

**CHURCHYARD EXTENSION  
ST MICHAEL'S CHURCH  
ST MICHAEL CAERHAYS  
CORNWALL**

Results of a Geophysical Survey



South West Archaeology Ltd. report no. 220517



[www.swarch.net](http://www.swarch.net)

01769 573555

01872 223164

# Churchyard Extension, St Michael's Church, St Michael Caerhays, Cornwall

## Results of a Geophysical Survey

---

By J. Bampton, MCifA  
Report Version: FINAL  
Draft Issued: 13<sup>th</sup> May 2022  
Report Finalised: 23<sup>rd</sup> May 2022

Work undertaken by SWARCH for St Michael Caerhays Parochial Church Council (The Client)

### SUMMARY

---

*This report presents the results of a geophysical survey carried out by South West Archaeology Ltd. (SWARCH) on land east of St Michael's Church, St Michael Caerhays, Cornwall. The site is located against the eastern boundary of St Michael's churchyard, Caerhays. A wider survey area to the site was extended around the site and churchyard to improve interpretation of the data. The church is Grade I Listed, of 12<sup>th</sup> century origins, (MCO6489). A 15<sup>th</sup> century field name for the church includes a 'lan'-element indicating potential earlier origins for a religious context on the site (MCO26226). 19<sup>th</sup> century and later cartographic sources depict the extant graveyard as extended to its current size between 1879 and 1906. LiDAR imagery of the area may indicate a terrace and or platform and areas of ground disturbance within the survey area.*

*The survey identified 2 groups of anomalies on the site and a total of 21 groups of c.33 anomalies across the survey area as a whole. From these one could infer that the site is in an area of multiple phases of enclosure or drainage activity that could be associated with agricultural works or a former lann- and potentially earlier religious site or settlement. The site itself appears to have much lower archaeological potential than the rest of the surveyed area and is the quietest part of the survey data.*

*The geophysical survey results for the wider survey area indicate a very high archaeological potential for the wider area with future research potential, but for the proposed churchyard extension it appears to have much lower potential.*

---



May 2022

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>	3
<i>LIST OF APPENDICES</i>	3
<i>ACKNOWLEDGEMENTS</i>	4
<i>PROJECT CREDITS</i>	4
<b>1.0 INTRODUCTION</b>	<b>5</b>
1.1 PROJECT BACKGROUND	5
1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND	5
1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND	5
1.4 METHODOLOGY	7
<b>2.0 GEOPHYSICAL SURVEY</b>	<b>9</b>
2.1 INTRODUCTION	9
2.2 SITE INSPECTION	9
2.3 METHODOLOGY	9
2.4 RESULTS	10
2.5 DISCUSSION	14
<b>3.0 CONCLUSION</b>	<b>18</b>
<b>4.0 BIBLIOGRAPHY &amp; REFERENCES</b>	<b>19</b>

## LIST OF FIGURES

---

*COVER PLATE: THE SITE; VIEWED FROM THE NORTH (NO SCALE).*

FIGURE 1: SITE LOCATION (THE SITE IS INDICATED).	8
FIGURE 2: SHADE PLOT OF GRADIOMETER SURVEY DATA; MINIMAL PROCESSING.	16
FIGURE 3: INTERPRETATION OF GRADIOMETER SURVEY DATA.	17
FIGURE 4: GEOPHYSICAL SURVEY GRID LOCATION AND NUMBERING.	20
FIGURE 5: RED-GREY-BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA; GRADIATED SHADING; CLIPPED TO 1SD.	21
FIGURE 6: RED-GREY-BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.	22
FIGURE 7: RED-GREY-BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA WITH THEORETICAL EXTENT OF POTENTIAL RELICT STRUCTURE.	23
FIGURE 8: INTERPRETATION OF GRADIOMETER SURVEY DATA AT A SCALE OF 1:500.	24
FIGURE 9: INTERPRETATION OF GRADIOMETER SURVEY DATA WITH THEORETICAL LOCATION OF POSSIBLE RELICT STRUCTURE.	25
FIGURE 10: EXTRACT FROM THE SURVEYOR'S DRAFT MAP, c.1811.	26
FIGURE 11: EXTRACT FROM THE ST MICHAEL CAERHAYS TITHE MAP, c.1840.	26
FIGURE 12: EXTRACT FROM THE ORDNANCE SURVEY 1 <sup>ST</sup> EDITION, 25 INCH SERIES, PUBLISHED 1881.	26
FIGURE 13: EXTRACT FROM THE ORDNANCE SURVEY 2 <sup>ND</sup> EDITION, 25 INCH SERIES, PUBLISHED 1907.	27
FIGURE 14: IMAGES DERIVED FROM LIDAR DATA (ABOVE DSM; BELOW DTM).	27

## LIST OF TABLES

---

TABLE 1: INTERPRETATION OF GRADIOMETER SURVEY DATA.	13
---	----

## LIST OF APPENDICES

---

APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY	20
APPENDIX 2: SUPPORTING SOURCES	26
APPENDIX 3: SUPPORTING PHOTOGRAPHS	28

## ACKNOWLEDGEMENTS

---

ST MICHAEL CAERHAYS PAROCHIAL CHURCH COUNCIL (THE CLIENT)  
CORNWALL COUNCIL  
KRESEN KERNOW

## PROJECT CREDITS

---

PROJECT DIRECTOR: DR. SAMUEL WALLS, MCIFA  
PROJECT MANAGER: DR. SAMUEL WALLS, MCIFA  
FIELDWORK: JOSEPH BAMPTON, MCIFA  
REPORT: JOSEPH BAMPTON, MCIFA  
GRAPHICS: JOSEPH BAMPTON, MCIFA  
EDITING: DR. SAMUEL WALLS, MCIFA

## 1.0 INTRODUCTION

---

<b>LOCATION:</b>	LAND IMMEDIATELY EAST OF ST MICHAEL'S CHURCH GRAVEYARD
<b>PARISH:</b>	ST MICHAEL CAERHAYS
<b>COUNTY:</b>	CORNWALL
<b>CENTROID NGR:</b>	SW 96420 42180
<b>PLANNING REF:</b>	PRE-APPLICATION
<b>SWARCH REF:</b>	CCEG22
<b>OASIS REF:</b>	SOUTHWES1-507872

### 1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by St Michael Caerhays Parochial Church Council (The Client) to undertake a geophysical survey on land immediately east of St Michael's Church, St Michael Caerhays, Cornwall. This was requested pre-planning in preparation for the proposed extension of the church graveyard. This work was undertaken in accordance with best practice and ClfA guidance.

### 1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

St Michael's Church, Caerhays, is located near the middle of the parish of St Michael Caerhays; c.10.8km south-west of St Austell and c.1.2km north of the coast and Veryan Bay. It is towards the north and north-west edge of existing settlement activity associated with the Caerhays estate. It is along the main village road for Caerhays that follows a ridge or spur of land between two valleys with associated springs and water channels and streams running into Veryan Bay. The church sits at the eastern edge of a slight plateau on a slight hill along this ridge/spur. The site was an approximately 10mx60m strip of level land fenced off along the eastern side of the existing churchyard, within an adjacent field, at a height of c.85m AOD.

The soils on the site are the well drained fine loamy soils over slate or slate rubble of the Denbigh Association (SSEW 1983), which overlie sandstone of the Carne Formation (BGS 2022).

### 1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

The parish of St Michael Caerhays is in the deanery and east division of the hundred of Powder (Lysons 1814). The manor and barton of Caerhays belonged anciently to the Arundells from whom it passed by marriage to the Trevanions (Lysons 1814) whose descendants still owned much of the surrounding land and estate in the 19<sup>th</sup> century, although the male line of the families elder branch died out in c.1768 (Lysons 1814; Tithe Apportionment 1840). The site is in a field abutting the graveyard of St Michael's Church in the parish.

St Michael's Church is a Grade I Listed church of 12<sup>th</sup> century origins (List Entry No.1327073; MCO6489). An additional five Grade II Listings associated with the church incorporate 8 monuments in the graveyard and the Lych Gate. The church was dedicated to St Michael and all Angels in 1259 (St Michael Caerhays PCC 2011). In the 11<sup>th</sup> century the parish was part of the manor of Brannel and until 1852 had a united rectory with the parishes of St Stephen and St Dennis. From the 16<sup>th</sup> St Michael's Church was regarded as the mother church as the shared parish rectors lived at Caerhays. The church was expanded in the 13<sup>th</sup> and 14<sup>th</sup> centuries and carved stonework and a basin survive from the early church. In the 15<sup>th</sup> and 16<sup>th</sup> centuries major works were undertaken on the church by the Travanions; including to the tower and installation of three bells that are still there, and the expansion of the south transept. In the early 19<sup>th</sup> century the church was recorded as in poor condition and repairs/alterations were subsequently undertaken. Historically the rector would have farmed c.20 acres of glebe land; although the 1840 tithe apportionment lists 21 acres of working

land and 29 acres of glebe including gardens etc. held by the rector at the time (St Michael Caerhays PCC 2011; Tithe Apportionment 1840).

Cornwall's Historic Environment Record (HER) lists that the church is on the site of a possible lann based on the field name of *Lanvyhaill* meaning 'church of St Michael', first recorded in 1473 (MCO26226); although evidence of an earlier lann site is recorded as inconclusive. The HER lists possible prehistoric activity c.500m north-west of the site in the form of demolished bronze age barrows and possible supporting documentary evidence for barrows near Polven (e.g. MCO3329 and MCO3333) as well as possible prehistoric linear features/enclosures (e.g. MCO50238). South of the site at Caerhays Barton is cropmark and aerial photographic evidence for a prehistoric settlement and fields (MCO50247). The place-name of Caerhays itself has been used to suggest the possible presence of a 'round' (MCO7687) due to the *ker* element in some early forms and other regional dialect words for fort. But the place-name has also been linked to a possible Breton personal name element (Watts 2004); and the *Keri* element of some 13<sup>th</sup> century forms and subsequent forms could also be derived from words for 'hard, stone, stony' as in the case of some south-west river names (e.g. River Cary)(using Watts 2004).

Approximately 1km to the west-north-west is a c.36m diameter Iron Age 'round' at Polmenna (MCO8377). In 1869 a Roman coin hoard of between 1600 and 2500 3<sup>rd</sup> century coins was found c.500m north-east of the site, in a tin jug that had been boxed in with three stones in Beechtree Wood (MCO26321). Medieval and later activity near the site includes existing and documented settlements such as Polgrain to the north-west of the site (MCO16359) and the documented existence of a chapel reported in a 17<sup>th</sup> century lease within c.500m south-west of the site. Most of the medieval and later activity listed near the site is focused around the Caerhays estate, south and east of the site; Trevanion, destroyed c.1720 (MCO11548), a documented possibly demolished Caerhays house north of the existing property (MCO10755), a deer park (MCO26232), the 13<sup>th</sup> century settlement of Caerhays (MCO13687), the 12<sup>th</sup>-19<sup>th</sup> century Caerhays Manor (MCO11120), the current 19<sup>th</sup> century Caerhays Mansion/Castle (MCO11701), a documented chapel with no remains at Caerhays Castle/Mansion (MCO9840), The current Caerhays Barton (MCO59718), the 19<sup>th</sup> century rectory called 'The Veau' (MCO52354), and former 19<sup>th</sup> and later century schools and workhouse (MCO53096, MCO53097). There are no Scheduled Monuments within 1km of the site. The limit of the Grade II\* Registered park and garden of Caerhays Castle (List Entry No. 1000448) is located c.200m east of the site.

Cornwall's Historic Landscape Characterisation (HLC) describes the site as within Medieval Farmland (HCO4) – *'The agricultural heartland, with farming settlements documented before the 17<sup>th</sup> century AD and whose field patterns are morphologically distinct from the generally straight-sided fields of later enclosure. Either medieval or prehistoric origins'*.

Historical mapping from c.1811 shows the church of St Michael's within an enclosure among fields along the east side of the road on which it sits, and a valley to its east. These early Surveyor's draft maps are reliable indicators of road layouts and land-/field scapes but generally lack fine detail and can simplify aspects of the mapping. In this instance, compared to the current church yard boundary, the church's enclosure appears to extend to the south. This could be a simplification or allude to structures or activity on the south side of the extant church yard. The 1840 tithe map shows the church in a small squared-off churchyard extending approximately as far east as it currently does. The proposed site would be along this east boundary (although extrapolated north along a subsequent graveyard extension) in field plot 120. This field has a distinctly kinked boundary adjacent to plots 132 and 165 and the *vicarage* beyond its south-east corner. A footpath is depicted running across the field from the along the south-side of the churchyard to the south-east corner of the field. Plot 120 is listed in the tithe apportionment as *Part of the Barton of Caerhays*, which belonged to a John Charles Bettesworth Trevanion Esq. and was occupied by a John Ball Smith. It was named *Peters meadow* and was under arable cultivation. The adjacent plot 119 was part of the

same estate and farm and called *Church Town meadows*, also under arable cultivation. Glebe lands were listed under ownership and occupancy of the Rev. C.J. Kempe. These included the adjacent plot 165, called *Higher field*, also arable land, and included the land wrapping around the spur of land to the south and back around to the *vicarage* as well as a strip of land west of the church, on the opposite side of the road, which included a number of fields with *Sanctuary* in their titles.

The Ordnance Survey (OS) 1<sup>st</sup> edition map surveyed in 1879 predominantly shows continuity with the earlier tithe map; only a small structure having been removed from plot 165 to the south of the site. The 1906 OS revision/2<sup>nd</sup> edition shows the east boundary of the graveyard has been extended northwards to meet the adjacent field boundary. This forms the boundary along which the proposed site will run. A building (cattle shed) is also depicted approximately half way along the southern boundary of plot 120, within dog-leg in the boundary. Possible terraces in the slope of field plot 120 can be seen east of the church and the site in LiDAR imagery of the site recorded in 2017 and 2020. Some possible ground disturbance east of the churchyard and a hollow or platform south-east of the churchyard can be seen associated with this area of possible terraces in the LiDAR imagery. Supporting cartographic sources and LiDAR imagery for this section can be seen in Appendix 2.

#### 1.4 METHODOLOGY

This work was undertaken in accordance with current best practice and CIfA guidance. Any desk-based assessment aspect of this report follows 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 geophysical (gradiometer) survey follows the general guidance as outlined in: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider* (Europae Archaeologiae Consilium/European Archaeological Council 2016) and *Standard and Guidance for Archaeological Geophysical Survey* (CIfA 2014b).



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



## 2.0 GEOPHYSICAL SURVEY

---

### 2.1 INTRODUCTION

An area c.10m by c.60m alongside the existing St Michael's church graveyard had been fenced off as part of a proposed extension to the graveyard. This area (the site) was subject to a magnetometry (gradiometer) survey; however, this relatively small area in geophysical survey terms, which was made smaller by the theoretical disturbance to the survey from the surrounding fence was deemed improbable to yield meaningful analytical data. Therefore, a wider area (the survey area), c.0.6ha, including and beyond the proposed site boundary was subject to a magnetometry (gradiometer) survey. The purpose of this survey was to identify and record magnetic anomalies within the survey area and 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 13<sup>th</sup> of April 2022 by J. Bampton; the survey data was processed by J. Bampton.

### 2.2 SITE INSPECTION

The site was located at the west end of a single field, beside the east boundary of St Michael's churchyard. It was on a level strip of ground under short, recently cut and well kept grass and was fenced off from the wider survey area by post and wire fencing. The wider survey area extended into the afore mentioned field, which was under relatively short grass with some scrubby areas, and wrapped around the southern side of the church yard boundary. The south half of the church yard, on which the church sits was raised and level with its west boundary, beside the site, being a steep and overgrown bank. The north half of the churchyard was at a lower level more akin to the lie of the surrounding land and its east boundary, beside the site, was a grassed over earth bank with a moderate west slope and near vertical east face. A gate between these high and low levels of this boundary afforded access to the site. A gate in the fence defining the site allowed access into the adjacent field and wider survey area. The wider survey area had patches of scrub in its south-west area where some modern debris was visible. Scrub also was prominent in the south-east corner of the survey area and more so beside the access gate near to the actual site. Some of this scrub could be associated with underlying debris in the ground or disturbance from recent agricultural practices such as ring feeders or machinery having recently been stored there. Platforms and slopes in the slope of the surveyed field included a clear level area aligned approximately north-south across the middle of the survey area and possible slight platforms further down the slope. At the time of survey these were considered to resemble lynchets formed by ploughing or possibly landscaping for a former track or platforms. Outside the survey area in the south-west of the field, near its roadside entrance were a number of irregular lumps and bumps in the ground surface, which could allude to former settlement or agricultural activity. Supporting photographs for the site inspection can be seen in Appendix 3.

### 2.3 METHODOLOGY

The gradiometer survey follows the general guidance as outlined in: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider* (Europae Archaeologiae Consilium/European Archaeological Council 2016) 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- and set out using a Leica CS15 GNSS Rover GPS. The data was downloaded onto *Grad601 Version 3.16* and processed using *TerraSurveyor Version 3.0.36.0*. 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:

*DeStripe* all traverses, median; used to equalise underlying differences between grids (potentially caused by instrument drift or orientation, directional effects inherent in magnetic instrument, or differences in instrument set up during survey e.g. using two gradiometers).

*DeStagger* all traverses out- and inbound by 0.25m (grids 1-4), by 0.50m (grid 5), by 0.75m grids 6-10); reduces staggering effects within data derived from zig-zag collection method.

*Clip +/- 1SD*; removes extreme data point values.

Details:

0.59135ha surveyed

Stats unadjusted/prior to processing or data clipping; Max. 98.52nT, Min. -100.00nT; Standard Deviation 9.09nT, mean 0.11nT, median 0.15nT.

Stats threshold adjusted/post processing (clipped to 1SD); Max. 8.73nT, Min. -8.44nT; Standard Deviation 4.08nT, mean 0.23nT, median 0.01nT.

## 2.4 RESULTS

Table 1 with the accompanying Figures 2 and 3 show the analyses and interpretation of the geophysical survey data. Additional graphic images of the survey data and numbered grid locations can be found in Appendix 1.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
1	Moderate positive and negative, probable	Rectangular	Structure	Indicative of a cut and in-filled feature such as a ditch of robbed-out wall line for a possible rectangular/square feature such as a structure. In the middle south part of the survey area. Slight negative associated responses possibly relative or indicative of compacted surfaces/deposits or stony rubble or debris. Response strengths of c.+5nT to c.+24nT with associated negative responses of <c.-16nT.
2	Moderate positive, probable	Rectilinear	Ditch, boundary, robbed-out wall	Indicative of a cut and in-filled feature such as a ditch, or by association with Group 1, a possible robbed-out wall. Aligned approximately parallel to- and along the western half of Group 1 anomaly. Response strength of c.+10nT to c.+20nT.
3	Weak-moderate positive, possible	Oval	Pits, tree-throws, geology	Two examples indicative of possible broad pits, tree-throws, natural geological features or deposits near to Group 1 in the south half of the site and near an approximate rear/upslope edge to a terrace running approximately north-south on the survey area. Slightly diffuse result could be indicative of a natural origin or shallow nature. Response strength of <c.12nT
4	Moderate-strong positive and weak negative, probable	Linear	Ditch, boundary, track-way	Indicative of a cut and in-filled feature such as a ditch with possible associated bank material in the south-west corner of the survey area. Aligned north-east by south-west. Response strength of <c.+29nT and between -4nT and -10nT.
5	Weak-moderate positive and very weak negative, probable	Linear	Boundary, ditches	Indicative of a traditional Cornish hedgebank with parallel ditches flanking bank material in patches. On south side of site. Aligned north-west by south-east but turning west at its north-west end. Response strengths of between +6nT and +20nT and c.-3nT.
6	Weak positive and negative, possible	Amorphous/rectangular	Platform, made-ground, geology	Indicative of a rectilinear platform containing deposits of material or defined by ditches at the south-east edge of the survey area. Ostensibly respected by- and associated with other anomalies on the site (Groups 7 and 12)
7	Weak positive and very weak negative, probable	Linear	Boundary, ditches	Indicative of a removed boundary with parallel ditch-like anomalies flanking an area of compacted or former bank material. On the east side of the survey area aligned north-south. This anomaly roughly defines the eastern edge of a sight terrace in the slope that extends roughly westward to the boundary of the churchyard. Possibly contiguous with the east edge of Group 6 and associated with Groups 8, 9, 10 and 11. Response strength of <+10nT and c.-3nT.
8	Very weak Positive and negative, possible	Linear	Ditch, boundary, track-way	Indicative of a cut and in-filled feature such as a ditch with possible associated bank material in the south-east part of the survey area. Aligned east-west and seemingly contiguous with Group 7 and aligning with the north-west end of Group 5. Similar in form to Group 4 but much weaker responses indicative of poor/shallow survival/truncation. Response strength of c.+/-4nT.
9	Weak-moderate positive and negative, probable	Linear (slightly curving)	Ditch, boundary, track-way	Indicative of a cut and in-filled feature such as a ditch with possible associated bank material in the south-west corner of the survey area. Aligned approximately east-west at the north end of the site and of Group 7. Response strength of <c.+12nT and <c.-13nT.
10	Moderate-strong positive and negative, probable	Linear	Ditch, boundary, track-way	Indicative of a line of cut and in-filled or disturbed ground such as a ditch, boundary or track at the north end of the site, aligned north-east by south-west possibly containing some modern, thermoremanent or metallic debris possibly associated with a relict field system along with other linear anomaly groups, particularly 7 and 9, or 4 or 13. Response strength of <c.+/-25nT and <+70nT.
11	Moderate positive and negative, probable	Linear	Boundary, ditches	Indicative of a traditional Cornish hedgebank with parallel ditches flanking bank material. On east side of survey area. Aligned east-west, off of Group 7. Response strengths of between +5nT and +23nT and c.-10nT.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
12	Very weak positive and negative, possible	Linear	Boundary, ditches, geology	Very weak and intermittent response indicative of a possible truncated, shallow or poorly surviving archaeological feature such as a boundary with parallel ditches flanking a bank. Possibly geological given intermittent nature and weak response. Otherwise, in the south half of the survey area, aligned approximately north-south and aligning with the west edge of Group 6. Response strengths of c.+/-5nT.
13	Weak-moderate positive, possible	Irregular linear, sinuous	Ditches, geology, disturbed ground	Indicative of two cut and in-filled features, such as ditches or naturally worn and silted-up features such as geological striations or palaeochannels. Also possibly areas of shallow ground disturbance associated with tracks. In the middle and north parts of the survey area aligned approximately east-west. The southern example may be associated with a continuation- of and truncated Group 11. The area between these anomalies on the ground was particularly scrubby. Response strengths of c.+6nT to c.+12nT on the north example and between c.+9nT and c.+18nT on the southern example.
14	Moderate positive, possible	Sub-oval	Pits, tree-throws, geology, disturbed ground	Indicative of 4 discrete cut and in-filled features near the middle of the survey area. In an area of scrubby ground and associated with possible ground disturbance or underlying debris and associated with Group 13. Less distinct/strong examples within the same area as this Group (not highlighted) Response strengths of between c.+10nT to c.+19nT.
15	Very weak positive, possible	Curvi-linear	Ditch, ground disturbance	Indicative of shallow ground disturbance or a subtle cut and in-filled feature such as a ditch. In this instance possibly associated with an area associated with Group 13 or activity in the corner of a possible enclosure defined by Groups 7 and 11. Possibly associated with geological variation given its very weak response. Response strength of <+5nT.
16	Moderate positive, possible	Oval	Pits, tree-throws, geology	Indicative of a discrete cut and in-filled feature such as a pit or tree-throw in the north-east corner of the survey area. Although similar to Group 14 this example is outside an area associated with overlaying scrub and Group 13. Also comparable to Group 17, but on the opposite side of the survey area. Response strength of c.+20nT.
17	Moderate positive, probable	Oval	Pits, tree-throws, geology	Indicative of 3 discrete cut and in-filled features such as pits or tree-throws. In the south-west part of the survey area. Comparable to Group 17, but on the opposite side of the survey area. Response strengths of c.+15nT and c.+17nT.
18	Moderate positive, possible	Oval	Pits, postholes, tree-throws, geology	A group of 5 anomalies indicative of discrete cut and in-filled features such as pits, tree-throws; or in this case possibly postholes approximately defining a ring in the south-west corner of the survey area. Possibly indicative of prehistoric or later settlement activity, associated with Group 19. Response strengths of c.+13nT <+21nT.
19	Strong mixed response, possible	Sub-rectangular	Thermoremanent debris, modern deposit/ disturbance	A strong negative response surrounded by a very strong positive response that could be indicative of a modern metallic deposit or debris within a possible rectangular pit or spread; or could be associated with a thermoremanent deposit. Thermoremanent events are often a similar but reversed response; although this could be an event it is more likely a deposit of burnt or ceramic material of unknown date or a post-medieval to modern dump of magnetic debris. By location it may be associated with Group 18. Response strength of between c.-48nT and c.+79nT.
20	Very weak to moderate positive, possible	Amorphous	Pits, tree-throws, geology, disturbed ground, disturbed boundary	Indicative of a spread of in-filled or geological material that could be associated with man-made or natural activity. At the north end of the site. It is roughly in the location of where Group 9 would extend into the site and may be indicative of truncation or obfuscation of an anomaly/feature by landscaping associated with previous and current graveyard extensions. Response strength of c.+3nT to c.+10nT.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
21	Very weak to moderate positive, possible	Irregular linear, sinuous	Ditches, geology, disturbed ground	Comparable to Group 13 and possible Group 14. These 2 or 3 linear anomalies could be indicative of ditches, some other probable shallow ground disturbance, a pit and ditches, or geological features. Response strength of c.+5nT to c.+13nT.
<b>Other Anomalies</b>				
-	Moderate-strong dipolar, probable	Point/ovoid	Geology/ Ferrous objects/debris	The site has a handful of dipolar responses. Black crosses in Figure 3. The strongest examples are indicative of ferrous objects that are typically presumed to be modern, such as farm machinery fragments. Similar and weaker responses can be indicative of geological features/anomalies. These are highly probable to be non-archaeological in nature. Responses of < +/-100nT.
-	Magnetic disturbance, probable	Spreads associated with site boundaries	Magnetic disturbance	Near the edges and middle of the survey area magnetic disturbance from either fence lines, debris or farm equipment is visible. Crosshatched areas in Figure 3 Responses of c.+/-100nT.

TABLE 1: INTERPRETATION OF GRADIOMETER SURVEY DATA.

## 2.5 DISCUSSION

The survey identified 2 groups of anomalies on the site and a total of 21 groups of c.33 anomalies across the survey area as a whole. These included: probable ditches and boundaries associated with one or relict field systems and associated terraces (Groups 4, 5, 7-12); sinuous linear anomalies indicative of ditches, ground disturbance or natural features (Groups 13, 15 and 21); spreads of material associated with pits, tree-throws, hollows or other anomalies having been effected by later work (Groups 3 and 20); possible and probable pits or tree-throws or geological features (Groups 14, 16 and 17); a possible pit containing thermoremanent or magnetic debris (Group 19) within the limits of a 'ring' of possible postholes, pits or similar features (Group 18); a platform associated with possible agricultural or building activity (Group 6); and ostensibly concentric recti-linear features indicative of possible demolished structures (Groups 1 and 2). Instances of magnetic disturbance or debris associated with ferrous debris/farm equipment and fence lines were also evident in the survey data. Visual interpretations of the data and cartographic sources supporting the discussion and comments can be seen in Appendices 1 and 2.

The general 'noise' (inherent geological variation) of the site was relatively quiet across the site,  $<c. +/-1nT$ , with occasionally higher fluctuations of up to  $+/-6nT$ . Anomalies of a comparable strength are probably/possibly natural and geological in nature.

The only anomaly groups identified on the site (Groups 20 and 21) were not particularly conclusive responses and can mostly be associated with an area of disturbance and irregular anomalies immediately east of the site (Groups 13 and 14), and a spread associated with a possible boundary with ditch and bank material immediately east of the site (Group 9). The site is across an area that is interfered with magnetically by debris and boundary fences, which may obscure geophysical anomalies. It is also on a strip of land that, although slopes gently down to the south, is relatively level running east-west and may be part of an approximate north-south terrace cut into the field or formed over time due to ploughing. The slope of the field seemed to level out across an area from roughly the site to approximately the Group 7 anomaly. The formation process for this terrace may account for some areas of truncation and some areas of deeper/shallower topsoil on the site.

This 'terrace' may be represented by a 'platform' defined by Group 6 and associated boundaries represented by Group 7 and possibly Group 12. Groups 8 and 13 could be indicative of internal divisions or drainage within this field system that is potentially further defined by Groups 9, 10 and 11. Groups 4 and 5 could also be associated with phases of this field system.

An area defined by Groups 13, 14 and 15 generally contains a spread of amorphous and sinuous anomalies that could be indicative of ditches and pits, or tree-throws and geological features, or simply ground disturbance to varying degrees. They are generally within an area that is evidently defined by relict enclosures and activity of some sort.

Possible/probable pits or tree-throws on the site (Groups 14, 16 and 17) could be seen as being sporadically spread across the site. However, they may follow a north-east by south-west line. If this were the case they could indicate: a former boundary line, perhaps an extrapolation and inclusion of Group 4; or prospection for minerals or a spring given the presence of springs in the wider landscape. The similar broader examples of this type of anomaly that may indicate hollows or large pits (Group 3) could be associated with Groups 1 and 2 and 5 or the removal and levelling of features associated with these responses.

The possible postholes represented by Group 18 are rare to be identifiable on surveys of this type and at the reading frequency typical of this type of survey. However, these indicate a possible post-ring, approximately 10m across. A post-ring could indicate the presence of a Prehistoric (possible Bronze Age) structure. There is not a discernable sunken featured/hollow element within this group

or a discernable ring-ditch around them. There is an associated anomaly indicative of thermoremanent or magnetic debris.

The most significant and noteworthy anomalies identified in the survey area are Groups 1 and 2. Together these are indicative of a possible relict religious structure. Concentric square/rectangular structures/enclosures or walls are typical of Roman (Romano-British) temples in Britain. These can vary from up to 10m to 25 or 30m across and then much more when part of a large temple precinct, which typically mirrors the layout (de la Bédoyère 1991). Although Romano-British temples can be rare in Cornwall Roman activity in the area can be attested from multiple sites within 5km of the site. A 3<sup>rd</sup> century Roman coin hoard in a tin jug is recorded from within 1km to the north-east of the site near the water course east of the site (MCO26231). Another Roman findspot includes a possible crossbow piece recorded from further north along the same water course (MCO1560). An inscribed block of tin has been recovered from near Tredinnick to the west (MCO432). And at Tregony north-west of the site, three coins from field walking (MCO39920), and a Roman cemetery/shrine enclosure and cremation burial (MCO56254), which included *'part of rectilinear enclosure and associated pits, excavated in 2005, indicate a possible cemetery and/or shrine/temple site. One pit held two intact vessels within which were found the cremated remains of a mature adult female'*.

Another possible explanation for Groups 1 and 2 is a later religious structure. Possibly from the Anglo-Saxon period. The site has documentary, place-name, evidence indicating a possible *lann* site (MCO26226) and early religious site as well as 17<sup>th</sup> century descriptions of a former chapel west-south-west of the church (MCO16359) and another chapel at Caerhays Castle/Manor being probably demolished during a time of reconstruction (MCO9840). Caerhays may have had numerous chapels, earlier churches than St Michael's, and confusion between earlier chapels. Examples of simple Anglo-Saxon churches of a similar size to Group 1 are known (e.g. St Laurence's, Bradford-upon-Avon (Service 1982)). These early churches may have sat within a *lann*, which could be partially defined by some of the possible boundary-type anomalies in the survey data, or have been within walled enclosures, perhaps within a rural church complex. The potential for pre-conquest church complex sites on existing religious/burial sites has been identified at larger religious centres (e.g. St Oswald's Priory, Gloucestershire (Lane & Blaylock 2017)), but also on smaller rural church sites such as Jacobstowe, West Devon (Bampton 2019).

The geophysical survey results for the site are not of particular interest and are indicative of a relatively low archaeological potential. The evidence of the wider survey area demonstrates a very high archaeological potential for the wider area. The possible structure and its enclosure (Groups 1 and 2) do not appear to extend into the site. Small discrete anomalies may not be identifiable in the survey data and could be obscured by magnetic disturbance from modern fence lines and debris. Such potential features could be of prehistoric, Romano-British, early medieval or later dates based on the potential features represented in the survey data.



FIGURE 2: SHADE PLOT OF GRADIOMETER SURVEY DATA; MINIMAL PROCESSING, THE PROPOSED SITE IS OUTLINED IN GREEN.



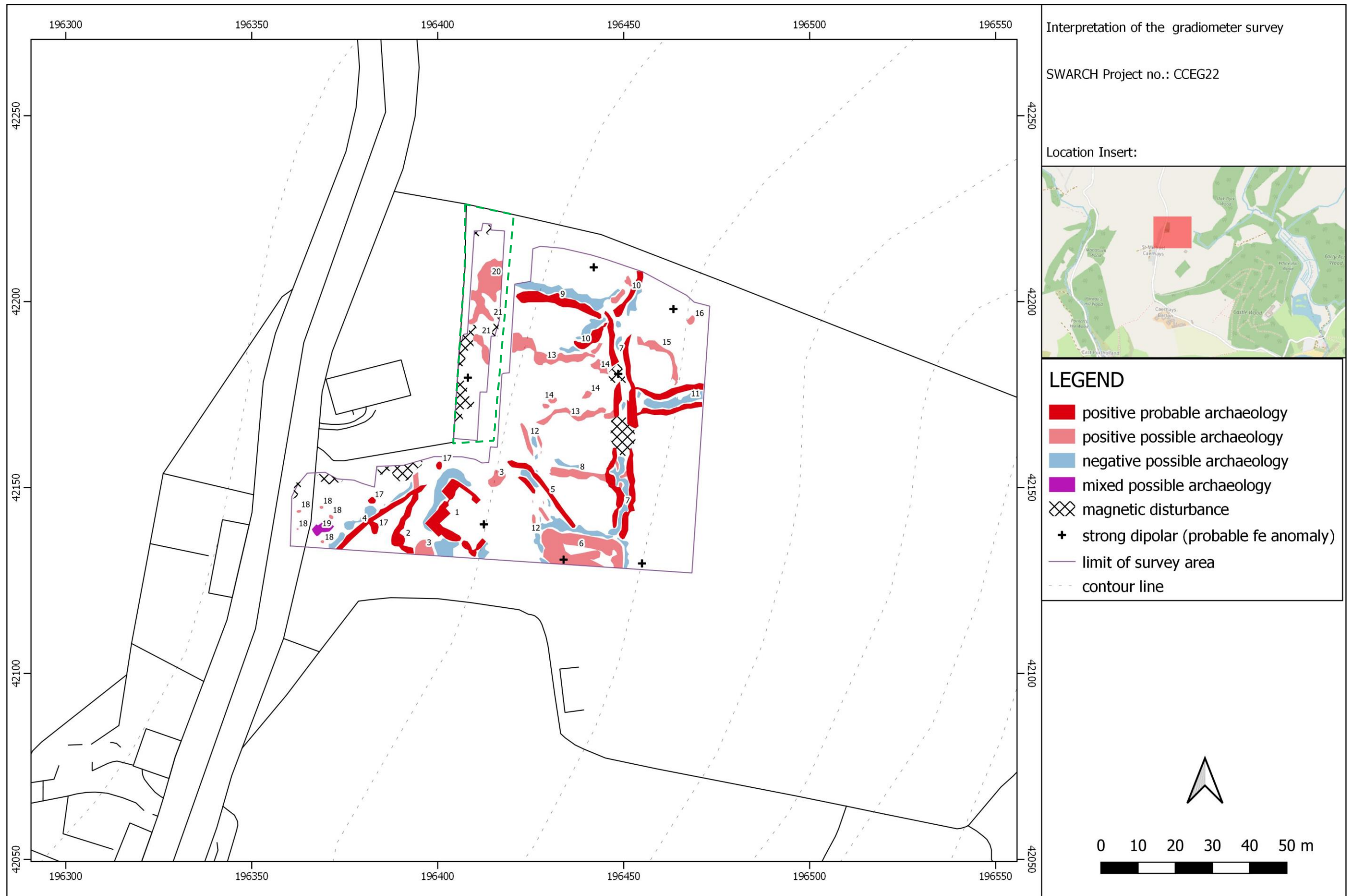


FIGURE 3: INTERPRETATION OF GRADIOMETER SURVEY DATA, THE PROPOSED SITE IS OUTLINED IN GREEN.

### 3.0 CONCLUSION

---

The site is located against the eastern boundary of St Michael's churchyard, Caerhays. A wider survey area to the site was extended around the site and churchyard to improve interpretation of the data. The church is Grade I Listed, of 12<sup>th</sup> century origins, was dedicated in the mid-13<sup>th</sup> century, and was subject to expansions and renovations through into the 19<sup>th</sup> century (MCO6489). A 15<sup>th</sup> century field name for the church includes a 'lan'-element indicating potential earlier origins for a religious context on the site (MCO26226). Cornwall's HLC lists the site as within *Medieval Farmland*. 19<sup>th</sup> century and later cartographic sources depict the extant graveyard as extended to its current size between 1879 and 1906, but no other changes were notable and no features were represented within the site or wider survey area apart from a footpath. LiDAR imagery of the area may indicate a terrace and or platform and areas of ground disturbance within the survey area.

The survey identified 2 groups of anomalies on the site and a total of 21 groups of c.33 anomalies across the survey area as a whole. From these one could infer that the site is in an area of multiple phases of enclosure or drainage activity that could be associated with agricultural works or a former lann- and potentially earlier religious site or settlement. The site itself appears to have much lower archaeological potential than the rest of the surveyed area and is the quietest part of the survey data.

The geophysical survey results for the wider survey area indicate a very high archaeological potential for the wider area with future research potential, but for the proposed churchyard extension it appears to have much lower potential.

## 4.0 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*.
- DW Consulting** 2016: *TerraSurveyor User Manual*.
- Europae Archaeologiae Consilium** 2016: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider, EAC guidelines 2*.
- English Heritage** 2008: *Geophysical Survey in Archaeological Field Evaluation*.
- Lane, R. & Blaylock, S.** 2017: 'Late Saxon and Medieval Discoveries at the Church of St. James, Jacobstowe, Devon, in 2015' in Maxfield, V.(ed.) 2017: *Devon Archaeological Society Proceedings No. 75 2017. DAS*.
- Lysons, D. & Lysons, S.** 1814: *Magna Britannia, volume 3: Cornwall*. London.
- Schmidt, A.** 2002: *Geophysical Data in Archaeology: A Guide to Good Practice*. ADS series of Guides to Good Practice. Oxbow Books, Oxford.
- 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)*.
- Watts, V.** 2004: *The Cambridge Dictionary of English Place-Names*. Cambridge University Press, Cambridge.

### *Unpublished Sources:*

- Bampton, J.** 2019: *St James's Church, Jacobstowe, West Devon, Devon: Results of Archaeological Monitoring and Recording*. Swarch Report no. 191217.
- St Michael Caerhays PCC** 2011: *The parish church of St Michael Caerhays, Cornwall: A brief history*.

### *Websites:*

- British Geological Survey** 2022: *Geology of Britain Viewer*.  
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
- Cornwall Council Historic Environment Record (HER) and HLC** 2022: *Cornwall Council Interactive Map*  
<https://map.cornwall.gov.uk/website/ccmap/> and <http://www.heritagegateway.org.uk>
- Environment Agency** 2022: *LiDAR, Digital Terrain Model data & Digital Surface Model data*  
<https://environment.data.gov.uk/DefraDataDownload/?Mode=survey>

### *Kresen Kernow (KK)*

- Surveyors draft map for the Grampound area, c.1811
- St Michael Caerhays Tithe Apportionment, c.1840
- St Michael Caerhays Tithe Map, c.1840
- Ordnance Survey 1<sup>st</sup> edition, 25 inch map, Sheet: Cornwall LXVI.2, surveyed 1879, published 1881
- Ordnance Survey 2<sup>nd</sup> edition, 25 inch map, Sheet: Cornwall LXVI.2, revised 1906, published 1907

APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY

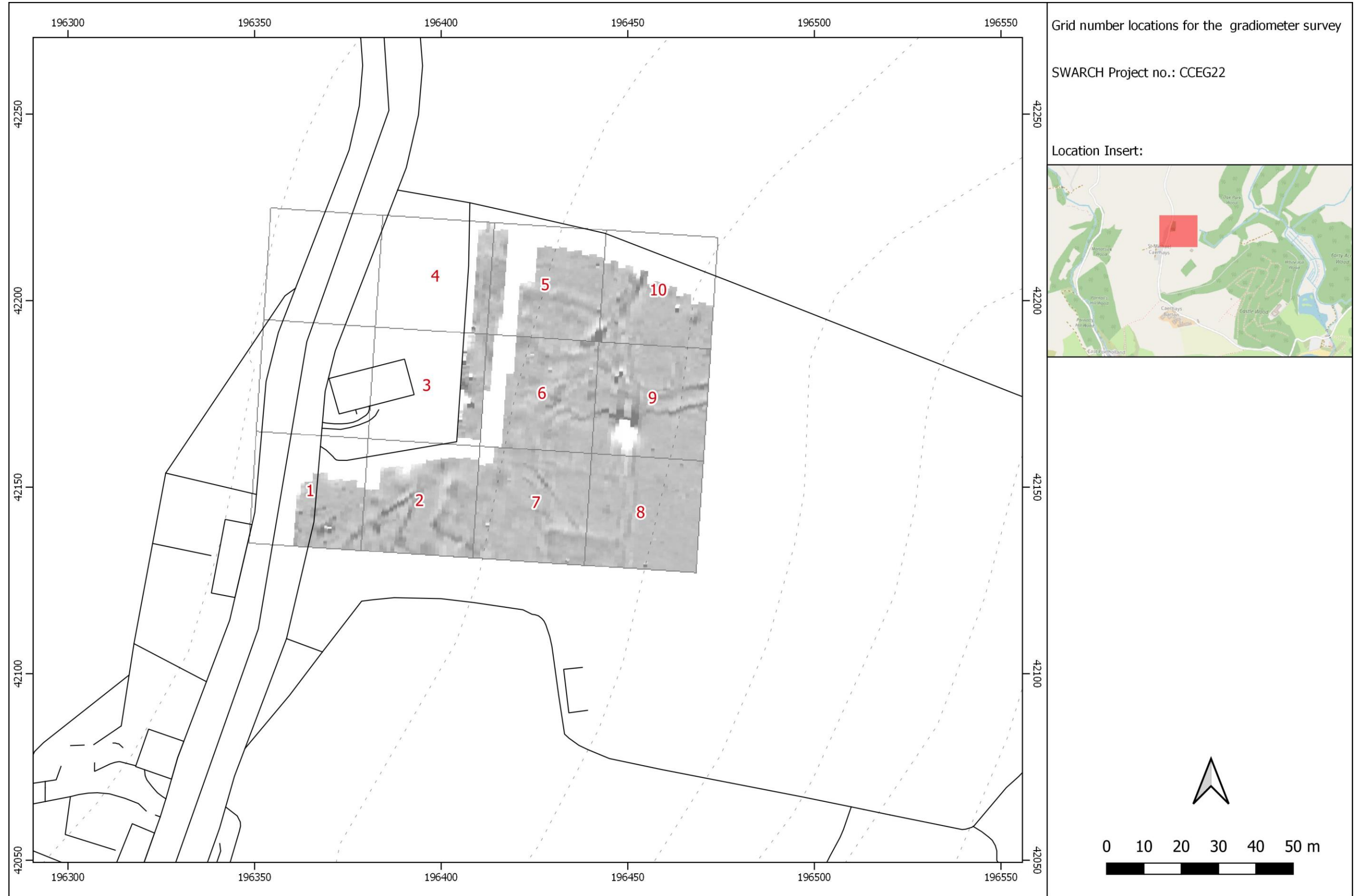


FIGURE 4: GEOPHYSICAL SURVEY GRID LOCATION AND NUMBERING.





FIGURE 5: RED-GREY-BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA; GRADIATED SHADING; CLIPPED TO 1SD (STANDARD DEVIATION).



FIGURE 6: RED-GREY-BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.





FIGURE 7: RED-GREY-BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA WITH THEORETICAL EXTENT OF POTENTIAL RELIGIOUS STRUCTURE IN YELLOW; THE SITE IS OUTLINED IN GREEN.

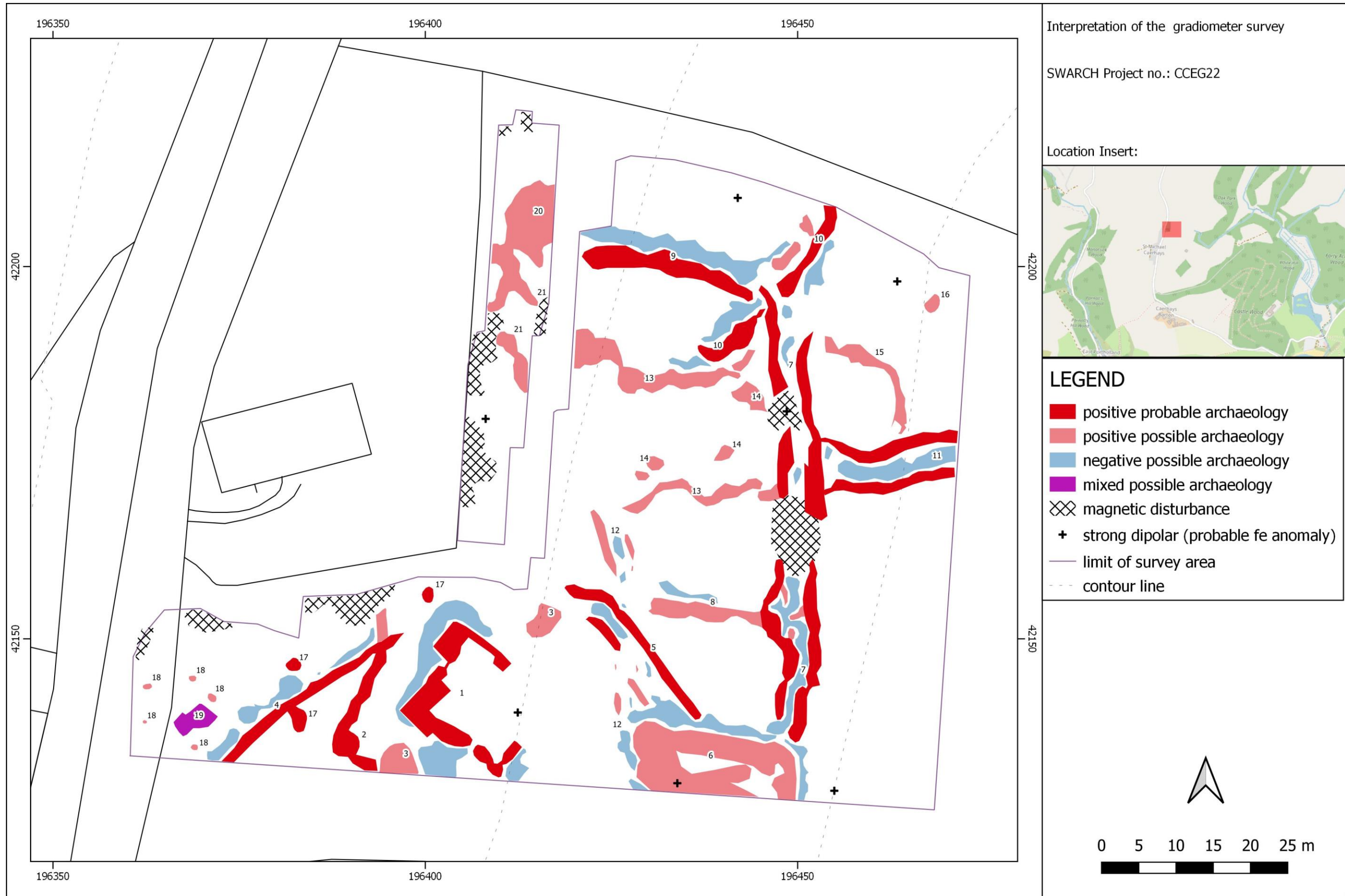
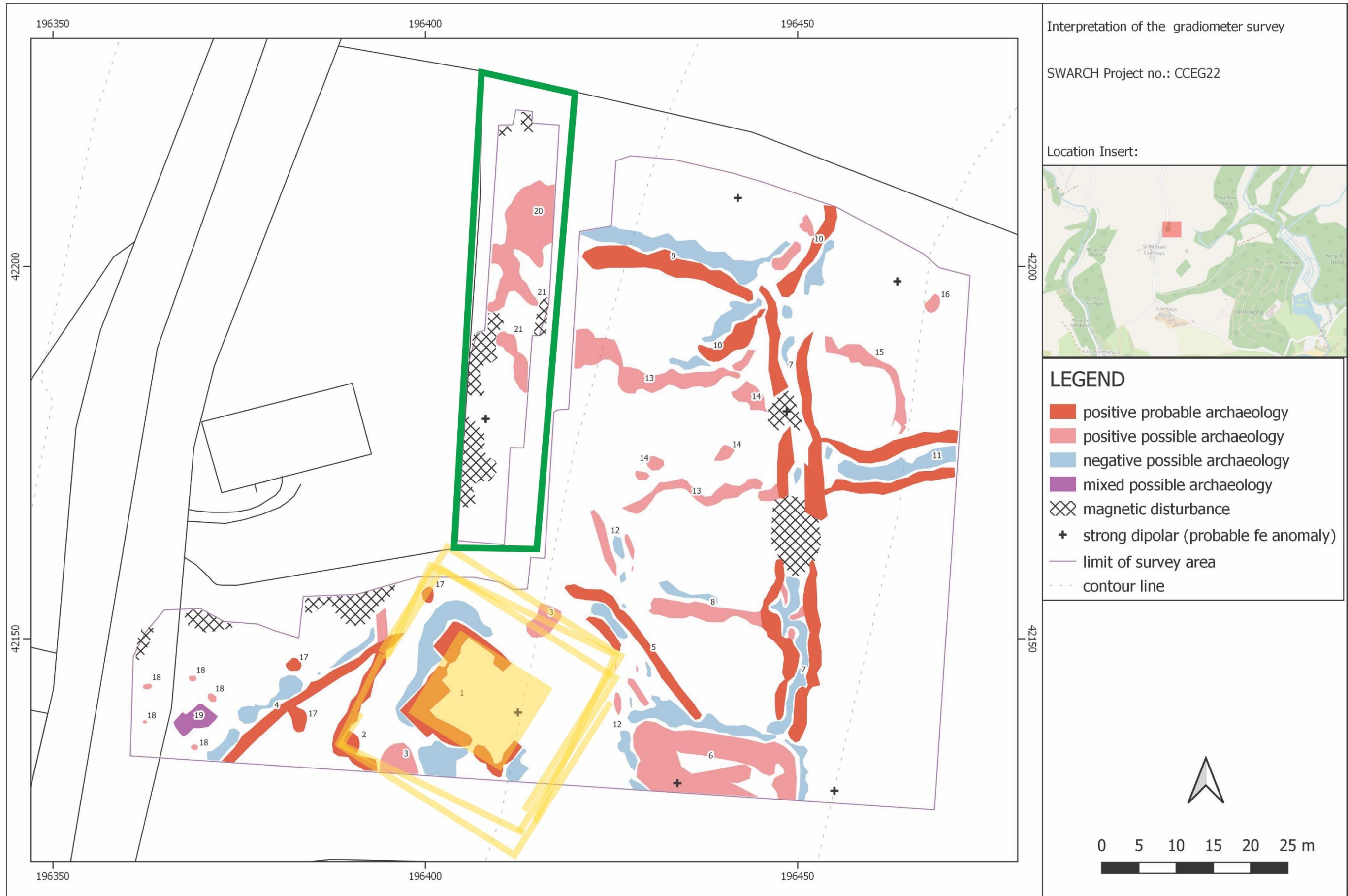


FIGURE 8: INTERPRETATION OF GRADIOMETER SURVEY DATA AT A SCALE OF 1:500.





Interpretation of the gradiometer survey

SWARCH Project no.: CCEG22

Location Insert:



**LEGEND**

- positive probable archaeology
- positive possible archaeology
- negative possible archaeology
- mixed possible archaeology
- magnetic disturbance
- + strong dipolar (probable Fe anomaly)
- limit of survey area
- contour line

FIGURE 9: INTERPRETATION OF GRADIOMETER SURVEY DATA WITH THEORETICAL LOCATION OF POSSIBLE RELIGIOUS STRUCTURE AT A SCALE OF 1:500; THE SITE IS OUTLINED IN GREEN.

APPENDIX 2: SUPPORTING SOURCES



FIGURE 10: EXTRACT FROM THE SURVEYOR'S DRAFT MAP, C.1811; THE APPROXIMATE LOCATION OF THE SITE IS INDICATED (KK).

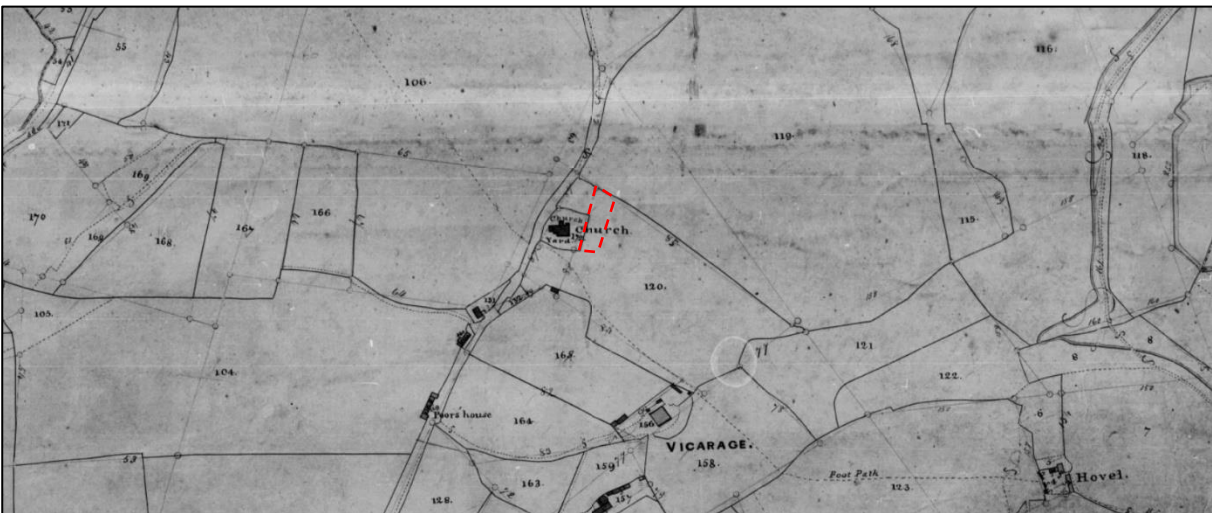


FIGURE 11: EXTRACT FROM THE ST MICHAEL CAERHAYS TITHE MAP, C.1840; THE SITE IS OUTLINED IN RED (KK).

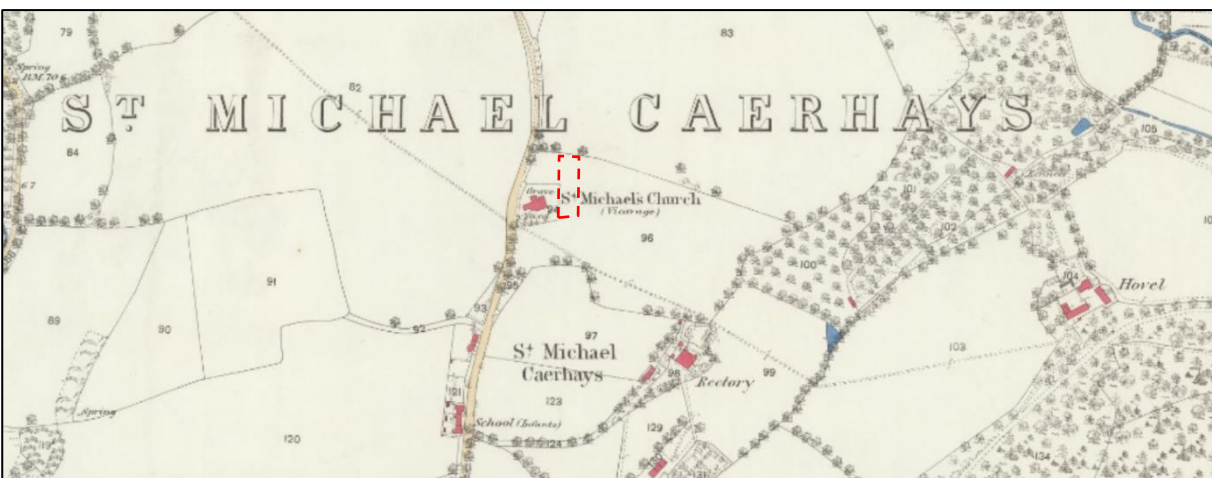


FIGURE 12: EXTRACT FROM THE ORDNANCE SURVEY 1<sup>ST</sup> EDITION, 25 INCH SERIES, PUBLISHED 1881; THE SITE IS OUTLINED IN RED (KK).





FIGURE 13: EXTRACT FROM THE ORDNANCE SURVEY 2<sup>ND</sup> EDITION, 25 INCH SERIES, PUBLISHED 1907; THE SITE IS OUTLINED IN RED (KK).

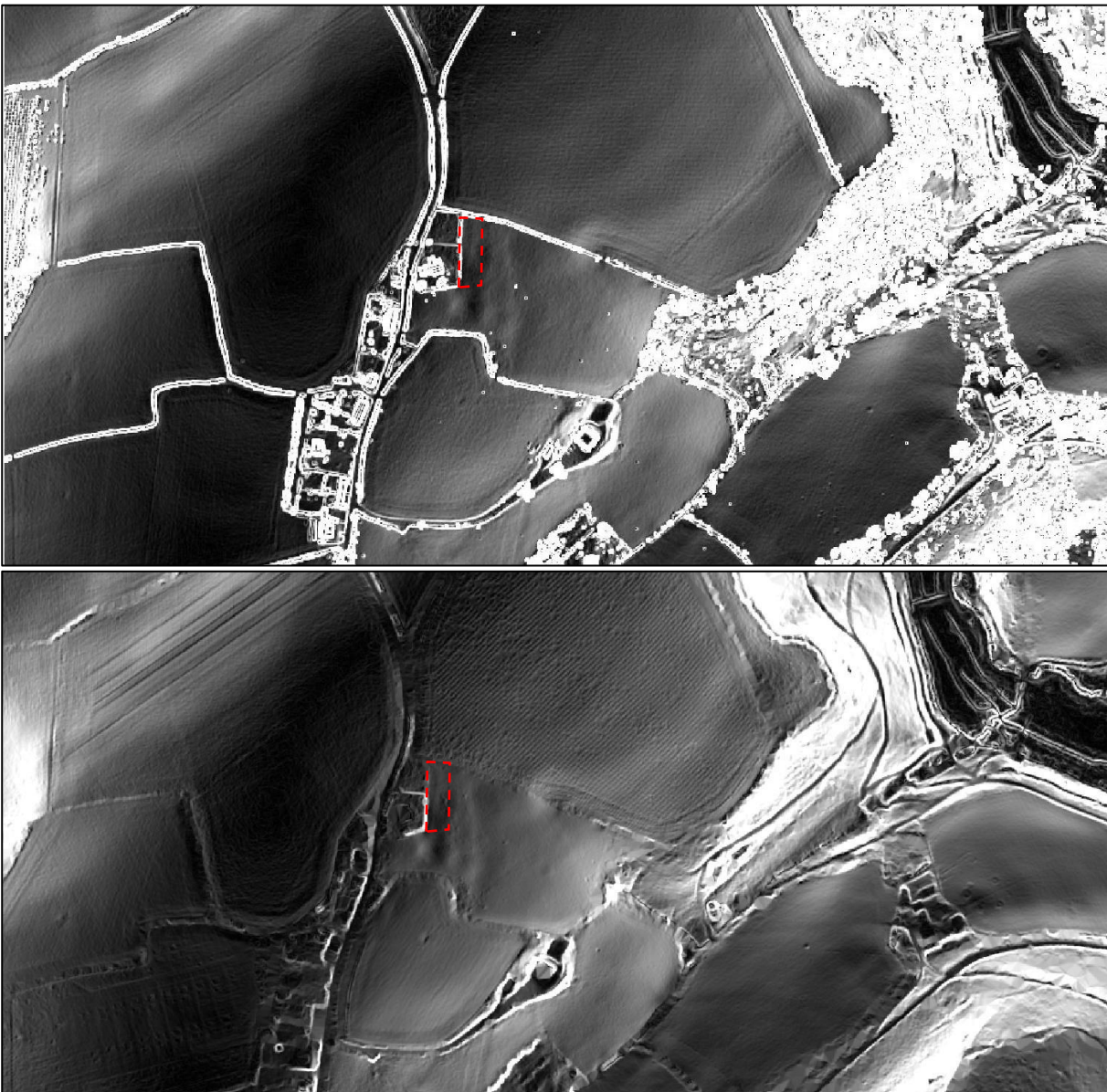


FIGURE 14: IMAGES DERIVED FROM LIDAR DATA (ABOVE DSM; BELOW DTM); THE SITE IS OUTLINED IN RED (PROCESSED USING QGIS VER2.18.4, TERRAIN ANALYSIS/SLOPE, VERTICAL EXAGGERATION 3.0). DATA: CONTAINS FREELY AVAILABLE DATA SUPPLIED BY NATURAL ENVIRONMENT RESEARCH COUNCIL (CENTRE FOR ECOLOGY & HYDROLOGY; BRITISH ANTARCTIC SURVEY; BRITISH GEOLOGICAL SURVEY); ©NERC.



APPENDIX 3: SUPPORTING PHOTOGRAPHS



1. SITE ACCESS AND STEPPED LEVELS IN CHURCHYARD; VIEWED FROM THE WEST (NO SCALE).



2. ST MICHAEL'S CHURCH ON ITS RAISED AREA; VIEWED FROM THE NORTH-EAST (NO SCALE).



3. NORTH HALF OF BOUNDARY BETWEEN GRAVEYARD AND SITE; VIEWED FROM THE SOUTH (NO SCALE).



4. VIEW FROM THE NORTH-EAST CORNER OF THE SITE TOWARDS THE CHURCH; VIEWED FROM THE NORTH-EAST (NO SCALE).



5. VIEW FROM THE SITE TOWARDS THE GRAVEYARD ACCESS; VIEWED FROM THE EAST (NO SCALE).



6. VIEW OF THE SITE; VIEWED FROM THE SOUTH (NO SCALE).





7. VIEW FROM THE SOUTH-EAST CORNER OF THE SITE TOWARDS THE FIELD SOUTH OF THE CHURCHYARD; VIEWED FROM THE EAST-NORTH-EAST (NO SCALE).



8. VIEW ALONG THE SOUTH BOUNDARY OF THE SITE; VIEWED FROM THE WEST (NO SCALE).



9. VIEW FROM THE SOUTH END OF THE SITE TOWARDS THE KINK AND STRUCTURE ALONG THE SOUTH BOUNDARY OF THE FIELD IN WHICH THE SITE SITS (NO SCALE).



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

01769 573555  
01872 223164  
[MAIL@SWARCH.NET](mailto:MAIL@SWARCH.NET)