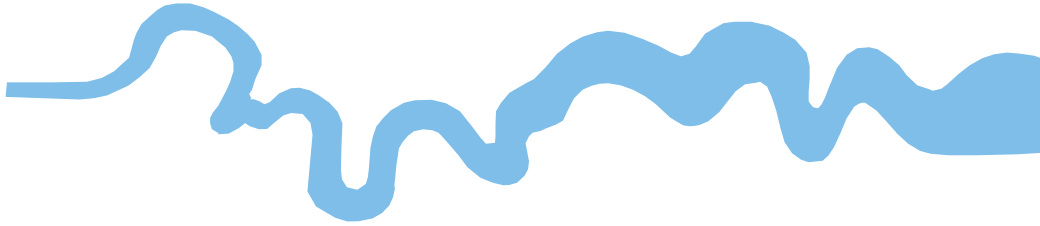


T V A S



SOUTH

**Land at Reading Street Road,
Reading Street, Thanet, Kent**

Geophysical Survey (Magnetic)

by Kyle Beaverstock

Site Code: RST 22/78

(TR 3873 6985)

**Land at Reading Street Road, Reading Street,
Thanet, Kent**

Geophysical Survey (Magnetic) Report

For Lanpro Services

by Kyle Beaverstock

TVAS South

Site Code RST 22/78

May 2022

Summary

Site name: Land at Reading Street Road, Thanet, Kent

Grid reference: TR 3873 6985

Site activity: Magnetometer survey

Date and duration of project: 23rd - 24th May 2022

Project coordinator: Tim Dawson

Site supervisor: Kyle Beaverstock

Site code: RST 22/78

Area of site: c. 5ha

Summary of results: A number of discrete sub-circular magnetic anomalies were uncovered, these may represent buried features such as pits or containing structural material.

Location of archive: The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

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www.tvas.co.uk/reports/reports.asp.*

Report edited/checked by: Steve Ford✓ 27.05.22 Tim Dawson✓ 27.05.22
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Land at Reading Street Road, Reading Street, Thanet, Kent A Geophysical Survey (Magnetic)

by Kyle Beaverstock

Report 22/78

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Reading Street, Thanet, Kent (TR 3873 6985) (Fig. 1). The work was commissioned by Mitchell Pollington of Lanpro Ltd. on behalf of Land Allocation Limited,

Planning permission is being sought for the construction of housing and associated facilities. In preparation, a geophysical survey has been requested to inform the application. This is in accordance with the *National Planning Policy Framework* (NPPF 2021), and the District's policies on archaeology. The fieldwork was undertaken by Kyle Beaverstock between the 23rd and 24th May 2022 and the site code is RST 22/78.

The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

Location, topography and geology

The site is located to the north of Broadstairs (Fig. 1), bounded by Reading Street Road to the south-west, Convent Road to the south-east and arable farmland to the north-east and north-west. This irregularly shaped parcel of land sits at a height of 41m above Ordinance Datum (aOD) in the north-east sloping up to 47m aOD in the south-west. The underlying geology is stated as mostly Brickearth with some potential Head in the north-west (BGS 1980).

Site history and archaeological background

A complete assessment of the archaeological background can be found in a desk-based assessment for the site (BA 2020). To summarise, there is significant potential for prehistoric activity as a number of features were identified by aerial photography to the immediate north-west of the site although no features were identified within the site boundary. There is also a significant amount of Roman activity in the area which suggests the potential for Roman finds and features to be present.

Methodology

Sample interval

Data collection involved the traversing of the survey area along straight and parallel lines using two cart-mounted Bartington Grad601-2 fluxgate gradiometers. Even coverage was achieved with the use of regularly spaced markers at the ends of traverses and the real-time positional trace plot. Readings were taken at 0.25m intervals along traverses 1m apart, providing an appropriate methodology balancing cost and time with resolution. Traverses were walked at an alternating zig-zag pattern along a south-west to north-east orientation across the north-east of the survey area and along a north-west to south-east orientation in the south-west. No significant obstructions were encountered across most of the survey area however, in the south-east along the boundary was a small embankment. Also, due to adverse weather conditions no useful data could be gathered from the south-west of the survey area. Conditions were wet and stormy.

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. Under normal operating conditions it can be expected to identify buried features >0.5m in diameter. Features which can be detected include disturbed soil, such as the fill of a ditch, structures that have been heated to high temperatures (magnetic thermoremnance) and objects made from ferro-magnetic materials. The strength of the magnetic field is measured in nano Tesla (nT), equivalent to 10^{-9} Tesla, the SI unit of magnetic flux density.

Equipment

The purpose of the survey was to identify geophysical anomalies that may be archaeological in origin in order to inform a targeted archaeological investigation of the site prior to development. The survey and report generally follow the recommendations and standards set out by both European Archaeological Council (EAC 2015) and the Chartered Institute *for* Archaeologists (2002, 2014).

Magnetometry was chosen as a survey method as it offers the most rapid ground coverage and responds to a wide range of anomalies caused by past human activity. These properties make it ideal for the fast yet detailed surveying of an area.

The detailed magnetometry survey was carried out using two dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometers mounted upon a Bartington non-magnetic cart. A two-wheeled lightweight structure pushed by hand, the cart consisted a bank of four vertically-mounted Bartington Grad601-2 magnetic sensor tubes at 1m apart and a Trimble Geo 7x centimetre edition GPS. Readings were collected by two Bartington

Grad601-2 loggers and collated using MLgrad601 software on a Linx 12x64 tablet running Windows 10 mounted at the rear of the cart. This enables readings to be taken of both the general background magnetic field and any localised anomalies with the difference being plotted as either positive or negative buried features. All sensors are calibrated to cancel out the local magnetic field and react only to anomalies above or below this base line. On this basis, strong magnetic anomalies such as burnt features (kilns and hearths) will give a high response as will buried ferrous objects. More subtle anomalies such as pits and ditches can be seen from their infilling soils containing higher proportions of humic material, rich in ferrous oxides, compared to the undisturbed subsoil. This will stand out in relation to the background magnetic readings and appear in plan following the course of a linear feature or within a discrete area.

The Trimble Geo7x centimetre edition GPS system with centimetre real-time accuracy was used to tie the cart traverses into the Ordnance Survey national grid. This unit offers both real-time correction and post-survey processing; enabling a high level of accuracy to be obtained both in the field and in the final post-processed data.

Data gathered in the field was processed using the TerraSurveyor software package. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies, particularly those likely to be of archaeological origin. The table below lists the processes applied to this survey, full survey and data information is recorded in Appendix 1.

Process	Effect
Clip from -5.43 to 5.50 nT	Enhance the contrast of the image to improve the appearance of possible archaeological anomalies.
De-stripe: median, all sensors	Removes the striping effect caused by differences in sensor calibration, enhancing the visibility of potential archaeological anomalies.
De-spike: threshold 1, window size 3×3	Compresses outlying magnetic points caused by interference of metal objects within the survey area.
De-stagger: all grids, both by -1 intervals	Cancels out effects of site's topography on irregularities in the traverse speed.

The raw data plot is presented as a greyscale plot shown in relation to the site (Fig. 2) with the processed data then presented as a second figure (Fig. 3), followed by a third plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 4). Anomalies are shown as colour-coded lines, points and polygons.

The greyscale plot of the processed data is exported from TerraSurveyor in a georeferenced portable network graphics (.PNG) format, a raster image format chosen for its lossless data compression and support for transparent pixels, enabling it to easily be overlaid onto an existing site plan. The data plot is combined with grid and site plans in QGIS 2.18.15 and exported again in .PNG format in order to present them in figure templates in

Adobe InDesign CS5.5, creating .INDD file formats. Once the figures are finalised they are exported in .PDF format for inclusion within the finished report.

Results

A number of discrete magnetic anomalies were discovered by the geophysical survey (Figs. 2 and 3), these are all within the south-western area of the site. Three of these are sub-circular positive anomalies [**Fig. 4: 1**] surrounded by an area of negative response, these have a defined, regular form which suggests that they are intrusive features such as pits, however the high responses may indicate the presence of ferrous or other structural material. There is also a sub-circular positive anomaly [**2**] without the associated negative response, which may possibly suggest a pit-like feature. To the north-east of these is a sub-circular weak positive anomaly [**3**], this anomaly has a relatively low response and may indicate the presence of a shallow discrete feature or possibly a perturbation in the natural geology.

Conclusion

The geophysical survey discovered a number of sub-circular magnetic anomalies that may represent discrete features such as pits although some have a high response suggesting the presence of ferrous materials or others such as brickwork and therefore may represent structural remains of indeterminate date. No other anomalies were uncovered by the geophysical survey.

References

- BGS, 1980, *British Geological Survey*, 1:50,000, Sheet 274, Solid and Drift Edition, Keyworth
- Border Archaeology, 2020, 'Archaeological Desk-based Assessment; Land at Reading Street Road, Reading Street, Broadstairs, Kent', Leominster
- CI/A, 2014, 'Standard and Guidance for archaeological geophysical survey', Reading
- EAC, 2015, *EAC Guidelines for the use of Geophysics in Archaeology: Questions to Ask and Points to Consider*, EAC Guidelines 2, Namur
- IFA, 2002, 'The Use of Geophysical Techniques in Archaeological Evaluation', IFA Paper No. 6, Reading
- NPPF, 2021, *National Planning Policy Framework*, Ministry of Housing, Communities and Local Govt, London

Appendix 1. Survey and data information

Programme:

Name: TerraSurveyor
Version: 3.0.25.0

Raw data

Filename: Reading Road A RAW.xcp
Instrument Type: MLgrad Import
Units:
UTM Zone: 30
Survey corner coordinates (X/Y):
Northwest corner: 638672.653493671, 170015.138565892 m
Southeast corner: 638875.843493671, 169780.228565892 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 2 @ 1 m spacing.
Dummy Value: 32702

Dimensions

Survey Size (meters): 203 m x 235 m
X&Y Interval: 0.13 m
Source GPS Points: Active: 69383, Recorded: 69383

Stats

Max: 105.02
Min: -109.64
Std Dev: 2.34
Mean: 0.75
Median: 0.63
Composite Area: 4.7731 ha
Surveyed Area: 1.7975 ha

Filename: Reading Road B RAW.xcp

Instrument Type: MLgrad Import
Units:
UTM Zone: 30
Survey corner coordinates (X/Y):
Northwest corner: 638612.948111233, 169847.088473806 m
Southeast corner: 638806.648111233, 169628.168473806 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 2 @ 1 m spacing.
Dummy Value: 32702

Dimensions

Survey Size (meters): 194 m x 219 m
X&Y Interval: 0.13 m
Source GPS Points: Active: 46743, Recorded: 46743

Stats

Max: 103.40
Min: -102.55
Std Dev: 4.27
Mean: 0.46
Median: 0.35
Composite Area: 4.2405 ha
Surveyed Area: 1.5347 ha

Processed data

Filename: Reading Road A.xcp
Stats
Max: 3.29
Min: -3.05
Std Dev: 0.84
Mean: 0.05
Median: 0.02
Composite Area: 4.7731 ha
Surveyed Area: 1.7888 ha

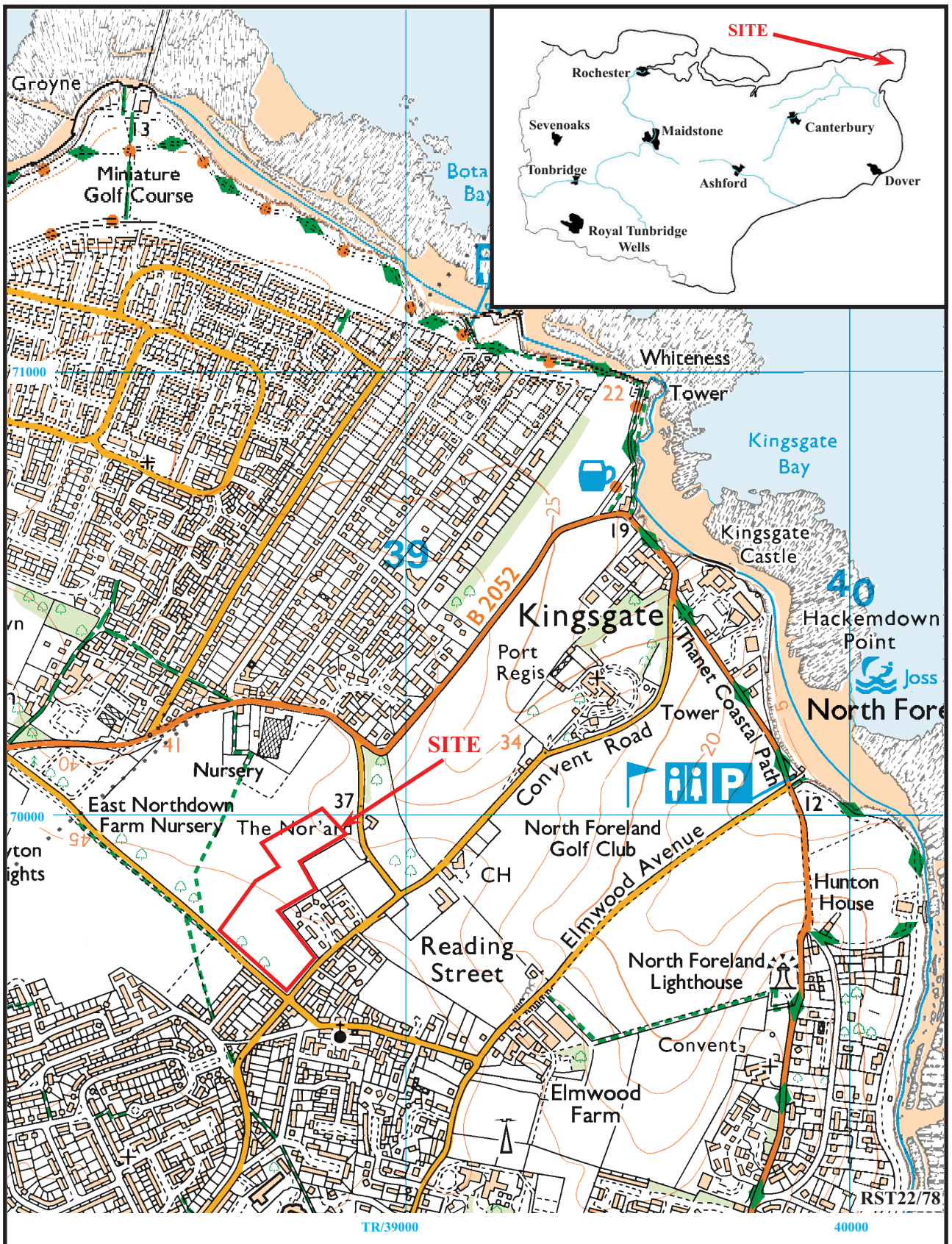
GPS based Proce5

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip at 1.00 SD
- 5 DeStagger by: 50.00cm, Shift Positions

Filename: Reading Road B.xcp
Stats
Max: 5.50
Min: -5.43
Std Dev: 1.12
Mean: -0.03
Median: 0.00
Composite Area: 4.2405 ha
Surveyed Area: 1.5347 ha

GPS based Proce4

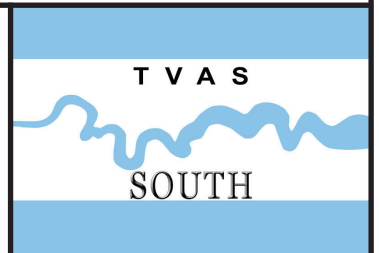
- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip at 1.00 SD



Land at Reading Street Road, Reading Street,
 Thanet, Kent, 2022
 Geophysical Survey (Magnetic)

Figure 1. Location of site within Thanet and Kent,

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TR 38600

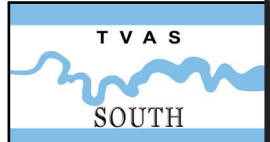
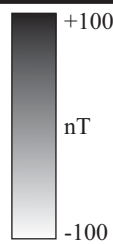
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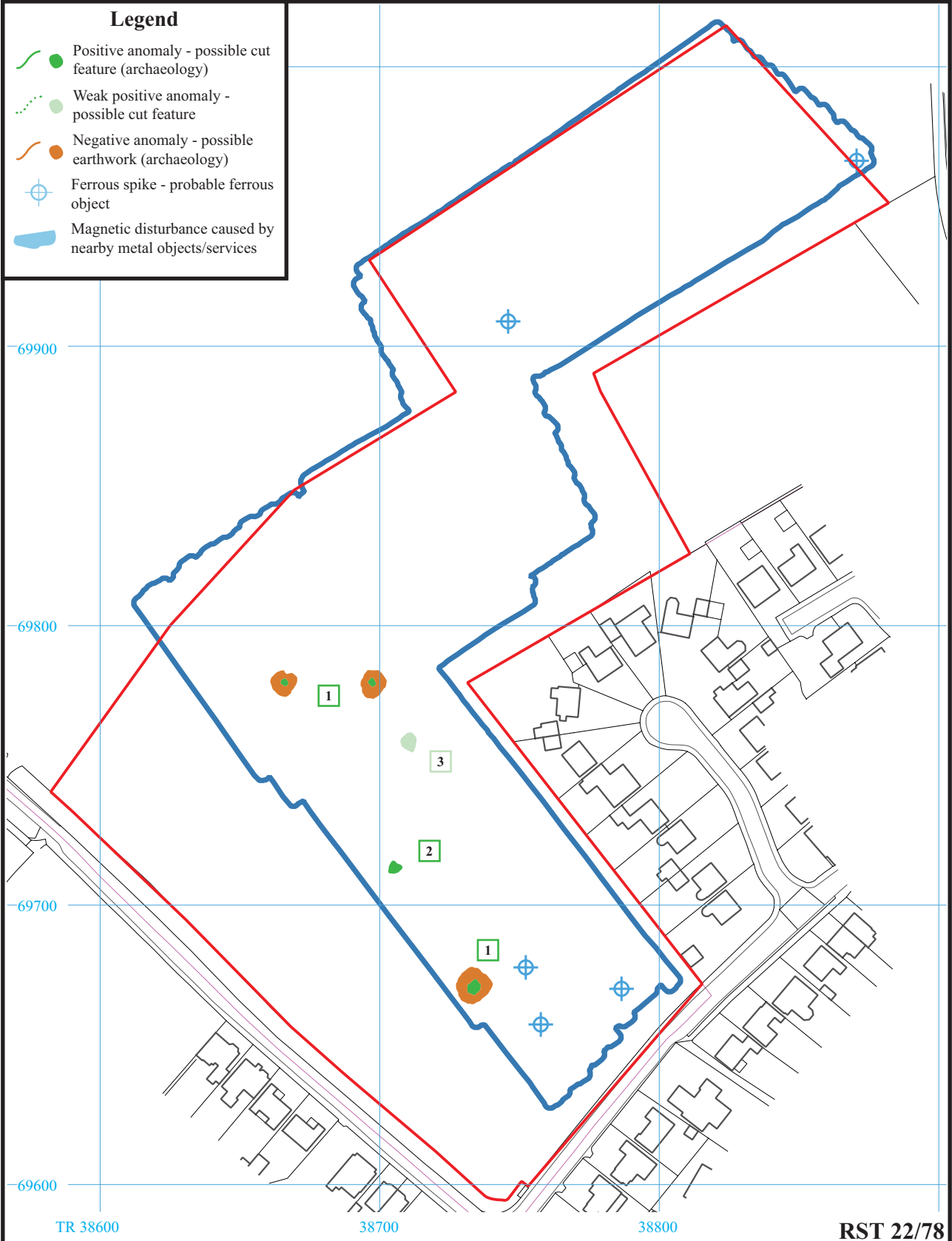
RST 22/78



**Land at Reading Street Road, REading Street,
Thanet, Kent, 2022**
Geophysical Survey (Magnetic)
Figure 2. Plot of raw gradiometer data.







**Land at Reading Street Road, Reading Street,
Thanet, Kent, 2022**
Geophysical Survey (Magnetic)
 Figure 4. Interpretation plot.





Plate 1. North-east of the survey area looking south-west



Plate 2. Centre of the survey area looking south-east



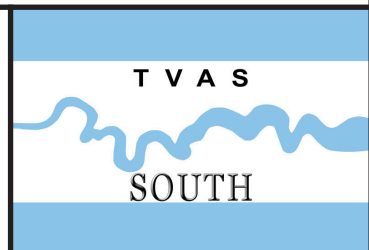
Plate 3. Southern part of survey area looking south



Plate 4. South-west of survey area looking south-west

RST 22/78

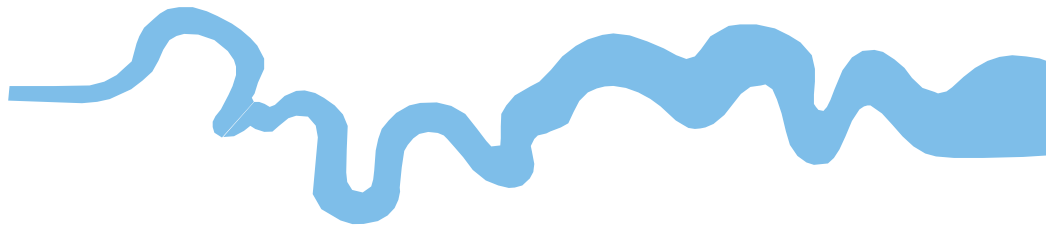
**Land at Reading Street Road, Reading Street,
Thanet, Kent, 2022
Geophysical Survey (magnetic)
Plates 1 to 4.**



TIME CHART

	Calendar Years
Modern _____	AD 1901
Victorian _____	AD 1837
Post Medieval _____	AD 1500
Medieval _____	AD 1066
Saxon _____	AD 410
Roman _____	AD 43 AD 0 BC
Iron Age _____	750 BC
Bronze Age: Late _____	1300 BC
Bronze Age: Middle _____	1700 BC
Bronze Age: Early _____	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
Mesolithic: Late	6000 BC
Mesolithic: Early	10000 BC
Palaeolithic: Upper	30000 BC
Palaeolithic: Middle	70000 BC
Palaeolithic: Lower	2,000,000 BC





**TVAS (South),
77a Hollingdean Terrace
Brighton, BN1 7HB**

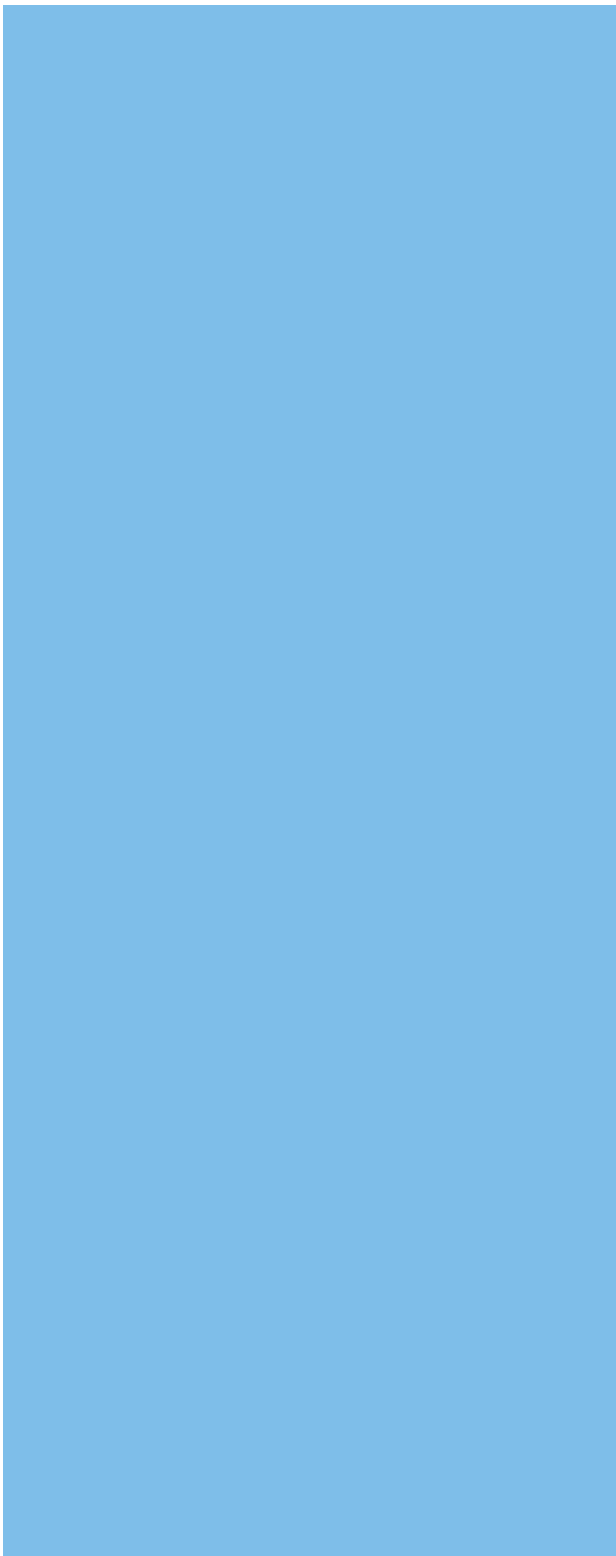
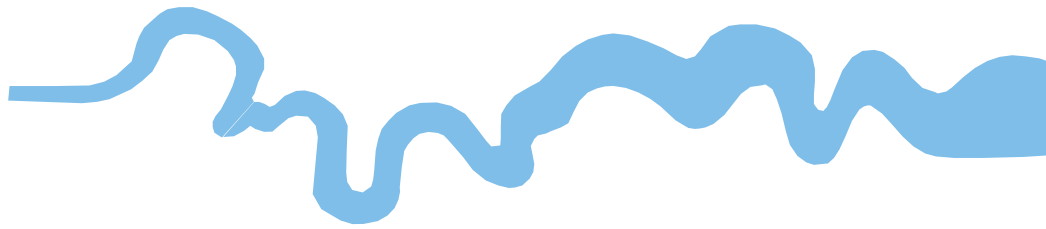
**Tel: 01273 554198
Email: south@tvas.co.uk
Web: www.tvas.co.uk/south**

***Offices in:
Reading, Taunton, Stoke-on-Trent, Wellingborough
and Ennis (Ireland)***

TIME CHART

	Calendar Years
Modern _____	AD 1901
Victorian _____	AD 1837
Post Medieval _____	AD 1500
Medieval _____	AD 1066
Saxon _____	AD 410
Roman _____	AD 43 AD 0 BC
Iron Age _____	750 BC
Bronze Age: Late _____	1300 BC
Bronze Age: Middle _____	1700 BC
Bronze Age: Early _____	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
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Mesolithic: Early	10000 BC
Palaeolithic: Upper	30000 BC
Palaeolithic: Middle	70000 BC
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