

**LAND AT FALMOUTH GOLF COURSE
SWANPOOL ROAD
FALMOUTH
CORNWALL**

Results of a Geophysical Survey



South West Archaeology Ltd. report no. 190424



www.swarch.net

01769 573555
01872 223164

Land at Falmouth Golf Club, Swanpool Road, Falmouth, Cornwall

Results of a Geophysical Survey

By P. Bonvoisin
Report Version: FINAL
24th April 2019

Work undertaken by SWARCH
On behalf of D.C. Hughes Ltd. (the Client)

SUMMARY

South West Archaeology Ltd. (SWARCH) was commissioned by to undertake a geophysical survey for land at Falmouth Golf Course, as part as pre-commencement works prior to the creation of a new 18th green.

The proposed site is located on the eastern edge of Falmouth Golf Course and located away from the historic core of the town. There is some previous activity noted on the Cornwall HER within the surrounding area, including Second World War features, including a barrage balloon site, which was excavated in 2012. The site lies within a landscape of post-medieval enclosed land, but lies to the north-east of medieval farmland.

The geophysical survey identified multiple features of archaeological origin, the clearest being two historic field boundaries, present on the historic mapping of the site. The alignment and location of these boundaries are still visible as earthworks, with a small section of the southern boundary remaining standing. The majority of the other features may correspond to parts of an earlier field system, of an unknown date. Two parallel possible banks are also present within the site but have no demonstrably clear relationship with other anomaly groups. The responses in the northern corner of the site have a less clear origin and may relate to a service found during 2012 excavations or potentially Second World War features.



South West Archaeology Ltd. shall retain the copyright of any commissioned reports, tender documents or other project documents, under the Copyright, Designs and Patents Act 1988 with all rights reserved, excepting that it hereby provides an exclusive licence to the client for the use of such documents by the client in all matters directly relating to the project.

The views and recommendations expressed in this report are those of South West Archaeology Ltd. and are presented in good faith on the basis of professional judgement and on information available at the time of production.

CONTENTS

<i>SUMMARY</i>	2
<i>LIST OF FIGURES</i>	3
<i>LIST OF TABLES</i>	3
<i>LIST OF APPENDICIES</i>	3
<i>ACKNOWLEDGEMENTS</i>	4
<i>PROJECT CREDITS</i>	4
1.0 INTRODUCTION	5
1.1 PROJECT BACKGROUND	5
1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND	5
1.3 HISTORICAL BACKGROUND	5
1.4 ARCHAEOLOGICAL BACKGROUND	5
1.5 METHODOLOGY	6
2.0 CARTOGRAPHIC DEVELOPMENT	8
3.0 GEOPHYSICAL SURVEY	10
3.1 INTRODUCTION	10
3.2 METHODOLOGY	10
3.3 SITE INSPECTION	10
3.4 RESULTS	12
3.5 DISCUSSION	13
4.0 CONCLUSION	16
5.0 BIBLIOGRAPHY & REFERENCES	17

LIST OF FIGURES

COVER PLATE: VIEW ACROSS THE SITE ALONG THE SOUTH-WESTERN BOUNDARY; VIEWED FROM THE SOUTH-EAST (NO SCALE).

FIGURE 1: SITE LOCATION.	7
FIGURE 2: EXTRACT FROM THE OS 25 INCH MAP, PUBLISHED 1880 (SURVEYED 1878).	8
FIGURE 3: EXTRACT FROM THE OS 25 INCH MAP, PUBLISHED 1935 (SURVEYED 1933).	9
FIGURE 4: VIEW OF THE SPOIL HEAPS IN THE SOUTHERN CORNER OF THE SITE; VIEWED FROM THE SOUTH (NO SCALE).	11
FIGURE 5: VIEW ACROSS THE SITE ALONG THE SOUTH-WESTERN BOUNDARY OF THE SITE; VIEWED FROM THE NORTH (NO SCALE).	11
FIGURE 6: SHADE PLOT OF GRADIOMETER SURVEY DATA; GREYSCALE.	14
FIGURE 7: INTERPRETATION OF GRADIOMETER SURVEY DATA.	15
FIGURE 8: LOCATION AND NUMBERS OF THE SURVEY GRIDS.	18
FIGURE 9: RED GREYSCALE BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.	19
FIGURE 10: RED-BLUE-GREEN (2) SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.	20

LIST OF TABLES

TABLE 1: INTERPRETATION OF GRADIOMETER SURVEY DATA.	12
---	----

LIST OF APPENDICIES

APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY	18
---	----

ACKNOWLEDGEMENTS

D.C. HUGHES LTD (THE CLIENT)
CORNWALL COUNTY HER

PROJECT CREDITS

DIRECTOR: DR. SAMUEL WALLS
FIELDWORK: PETER BONVOISIN
REPORT: PETER BONVOISIN
EDITING: DR. SAMUEL WALLS
GRAPHICS: PETER BONVOISIN

1.0 INTRODUCTION

LOCATION:	LAND AT FALMOUTH GOLF CLUB
PARISH:	FALMOUTH
COUNTY:	CORNWALL
NGR:	SW 79911 31018
SWARCH REF.	FGC19

1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by D.C. Hughes Ltd. (the Clients) to undertake a geophysical survey for land at Falmouth Golf Club prior to development. This work was undertaken in accordance with best practice and CifA guidelines.

1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

The survey area is located immediately south-east of the current car park for Falmouth Golf Club; with the centre of the site located c.700m north-west of Pennance Point, c.2.0km south-west of Falmouth bay and c.3.8km south-south-east of Penryn. The site is contained within a single field, with partial evidence and remains of older field boundaries crossing the site. The Site is used as a driving range at the north-eastern corner of Falmouth Golf Club with residential areas to the north and with fields immediately to the north and east of the site; Swanpool Beach and the residential areas of Falmouth can be seen from within the site.

The site is currently under pasture, with roughly half of the survey area cut to a lawn length; the height ranges from 38m AOD (Above Ordnance Datum) in the eastern corner to 48m AOD in the western corner of the site, the slope roughly facing north-east.

The soils of this area are the shallow fine loamy soils of the Denbigh 2 Association (SSEW 1983), which overlie the sedimentary interbedded sandstone and subordinate argillaceous rocks of the Portscatho Formation (BGS 2019).

1.3 HISTORICAL BACKGROUND

An archaeological assessment of the site was written in 2008 by Cornwall County Councils Historic Environment Service (Projects) (HEP2008:R123). From which a brief historical statement about the site has been summarised below.

Pennance was first recorded in 1208. Its name is derived from the Cornish place-name elements pen 'head' and nans 'valley'. The landscape around Pennance was made up of a number of Medieval farms including a number with the tre 'farmstead place-name element that was well established before AD 1000. Although an established Manor, for which a detailed estate map from 1769 exists and documentary evidence of ownership in the early 17th century, Pennance was not recorded as a specific settlement on Gascoyne's map of 1699. The 1880 and 1907 OS maps show continuity with the 1840 Tithe map.

1.4 ARCHAEOLOGICAL BACKGROUND

Other than the historic field systems that survive on the development site, the golf course also contains sites relating to the Second World War defences of the port of Falmouth; such as an anti-aircraft battery, tank trap and associated building battery that are visible on the ground and numerous features evident in aerial photography of the site. A Roman coin hoard (HER No.18670)

was discovered in the 19th century south of the site on Pennance Point. A group of three crop marks which may represent Bronze Age barrows (HER No.18547.01) have been identified to the south-west of the site. A modern barrage balloon setting (HER No.50781) was located immediately north-west of the site, and was identified in a previous phase of works on the Golf Course (Bampton & Walls 2012); finally a Mesolithic tranche axe findspot (HER No.18690) is (approximately) indicated towards the eastern corner of the site.

1.5 METHODOLOGY

This work was undertaken in accordance with best practice. The gradiometer survey follows the general guidance as outlined in: *Geophysical Survey in Archaeological Field Evaluation* (English Heritage 2008) and *Standard and Guidance for Archaeological Geophysical Survey* (CIfA 2014b).



FIGURE 1: SITE LOCATION (THE SITE IS INDICATED IN RED).

2.0 CARTOGRAPHIC DEVELOPMENT

The cartographic sources looked at for this survey are the 1st and 2nd edition Ordnance Survey (OS) 25 inch mapping (Figures 4 and 5, respectively). The site covers part of plots 1111 and 1112 as well as the entirety of plot 1114 on the OS mapping. The 1880 OS mapping shows field boundaries cutting the site into three segments with further field systems continuing towards the south-west. The second edition OS mapping, dating to 1935, shows significant change to the south-west of the site, with field system having been replaced by the earlier iterations of Falmouth Golf Course; the club house can be seen to the west of the site.

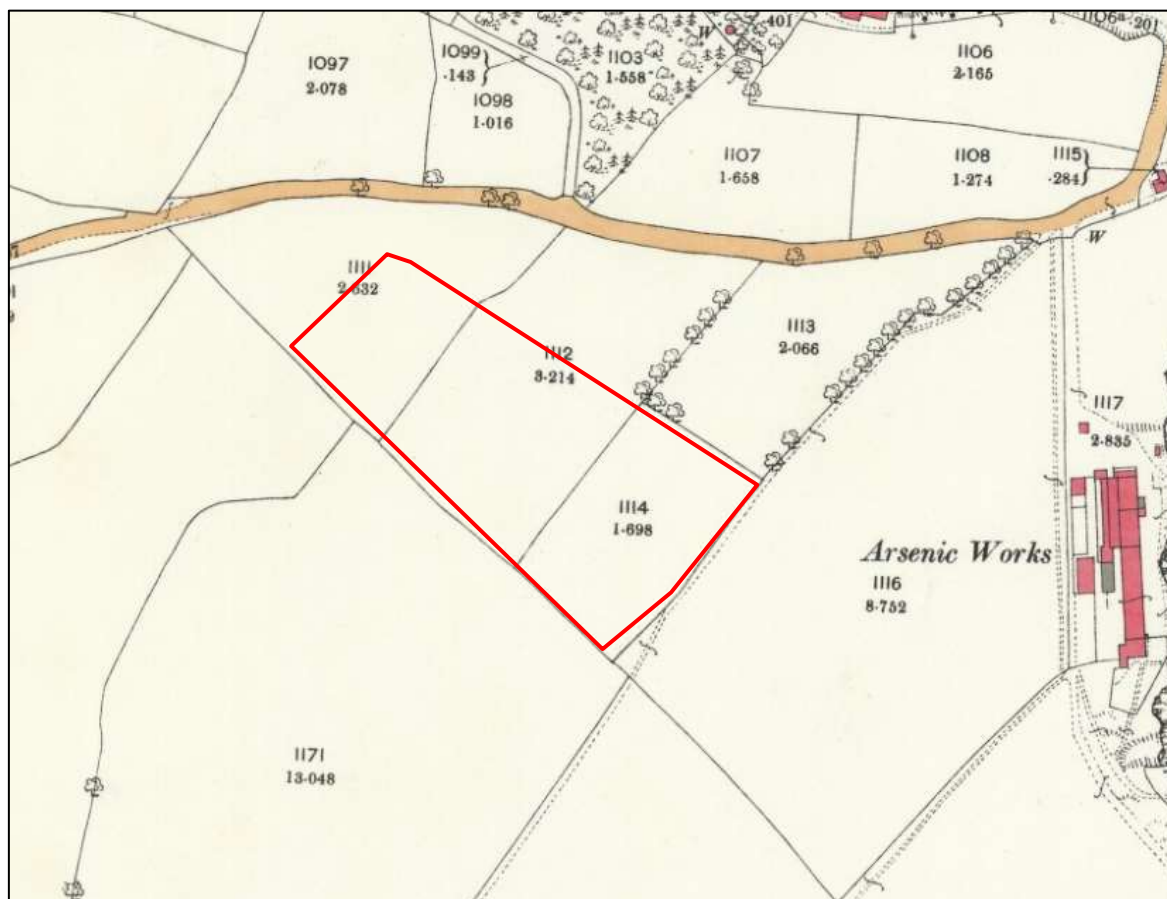


FIGURE 2: EXTRACT FROM THE OS 25 INCH MAP, PUBLISHED 1880 (SURVEYED 1878). THE APPROXIMATE LOCATION OF THE SITE IS INDICATED (NLS).

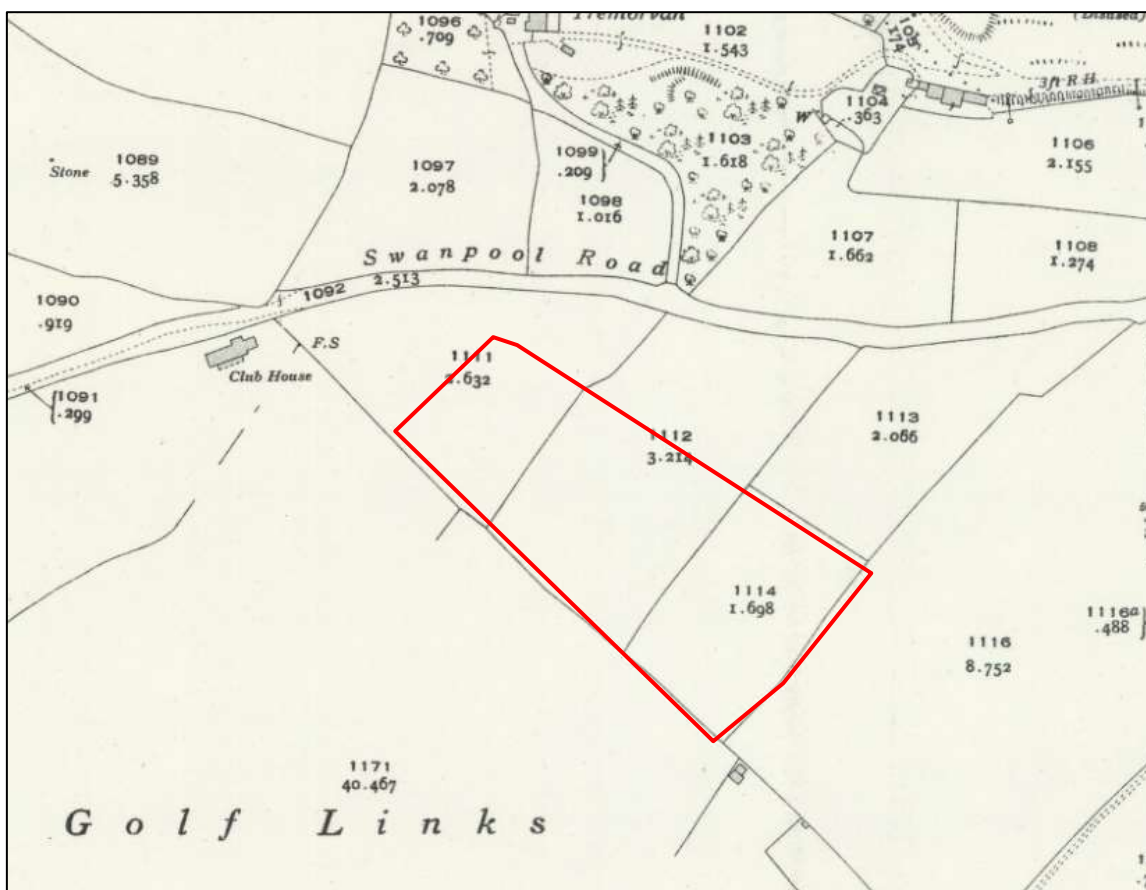


FIGURE 3: EXTRACT FROM THE OS 25 INCH MAP, PUBLISHED 1935 (SURVEYED 1933). THE APPROXIMATE LOCATION OF THE SITE IS INDICATED (NLS).

Significant changes in the local area have taken place since 1933, with the land to the north of the site now mostly residential. The golf course has since expanded, with a driving range being constructed within plot 1111, immediately north of the survey area; this was removed in the 21st century along with archaeological works which confirmed the location of moorings for a Second World War barrage balloon (Bampton & Walls 2012). The field boundaries within the survey area have since been removed, with fencing being erected along the north-eastern boundary of the site, bisecting what was plot 1112 on the OS mapping.

3.0 GEOPHYSICAL SURVEY

3.1 INTRODUCTION

An area of c.1.6ha was the subject of a magnetometry (gradiometer) survey. The purpose of this survey was to identify and record magnetic anomalies within the proposed site. While identified anomalies may relate to archaeological deposits and structures, the dimensions of recorded anomalies may not correspond directly with any associated features. The following discussion attempts to clarify and characterise the identified anomalies. The survey was undertaken on the 15th of April 2019 by P. Bonvoisin; the survey data was processed by P. Bonvoisin.

3.2 METHODOLOGY

The gradiometer survey follows the general guidance as outlined in: *Geophysical Survey in Archaeological Field Evaluation* (English Heritage 2008) and *Standard and Guidance for Archaeological Geophysical Survey* (ClfA 2014b).

The survey was carried out using a twin-sensor fluxgate gradiometer (Bartington Grad601). These machines are sensitive to depths of up to 1.50m. The survey parameters were: sample intervals of 0.25m, traverse intervals of 1m, a zigzag traverse pattern, traverse orientation was circumstantial, grid squares of 30×30m. The gradiometer was adjusted ('zeroed') every 0.5-1ha. The survey grid was tied into the Ordnance Survey National Grid. The data was downloaded onto *Grad601 Version 3.16* and processed using *TerraSurveyor Version 3.0.25.0*. The primary data plots and analytical tools used in this analysis were *Shade* and *Metadata*. The details of the data processing are as follows:

Processes: Clip +/- 3SD; DeStripe all traverses, median. DeStagger of particular grids.

Area Details: 1.3765ha surveyed; Max. 98.42nT, Min. -127.84nT; Standard Deviation 9.45, mean 0.29nT, median 1.05nT.

3.3 SITE INSPECTION

The proposed development site and survey area covers most of an open area of pasture, with clear markings of having been three separate smaller fields. The site lies south of Swanpool Road and to the east of Falmouth Golf Club, the previous driving range for the golf club lay at the north-western end of the survey area but is no longer in place. An open excavated area, corresponding to Area F in the 2012 report (Bampton & Walls 2012), lies immediately to the north-west of the site. The south-western and south-eastern boundaries of the site comprise stone lined hedgebanks; the north-eastern boundary of the site comprises a hedgebank and partially collapsed metallic fencing. The north-western edge of the site lies open into the Falmouth Golf Club car park. Approximately half the site is lawn length pasture, with longer grass towards the northern and southern corners of the site, a small portion of turf has been removed in the western corner of the site; the southern corner of the site contains some spoil dumping. A corner of stone lined hedgebank has been recently removed; this corresponded to grids a15 and a18 on the survey, towards the northern corner of the site. A small section of one of the historic field boundaries also remains within the field; the location of the removed boundaries can clearly be seen in the topography of the site. A full complement of site photographs can be found in Appendix 2.



FIGURE 4: VIEW OF THE SPOIL HEAPS IN THE SOUTHERN CORNER OF THE SITE; VIEWED FROM THE SOUTH (NO SCALE).



FIGURE 5: VIEW ACROSS THE SITE ALONG THE SOUTH-WESTERN BOUNDARY OF THE SITE; VIEWED FROM THE NORTH (NO SCALE).

3.4 RESULTS

Table 1 with the accompanying Figures 6 and 7 shows the analysis and interpretation of the geophysical survey data. Additional graphic images of the survey data can be found in Appendix 1.

TABLE 1: INTERPRETATION OF GRADIOMETER SURVEY DATA.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
1	Strong negative with positive border, probable	Linear	Historic field boundary	Indicative of a Cornish hedge bank, matches a boundary visible on the 25 inch Ordnance Survey mapping. Responses of c.+34.42nT to c.-22.80nT.
2	Strong negative with positive border, probable	Linear	Historic field boundary	Indicative of a Cornish hedge bank, matches a boundary visible on the 25 inch Ordnance Survey mapping. Responses of c.+28.28nT to c.-24.99nT.
3	Moderate positive, probable	Linear	Ditch	Indicative of a discrete cut feature such as a ditch, likely associated with anomaly groups 4 to 7, may be associated with anomaly groups 8 to 10. Responses of c.+10.40nT to c.+3.63nT.
4	Moderate to weak positive, probable	Linear	Ditch	Indicative of a discrete cut feature such as a ditch, likely associated with anomaly groups 3, 5 to 7, may be associated with anomaly groups 8 to 10. Responses of c.+9.80nT to c.+2.42nT.
5	Moderate positive, probable	Linear	Ditch	Indicative of a discrete cut feature such as a ditch, likely associated with anomaly groups 3, 4, 6 and 7, may be associated with anomaly groups 8 to 10. Responses of c.+13.92nT to c.+1.76nT.
6	Moderate positive, probable	Linear	Ditch	Indicative of a discrete cut feature such as a ditch, likely associated with anomaly groups 3 to 5 and 7, may be associated with anomaly groups 8 to 10. Responses of c.+12.73nT to c.+2.51nT.
7	Moderate positive, probable	Linear	Ditch	Indicative of a discrete cut feature such as a ditch, likely associated with anomaly groups 3 to 6, may be associated with anomaly groups 8 to 10. Responses of c.+19.92nT to c.+3.86nT.
8	Weak positive, possible	Linear	Ditch	Indicative of a discrete cut feature such as a ditch, may be associated with anomaly groups 3 to 7, 9 and 10. Responses of c.+5.73nT to c.+1.06nT.
9	Weak positive, possible	Linear	Ditch	Indicative of a discrete cut feature such as a ditch, may be associated with anomaly groups 3 to 8 and 10. Responses of c.+5.27nT to c.+1.33nT.
10	Moderate to weak positive, possible	Linear	Ditch	Indicative of a discrete cut feature such as a ditch, may be associated with anomaly groups 3 to 9. Responses of c.+8.49nT to c.+2.13nT.
11	Weak positive, possible	Amorphous area	Cut feature	Indicative of a discrete cut feature, possibly marking a break in the ditch represented by anomaly groups 3 and 4. Responses of c.+6.06nT to c.+1.72nT.
12	Moderate negative, probable	Linear	Bank or raised feature	Indicative of raised ground or a small bank, flanked by positive responses possibly indicating a bank with flanking ditches. May be associated with anomaly group 13. Responses of c.-9.68nT to c.-2.60nT.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
13	Moderate negative, probable	Linear	Bank or raised feature	Indicative of raised ground or a small bank, flanked by positive responses possibly indicating a bank with flanking ditches. May be associated with anomaly group 12. Responses of c.-11.83nT to c.-6.37nT.
14	Strong positive, to weak negative, possible	Amorphous area with border	Raised and cut feature	Indicative of a raised ground but flanked with cut features. Responses of c.+23.26nT to c.-9.30nT.
15	Strong positive to strong negative, probable	Alternate linears	Possible utility	Indicative of a series of cut and raised parallel linears. Responses of c.+26.26nT to c.-32.59nT.
16	Moderate to weak positive and negative, probable	Area	Stripped turf	Corresponds to the removed turf visible on site. Responses of c.+8.40nT to c.-9.82nT.

3.5 DISCUSSION

The survey identified 16 groups of anomalies showing features of viable interest within the survey area. The survey and cartographic resources indicate that historic field boundaries bisect the site. The other anomaly groups visible within the survey results may correspond to an earlier phase of boundaries or field divisions.

Groups 1 (+34nT to -23nT) and 2 (+28nT to -25nT), are strong negative linears with positive borders, indicative of Cornish hedgebanks. These linears correspond to known historic field boundaries that crossed the site, the small marked area within anomaly group 2 shows where part of the hedgebank remains standing.

Groups 3 to 7 (c.+20nT to +2nT) are moderate positive linears, indicative of ditches or similar cut features. They appear to represent an earlier field system with the relationship between groups 3 and 4 being clearest. Anomaly groups 8, 9 and 10 (c.+8.5nT to +1nT), likely also represent this earlier field system but generate weaker responses.

Group 11 (+6nT to +2nT) is a weak amorphous area between anomaly groups 3 and 4 and may indicate a break in the ditch or cut feature.

Groups 12 (-10nT to -3nT) and 13 (-12nT to -6nT) are moderate negative linears with positive borders. These groups run parallel and are likely related, indicative of a banks or similar raised features.

Group 14 (+23nT to -9nT) is a strong positive linear around a moderate negative area, possibly indicative of a removed bank, this feature is less clear.

Group 15 (+26nT to -33nT) are three strong negative linears, flanked by positive linears. Possibly related to the modern service found in Area F of the 2012 excavation (Bampton & Walls 2012).

Group 16 (+8.4nT to -9.8nT), is a moderate positive to negative area, representative of an area of stripped turf within the site.

Di-Polar anomalies and magnetic disturbance are present across the site, with the magnetic disturbance mostly relating to the boundaries of the site. The Di-Polar anomalies are spread across the site with no particular pattern, though a small concentration is located closer to anomaly group 2.



FIGURE 6: SHADE PLOT OF GRADIOMETER SURVEY DATA; GREYSCALE.

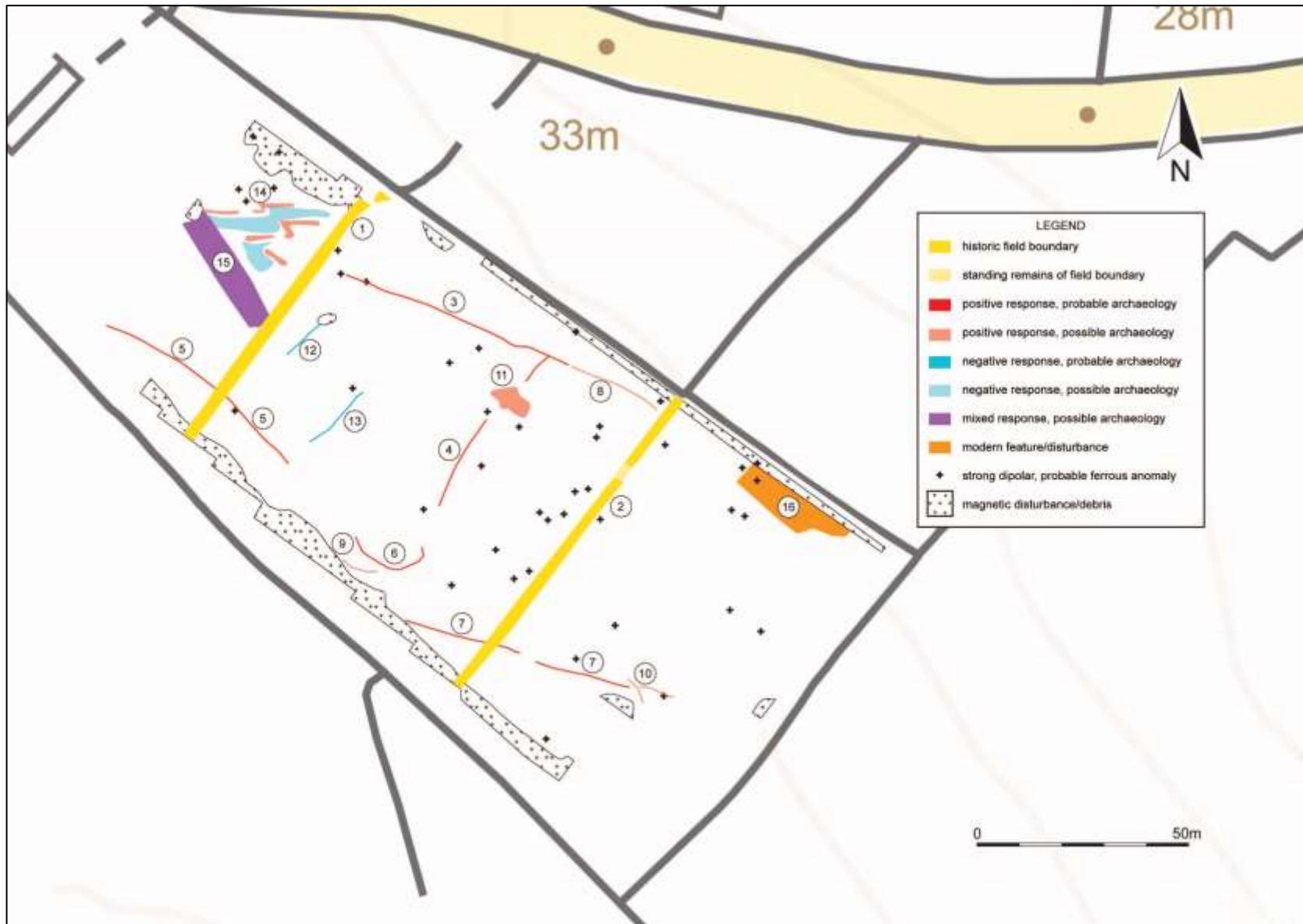


FIGURE 7: INTERPRETATION OF GRADIOMETER SURVEY DATA.

4.0 CONCLUSION

The site is located on the eastern edge of Falmouth Golf Course and located away from the historic core of the town. There is some previous activity within the surrounding area, including Second World War features (see Bampton and Walls 2012). The site lies within a landscape of post-medieval enclosed land, but lies to the north-east of medieval farmland.

The geophysical survey identified multiple features of interest, the most clear being two historic field boundaries, present on the historic mapping of the site. The alignment and location of these boundaries are still visible as earthworks, with a small section of the southern boundary remaining standing. The majority of the other features correspond to an earlier field system. The responses in the northern corner of the site have a less clear origin and may relate to a service found during the 2012 excavation or potentially further Second World War features, or dispersed remains of a removed boundary.

Given the nature of the identified anomalies and that the proposed landscaping for the new 18th Green will mostly involve raising levels it is unlikely that any significant archaeological features or deposits are going to be destroyed.

5.0 BIBLIOGRAPHY & REFERENCES

Published Sources:

Chartered Institute of Field Archaeologists 2014a (Revised 2017): *Standard and Guidance for Historic Environment Desk-based Assessment*.

Chartered Institute for Archaeologists 2014b (Revised 2017): *Standard and Guidance for Archaeological Geophysical Survey*.

English Heritage 2008: *Geophysical Survey in Archaeological Field Evaluation*.

Heritage 2012: *Understanding Place: historic area assessments in a planning and development context*.

Soil Survey of England and Wales 1983: *Legend for the 1:250,000 Soil Map of England and Wales (a brief explanation of the constituent soil associations)*.

Websites:

British Geological Survey 2019: *Geology of Britain Viewer*.

www.bgs.ac.uk

Unpublished Sources:

SWARCH 2012. J. Bampton & S. Walls: *Falmouth Golf Course: Results of a Geophysical Survey and Archaeological Monitoring and Recording*

NLS

1880 OS 25" map (surveyed 1878), Cornwall sheet LXXI.15

1935 OS 25" map (surveyed 1933), Cornwall sheet LXXI.15

APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY



FIGURE 8: LOCATION AND NUMBERS OF THE SURVEY GRIDS.



FIGURE 9: RED GREYSCALE BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.

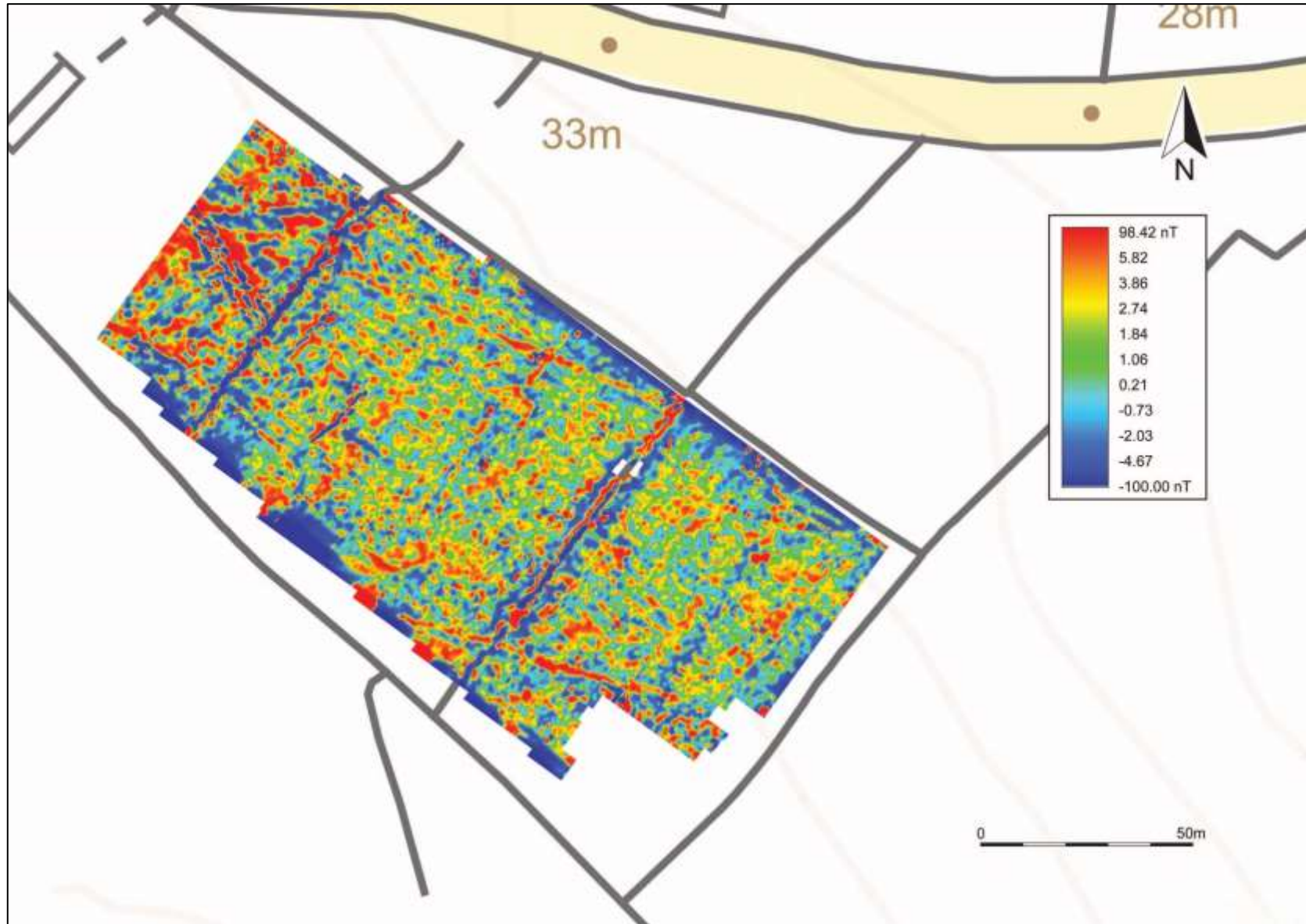


FIGURE 10: RED-BLUE-GREEN (2) SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.



THE OLD DAIRY
HACCHE LANE BUSINESS PARK
PATHFIELDS BUSINESS PARK
SOUTH MOLTON
DEVON
EX36 3LH

01769 573555

01872 223164

EMAIL: MAIL@SWARCH.NET