

LAND AT POLWITHEN DRIVE

CARBIS BAY

ST IVES

CORNWALL

Heritage Assessment and Geophysical Survey



South West Archaeology Ltd. report no. 191114



www.swarch.net

Tel. 01769 573555
01872 223164

Land at Polwithen Drive, Carbis Bay, St Ives, Cornwall Heritage Assessment and Geophysical Survey

By P. Bonvoisin & P. Webb
Report Version: FINALv2
Issued: 14th November 2019
Revised: 13th December 2019

Work undertaken by SWARCH on behalf of bunnyhomes (The Client)

SUMMARY

This report presents the results of a heritage assessment carried out by South West Archaeology Ltd. (SWARCH) for land at Polwithen Drive, Carbis Bay, St Ives, Cornwall. This work was undertaken in advance of a planning application.

The site is located on the southern edge of Carbis Bay, a post-medieval seaside settlement on the western side of St Ives Bay. The site forms part of the former land of the manor of Lelant and Trevethow. The surrounding landscape contains evidence of prehistoric, medieval and post-medieval settlement and farming activity, the site itself appearing to have remained undeveloped despite the substantial growth of Carbis Bay during the 20th century.

Assessment of the readily available aerial photography and LiDAR for the proposal site indicates that the site is largely clear of visible earthworks, though a removed historic field boundary is visible to the south of the proposal site. The cartographic sources similarly indicate a field boundary at this location. The geophysical survey did not identify any significant features of note, with the historic division between pasture and waterlogged or boggy ground visible, a single positive linear runs across the centre of the site, and may represent a ditch or earlier field system but has been partially obscured by the response produced by the modern utility running across the site. There is no clear boundary for the waterlogged ground, but a change in surface level was visible on site. The geotechnical investigations on the site suggest that the wet ground to the west of the site reflects modern made ground overlying a buried topsoil. There was no evidence of any mine working or mining waste encountered in either phase of geotechnical trenching and test-pitting on the site.

Whilst the geophysical and previous geotechnical surveys did not identify any clearly significant features within the survey area the local archaeological potential is moderate. The presence of prehistoric features within the local area, as well as the proximity of medieval and later mining activity it would suggest that further mitigation in the form of a conditioned watching brief would be appropriate.



November 2019

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>CONTENTS</i>	3
<i>LIST OF FIGURES</i>	3
<i>LIST OF TABLES</i>	4
<i>LIST OF APPENDICES</i>	4
<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 DESK-BASED APPRAISAL	7
2.1 DOCUMENTARY HISTORY	7
2.2 CARTOGRAPHIC DEVELOPMENT	7
2.3 ARCHAEOLOGICAL BACKGROUND	10
2.4 AERIAL PHOTOGRAPHY AND LIDAR	12
2.5 GEOTECHNICAL ASSESSMENTS	13
3.0 GEOPHYSICAL SURVEY	15
3.1 INTRODUCTION	15
3.2 METHODOLOGY	15
3.3 SITE INSPECTION	15
3.4 RESULTS	17
3.5 DISCUSSION	17
4.0 CONCLUSION	21
5.0 BIBLIOGRAPHY & REFERENCES	22

LIST OF FIGURES

Cover plate: View across the site; from the south-east.

FIGURE 1: SITE LOCATION (THE SITE IS INDICATED).	6
FIGURE 2: EXTRACT FROM THE UNY LELANT TITHE MAP OF 189; THE EXTENT OF THE SURVEY AREA IS INDICATED (CRO).	8
FIGURE 3: EXTRACT FROM THE OS FIRST EDITION 6" MAP OF 1887; THE EXTENT OF THE SURVEY AREA IS INDICATED (NLS).	9
FIGURE 4: EXTRACT FROM THE SECOND EDITION OS 6" MAP OF 1908; THE EXTENT OF THE SURVEY AREA IS INDICATED (NLS).	10
FIGURE 5: NEARBY HERITAGE ASSETS (SOURCE: CORNWALL & SCILLY HER).	11
FIGURE 6: AERIAL PHOTOGRAPH OF THE SITE TAKEN IN 2001; SHOWING NO CLEAR SIGN OF VISIBLE EARTHWORKS.	12
FIGURE 7: IMAGE DERIVED FROM LIDAR DATA.	13
FIGURE 8: MADE GROUND AND SERVICE AS IDENTIFIED IN THE GEOTECHNICAL REPORTS (AFTER: HYDROCK 2019).	14
FIGURE 9: VIEW ALONG THE SOUTH-WESTERN BOUNDARY OF THE SURVEY AREA; VIEWED FROM THE SOUTH-EAST (NO SCALE).	16
FIGURE 10: VIEW ALONG THE NORTH-EASTERN BOUNDARY OF THE SURVEY AREA; VIEWED FROM THE NORTH-WEST (NO SCALE).	16
FIGURE 11: SHADE PLOT OF GRADIOMETER SURVEY DATA; GREYSCALE.	19
FIGURE 12: INTERPRETATION OF GRADIOMETER SURVEY DATA.	20
FIGURE 13: LOCATION AND NUMBERING OF THE SURVEY GRIDS.	23
FIGURE 14: GREYSCALE SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.	24
FIGURE 15: RED GREYSCALE BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.	25
FIGURE 16: RED-BLUE-GREEN (2) SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.	26

LIST OF TABLES

TABLE 1: EXTRACT FROM THE 1839 UNY LELANT TITHE APPORTIONMENT.	8
TABLE 2: TABLE OF NEARBY UNDESIGNATED HERITAGE ASSETS (SOURCE: CORNWALL & SCILLY HER).	11
TABLE 3: INTERPRETATION OF GRADIOMETER SURVEY DATA.	17

LIST OF APPENDICES

APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY	23
APPENDIX 2: SUPPORTING PHOTOGRAPHS: SITE INSPECTION	27

ACKNOWLEDGEMENTS

BUNNYHOMES (THE CLIENT)
THE LANDOWNER (FOR ACCESS)
CORNWALL COUNCIL

PROJECT CREDITS

DIRECTOR: DR. BRYN MORRIS
FIELDWORK: PETER BONVOISIN
REPORT: PETER BONVOISIN; PETER WEBB
EDITING: DR. SAMUEL WALLS, MCIFA.
GRAPHICS: PETER BONVOISIN

1.0 INTRODUCTION

LOCATION:	POLWITHEN DRIVE, CARBIS BAY
PARISH:	ST IVES
COUNTY:	CORNWALL
NGR:	SW 52355 38305
PLANNING NO.	PRE-APPLICATION
SWARCH REF.	IPD19

1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by bunnyhomes (the Client) to undertake a heritage statement and geophysical survey on Land at Polwithen Drive, Carbis Bay, St Ives, Cornwall, in advance of proposed development of the land. This work was undertaken in accordance with best practice and ClfA guidelines.

1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

Carbis Bay is a post-medieval seaside settlement on the western side of St Ives Bay, approximately 2.2km south-east of St Ives. The site is situated towards the foot of a north-east facing slope overlooking the bay at a height of c.100m AOD and comprises the northern end of a larger sub-rectangular field at the southern edge of the settlement (Figure 1). The soils of this area are the well-drained gritty loamy soils of the Moretonhampstead Association (SSEW 1983), overlying granite of the Land's End Intrusion (BGS 2019).

1.3 HISTORICAL BACKGROUND

Carbis Bay is situated in the parish of St Ives, formerly of Uny Lelant, in the Lizard Peninsula of Cornwall. The manor of Lelant and Trevethow was a medieval manor in the hundred and deanery of Penwith, owned variously by the families of Bottreaux, Godolphin and Praed. The site is situated between the historic settlements of: Boskerris Wartha (now Trewartha Farm), Boskerris Woolas, and Carninney. The surrounding landscape is dominated by elements of the wider Cornish mining landscape, Providence Mine being located just to the north-west.

The site lies within an area characterised by the Cornwall HLC as *medieval farmland*, forming part of the category *Anciently Enclosed Land*; these areas are regarded as having a *high* potential for Prehistoric and Romano-British remains.

1.4 ARCHAEOLOGICAL BACKGROUND

This locality has seen limited archaeological fieldwork, desk-based assessment and walkover survey (CAU: Goacher 2015), geophysical survey (Stratascan: Gater 2016), and evaluation trenching and building recording (SWARCH: Morris 2018; Morris & Balmond 2018) having been carried out at Carninney Barns; archaeological monitoring at Carninney Farm (SWARCH: Bampton 2017; Webb 2018); geophysical survey and archaeological monitoring at Menhyr Drive, Carbis Bay (SWARCH: Bonvoisin 2018) which have identified elements of the historic development of the farm and surrounding landscape. The remaining archaeological evidence is derived from the Cornwall and Scilly Historic Environment Record (HER) which lists a series of undesignated assets in the local area. These mostly arise from documentary or place-name reference to the prehistoric and medieval settlement and farming of the landscape; but include findspots and cropmarks. Much of the evidence, however, takes the form of the extant post-medieval structures,

particularly of Carbis Bay itself, which reflect the post-medieval development and expansion of the settlement.

1.5 METHODOLOGY

This work was undertaken in accordance with best practice. The assessment following the guidance as outlined in: *Standard and Guidance for Archaeological Desk-Based Assessment* (CIfA 2014a) and *Understanding Place: historic area assessments in a planning and development context* (English Heritage 2012). 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).

2.0 DESK-BASED APPRAISAL

2.1 DOCUMENTARY HISTORY

Carbis Bay is situated in the parish of St Ives, formerly of Uny Lelant, in the Lizard Peninsula of Cornwall. The manor of Lelant and Trevethow was a medieval manor in the hundred and deanery of Penwith, owned by William Bottreaux and subsequently the families of Godolphin and Praed (Lysons 1814). The site is situated between the historic settlements of: Boskerris Wartha (now Trewartha Farm), first recorded in 1314 as *Boskevreswartha* from the Cornish 'bod' meaning dwelling and 'kew-rys' meaning 'hollow ford', the *Wartha* element from the suffix 'guartha' and meaning 'upper' (MCO13520); Boskerris Woolas, first recorded in 1314 (MCO13520) and the lower Boskerris settlement; and Carninney, first recorded in 1327 as *Karneny*, from the Cornish 'carn' meaning 'rock-pile/tor' and an unknown element (MCO13827). The surrounding landscape is dominated by elements of the wider Cornish mining landscape, Providence Mine being located just to the north-west.

The site lies within an area characterised by the Cornwall HLC as *medieval farmland*, forming part of the category *Anciently Enclosed Land*; these areas are regarded as having a *high* potential for Prehistoric and Romano-British remains.

2.2 CARTOGRAPHIC DEVELOPMENT

The earliest detailed cartographic source available to this study is the Uny Lelant tithe map of 1839 (Figure 2). This shows the settlements of Boskerris Wartha, Boskerris Woolas, and Carninney within a landscape dominated by agricultural fields and isolated farmsteads; the proposal site forming part of a large sub-rectangular field between the three. The accompanying 1839 apportionment (Table 1) indicates that the land within the development area was owned by Mrs Sophia Praed, mother and guardian of William Blackwell Praed; leased by Mrs Catherine Bohenna; and occupied by John Wallis as part of a larger field as part of the estates of Boskerris Wartha, with some of the adjacent fields owned by William Veale (occupied by John Ellis), and as common land.

The curving and irregular field boundaries suggest that the irregularly shaped but straighter bounded post-medieval boundaries sit within a wider medieval fieldscape. The field names are largely prosaic, representing the topography of the land, or their position in relation to other parcels of land (*Little Meadow*). The nearby field names with the *Round* element may indicate that these fields are situated close to the site of an earthwork as part of possible prehistoric settlement. The proposal site falls at the northern end of a much larger field named as *Park an Hale* (no.240).

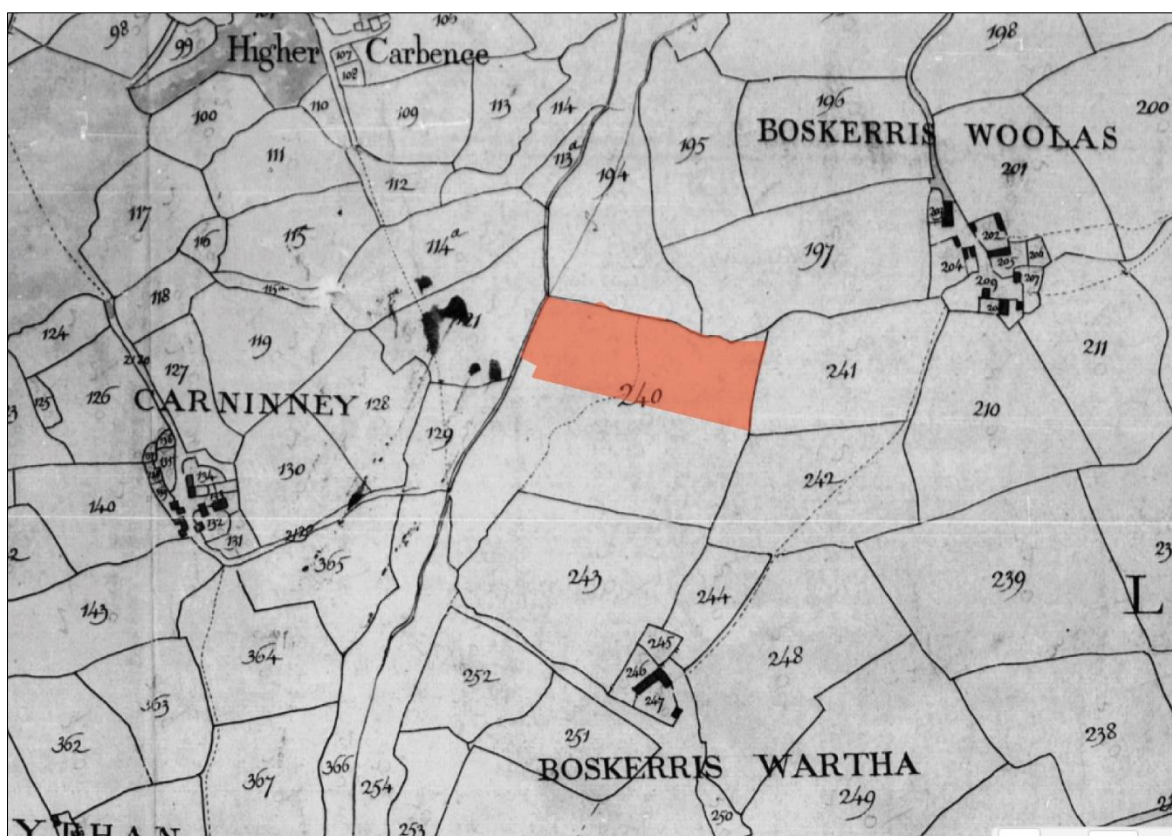


FIGURE 2: EXTRACT FROM THE UNY LELANT TITHE MAP OF 1891; THE EXTENT OF THE SURVEY AREA IS INDICATED (CRO).

TABLE 1: EXTRACT FROM THE 1839 UNY LELANT TITHE APPORTIONMENT.

Number	Landowner	Lessee	Tenant	Field Name	Cultivation
Commons on Carninney					
129	Mrs Sophia Praed and John Davis Gilbert		Tenants of Carninney	Moor	Moor
Boskerris Woolas					
194	William Veale		John Ellis	The Moor	Moor
197				Park Skibber	Arable
Boskerris Wartha					
240	Mrs Sophia Praed	Mrs Catherine Bohenna	John Wallis	Park an Hale	Furze
241				Wartha Fields	Arable
242				Wartha Fields	Arable
243				Higher Park an Hale	Arable
244				Little Meadow	Arable
245				Orchard	Orchard
246				House, homestead & curtilage	Homestead
247				Barn and mowhay	Homestead
248				Before Door	Arable
249				The Crilla	Arable
250				Calfs Garden	Garden
251				Enclosure from Downs	Improved
252				Round Gew	Arable
253				Long Gew	Arable
254	Gew Moor	Moor			

By the latter half of the 19th century, the 1888 OS 1st edition map (Figure 3) depicts a landscape very similar to that of 1840. Some boundary loss had occurred (including between the *Wartha Fields*; and *Park an Hale* and *Higher Park an Hale*), though there was additional boundary creation, including separating an area of rough ground/marsh previously only separated by a track within *Park an Hale*. The most notable development appears to have been the encroachment of the Providence Mine towards Carninney alongside the growth of the roadside settlement around Lower Carbence, now called Carbis Water, and including a Methodist chapel. Boskerris Wartha

has also been renamed, now recorded as Trewartha, with an additional building to the north.

The landscape as depicted in the 1907 OS 2nd edition map (Figure 4) is almost unchanged, with only a small degree of alteration in the arrangement of buildings within the settlements, along with the closure of Providence Mine. Later OS mapping (not depicted) shows the growth Carbis Bay within the 20th century, mostly in the post second world war period, including the construction of the estate to the immediate north of the proposal site.

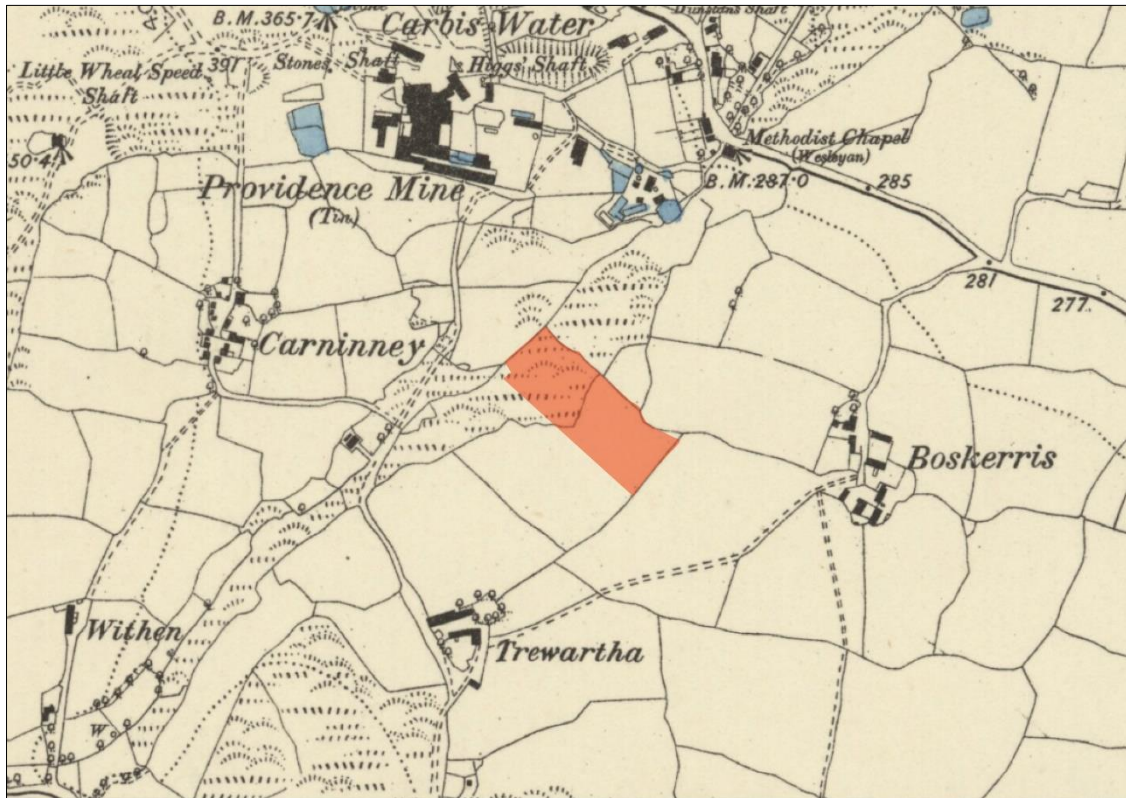


FIGURE 3: EXTRACT FROM THE OS FIRST EDITION 6" MAP OF 1887; THE EXTENT OF THE SURVEY AREA IS INDICATED (NLS).

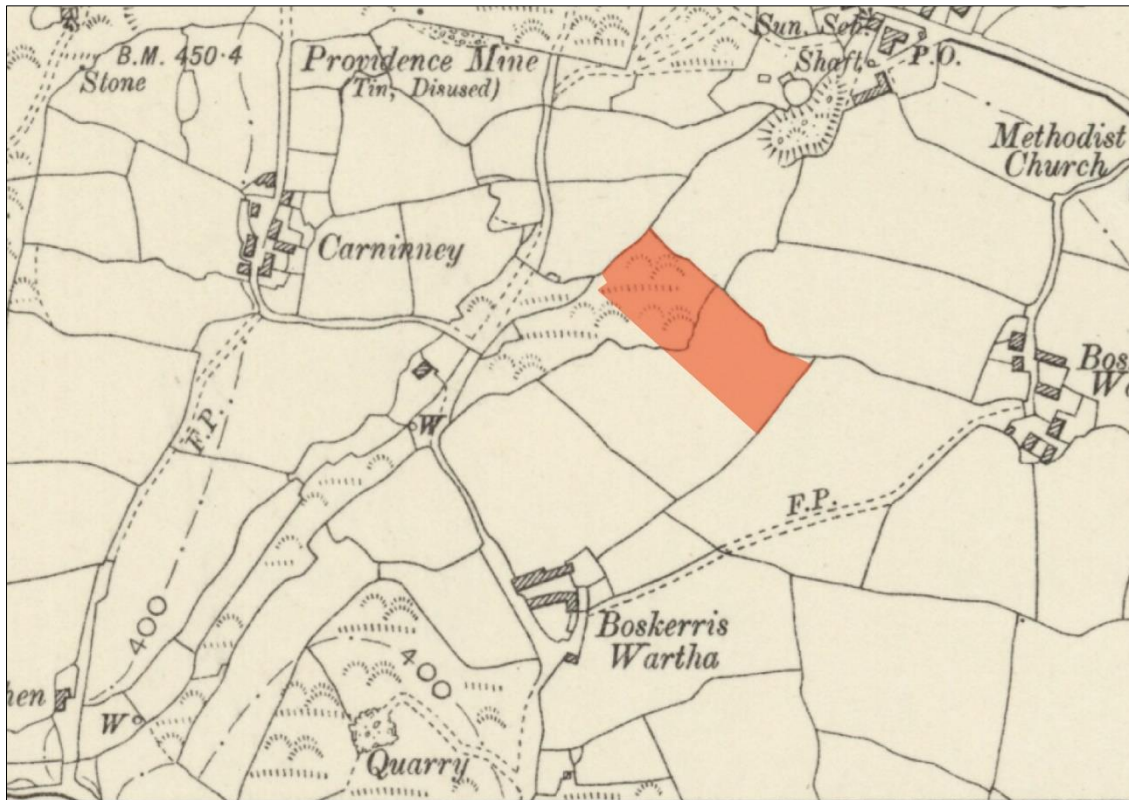


FIGURE 4: EXTRACT FROM THE SECOND EDITION OS 6" MAP OF 1908; THE EXTENT OF THE SURVEY AREA IS INDICATED (NLS).

2.3 ARCHAEOLOGICAL BACKGROUND

This locality has seen limited archaeological fieldwork, desk-based assessment and walkover survey (CAU; Goacher 2015), geophysical survey (Stratascan; Gater 2016), and evaluation trenching and building (Morris 2018; Morris & Balmond 2018) having been carried out at Carninney Barns; archaeological monitoring at Carninney Farm (Bampton 2017; Webb 2018); geophysical survey and archaeological monitoring at Menhyr Drive, Carbis Bay (Bonvoisin 2018) which have identified elements of the historic development of the farm and surrounding landscape, including prehistoric activity.

The Cornwall and Scilly Historic Environment Record (HER) lists a series of undesignated assets in the local area, mostly arising from documentary or place-name reference to the prehistoric and medieval settlement and farming of the landscape; but include findspots and cropmarks (see Table 2 and Figure 5).

Much of the evidence, however, takes the form of the extant post-medieval structures, particularly of Carbis Bay itself, which reflect the post-medieval development and expansion of the settlement.

The historic landscape characterisation (HLC) for Cornwall shows this as *medieval farmland*, areas containing farming settlements documented before the 17th century and forming a component part of *Anciently Enclosed Land* (AEL). AEL is regarded as having a *high* potential for Prehistoric or Romano-British archaeological remains. This is most obviously suggested by the cropmark enclosures at Trevartha (MCO50872).

2.3.1 PREHISTORIC 4000BC - AD43

The evidence for Prehistoric activity in this area is relatively limited, and probably reflects a lack of fieldwork rather than a genuine absence of archaeological remains, though includes a number of findspots and documentary records suggestive of prehistoric settlement, though with limited

surviving remains. The earliest evidence dates to the late Mesolithic to early Neolithic periods, flint artefacts and scatters recorded at Carbis Bay (MCO338) and Chyangweal (MCO466). By the Bronze and Iron Ages this activity appears more sustained, possible settlement activity suggested at Boskerris Wartha (MCO7643, MCO18862) and Trevartha (MCO50872). Excavation at Carninney Farm identified a Middle Bronze Age sunken-featured roundhouse (Morris 2018), and is likely to have formed part of wider pattern of land-use which can be seen extending into the wider landscape

2.3.2 MEDIEVAL AD1066 - AD1540

Most of the farms and many of the settlements in the area are at least medieval in origin, with documentary evidence for sites at Within (1309) (MCO18375), Boskerris (1314) (MCO13520), and Carninney (1327) (MCO13827). Open or strip fields at likely to have been laid out in association with these farms, subject to enclosure during the late and post-medieval period; these form the basis of the modern fieldscape.

2.3.3 POST-MEDIEVAL AND MODERN AD1540 - PRESENT

Population and settlement expanded during the post-medieval period, several of the existing farmhouses being constructed during the 18th century (Boskerris Farmhouse, List 1143336; Boskerris Woollas, List 1136949). Further expansion continued into the 19th century, mine workings at Carbence being significantly developed into Providence Mine (MCO12462), and the existing buildings at Carninney Farm being constructed. By the end of the century further development included Wesleyan and Methodist chapels at Carbis Bay; though it was not until the later 20th century that there was extensive development of the settlement.

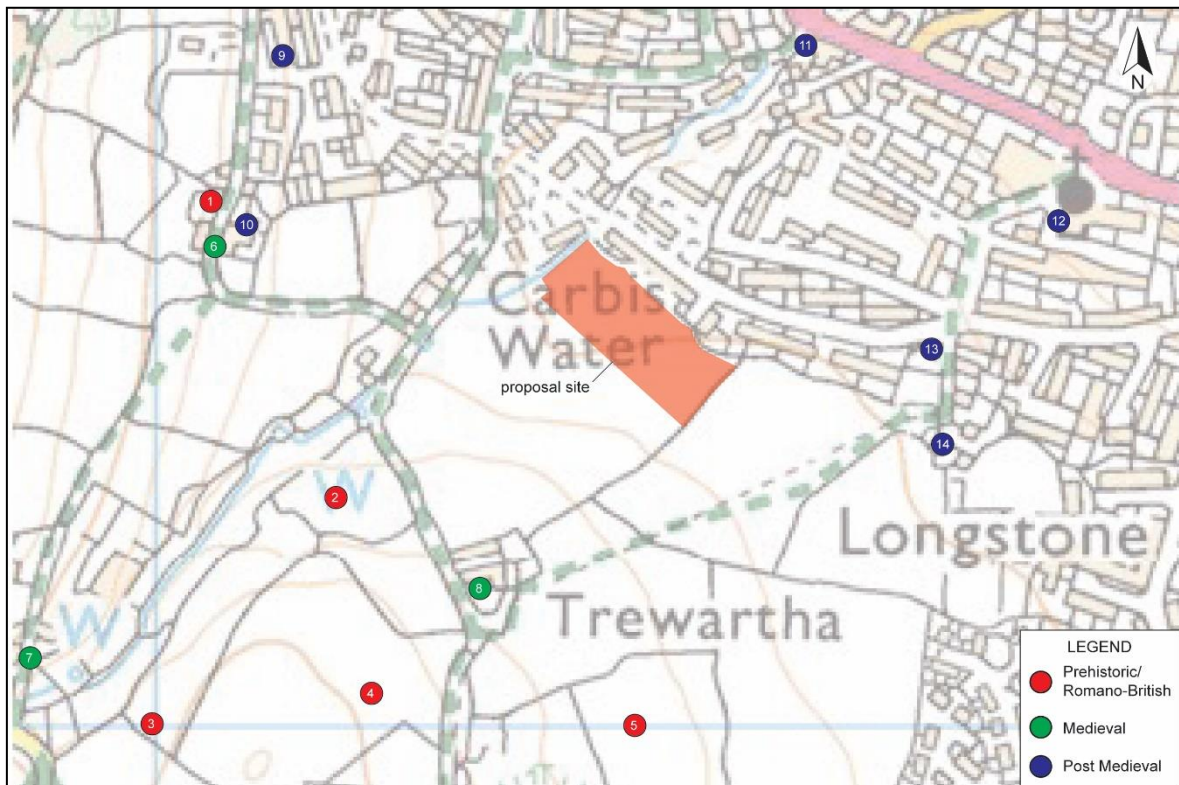


FIGURE 5: NEARBY HERITAGE ASSETS (THE SITE IS INDICATED) (SOURCE: CORNWALL & SCILLY HER).

TABLE 2: TABLE OF NEARBY UNDESIGNATED HERITAGE ASSETS (SOURCE: CORNWALL & SCILLY HER).

No.	Mon ID.	Name	Record	Details
1	MCO7768	Carninney – Iron Age round, Romano-British round	Documentary	An Iron Age or Romano-British round is plotted on the HER at this location based on a mis-read field-name (<i>pound</i> is referred to as <i>pound</i>) and used to infer the location of

				prehistoric settlement.
2	MCO7643	Boskerris Wartha – Iron Age round, Romano-British round	Documentary	The field-name <i>Round Gew</i> is used to infer the site of a round, but no remains are visible.
3	MCO338	Carbis Bay – Neolithic findspot	Findspot	A Group One greenstone axe roughout was found at Carbis Bay.
	MCO466	Chyangweal – Mesolithic findspot, Neolithic findspot	Findspot	A flint axe was found at Changweal.
4	MCO50872	Trevartha – Prehistoric field system	Cropmark	A rectilinear field system is visible on aerial photographs.
5	MCO18862	Boskerris Wartha – Bronze Age hut circle, Iron Age hut circle	Documentary	The field-name <i>The Crilla</i> may indicate hut circles, but no remains have been identified.
6	MCO13827	Carninney – Medieval settlement	Documentary	The settlement of Carninney is first recorded as <i>Karneny</i> in 1327
7	MCO18375	Within – Medieval settlement	Documentary	The settlement of Within is possibly first recorded in 1309 as <i>le Wethen</i> .
8	MCO13520	Boskerris – Early medieval settlement	Documentary	The settlement of Boskerris is first recorded as <i>Boskevreswartha</i> in 1314
9	MCO12462	Providence – Post-medieval mine	Documentary	Providence mine is recorded on the 1839 tithe map extending this far south.
10	MCO58173	Carninney – 19 th century farmstead	Structure	The current farm buildings that comprise Carninney farmstead, including the cottages, farmhouse and various farm buildings are likely of early-mid 19 th century date.
11	MCO52167	Carbis Water – Post-medieval non-conformist chapel	Structure	A Wesleyan Methodist Chapel is recorded on the 1880 first edition OS map.
12	MCO32904	Carbis Bay – Post-medieval non-conformist chapel	Structure	Extant Methodist chapel, probably built around 1900.
13	LIST1143336	Boskerris Farmhouse	Listed building	Grade II Listed late 18 th century house.
14	LIST1136949	Boskerris Woollas	Listed building	Grade II Listed late 18 th century house.

2.4 AERIAL PHOTOGRAPHY AND LIDAR

Assessment of the readily-available aerial photography and LiDAR for the proposal site indicates that the site is largely clear of earthworks, though the removed field boundary between *Park an Hale* and *Higher Park an Hale* (indicated) is visible on both the aerial photograph and LiDAR data.



FIGURE 6: AERIAL PHOTOGRAPH OF THE SITE TAKEN IN 2001 (© GOOGLE EARTH 2019) SHOWING NO CLEAR SIGN OF VISIBLE EARTHWORKS.

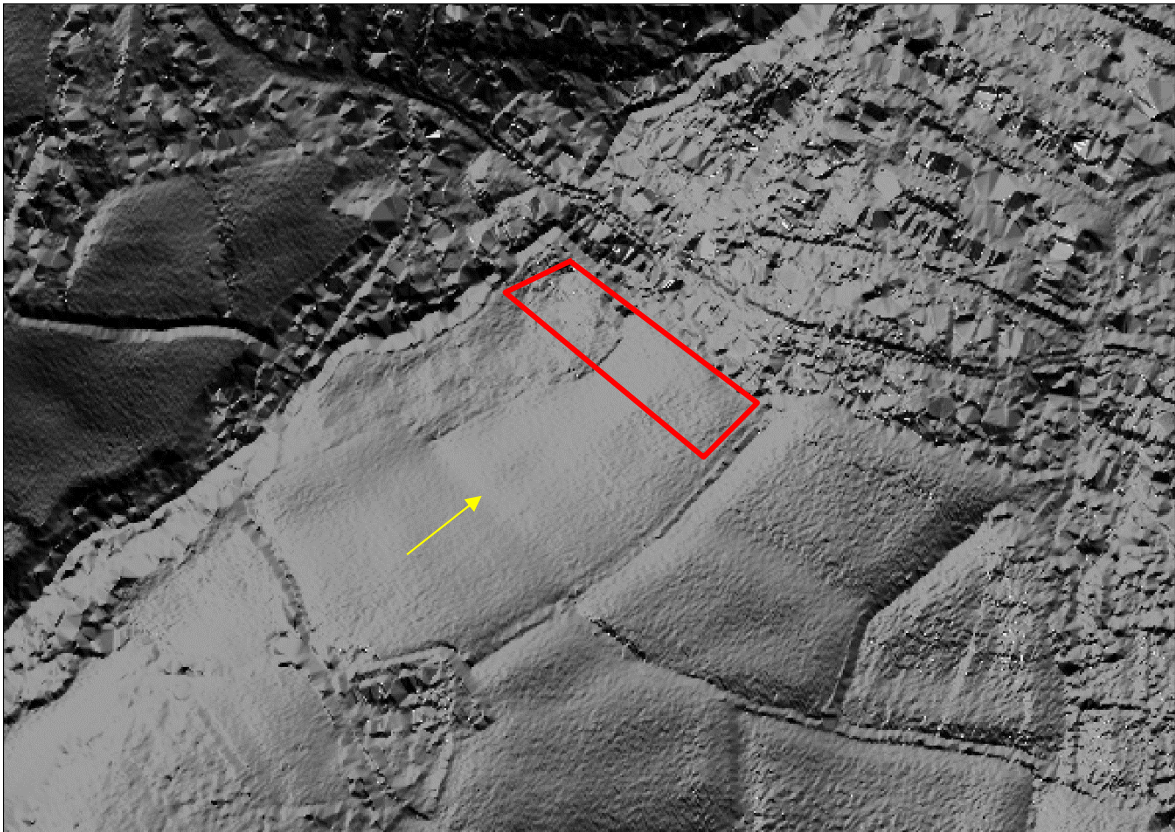


FIGURE 7: IMAGE DERIVED FROM LIDAR DATA, SHOWING THE APPROXIMATE OUTLINE OF THE PROPOSAL SITE (RED) AND POSSIBLE EARTHWORK FEATURES (ARROWED) (PROCESSED USING QGIS VER2.18.4, TERRAIN ANALYSIS/SLOPE, VERTICAL EXAGGERATION 3.0). DATA: CONTAINS FREELY AVAILABLE DATA SUPPLIED BY NATURAL ENVIRONMENT RESEARCH COUNCIL (CENTRE FOR ECOLOGY & HYDROLOGY; BRITISH ANTARCTIC SURVEY; BRITISH GEOLOGICAL SURVEY); ©NERC (CENTRE FOR ECOLOGY & HYDROLOGY; BRITISH ANTARCTIC SURVEY; BRITISH GEOLOGICAL SURVEY) 2017.

2.5 GEOTECHNICAL ASSESSMENTS

In December 2018, Ian Farmer Associates prepared a Preliminary Investigation Report (ref: C61799 PIR/1.0) for the site and subsequently, in April 2019, prepared a Ground Investigation Report (ref: C61968). Further ground investigations have been conducted for the site by Hydrock in October 2019 (ref: PDC-HYD-XX-GI-RP-GE-0001).

In summary these works suggest the western part of the site has naturally occurring soils and that there was no evidence of any mine working or waste deposits. In places (particularly to the west of the site) modern made-ground (including plastic and concrete) was encountered (see Figure 8) and this made-ground overlay a relic topsoil. Topsoil (and relic topsoil) deposits in general seem to be about 0.2-0.3m thick on the site.

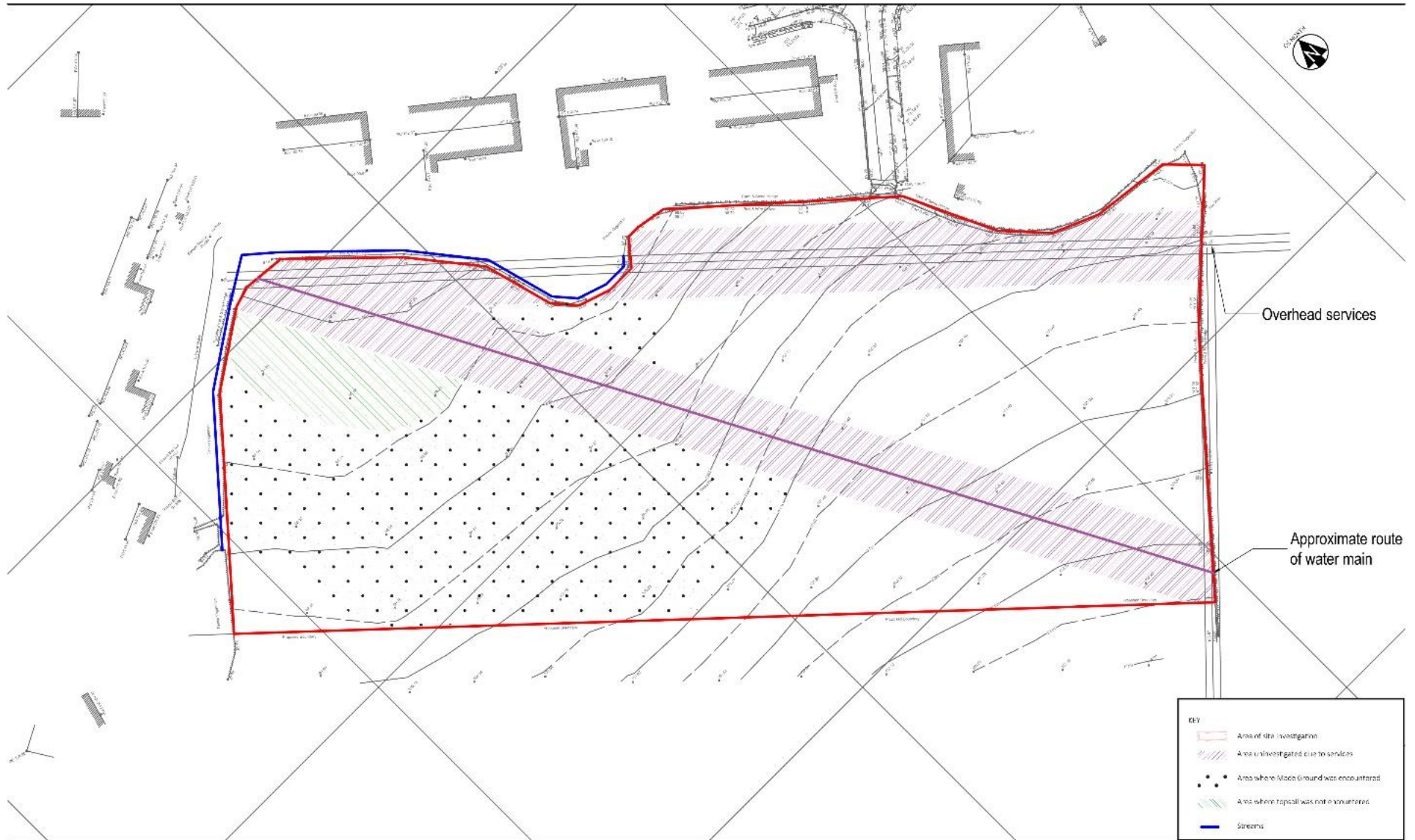


FIGURE 8: MADE GROUND AND SERVICE AS IDENTIFIED IN THE GEOTECHNICAL REPORTS (AFTER: HYDROCK 2019).

3.0 GEOPHYSICAL SURVEY

3.1 INTRODUCTION

An area of c.0.7ha 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 1st of November 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: 0.7258ha surveyed; Max. 140.33nT, Min. -198.34nT; Standard Deviation 28.36, mean -0.03nT, median -0.02nT.

3.3 SITE INSPECTION

The proposed development site and survey area covers the northern extent of a larger field. The site lies immediately south of the residential properties that line Polwithen Drive and Polwithen Gardens. The site was bounded to the south-west by a hedgebank; to the north-west and north-eastern by irregular overgrown hedgebanks, scrub and residential fencing; and to the south-east a recent wooden post and wire mesh fence separates the rest of the field from the proposed development site. A watercourse runs along the north-western boundary of the site; whilst overhead cabling runs along the north-eastern boundary, a pole and debris situated centrally along the north-eastern boundary. Geotechnical trenching was evident across the waterlogged ground in the north-western half of the site. Two piles of scrub material were also present. A full complement of site photographs can be found in Appendix 2.



FIGURE 9: VIEW ALONG THE SOUTH-WESTERN BOUNDARY OF THE SURVEY AREA; VIEWED FROM THE SOUTH-EAST (NO SCALE).



FIGURE 10: VIEW ALONG THE NORTH-EASTERN BOUNDARY OF THE SURVEY AREA; VIEWED FROM THE NORTH-WEST (NO SCALE).

3.4 RESULTS

Table 3 with the accompanying Figures 11 and 12 show the analysis and interpretation of the geophysical survey data. Additional graphic images of the survey data and numbered grid locations can be found in Appendix 1.

TABLE 3: INTERPRETATION OF GRADIOMETER SURVEY DATA.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
1	Moderate positive, probable	Linear	Ditch or cut feature	Indicative of a ditch or cut features, does not correspond with known field boundaries. Responses of c.+1.8nT to c.+6.6nT.
2	Weak negative, probable	Linear	Possible land drain	Indicative of a raised or buried feature such as a land drain. Runs parallel to the south-west boundary. Responses of c.-1.1nT to c.-0.4nT.
3	Very strong positive to vert strong negative, probable	Linear	Modern utility	Indicative of a buried modern utility. Responses of c.-190nT to c.+190nT.
4	Strong positive to strong negative, probable	Amorphous area	Area of previous boggy ground	Indicative of boggy or waterlogged ground, corresponds to a change visible on some of the historic mapping. Responses of c.-70nT to c.+70nT. Corresponds approximately with the made-ground identified in the geo-tech surveys.

3.5 DISCUSSION

The survey identified 4 groups of anomalies within the site. These were predominantly associated with modern utility features, but also include features associated with a possible early ditch or boundary not identified on the historic mapping. The cartographic resources indicate a division within the site between waterlogged boggy ground and standard pasture, and the geophysical survey results demonstrate this change in nature of the ground surface.

Anomaly Group 1 (c.+1.8nT +6.6nT), consists of a weak to moderate positive linear response, partly obscured by the strong response of anomaly Group 3 and represents a cut feature on a rough south-west to north-east axis. Anomaly Group 1 has no clear relationship to the other features and does not correlate to any known features on the historic mapping, and is likely to relate to an earlier, possibly medieval, phase of field system.

Anomaly Group 2 (c.-1.1nT to -0.4nT), consists of a weak negative linear response running parallel to the south-west boundary of the site, with an associated positive response along its edge. Anomaly Group 2 is indicative of a buried feature such as a non-metallic utility or field-drain.

Anomaly Group 3 (c.+/-190nT), consists of a very strong mixed linear response, running on an approximate north-west to south-east axis across the length of the site. This feature cuts through anomaly Group 1 and likely represents a modern utility.

Anomaly Group 4 (c.+/-70nT), consists of a strong mixed irregular area coving much of the north-western half of the site. This anomaly corresponds to the land division visible on the historic mapping, depicted on the Ordnance Survey maps as marshy ground, with later pastoral and agricultural usage. This response is indicative of waterlogged or boggy ground; at the time of the survey this area was heavily waterlogged.

Di-Polar anomalies and magnetic disturbance is present across the site, with Di-Polar anomalies present in no particular pattern. Magnetic disturbance across the site is mostly associated with the metallic fencing of the new field boundary along the south-western border of the site.

LAND AT POLWITHEN DRIVE, CARBIS BAY, ST IVES, CORNWALL

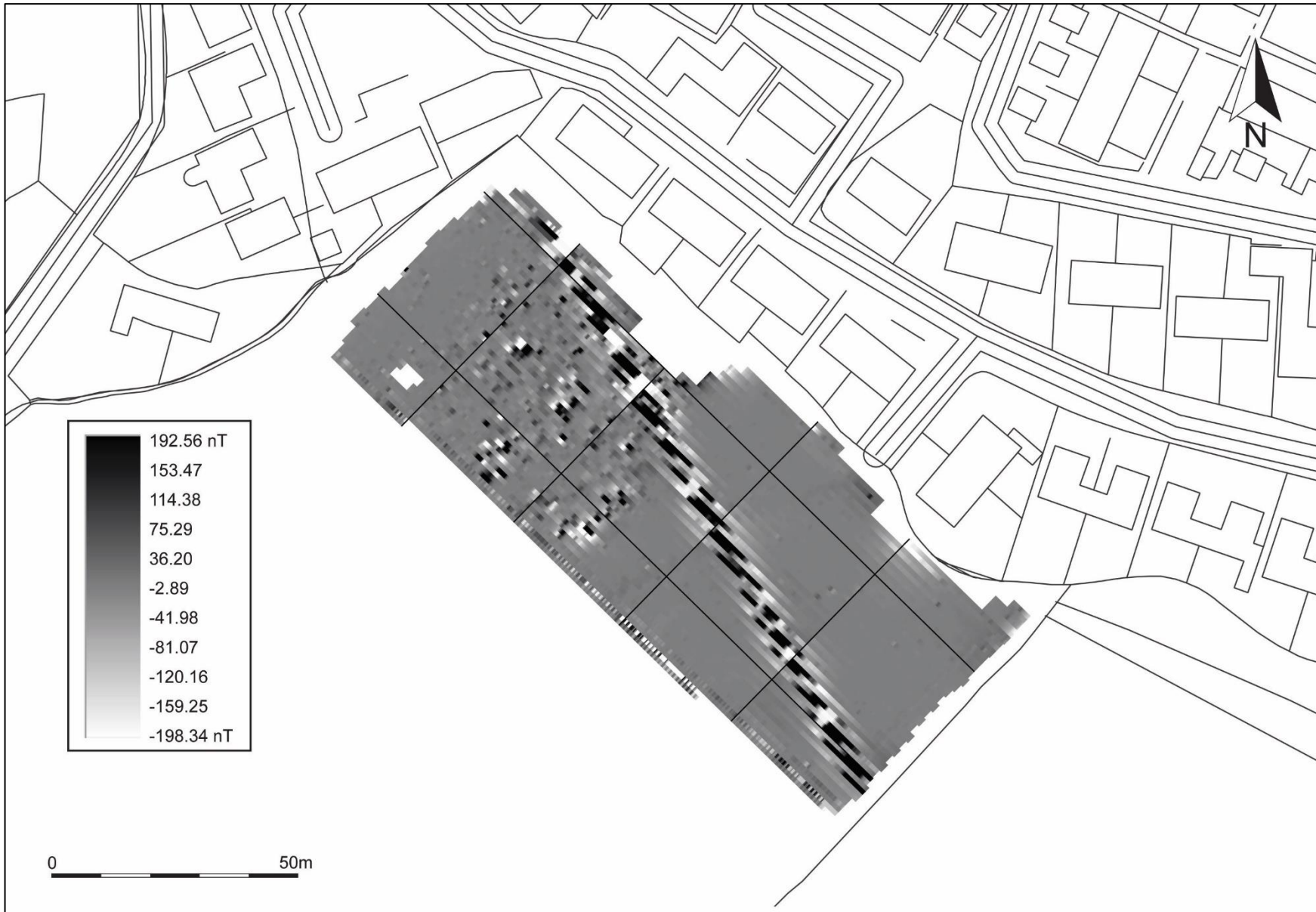


FIGURE 11: SHADE PLOT OF GRADIOMETER SURVEY DATA; GREYSCALE.



FIGURE 12: INTERPRETATION OF GRADIOMETER SURVEY DATA.

4.0 CONCLUSION

This report presents the results of a heritage assessment carried out by South West Archaeology Ltd. (SWARCH) for land at Polwithen Drive, Carbis Bay, St Ives, Cornwall. This work was undertaken in advance of a planning application.

The site is located on the southern edge of Carbis Bay, a post-medieval seaside settlement on the western side of St Ives Bay. The site forms part of the former land of the manor of Lelant and Trevethow. The surrounding landscape contains evidence of prehistoric, medieval and post-medieval settlement and farming activity, the site itself appearing to have remained undeveloped despite the substantial growth of Carbis Bay during the 20th century.

Assessment of the readily available aerial photography and LiDAR for the proposal site indicates that the site is largely clear of visible earthworks, though a removed historic field boundary is visible to the south of the proposal site. The cartographic sources similarly indicate a field boundary at this location. The geophysical survey did not identify any significant features of note, with the historic division between pasture and waterlogged or boggy ground visible. A single positive linear feature runs across the centre of the site, and may represent a ditch or earlier field system but has been partially obscured by a modern utility running across the site. There is no clear boundary for the waterlogged ground, but a change in surface level was visible on site, and the geotechnical investigations have demonstrated that the ground had been raised recently (i.e. made-ground material includes plastic and concrete).

Whilst the geophysical (and previous geotechnical) surveys did not identify any clearly significant features within the survey area the local archaeological potential is moderate. The presence of prehistoric features within the local area, as well as the proximity of the early medieval and later elements it would suggest that further mitigation in the form of a conditioned watching brief would be appropriate to mitigate any potential harm.

5.0 BIBLIOGRAPHY & REFERENCES

Published Sources:

- Chartered Institute of Field Archaeologists** 2014a: *Standard and Guidance for Historic Environment Desk-based Assessment*.
- Chartered Institute of Field Archaeologists** 2014b: *Standard and Guidance for Archaeological Geophysical Survey*.
- English Heritage** 2008: *Geophysical Survey in Archaeological Field Evaluation*.
- English Heritage** 2012: *Understanding Place: historic area assessments in a planning and development context*.
- Lysons, D. & Lysons, S.** 1814: *Magna Britannia, volume 3: Cornwall*. London.
- 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:

- Archaeological Data Service (ADS)** 2017: *Archsearch & Grey Literature*
<http://archaeologydataservice.ac.uk>
- British Geological Survey** 2019: *Geology of Britain Viewer*.
http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html
- Cornwall Council Interactive Map** 2019: *HER and HLC*
<https://map.cornwall.gov.uk>

Unpublished Sources

- Bampton, J.** 2017: *Land East of Carninney Farm, Carninney Lane, St Ives, Cornwall*. SWARCH report.
- Bonvoisin, P.** 2018: *Land off Menhyr Drive, Carbis Bay, St Ives, Cornwall: Results of a geophysical survey & monitoring and recording of CBR test-pits*. SWARCH report 181109.
- Gater, J.** 2016: *Carninney Rise, St Ives, Cornwall: Geophysical Survey Report*. Stratascan report J10561.
- Goacher, H.** 2015: *Carninney, St Ives, Cornwall: Archaeological assessment*. CAU report 2015R028.
- Hydrock** 2019: *Land at Polwithen Drive, Carbis Bay: Further Ground Investigation Report (ref: PDC-HYD-XX-GI-RP-GE-0001)*.
- Ian Farmer Associates** 2018: *Land at Polwithen Drive, Carbis Bay: Preliminary Investigation Report (ref: C61799 PIR/1.0)*
- Ian Farmer Associates** 2019: *Land at Polwithen Drive, Carbis Bay: Ground Investigation Report (ref: C61968)*.
- Morris, B.** 2018: *Carninney West Barns, St Ives, Cornwall: Historic building recording & archaeological monitoring and recording*. SWARCH report 180307.
- Morris, B., & Balmoud, F.** 2018: *Carninney North Barn, St Ives, Cornwall: Historic building recording & archaeological monitoring and recording*. SWARCH report 180306.
- Webb, P.** 2018: *Land East of Carninney Farm, Carninney Lane, St Ives, Cornwall: Results of Phase 1 site visit*. SWARCH interim report.

Cornwall Record Office

Uny Lelant tithe map (1839) and apportionment (1839)

National Library of Scotland

Ordnance Survey First Edition 6 Inch Map
Ordnance Survey Second Edition 6 Inch Map

APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY



FIGURE 13: LOCATION AND NUMBERING OF THE SURVEY GRIDS.

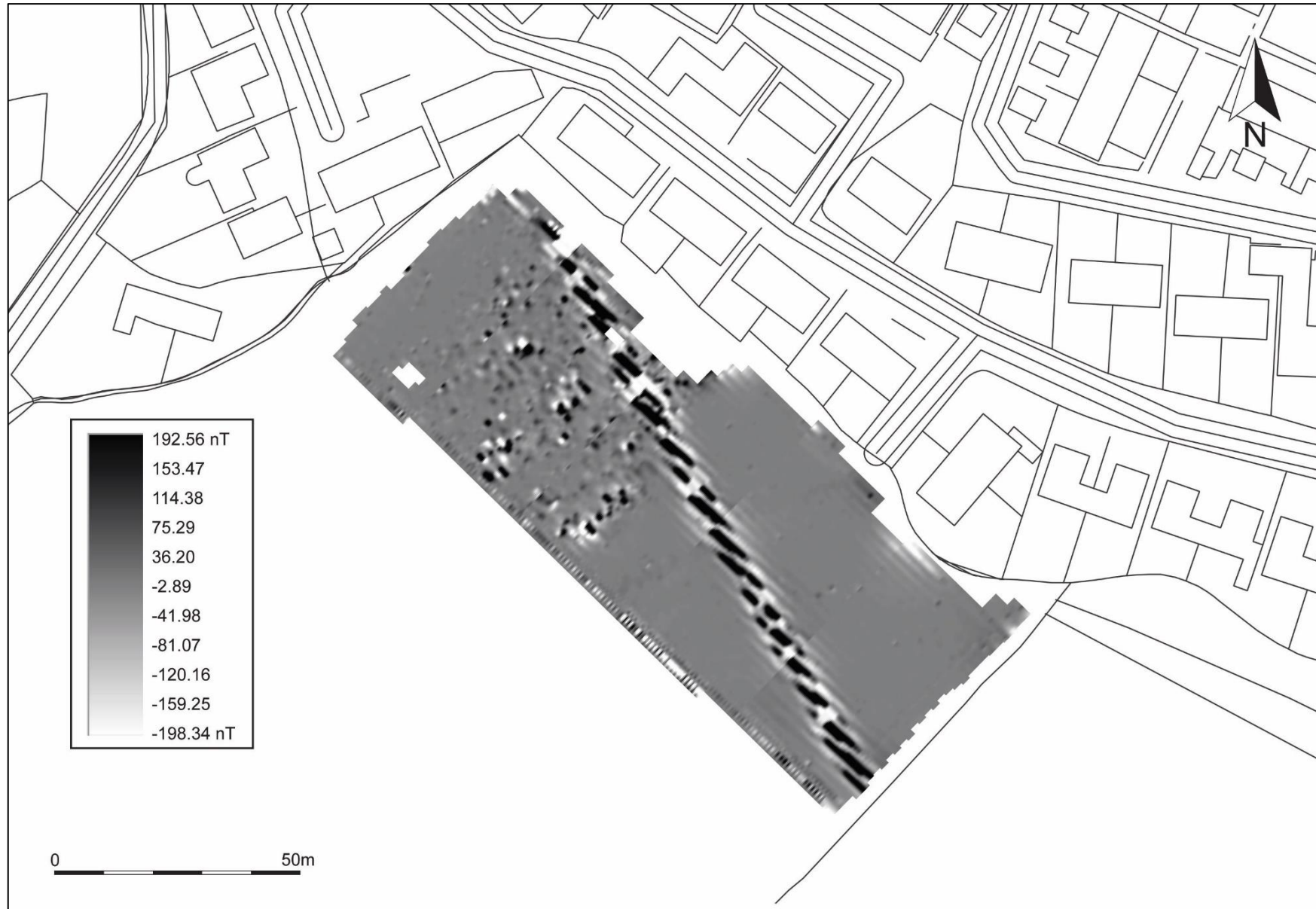


FIGURE 14: GREYSCALE SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.



FIGURE 15: RED GREYSCALE BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.

LAND AT POLWITHEN DRIVE, CARBIS BAY, ST IVES, CORNWALL

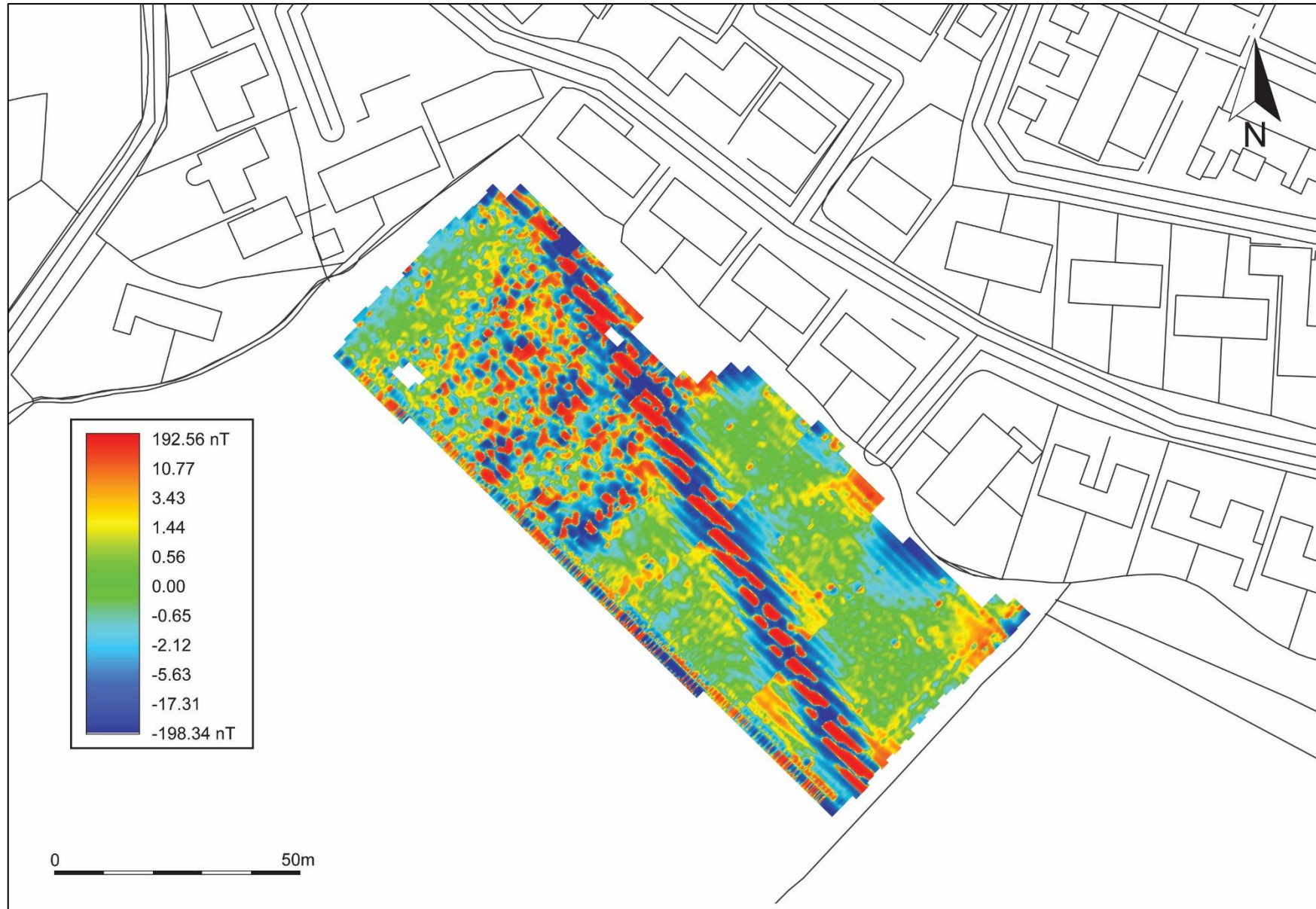


FIGURE 16: RED-BLUE-GREEN (2) SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.

APPENDIX 2: SUPPORTING PHOTOGRAPHS: SITE INSPECTION



1. THE NORTH-EASTERN CORNER OF THE SITE; VIEWED FROM THE WEST (NO SCALE).



2. THE SOUTHERN CORNER OF THE SITE; VIEWED FROM THE NORTH (NO SCALE).



3. THE SOUTH-EASTERN BOUNDARY OF THE SITE; VIEWED FROM THE NORTH-WEST (NO SCALE).



4. THE SOUTH-EASTERN BOUNDARY OF THE SITE; VIEWED FROM THE EAST (NO SCALE).



5. THE NORTH-EASTERN BOUNDARY OF THE SITE; VIEWED FROM THE SOUTH-WEST (NO SCALE).



6. THE EASTERN CORNER OF THE SITE; VIEWED FROM THE WEST (NO SCALE).



7. ONE OF THE GEOTECHNICAL TRENCHES/TEST-PITS; VIEWED FROM THE SOUTH (NO SCALE).



8. THE NORTH-WESTERN BOUNDARY OF THE SITE; VIEWED FROM THE SOUTH-WEST (NO SCALE).



9. THE NORTHERN CORNER OF THE SITE; VIEWED FROM THE SOUTH (NO SCALE).



10. THE AREA OF SCRUB AND DEBRIS ALONG THE NORTH-EASTERN BOUNDARY OF THE SITE; VIEWED FROM THE SOUTH (NO SCALE).



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

01769 573555

01872 223164

MAIL@SWARCH.NET