

London Road, Shrewsbury

Geophysical Investigations 2021

C M Matthews MRes BSc

2021

Produced on behalf of



Version 1.1

© Archaeological Survey West LLP

Abstract

This report describes the results of an archaeological geophysical investigation undertaken on land adjacent to London Road, Shrewsbury. The investigations were conducted by Archaeological Survey West LLP (ASW) and consisted of 5 hectares of magnetic survey with 1 hectare un-surveyable due to overgrowth. The survey identified field boundaries present on Ordnance Survey (OS) with a connected rectangular enclosure that is probably contemporary. A curvilinear feature was also identified that is likely to be an earlier field boundary or part of an enclosure not noted on OS mapping. This form of curvilinear features is often attributed to Prehistoric activity. No evidence of a Roman Road was identified in this survey; however, the postulated route of the road was heavily affected by modern disturbances including an electrical service and debris.

Contents

Abstract.....	1
Figures.....	2
Maps	2
1. Introduction	3
2. Site background	3
Geology and Topology	3
Historical background	4
3. Survey methodology	4
4. Survey analysis	5
Summary	5
5. Discussion and Conclusion	6
Bibliography	7
Appendices.....	8
Glossary of terms	8
Raw data and metadata.....	9
Dimensions.....	9
Raw Survey Data	9
Stats	9
Processed Data.....	9
Plates.....	12

Figures

Figure 1: Site location	3
Figure 2: Archaeological interpretation	6
Figure 3: Overflowing sewerage manhole	11
Figure 4: Overgrown southern survey area between London Road house plots	12

Maps

Map 1: Magnetic Survey Grey-scale Plot	13
Map 2: Magnetic Survey Feature Plot	14
Map 3: LiDAR Hillshade Analysis	15

1. Introduction

This report describes the results of an archaeological geophysical investigation undertaken on land to the north of London Road in Shrewsbury, Shropshire. The main aim of the survey was to identify the archaeological potential of the land totalling 6 hectares, so as to inform any potential constraints to future development.

Archaeological Survey West was commissioned by Aeon Archaeology to conduct the survey after the potential for Prehistoric and Roman activity, as well as, medieval field systems was identified in a Desk Based Assessment produced by Aeon Archaeology (Cooke, 2021).

The method of survey employed during these investigations comprised of standard resolution magnetometry.

The survey was carried out in accordance with national standards, as laid out by 'Geophysical survey in archaeological field evaluation by David A, Linford N (2008)' and the Chartered Institute for Archaeology's (CIfA) 'Standard and guidance for archaeological geophysical survey' (2014).

As stipulated by CIfA guidelines, this report and its associated archive will be deposited with the relevant local and national curators by our client, and an electronic record of the project details will be deposited with the Shropshire Historic Environment Records.

2. Site background

Geology and Topology

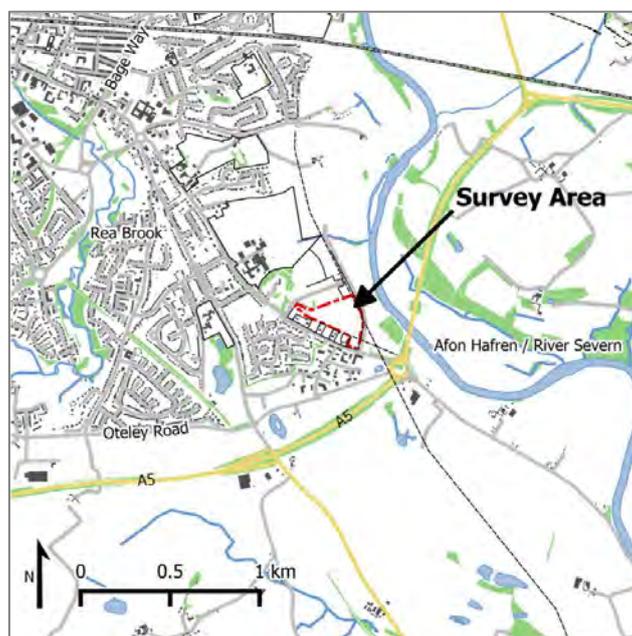


Figure 1: Site location

The site is situated to the north of London Road on a plateau overlooking the River Severn to the northeast. The north eastern boundary is comprised of Harris fencing adjoining Pankhurst Way. To the south is London Road, as well as, interspersed house plots extending into the survey area. The western boundary consists of a mixed hedgerow and wire fence adjoining Emstreay Cemetery.

The geology of the site consists of a combination of sedimentary stones including Bridgnorth Sandstone Formation, Salop Formation mudstone and Halesowen Formation mudstone, formed in the Permian and Carboniferous Periods. The superficial geology consists of predominantly glaciofluvial sand and gravel deposits formed in the Quaternary Period. (BGS, 2018).

Sand and gravel is known to give mixed to poor results in magnetic surveys and is likely to limit the identification of some cut features, as well as, producing enhanced geological anomalies.

Historical background

A Desk Based Assessment was produced by Aeon Archaeology in 2021 which identified the potential for Prehistoric and Roman activity on site, as well as, Medieval cultivation and field systems. The site is believed to contain the route of a Roman Road running within the boundary of Emstrey Cemetery and has also been identified as a high potential for settlement activity.

3. Survey methodology

The purpose of geophysical survey was to identify the archaeological potential of an area of land in a non-intrusive, quick and relatively inexpensive way. To achieve all three and still produce the highest standard of data possible, which also identifies the widest range of past human activity, the survey method of magnetometry was chosen.

All fieldwork and the resulting reports follow the recommendations set out by the Chartered Institute for Archaeologists guidelines for geophysical survey in archaeology (CIFA, 2014).

Magnetometry measures and maps the background magnetic field and any local anomalies. These anomalies can be caused by the presence of features containing greater or lesser magnetic properties than the soils around them. This can be due to the natural magnetic properties of a material, as well as, a range of toponomic processes that can alter magnetic properties. As a broad example, buried walls and built-up features which are generally comprise of low magnetic materials, such as stone, appear as weak negative magnetic anomalies, where as a ditch would often appear as a weak positive anomaly due to a collection of more magnetic material. These can be distinguished from responses caused by high ferrous materials such as iron and ceramic or areas of intense burning (thermoremnance), based on the strength and gradient of the magnetic response. The strength of the magnetic field is measured in nano Tesla (nT), a unit of measurement of magnetic flux density, equal to one billionth of a Tesla [T] (1T = 1000000000 nT) (Milsom & Eriksen, 2011).

The equipment used for the survey was a dual sensor Bartington Instrument Grad 601-2 fluxgate gradiometer. This instrument consists of two sets of sensors, each mounted with a vertical separation of 1m, one set at each end of a 1m long horizontal bar. This provides two sets of parallel readings and, under normal operating conditions, is capable of surveying to a depth of between 0.5m to 1m, although, materials with higher magnetic properties can be detected at a greater depth.

To set out the survey grids, a Trimble R4 GPS run with a VRS correction was used, operating at an accuracy of 0.014m to 0.03m. The survey areas were plotted with a temporary grid of 40m x40m. Each 40m grid was then walked using a zig-zag traverse with a sample interval of **0.25m** (4 points per meter) and traverse interval of **1m**.

Processing and interpretation

Data collected in the field were downloaded and processed using TerraSurveyor software version 3.0.37.4. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies. Full survey and processing metadata can be seen in the appendix with additional plots available on request.

The results of this survey have been presented as a combination of greyscale plots and interpretations published through GIS.

The types of features have been classified using established typologies based on Gaffney and Gater (Revealing the buried past: geophysics for archaeologists, 2003), as well as, the standardised interpretation key used by Archaeological Survey West.

4. Survey analysis

Summary

The survey data covers 5 hectares of surveyable ground, consisting of well grazed pastoral land with a gentle slope towards the northeast. The southern extent of the survey area, set between the interspersed house plots was un-surveyable due to a combination of overgrown grass and brambles, as well as, debris including a stack of wooden pallets (figures 4). The ground conditions were mostly dry with some impassable areas, including a pylon grounding point and an overflowing sewerage manhole (figure 3).

The background data shows significant scatters of noise across the southern boundary, with greater concentrations along the south western extent near to the housing of London Road and the cemetery to the northwest. This is likely to be the result of topsoil debris associated with modern activity and/or agricultural activity.

Throughout the survey area there were very faint traces of linear striations likely to be associated with cultivation. The orientation of the cultivation marks in the eastern half of the site appear to respect the north eastern boundary and proposed route of the Roman Road, with the striation at the south western extent respecting the former north-south field boundary.

There was significant metallic interference resulting from steel construction fencing along the northeast boundary, as well as, services including a buried cable, pylons and sewerage manholes running behind the London Road housing. The continuous flow of traffic along London Road at the south-eastern extent of the survey also resulted in significant magnetic interference.

The features identified in Map 2 (Appendix) are as follows.

- A.** This feature consists of a linear spread of magnetic noise following a linear ridge visible on the LiDAR data (Map 3), which also corresponds with field boundaries present on 19th and 20th century Ordnance Survey (OS) maps, and a track way noted on the 1927 and 1962 OS map (County Series 1:2,500). The anomaly connects with feature D to form a historic field system.
- B.** This feature consists of sharply defined positive linear anomalies that connect to features A and D, to form a rectangular enclosure measuring 77m by 32m. The feature is likely to be of agricultural use but is not referenced on any 19th or 20th century OS mapping. A 1948 aerial photograph retained by Historic England shows temporary paddock enclosures which do not

appear in a second image shown as being the same year (Cooke, 2021), however, one of the dates of the images may be incorrect.

- C. This feature consists of a large metallic spike that is likely associated with a large ferrous object. However, ferrous spikes of this size can often be attributed to industrial activity such as ovens or kilns. The feature also corresponds with a small mound visible on the ground during the survey.
- D. This feature consists of a weak scattered positive linear that corresponds with a field boundary present on the 19th and 20th century OS maps.
- E. This feature consists of a positive curvilinear anomaly indicating some form of cut ditch containing greater magnetic material and is likely to be a field boundary or part of an enclosure. The anomaly does not correspond with any known field boundaries or track ways with curvilinear features of this type often being attributed to prehistoric activity.
- F. This feature consists of a weak negative linear connecting to a ferrous spike and likely represents a modern service or drain.
- G. This feature consists of a spread of magnetic noise that is likely to be associated with the nearby housing on London Road. The anomaly is also located in the area believed to be the route of a Roman Road but is highly unlikely to be an associated feature.

5. Discussion and Conclusion

During December 2021, a geophysical investigation was undertaken on land to the north of London Road in Shrewsbury, Shropshire. The survey covered 6 hectares of land comprised grazed pastoral lands with an area of rough overgrown land adjoining London Road to the south. The aim was to determine the archaeological potential of the site prior to the sale of the land.



Figure 2: Archaeological interpretation

A key objective of the survey was the identification a possible Roman Road which was acknowledged in a Desk Based Assessment produced by Aeon Archaeology (Cooke, 2021). Given the appropriate conditions, a feature such as a Roman Road in a rural setting would present as a wide negative linear with two flanking positive linear edges, measuring an average of 6m wide. In the case of an urban setting, roads can often appear as a linear absence of readings (Gaffney & Gater, 2003). The

appropriate conditions for the identification of roads rely on either the construction material being sufficiently magnetically different from surrounding background data and/or having substantial roadside ditches that are in-filled with materials that will also contrast with the background data. Due to these constrictive conditions, Roman Roads can often be elusive in magnetic surveys.

At present, this survey has not produced sufficient evidence for a Roman Road within this field; however, the proposed route crosses an area that has been significantly impacted by modern activity including services, boundaries, and debris from the nearby housing.

Three notable features with archaeological potential have been identified in this survey; the first is a curvilinear anomaly that adjoins the north eastern boundary with the cemetery and is likely to be part of a field system or enclosure. Features of this kind are typically attributed to Prehistoric activity and given that similar Prehistoric curvilinear boundaries have been identified within the vicinity of the survey area, this feature could be considered of archaeological interest.

The second is a large rectangular enclosure connecting to field boundaries present on 19th and 20th century OS maps. The enclosure itself does not appear in any OS mapping and is unlikely to relate to temporary paddocks shown on 1940's aerial photographs. As the data suggests constructed ditches and activity that has left significant concentrations of magnetic noise, it is unlikely to be associated with temporary boundaries. The enclosure aligns with a notable straight section of the adjoining field boundary, which could indicate that the boundaries post date or emanate from this enclosure. The internal metallic noise, concentrated at the northeast end may indicate some form of structural debris and appears as small plateau in the LiDAR model. Therefore the feature could present an earlier small agricultural enclosure or farmstead that predates the 1846 tithe map.

The third feature is the former field boundaries that are present in the 19th and 20th century OS maps. These anomalies are wide, with scatters of noise that are likely associated with an adjoining track way, present in the 1927 and 1962 OS map (County Series 1:2,500).

In addition, the survey also identified a large metallic spike on the north east boundary that is likely to be the result of a sizable near surface ferrous object, however, large anomalies of this kind can also be attributed to industrial activity such as ovens or kilns. There is however, no suggestion of surrounding structural elements or noise associated with industrial activity.

Bibliography

BGS. (2018). *British Geological Survey Open Geoscience*. Retrieved May 2019, from www.bgs.ac.uk/opengeoscience

CIFA. (2014). *Standard and Guidance: for archaeological geophysical survey*. Chartered Institute for Archaeology.

Cooke, R. (2021). *Proposed New Development Site, London Road, Springfield, Shrewsbury, Shropshire SY2 6PS (Archaeological Assessment)*. Chester: Aeon Archaeology.

Gaffney, C., & Gater, J. (2003). *Revealing the buried past: geophysics for archaeologists*. Stroud: Tempus.

Milsom, J., & Eriksen, A. (2011). *Field Geophysics* (4th ed.). Oxford: Wiley & Sons Ltd.

Appendices

Glossary of terms

Road: This is typically defined by a wide negative linear flanked on either side by narrow positive linear features. In areas with more built up archaeology, this can also present as a linear absence of anomalies.

Industrial: This consists of anomalies with a strong positive to negative magnetic gradient that can be distinguished as separate from surface ferrous spikes. These readings indicate a thermoremanence where the action of heating has altered the magnetic properties within the ground or a structure and are usually associated with features such as kilns or furnaces.

Strong Positive linear: This is a linear feature defined by strong positive readings that are not of a gradient associated with ferrous but stronger than a weak positive anomaly. This can indicate fired materials such as ceramic and is often associated with field drains.

Wall (positive): This is a sharply defined positive linear feature that occurs when the wall materials have higher magnetic properties than the surrounding soils.

Wall (negative): This is a sharply defined negative linear feature that occurs when the building materials have lower magnetic properties than the surrounding soils.

Disturbed area (Structural): This is a feature associated with structural remains but where the footprint of the building cannot be determined. The depth and survival of an archaeological structure can often result in an area of magnetic noise as oppose to a clear rectilinear feature. This can be due to a number of toponomic processes including demolition and the extraction of materials (robbing).

Disturbed area: This is an area of increased noise that cannot be associated with modern activity and therefore is of potential archaeological interest.

Modern service: This is a feature defined by a strong positive-negative linear that regularly alternates between positive and negative polarity and is caused by modern piping and cables. Electricity cables tend to create a very broad area of disturbance.

Modern disturbance: This is a feature of disturbance generated by modern surface activity, often in the form of ferrous anomalies.

Geological: These include features believed to be of a geomorphological origin.

Raw data and metadata

SURVEY DATA

Instrument Type: Bartington (Gradiometer)
Units: nT
Direction of 1st Traverse: 270 deg
Collection Method: ZigZag
Sensors: 2 @ 1 m spacing.
Dummy Value: 32702

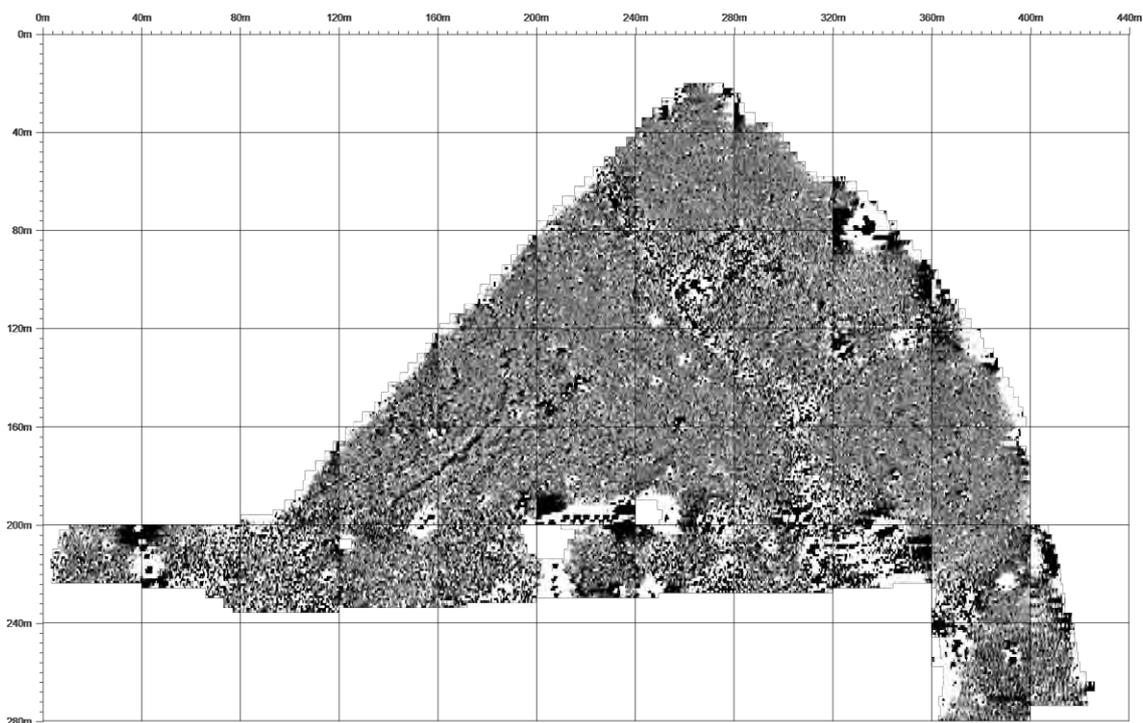
Dimensions

Composite Size (readings): 3520 x 560
Survey Size (meters): 440 m x 280 m
Grid Size: 40 m x 40 m
X Interval: 0.125 m (surveyed @ 0.25 m)
Y Interval: 0.5 m (surveyed @ 1 m)

PROGRAM

Name: TerraSurveyor
Version: 3.0.37.3

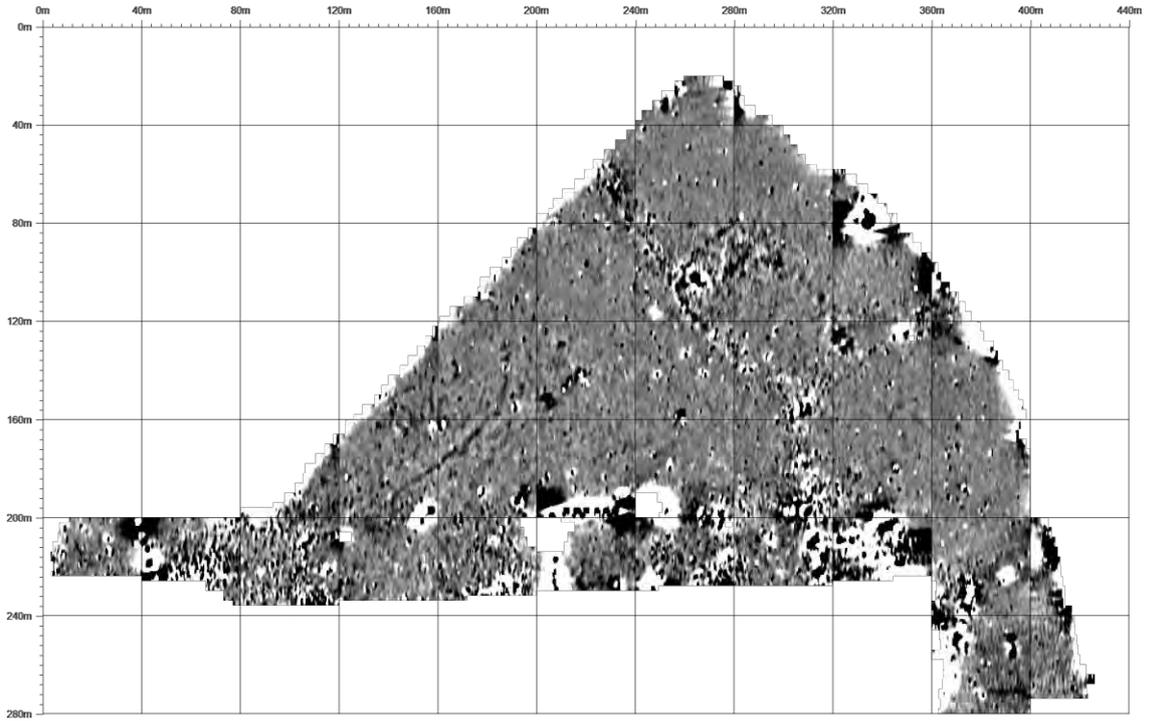
Raw Survey Data



Stats

Max: 3.00
Min: -3.00
Std Dev: 1.80
Mean: -0.02
Median: 0.00
Composite Area: 12.32 ha
Surveyed Area: 4.8088 ha

Processed Data



Stats

Max: 3.00
Min: -3.00
Std Dev: 1.50
Mean: -0.02
Median: 0.03
Composite Area: 12.32 ha
Surveyed Area: 4.8088 ha

Processes: 6

- 1 Base Layer
- 2 DeStripe Median Traverse: Grids: All
- 3 Despike Threshold: 1 Window size: 3x3
- 4 Low pass Gaussian filter: Window: 3 x 3
- 5 Interpolate: X & Y Doubled.
- 6 Clip from -3.00 to 3.00 nT

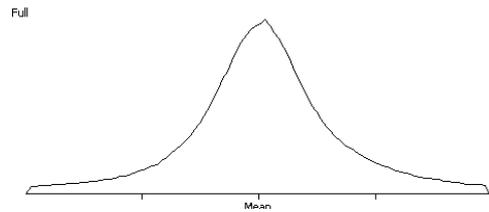


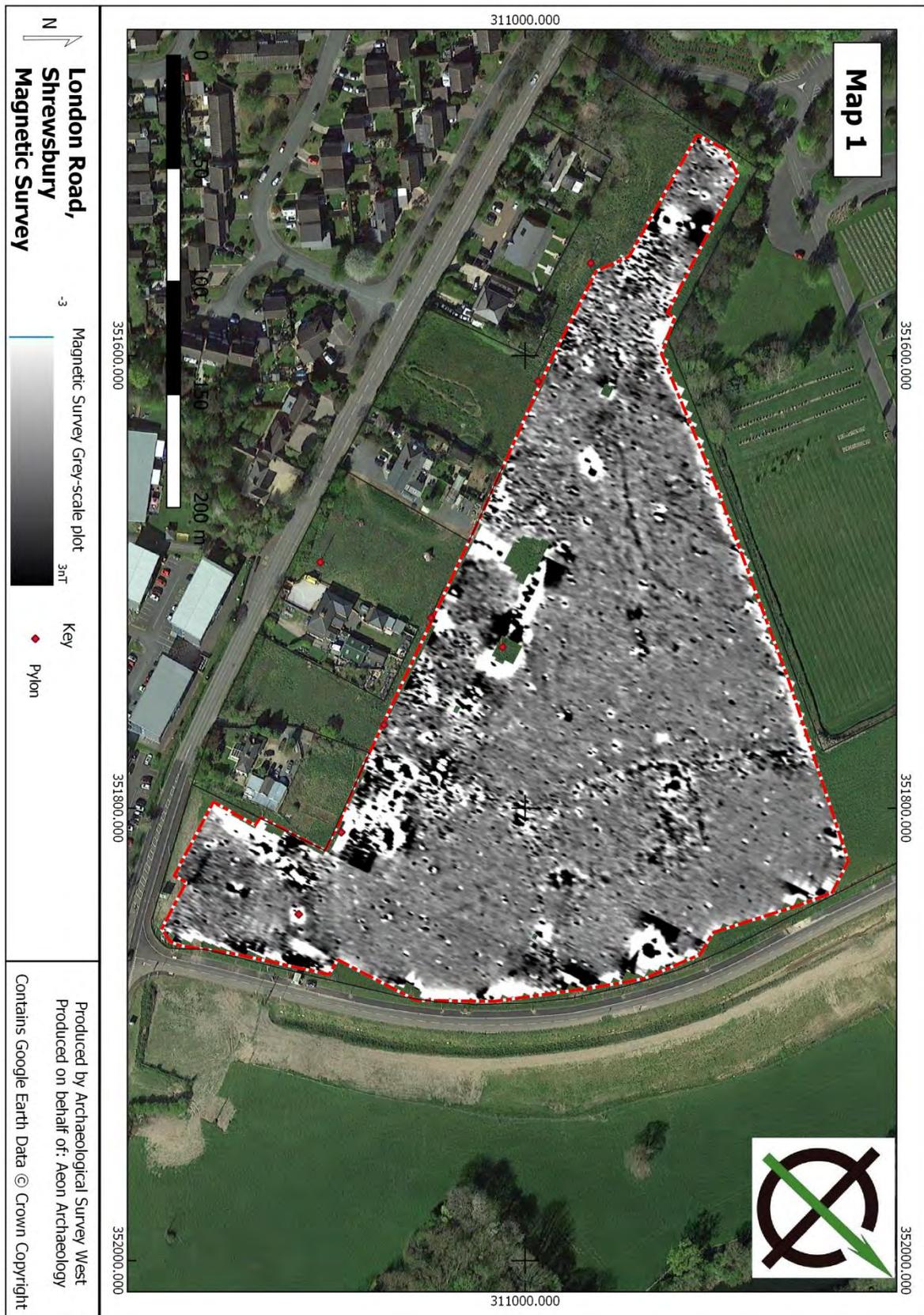


Figure 3: Overflowing sewerage manhole

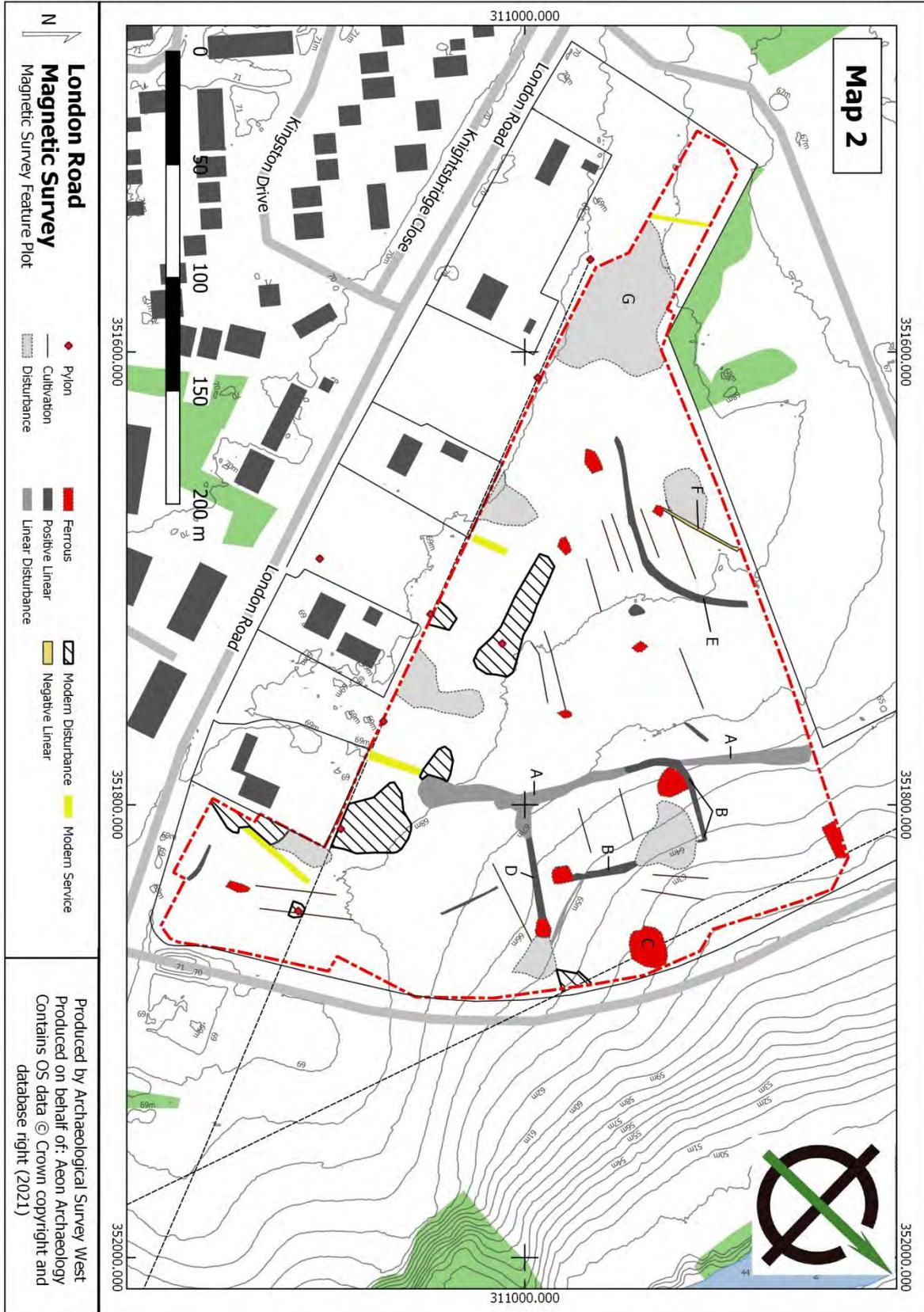


Figure 4: Overgrown southern survey area between London Road house plots

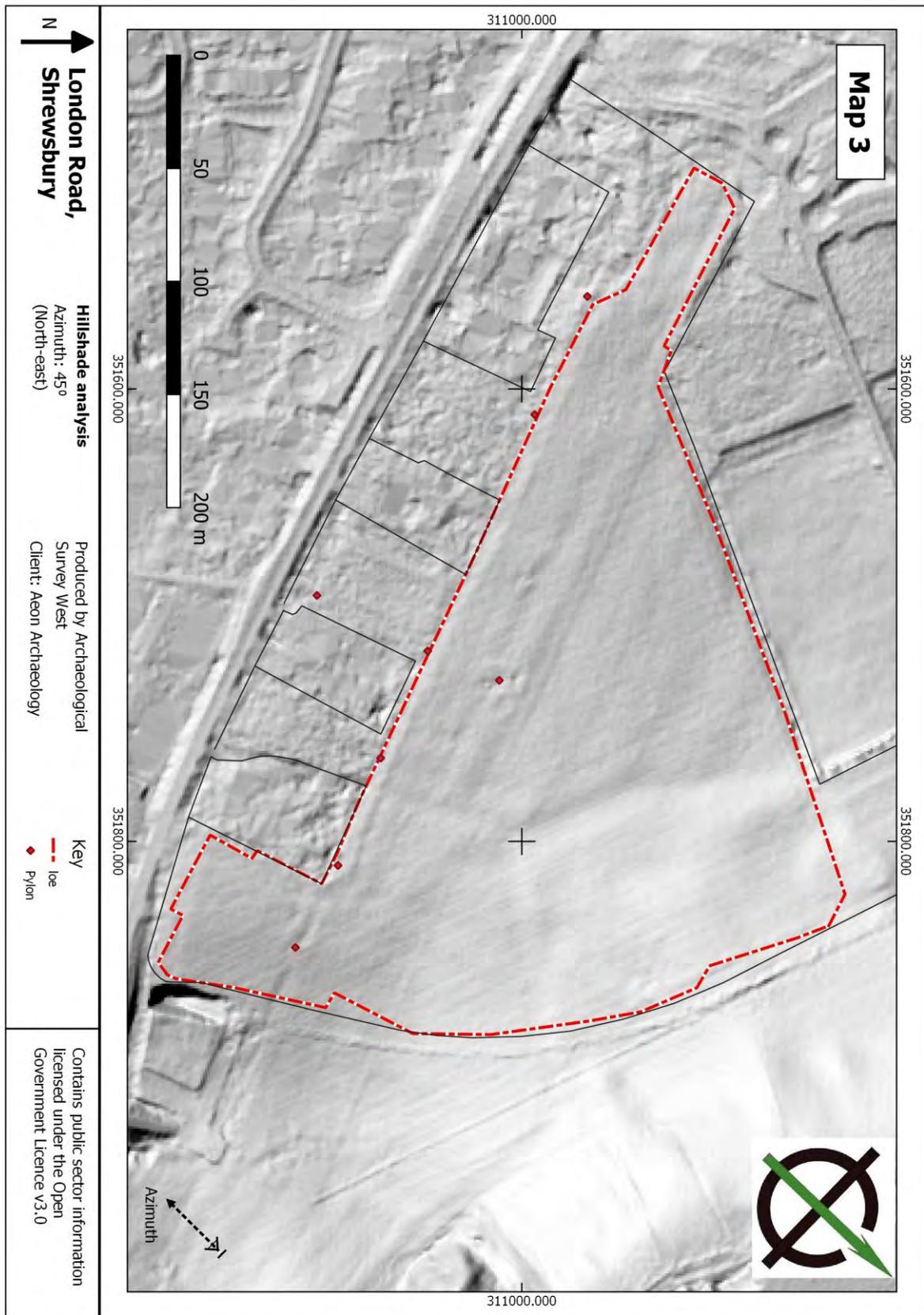
Plates



Map 1: Magnetic Survey Grey-scale Plot



Map 2: Magnetic Survey Feature Plot



Map 3: LiDAR Hillshade Analysis

