



**Archaeological geophysical survey  
at Middle Farm, Mixbury  
Oxfordshire  
March 2021**

Accession No. OXCMS: 2021.20

Report No. 21/027

Author and illustrator: Adam Meadows



# Archaeological geophysical survey at Middle Farm, Mixbury Oxfordshire March 2021

Accession No. OXCMS: 2021.20

Report No. 21/027

Project Manager: Camilla Collins

Quality control and sign off:

Issue No.	Date approved:	Checked by:	Verified by:	Approved by:	Reason for Issue:
1	09/04/2021	Rachel Clare	John Walford	Camilla Collins	Draft for client review

Author and illustrator: Adam Meadows

© MOLA Northampton 2021

Kent House  
30 Billing Road  
Northampton  
NN1 5DQ  
01604 809 800  
[www.mola.org.uk](http://www.mola.org.uk)  
[business@mola.org.uk](mailto:business@mola.org.uk)

*MOLA Northampton is a company limited by guarantee registered in England and Wales with company registration number 8727508 and charity registration number 1155198. Registered office: Mortimer Wheeler House, 46 Eagle Wharf Road, London N1 7ED.*

**STAFF**

Project Manager: Camilla Collins BSc PGDip

Supervisor: Adam Meadows BSc PCIfA

Fieldwork: Christopher Manktelow BSc

Text and illustrations: Adam Meadows

<b>Geophysical survey at Middle Farm, Mixbury</b>		<b>OASIS No:</b> molanort1-501603	
<b>ACTIVITY TYPE</b>			
Project/Activity type	Geophysical survey		
Reason for investigation	Planning: Pre application		
Development type	Residential development		
Planning reference ID	Cherwell District Planning Reference 20/02328/F		
<b>PROJECT LOCATION</b>			
National grid ref	SP 609 327		
Site name	Middle Farm		
<b>REVIEWERS/ ADMIN</b>			
HER for project	Oxfordshire		
National organisation	None		
<b>WORK UNDERTAKEN</b>			
Methodological summary	Magnetometer survey with a cart-mounted array of Bartington Grad601 fluxgate gradiometers.		
Previous work?	No	Future works?	Trial Trench
Dates - Start date:	8th March 2021	End date:	8th March 2021
<b>GEOPHYSICS</b>			
Geology	White Limestone Formation		
Land use (i.e. arable)	Arable. Wheat at time of survey		
Survey type	Magnetometry survey		
Size of survey area	<1 ha		
Instrumentation	Bartington Grad 601		
Configuration	Multiple		
Spatial resolution	Traverse spacing	0.5m	
Resolution (data values)	0.1nT		
<b>BIBLIOGRAPHY</b>			
Title	Archaeological geophysical survey at Middle Farm, Mixbury, Oxfordshire, March 2021		
Author(s)	Meadows, A.		
Date of publication	2021		
Publisher	MOLA Northampton		
Place of publication	Northampton		
Report number	21/027		
Report release delay?	3 months		
<b>PEOPLE</b>			
Organisation	MOLA Northampton		
Project manager	Camilla Collins		
Project officer/supervisor	John Walford, Adam Meadows		
Funding body	RPS Consulting Ltd		
<b>KEYWORDS</b>			
Monuments found/ date	N/A		
<b>RESULTS</b>			
Description of outcomes/summary of research framework contribution	The survey identified no definite archaeological features other than slight traces of medieval or later ridge and furrow. One possible small curvilinear feature was noted, but it was unclear whether this was archaeologically significant or merely a spurious feature formed by a chance arrangement of geological features and plough furrows. As matters stand the survey data can contribute little to the regional research agenda, although its value may be more reliably assessed once tested by the trial-trench stage of this evaluation.		
<b>ARCHIVES</b>			
Accession ID	Accession No. OXCMS: 2021.20		
Paper Archive repository	Oxfordshire Museums Service		
Digital Archive repository	Oxfordshire Museums Service		
<i>No finds made during survey - no finds archive to be deposited</i>			

# CONTENTS

1	INTRODUCTION .....	1
2	BACKGROUND .....	2
	2.1 Location, geology and topography.....	2
	2.2 Historical and archaeological background .....	2
3	METHODOLOGY .....	2
4	SURVEY RESULTS .....	3
5	CONCLUSION.....	4
6	BIBLIOGRAPHY .....	5

## Figures

Front cover: View north-west from western boundary of site

Fig 1: Site location	1:2000
Fig 2: Magnetometer survey results	1:2000
Fig 3: Magnetometer survey interpretation	1:2000
Fig 4: Unprocessed magnetometer data	1:2000
Fig 5: XY trace plot of magnetometer data	1:1000

# Archaeological geophysical survey

## at Middle Farm, Mixbury,

## Oxfordshire

## March 2021

### ABSTRACT

*MOLA (Museum of London Archaeology) was commissioned by RPS Consulting Ltd to conduct an archaeological geophysical survey on land to the north of Middle Farm, Mixbury, Oxfordshire.*

*The survey identified little of archaeological interest and the data being dominated by an irregular background patterning of geological anomalies. Apart from faint remnants of medieval or later ridge and furrow cultivation, the only feature of note was a small, indistinct curvilinear feature. This could be archaeological in origin or, more probably, a spurious feature formed by a chance arrangement of geological features and plough furrows.*

### 1 INTRODUCTION

MOLA (Museum of London Archaeology) was commissioned by RPS Consulting Ltd to undertake an archaeological geophysical survey across land to the north of Middle Farm, Mixbury, Oxfordshire (NGR SP 609 327). This was conducted in advance of the construction of agricultural polytunnels (Cherwell District Planning Reference 20/02328/F), being a requirement of Condition 4 of the planning approval.

The magnetometer survey took place on 8th March 2021 and was conducted in accordance with the Written Scheme of Investigation (WSI, MOLA 2021), prepared in accordance with the Chartered Institute for Archaeologists and European Archaeological Council guidelines (ClfA 2014 and Schmidt *et al* 2015). The work has been recorded by the Oxfordshire Museums Service under accession number OXCMS: 2021.20.

On arrival, the landowner was found to have staked out a survey area which differed somewhat from the GPS set-out coordinates supplied to the survey team; the outlines of these two conflicting areas are displayed on Fig 1. The combined extent of both areas was surveyed as fully as possible, although part of the proposed access roadway in the south was omitted, having already been stripped and filled by hardcore at time of survey.

## **2 BACKGROUND**

### **2.1 Location, geology and topography**

The site comprises a sub-hectare portion of a single arable field located immediately north of Middle Farm, south of the village of Mixbury in Oxfordshire, two miles from the Northamptonshire border (Fig 1). It covers an area of level ground standing between 121m and 122m above Ordnance Datum (aOD), which at time of survey was under a very young wheat crop. The field itself was bordered by Middle Farm to the south with hedgerows defining its other extents.

The underlying geology of the survey area is recorded as Jurassic White Limestone Formation overlain by superficial deposits of glaciofluvial material deposited during the last Ice Age (BGS 2021). Soils in the area are recorded as being loamy and clayey, seasonally wet with impeded drainage (Landis 2021).

### **2.2 Historical and archaeological background**

No previous archaeological investigations have been conducted within the current survey area, but a Heritage Statement was prepared by RPS as part of the planning application (RPS 2021). What follows is a summary of that assessment's findings, augmented by a search of Heritage Gateway, with monuments referred to by their Oxfordshire Historic Environment Record number.

An Iron Age settlement is thought to exist in the field immediately west of the survey area. Cropmarks indicate an oval enclosure (MOX27359) in the southern half of the field and a single-ditched irregular shaped enclosure with a north-eastern entrance (MOX4798) in the north. Dating for the site has been inferred from a single sherd of prehistoric pottery (MOX27423) and it is thought that the two areas of cropmarks are related due to their proximity.

Further cropmarks are present to the south-east of the study area, on the far side of Featherbed Lane. These comprise a curvilinear feature that gives an indication of having a funnel type entrance, typical of a banjo-type enclosure (MOX23360). South of this a second cropmark of a rectilinear enclosure, overlying smaller circular cropmarks and bisected by a linear feature, is recorded (MOX27316).

A Lidar plot of the surrounding area has detected traces of potential pitting in Mixbury Plantation, located c700 metres east of Middle Farm, and a possible barrow-like feature to the south (RPS 2021, fig 5).

Middle Farm itself contains several Grade II listed buildings, comprising Middle Farmhouse, a barn, and an abutting stable range (MOX14800 and MOX14380). These are of late-18th century construction with mid-19th century additions and more modern repairs present in the case of the barn.

Historic Ordnance Survey maps show the survey has been in agricultural use, with little change, since at least 1881 (Old Maps 2021; NLS 2021; RPS 2021, figs 6-8).

## **3 METHODOLOGY**

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 eight vertically-mounted Bartington Grad-01-1000L magnetic sensor tubes, spaced at half-metre intervals along a bar aligned crossways to the direction of travel.

The cart 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 specifically designed for that purpose.

The cart was propelled along straight and parallel traverses across the survey area, with data logging being manually 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 average speed of coverage was c1.8m/s, with an effective data resolution thus approximated to better than 0.225m x 0.50m.

The raw survey data was initially processed with MLGrad601 software, which calculated an actual 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 mis-matches in the calibration of the individual magnetic sensors (Fig 4). This was removed in TerraSurveyor by applying the median de-stripe function to runs of data from each sensor. No other processing was required.

The survey data is presented in this report as greyscale raster images which have been rotated and scaled to fit against Ordnance Survey base-mapping. The processed data are presented at a scale of  $\pm 4\text{nT}$  (Fig 2), and an interpretive overlay is presented over the data at the same scale (Fig 3). A minimally processed data plot is presented at a scale of  $\pm 10\text{nT}$  (Fig 4) as a comparison to the processed data. A further plot of the processed data, in XY trace format, is provided in Fig 5.

## **4 SURVEY RESULTS**

Overall, the survey data shows an extensive area of diffuse, mottled anomalies typical of natural geological variation. This may mask the presence of archaeological anomalies within the data, as these are often weaker in strength.

Towards the eastern half of the survey area there is the faint remanence of a potential penannular anomaly that may be of archaeological origin. Measuring approximately 11 meters in diameter, it appears unbroken to the west before becoming undetectable to the east.

Throughout the survey data, but most clearly in the east, there are faint traces of a series of parallel linear anomalies running. These most likely represent the remains of ridge and furrow cultivation aligned approximately west-north-west to east-south-east.

Many small, discrete magnetic dipoles are present within the survey data. These are indicative of scattered ferrous material, likely agricultural in nature, buried within the topsoil. A larger ferrous anomaly is present along the southern edge of the survey data. This darkened portion is the result of a magnetic 'halo' extending from barns and farming equipment within the farm compound.



## **5 CONCLUSION**

The survey has detected the remains of a singular penannular feature of potential archaeological origin. This anomaly is somewhat obscured by the surrounding geological and ferrous anomalies which may prove to be masking further remains of potential interest.

The rest of the survey has detected the ploughed out remains of ridge and furrow cultivation against a diffuse mottled background caused primarily by natural geological variation. The source of these anomalies likely arises from variation within the overlying superficial deposits of glaciofluvial material. Some of the stronger anomalies appear more discrete and may represent pitting, though these may also be geological in origin.

## 6 BIBLIOGRAPHY

BGS 2021 The British Geological Survey Geology of Britain Viewer, available at <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>, last accessed 17th March 2021

CIfA 2014 *Standard and Guidance for Archaeological Excavation*, Chartered Institute for Archaeologists

MOLA 2021 *Written Scheme of Investigation for Geophysical Survey, Archaeological Trial Trench Evaluation and Archaeological Mitigation at Land off Middle Farm, Mixbury, Oxfordshire*, MOLA Northampton

Landis 2021 *Soilscapes map*, available at <http://www.landis.org.uk/soilscapes/>, Cranfield University, last accessed 17th March 2021

NLS 2021 National Library of Scotland, *Explore georeferenced maps*, available at <https://maps.nls.uk/>, last accessed 17th March 2021

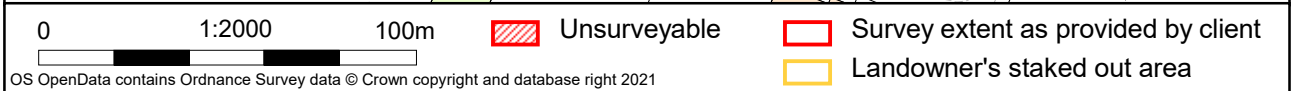
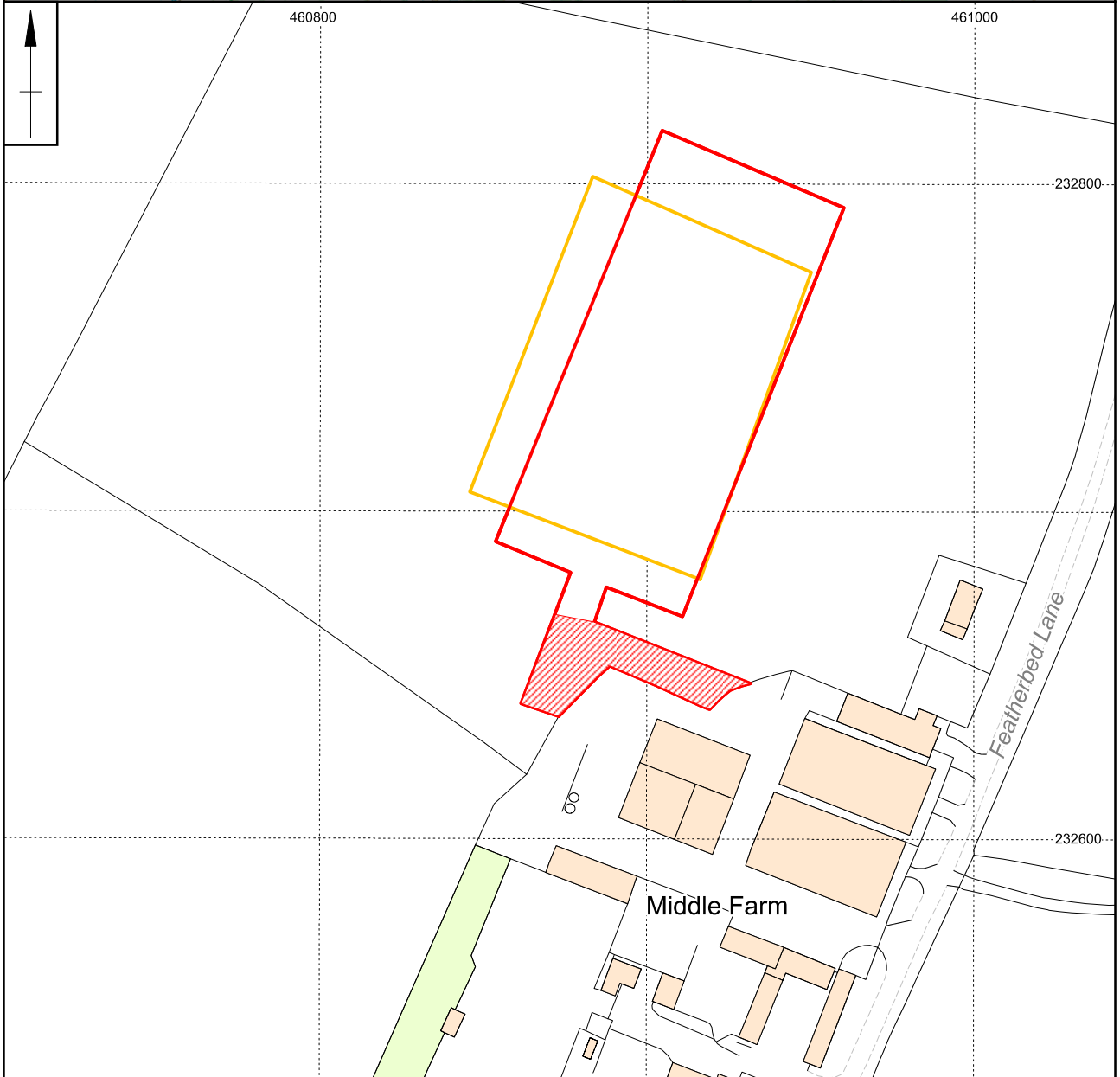
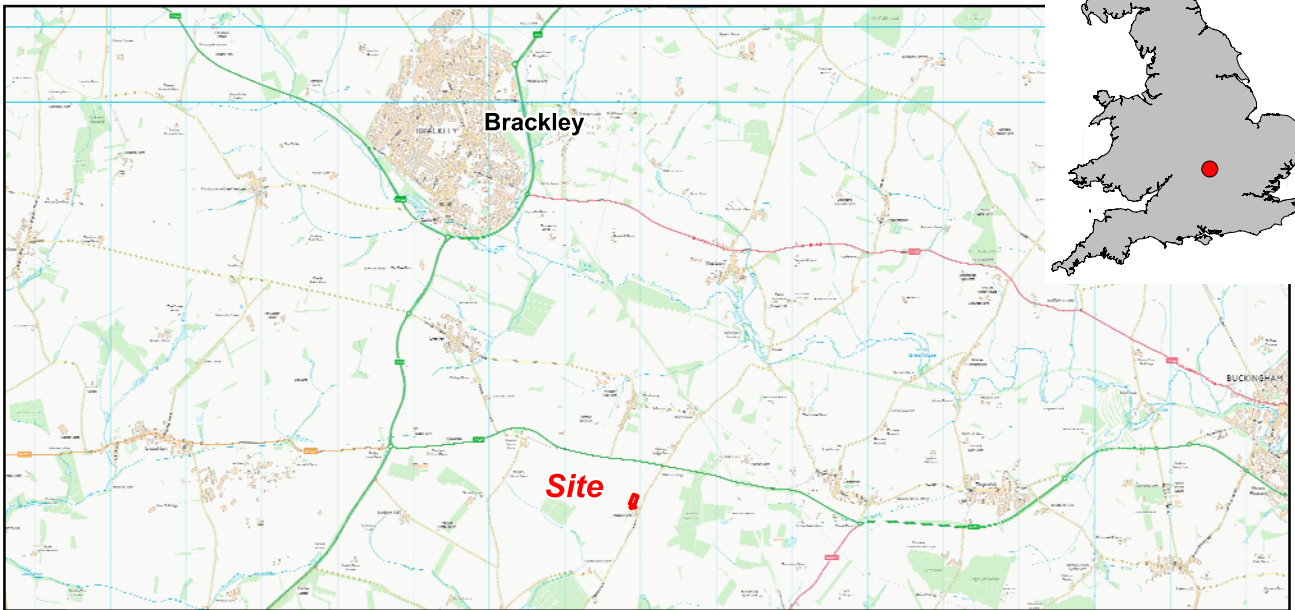
Old Maps 2021 *Historic Ordnance Survey Map Search*, <https://www.old-maps.co.uk>, Old-Maps, last accessed 17th March 2021

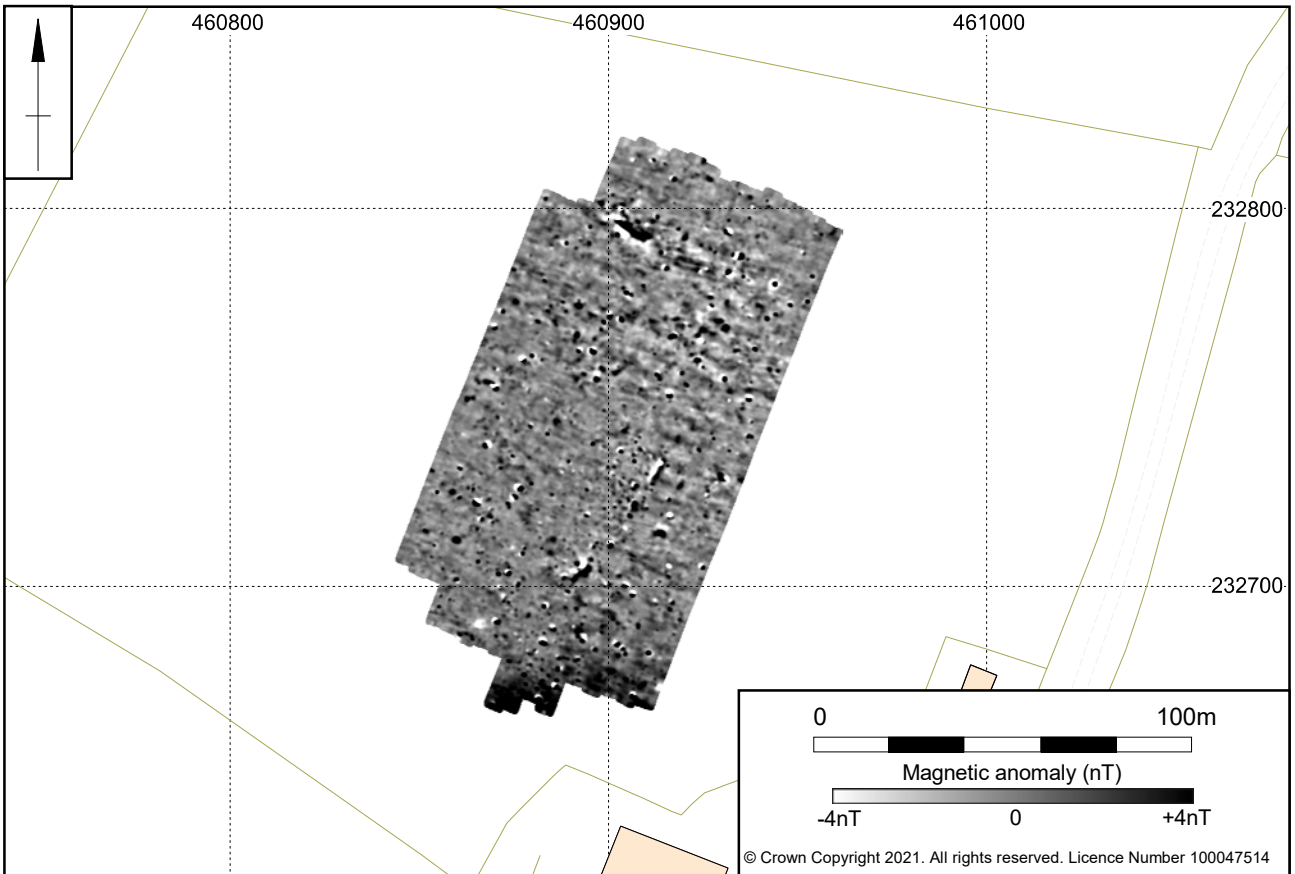
RPS 2021 *Proposed Polytunnels, Middle Farm, Mixbury, Oxfordshire: Heritage Assessment*, RPS Consulting Ltd, **JAC26491**

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*, European Archaeological Council

MOLA

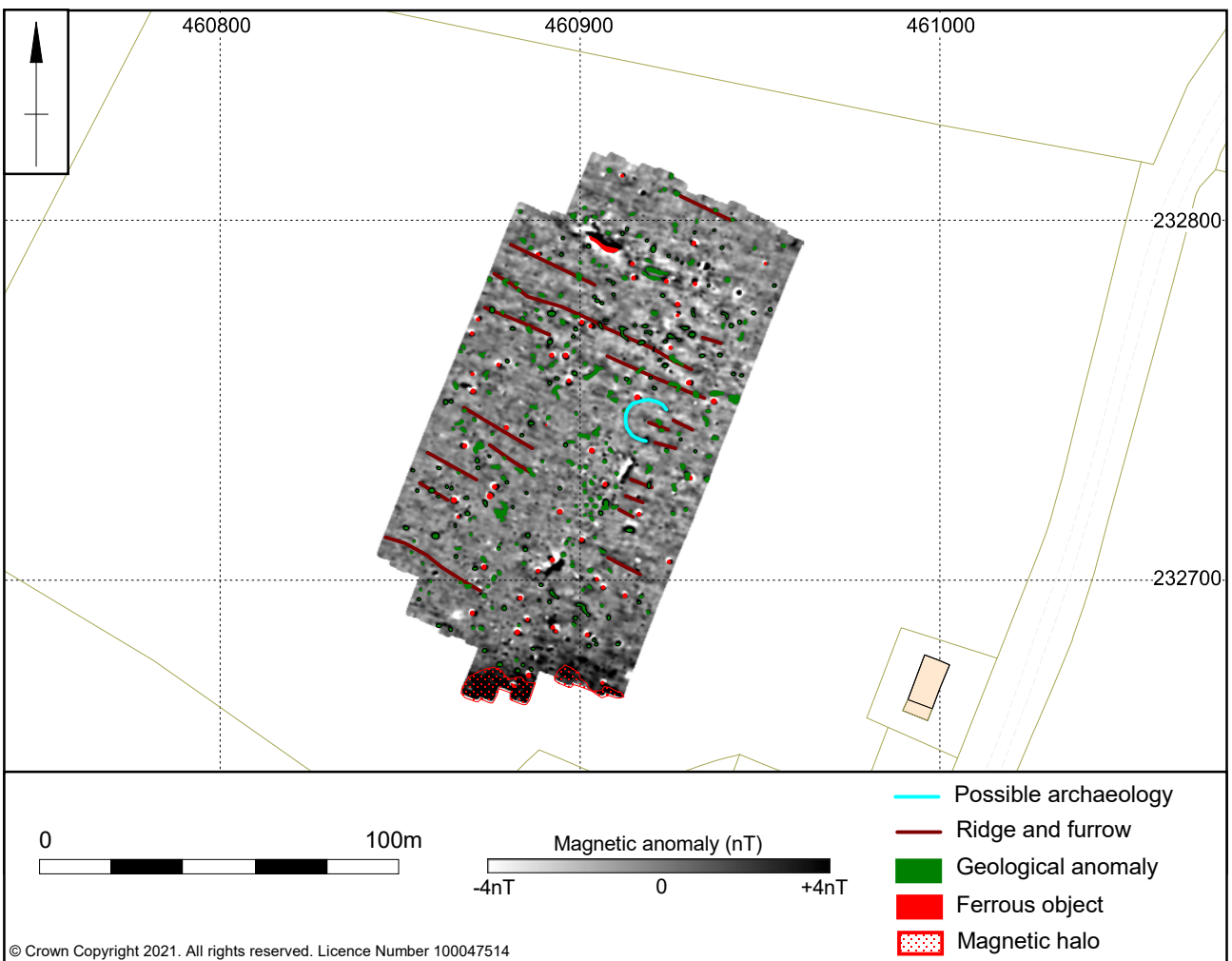
9th April 2021





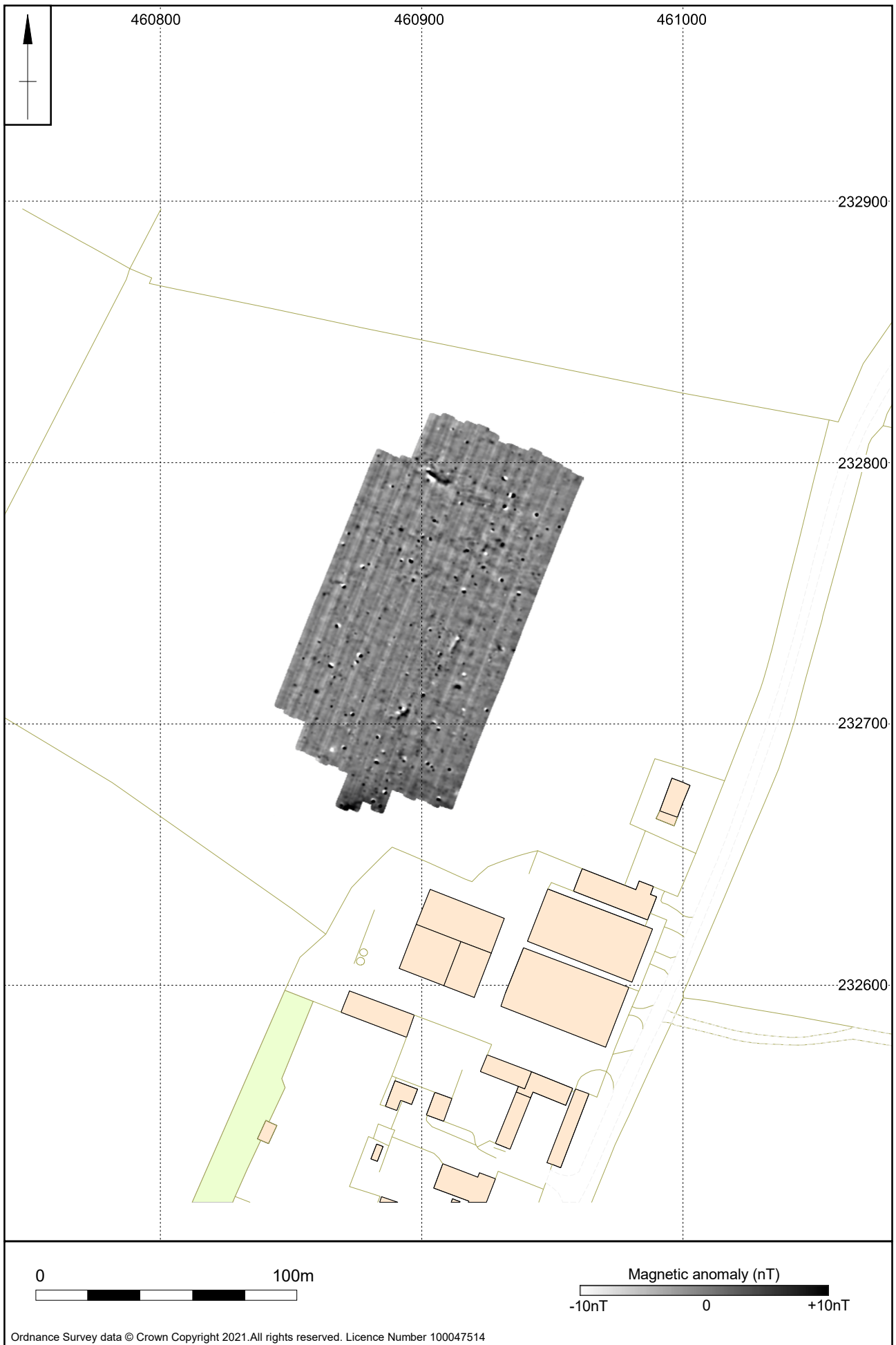
Scale 1: 2000

Processed magnetometer data Fig 2



Scale 1: 2000

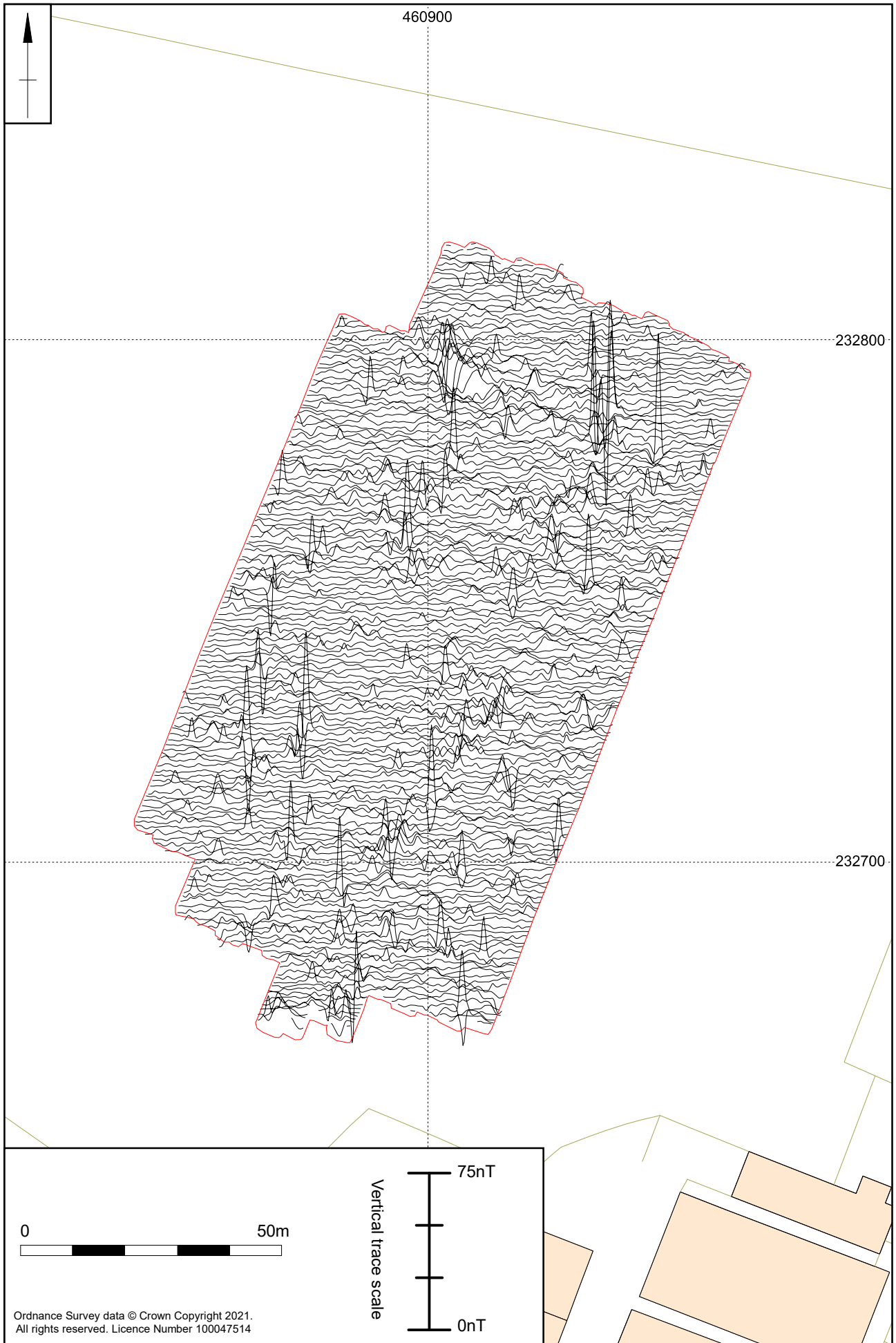
Magnetometer survey interpretation Fig 3



Ordnance Survey data © Crown Copyright 2021. All rights reserved. Licence Number 100047514

Scale 1: 2000

Unprocessed magnetometer data Fig 4



Scale 1: 1000

XY trace plot of magnetometer data Fig 5



MOLA  
Kent House  
30 Billing Road  
Northampton  
NN1 5DQ  
01604 809800  
[www.mola.org.uk](http://www.mola.org.uk)  
[business@mola.org.uk](mailto:business@mola.org.uk)