

CILFOWYR CHAPEL, CARREG WEN, PEMBROKESHIRE: GEOPHYSICAL AND TOPOGRAPHICAL SURVEYS 2015



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**CILFOWYR CHAPEL, CARREG WEN, PEMBROKESHIRE:
GEOPHYSICAL AND TOPOGRAPHIC SURVEY 2015**

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SUMMARY

Cilfowyr Chapel is mentioned in documents in 1547 but by 1833 it was recorded as being in ruins for many years. The site is now marked by the earthworks of the chapel enclosure and the chapel foundations in a corner of a field.

Dyfed Archaeological Trust visited the site in 2010, following which it was recommended that the site should be scheduled, subject to the collection of more information on the site through geophysical and topographical survey. These two surveys were carried out in 2015.

Both surveys recorded a rectangular chapel enclosure approximately 35m by 50m containing a rectangular chapel 13.7m by 6m. Geophysical survey data suggests some complexity to the site, possibly several phases of construction. No definite evidence for burials was detected. The results of the surveys indicate that high quality archaeology remains survive at the site.

INTRODUCTION

As a result of DAT's Cadw grant-aided Churches and Chapels threat-related assessment project of 2010-11 several sites were recommended for legal protection as Scheduled Ancient Monuments. However, it was recommended that further data was required to better assess certain sites before a final decision on whether to schedule or not could be made, and that the best methods for gathering this additional data were by geophysical and topographical survey.

An application to Cadw was made for grant-aid to support this further investigation of up to seven of these sites. Grant-aid was provided for the survey of one site in 2015: Cilfowyr Chapel in north Pembrokeshire (Figure 1). Cilfowyr Chapel lies at Carreg Wen in Manordeifi Community and Parish, Pembrokeshire (NGR SN 2208 4193) and is recorded on the Dyfed Historic Environment Record under Primary Record Number. 2079.

The investigation at Cilfowyr focussed on the area of visible earthworks in the south-east corner of the field in which it is located. It was intended to establish the extents of the chapel, the squared enclosure around it and any hidden, below ground archaeology associated with them. The geophysical survey took the form of a Magnetometry survey while the topographic survey consisted of a geo-located total-station survey.

HISTORICAL BACKGROUND AND ARCHAEOLOGICAL POTENTIAL

The following information has been extracted from the Historic Environment Record held by Dyfed Archaeological Trust.

Summary: Site of former chapel-of-ease to Manordeifi, mentioned in source from 1547, when it was a free chapel of Manordeifi parish. Recorded as 'in ruins for many years' in 1833. It was a donative free chapel, established by the patron of the parish.

Description: The site comprises extensive earthwork remains of a chapel within an enclosure, located within the corner of a field currently under pasture. The land has, according to the present landowners, been ploughed in the past. However, the earthworks are still very distinct and the enclosure was paced out at some 40 metres in diameter. A possible entrance was noted on the southwest side. The area of the chapel itself is some 8 metres in width and there are several exposed stones in the vicinity, particularly at the eastern (altar) end. The adjacent lane and hedgeline take a sharp bend to avoid the site.

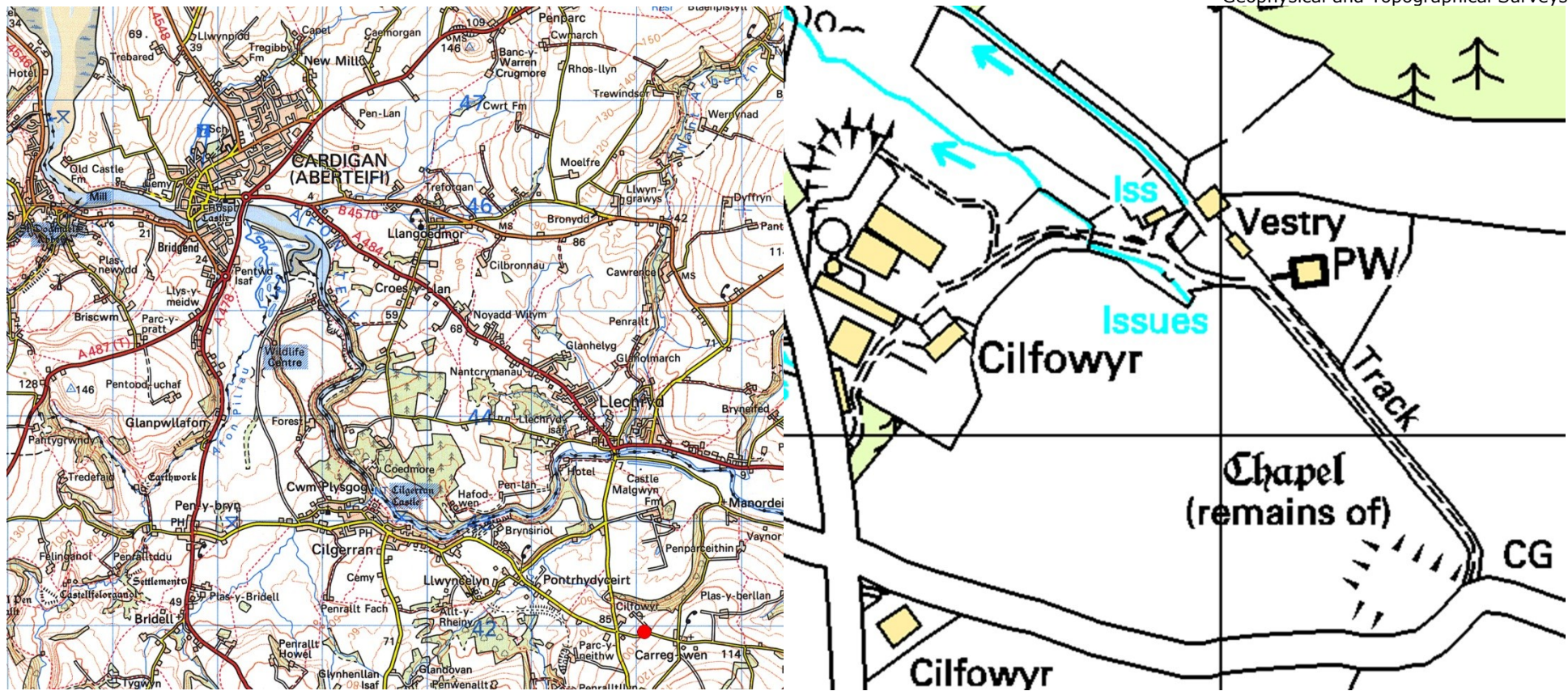


Figure 1: Location maps. Cilfowyr Chapel is indicated by a red dot on the extract from the Ordnance Survey 1:50,000 map.

METHODOLOGY

Permissions, Consents and Agreements

As the site is not currently scheduled and is on private land, the only permission that was required was that of the owners Mr and Mrs Johnson; which was duly given.

Geophysical Survey Methodology

A fluxgate gradiometer with a DL601 data logger was used to conduct the detailed survey, which detects variations in the earth's magnetic field. A sample interval of 0.25m (four readings per metre) was used with 1m wide traverses across 20m x 20m grids using the zigzag traverse method of collecting data. The gradiometers sensitivity was set to detect a magnetic variation in the order of 0.1 nanoTesla.

The survey grid was tied in to the local Ordnance Survey grid using a Trimble Total Station (TST), during the follow on topographic survey.

The data was processed using *Terrasurveyor 3.0* and is presented with a minimum of processing. The presence of high values caused by ferrous objects, which tend to hide fine details and obscure archaeological features, have been 'clipped' to remove the extreme values allowing the finer details to show through.

The processed data has been presented as a grey-scale plot, overlaid on local topographical features. The main magnetic anomalies have been identified and an interpretation of those results is also given.

The survey results and interpretation diagrams should not be seen as a definitive model of what lies beneath the ground surface, not all buried features will provide a magnetic response that can be identified by the gradiometer. In interpreting those features that are recorded the shape is the principal diagnostic tool, along with comparison with known features from other surveys. The intensity of the magnetic response could provide further information, a strong response for example indicates burning, high ferric content or thermoremnancy in geology. The context may provide further clues but the interpretation of many of these features is still largely subjective.

All measurements given will be approximate as accurate measurements are difficult to determine from fluxgate gradiometer surveys. The width and length of identified features can be affected by its relative depth and magnetic strength.

Topographic Survey Methodology

A Trimble Total Station (TST) was used to collect a large number of data points covering the area of the chapel and enclosure.

A survey station was set up at an arbitrary point near to the desired survey area to provide suitable coverage and visibility. From this point further survey stations were set up to allow the survey to include additional location data including known mapped buildings and an Ordnance Datum point. The data was downloaded onto a computer and processed using Trimble Geosite v5.1 software.

SUMMARY OF RESULTS

The geophysical survey was undertaken on the 14th August 2015 with the topographic survey on the 10th December 2015. The results of both were processed and then imported in a 3D-CAD workspace, and overlain and located together to allow individual interpretation followed by complementary comparison and adjustment to produce enhanced results.

They will first be discussed separately and then together to better show the conclusions reached.

Geophysical survey

The survey consisted of 9 20m x 20m grids covering all of the visible earthworks with some area outside also. The survey worked and the results show a mixture of positive and negative geomagnetic responses across the site with some forming linear, curvilinear and larger sub-rounded features as can be seen in Figure 2.

Immediately obvious are the three sides of the chapel enclosure and the matching two corners which show it to be roughly rectangular with rounded corners. The fourth side and corresponding eastern and southern corners are not clearly visible in the results and are likely outside of the survey area. The sides are defined by a mixture of positive and negative linear and curvilinear anomalies that could reflect phasing of the site and/or that a ditch and bank system was in place.

There are noticeable differences between each side of the enclosure, with the south-western side being composed of a wide positive linear, the north-western being composed of a narrow negative linear flanked by two broken positive linears and the north-eastern side being a wide negative linear flanked by two positive linears of varying widths. These differences may reflect the pre-existing natural topography; the design of the enclosure or the processes applied to the site once it fell out of use, or changed use.

In the northern and eastern corners of the enclosure there are additional faint linears and curvilinears present that give the appearance of smaller rectangular features. There is also a small concentration of dipolar readings in the north-eastern half of the enclosure. Several of the linear features that form the shape of the enclosure or chapel are associated with mid-sized sub-rounded or rounded positive and dipolar anomalies located at intersections, termini or changes in direction.

It is apparent that the results do not contain anything of the south and eastern corners, or the south-eastern side of the enclosure as they appear to be outside of the survey area. Given the close proximity of the field boundary it is possible that magnetic interference from the hedge and fence is masking the readings, or much more likely that the boundaries overlie them entirely. Overall the chapel enclosure measured approximately 35m by 50m.

Three buried services are identifiable from the results; two of which have been confirmed by the current landowner as water pipes, one active the other inactive.

The third service is likely to be a gas pipe that runs parallel with the southern field boundary. The shadow effect of the pipe combined with the magnetic effects of the field boundary obscures the southern extent of the enclosure, but using projection it is likely that the gas pipe truncates the enclosure around that area.

The chapel structure itself shows up very clearly as an incomplete rectangular negative feature, but is better defined by the strong positive linears surrounding it.

No obvious evidence for construction or activity could be seen outside of the enclosure, however this may be a limitation due to the survey size rather than a reflection of the surviving below ground archaeology.

Topographical survey

The topographical survey shows the slope of the site tends to east-north-east with a shallow channel visible running parallel to the north-eastern side of the enclosure running more north-east.

The survey shows three sides of the enclosure which appears as broadly rectangular. The corners are rounded. The internal layout of the enclosure shows the south-eastern half is slightly flatter and becomes more steeply sloping in the north-western half. An exception to this is in the northern corner there appears to be a flatter, roughly rectangular platform aligned northeast-southwest. A gap in the earthwork enclosure on its south-west side is probably a former entrance.

A shallow channel can be seen running parallel to the north-eastern side of the enclosure.

No additional, hitherto unexpected features could be identified from the topographical survey results.

Combined

When looked at together the results show general correlation. The trend and shape of the geophysical anomalies is reflected by the topographical survey. Some of the slight topographical features, that may normally be dismissed as representing the natural trend of the site can be picked out as being linked to a geophysical anomaly like potential services or underlying archaeology. These features were easily identifiable from the geophysics alone. However, confirming that minor topographical features relate to them, further supports their accurate location and strengthens the results of the combined surveys.

The high points of the earthworks recorded by the topographical survey would appear to coincide with positive anomalies from the geophysics survey. This is unusual as positive anomalies are normally associated with soil-filled features such as ditches rather than raised earthworks such as banks. This unusual correlation is also seen over the chapel site itself, with the top of the visible earthworks relating to positive anomalies from the geophysics. No reason for this correlation can be ascertained without further investigation of the site.

The topographic survey does not provide any additional interpretation regarding the majority of the small dipolar anomalies which dot the geophysical results.

Archaeological Interpretation (see Figures 4 and 5)

The enclosure (A) and chapel (B) are shown to be visible in both the geophysical and topographical surveys.

The chapel is shown to be rectangular in shape, aligned east/west and measuring c.13.7m in length by c.6m wide. This is an approximation at best as the measurement is taken from the middle of the wall line, because of the unusual relationship between the positive geophysical features with the above ground earthworks. Further investigation of the site using other types of below ground prospection such as resistivity or GPR, or through evaluation trenching, may help establish better the relationship and reason for this.

Tentative suggestions for the correspondence of positive features and upstanding earthworks include:

- That the earthworks represent tumble down and that the strong negative linears visible on the "inside" of the chapel represent the foundation and wall line.
- That the upstanding remains contain only occasional stonework (due to robbing) and are mostly earthen banks, perhaps also overlying soil-filled "foundations".

The enclosure is shown to be roughly rectangular, with the corners and edges that were not picked up by the surveys likely being incorporated into the present field boundary, or being truncated horizontally by modern ploughing. The service on the southern field boundary would also seem to have truncated the feature vertically. The surveys show the earthworks to be composed of a mixture of positive and negative linears/curvilinears, with 3 or 4 "layers" making up the visible earthwork. This is not altogether unheard of, but does make the enclosure itself a more substantial feature.

Two other internal features (C) may exist in the corners of the enclosure. They are represented by positive and negative curvilinears and linears on the geophysical survey, and by the forming of rough platforms on the topographical survey. Both are roughly rectangular but are not as strong features in comparison to the enclosure or chapel.

There is no way to be certain which, if any, of the features are contemporaneous. However we do know the building was noted in 1721 as being disused and had become the home of "...fowles and jackdaws" (parish magazine extract). Although no mention is made of the enclosure, the same passage refers to other chapels in the area being converted to barns and stables after falling into disuse, and it is easy to see the enclosure, if it was as substantial as the geophysical survey suggests, fulfilling some sort of role as a pound-ffald.

There are three features which are almost certainly service pipes (D). These features are shown on the geophysical survey as negative linears cutting across the enclosure or as the strongly dipolar area running parallel to the southern field boundary. After discussing with the present landowner, he confirmed that there are two plastic water pipes in the field, one active, one not, and that there is a large service running along the southern hedge-line.

There are two faint positive linears (E) running northeast-southwest in line with the present field boundary but set back. This may be a remnant of the enclosure if it was truncated horizontally by ploughing or the remains of some other feature with the enclosure boundary lying under the field boundary.

One of the potential features that was under investigation was whether or not any burials were associated with the enclosure. Although there are occasional positive magnetic features which could be interpreted as pit or grave-like, there are no concentrations of them that would confirm the enclosure and chapel have been used as a burial ground.

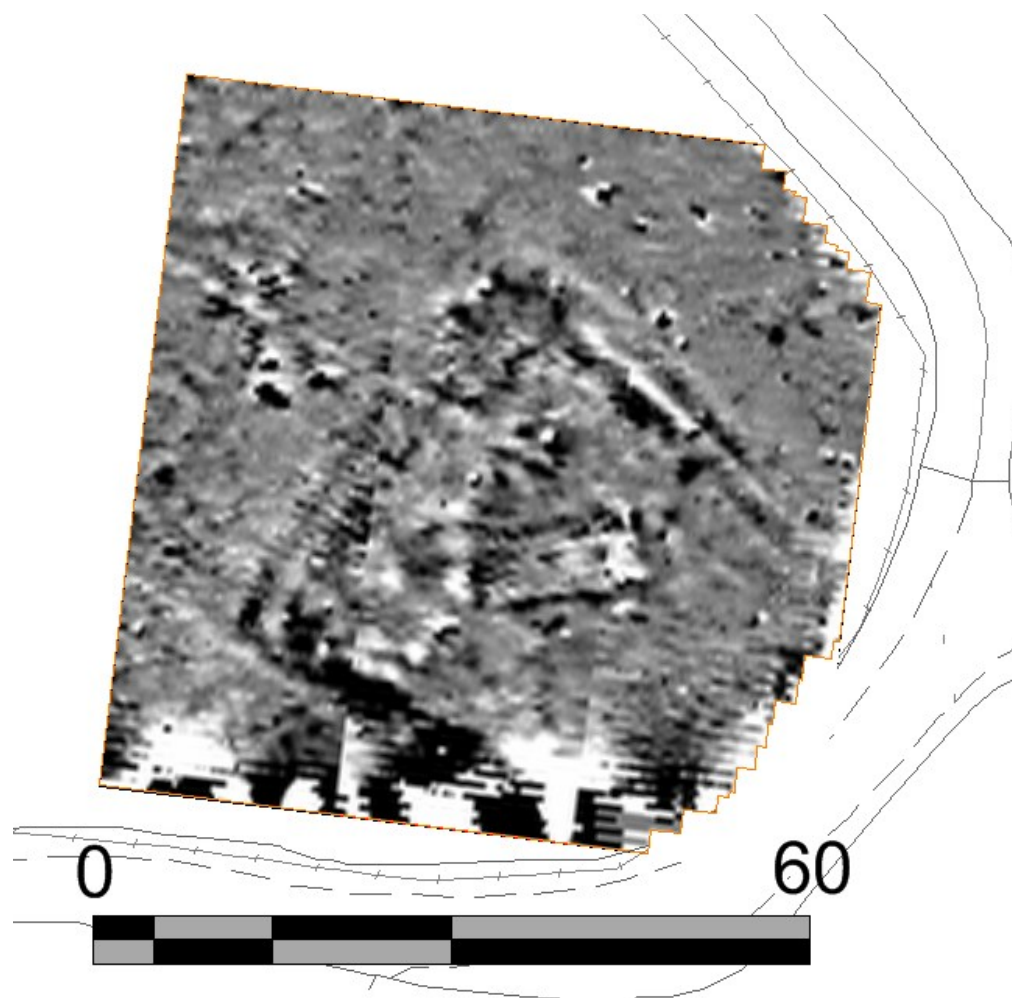


Figure 2: Geophysical survey results with a range of $\pm 8nT$

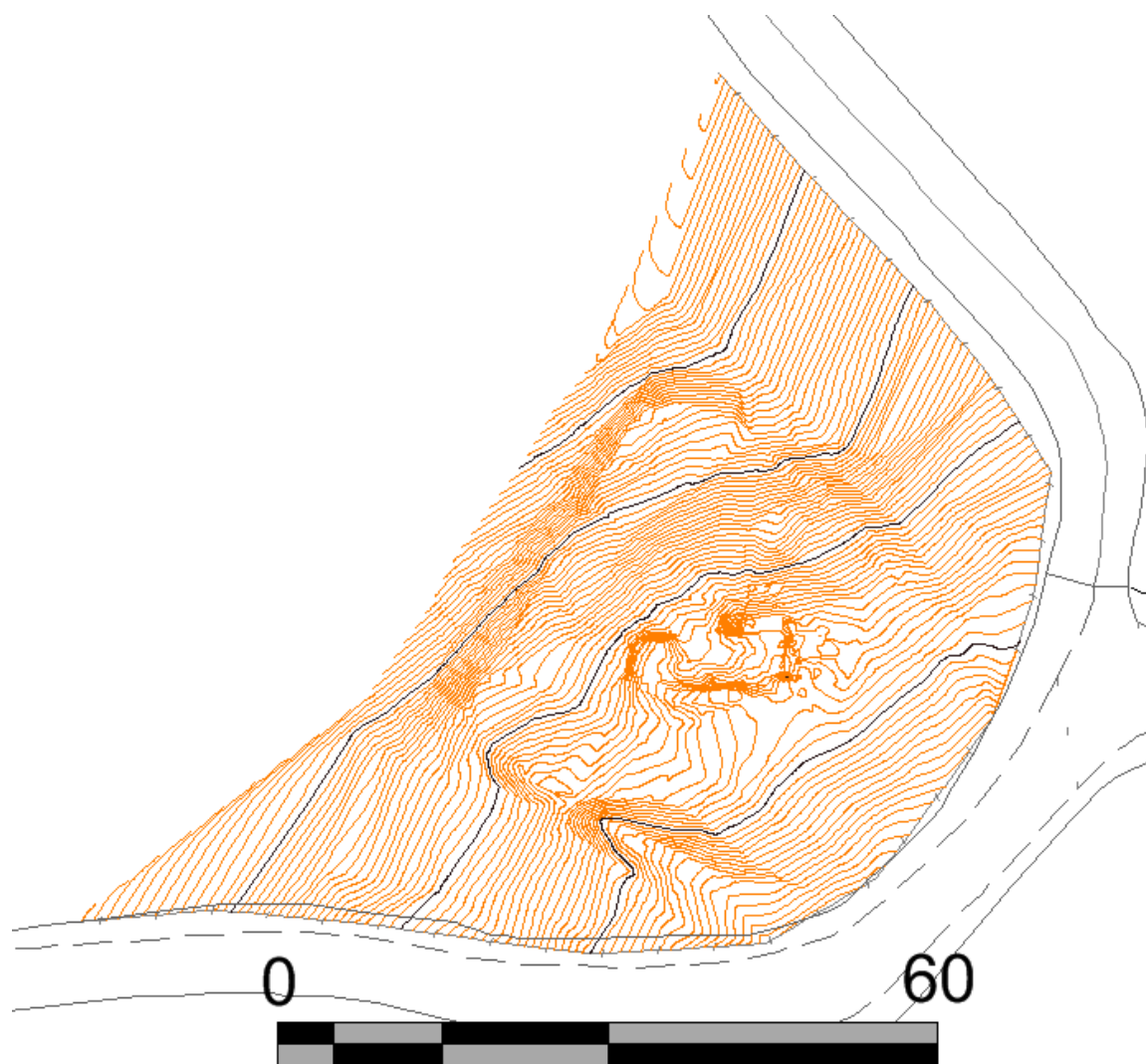


Figure 3: Topographical survey results. Contour intervals 1m and 5cm.

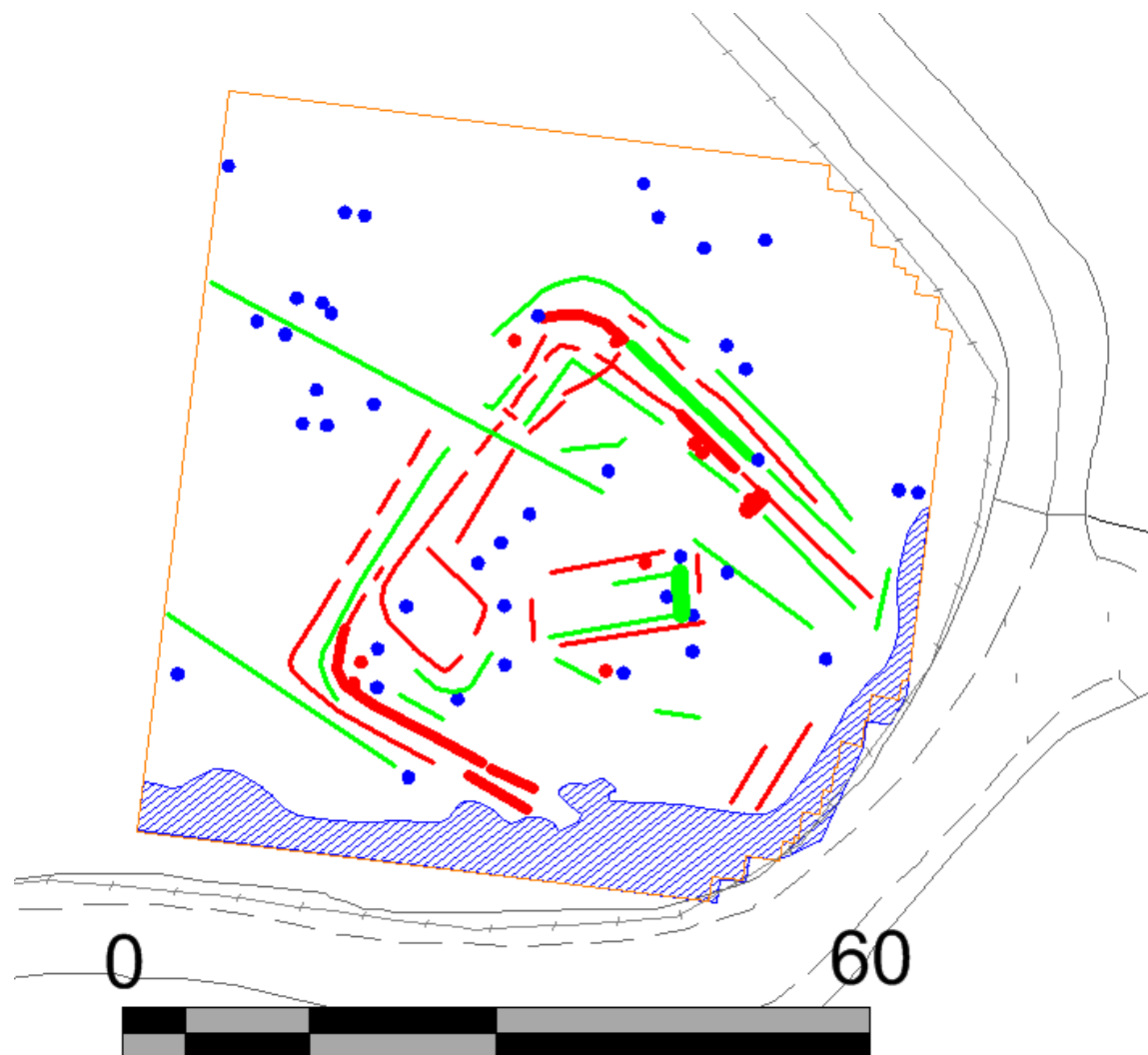


Figure 4: Geophysical survey results. Positive anomalies are in red, negative anomalies are in green and dipolar features are in blue.

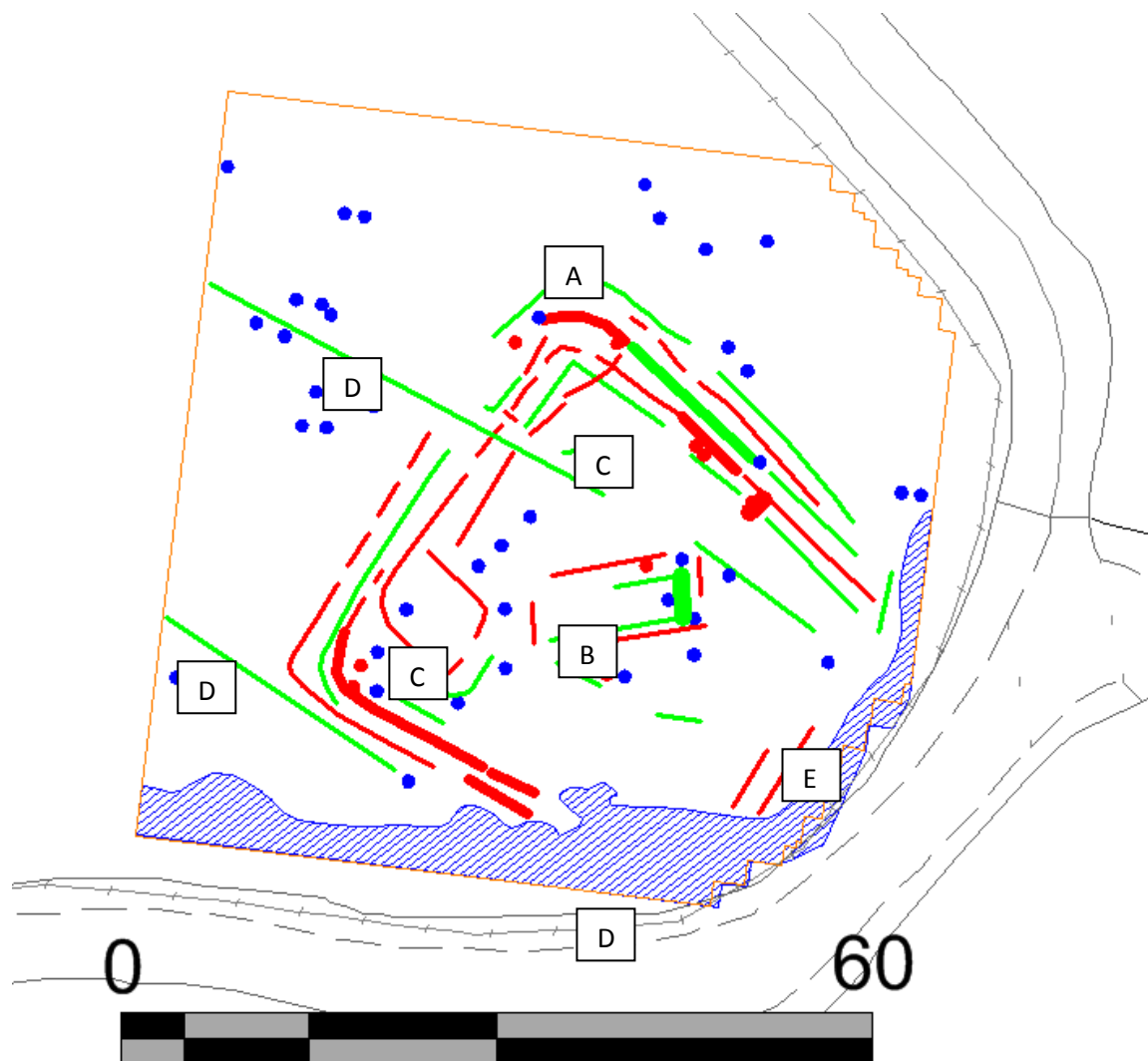


Figure 5: Interpretation of the geophysical and topographical surveys

ACKNOWLEDGEMENTS

Thanks are due to the owners of the land Mr and Mrs Johnson for allowing access to the land

The surveys were conducted by Charlie Enright, Edward Davies and Hubert Wilson.

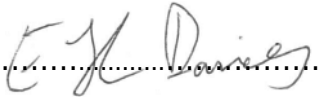
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ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: Trust Director

Llofnod / Signature  Dyddiad / Date 31/03/2016

Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau
sydd gennych ar gynnwys neu strwythur yr adroddiad hwn

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