

LAND NORTH OF STATION ROAD, NANTGAREDIG: GEOPHYSICAL SURVEY



*Ffynnon Newydd Henge (CM042), Nantgaredig, visible as a semi-circular parchmark
(© DAT AP89-Z7)*



Prepared by Dyfed Archaeological Trust
For: Crompton Land & Development Ltd.



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**LAND NORTH OF STATION
ROAD, NANTGAREDIG:
GEOPHYSICAL SURVEY**

By

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LAND NORTH OF STATION ROAD, NANTGAREDIG: GEOPHYSICAL SURVEY

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EXECUTIVE SUMMARY

DAT Archaeological Services were commissioned to undertake a geophysical survey on land north of Station Road, Nantgaredig, Carmarthenshire.

The purpose of the survey was to provide a better indication of the archaeological potential of the site and if required, enable targeting of any further archaeological mitigation requirements before or during the development.

The geophysical survey recorded several sub-circular features within the development area that, it is suggested, could represent surviving evidence for prehistoric activity. The proximity of known funerary and ritual features of prehistoric date in the surrounding area lends weight to this suggestion

Linear features recorded running across the development area probably represent former field boundaries of medieval/post-medieval date.

CRYNODEB GWEITHREDOL

Comisiynwyd Gwasanaethau Archeolegol YAD i gynnal arolwg geoffisegol ar dir i'r gogledd o Heol Gorsaf, Nantgaredig, Sir Gaerfyrddin.

Pwrpas yr arolwg oedd rhoi gwell arwydd o botensial archeolegol y safle ac, os oes angen, galluogi targedu unrhyw ofynion lliniaru archeolegol pellach cyn neu yn ystod y datblygiad.

Cofnododd yr arolwg geoffisegol sawl nodwedd is-gylchol yn yr ardal ddatblygu a allai, awgrymir, gynrychioli tystiolaeth sydd wedi goroesi ar gyfer gweithgaredd cynhanesyddol. Mae agosrwydd nodweddion angladdol a defodol hysbys o'r dyddiad cynhanesyddol yn yr ardal gyfagos yn rhoi pwys ar yr awgrym hwn

Mae'n debyg bod nodweddion llinellol a gofnodwyd yn rhedeg ar draws yr ardal ddatblygu yn cynrychioli ffiniau caeau blaenorol o'r dyddiad canoloesol / ôl-ganoloesol.

LAND NORTH OF STATION ROAD, NANTGAREDIG: GEOPHYSICAL SURVEY

SUMMARY

DAT Archaeological Services were commissioned by Crompton Land & Development Ltd to undertake a geophysical survey in an area proposed for residential development. The site is located north of Station Road, Nantgaredig, Carmarthenshire (centred on NGR SN 49469 21026).

The proposed development area lies within a landscape rich in prehistoric funerary and ritual sites. Approximately 100m to the north of the development area lies the scheduled monument of Ffynnon-Newydd Henge (CM042) and 200m to the south is the scheduled monument of Maes y Crug Bronze Age Round Barrow (CM328). A further two undesignated Bronze Age round barrows are also within the immediate surrounding area, and other prehistoric activity in the surrounding area is evidenced by Bronze Age finds and flint scatters of Mesolithic date.

Thus, the potential for further prehistoric remains to survive within the development area is high. During the revised Local Development Plan consultation in 2019, Dyfed Archaeological Trust – Development Management (DAT-DM), in its role as archaeological advisor to the local planning authority, judged that any development in this area of Nantgaredig would require archaeological mitigation.

Following discussions with DAT-DM a geophysical survey was suggested as the best way to provide a better indication of the archaeological potential of the site and if required, enable targeting of any further archaeological mitigation requirements before or during the development.

In total, an area measuring 1.3ha was surveyed. The geophysical survey recorded at least three potential archaeological features that could be prehistoric in date. Their size and spatial arrangement suggest they are possibly remnants of prehistoric burials, and the proximity of known funerary and ritual features of prehistoric date in the surrounding area lends weight to this suggestion.

Linear features running across the development area; are likely to represent former field boundaries. Although these boundaries are not visible on historic mapping they are of probable medieval/post-medieval date.

Further archaeological investigation in the form of trial trench excavation could determine the archaeological significance of the features recorded during the geophysical survey.

1. INTRODUCTION

1.1 Project Commission

- 1.1.1 DAT Archaeological Services were commissioned by Crompton Land & Development Ltd to undertake a geophysical survey within an area proposed for residential development, centred on NGR SN 49469 21026 (Figure 1).
- 1.1.2 The development proposals comprise the construction of circa 30 dwellings on land north of Station Road, Nantgaredig, Carmarthenshire.
- 1.1.3 The geophysical survey was undertaken using a fluxgate gradiometer which detects subtle variations in the earth's magnetic field, which can indicate the presence of buried features such as ditches, pits, walls or postholes, which are not visible on the ground surface. The purpose of the geophysical survey was to provide a better indication of the archaeological potential of the site through the identification of subsurface features which could be indicative of archaeology. This will allow for an informed decision on whether any further archaeological mitigation is required or not before or during the development programme.

1.2. Scope of the Project

- 1.2.1 The aim of the project was:
 - To identify the presence/absence of any potential archaeological deposits through an initial gradiometer survey;
 - To establish the character and extent of any potential archaeological remains within the site area that could be affected by the proposed works;
 - To prepare a report and archive on the results of the geophysical survey.

1.3 Report Outline

- 1.3.1 This report provides a summary and discussion of the geophysical survey and its results and puts those results within their regional and national context.

1.4 Abbreviations

- 1.4.1 Sites recorded on the regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Sites recorded on the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) are identified by their National Primary Record Number (NPRN). Scheduled Monument (SM). Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

1.5 Illustrations

- 1.5.1 Printed map extracts are not necessarily produced to their original scale.

1.6 Timeline

1.6.1 The following timeline (Table 1) is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text.

Period	Approximate date	
Palaeolithic –	c.450,000 – 10,000 BC	Prehistoric
Mesolithic –	c. 10,000 – 4400 BC	
Neolithic –	c.4400 – 2300 BC	
Bronze Age –	c.2300 – 700 BC	
Iron Age –	c.700 BC – AD 43	
Roman (Romano-British) Period –	AD 43 – c. AD 410	Historic
Post-Roman / Early Medieval Period –	c. AD 410 – AD 1086	
Medieval Period –	1086 – 1536	
Post-Medieval Period ¹ –	1536 – 1750	
Industrial Period –	1750 – 1899	
Modern –	20 th century onwards	

Table 1: Archaeological and Historical Timeline for Wales

¹ The post-medieval and industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Dyfed Archaeological Trust

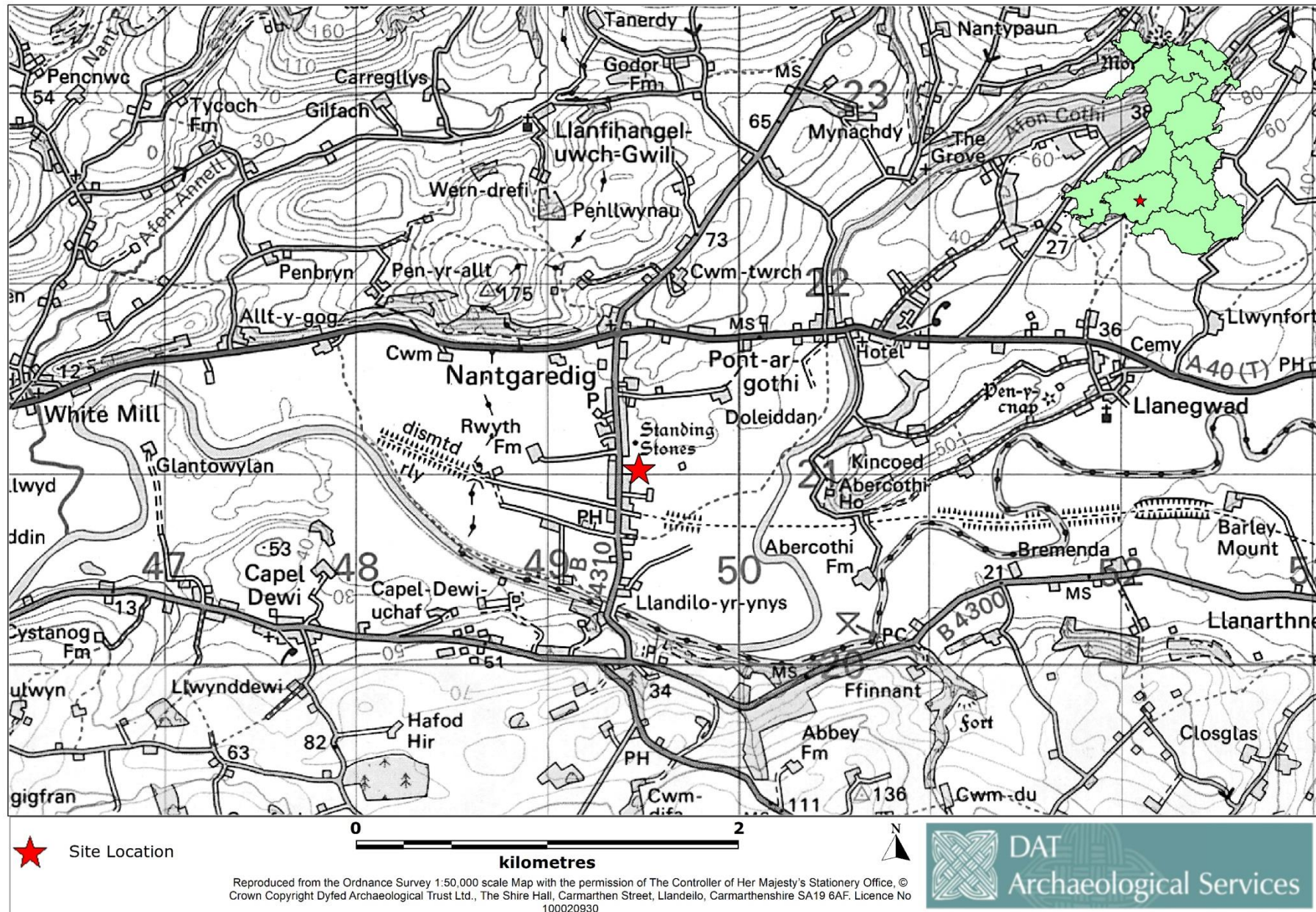


Figure 1: Site location

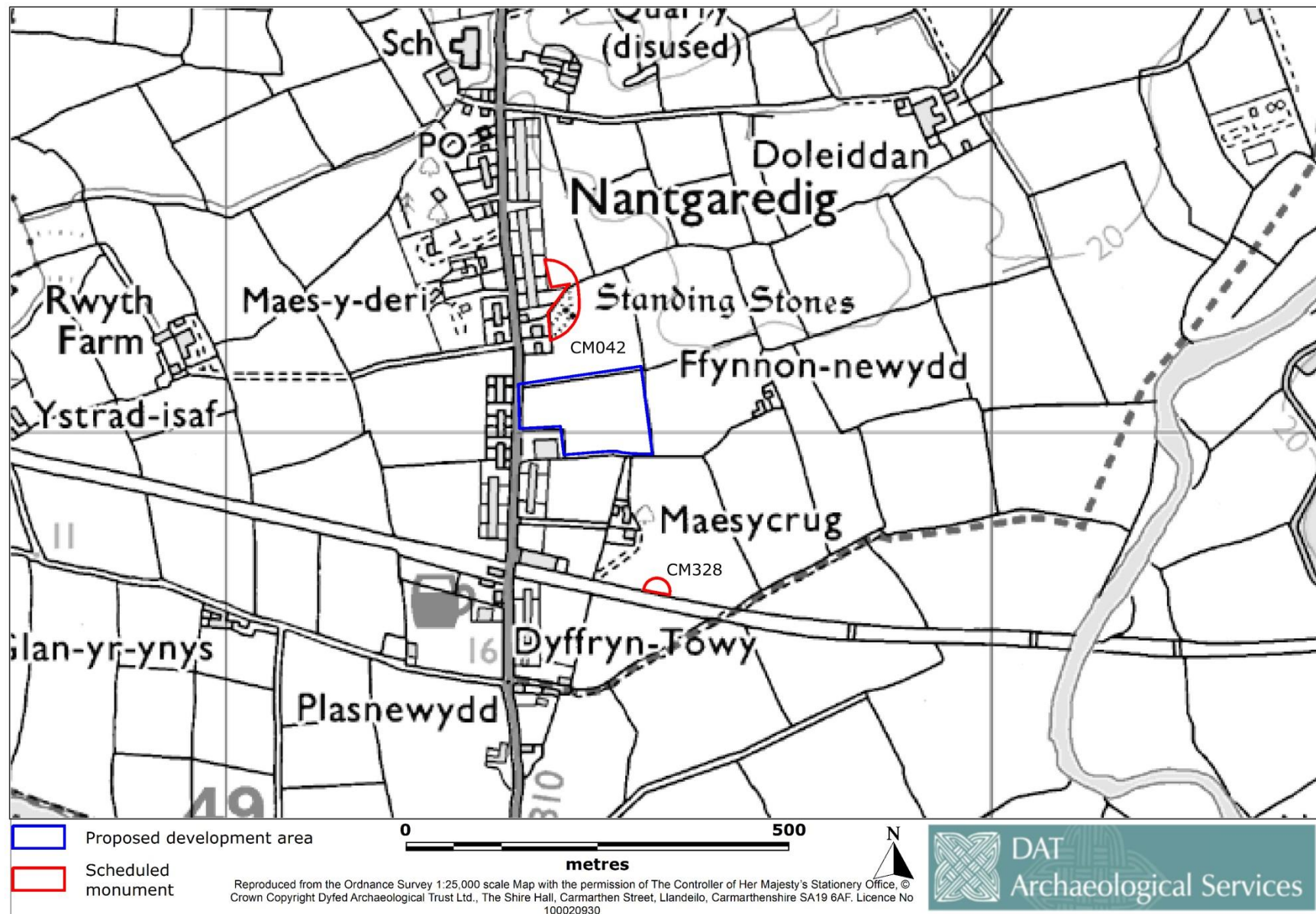


Figure 2: Proposed development area (outlined in blue)

2. THE SITE

2.1 Site Location and Topography

- 2.1.1 The proposed development site lies at the base of the Tywi Valley between Carmarthen and Llandeilo within the village of Nantgaredig (Figure 2). The development area is currently undeveloped pasture land (Photos 1 and 2).
- 2.1.2 The British Geological Survey records the superficial deposits beneath the site as river terrace deposits – sand and gravel formed up to three million years ago in an environment dominated by rivers. The bedrock geology is recorded as didymograptus Bifidus beds – Mudstone, a sedimentary rock formed approximately 461 – 466 million years ago in deep-sea environments (BGS online).



Photo 1: View from the entrance southeast across the proposed development site.



Photo 2: View of the development site from the southeast corner looking northwest.

2.2 Archaeological Potential

- 2.2.1 The development site lies close to two significant prehistoric scheduled monuments (Figure 2).
- 2.2.2 Approximately 100m to the north of the development area lies the scheduled monument of Ffynnon Newydd Henge (CM042, PRN 1754).
- 2.2.3 The essential characteristic of a henge is a ring-shaped bank and ditch, with the ditch inside the bank; hence they are not considered to have been defensive constructions. Typically, excavation reveals little if any evidence of occupation within a henge, although they can contain evidence of ritual structures such as stone and timber circles.
- 2.2.4 Ffynnon Newydd Henge is visible on aerial photographs (Photo 3) and as a slight earthwork. The henge had a diameter of c. 75m. Currently, only the southeast third survives above ground where part of the bank is identifiable as a rise in the surface of a pasture field. The remainder of the henge is under 20th-century housing development. This will have destroyed much of the henge although some buried remains may still survive in undisturbed garden areas. At the southeast edge of the henge are a pair of standing stones (PRN 109,231) with a third lying prone nearby. It is unclear whether the stones stood inside or outside of the henge.



Photo 3: Ariel photograph of Ffynnon Newydd Henge – seen as a semi-circular parch mark to the left of the housing. The field immediately to the north of this site forms the proposed development area. (DAT AP89-133.13)

- 2.2.5 To the south lies Maes y Crug (CM328, PRN 1752), a Bronze Age round barrow. At its simplest, a round barrow is a circular based mound of earth and/or stone raised over a burial placed in the middle. Numerous variations may employ surrounding ditches, stone kerbs or flat berms between ditch and mound.
- 2.2.6 The monument was first recorded in 1864 when it was truncated by the southern half of the construction of the railway. During these works, a cist burial was revealed, and within it, a vessel, described as a “ware pot” was found. The monument was scheduled by Cadw in 2003 as examples of round barrows on the lower gravels of the Tywi valley are considered rare.
- 2.2.7 There are a further two round barrows located nearby (PRN 1758 and 9958), and records of prehistoric finds within the surrounding area (PRNs 1755-1757).
- 2.2.8 During recent discussions with the current landowner of the development area it was alleged that in the 1970s, during the installation of a sewage pipe, several burials were exposed. No other information regarding this discovery is on record and the claims remain unsubstantiated.
- 2.2.9 This closely distributed group of recorded archaeological features suggests that this area had a ritual significance from the Neolithic to Bronze Age periods; possibly dedicated to ceremonial and burial purposes.

3. METHODOLOGY

- 3.1 A fluxgate gradiometer with a DL601 data logger was used to conduct the detailed geophysical survey, which detects variations in the earth's magnetic field. A sample interval of 0.25m (four readings per metre) was used with 1.0m wide traverses across 30m x 30m 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.
- 3.2 The survey grid was tied into the local Ordnance Survey grid using a Trimble R8s integrated GNSS with TSC3 controller.
- 3.3 The data was processed using *Terrasurveyor 3.0.35.10* 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.
- 3.4 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 where appropriate.
- 3.5 The resulting 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 a 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.
- 3.6 All measurements given will be approximate as accurate measurements are difficult to determine from fluxgate gradiometer surveys. The width and length of the identified features can be affected by its relative depth and magnetic strength.

4. RESULTS

4.1 The geophysical survey results are presented as a greyscale plot in Figure 3. In total, an area of 1.3ha was surveyed. There appears to be a general trend of north-south lineations across the survey area, which is likely to have been caused by modern ploughing.

4.2 Figure 4 shows an interpretation of the survey results, which are discussed by category below:

Ferrous material (Dipoles)

4.3 In geophysical greyscale plots, dipole anomalies are commonly seen across a range of sites, particularly agricultural land. Generally, unless they form a pattern or a part of a larger feature they are disregarded as not significant. They are usually the result of miscellaneous modern ferrous rich debris, such as brick and tile fragments as well as objects such as horseshoes or broken ploughshares, which lie within the topsoil. In rare instances, isolated dipoles may reflect features of archaeological interest, but only further intrusive investigation can verify this.

Magnetic Interference

4.4 Magnetic disturbance occurs where the survey encroaches near a field boundary that contains a ferrous material such as wire-fencing. In this instance, where the disturbance has occurred a single polarity response has been exhibited. This is particularly evident along the northern boundary of the northeast field. However, the interference is minimal and has not impacted adversely upon the rest of the survey.

Possible pits

4.5 Evidence for pits is often seen distributed throughout survey areas. Some of these might have an archaeological origin but it is also likely that they represent a natural feature such as a tree throw (former root bole of a tree shrub). Unless any discernible arrangement or grouping is apparent it is difficult to determine their origin.

Archaeological Features

4.6 **1) Linear ditch** – A strong positive anomaly suggests a probable ditch orientated roughly northeast to southwest across the site and measuring approximately 83m in length. Towards its southern end, the ditch becomes diffused, possibly by plough action. This could be a continuation of the existing field boundary mapped to the south.

4.7 **2) Double linear ditch** – Aligned roughly north to south across the survey area are the remnants of a probable double ditched field boundary. No historic documentary or mapping resources suggest a field boundary in this area. The strong dipole anomaly at the southern end is likely to be a ferrous object that has been incorporated into the boundary make-up.

4.8 **3) Ditch** – A section of ditch measuring 22m on the western edge of the survey area. The ditch appears to extend from beyond the western field boundary. A possible return to the ditch can be seen exiting the field in a westerly direction to the south.

Possible Archaeology

4.9 **4) Circular ditched enclosure** – Towards the centre of the survey area lies evidence of a possible circular ditched enclosure anomaly measuring approximately 16m in diameter; with a break in the circle to the north.

4.10 **5) Small square ditched feature** – This small right-angled ditched enclosure surrounds a central possible pit, and is itself surrounded by what might be an outer curving ditch.

- 4.11 **6) Curved ditch** – Located in the northeast corner of the field this possible curved ditch has been truncated by modern field boundaries. The surviving remnants suggest the curving ditch could indicate a circular enclosure of 8m in diameter
- 4.12 Features **4), 5) and 6)** are all redolent of sites of ploughed out round barrows identified on many other archaeological sites in Wales; particularly on areas of river gravels such as found further up the Towy Valley in Llandeilo (Hourihan, Long & Simpson 2015).

Geology

- 4.13 **7) & 8) Sweeping bands of enhanced magnetism** – These bands of enhanced magnetism are of unknown origin. They are not characteristic of anything archaeological and therefore likely represent a natural geological response.

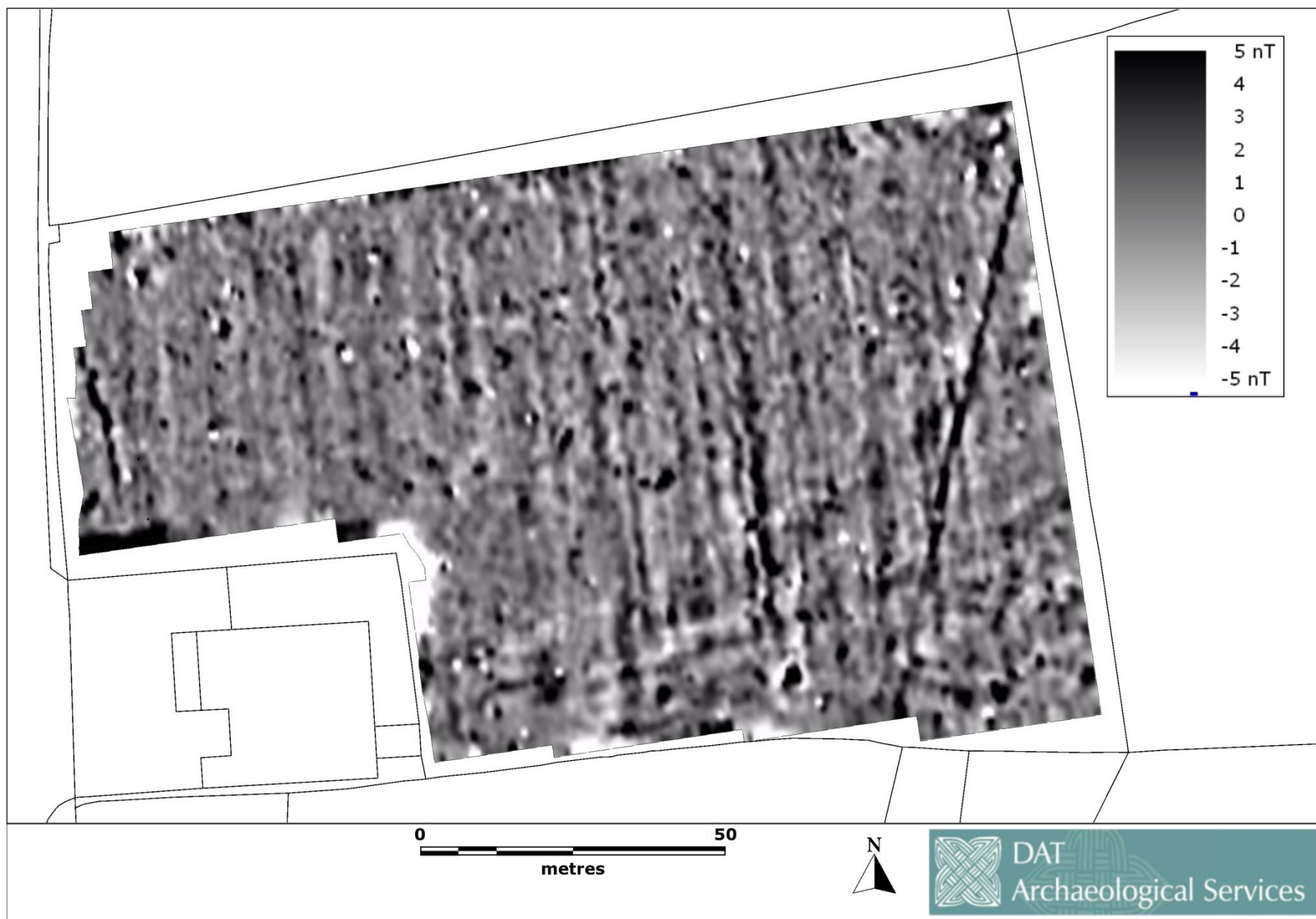


Figure 3: Geophysical survey greyscale plot.

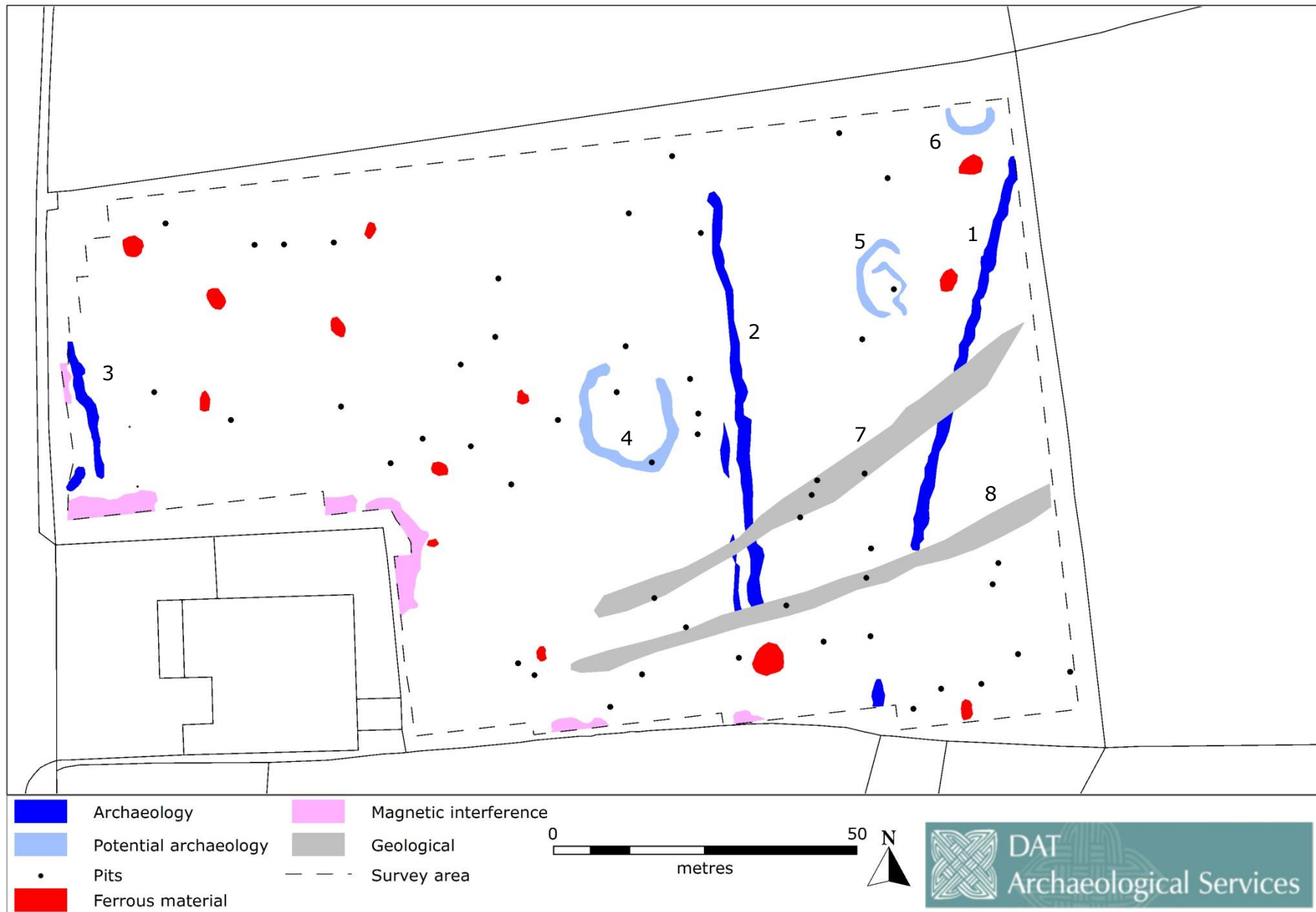


Figure 4: Geophysical survey interpretation

5. CONCLUSIONS

- 5.1 Generally the quality of the survey data was good; with little interference from external influences.
- 5.2 Several linear ditches were recorded which are probably evidence of former field boundaries, although available historic mapping of the area shows no differences in the field layout since at least 1842. An aerial photograph does appear to show the cropmark of a former field boundary (Photo 4) on the same alignment as ditch **2**), although it appears to be located too far west to be the same feature.
- 5.3 Ditch **1**) appears to align with the extant remains of a field boundary in the field directly to the south, and probably represents a continuation of this ditch which has subsequently been removed.
- 5.4 With so little surviving of ditch **3**), it is difficult to interpret what this ditch may represent. However, an indication of an angled return at the southern end of the ditch (that runs into the field boundary) may indicate that this ditch formed some sort of enclosure.



Photo 4: Meridian vertical aerial photograph taken in 1955 showing the proposed development site (red). The cropmark of a former boundary can be seen crossing the field north to south to the right of the house..

- 5.5 Features **4**), **5**) and **6**) are all redolent of sites of ploughed out round barrows identified on many other archaeological sites in Wales; particularly on areas of river gravels such as the prehistoric cemetery site at Love Lodge Farm, Llandeilo further up the Towy Valley (Hourihan, Long & Simpson 2015).
- 5.6 These features are difficult to discern against the general trend of the magnetic variation seen across the area in the geophysical survey, and their responses are somewhat weak and often diffused. However, the land has been heavily ploughed over many hundreds of years, and it is possible

that a substantial depth of soil has also been deposited over the floodplain in the same period; either of which could lessen or obscure strong magnetic responses from the archaeological features.

- 5.7 Despite this the general characteristics of this group of features and their spatial distribution, within a surrounding landscape of prehistoric funerary and ritual monuments, suggest the potential for them to be prehistoric burial features remains high.
- 5.8 Further archaeological investigations, including archaeological trial trench evaluation, could determine whether the features are of archaeological significance or not.

6. SOURCES

Published

CIfA, 2014 *Chartered Institute of Field Archaeologists Standards and Guidance for Archaeological Geophysical Survey*

Houriham, S, Long, P and Simpson, H 2015 *Archaeological Report for Ysgol Bro Dinefwr, Love Lodge Farm, Ffairfach, Carmarthenshire Volume 1*, AB Heritage Limited & Rubicon Heritage Services Limited

National Standard and Guidance for Collecting and Depositing Archaeological Archives in Wales 2017. <http://www.welshmuseumsfederation.org/en/news-archive/resources-landing/Collections/national-standard-and-guidance-for-collecting-and-depositing-archaeological-archives-in-wales-2017.html>

Online resources

British Geological Survey [online] Date Accessed 14th February, 2020. <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>.

7. GLOSSARY

Fluxgate Gradiometer

An instrument used to measure magnetism to search for areas of disturbed ground that may be associated with subsurface archaeological features.

nanoTesla (nT)

A unit of measurement of a magnetic field.

Ferrous object

Metals and alloys that contain iron.

Dipole

An anomaly consisting of a single positive response with an associated negative response forming a 'halo effect'. The negative and positive response is of equal magnitude but opposite polarity and are caused by the same feature. Dipole anomalies are very commonly observed across a range of sites, particularly agricultural land. Generally, unless the dipoles form part of a larger pattern or feature they are regarded as not significant. They are usually the result of modern ferrous rich debris such as brick and tile fragments as well as objects such as horseshoes or broken ploughshares, which lie within the topsoil.

