

An archaeological magnetometer survey

New Conquest Centre, Maldenbrook Lane Cheddon Fitzpaine, Taunton, Somerset

Centred on NGR (E/N): 324570,126920

Report: 1710CHE-R-1

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Project archive

Report	Adobe PDF format
Raw and processed grid & composite files I	DW Consulting TerraSurveyor 3 formats
Minimal processing data plots and metadata I	DW Consulting TerraSurveyor 3 formats
Final data processing data plots and metadata I	DW Consulting TerraSurveyor 3 formats
GIS project, shape files and classification schema	
GIS project	Manifold 8 '.map' file
GIS shape files	ESRI standard
GIS classification schema	Adobe PDF format
AutoCAD version of the survey interpretation	AutoCAD DXF

Website: substrata.co.uk

For an overview of Substrata, our archaeological geophysical surveying techniques and the results we obtain.

1 Survey description and summary

1.1 Survey

1.2 Clients

- Trevor J Spurway (Architect) Ltd., 55 Staplegrove Road, Taunton, Somerset TA1 1DG
- 1.3 Location

Site:	New Conquest Centre, Maldenbrook Lane, Cheddon Fitzpaine
Civil Parish:	Cheddon Fitzpaine
District:	Taunton Deane
Shire County:	Somerset
Nearest Postcode:	TA2 8JT
NGR:	ST 24570 26920 (point)
NGR (E/N):	324570,126920 (point)

1.4 Archive

OASIS number:
Archive:

substrat1-302042 At the time of writing, the archive of this survey will be held by Substrata. Depending on local authority policy, an archive of the unprocessed data may be deposited with the Archaeological Data Service

1.5 Introduction

This report presents the results of an archaeological magnetometer survey at the above site, hereafter referred to as the survey area. It has been prepared for Trevor J Spurway (Architect) Ltd., and was project managed by Oakford Archaeology. The survey area location is shown in Figure 1.

1.6 Summary

The magnetic responses across the survey area were sufficient to be able to differentiate between anomalies representing possible archaeological features and background magnetic responses.

Four magnetic anomaly groups were mapped as representing potential archaeological deposits or features. Two of these groups represent a former field boundary and deposits associated with a former structure recorded on historic Ordnance Survey maps. The structure is recorded in the Somerset Historical Environment Record as a possible cottage or field barn (HER entry 43989). The other two anomaly groups may represent archaeological deposits or features such as fragments of ditches but recent a origin for each cannot be ruled out.

2 Survey aims and objectives

2.1 Aims

To establish the presence or absence, extent and character of any archaeological features and deposits within the survey area.

2.2 Survey objectives

- 1. Complete a magnetometer survey across agreed parts of the survey area.
- 2. Identify any magnetic anomalies that may be related to archaeological deposits, structures or artefacts.
- 3. Within the limits of the techniques and dataset, archaeologically characterise any such anomalies or patterns of anomalies.
- 4. Accurately record the location of the identified anomalies.

5. Produce a report based on the survey that is sufficiently detailed to inform any subsequent development on the survey area about the location and possible archaeological character of the recorded anomalies.

3 Methodology

The work was undertaken in accordance with the survey methodology statement (Dean, 2017).

The survey grid location information and grid plan were recorded as part of the project in a suitable GIS system (Table 3).

Data processing was undertaken using appropriate software (Table 3), with all anomalies being digitised and geo-referenced. The final report (this document) includes a graphical and textual account of the techniques undertaken, the data obtained and an archaeological interpretation of that data and conclusions about any likely archaeology.

4 Standards

The standards used to complete this survey are defined by the Chartered Institute for Archaeologists (2014a) and Historic England (2010). The codes of approved practice that were followed are those of the Chartered Institute for Archaeologists (2014b) and Archaeology Data Service (undated).

5 Site description

5.1 Landscape and land use

The survey area comprises parts of two adjacent fields off Maldenbrook Lane to the north of Maldenbrook as shown in Figure 1. Both fields were bounded by hedges with adjoining agricultural fields. The fields were under young crops at the time of the survey.

5.2 Geology

The bedrock across the site comprises mudstone and halite-stone of the Triassic Mercia Mudstone Group. Generically the Mercia Mudstone Group consists dominantly red, less commonly green-grey, mudstones and subordinate siltstones with thick halite-bearing units in some basinal areas. Thin beds of gypsum/anhydrite are widespread; sandstones are also present. The superficial deposits are sands and gravels of Quaternary river terrace deposits (British Geological Survey, undated).

6 Archaeological background

6.1 Historic landscape characterisation
'Recently Enclosed Land, 18th to 21st century. General field size, 6-12ha. Between 25% and 50% boundary loss since 1905' (Archaeology Data Service (undated b).

6.2 Summary of archaeological background

This section is not designed to provide a comprehensive understanding of the historic environment of the surrounding area and should not be used as a source for further work.

The Somerset County Council Historic Environment Record was examined via the Heritage Gateway (Historic England, undated a) to gain an appreciation of historic assets pertinent to the geophysical survey data within approximately 500m of the survey area perimeter.

Table 1 provides a summary of the Historic Environment Record entries though relevant to the survey.

One historic environment asset has been recorded within the survey area. It is the site of a field barn or cottage mapped between 1888 and 1962 by the Ordnance Survey (Table 1, HER entry 43989). Anomalies likely to represent deposits associated with this structure were recorded in the survey dataset (Table 2, anomaly group 3).

7 Results, discussion and conclusions

7.1 Scope and definitions

This survey was designed to record magnetic anomalies. A magnetic anomaly is a local variation in the Earth's magnetic field. Such variations can result from changes in the magnetism of the underlying solid geology, superficial geology and other near-surface deposits including those altered and created by past human activities. Near-surface artefacts can also create magnetic anomalies.

The terms 'archaeological deposit', 'structure' and 'feature' refer to any artefacts, material deposits or disturbance of natural deposits thought to be the result of human activity, excluding recent land maintenance and farming.

Magnetic anomalies cannot be regarded as physical archaeological deposits, structures or features and the dimensions of the anomalies shown do not represent the dimensions of any associated archaeology.

The analysis presented below identifies and characterises anomalies and anomaly groups that may relate to archaeological deposits, structures and features.

The reader is referred to section 8.

7.2 Results

Figure 2 shows the interpretation of the survey data which includes the anomaly groups identified as possibly relating to archaeological deposits along with their identifying numbers. Table 2 is an extract of the detailed analysis of the survey data sourced from the attribute tables of the GIS project provided in the project archive.

Figure 2 along with Table 2 comprise the analysis of the survey data.

Figures 3 and 4 are plots of processed data as specified in Table 4. Figure 5 is a plot of minimally processed data with its metadata.

7.3 Discussion

7.3.1 General points

Discussion scope

Not all anomalies or anomaly groups identified in Table 2 are necessarily discussed below. All identified anomaly groups are recorded in the GIS project held the survey archive.

Data collection

Data collection along the survey area edges was restricted as shown in the figures due to the presence of magnetic materials within and adjacent to boundaries. Strong magnetic responses mapped close to the boundaries are likely to relate to these materials except where otherwise indicated in Figure 2 and Table 2.

Anomaly characterisation and mapping

There are a number of anomaly groups that could be interpreted as relating to large postholes or pits although most will have natural origins. Anomalies of this sort were mapped as potential archaeology when they were associated with other significant anomaly groups or otherwise formed recognisable patterns as listed in Table 2.

Anomalies thought to relate to natural features and recent man-made objects such as manholes, water management equipment, drains, cables and other services were only mapped where they comprised significant magnetic responses across the dataset that needed clarification.

Numerous dipole magnetic anomalies are scattered across the data set. These are likely to represent recent ferrous objects. They are only mapped if they could influence the analysis of anomaly groups thought to have an archaeological origin.

7.3.2 Data relating to historic maps and other records (Figure 2 and Table 2)

Magnetic anomaly group 2 coincides with, and likely represents, the footings of a former field boundary recorded on historic Ordnance Survey maps between 1888-89 and 1969-70.

Group **3** is likely to represent deposits and disturbed ground associated with a former building recorded on Ordnance Survey maps between 1888-89 and 1962 and in the Somerset County Council Historic Environment Record (entry number 43989, summarised in Table 1).

7.3.3 Data with no previous archaeological provenance (Figure 2 and Table 2)

Groups 1 and 4 are disrupted linear and curvilinear anomalies respectively of unknown provenance which may have an archaeological origin although a recent origin cannot be ruled out.

7.4 Conclusions

The magnetic responses across the survey area were sufficient to be able to differentiate between anomalies representing possible archaeological features and background magnetic responses.

Four magnetic anomaly groups were mapped as representing potential archaeological deposits or features. Two of these groups represent a former field boundary (group 2) and deposits associated with a former structure (group 3) recorded on historic Ordnance Survey maps. The structure is recorded in the Somerset County Council Historical Environment Record as a possible cottage or field barn (HER entry 43989). The other two anomaly groups (1 and 4) may represent archaeological deposits or features such as fragments of ditches but a recent origin for each cannot be ruled out.

8 Disclaimer and copyright

The description and discussion of the results presented in this report are the authors, based on his interpretation of the survey data. Every effort has been made to provide accurate descriptions and interpretations of the geophysical data set. The nature of archaeological geophysical surveying is such that interpretations based on geophysical data, while informative, can only be provisional. Geophysical surveys are a cost-effective early step in the multi-phase process that is archaeology. The evaluation programme of which this survey is part may also be informed by other archaeological assessment work and analysis. It must be presumed that more archaeological features will be evaluated than those specified in this report.

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9 Acknowledgements

Substrata would like to thank T J Spurway DIP ARCH RIBA, Managing Director of Trevor J Spurway (Architect) Ltd, for commissioning us to complete this survey. We would also like to thank Marc Steinmetzer of Oakford Archaeology for project managing the survey.

10 Bibliography

Archaeology Data Service (undated) *Archaeology Data Service/Digital Antiquity Guides to Good Practice: Geophysical Data in Archaeology.* [Online], Available: http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics Toc [October 2017]

Archaeology Data Service (undated b) Somerset and Exmoor Historic Landscape Characterisation, [Online], Available: http://archaeologydataservice.ac.uk/archives/view/ somersetexmoor_hlc_2013/ [November 2017]

British Geological Survey (undated) *Geology of Britain viewer*, 1:50000 scale data [Online], Available: http://www.bgs.ac.uk/discovering Geology/geologyOfBritain/viewer.html [November 2017]

Chartered Institute for Archaeologists (2014a) *Standard and guidance archaeological geophysical survey* [Online], Available: http://www.archaeologists.net/sites/default/files/ CIFAS&GGeophysics_1.pdf [October 2017]

Chartered Institute for Archaeologists (2014b) *Code of conduct* [Online], http://www.archaeologists.net/sites/default/files/CodesofConduct.pdf [April 2017]

Clark, A. (2000) Seeing Beneath the Soil, Prospecting methods in archaeology. London: Routledge

Dean, R. (2017) A survey method statement for a detailed magnetometer survey at New Conquest Centre, Maldenbrook Lane, Cheddon Fitzpaine, Taunton, Somerset. Substrata Ltd unpublished document 1707MOO-M-1

Historic England (undated) *Heritage Gateway* [Online], http://www.heritagegateway.org.uk/ Gateway/ [November 2017]

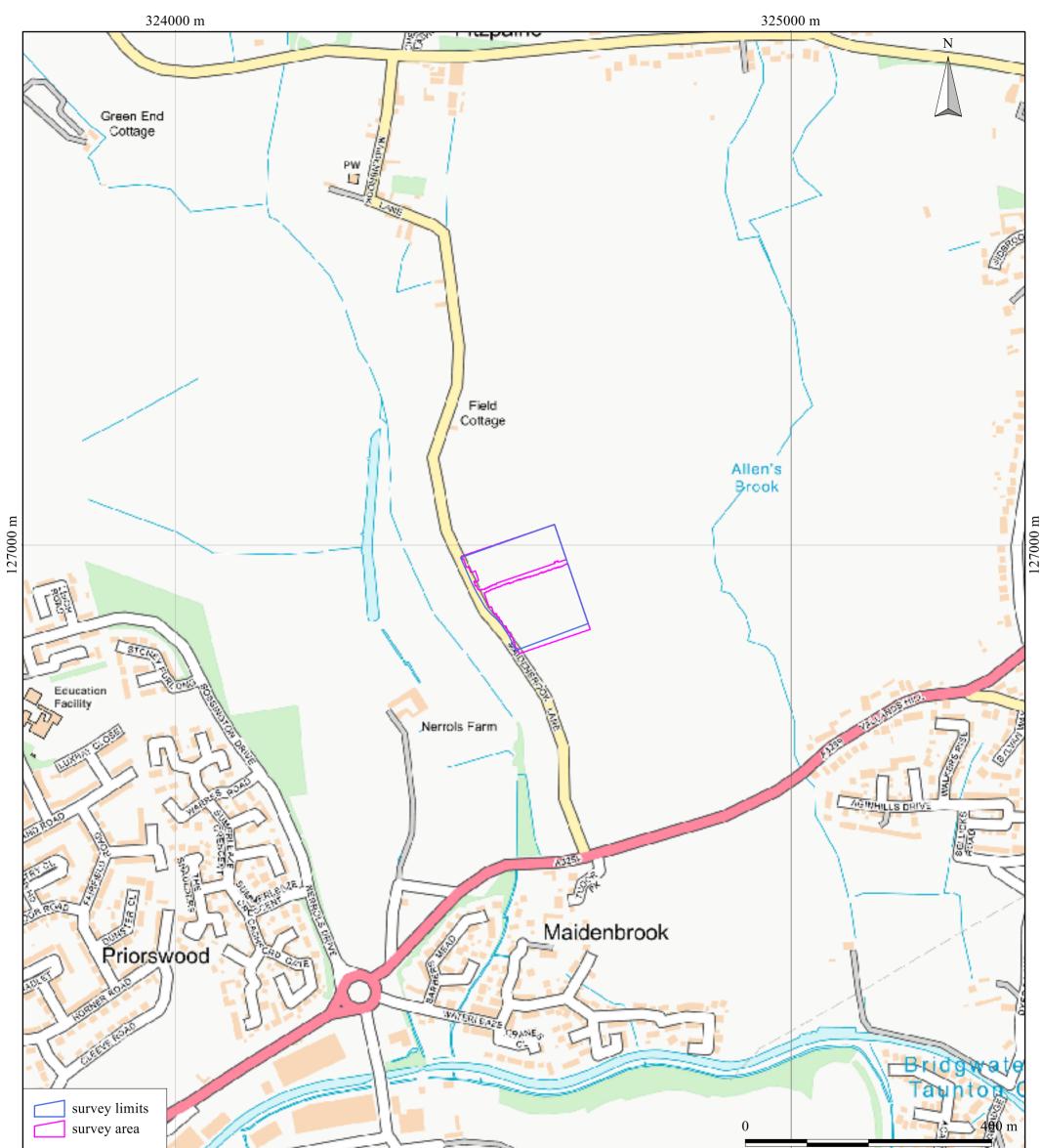
Historic England (2010) *Geophysical Survey in Archaeological Field Evaluation* [Online], Available: https://content.historicengland.org.uk/images-books/publications/geophysical-survey-in-archaeological-field-evaluation/geophysics-guidelines.pdf/ [October 2017]

Appendix 1 Figures

General Guidance

The anomalies represented in the survey plots provided in this appendix are magnetic anomalies. The apparent size of such anomalies and anomaly patterns are unlikely to correspond exactly with the dimensions of any associated archaeological features.

A rough rule for interpreting magnetic anomalies is that the width of an anomaly at half its maximum reading is equal to the width of the buried feature, or its depth if this is greater (Clark, 2000: 83). Caution must be applied when using this rule as it depends on the anomalies being clearly identifiable and distinct from adjacent anomalies. In northern latitudes the position of the maximum of a magnetic anomaly will be displaced slightly to the south of any associated physical feature.



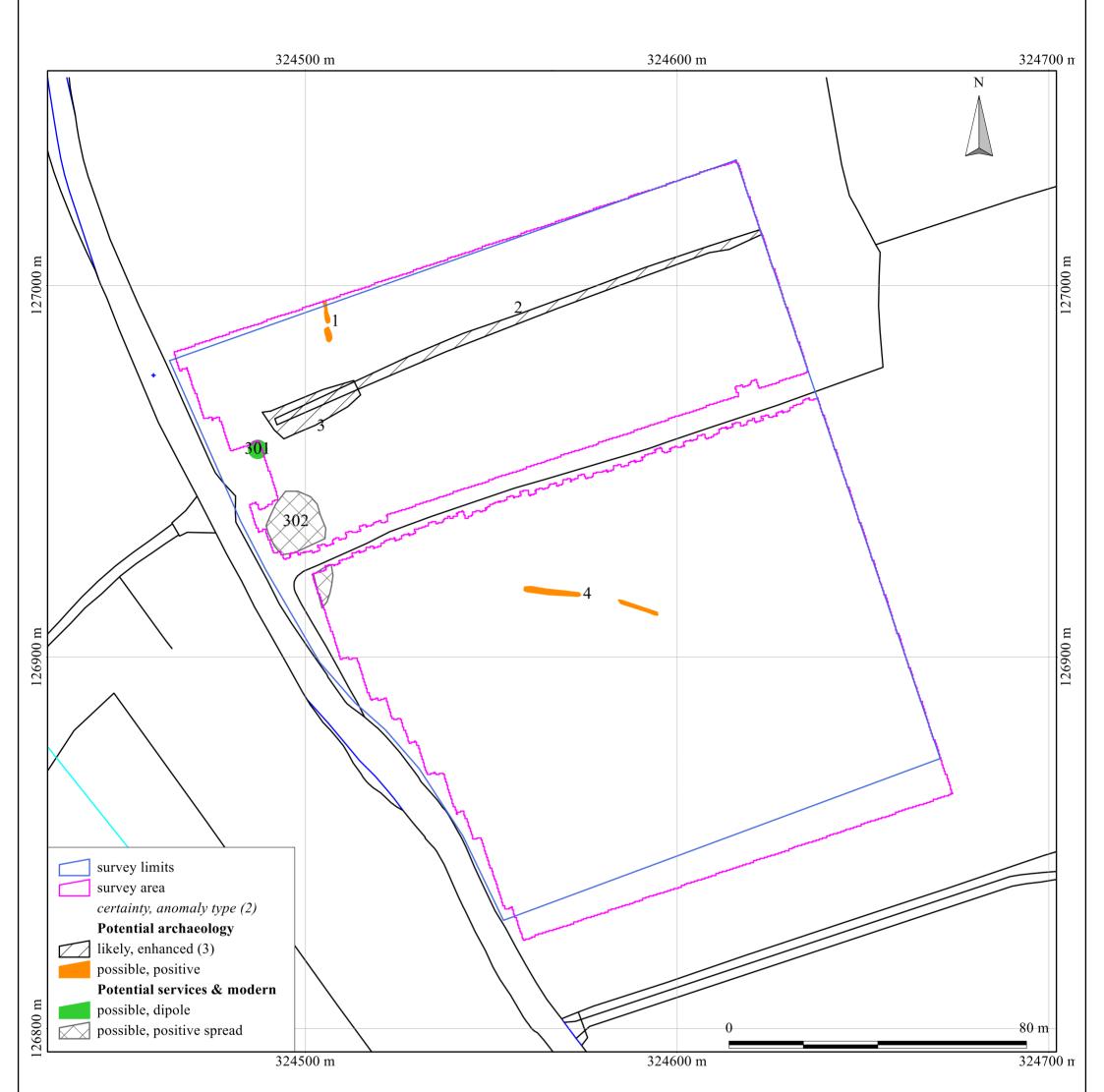
324000 m 325000 m

British Grid centre X: 324566.35 m, centre Y: 126925.76 m Geophysical survey: Copyright Substrata Limited. Base map: Contains Ordnance Survey data © Crown copyright and database right 2017

Scale: 1:6000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological magnetometer survey New Conquest Centre, Maldenbrook Lane Cheddon Fitzpaine, Taunton, Somerset Centred on NGR (E/N): 324570,126920 Report: 1710CHE-R-1

Figure 1: location map



Geophysical survey: Copyright Substrata Limited. Base map: Ordnance Survey (c) Crown Copyright 2017. All rights reserved. Licence number 100022432

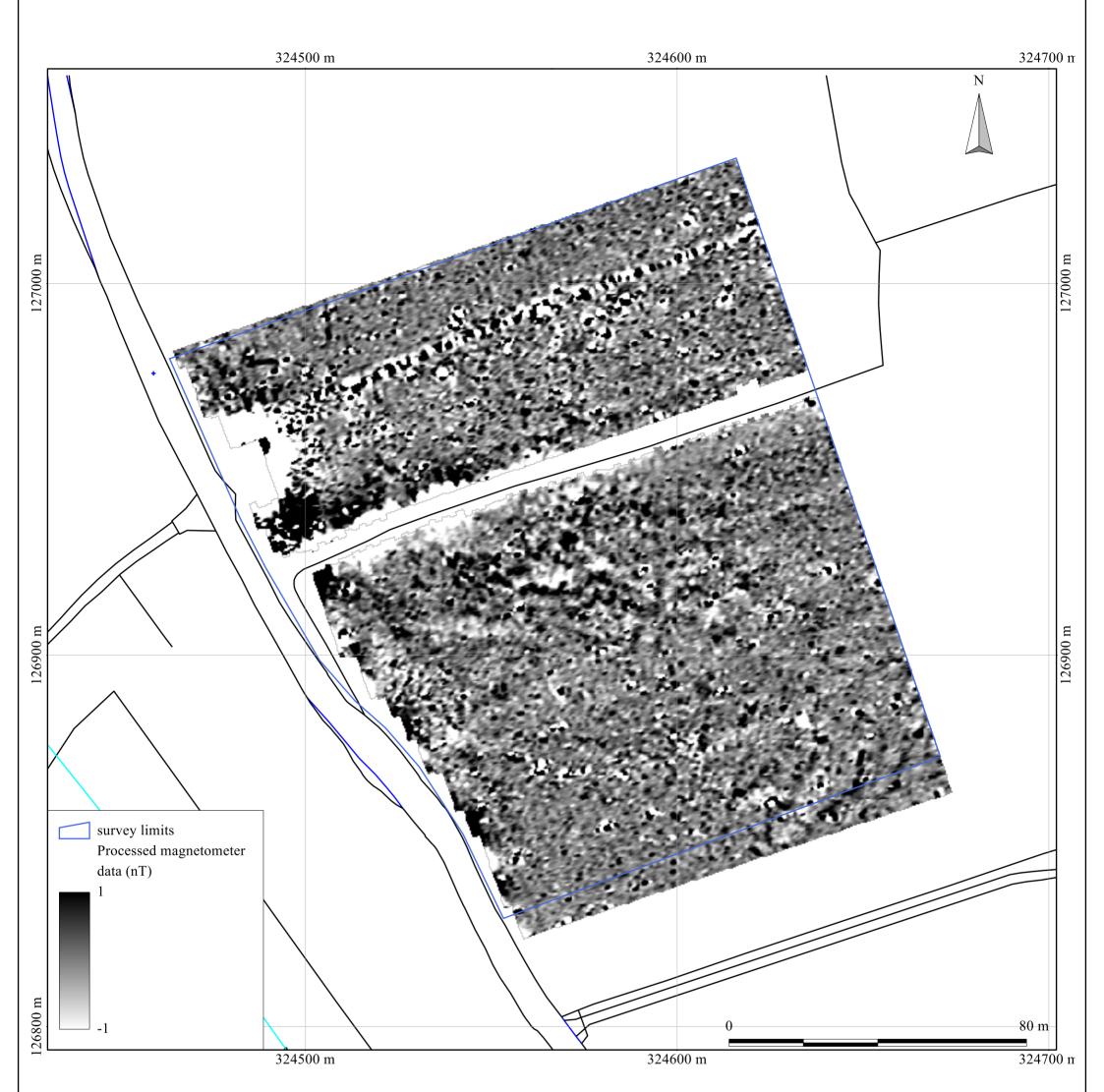
Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

Notes:

- 1. All interpretations are provisional and represent potential archaeological deposits.
- 2. 'Anomaly type' is a description of the magnetic anomaly. See the report text or GIS for an archaeological characterisation.
- 3. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.
- 4. Not all instances are mapped.
- 5. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

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Figure 2: survey interpretation

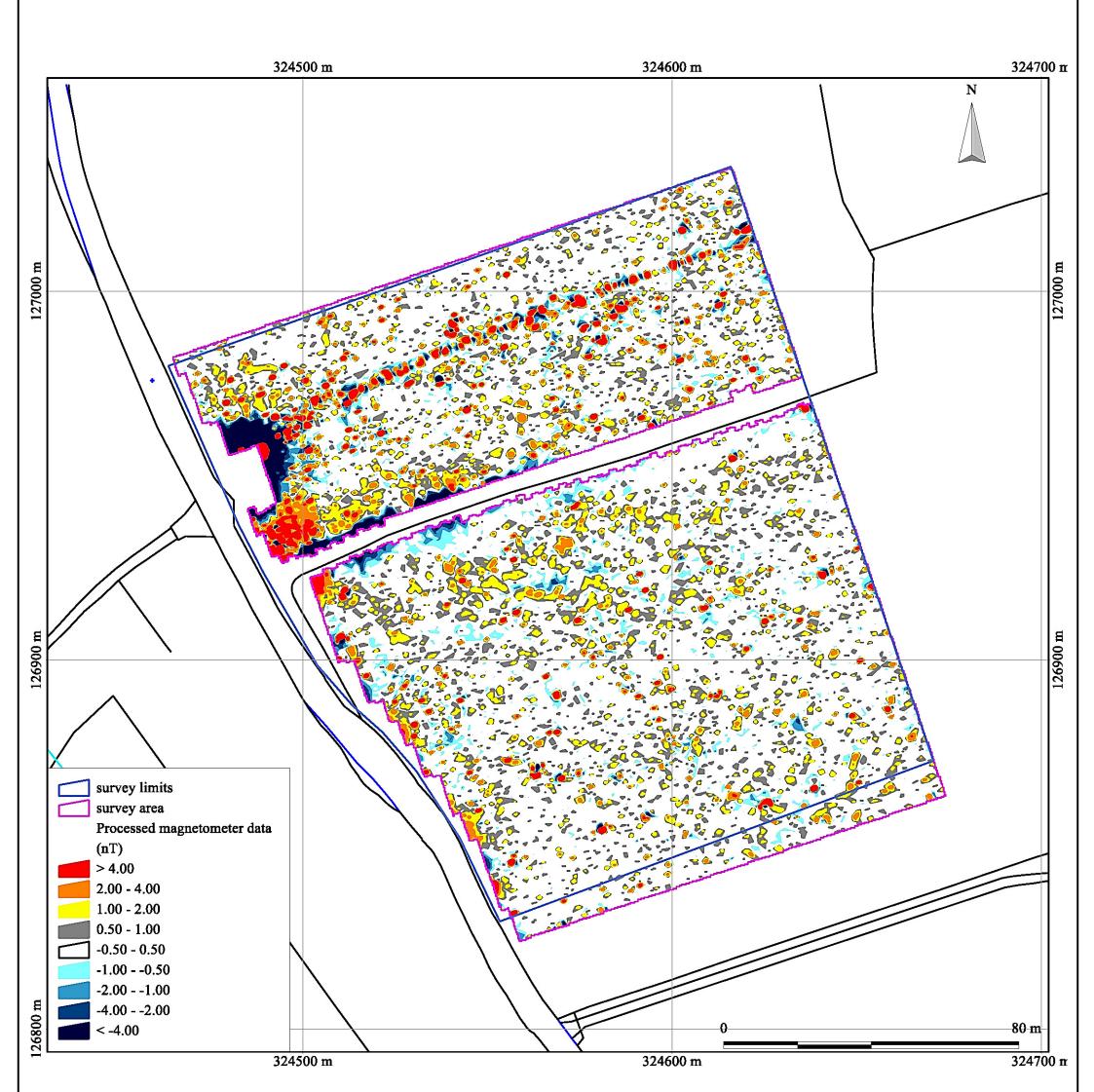


Geophysical survey: Copyright Substrata Limited. Base map: Ordnance Survey (c) Crown Copyright 2017. All rights reserved. Licence number 100022432

Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological magnetometer survey New Conquest Centre, Maldenbrook Lane Cheddon Fitzpaine, Taunton, Somerset Centred on NGR (E/N): 324570,126920 Report: 1710CHE-R-1

Figure 3: shade plot of processed data

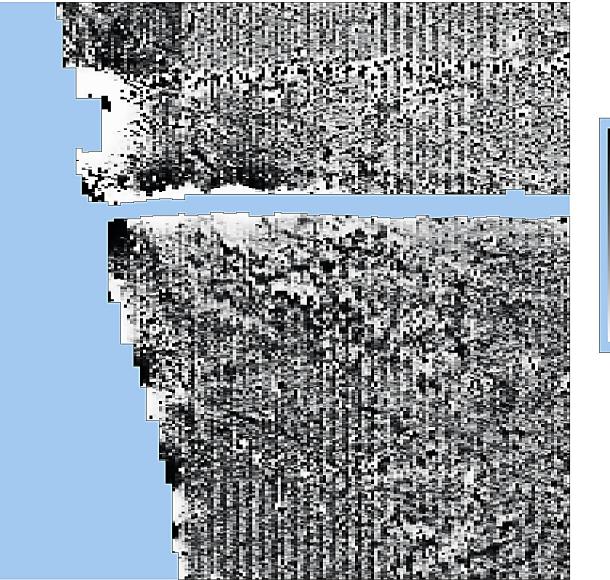


British Grid centre X: 324566.35 m, centre Y: 126925.76 m Geophysical survey: Copyright Substrata Limited. Base map: Ordnance Survey (c) Crown Copyright 2017. All rights reserved. Licence number 100022432

Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological magnetometer survey New Conquest Centre, Maldenbrook Lane Cheddon Fitzpaine, Taunton, Somerset Centred on NGR (E/N): 324570,126920 Report: 1710CHE-R-1

Figure 4: contour plot of processed data



3000 nT
0.7
0.3
0.1
0
-0.1
-0.3
-0.5
-0.7
-1.1

-3000 nT

0

-20	0	20		
E				

Instrument Type:	Bartington Grad 601
Units:	nT
Direction of 1st Tra	
Collection Method:	. 0
	ZigZag
Sensors:	2 @ 0.00 m spacing.
Dummy Value:	32702
Grid Size:	30 m x 30 m
X Interval:	0.25 m
Y Interval:	1 m
Stats	
Max:	3000.00
Min:	-3000.00
Std Dev:	144.30
Mean:	-5.08
Median:	-0.10
Surveyed Area:	2.4307 ha
PROGRAM	
Name:	TerraSurveyor
Version:	3.0.31.0
Processes: 1	
1 Base Layer	

Appendix 2 Tables

An archaeological magnetometer survey New Conquest Centre, Maldenbrook Lane Cheddon Fitzpaine, Taunton, Somerset Centred on NGR (E/N): 324570,126920 Report: 1710CHE-R-1 County: Somerset District: Taunton Deane Parish: Cheddon Fitzpaine Source: Heritage Gateway

	grid reference	designations related HER e	•	period	description	distance (m) from site centre	bearing (GN) from site centre
43989	ST244269		Field barn	Post medieval	WITHIN SURVEY AREA. Small building shown on OS 6" map. May be a field barn or a cottage.	171	263
31627	ST243269		Auxiliary unit operational base	Second World War	Friends of the landowner machine excavated a trench through the buried remains of the base. A chamber was visible extending south but the site was much disturbed.	271	266
43387	ST247266		Enclosure	Roman, Later prehistoric	Cropmarks visible on St Joseph AP 258. Nothing seen on the ground. Those on the photo appear to represent parts of three sides of a squarish enclosure with one entrance gap in the E side. Vague cropmarks are visible on vertical photographs of this area but they are not convincing as archaeology.	345	158
19849	ST243267		Sheep dip	Post medieval	Sheepwash' shown on Ordnance Survey map of c1904. No longer extant.	348	231
44192	ST250269		Settlement, Rectilinear enclosure	Roman, Later prehistoric	A possible Prehistoric and/or Roman ditched enclosure is visible as cropmarks on aerial photographs. It encloses a rectangular area measuring 32m by 27m.	430	93
30276	ST242267	26899 28355	Geophysical survey	2010	The survey covered 19ha of agricultural land within six fields. The results substantiated cropmark evidence for a rectilinear enclosure within the north western part of the site. Other positive linear, curvilinear and discrete anomalies close to the enclosure appeared to relate to ditch-like and pit-like features. The survey areas within the southern and eastern parts of the site, contained many positive linear, curvilinear, diffuse and discrete anomalies, and although some may relate to natural features, others may indicate cut features of anthropogenic origin.	430	239
28355	ST242267	26899 30276	Evaluation	2010	A rectangular enclosure with associated features in a field to the north-west of the farm was provisionally dated to the early to middle Bronze Age by a small pottery assemblage. To the south-east a series of ditches, gullies, pits and post holes clustered around a broad trackway produced a larger assemblage of medieval pottery dated to the 11th-15th centuries.	430	239
44519	ST241270		Enclosed settlement	Roman, Later prehistoric	Aerial photographs show clearly a double ditched sub square enclosure. Parts are only just visible in a less sympathetic crop. A possible Prehistoric and/or Roman ditched enclosure is partially visible as indistinct cropmarks on aerial photographs. Ditches partially enclose a rectangular area measuring 34m by 28m. It may be defined by a double ditch on the north side.	477	280
30329	ST248265	30328	Enclosure	Uncertain	Evaluation January 2011: Two ditch sections appeared to relate to a sub-circular enclosure recorded during an earlier geophysical survey. This contained at least two internal features. No dating evidence was recovered and the relationship of this enclosure to the rectangular enclosure further south was unclear.	479	151
26899	ST241268	28355 30276	Enclosed settlement, Ditch, Enclosure, Pot, Flake	Bronze age, Early bronze age, Middle bronze age	A possible Prehistoric and/or Roman ditched enclosure is partially visible as indistinct cropmarks on aerial photographs. Three sides partially enclose a rectangular area measuring 43m by 30m. There may be more archaeological features to the south but the cropmarks in this area were too indistinct to tell and may represent natural features.	485	256
44451	ST241271		Enclosed settlement, Long barrow, Mortuary enclosure	Roman, Later prehistoric, Neolithic		503	291
30328	ST248264	30329	Ditch, Pit, Pot	Roman,C4,C3	Evaluation, January 2011: A pit and a ditch of Roman date were identified. The fill of the pit contained seven sherds of Roman pottery and the ditch contained four sherds of 3rd to 4th century pottery. The ditch matches a linear geophysical anomaly also recorded in in other trenches, and appears to be part of a possible rectangular enclosure. The two ditches recorded during the geophysics survey running east-west from the south-western corner of the enclosure may represent an associated ditched trackway.	569	156
44774	ST241264		Watching brief	1998	The construction of an estate road and associated services were monitored. Three flint flakes were recovered.	701	222
44788	ST240265		Evaluation	1990	The majority of the features recorded are interpreted as boundary ditches and were undated. There was no sign of a penannular feature seen on aerial photos. The only pottery came from the northern end of the site and comprised 3 small prehistoric sherds of neolithic or late bronze-age/early iron age fabric and 5 sherds of Romano-British pottery. Larger quantities of flintwork were recovered, the stratified material, again concentrating at the northern end of the site.	708	234

Table 1: Historical Environment Entries thought relevant to geophysical survey

Site: An archaeological magnetometer survey New Conquest Centre, Maldenbrook Lane Cheddon Fitzpaine, Taunton, Somerset Centred on NGR (E/N): 324570,126920 Report: 1710CHE-R-1

anomaly	anomaly characterisation	anomaly form	additional archaeological	comments	suppor
group	certainty & class		characterisation		
1	possible, positive	disrupted linear			
2	likely, enhanced	linear	field boundary	anomaly group coincides with a field boundary recorded on historic maps up to but not beyond 1969-70	Ordna
3	likely, enhanced	sub-rectangular	building	anomaly group coincides with a building recorded on historic maps up to but not beyond 1962	Ordna
					Somer
4	possible, positive	disrupted curvilinear			
301	possible, dipole		ferrous material		
302	possible, positive spread	irregular	relatively recent fill		

Table 2: data analysis

oorting evidence

nance Survey 1888-89 1:2500 - 1969-70 1:10560 nance Survey 1888-89 1:2500 - 1962 1:10560 terset County Council HER entry 439898

Grid Method of Fixing: DGPS set-out using pre-planned survey grids and Ordnance Survey coordinates. Composition: 30m by 30m grids Recording: Geo-referenced and recorded using digital map tiles. DGPS used: Spectra Precision PM5V2 GPS with external antenna and survey pole and DigiTerra Explorer 7 as the survey control program.		
Equipment Instrument: Bartington Instruments grad601-2 Firmware: version 6.1	Data Capture Sample Interval: 0.25m Traverse Interval: 1 metre Traverse Method: zigzag Traverse Orientation: GN	
Data Processing, Analysis and Presentation Sof QCAD Professional 3 DW Consulting TerraSurveyor3 Manifold System 8 GIS Microsoft Corp. Office Excel 2013 Microsoft Corp. Office Publisher 2013 Adobe Systems Inc Adobe Acrobat 9 Pro Extended		

Table 3: methodology information

Instrument			
Type: Bartington Grad-601 gradiometer			
Units:			
Direction of 1st Traverse: see below			
Collection Method: ZigZag			
Sensors:			
Dummy Value: 32702			
Program			
Name: TerraSurveyor			
Version: 3.0.31.0			
Statistics Processing			
Max:	180.69	1 Base Layer	
Min:	-196.31	2 Clip at 1.00 SD	
Std Dev:	8.19		
Mean:	-0.39	4 De Stagger: Grids: All Mode: Both By: -1 intervals	
Median:	0.00	5 De Stagger: Grids: All Mode: Both By: -1 intervals	
Surveyed Area:	2.4ha	1	
		7 Interpolate: Match X & Y Doubled.	

Table 4: processed data metadata