

GEOPHYSICAL SURVEY REPORT

**Norton Fitzwarren Hillfort, Norton Fitzwarren,
Somerset**

Client

South West Heritage Trust

For

Somerset West and Taunton Council

Survey Report
05788

OASIS Ref. No.
sumogeop1-505861

HER Event No.
45755

Date

6 April 2022



Survey Report 06791: Norton Fitzwarren Hillfort, Norton Fitzwarren, Somerset

Survey dates	15 March 2022
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Report Date	06 April 2022
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3 SURVEY TECHNIQUE

3.1 Detailed magnetic survey (magnetometry) was chosen as the most efficient and effective method of locating the type of archaeological anomalies which might be expected at this site.

Bartington Grad 601-2

Traverse Interval 1.0m

Sample Interval 0.125m

The only processes performed on data are the following unless specifically stated otherwise:

Zero Mean Traverse	This process sets the background mean of each traverse within each grid to zero. The operation removes instrument striping effects and edge discontinuities over the whole of the data set.
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4 SUMMARY OF RESULTS

- 4.1 A magnetometer survey of approximately 5ha of land covering the interior of Norton Fitzwarren hillfort, has identified a complex of magnetic responses spread across the hillfort. As such, the results have accurately located the archaeological features visible in aerial photographs; enclosures and ring features have been mapped and potential fired features highlighted.

5 INTRODUCTION

- 5.1 SUMO Geophysics Ltd were commissioned to undertake a geophysical survey as part of the long-term management of this site being carried out by **South West Heritage Trust** on behalf of **Historic England** and **Somerset West and Taunton Council**.

- 5.2 The site is a Scheduled Monument: Norton Fitzwarren Hillfort, TA2 6RH, Monument no: 100846, Case No:SL00234250: A section 42 Licence was granted by Historic England.

5.3 Site Details

NGR / Postcode	ST19608 26325 / TA2 6RH
Location	The hillfort lies approximately 3km north-west of the centre of Taunton on the northern outskirts of Norton Fitzwarren
HER	Somerset
HER Event No.	45755
Monument No.	1008467
OASIS Ref. No.	sumogeop1-505861
District	Somerset West and Taunton
Parish	Norton Fitzwarren CP
Topography	The hillfort sits on a shallow knoll some 50 to 55m aOD
Land Use	Pasture
Geology (BGS 2022)	Bedrock: Mercia Mudstone Group - mudstone and halite-stone Superficial: River Terrace Deposits, 2 - sand and gravel
Soils (CU 2022)	Soilscape 8: slightly acid loamy and clayey soils with impeded drainage
Survey Methods	Magnetometer survey (fluxgate gradiometer)
Study Area	c.5ha

5.4 Archaeology (SWHT 2021)

- 5.4.1 A hill-top contour fort enclosing c.5ha with three entrances, each a deep hollow way. The defences are univallate and now consist of a scarp up to 3m high. The three holloways are about 450m long and up to 6m deep at the inner end.
- 5.4.2 A trench was excavated across the ditch on the WNW side of the hillfort in 1908 (Gray 1908). The ditch was found to be 9ft (2.75m) deep, originating in the Middle Bronze Age with Iron Age and Romano-British layers above. Trenches across the defences in 1968-71 showed creation in middle Bronze Age and recut in Iron Age and silted up during Romano-British period. In the interior, trenches found gullies of IA date, area of RB metalworking, pits of IA and RB date and a possible RB kiln. Moulds for BA swords were found. Mesolithic and Neolithic flint suggest activity during those periods but no definite features were recorded. Examination of slags etc

from the excavations suggested that they were evidence for small-scale smithing in the Roman or later periods (Budd 1987).

5.4.3 Aerial photographs taken between 1989 and 1991 show numerous internal features visible as cropmarks. At least 5 circular or sub-circular ditched features are visible c.12-18 metres diameter. A sub rectangular ditched enclosure (plus associated features) c.30 by 25m, with an east-facing entrance, is located just inside the northern rampart. The clearest air photo is shown below suggesting the presence of multiple enclosures and activity of probably several phases.

5.4.4 Local folklore says that "When Taunton was a furzey down, Norton was a market town". Also a dragon is reputed to have lived at the hillfort before being slain by Fulk Fitzwarren.

5.5 Aims and Objectives

- Identify the presence of internal features within the hillfort (enclosures, buildings, trackways etc)
- Clarify what is happening around the holloway entrances into the site
- Identify any potential areas of significant metalworking/industrial activity
- To identify any areas of metalworking or cooking/baking within the hillfort.

6 RESULTS

6.1 **Archaeology** (*Background notes taken from Official List Entry for Scheduled Monument or the Project Brief*)

6.2 **Internal features –**

6.2.1 A sub rectangular ditched enclosure (plus associated features) c.30 by 25m, with an east-facing entrance, is located just inside the northern rampart.

6.2.2 This enclosure is clearly visible in the magnetic data [1]. There appear to be two offset large pits or gullies at the eastern entrance and indications of another break in the southern ditch anomaly which could imply a second entrance. Possible ditch-like responses [2] are visible stretching across the area to the south, while to the north is another enclosure [3] apparently attached the northern rampart on the aerial photographs (see Fig 05).

6.2.3 Aerial photographs have shown a complex of sub-square...enclosures beneath the ground within the interior of the fort, which are Romano-British in form.

6.2.4 A large sub-rectangular ditched enclosure [4] measures approximately 45m x 33m with two possible entrances; one in the south-east corner and one in the north-east. There may also be a break in the north-west corner and perhaps an internal division; the results are not totally clear. To the north-east and following a similar NE-SW and NW-SE alignment to this enclosure is a further series of linear responses [5] suggesting additional enclosures. In fact this regular pattern / form is followed by numerous of other ditches to the east and south-east including: a polygonal open-sided enclosure [6]; poorly defined linear trends [7]; two sub-rectangular enclosures, the first [8] abuts the south-western rampart while the second [9] appears to have three sides. Finally, more broken linear responses are present around [10].

6.3 ***Circular features***

- 6.3.1 A cluster of magnetic responses appear to form a sub-circular ring [11] some 15m in diameter, though other curvilinear trends are partially masking the results. A second ring or annular response [12] measures approximately 17m x 19m with a clear break on the south-western side; as such this would appear to be a former round house. It should be noted that it is not possible on the basis of the magnetic data alone to establish whether this ring is earlier in date than the polygonal enclosure [6]. More tentative ring / oval features are visible at [13] and [14].
- 6.3.2 Holloway entrances - The interior of the fort is approached by three hollow ways up to 6m deep, from the WSW, north, and south east, ending a short way inside the ramparts. That from the WSW is broadest and deepest, and divides into two below the rampart. There is now a steep face at the end of these ways into the fort, but aerial photographs show that they originally extended into the interior. There are a number of other gaps in the ramparts, of which most are modern, but excavation indicated that the entrance on the west, which appeared to be on the site of an entrance to the previous Bronze Age enclosure, may have continued in use in the initial hillfort. On the eastern side of the fort is an opposite gap, now overgrown, and in its original form the fort may have had a more usual arrangement of opposing east/west entrances.
- 6.3.3 There are slight indications in the magnetic data of two trackways [15] and [16] extending into the hillfort from the WSW Holloway and similar responses at [17] near the N entrance and at [18] extending from the SE entrance which could have the same interpretation. Stronger magnetic responses are visible at [19] and if they are also associated with a track, the magnetic data could support a that there was a break at this point on the eastern side of the hillfort, opposite the WSW entrance (however, the putative 'eastern entrance' might be at [20] where there seems to be modern disturbance?).

6.4 ***Metalworking / Ovens***

- 6.4.1 Tentative fired features are shown on the interpretation figure; none of the responses are definitely thermoremanent in origin but the highlighted anomalies might indicate small-scale features that have a burnt component. However, they could be a result of ferrous objects below the topsoil.

6.5 ***Ferrous / Magnetic Disturbance***

- 6.5.1 Ferrous responses close to boundaries are due to adjacent fences and gates. Smaller scale ferrous anomalies ("iron spikes") are present throughout the data and are characteristic of small pieces of ferrous debris (or brick / tile) in the topsoil; they are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretation diagram.

7 **DATA APPRAISAL & CONFIDENCE ASSESSMENT**

- 7.1 Historic England guidelines (EH 2008: see references) Table 4 states that the typical magnetic response on the local soils / geology is variable. The results from this survey indicate the presence of a range of archaeological features; as a consequence, the technique is deemed to have worked well.

8 CONCLUSION

- 8.1 The magnetometer survey has identified a number of features of archaeological interest and there is generally very good correlation with the aerial photographic evidence; the geophysical data has the advantage of being accurately georeferenced making any targeted excavation far easier to locate.
- 8.2 The results confirm the presence of a number of enclosures, many on a similar alignment; a few ring ditches, some well-defined, others less so; several pit-like responses plus tentative fired features. Short lengths of tracks are visible near the entrances, but these cannot be traced across the fort.

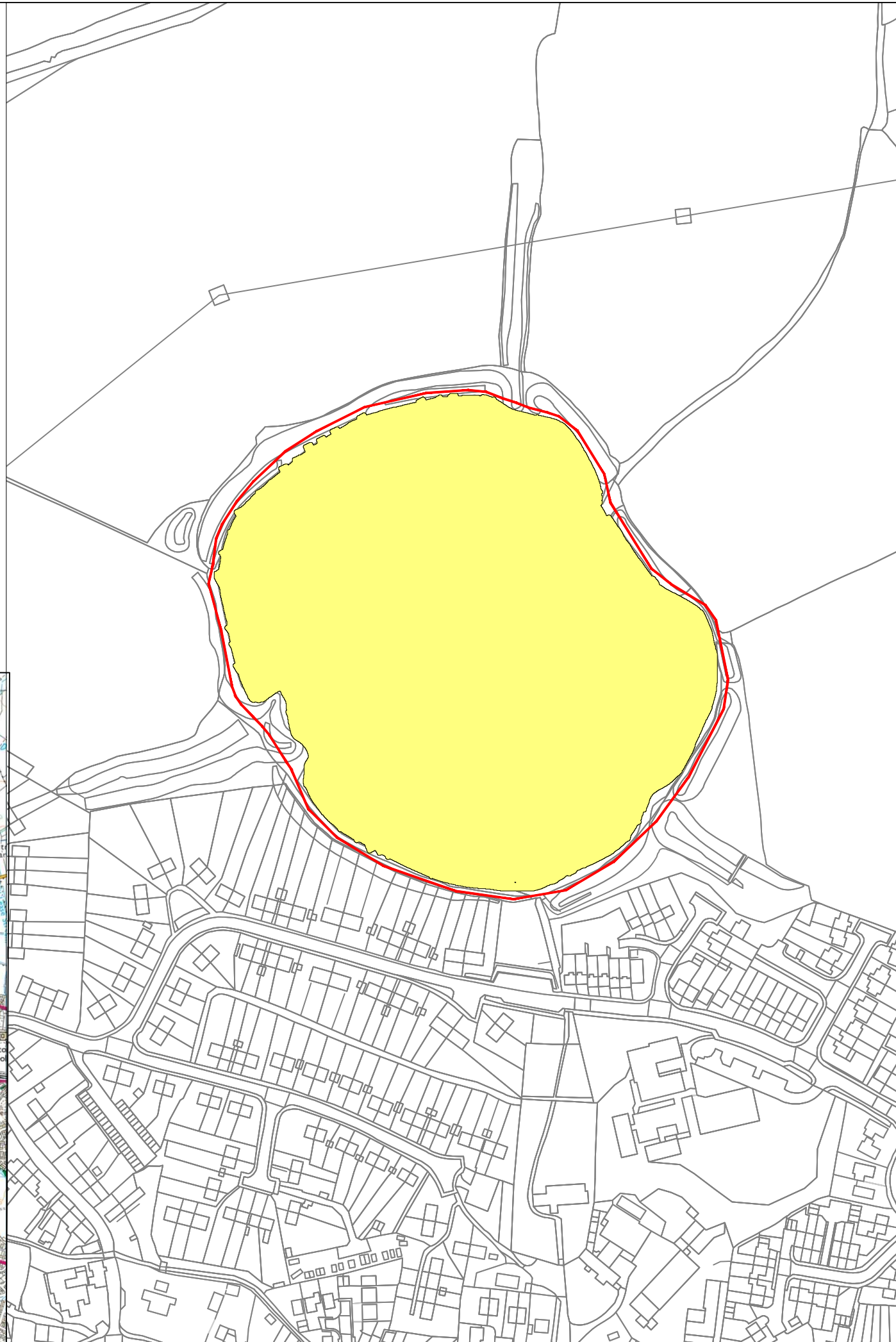
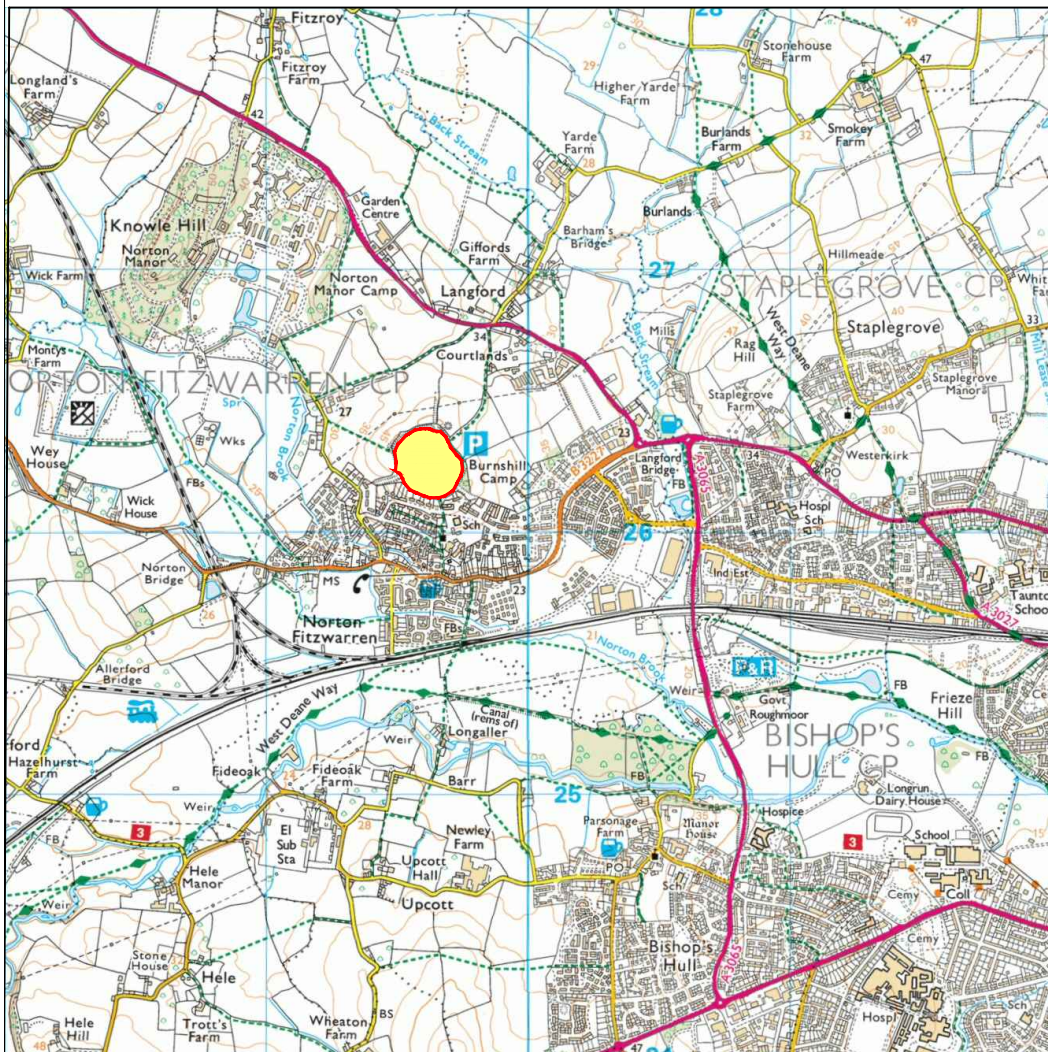
9 REFERENCES

- BGS 2022 British Geological Survey, Geology of Britain viewer *website*:
(<http://www.bgs.ac.uk/opengeoscience/home.html?Accordion1=1#maps>) [accessed 01/03/2022]
- Budd, P. 1987. *The Evidence for Metalworking from Norton Fitzwarren Hillfort, Somerset*. English Heritage report No: 64/87 Copy in HER file. HER source: 46851,
- ClfA 2014 (updated 2020) *Standard and Guidance for Archaeological Geophysical Survey*. ClfA Guidance note. Chartered Institute for Archaeologists, Reading.
https://www.archaeologists.net/sites/default/files/ClfAS%26GGeophysics_3.pdf
- CU 2022 The Soils Guide. Available: www.landis.org.uk. Cranfield University, UK. *website*:
<http://mapapps2.bgs.ac.uk/ukso/home.html> [accessed 01/03/2022]
- Dymond, CW. 1872 Norton Camp. Somerset Archaeology and Natural History, 18, 43-46.
- EAC 2016 *EAC Guidelines for the Use of Geophysics in Archaeology*, European Archaeological Council, Guidelines 2.
- Ellis, P. 1989 *Norton Fitzwarren hillfort: a report on the excavations by Nancy and Philip Langmaid between 1968 and 1971*. Somerset Archaeology and Natural History, 133, 1-74
- EH 2008 *Geophysical Survey in Archaeological Field Evaluation*. English Heritage, Swindon. (now withdrawn, but used for evaluating suitability of soil types)
- Gray, H. St. G. 1908 *Excavations at Norton Camp, near Taunton*. Somerset Archaeology and Natural History, 54, 131-143.
- SWHT 2021 *Brief For Geophysical Survey Norton Fitzwarren Hillfort*, South Western Heritage Trust, November 2021.

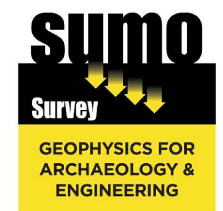
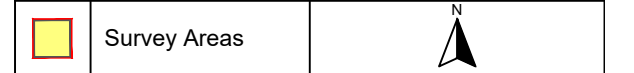
10 ARCHIVE

- 10.1 The minimally processed data, data images, XY traces and a copy of this report are stored in **SUMO Geophysics Ltd.'s** digital archive, on an internal RAID configured NAS drive in the Midland's Office. These data are also backed up to the Cloud for off-site storage.
- 10.2 The Grey Literature will be archived with OASIS and the relevant HER within a period of 12 months

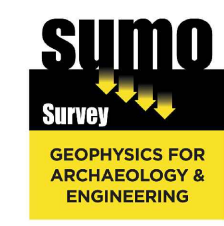
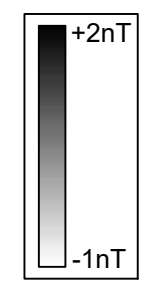
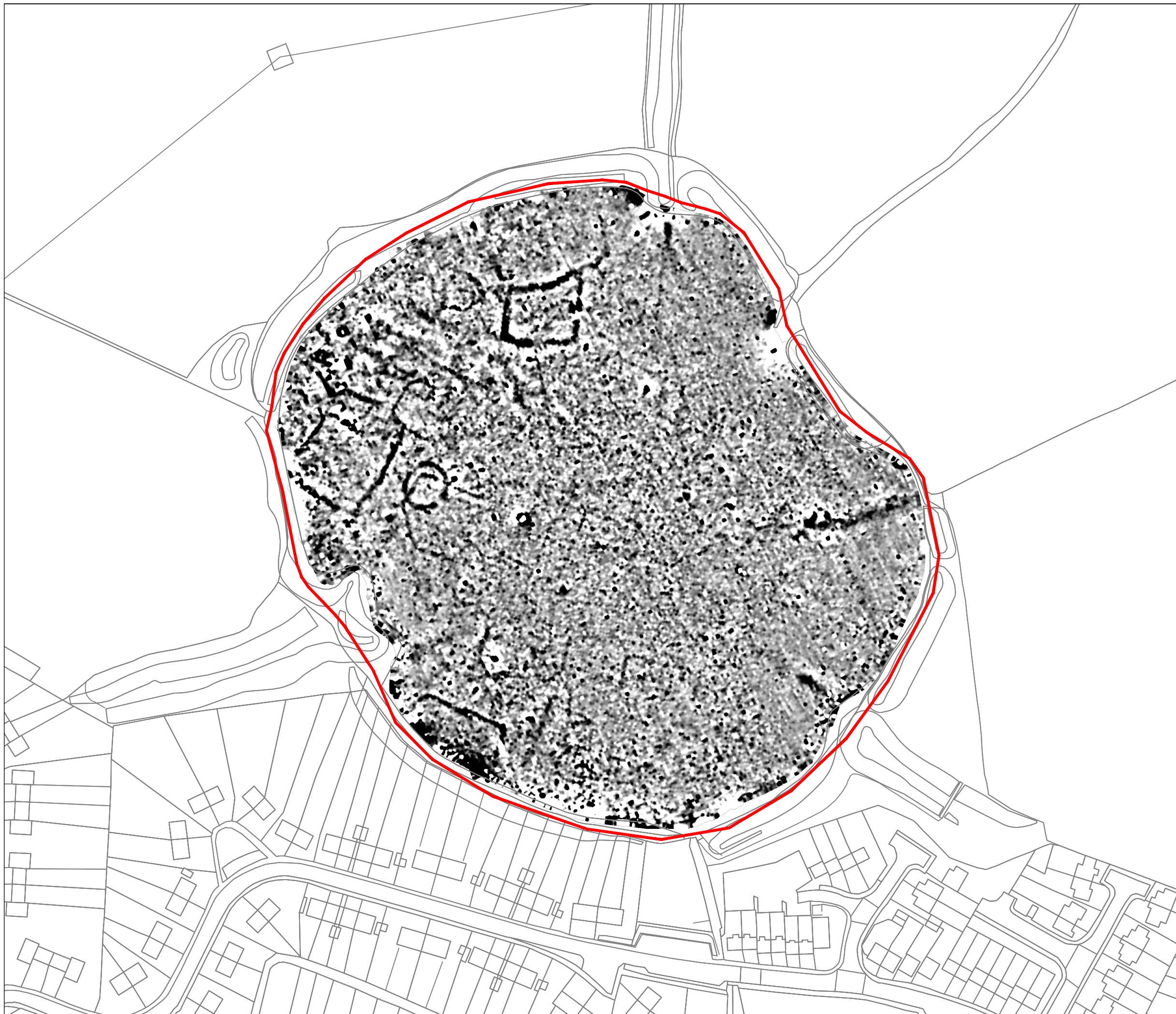
Survey Area



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Title:	Site Location	
Client:	South West Heritage Trust	
Project:	05788 Norton Fitzwarren	
Scale:	NOT TO SCALE	Fig No: 01



Title: Magnetometer Survey - Greyscale Plot

Client: South West Heritage Trust

Project: 05788 Norton Fitzwarren

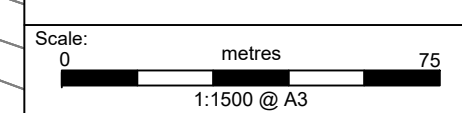
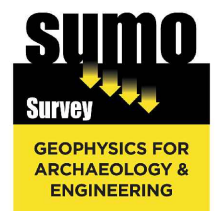
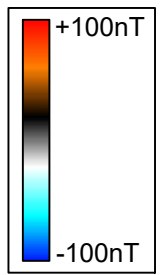
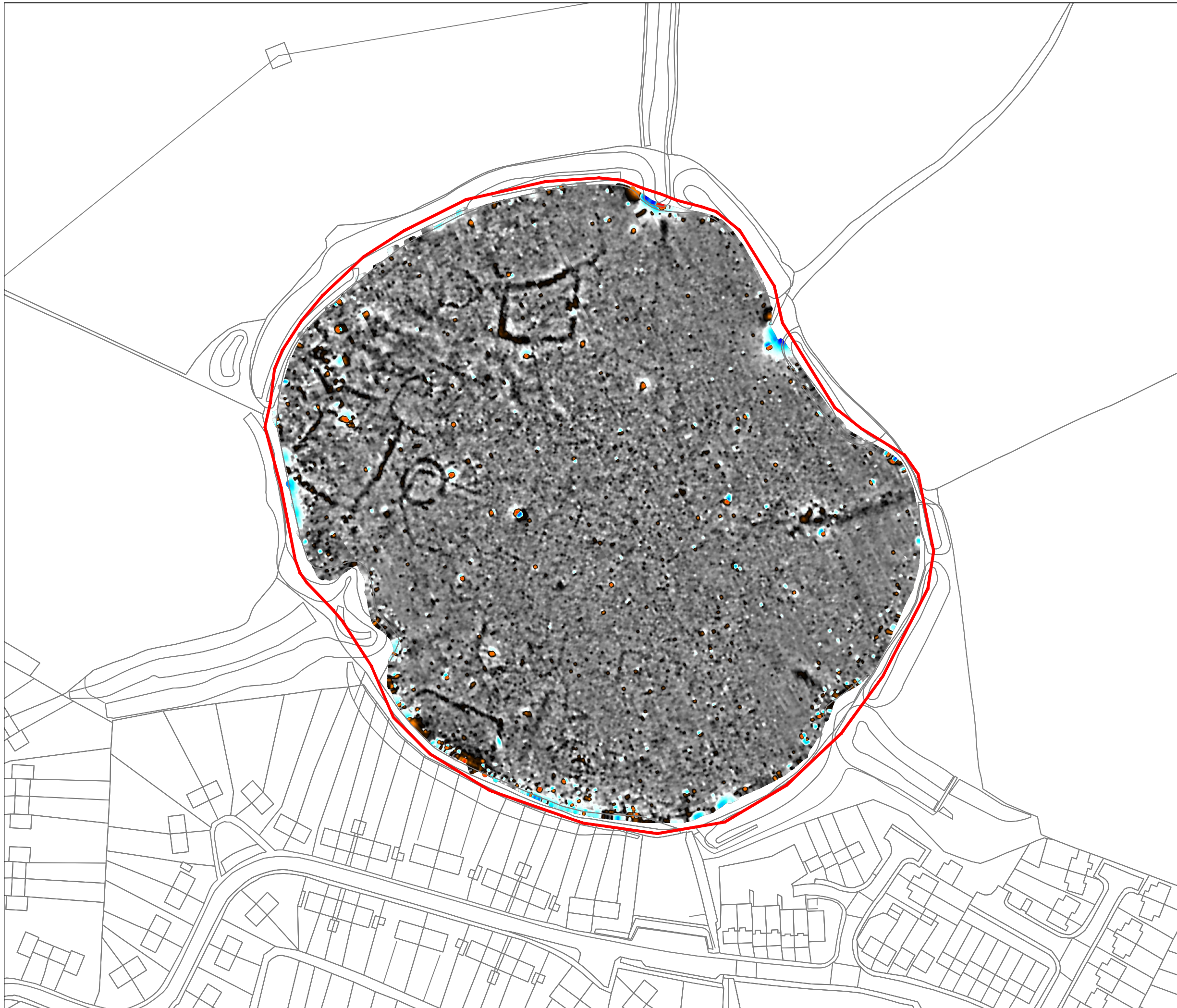


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Title: Magnetometer Survey - Colour Plot

Client: South West Heritage Trust





Project: 05788 Norton Fitzwarren

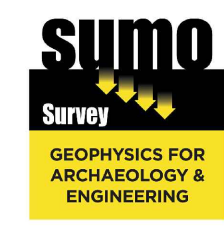
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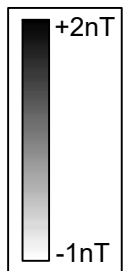
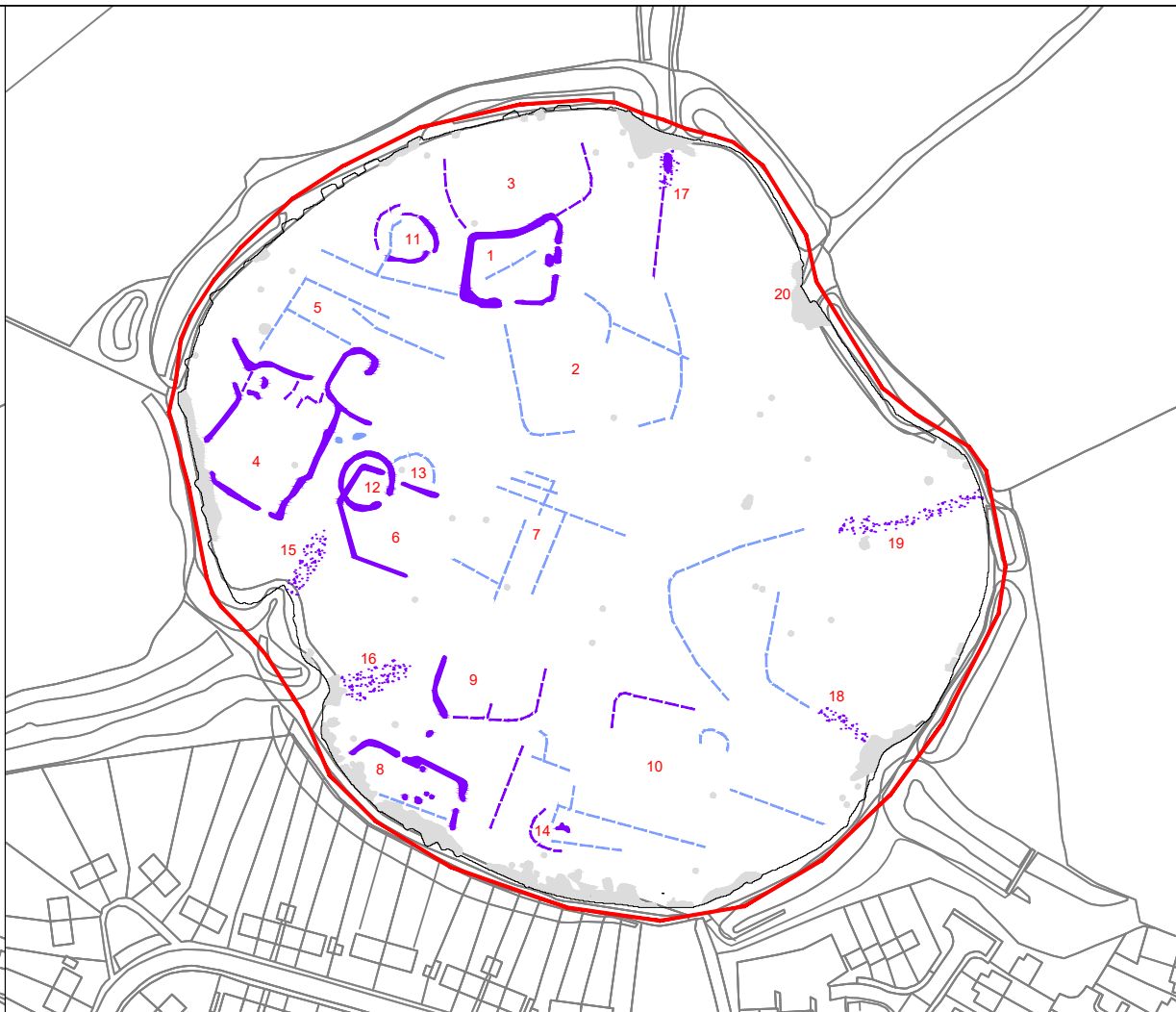
KEY

	?Fired features
	Probable archaeology (discrete anomaly / trend / increased response)
	Possible archaeology (discrete anomaly / trend)
	Ferrous



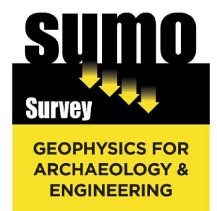
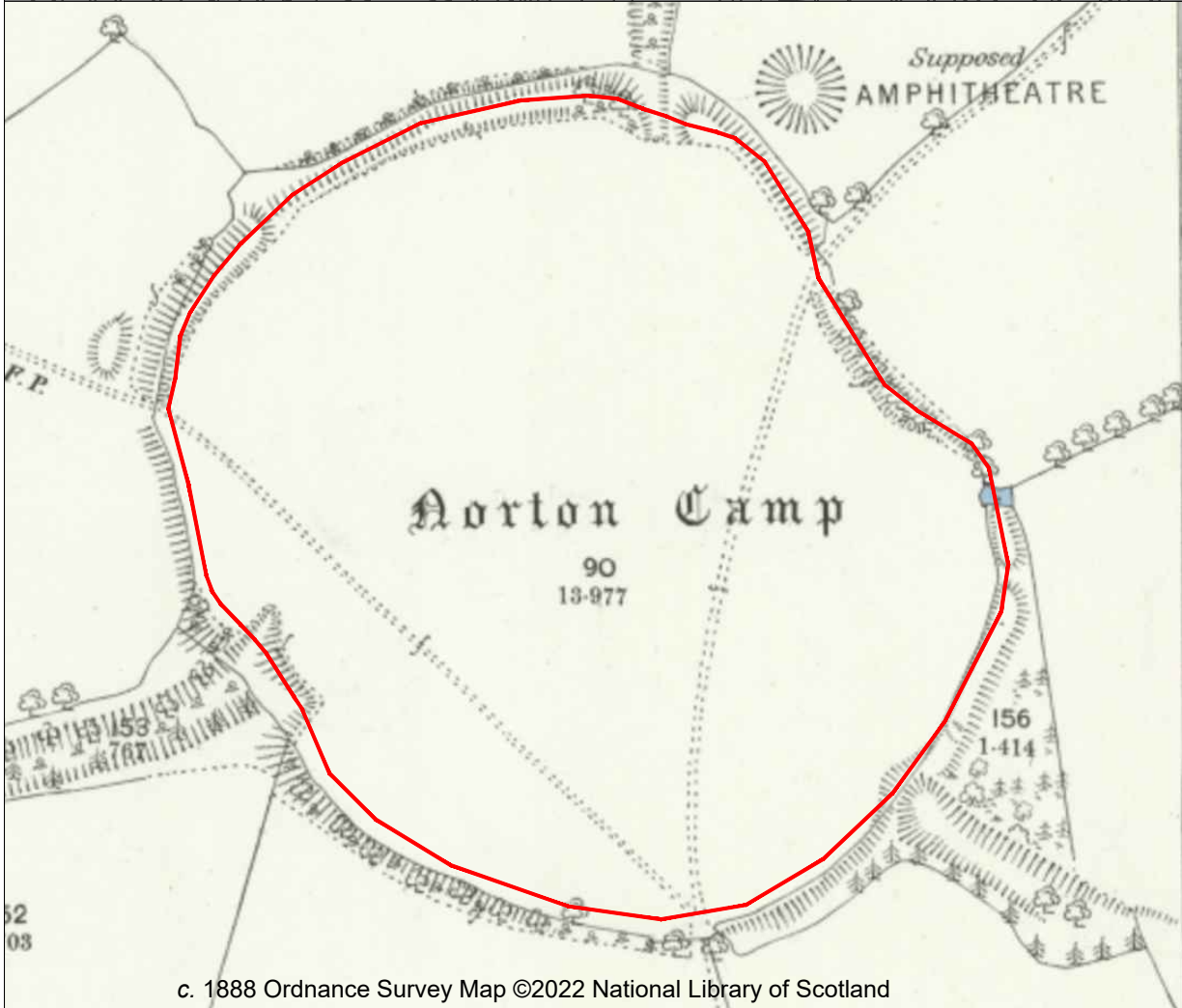
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Client:	South West Heritage Trust
Project:	05788 Norton Fitzwarren

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KEY

	?Fired features
	Probable archaeology (discrete anomaly / trend / increased response)
	Possible archaeology (discrete anomaly / trend)
	Ferrous



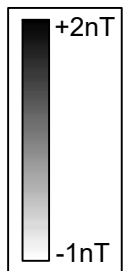
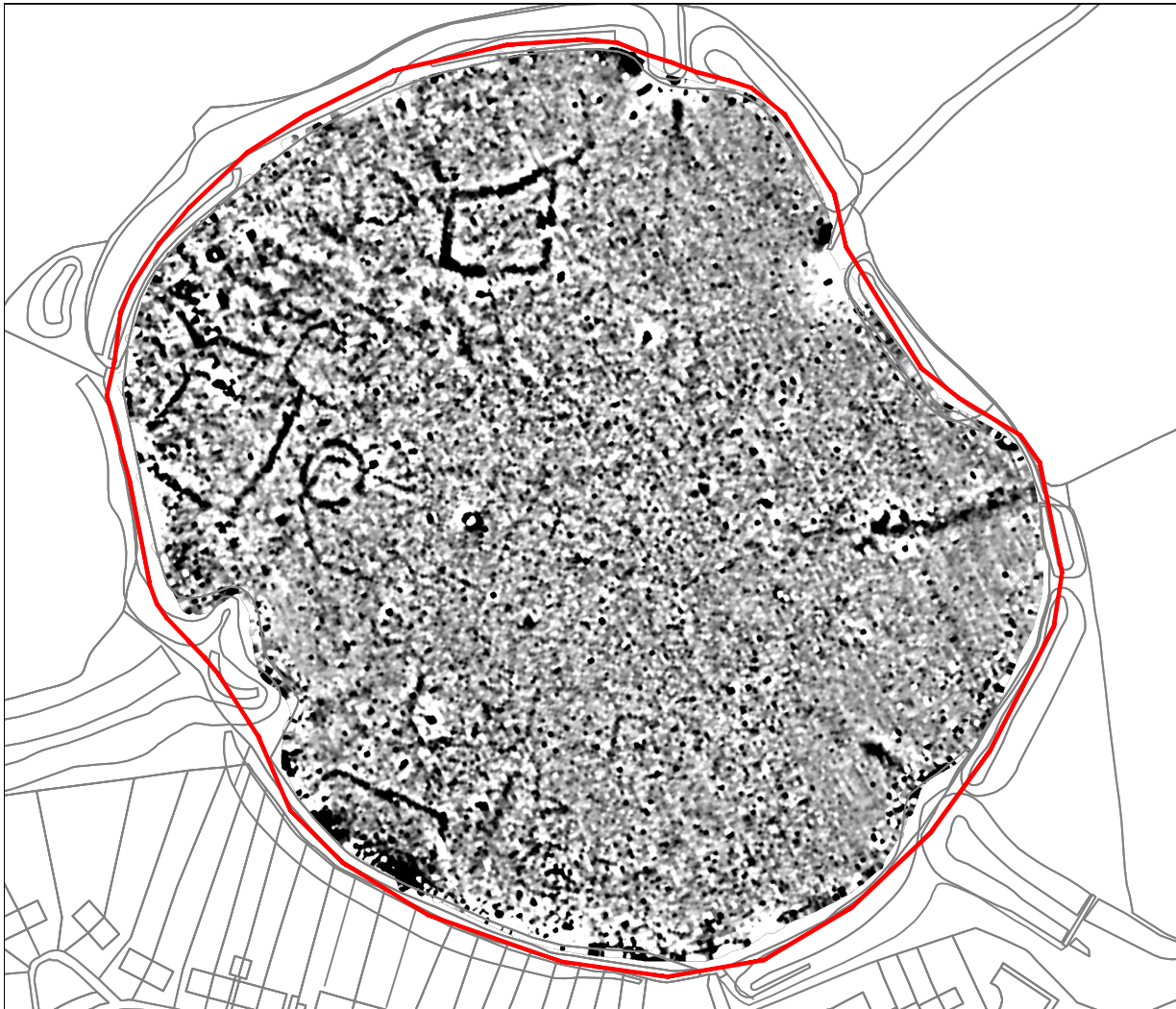
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2017 Aerial Image

Client:
South West Heritage Trust





Project:
05788 Norton Fitzwarren

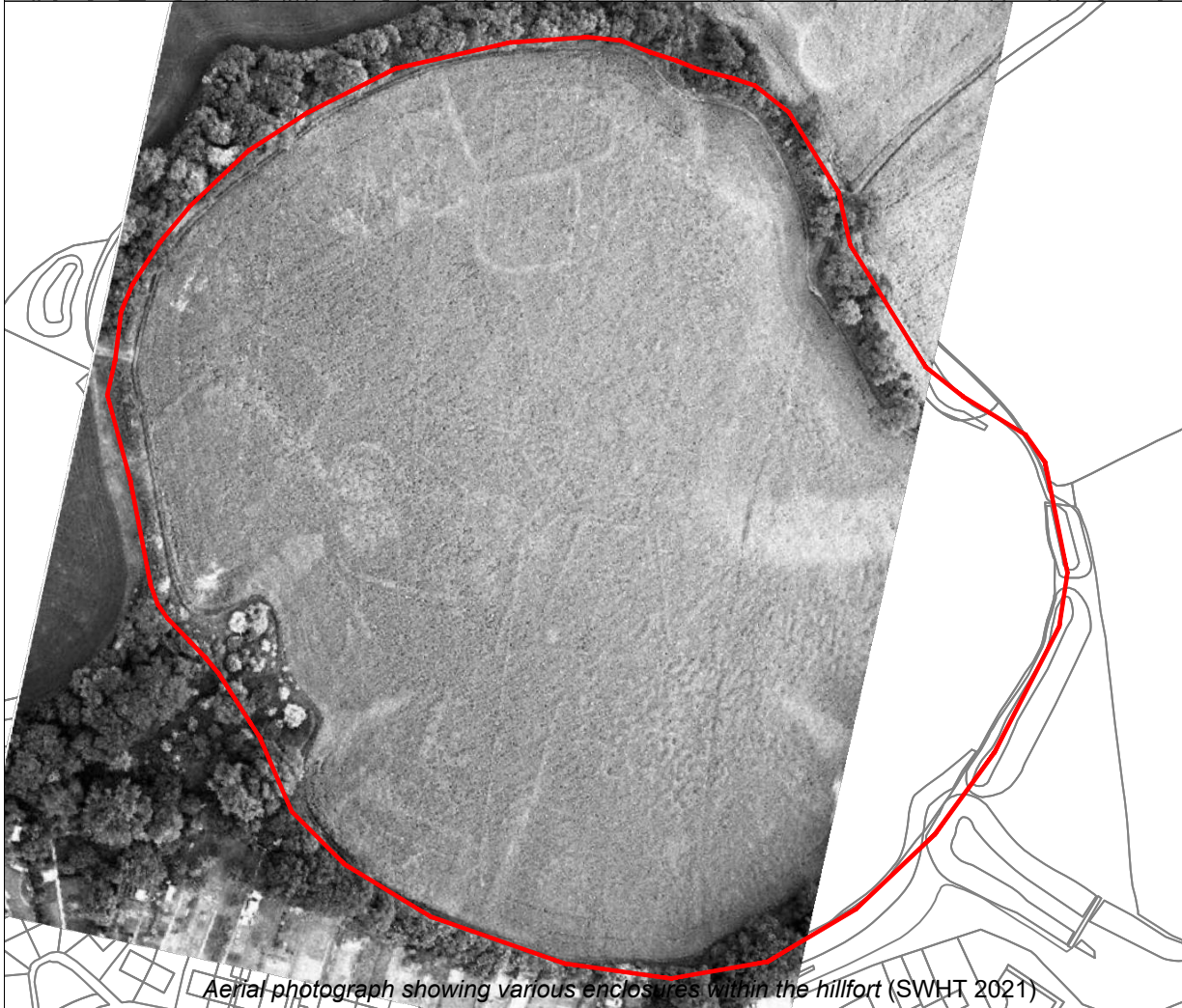
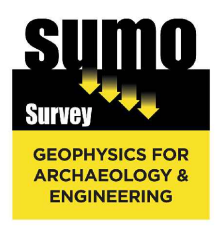
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Fig No:
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KEY

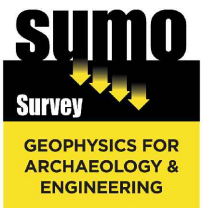
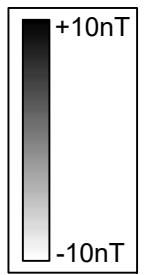
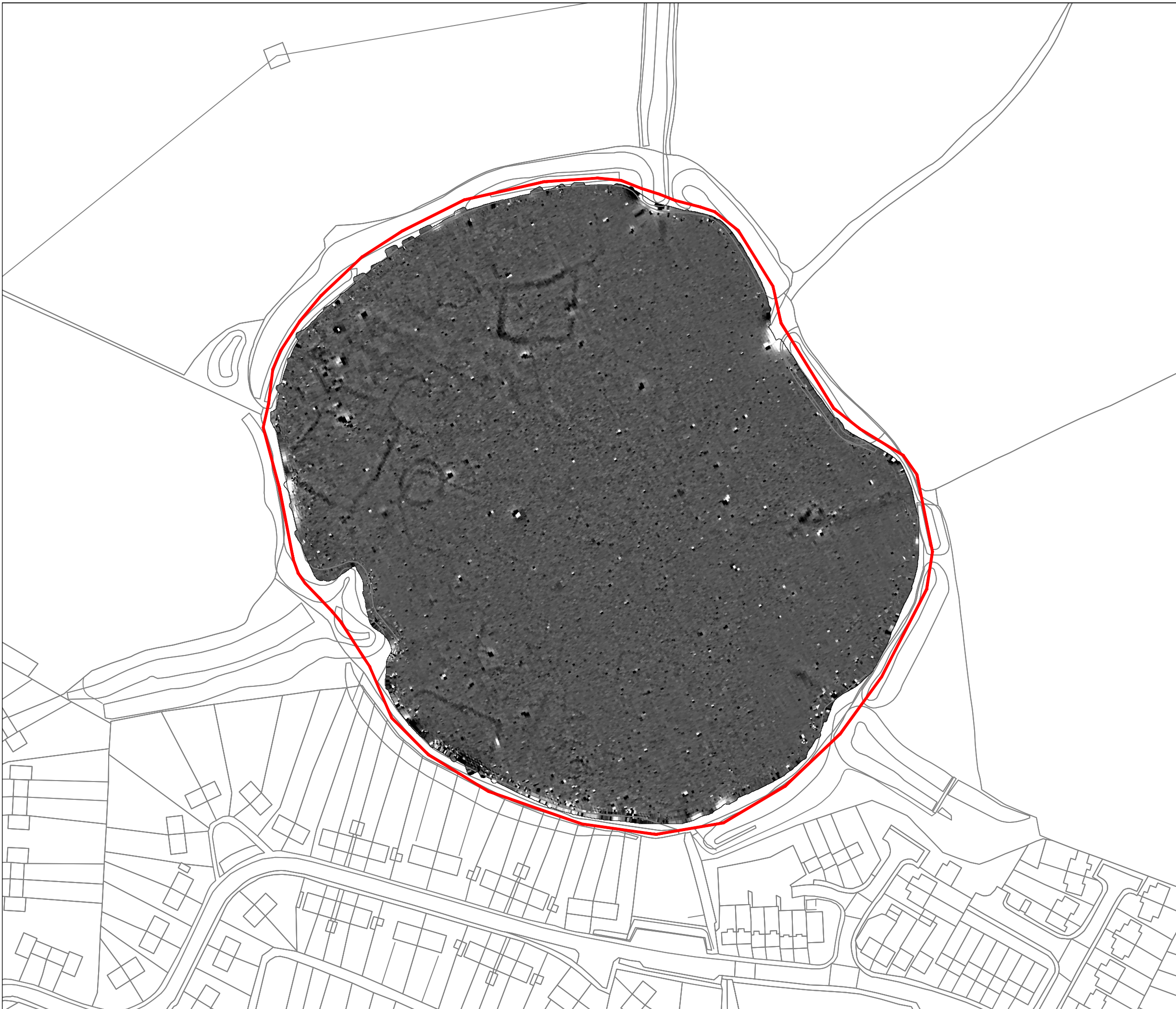
	?Fired features
	Probable archaeology (discrete anomaly / trend / increased response)
	Possible archaeology (discrete anomaly / trend)
	Ferrous



Aerial photograph showing various enclosures within the hillfort (SWHT 2021)

©2022 Google Earth

Title: Greyscale Plots / Interpretation / Aerial photograph showing various enclosures / 2017 Aerial Image	
Client: South West Heritage Trust	
Project: 05788 Norton Fitzwarren	
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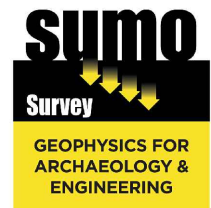
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Client: South West Heritage Trust

Project: 05788 Norton Fitzwarren

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Fig No: 07



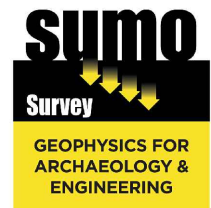
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Client: South West Heritage Trust

Project: 05788 Norton Fitzwarren

Scale: 0 metres 75
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Fig No: 08



Title: XY Trace Plot (clipped at +/-50nT)

Client: South West Heritage Trust

Project: 05788 Norton Fitzwarren

Scale: 0 metres 75
1:1500 @ A3

Fig No: 09

Appendix A - Technical Information: Magnetometer Survey Method

Grid Positioning

For hand held gradiometers the location of the survey grids has been plotted together with the referencing information. Grids were set out using a Trimble R8 Real Time Kinematic (RTK) VRS Now GNSS GPS system.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. This results in an accuracy of around 0.01m.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1.0m	0.25m
Magnetometer	Bartington Cart System	1.0m	0.125m

Instrumentation:

Bartington instruments operate in a gradiometer configuration which comprises fluxgate sensors mounted horizontally, set 1.0m apart. The fluxgate gradiometer suppresses any diurnal or regional effects. The instruments are carried, or cart mounted, with the bottom sensor approximately 0.1-0.3m from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is measured in nanoTesla (nT). The sensitivity of the instrument can be adjusted; for most archaeological surveys the most sensitive range (0.1nT) is used. Generally, features up to 1m deep may be detected by this method, though strongly magnetic objects may be visible at greater depths.

Bartington Grad 601-2

Hand-Held: Data will be collected using a Bartington Grad 601-2. The instrument consists of two paired sensors and readings are logged at 0.25m centres along traverses 1.0m apart across 30m grids. The collection of data at 0.25m centres provides an appropriate methodology balancing cost and time with resolution as per Historic England guidelines

Bartington Cart System

Data will be collected using a cart carrying four paired Bartington magnetic sensors. Each data point is geographically referenced using an on-board Trimble RTK survey grade GPS system. Readings will be taken at 0.125m centres along traverses 1.0m apart.

Data Processing

Zero Mean Traverse	This process sets the background mean of each traverse within each grid to zero. The operation removes striping effects and edge discontinuities over the whole of the data set.
Step Correction (De-stagger)	When gradiometer data are collected in 'zig-zag' fashion, stepping errors can sometimes arise. These occur because of a slight difference in the speed of walking on the forward and reverse traverses. The result is a staggered effect in the data, which is particularly noticeable on linear anomalies. This process corrects these errors.

Display

Greyscale/ Colourscale Plot	This format divides a given range of readings into a set number of classes. Each class is represented by a specific shade of grey, the intensity increasing with value. All values above the given range are allocated the same shade (maximum intensity); similarly, all values below the given range are represented by the minimum intensity shade. Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. The assigned range (plotting levels) can be adjusted to emphasise different anomalies in the data-set.
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Interpretation Categories

In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, *Roman Road, Wall, etc.*) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

<i>Archaeology / Probable Archaeology</i>	This term is used when the form, nature and pattern of the responses are clearly or very probably archaeological and /or if corroborative evidence is available. These anomalies, whilst considered anthropogenic, could be of any age.
<i>Possible Archaeology</i>	These anomalies exhibit either weak signal strength and / or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
<i>Industrial / Burnt-Fired</i>	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metal-working areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
<i>Former Field Boundary (probable & possible)</i>	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions. Possible denotes less confidence where the anomaly may not be shown on historic mapping but nevertheless the anomaly displays all the characteristics of a field boundary.
<i>Ridge & Furrow</i>	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases, the response may be the result of more recent agricultural activity.
<i>Agriculture (ploughing)</i>	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.
<i>Land Drain</i>	Weakly magnetic linear anomalies, quite often appearing in series forming parallel and herringbone patterns. Smaller drains may lead and empty into larger diameter pipes, which in turn usually lead to local streams and ponds. These are indicative of clay fired land drains.
<i>Natural</i>	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions.
<i>Magnetic Disturbance</i>	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present.
<i>Service</i>	Magnetically strong anomalies, usually forming linear features are indicative of ferrous pipes/cables. Sometimes other materials (e.g. pvc) or the fill of the trench can cause weaker magnetic responses which can be identified from their uniform linearity.
<i>Ferrous</i>	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.
<i>Uncertain Origin</i>	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning gives little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of <i>Possible Archaeology / Natural</i> or (in the case of linear responses) <i>Possible Archaeology / Agriculture</i> ; occasionally they are simply of an unusual form.

Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: weak and poorly defined).

Appendix B - Technical Information: Magnetic Theory

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock. Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.1 nanoTeslas (nT) in an overall field strength of 48,000 (nT), can be accurately detected.

Weakly magnetic iron minerals are always present within the soil and areas of enhancement relate to increases in *magnetic susceptibility* and permanently magnetised *thermoremanent* material.

Magnetic susceptibility relates to the induced magnetism of a material when in the presence of a magnetic field. This magnetism can be considered as effectively permanent as it exists within the Earth's magnetic field. Magnetic susceptibility can become enhanced due to burning and complex biological or fermentation processes.

Thermoremanence is a permanent magnetism acquired by iron minerals that, after heating to a specific temperature known as the Curie Point, are effectively demagnetised followed by re-magnetisation by the Earth's magnetic field on cooling. Thermoremanent archaeological features can include hearths and kilns; material such as brick and tile may be magnetised through the same process.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement allowing assessment and characterisation of subsurface features. Material such as subsoil and non-magnetic bedrock used to create former earthworks and walls may be mapped as areas of lower enhancement compared to surrounding soils.

Magnetic survey is carried out using a fluxgate gradiometer which is a passive instrument consisting of two sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field whilst the lower sensor measures the same field but is also more affected by any localised buried feature. The difference between the two sensors will relate to the strength of a magnetic field created by this feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity and disturbance from modern services.

Summary for sumogeop1-505861

OASIS ID (UID)	sumogeop1-505861
Project Name	Geophysical Survey at Norton Fitzwarren Hillfort, Norton Fitzwarren, Somerset
Sitename	
Activity type	Geophysical Survey, MAGNETOMETRY SURVEY
Project Identifier(s)	05788
Planning Id	
Reason For Investigation	Heritage management
Organisation Responsible for work	SUMO Geophysics Ltd.
Project Dates	15-Mar-2022 - 15-Mar-2022
Location	Norton Fitzwarren Hillfort, Norton Fitzwarren, Somerset NGR : ST 19626 26262 LL : 51.0300803645772, -3.1475176651936 12 Fig : 319626,126262
Administrative Areas	Country : England County : Somerset District : Somerset West and Taunton Parish : Norton Fitzwarren
Project Methodology	A temporary grid system was established over the site and marked out using canes. The location of the grid will be set out using an RTK GPS system theoretically accurate to some 0.01m and referenced to OS co-ordinates. Data will be collected using a cart carrying four paired Bartington magnetic sensors. Four sensors mounted 1m horizontally apart and very accurately aligned to nullify the effects of the earth's magnetic field. Readings relate to the difference in localised magnetic anomalies compared with the general magnetic background. Each data point is geographically referenced using an on-board Trimble RTK survey grade GPS system. Readings will be taken at 0.125m centres along traverses 1.0m apart. Readings relate to the difference in localised magnetic anomalies compared with the general magnetic background. At the end of every data collection a zone of data was recollected as a control.
Project Results	The magnetometer survey has identified a number of features of archaeological interest and there is generally very good correlation with the aerial photographic evidence; the geophysical data has the advantage of being accurately georeferenced making any targeted excavation far easier to locate. The results confirm the presence of a number of enclosures, many on a similar alignment; a few ring ditches, some well-defined, others less so; several pit-like responses plus tentative fired features. Short lengths of tracks are visible near the entrances, but these cannot be traced across the fort.

Keywords	Ditched Enclosure - LATER PREHISTORIC - FISH Thesaurus of Monument Types Ring Ditch - LATER PREHISTORIC - FISH Thesaurus of Monument Types Ditch - LATER PREHISTORIC - FISH Thesaurus of Monument Types Oven - LATER PREHISTORIC - FISH Thesaurus of Monument Types Trackway - LATER PREHISTORIC - FISH Thesaurus of Monument Types
Funder	
HER	Historic England review - unRev - STANDARD Somerset HER - unRev - STANDARD
Person Responsible for work	Thomas, Cockcroft, John, Gater
HER Identifiers	HER Event No - 45755
Archives	Digital Archive - to be deposited with Somerset Museum Service



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Direct Dial: 0117 975 1338

Our ref: AATBC

Dear Ms Sidley

Ancient Monuments and Archaeological Areas Act 1979 (as amended) section 42 - licence to carry out a geophysical survey

NORTON FITZWARREN, TA2 6RH

Case No:SL00234249
Monument no:1008467

I refer to your application dated 23 February 2022, to carry out a geophysical survey at the above site.

Historic England is empowered to grant licences for such activity and I can confirm that we are prepared to do so as set out below.

By virtue of powers contained in section 42 of the 1979 Ancient Monuments and Archaeological Areas Act (as amended by the National Heritage Act 1983) Historic England hereby grants permission for geophysical survey of NORTON FITZWARREN, for the areas shown on the map that accompanied your application (copy attached). This permission is subject to the following conditions.

1. The permission shall only be exercised by Tom Cockroft of SUMO Geophysics Ltd or nominated members of his team and by no other person. It is not transferable to another individual.
2. The permission shall commence on 14 March 2022 and shall cease to have effect on 1 April 2022.
3. A full report summarising the results of the geophysical survey and their interpretation shall be sent in hard copy to Beth Prentice at the address below and electronic (pdf) format to sasha.chapman@historicengland.org.uk, copied to Paul.Linford@HistoricEngland.org.uk no later than after the completion of the survey.
4. The enclosed questionnaire shall be completed and appended to the survey report. For convenience an electronic version of this questionnaire can be



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downloaded from <http://HistoricEngland.org.uk/advice/technical-advice/archaeological-science/geophysics>.

5. A copy of the report shall also be sent (in their preferred format) to the local Historic Environment Record (HER). The local HER's contact details can be found at <http://www.heritagegateway.org.uk/gateway/chr/default.aspx>.
6. A record signposting your investigation shall be made with the Archaeology Data Service using their online OASIS Data Collection form no later than after completion of the survey. Please see <http://oasis.ac.uk/> for details or contact oasis@HistoricEngland.org.uk for information and training.

This letter does not carry any consent or approval required under any enactment, by-law, order or regulation other than section 42 of the 1979 Act (as amended).

You are advised that the person nominated under this licence to carry out the activity should keep a copy of this licence in their possession in case they should be challenged whilst on site.

Yours sincerely

Sasha Chapman

Inspector of Ancient Monuments

E-mail: sasha.chapman@historicengland.org.uk

cc Richard Brunning, South West Heritage Trust

Charlotte Russell, Partnerships Team, Historic England



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Historic England Geophysical Survey Summary Questionnaire

Survey Details

Name of Site: Norton Fitzwarren Hillfort, Norton Fitzwarren, Somerset

County: Somerset

NGR Grid Reference (Centre of survey to nearest 100m): ST 19608 26325

Start Date: 15 March 2022

End Date: 15 March 2022

Geology at site (Drift and Solid):

Bedrock: Mercia Mudstone Group - mudstone and halite-stone

Superficial: River Terrace Deposits, 2 - sand and gravel

Known archaeological Sites/Monuments covered by the survey

(Scheduled Monument No. or National Archaeological Record No. if known)

Monument number 1008467

Archaeological Sites/Monument types detected by survey

(Type and Period if known. "?" where any doubt).

A sub rectangular ditched enclosure (plus associated features) c.30 by 25m, with an east-facing entrance, is located just inside the northern rampart. This enclosure is clearly visible in the magnetic data [1]. There appear to be two offset large pits or gullies at the eastern entrance and indications of another break in the southern ditch anomaly which could imply a second entrance. Possible ditch-like responses [2] are visible stretching across the area to the south, while to the north is another enclosure [3] apparently attached the northern rampart on the aerial photographs (see Fig 05). Aerial photographs have shown a complex of sub-square...enclosures beneath the ground within the interior of the fort, which are Romano-British in form.



A large sub-rectangular ditched enclosure [4] measures approximately 45m x 33m with two possible entrances; one in the south-east corner and one in the north-east. There may also be a break in the north-west corner and perhaps an internal division; the results are not totally clear. To the north-east and following a similar NE-SW and NW-SE alignment to this enclosure is a further series of linear responses [5] suggesting additional enclosures. In fact this regular pattern / form is followed by numerous of other ditches to the east and south-east including: a polygonal open-sided enclosure [6]; poorly defined linear trends [7]; two sub-rectangular enclosures, the first [8] abuts the south-western rampart while the second [9] appears to have three sides. Finally, more broken linear responses are present around [10].

Circular features -

A cluster of magnetic responses appear to form a sub-circular ring [11] some 15m in diameter, though other curvilinear trends are partially masking the results. A second ring or annular response [12] measures approximately 17m x 19m with a clear break on the south-western side; as such this would appear to be a former round house. It should be noted that it is not possible on the basis of the magnetic data alone to establish whether this ring is earlier in date than the polygonal enclosure [6]. More tentative ring / oval features are visible at [13] and [14].

Holloway entrances - The interior of the fort is approached by three hollow ways up to 6m deep, from the WSW, north, and south east, ending a short way inside the ramparts. That from the WSW is broadest and deepest, and divides into two below the rampart. There is now a steep face at the end of these ways into the fort, but aerial photographs show that they originally extended into the interior. There are a number of other gaps in the ramparts, of which most are modern, but excavation indicated that the entrance on the west, which appeared to be on the site of an entrance to the previous Bronze Age enclosure, may have continued in use in the initial hillfort. On the eastern side of the fort is an opposite gap, now overgrown, and in its original form the fort may have had a more usual arrangement of opposing east/west entrances.

There are slight indications in the magnetic data of two trackways [15] and [16] extending into the hillfort from the WSW Holloway and similar responses at [17] near the N entrance and at [18] extending from the SE entrance which could have the same interpretation. Stronger magnetic responses are visible at [19] and if they are also associated with a track, the magnetic data could support a that there was a break at this point on the eastern side of the hillfort, opposite the WSW entrance (however, the putative 'eastern entrance' might be at [20] where there seems to be modern disturbance?).

Surveyor (Organisation, if applicable, otherwise individual responsible for the survey):

SUMO Geophysics Ltd

Name of Client, if any:

South West Heritage Trust on behalf of Somerset West and Taunton Council



Purpose of Survey:

SUMO Geophysics Ltd were commissioned to undertake a geophysical survey as part of the long-term management of this site being carried out by South West Heritage Trust on behalf of Historic England and Somerset West and Taunton Council.

Identify the presence of internal features within the hillfort (enclosures, buildings, trackways etc)

Clarify what is happening around the holloway entrances into the site

Identify any potential areas of significant metalworking/industrial activity

To identify any areas of metalworking or cooking/baking within the hillfort.

Location of:

a) Primary archive, i.e. raw data, electronic archive etc:

C:\Users\tom\Documents\06 Confirmed Projects\SUMO-05788 Norton Fitzwarren

b) Full Report:

C:\Users\tom\Documents\06 Confirmed Projects\SUMO-05788 Norton Fitzwarren\05788-Final report\PDF



Technical Details

(Please fill out a separate sheet for each survey technique used)

Type of Survey (Use term from attached list or specify other): Detailed magnetic survey (magnetometry)

Area Surveyed, if applicable (In hectares to one decimal place): 5.0 ha

Traverse Separation: 1.0m **Reading/Sample Interval:** 0.125m

Type, Make and model of Instrumentation: Bartington Grad 601-2 (Fluxgate)

For Resistivity Survey:

Probe configuration:

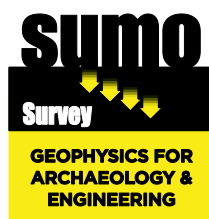
Probe Spacing:

Land use at the time of the survey (Use term/terms from the attached list or specify other): Grassland - Pasture



Historic England

Additional Remarks (Please mention any other technical aspects of the survey that have not been covered by the above questions such as sampling strategy, non standard technique, problems with equipment etc.): none



- Archaeological
- Geophysical
- Laser Scanning
- Measured Building
- Topographic
- Utility Mapping

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