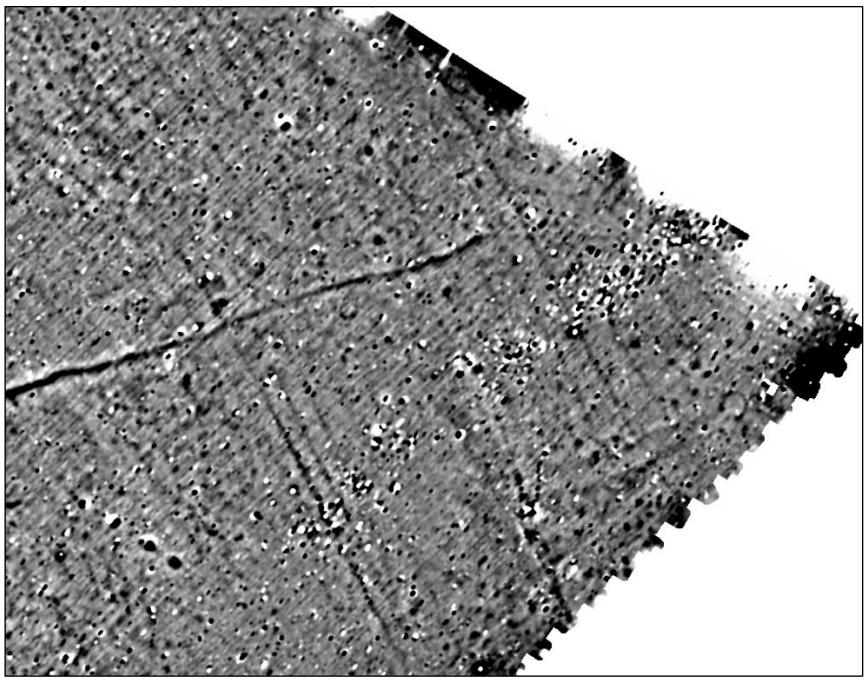

Archaeological geophysical survey of land south of Steppingley Road, Flitwick Bedfordshire October 2021

Report No. 21/100

Author: Adam Meadows

Illustrator: Adam Meadows

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Project Manager: Mo Muldowney
NGR: TL 0247 3536

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Report No. 21/100

Project Manager: Mo Muldowney

Quality control and sign off**:**

Issue No.	Date approved:	Checked by:	Verified by:	Approved by:	Reason for Issue:
1	24-11-2021	Tracy Preece	John Walford	Mo Muldowney	

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Project Manager:	Mo Muldowney BA MCIfA
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Project: STEPPINGLEY ROAD, FLITWICK			OASIS No: molanort1-502822	
ACTIVITY TYPE				
Project/Activity type	Geophysical survey			
Reason for investigation	Planning: Between application and determination			
Development type	Residential development			
Planning reference ID	-			
PROJECT LOCATION				
National grid ref	TL 0247 3536			
Site name	Steppingley Road, Flitwick			
REVIEWERS/ ADMIN				
HER for project	Bedfordshire			
National organisation	Historic England			
WORK UNDERTAKEN				
Methodological summary	Magnetometer survey with a cart-mounted array of Bartington Grad-01-100L fluxgate gradiometers.			
Previous work?	None		Future works?	Yes
Dates - Start date:	12-10-21		End date:	13-10-21
GEOPHYSICS				
Geology	Woburn Sands Formation Sandstone. No drift geology recorded			
Land use (i.e. arable)	Arable			
Survey type	Magnetometer survey			
Size of survey area	*c*8ha			
Instrumentation	Bartington Grad-01-1000L		Fluxgate – Multiple sensor	
Configuration	Pushed cart survey (6-probe)			
Spatial resolution	Traverse spacing	0.8m	Reading interval	0.225m
Resolution (data values)	0.1nT			
BIBLIOGRAPHY				
Title	Archaeological geophysical survey of land south of Steppingley Road, Flitwick, Bedfordshire. October 2021			
Author(s)	Adam Meadows			
Publisher / place / date	MOLA Northampton / Northampton / 2021			
Report number	21/100			
Report release delay?	6 months			
PEOPLE				
Organisation	MOLA			
Project manager	Mo Muldowney			
Project supervisor	Adam Meadows			
Funding body	Persimmon Homes Ltd (via RPS Group)			
KEYWORDS				
Monuments found/ date	Ring ditch – undated Linear ditch – undated			
RESULTS				
Description of outcomes	The survey identified two probable archaeological features of indeterminate date, comprising a sinuous linear ditch and a small (7m diameter) penannular ditch.			
ARCHIVES				
Accession ID	None			
Finds Archive repository	None		Expected date of submission:	-
Paper Archive repository	None		Expected date of submission:	-
Digital Archive repository	TBC		Expected date of submission:	TBC

CONTENTS

Figures

Archaeological geophysical survey of land south of Steppingley Road, Flitwick Bedfordshire, October 2021

ABSTRACT

MOLA (Museum of London Archaeology) was commissioned to undertake a magnetometer survey across c8ha of land south of Steppingley Road, Flitwick, Bedfordshire. An isolated ring ditch measuring c7m in diameter was detected in the eastern portion of the survey area and a meandering ditch crossed through the area on a north-east to south-west alignment.

1 INTRODUCTION

MOLA (Museum of London Archaeology) was commissioned by RPS Group, on behalf of Persimmon Homes Ltd, to undertake an archaeological geophysical survey on land to the south of Steppingley Road, Flitwick, Bedfordshire (NGR TL 02474 35361) (Fig 1). The purpose of the survey was to identify and map any archaeological remains which may be affected by a proposed development scheme.

The survey comprised a magnetometer survey and was conducted over two days commencing on 12th October 2021. The survey followed a Written Scheme of Investigation (MOLA 2021) and was also conducted in accordance with Chartered Institute for Archaeologists and European Archaeological Council guidelines (CIfA 2014 and Schmidt *et al* 2015).

2 BACKGROUND

2.1 Location, geology and topography

The survey area is located within a single field on the southern side of Steppingley Road, Flitwick (Fig 1). The field is predominantly bounded by hedgerows and trees with a headland turned footpath demarking the south-western limit. At time of survey the ground conditions were that of a drilled stubble field showing early signs of a winter wheat crop.

The survey area lies on a north-west facing slope measuring *c*87m aOD (above Ordnance Datum) at its highest in the south-east, falling to *c*75m aOD to the north-west.

The solid geology of site is recorded as sandstones of the Woburn Sands Formation, originating from the Cretaceous Period. No drift geology is recorded (BGS 2021). The soils are described as being highly erodible, freely draining, acidic and sandy (Landis 2021).

2.2 Historical and archaeological background

The following summary is largely based on data presented in a desk-based assessment (DBA of the site, prepared by RPS Group (Dawson 2021). This document references data held by Historic England's National Heritage List for England (NHLE)

and by the Central Bedfordshire Historic Environment Record (HER), as well as historic maps of the site.

Whilst there are no recorded archaeological finds from the survey area, the HER mentions a circular cropmark '*just about discernable*' at the centre of the field on an aerial photograph taken in 1970 (HER564). A much smaller circular cropmark, not recorded by the HER, occurs near the eastern corner of the field (Google Earth, imagery dated 28/08/2013).

Evidence of Mesolithic and Neolithic activity near the survey area comprises individual flint scrapers recovered during archaeological works at Manor Way, 150m to the south-east (HER564) and Steppingley Wood, 300m to the south of the survey area (HER13239). These finds may result from transient activity; there is no evidence suggestive of long-term settlement.

The remains of a Roman field system have been recorded *c*400m north of the survey area under what is now Steppingley Gardens (HER562). Two ditches were uncovered and dated by excavation; nearby cropmarks may indicate other parts of the same system.

Works conducted at Manor Way by the Ampthill and District Archaeological and Local History Society in 1973-4 targeted a rectilinear cropmark located *c*150m south-east of the survey area (HER564). The excavation confirmed the presence of a 2nd to 4th century AD enclosure measuring *c*41m across. It was defined by a single ditch on three sides with a potential palisade on the fourth; a T-shaped corn drying oven was also uncovered within the enclosure.

Evidence of Saxon to medieval activity within the survey area is sparse, the site being then, as now, located outside the settlement area of Flitwick. Historical field divisions have been encountered in nearly all previous archaeological works in proximity to the site. Many like those c500m north of the survey area, contained medieval pottery (HER19768). The current field boundaries appear unchanged from those depicted on the earliest detailed Ordnance Survey mapping of the survey area (1882).

3 METHODOLOGY

3.1 Fieldwork

The magnetometer survey was undertaken with a Bartington magnetometer cart. This is a two-wheeled, lightweight sensor platform designed to be pushed by hand. It incorporates a bank of six vertically-mounted Bartington Grad-01-1000L magnetic sensors (fluxgate gradiometers), spaced at 0.8m intervals along a bar aligned crossways to the direction of travel. These sensors were calibrated ('zeroed') at the start of each day's survey to minimise heading errors and offsets in their zero values.

The cart also incorporates a Leica Geosystems Viva GPS antenna mounted on the central axis, 1.02m astern of the sensors. The magnetic sensors each output data at a rate of eight readings per second and the GPS antenna outputs NMEA format data (GGA messages) at a rate of one position per second. These data streams are compiled into a single raw data file by MultiGrad601 logging software.

The cart was propelled along straight and parallel traverses across the survey area, with data logging being toggled on and off at the start and end of each traverse to avoid the collection of spurious data whilst turning. Traverse ends were marked with ranging poles to aid even coverage, and the evenness of coverage was further checked by monitoring the positional trace plotted in real time by the MultiGrad601 logging software. The typical speed of coverage was under 1.8m/s, with the effective data resolution thus approximating to better than 0.225m x 0.80m.

3.2 Data processing and presentation

The raw survey data was initially processed with MLGrad601 software, which calculated a UTM co-ordinate for each data point by interpolating the GPS readings and applying offset corrections based on the array geometry and calculated heading direction. This produced an output file in XYZ format which could be imported into TerraSurveyor software for data visualisation and further processing.

The raw XYZ data exhibited minor striping caused by slight mismatches in the calibration of the individual magnetic sensors. This was removed in TerraSurveyor by applying the median de-stripe function to runs of data from each sensor.

The processed survey data is presented in this report as greyscale raster images which have been rotated and scaled to fit against topographic base-mapping at a scale of 1:2000.

The processed magnetometer data is displayed at a greyscale range of +/-3nT (Fig 2). An interpretive overlay highlights notable anomalies for discussion (Fig 3). A minimally processed data plot for the magnetometer survey is presented at a range of +/ 10nT (Fig 4) as a comparison to the final de-striped results.

4 SURVEY RESULTS

The survey has detected an isolated penannular anomaly near the eastern corner of the survey area, closely matching the location of the small circular cropmark noted above in Section 2.1. It is likely to represent a ring ditch, measuring approximately 7m in diameter, with a south facing entranceway.

A sinuous linear anomaly crosses the middle of the survey area on an east to west alignment. Its magnetic strength varies, with negative halos present in places where the anomaly is strongest. It probably indicates a boundary ditch and could be of early date as it does not appear on the historic Ordnance Survey mapping dating from 1882 onward.

Further short and straight linear anomalies have been detected in the south and west of the survey area. These are also likely to represent ditches or other such earthworks of unknown age.

Evidence of medieval to early post-medieval ridge and furrow has been detected in the eastern portion of the survey area, where a series of parallel, gently curving anomalies, spaced at regular 6 metre intervals, are aligned broadly north-west to south-east down the natural incline.

The survey data exhibits a multitude of irregularly shaped magnetically positive blobular anomalies, some of which have tight negative halos. These anomalies, which are most concentrated in the northern half of the field, probably represent variations in the natural geology. There is a slight possibility that some of them represent manmade pits but only one example is convincing enough to have been marked as such on the interpretation plot (Fig 3).

A scattering of strongly magnetic dipoles of varying size has been detected during this survey, originating from small ferrous objects located within the ploughsoil. A particular concentration of these extends in a band from the north-eastern edge of the survey area down towards the south-west, following the direction of modern ploughing. It is possible that this represents a concentration of debris along the line of a former track or hedgeline, or else that a concentration of dumped materials at the side of the field is slowly being dragged across the site by ploughing.

Large ferrous halos occur along the north-eastern boundary of the survey area, originating from a wire fence that abuts the hedgerow.

5 CONCLUSION

The survey has detected a small ring ditch or gully with a south-facing entrance, located near the eastern corner of the survey area. This feature, with a diameter of 7m, could mark the site of a small roundhouse, perhaps at the edge of an Iron Age or Roman settlement, or could be a monument of earlier prehistoric date. It corresponds with a small, and previously unrecorded circular cropmark (Google Earth, imagery dated 28/08/2013) but not with the much larger circular cropmark recorded to the west by the HER (HER 564). Indeed, nothing has been detected which might correspond to the latter feature.

The other archaeological anomalies found by this survey are linear ditches of unknown date. They may represent former field boundaries, although none match with boundaries recorded on late 19th- and 20th-century maps of the survey area.

Medieval ridge and furrow cultivation has been detected across much of the site. It is aligned differently from the existing hedgerows and meets Steppingley Road at an awkwardly oblique angle, perhaps indicating that the present alignment of the road-post-dates the ploughing of the furrows. The preservation of the furrows, albeit only as below-ground features, implies that the land has been largely untouched, used only for agricultural purposes since the medieval period.

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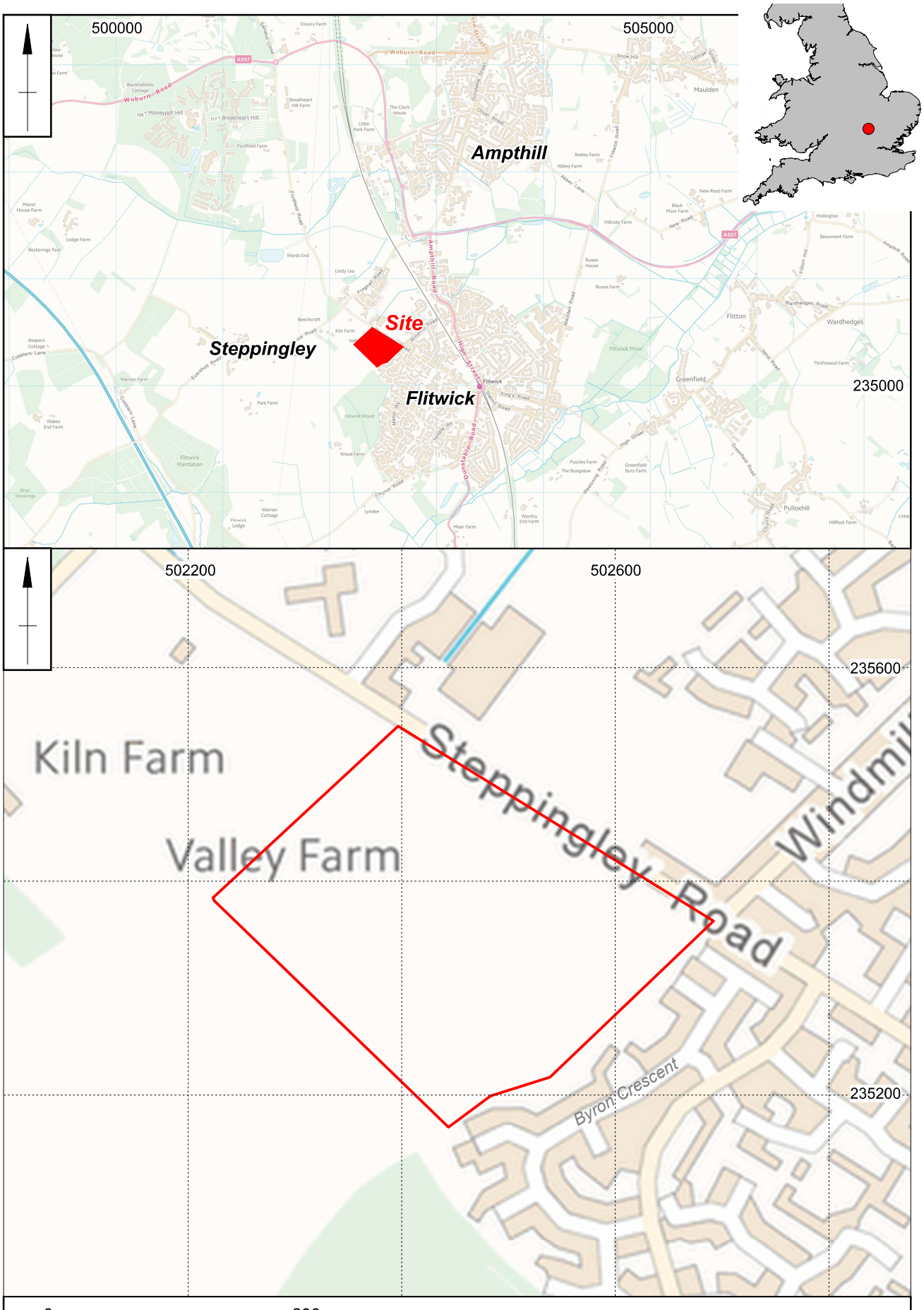
MOLA

24th November 2021



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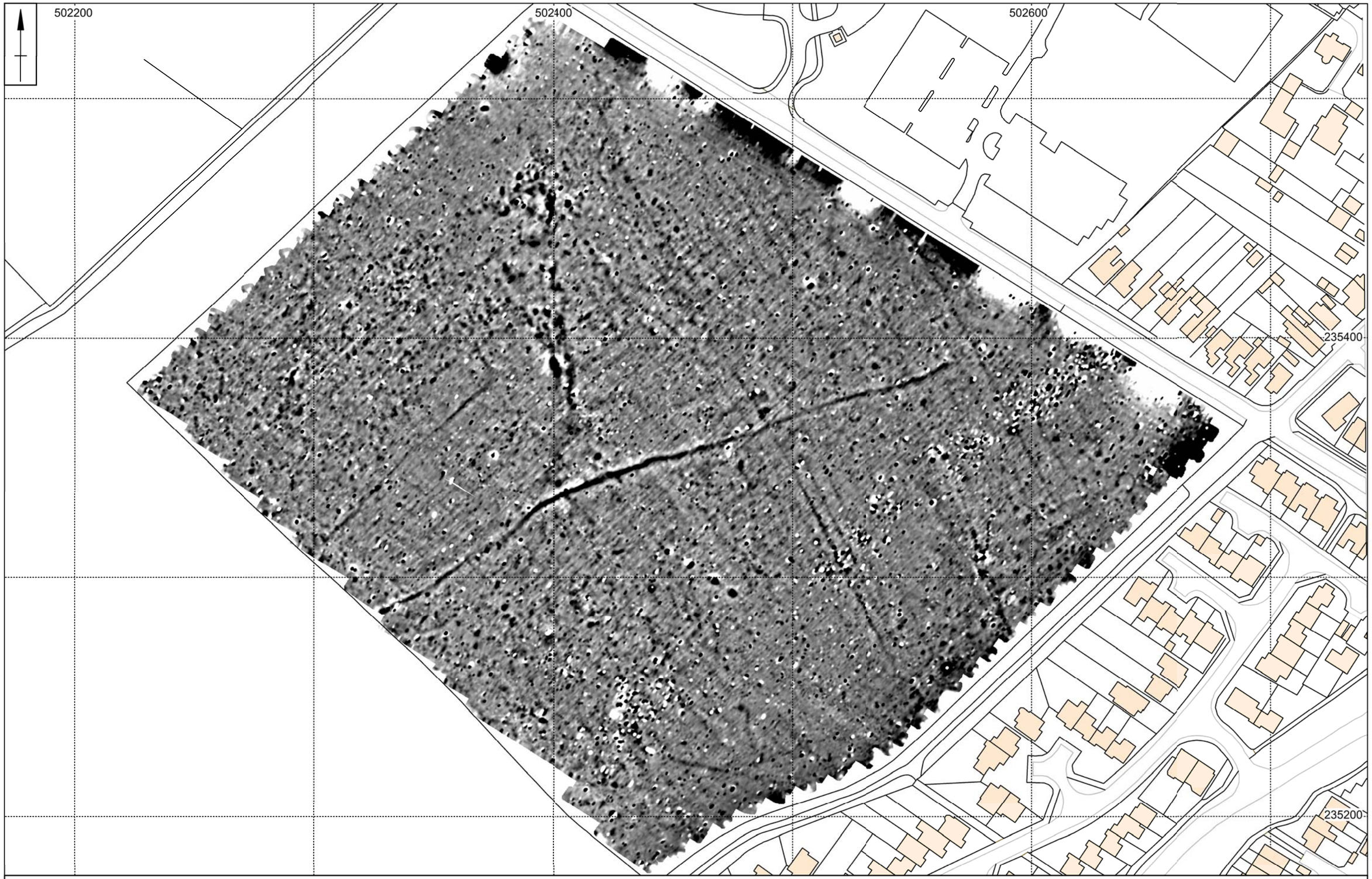
Site location Fig 1



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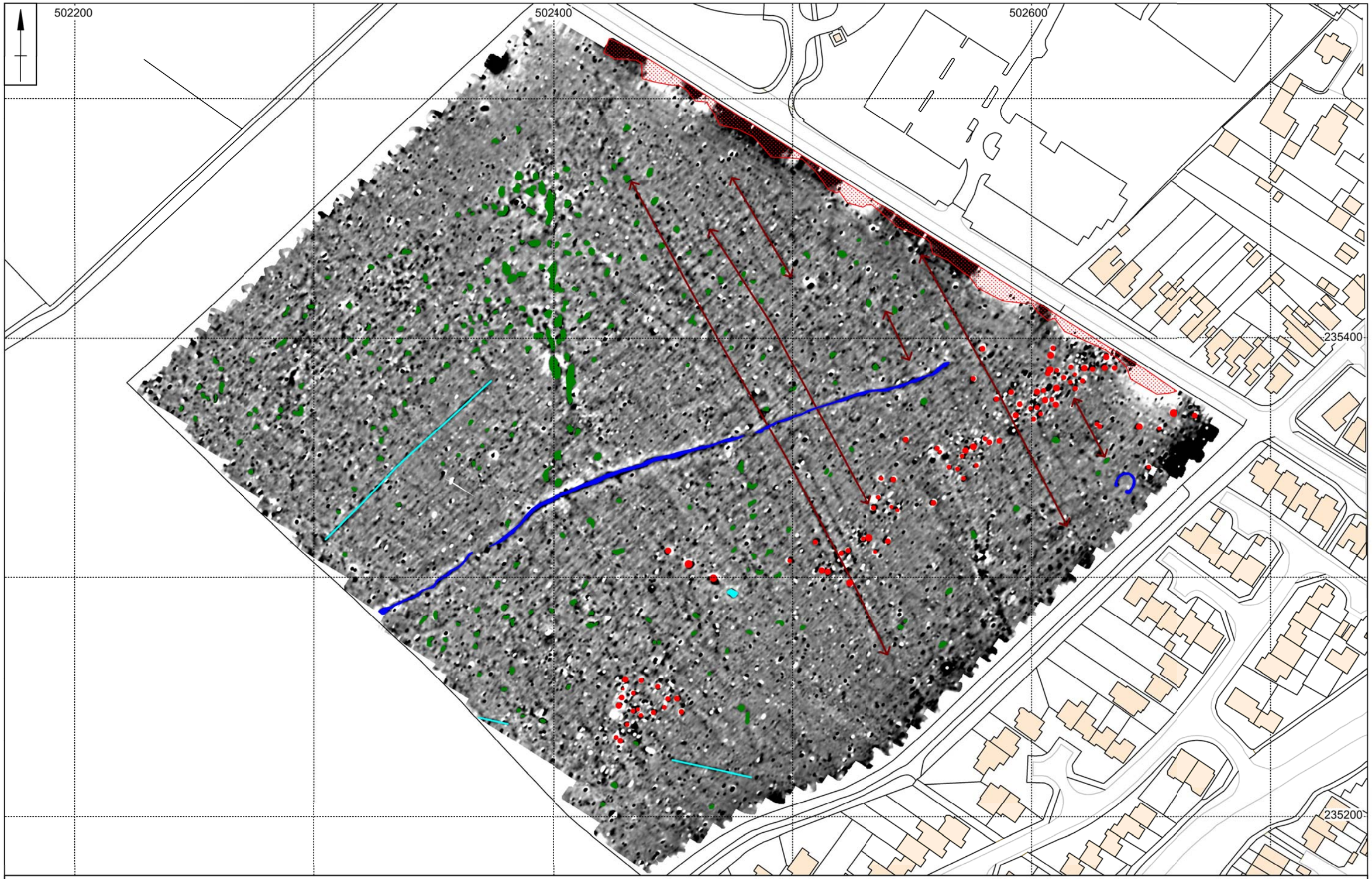
Processed magnetometer data Fig 2



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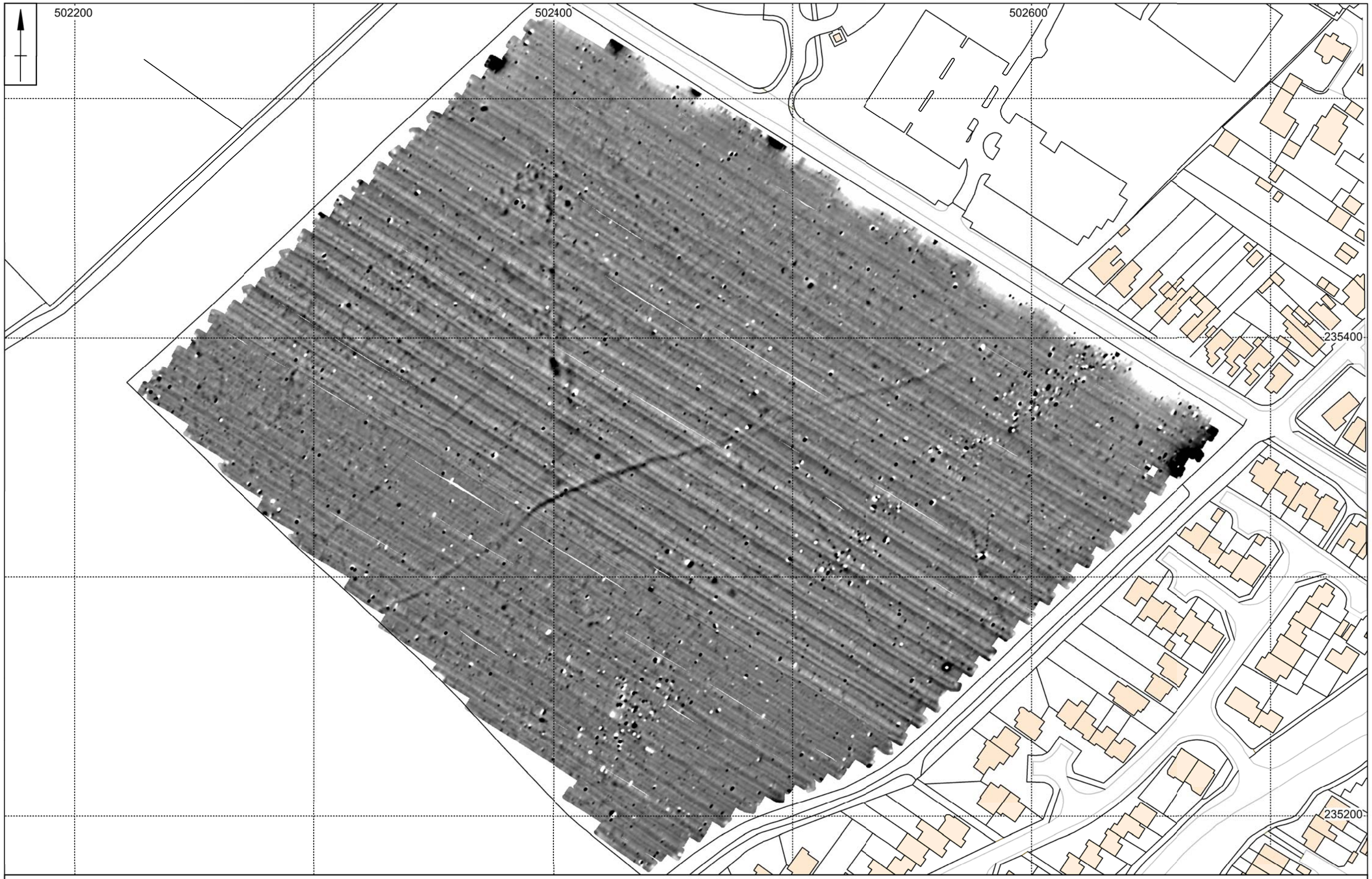
Magnetometer data interpretation Fig 3



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Scale 1:1500

Unprocessed magnetometer data Fig 4

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