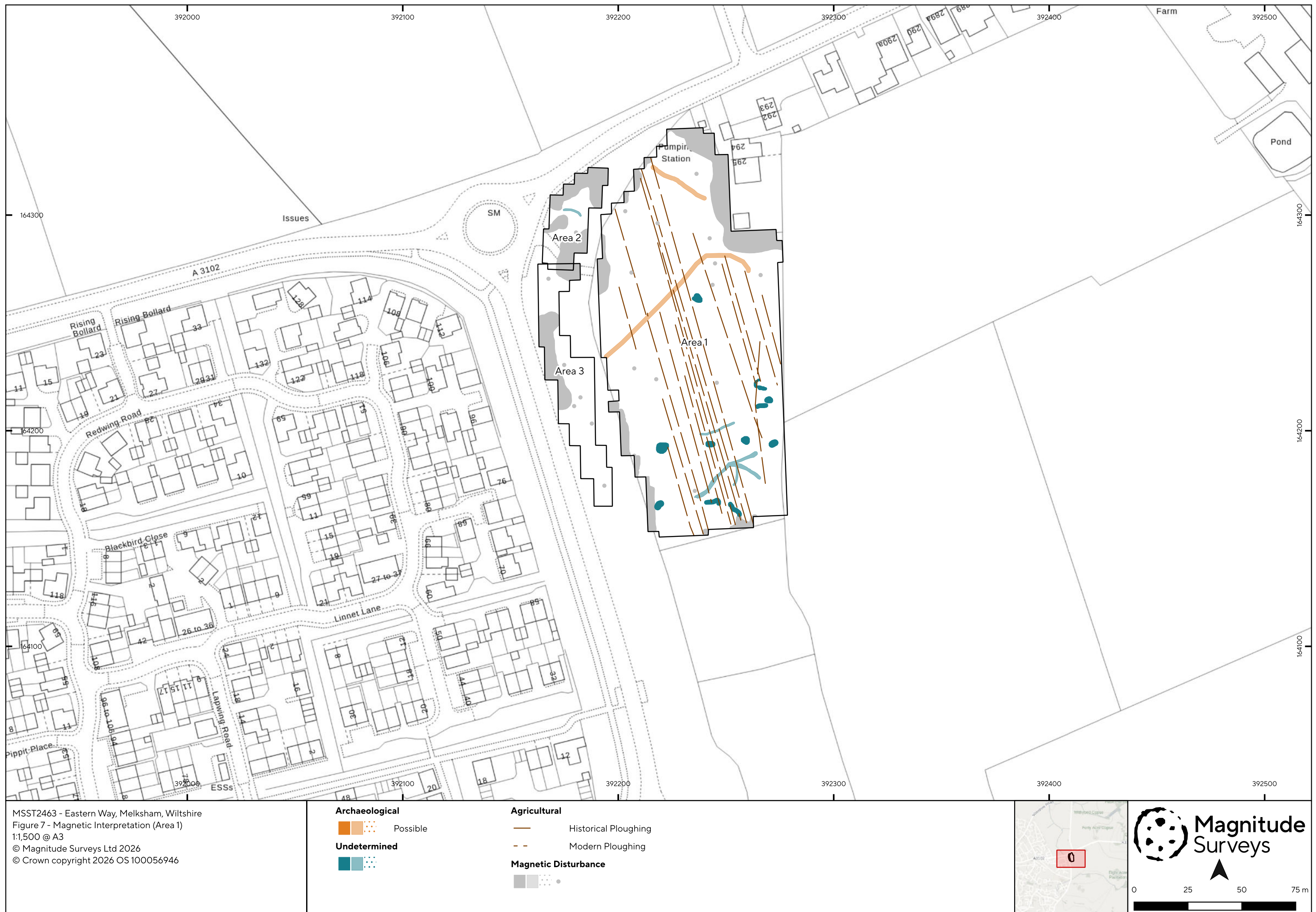
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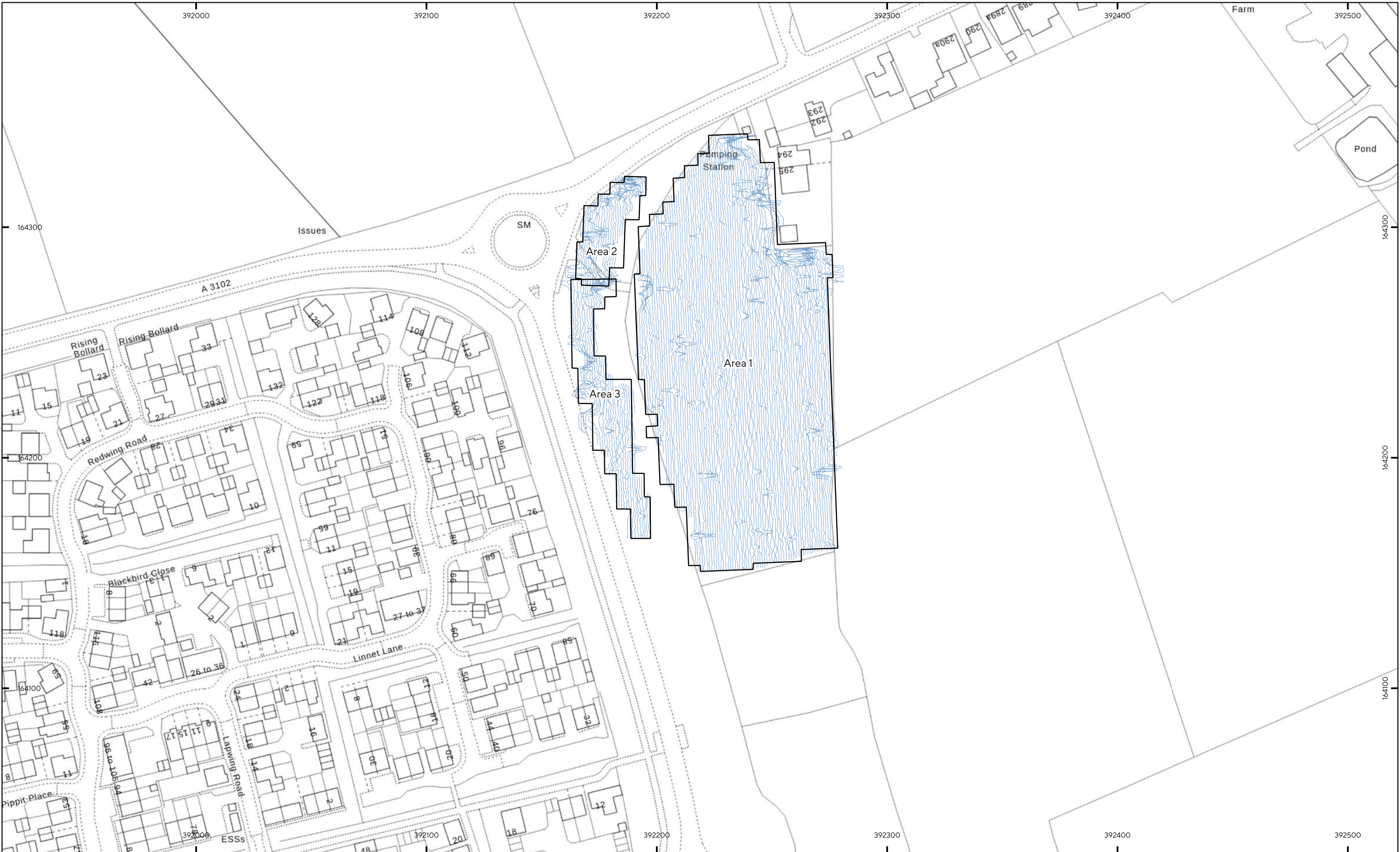




MSST2463 - Eastern Way, Melksham, Wiltshire
Figure 6 - Magnetic Gradient (Area 1)
1:1,500 @ A3
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MSST2463 - Eastern Way, Melksham, Wiltshire
Figure 8 - XY Trace Plot - 90nT/cm at 1:1,500 (Area 1)
1:1,500 @ A3
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XY Traces





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