

Substrata

Archaeological Geophysical Surveyors

An archaeological magnetometer survey
St Ann's Chapel, Kingsbridge, Devon

Centred on NGR (E/N): 266395,047330

Report: 1710ANN-R-1

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1 Introduction

This report presents the results of an archaeological geophysical survey at the site listed below, hereafter referred to as the Site. It has been prepared for Oakford Archaeology on behalf of clients as part of a housing feasibility scheme with due consideration to the National Planning Policy Framework (Department for Communities and Local Government, 2012). The survey area location is shown in Figure 1.

2 Survey description

2.1 Survey

Method: magnetometry
Instrument: twin-sensor fluxgate gradiometer
Date: 16 February 2018
Area: 1.55ha

2.2 Location

Name: St Ann's Chapel, Kingsbridge, Devon
Civil parish: Bigbury
District: South Hams
County: Devon
Nearest Postcode: TQ7 4HG
NGR: SX 66395 47330 (point)
NGR (E/N): 266395,047330 (point)

2.3 Client

Oakford Archaeology, 44 Hazel Road, Exeter, Devon EX2 6HN

3 Summary

A magnetometer survey was selected to provide a relatively fast and cost-effective evaluation of any buried archaeology across the Site. The magnetic responses across the survey area were sufficient to be able to differentiate between possible buried archaeology and background magnetic responses. The magnetic anomaly groups pertaining to potential buried archaeology were georeferenced to the Ordnance Survey National Grid, mapped, characterised and assigned with an appropriate degree of certainty in conformance with the survey aims and objectives set out in Section 4.

Eighteen magnetic anomaly groups were mapped as representing potential archaeological deposits and features. Of these, two represent field boundaries, possibly of late medieval origin, recorded on the 1843 Bigbury tithe map. One of these boundaries was removed before 1886 and the other between 1953-4 and 1974 as depicted on historic Ordnance Survey maps. A further two anomaly groups have the same magnetic characteristics and trend. These are most likely to represent similar field boundaries removed before the publication of the tithe map. One group represents rubble and disturbed ground associated with a house mapped in 1843 and demolished between 1953-4 and 1974. Adjacent to the site of the house, one anomaly group represents a garden wall removed between 1843 and 1886 and a second group represents an orchard and garden boundary removed between 1953-4 and 1974. Two groups may represent segments of field boundaries of the Devon bank type. One group may represent a deposit of rubble or near-surface bedrock. The remaining magnetic anomaly groups have characteristics typical of remnants of former field boundaries or enclosures of unknown period and possibly of more than one phase of past land management.

4 Aims and objectives

4.1 Aims

Within the framework set out in Chartered Institute for Archaeologists (2014a), complete an archaeological geophysical survey and report to:

1. As far as possible inform on the presence of absence, character, extent and in some cases, apparent relative phasing of buried archaeology, in order to make an assessment of its merit in the appropriate context, which may lead to one or more of the following:
 - a. The formulation of a strategy to ensure further recording, preservation or

- management of the resource
 - b. The formulation of a strategy to mitigate a threat to the archaeological resource
 - c. The formulation of a proposal for further archaeological investigation within a programme of research' (ibid, 2014a: 4).
2. Provide in the report sufficient objective data to enable an informed and reasonable planning decision (ibid, 2014a: 13).

4.2 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 technique(s) 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.

5 Standards

The standards used to complete this survey are defined by the Chartered Institute for Archaeologists (2014a) and Historic England (2008). The codes of approved practice that were followed are those of the Chartered Institute for Archaeologists (2014b) and Archaeology Data Service (undated).

6 Methodology

The magnetometer survey was undertaken in accordance with the survey method statement (Dean, 2017) to achieve the aims and objectives set out in Section 4 using the standards and guidance specified in Section 5. The survey method was selected to provide a relatively fast and cost-effective evaluation of any buried archaeology across the Site.

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. It conforms to the Chartered Institute for Archaeologists standard for geophysical survey (CIfA, 2014a).

7 Site

7.1 Land use

The Site is part of a single agricultural field under stubble at the time of the survey.

7.2 Topology

The Site has an area of approximately 1.55ha and is situated on the northern edge of the hamlet of St Ann's Chapel which lies approximately 8km west-north-west of Kingsbridge. The Site is bounded by a hedgerow and the B3392 road on the south-western side with village infrastructure in the southern corner. The south-eastern and north-eastern sides are bound by a lane leading to Holwell Farm with partial hedging and fencing along its edge. To the north lies the rest of the field (Figure 1).

The land slopes from approximately 120m above Ordnance Datum (AOD) along the south-western boundary to approximately 110m AOD towards the north-eastern boundary with a relatively steep decline to 100m AOD in the eastern corner at the site of St Ann's Well (Figure 2).

7.3 Geology

The bedrock across the Site is slate, siltstone and sandstone of the Devonian Dartmouth Group. The superficial geology was not recorded in the source used (British Geological Survey, undated).

7.4 Soils
Soilscape 12: freely draining, acid, loamy soils over rock (LandIS, undated).

8 Archaeological background

8.1 Historic Environment Status

St. Ann's Well, Scheduled Monument 1019315/Listed Building (II) 1309152, lies within the Site but outwith the housing feasibility scheme area.

8.2 Historic landscape characterisation

'Modern enclosures': These modern fields have been created out of probable medieval enclosures, the area being first enclosed during the later middle ages. A curving form of hedge-banks survives in places which suggests that the land may have been farmed as open strip-fields prior to enclosure (Devon County Council, undated)

8.3 Summary

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 Devon County Council Historic Environment Record (DHER) was examined via the Heritage Gateway (Historic England, undated) 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 DHER entries though relevant to the survey.

9 Results

9.1 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.

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 12.

9.2 Analysis

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 as specified in Table 5. Figure 6 shows the location of the survey grid.

10 Discussion

10.1 General points

10.1.1 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.

10.1.2 Data collection

Data collection along the survey area edges was restricted as shown in Figures 2 to 5 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.

Dense brambles and other vegetation precluded surveying immediately around St Ann's Well (Figures 2 to 6) which is a Scheduled Monument and Grade II listed building (Table 1).

10.1.3 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 present within the dataset. 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.

10.1.4 Data trends

The north-east to south-west set of closely spaced, parallel lines in the data are likely to relate to relatively recent ploughing disturbance (Figures 3 to 6).

10.2 Data relating to historic maps and other records

Magnetic anomaly group **2** coincides with, and likely represents, a former field boundary mapped on the 1843 Bigbury tithe map and on historical Ordnance Survey maps between 1886 and 1953-4. It was removed before the publication of the 1:2,500 Ordnance Survey map in 1974. The anomaly group has a curvilinear trend which, given the historic landscape characterisation assigned to the Site (Section 8.2), implies that the field boundary it represents was probably first created during the later middle ages and followed the course of earlier open strip-fields.

Group **10** coincides with and likely represents a former field boundary mapped on the 1843 Bigbury tithe map but removed before the publication of the First Edition Ordnance Survey map in 1886. As with group 2, the curvilinear trend of group 10 may imply a later medieval origin for the field boundary it represents. Group **12** may be a northern extension of group 10 and, if so, the section of the field boundary represented by group 12 was removed before the publication of the tithe map in 1843.

Anomaly group **13** has magnetic characteristics typically seen over areas of rubble and disturbed ground. It coincides with the position of a house recorded on the 1843 Bigbury tithe map and on historical Ordnance Survey maps between 1886 and 1953-4. Group **11** is likely to represent a garden boundary adjacent to the house and recorded on the tithe map but not on later maps. Group **17** is likely to represent the boundary of a garden and orchard adjacent to the house and mapped between 1886 and 1953-4.

10.3 Data with no previous archaeological provenance

Magnetic anomaly groups **1** and **3** have the same curvilinear trend as groups 2 and 10 (Section 10.2). Given the historic landscape characterisation for the Site (Section 8.2), the same argument can be made for late medieval origins of the field boundaries that groups 1 and 3 represent.

The characteristics of anomaly groups **14** and **16** are often associated with field boundaries of the Devon bank type (a stony core within an earthen bank flanked by ditches).

Group **15** may represent a boundary return but the eastern 'arm' has the same trend as likely modern ploughing disturbance (Section 10.1.4) and so may represent recent disturbance rather than an archaeological deposit.

Group **18** may represent a deposit of rubble of unknown origin or near-surface bedrock.

The remaining anomaly groups (**4, 5, 6, 7, 8, 9** and **12**) have characteristics typically associated with remnants of former field boundaries and enclosures of unknown date.

11 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.

Eighteen magnetic anomaly groups were mapped as representing potential archaeological deposits and features (Figure 2). Of these, two represent field boundaries, possibly of late medieval origin, recorded on the 1843 Bigbury tithe map. One of these boundaries (10) was removed before 1886 and the other (2) between 1953-4 and 1974 as depicted on historic Ordnance Survey maps. A further two anomaly groups (1 and 3) have the same magnetic characteristics and trend. These are most likely to represent similar field boundaries removed before the publication of the tithe map. One group (13) represents rubble and disturbed ground associated with a house mapped in 1843 and demolished between 1953-4 and 1974. Adjacent to the site of the house, one anomaly group (11) represents a garden wall removed between 1843 and 1886 and a second group (17) represents an orchard and garden boundary removed between 1953-4 and 1974. Two groups (14 and 16) may represent segments of field boundaries of the Devon bank type. One (18) group may represent a deposit of rubble or near-surface bedrock. The remaining magnetic anomaly groups (4 to 9, 12 and 15) represent remnants of former field boundaries or enclosures of unknown period and possibly of more than one phase of past land management.

12 Disclaimer

The description and discussion of the results presented in this report are the author's, 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.

13 Copyright

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14 Archive

14.1 Online Access to the Index of archaeological investigationS (OASIS)

OASIS ID: substrat1-311040

The OASIS entry has been completed and the boundary file and report uploaded with a six months delay in publication.

14.2 Substrata Limited archive

A full archive of this survey will be held by Substrata Limited on cloud and local hard drive storage as specified in Appendix 3.

14.3 Archaeological Data Service (ADS)

Depending on local authority policy, an archive may be deposited with the ADS as specified in Appendix 3.

14.4 Historic Environment Record (HER)

Subject to any contractual requirements on confidentiality, a PDF or printed copy of the report will be submitted to the appropriate HER within six months of completion.

15 Acknowledgements

Substrata would like to thank Marc Steinmetzer of Oakford Archaeology for project managing this survey.

16 Bibliography

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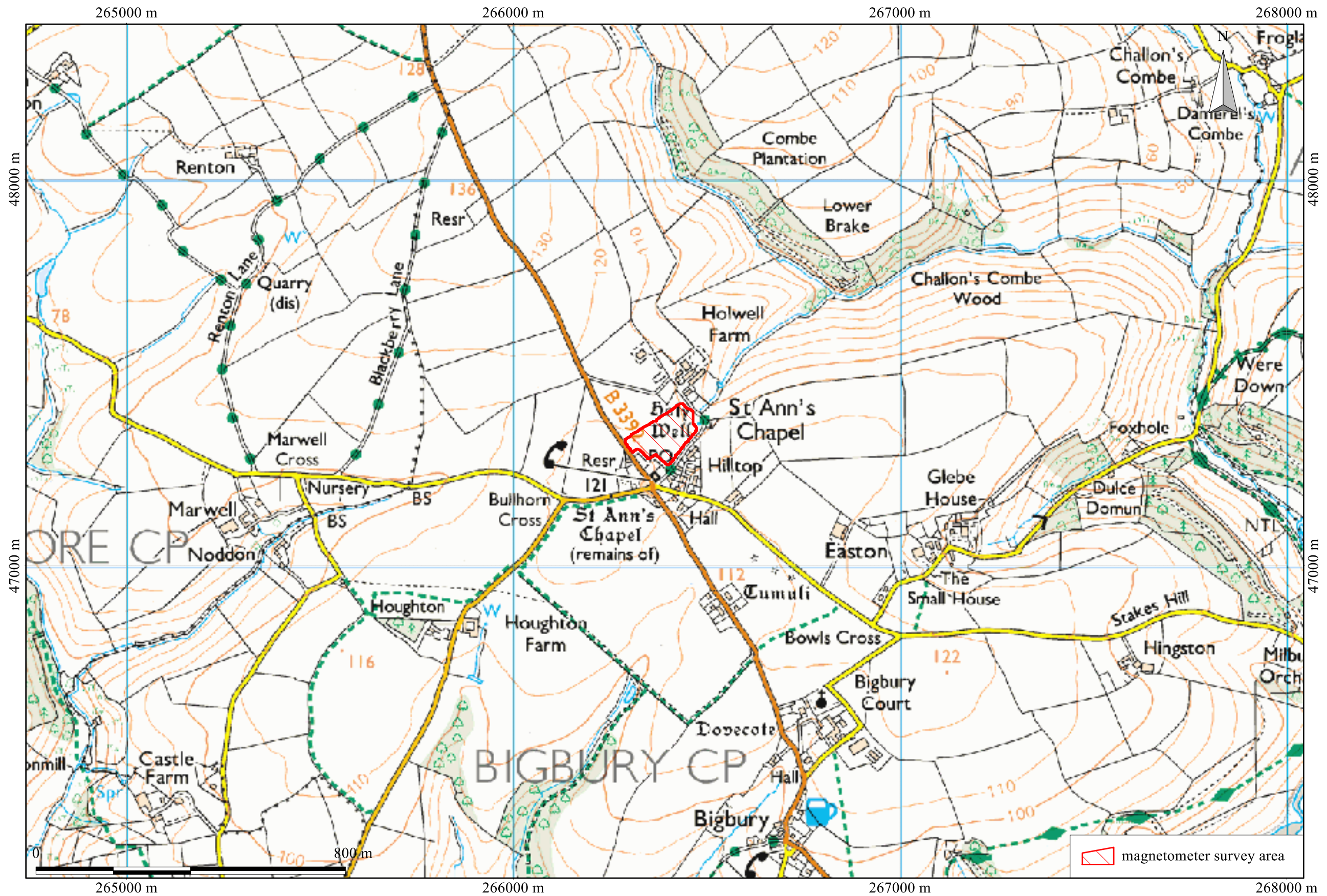
LandIS (undated) *Cranfield Soils and Agrifood Institute Soilscales* [Online], Available: <http://www.landis.org.uk/soilscales/> [March 2018]

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.



British Grid
 centre X: 266391.70 m, centre Y: 47296.58 m

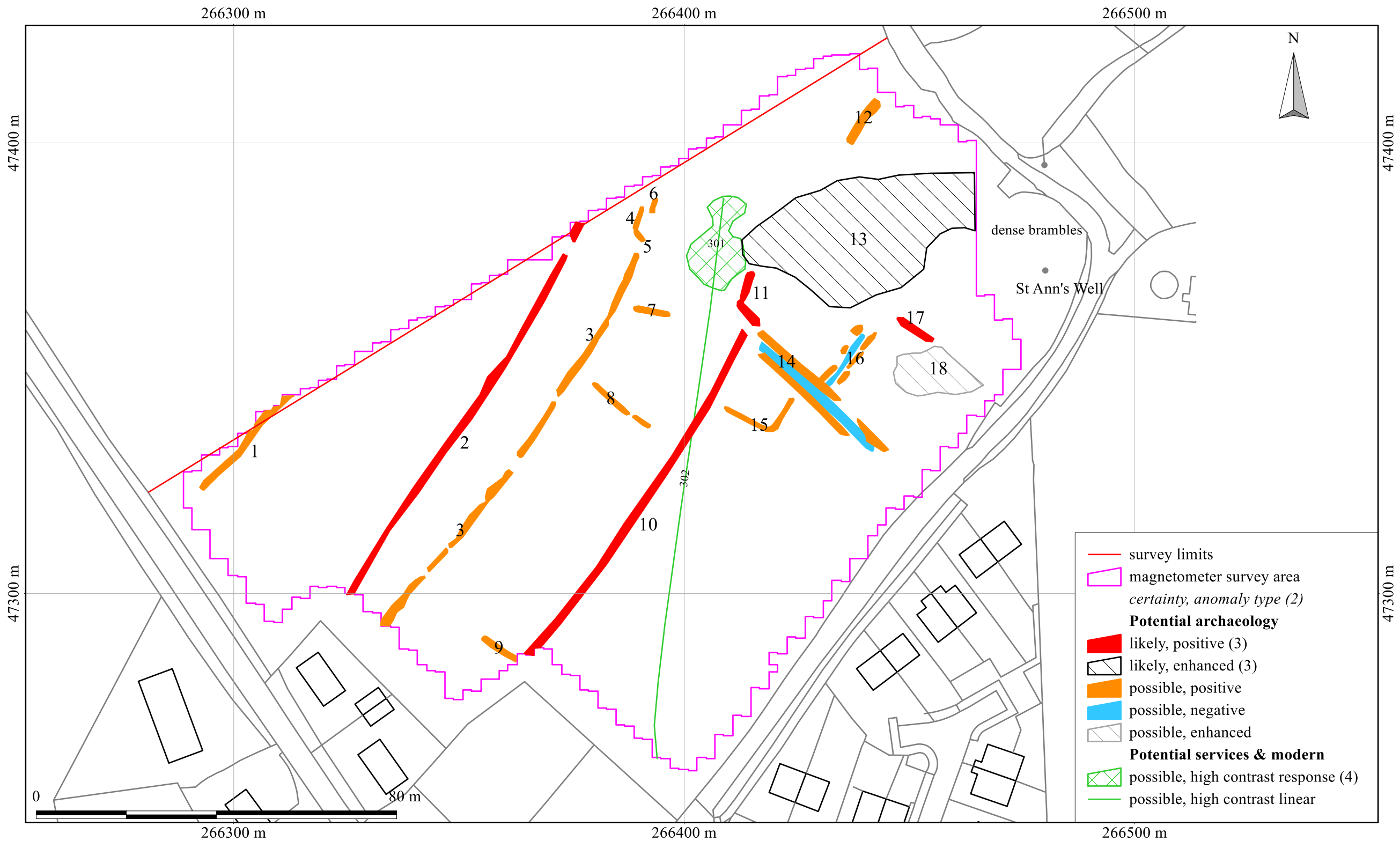
Scale: 1:10000 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
 Base map: Ordnance Survey (c) Crown Copyright 2018.
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An archaeological magnetometer survey
 St Ann's Chapel, Kingsbridge, Devon
 Centred on NGR (E/N): 266395,047330
 Report: 1710ANN-R-1

Figure 1: location map

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British Grid
 centre X: 266403.91 m, centre Y: 47337.62 m

Scale: 1:900 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
 Base map: Ordnance Survey (c) Crown Copyright 2018.
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- 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.

An archaeological magnetometer survey
 St Ann's Chapel, Kingsbridge, Devon
 Centred on NGR (E/N): 266395,047330
 Report: 1710ANN-R-1

Figure 2: survey interpretation

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 Web: substrata.co.uk



British Grid
 centre X: 266403.91 m, centre Y: 47337.62 m

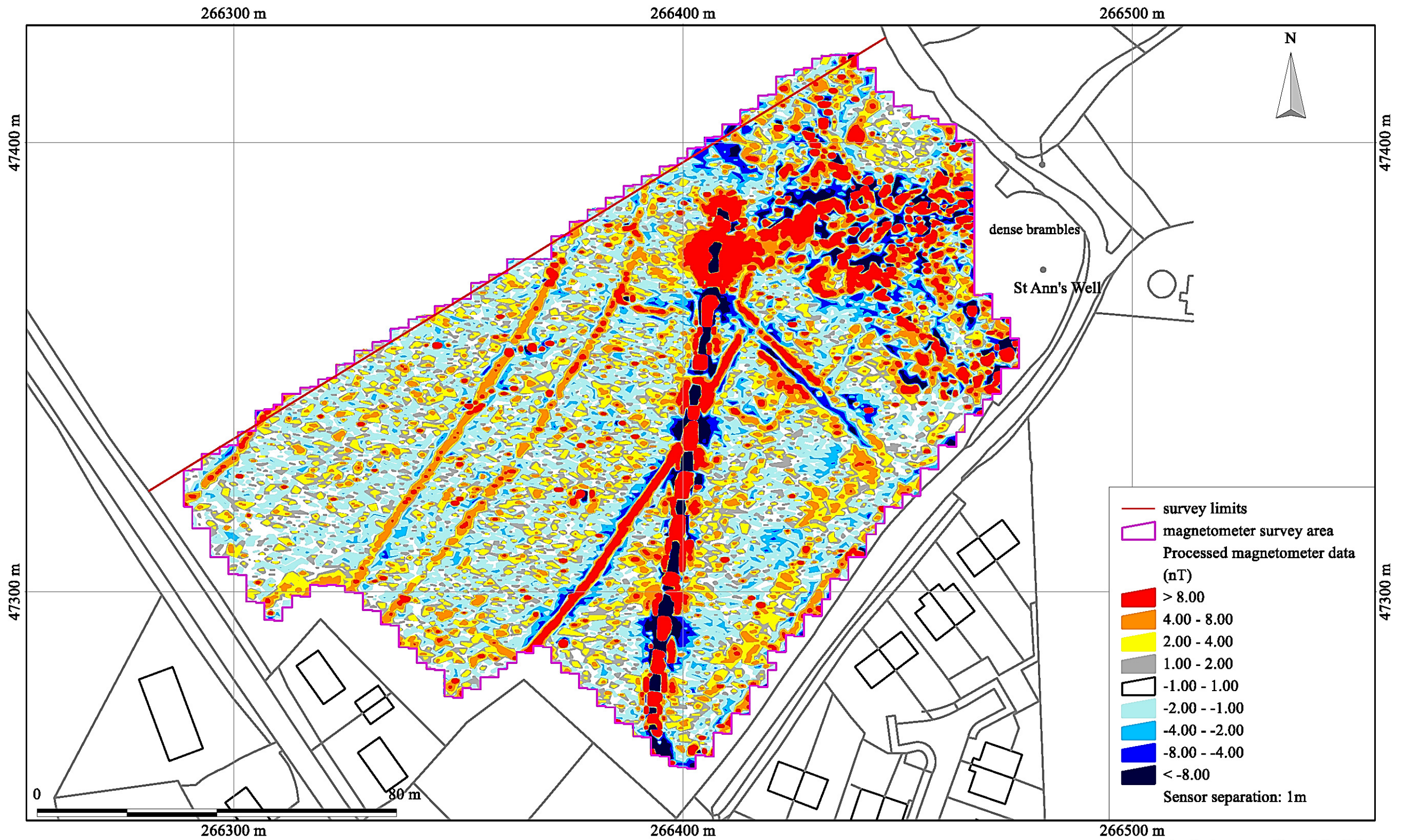
Scale: 1:900 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
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An archaeological magnetometer survey
 St Ann's Chapel, Kingsbridge, Devon
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 Report: 1710ANN-R-1

Figure 3: shade plot of processed data

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British Grid
centre X: 266403.91 m, centre Y: 47337.62 m

Scale: 1:900 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
Base map: Ordnance Survey (c) Crown Copyright 2018.
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An archaeological magnetometer survey
St Ann's Chapel, Kingsbridge, Devon
Centred on NGR (E/N): 266395,047330
Report: 1710ANN-R-1

Figure 4: contour plot of processed data

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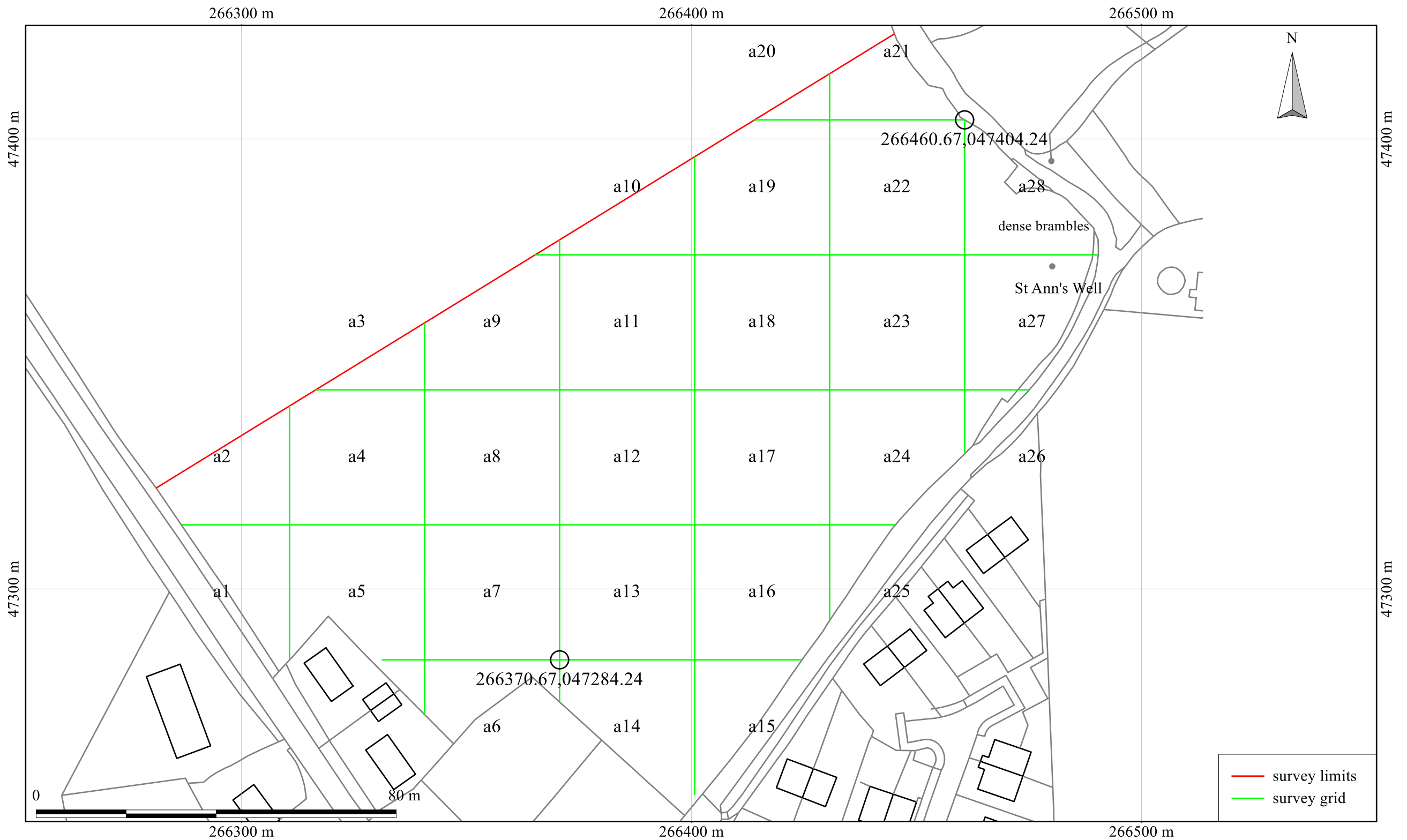


British Grid
 centre X: 266403.91 m, centre Y: 47337.62 m

Scale: 1:900 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
 Base map: Ordnance Survey (c) Crown Copyright 2018.
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Figure 5: shade plot of minimally processed data



British Grid
 centre X: 266402.11 m, centre Y: 47336.77 m

Scale: 1:900 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
 Base map: Ordnance Survey (c) Crown Copyright 2018.
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Figure 6: survey grid location and labels

Appendix 2 Tables

An archaeological magnetometer survey
 St Ann's Chapel, Kingsbridge, Devon
 Centred on NGR (E/N): 266395,047330
 Report: 1710ANN-R-1

County: Devon
 District: South Hams
 Parish: Bigbury
 Source: Heritage Gateway

HER number	grid reference	designations	type	period	description	distance (m) from site centre	bearing (GN) from site centre
MDV4873 MDV36059	SX 664 473	Scheduled Monument 1019315 Listed Building (II) 1309152	Holy Well	Medieval - 1066 AD to 1539 AD	Medieval holy well known at St. Ann's Well situated to the south of Holwell Farm	30	171
MDV19444	SX 664 474		Farmstead	XI to Late Medieval - 1001 AD to 1539 AD	Holwell was part of the manor of bigbury (bicheberia), in domesday.	70	4
MDV118254	SX 663 471		Enclosure/Field system	Unknown	A gradiometer survey identified a number of anomalies including a curvilinear anomaly	249	202
MDV113767	SX 665 471		Archaeological Feature	Unknown	Geophysical survey recorded four possible discreet anomalies	253	155
MDV118255	SX 663 470		Archaeological Feature	Unknown	A gradiometer survey identified a number of anomalies, possible rectilinear enclosure	343	196
MDV118257	SX 663 470		Round Barrow? Pit?	Bronze Age - 2200 BC to 701 BC/ Unknown	A gradiometer survey identified a number of anomalies on Land at St Ann's Chapel including a distinct anomaly group with a sub-circular pattern	343	196
MDV118261	SX 663 470		Field boundary	XIX to XX - 1880 AD to 1960 AD	A gradiometer survey identified a number of anomalies	343	196
MDV113766	SX 665 470		Archaeological Feature	Unknown	Geophysical survey recorded several linear anomalies	346	162
MDV114928	SX 665 470		Archaeological Feature	Unknown	Archaeological features visible on the 1946 Royal Air Force aerial photographs.	346	162
MDV36059	SX 666 470	Scheduled Monument 1019239	Barrow	Neolithic - 4000 BC to 2201 BC	Neolithic long barrow, of tapering form, with proximal end at south-west.	388	148
MDV50110	SX 663 469		Enclosure	Prehistoric - 698000 BC to 42 AD	Sub-rectangular enclosure measuring about 60m x 50m, recorded from aerial photographs 1992	440	192
MDV36060	SX 666 469	Scheduled Monument 1019239	Barrow	Late Neolithic to Late Bronze Age - 3000 BC to 701 BC	Small bowl barrow, the central one of three barrows to the south-east of Chapelcombe.	476	155
MDV16575	SX 667 469	Scheduled Monument 1019239	Barrow	Late Neolithic to Late Bronze Age - 3000 BC to 701 BC	Bowl Barrow. The easternmost of three barrows to the south-east of Chapelcombe. The largest of the group, it has been cut on the north-east side by a road.	527	145

Table 1: Historical Environment entries thought relevant to geophysical survey

Site: An archaeological magnetometer survey
 St Ann's Chapel, Kingsbridge, Devon
 Centred on NGR (E/N): 266395,047330
 Report: 1710ANN-R-1

anomaly group	associated anomalies	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
1		possible, positive	linear			
2		likely, positive	disrupted curvilinear	field boundary	anomaly group coincides with and likely represents part of a field boundary recorded on the Bigbury tithe map and on later Ordnance Survey maps, removed after 1953-4 and before 1974	1843 Bigbury tithe map, Ordnance Survey maps 1886 1:2500 to 1974 1:2500
3	6?	possible, positive	disrupted curvilinear			
4	5?	possible, positive	linear		not certain whether groups 4 and 5 represent separate linear features or a single return	
5	4?	possible, positive	linear		not certain whether groups 4 and 5 represent separate linear features or a single return	
6	3?	possible, positive	linear			
7		possible, positive	linear			
8		possible, positive	disrupted linear			
9		possible, positive	linear			
10		likely, positive	curvilinear	field boundary	anomaly group coincides with and likely represents a field boundary recorded on the Bigbury tithe map but not on later Ordnance Survey maps, removed before 1886	1843 Bigbury tithe map
11		likely, positive	return	garden boundary	anomaly group coincides with and likely represents part of a garden boundary recorded in the Bigbury tithe apportionment and map but not on later Ordnance Survey maps, removed before 1886	1842 Bigbury tithe apportionment and 1843 Bigbury tithe map
12		possible, positive	linear			
13		likely, enhanced	irregular	building rubble and disturbed ground	anomaly group coincides with a house recorded in the Bigbury tithe apportionment and map, and on later Ordnance Survey maps, removed after 1953-4 and before 1974	1842 Bigbury tithe apportionment and 1843 Bigbury tithe map, Ordnance Survey maps 1886 1:2500 to 1974 1:2500
14		possible, positive/negative/positive	linear	Devon bank field boundary		
15		possible, positive	return	enclosure or field corner?		
16		possible, positive/negative/positive	disrupted linear	Devon bank field boundary		
17		likely, positive	linear	garden and orchard boundary	anomaly group coincides with and likely represents part of a garden and orchard boundary recorded in the Bigbury tithe apportionment and map, and on later Ordnance Survey maps, removed after 1953-4 and before 1974	1842 Bigbury tithe apportionment and Bigbury tithe map, Ordnance Survey maps 1886 1:2500 to 1974 1:2500
18		possible, enhanced	irregular	rubble, disturbed ground or near-surface bedrock		
301		possible, high contrast response	irregular	ferrous material associated with a service		
302		possible, high contrast linear		service ferrous pipe or cable		

Table 2: data analysis

Grid <i>Method of Fixing:</i> DGPS set-out using pre-planned survey grids and Ordnance Survey coordinates. <i>Composition:</i> 30m by 30m grids <i>Recording:</i> Geo-referenced and recorded using digital map tiles. <i>DGPS used:</i> Spectra Precision PM5V2 GPS with external antenna and survey pole and DigiTerra Explorer 7 as the survey control program.	
Equipment <i>Instrument:</i> Bartington Instruments grad601-2 <i>Firmware:</i> version 6.1	Data Capture <i>Sample Interval:</i> 0.25m <i>Traverse Interval:</i> 1 metre <i>Traverse Method:</i> zigzag <i>Traverse Orientation:</i> GN
Data Processing, Analysis and Presentation Software 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: nT Direction of 1st Traverse: see below Collection Method: ZigZag Sensors: 2 @ 1.00 m spacing. Dummy Value: 32702	
Program Name: TerraSurveyor Version: 3.0.33.6	
Statistics Max: 331.20 Min: -322.70 Std Dev: 28.22 Mean: 0.42 Median: 0.00	Processing 1 Base Layer 2 Clip at 1.00 SD 3 DeStripe Median Traverse: Grids: All 4 De Stagger: Grids: All By: 0 intervals, 25.00cm 5 De Stagger: Grids: all.xgd By: 0 intervals, -50.00cm 6 Interpolate: Match X & Y Doubled.

Table 4: processed data metadata

Instrument Type: Bartington Grad-601 gradiometer Units: nT Direction of 1st Traverse: see below Collection Method: ZigZag Sensors: 2 @ 1.00 m spacing. Dummy Value: 32702	
Program Name: TerraSurveyor Version: 3.0.33.6	
Statistics Max: 3000.00 Min: -3000.00 Std Dev: 255.74 Mean: -2.73 Median: -0.34	Processing 1 Base Layer 2 Interpolate: Match X & Y Doubled to allow export of the data to a GIS 3 Clip from -3000.00 to 3000.00 nT to reduce interpolated data magnitude expansion beyond the limits of the recording instrument.

Table 5: minimally processed data metadata

Appendix 3 Project archive contents

A3.1 Substrata Limited archive

A full archive of this survey will be held by Substrata Limited on cloud and local hard drive storage as follows:

Report:	Adobe PDF format
Raw grid & composite files:	DW Consulting TerraSurveyor 3 format xyz files
Final data processing composite files: (excluding interpolation processes)	DW Consulting TerraSurveyor 3 format xyz files
GIS project:	GIS project Manifold 8 .map format ESRI shape files
AutoCAD version of the survey interpretation: (if generated)	AutoCAD DXF
All project working files:	various (Table 3)

A3.2 Online Access to the Index of archaeological investigationS (OASIS)

Metadata:	online form
Georeferenced survey boundary file:	ESRI shape file
Report:	Adobe PDF format

A3.3 Archaeological Data Service

Depending on local authority policy, an archive may be deposited with the ADS as follows:

Raw data composite file:	xyz file
Processed data plot:	rendered images in TIFF format
Survey grid plot:	image in TIFF format
Details of data processing:	image in TIFF format
Interpretation plot:	rendered images in TIFF format
Metadata:	Microsoft Excel format

A3.4 Historic Environment Record (HER)

Subject to any contractual requirements on confidentiality, a PDF copy of the report will be submitted to the appropriate HER within 6 months of the completion of this report via the OASIS process or by other means, depending on the relevant HER process.