GEOPHYSICAL SURVEY REPORT

GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Cotswold Hills Golf Club, Coberley, Gloucestershire

Client
Longman Archaeology

Survey Report
10835

Date
February 2017

Incorporating

GSB PROSPECTION LTD

and

STRATASCAN LTD

SUMO Services Ltd
Cowburn Farm
Market Street
Thornton
Bradford
BD13 3HW
T: 01274 835016

SUMO Services Ltd
Vineyard House
Upper Hook Road
Upton upon Severn
Worcestershire
WR8 0SA
T: 01684 592266

geophysics@sumoservices.com
www.sumoservices.com

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Project name:
Cotswold Hills Golf Club, Coberley, Gloucestershire

SUMO Job reference:
10857

Client:
Longman Archaeology

On behalf of:
Grass Roots Planning Ltd

Survey date:
31 January – 3 February 2017

Report date:
23 February 2017

Field co-ordinator:
Adam Clark **BA (Hons)**

Field Team:
Stephanie Rhodes **BSc (Hons) FGS**

Report written by:
Dr John Gater **BSc DSc(Hon) MCIfA FSA**

CAD illustrations by:
Rebecca Davies **BSc (Hons)**

Project Manager:
Simon Haddrell **BEng (Hons) AMBCS PCIfA**

Report approved by:
Dr John Gater **BSc DSc(Hon) MCIfA FSA**

TABLE OF CONTENTS

LIST OF FIGURES

DIGITAL CONTENT (Archive Data)

- Minimally Processed Greyscale Images and XY Trace Plots in DWG format
- DWG Viewer
- Digital Copies of Report Text and Figures (both PDF and native formats)

1 SUMMARY OF RESULTS

No anomalies of archaeological interest have been identified in the survey, though a plethora of magnetic responses associated with the golf course has resulted in a complex dataset. As a consequence, many of the responses have been classified as being of uncertain origin, because it is not possible to provide a more accurate interpretation.

2 INTRODUCTION

2.1 Background synopsis

SUMO Services were commissioned to undertake a geophysical survey of an area outlined for development. This survey forms part of an archaeological investigation being undertaken by **Longman Archaeology** on behalf of **Grass Roots Planning Ltd.**.

2.2 Site details

NGR / Postcode	SO 954 167 / GL53 9QT
Location	The site is located approximately 5km south of Cheltenham, in a triangle of land between the A436 (which forms the southern boundary) and the A417. The survey area is located within the existing golf course but occupies a very irregular shape.
HER/SMR	Gloucestershire
District	Cotswolds
Parish	Coberley CP
Topography	Undulating
Current Land Use	Golf course - grassland
Weather Conditions	Overcast, dry, occasional showers
Geology	Solid: Birdlip Limestone Formation - Limestone. Superficial: None. (BGS 2017).
Soils	Elmton 1 Association (343a) – shallow well drained calcareous silty soils (SSEW 1983).
Archaeology	The site is considered to have a low potential for remains of any period (BaRAS 2016).
Survey Methods	Magnetometer survey (fluxgate gradiometer)
Study Area	*c.*13.6 ha

2.3 Aims and Objectives

To locate and characterise any anomalies of possible archaeological interest within the study area.

3 METHODS, PROCESSING & PRESENTATION

3.1 Standards & Guidance

This report and all fieldwork have been conducted in accordance with the latest guidance documents issued by Historic England (EH 2008) (then English Heritage) and the Chartered Institute for Archaeologists (IfA 2002 & CIfA 2014).

3.2 Survey methods

Detailed magnetic survey was chosen as an efficient and effective method of locating archaeological anomalies.

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

More information regarding this technique is included in Appendix A

3.3 Data Processing

The following basic processing steps have been carried out on the data used in this report:

De-stripe
De-stagger
Interpolate

3.4 Presentation of results and interpretation

. The presentation of the results for each site involves a grey-scale and colour-scale plot of processed data. Magnetic anomalies are identified, interpreted and plotted onto the 'Interpretation' drawings. The minimally processed data are provided as a greyscale image in the Archive Data Folder with an XY trace plot in CAD format. A CAD viewer is also provided.

When interpreting the results, several factors are taken into consideration, including the nature of archaeological features being investigated and the local conditions at the site (geology, pedology, topography etc.). Anomalies are categorised by their potential origin. Where responses can be related to other existing evidence, the anomalies will be given specific categories, such as: *Abbey Wall* or *Roman Road*. Where the interpretation is based largely on the geophysical data, levels of confidence are implied, for example: *Probable*, or *Possible Archaeology*. The former is used for a confident interpretation, based on anomaly definition and/or other corroborative data such as cropmarks. Poor anomaly definition, a lack of clear patterns to the responses and an absence of other supporting data reduces confidence, hence the classification *Possible*.

4 RESULTS

4.1 *Probable / Possible Archaeology*

4.1.1 No magnetic responses have been recorded which would readily be interpreted as being of archaeological interest.

4.2 *Former Field Boundary*

4.2.1 A short linear anomaly in the central southern part of the survey is aligned with an existing field boundary. The magnetic response shows the this originally extended further north and map evidence supports this interpretation (BaRAS 2016).

4.3 *Agricultural – Ploughing*

4.3.1 Parallel, narrowly-spaced linear anomalies are visible throughout the survey areas, with concentrations appearing on some of the open fairways. Such responses would normally be interpreted as being associated with modern, agricultural ploughing. While such a classification is still possible, it is perhaps more likely that the furrows are associated with landscaping of the ground for the golf course.

4.4 *Golf Course Features*

4.4.1 This category has been created to accommodate the numerous magnetic responses which are directly attributable to existing or former golf course features, such as greens, tees, areas of planting and bunkers. These have been correlated with observed features and Google imagery.

4.4 *Uncertain / Natural*

4.4.1 It is inevitable that in a survey of this size, magnetic responses are going to be identified which prove difficult to interpret. Given the extensive landscaping which the site has undergone to create the existing golf course, this makes the classification of anomalies even more problematic. Therefore, numerous linear and discrete anomalies have been highlighted where there is no obvious link with the golf course. However, they could still be the result of past consolidation or landscaping when the course was built, as it is not always possible to determine where this has taken place. An alternate explanation is that they are an agricultural or natural effect, and although perhaps unlikely, an archaeological origin cannot be ruled out. Anomalies most likely to be natural in origin have been highlighted.

4.5 *Ferrous / Magnetic Disturbance*

4.5.1 A small area of magnetic disturbance is visible at the northern limit of the western arm of the survey. This coincides with a former quarry marked on early maps (BaRAS 2016). Linear ferrous responses in the vicinity are associated with two pipes.

4.5.3 Small scale ferrous anomalies ("iron spikes") are present throughout the data and their form is best illustrated in the XY trace plots or the colour-scale plots. These responses are characteristic of small pieces of ferrous debris (or brick / tile / igneous rocks) in the topsoil and are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretation diagram.

5 DATA APPRAISAL & CONFIDENCE ASSESSMENT

5.1 English Heritage Guidelines (EH 2008) Table 4 states that the average magnetic response on limestones is good. The difficulty with this survey is the presence of the golf course features and the knowledge that the ground has been extensively landscaped. Therefore, whilst enclosures, ring ditches or other defined archaeological features should be readily identifiable, more ephemeral features may not be recognised.

6 CONCLUSION

6.1 No responses of clear archaeological interest have been identified. The results are dominated by anomalies associated with golf course features. Due to extensive past landscaping many anomalies fall into the category of uncertain origin.

7 REFERENCES

BaRAS 2016 *Cotswold Hills Golf Club Course, Coberley, Gloucestershire, Archaeological Desk-based Assessment,* Bristol & Region Archaeological Services, unpublished report.

BGS 2017 British Geological Survey *website*: (http://www.bgs.ac.uk/opengeoscience/home.html?Accordion1=1#maps) Geology of Britain viewer [Accessed 23/02/2017].

CIfA 2014 *Standard and Guidance for Archaeological Geophysical Survey*. Amended 2016. CIfA Guidance note. Chartered Institute for Archaeologists, Reading http://www.archaeologists.net/sites/default/files/CIfAS%26GGeophysics_2.pdf

EH 2008 *Geophysical Survey in Archaeological Field Evaluation.* English Heritage, Swindon https://content.historicengland.org.uk/images-books/publications/geophysical-survey-in-archaeological-field-evaluation/geophysics-guidelines.pdf/

IfA 2002 *The Use of Geophysical Techniques in Archaeological Evaluations*, IFA Paper No 6, C. Gaffney, J. Gater and S. Ovenden. Institute for Archaeology, Reading

SSEW 1983 *Soils of England and Wales. Sheet 5, South West England*. Soil Survey of England and Wales, Harpenden.