LAND TO THE REAR OF RED LION FARM, BALA, GWYNEDD

ASESU A GWERTHUSO ARCHEOLEGOL / ARCHAEOLOGICAL ASSESSMENT AND EVALUATION

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

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Golygfa o Maes Treflyn o ardal yr astudiaeth a'r Bala y tu hwnt / View from Maes Treflyn of the study area and Bala beyond (G2659_026)

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CRYNHODEB ANHECHNEGOL

Comisiynwyd Ymddiriedolaeth Archaeolegol Gwynedd gan Cadnant Planning Ltd. i gwblhau asesiad archaeolegol ac arolwg geoffisegol cyn datblygiad preswyl arfaethedig ar dir y tu ôl i Fferm Red Lion, Bala, Gwynedd. Roedd y datblygiad yn cynnwys ardal agored fawr wedi'i hamgylchyni gan dai modern. Ni nodwyd unrhyw safleoedd cyfnod cynhanesyddol na Rhufeinig yng nghyffiniau'r ardal asesu, ond nodwyd ei fod ar ymyl de-orllewin tref farchnad gynlluniedig ganoloesol y Bala. Nododd yr arolwg geoffisegol sawl anghysondeb, gan gynnwys olion ffosydd cau posibl yn rhan dde-ddwyrain y safle. Daethpwyd i'r casgliad bod potensial cymedrol i archaeoleg ganoloesol fod yn bresennol wedi'i guddio o dan y tir pori, argymhellwyd rhaglen arall o werthuso archaeoleg i ymchwilio hyn ac anghysondebau geoffisegol penodol.

NON-TECHNICAL SUMMARY

Gwynedd Archaeological Trust was commissioned by Cadnant Planning Ltd. to complete an archaeological assessment and geophysical survey in advance of a proposed residential development on land to the rear of Red Lion Farm, Bala, Gwynedd. The development comprised a large open area surrounded by modern housing. No prehistoric or Roman period sites were identified within the vicinity of the assessment area, but it was noted to lie on the southwestern edge of the medieval planned market town of Bala. The geophysical survey identified several anomalies, including the remains of possible enclosure ditches in the southeastern part of the area. It was concluded that there was moderate potential for medieval archaeology to be present and obscured under the improved pastureland and a further programme of archaeological evaluation was recommended to investigate this and specific geophysical anomalies.

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by Cadnant Planning Ltd. to undertake an archaeological assessment and evaluation (geophysical survey) in advance of proposed residential development on land to the rear of Red Lion Farm, Bala, Gwynedd (NGR SH92333586; postcode: LL23 7AS; Figure 01). The development area measured 2.58ha in size and was located northwest of the High Street within a field of improved open pasture. The proposals were for 42 dwellings located towards the centre and northwestern end of the plot, with an access road from the High Street across undeveloped ground that is protected open space (cf. Figure 02 for an indicative layout).

The archaeological assessment and evaluation were undertaken in July and August 2020 and conformed to the following guidelines:

- *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* Version 1.1 (The Welsh Archaeological Trusts, 2018);
- *Guidelines for digital archives* (Royal Commission on Ancient and Historic Monuments of Wales, 2015);
- *Management of Archaeological Projects* (English Heritage, 1991);
- *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England, 2015);
- *Standard and Guidance for Archaeological Geophysical Survey* (Chartered Institute for Archaeologists, 2014); and
- *Standard and Guidance for Historic Environment Desk-Based Assessment* (Chartered Institute for Archaeologists, 2017).

The archaeological assessment and evaluation was monitored by the Gwynedd Archaeological Planning Service and was undertaken in accordance with an approved Written Scheme of Investigation (Appendix I). In line with the Gwynedd Historic Environment Record (HER) requirements, the HER was contacted at the onset of the project to ensure that any data arising was formatted in a manner suitable for accession to the HER under the guidance set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (The Welsh Archaeological Trusts, 2018). The HER was informed of the project start date, location, grid reference and estimated timescale; the project was assigned

HER Enquiry Number GATHER1291 and the Event PRN 45941. A bilingual event summary has been prepared for submission to the HER in accordance with their guidance.

Gwynedd Archaeological Trust is certified to ISO 9001:2015 and ISO 14001:2015 (Cert. No. 74180/B/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists and a member of the Federation of Archaeological Managers and Employers (FAME).

2 METHODOLOGY

2.1 Introduction

The archaeological assessment/evaluation was completed as a staged process and comprised the following:

- A desk-based assessment of the proposed development area; and
- a geophysical survey (magnetometer) of the area to detect for the possible presence of buried archaeology.

The desk based assessment was undertaken by GAT personnel and the geophysical survey by *Karta Geo* on behalf of GAT.

2.2 Desk Based Assessment

A desk-based assessment is defined as “a programme of study of the historic environment within a specified area or site on land, the inter-tidal zone or underwater that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage….Significance is to be judged in a local, regional, national or international context as appropriate” (CIfA 2014, 4).

The desk-based assessment involved a study of the following resources:

1. The regional Historic Environment Register (HER) Gwynedd Archaeological Trust, Craig Beuno, Ffordd y Garth, Bangor, Gwynedd LL57 2RT) was examined for information concerning the study area, defined as the new roadway and bridge location, and the immediate environs. This included an examination of the core HER, the 1:2500 County Series Ordnance Survey maps and any secondary information held within the HER. All identified features were mapped, described and added to a gazetteer of sites and the relative importance of any sites defined;
2. The National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, Plas Crug, Aberystwyth SY23 1NJ) was checked for sites additional to the HER;

3. Aerial photographs from the National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, National Monuments Record of Wales, Plas Crug, Aberystwyth SY23 1NJ) were examined for potential features;

4. An on-line catalogue search of the National Library of Wales (Penglais Rd, Aberystwyth SY23 3BU) was completed;

5. Archive data, including primary and secondary sources, historic maps and estate maps were examined at the regional archives (Meirionydd Archives, Bala Road, Dolgellau LL40 2YF); and

6. Light Detection and Ranging (LiDAR) data was examined from the Lle Geo-Portal at http://lle.gov.wales/home for information on potential surface features using digital terrain modelling and digital surface modelling.

A walkover survey was undertaken within the assessment area and descriptive information completed on GAT pro-formas. Any features identified were recorded and then added to the overall gazetteer, with their relative importance. A photographic record was maintained using GAT pro-formas and images were taken in RAW format using a digital SLR set to maximum resolution. Photographic images were archived in TIFF format using archive numbering system G2659_001 to G2659_027 (Appendix IV).

2.3 Geophysical survey

2.3.1 Introduction

The geophysical survey was carried out by a GAT appointed sub-contractor, Karta Geo Ltd, on Thursday 6th August 2020. The key aim and objective of the geophysical survey was to establish the extent to which potential archaeological remains survive at the location of the proposed development. The location and extent of the survey area is shown on Figure 08.

2.3.2 Survey methods

The survey control was predefined in AutoCAD by Karta Geo Ltd. prior to the commencement of the fieldwork. Baselines were plotted within the area in AutoCAD to ensure comprehensive and even data collection. The grid points associated with the baselines were exported from AutoCAD then imported into a Leica GS16 RTK Global Positioning System (GPS). The GPS instrument was used to set out the baselines within the field using bamboo flags as non-magnetic markers. The survey was completed using a Bartington Grad multi-sensor platform with a 1m traverse interval and a 0.13m sample interval.

2.3.3 Instrumentation

A Bartington multi-sensor platform, a two-wheeled cart that is pulled manually along the ground by an operator, was used as the data measurement and collection instrument. The platform is GPS enabled using a mounted Leica GS16 antenna and hosts two DL601 data loggers with four associated Grad-01-1000L fluxgate gradiometer sensors spaced at 1m intervals.

The gradiometer detects variations in the earth' s magnetic field measured in nanoTeslas (nT). The earth's magnetic field strength is about 48,000 nT; typical archaeological features produce readings of below 15nT although burnt features and iron objects can result in changes of several hundred nT. The machine is capable of detecting changes as low as 0.1nT and anomalies down to a depth of approximately one meter.

The instrument detects variations in the earth's magnetic field caused by the presence of iron in the soil. This is usually in the form of weakly magnetized iron oxides which tend to be concentrated in the topsoil. Features cut into the subsoil and backfilled or silted with topsoil, therefore contain greater amounts of iron and can, therefore, be detected with the

gradiometer. This is a simplified description as there are other processes and materials which can produce detectable anomalies. The most obvious is the presence of pieces of iron in the soil or immediate environs which usually produce very high readings and can mask the relatively weak readings produced by variations in the soil. Strong readings are also produced by archaeological features such as hearths or kilns as fired clay acquires a permanent thermo-remnant magnetic field upon cooling. This material can also get spread into the soil leading to a more generalized magnetic enhancement around settlement sites.

The instrument was balanced in a magnetically stable area either within or external to the survey area. The sensors were regularly checked for drift and rebalanced from this position if required.

2.3.4 Limitations

The success of the magnetometer survey detecting archaeological features is dependent upon a measurable contrast between the anomaly and the surrounding ground. Not all surveys can produce good results as results can be masked by large magnetic variations in the bedrock, drift geology or soil or high levels of natural background “noise” (interference consisting of random signals produced by material within the soil). In some cases, there may be little variation between the magnetic properties of the topsoil and subsoil resulting in undetectable features. The presence of ferrous materials, made ground and modern burnt remains can all produce strong responses that can mask the presence of archaeological features.

To ensure data quality, the Bartington multi-sensor platform operator is required to follow regular traverses pulling or pushing the survey cart at walking pace. Areas of waterlogged or rough uneven ground, deeply ploughed fields or dense vegetation or crops may restrict the movement of the operator and cart and limit the amount of data collected within these areas. In this instance, the entire survey area was accessible to the cart.

2.3.5 Data collection

Data was collected by a field computer mounted on the multi-sensor cart platform using MLGrad-601 software that acquires and records the values provided by the gradiometer loggers as well as the NMEA stream from the GPS receiver. The operator pushes or pulls the cart platform in straight traverses using the baselines for heading references. The software records a GPS position every second with approximately 8 sensor readings

between each timestamp. The cart logs readings at intervals of 0.13m with a traverse interval of 1m. The instrument sensitivity was set at 0.1nT.

The collected data was downloaded during a mid-day interval and at the end of the shift to monitor quality and the progression of the survey.

2.3.6 Data processing

The downloaded data was imported into MultiGrad601 to process the data files recorded by the MLGrad-601 software. The system geometry was revised, and the results exported as a suitable .XYZ file for importation into Terrasurveyor v.3.0.33.10 software and supplied to GAT by Karta Geo Ltd. for further processing, interpretation and presentation.

During processing, the numeric data are converted to a greyscale plot where data values are represented by modulation of the intensity of a greyscale within a geo-referenced rectangular area corresponding to the data collection point. This produces a plan view of the survey and allows subtle changes in the data to be displayed. X-Y trace plots of the collected data are also used to aid interpretation.

When raw data is presented in greyscale format all but the extreme high or low readings are rendered in the central range of the greyscale and therefore not visible against the background. The data is minimally processed by clipping as archaeological features tend to produce readings within the +/-15nt range.

Corrections may also be made to the data to compensate for instrument drift and other data collection inconsistencies. These corrections may include: These corrections may include:

- de-striping using *zero mean traverse* which sets the background mean of each traverse within each grid to zero, removing striping effects and edge discontinuities;
- de-staggering in order to correct for slight differences in the speed of walking on forward and reverse traverses;
- de-spiking to remove high or low readings caused by stray pieces of iron, fences, etc. in order to reduce background magnetic noise;
- the application of a high pass filter to remove low frequency, large scale spatial detail for example a slowly changing geological background;

- the application of a low pass filter to remove high frequency, small scale spatial detail in order to smooth data or to enhance larger weak anomalies; and

- interpolation to produce a smoothed grayscale plot with more but smaller pixels in order to aid clarity.

2.3.7 Presentation of results and interpretation

The results of the survey are presented as a minimally processed greyscale plot (raw data clipped to +/- 15 SD) and a processed greyscale plot if further processing or enhancement has been performed. X-Y trace plots of the collected data may also be included if they are necessary to support the interpretation of specific anomalies visible on the greyscale plots.

Magnetic anomalies are identified, interpreted and plotted onto an interpretative plot with reference numbers linking the anomalies to descriptions in the written report. When interpreting the results, several factors are taken into consideration, including the shape, scale and intensity of the anomaly and the local conditions at the site (geology, pedology, topography, etc.). Anomalies are categorised by their potential origin. Where responses can be related to other existing evidence, the anomalies will be given specific categories, such as Abbey Wall or Roman Road. Where the interpretation is based largely on the geophysical data, levels of confidence are implied, for example: *Probable*, or *Possible* Archaeology. The former is used for a confident interpretation, based on anomaly definition and/or other corroborative data such as cropmarks. Poor anomaly definition, a lack of clear patterns to the responses and an absence of other supporting data reduces confidence, hence the classification *Possible*.

2.3.8 Interpretation categories

In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, Roman Fort, Wall, etc.) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

Definition	**Description**
Archaeology / Probable Archaeology	This term is used when the form, nature and pattern of the responses are clearly or very probably archaeological and/or if corroborative evidence is available. These anomalies, whilst considered anthropogenic, could be of any age.
Possible Archaeology	These anomalies exhibit either weak signal strength and/or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
Industrial / Burnt-Fired	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metalworking areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
Former Field Boundary (probable and possible)	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions. Possible denotes less confidence where the anomaly may not be shown on historic mapping but nevertheless the anomaly displays all the characteristics of a field boundary.

Definition	Description
Ridge and Furrow	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases, the response may be the result of more recent agricultural activity
Agriculture (ploughing)	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.
Land Drain	Weakly magnetic linear anomalies, quite often appearing in series forming parallel and herringbone patterns. Smaller drains may lead and empty into larger diameter pipes, which in turn usually lead to local streams and ponds. These are indicative of clay fired land drains.
Natural	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions.
Magnetic Disturbance	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present.
Service	Magnetically strong anomalies, usually forming linear features are indicative of ferrous pipes/cables. Sometimes other materials (e.g. PVC) or the fill of the trench can cause weaker magnetic responses which can be identified from their uniform linearity.
Ferrous	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above-ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.

Definition	Description
Uncertain Origin	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning give little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of Possible Archaeology / Natural or (in the case of linear responses) Possible Archaeology / Agriculture; occasionally they are simply of an unusual form.

Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: low and poorly defined).

2.4 Gazetteer

A gazetteer has been compiled for all existing and newly identified sites within the local area, based on information sourced from the desk based assessment and geophysical survey; the gazetteer (para. 3.4) has been prepared in the following format:

Feature Number	
Site name	
PRN number	
Grid reference	
Period	
Site type	
Assessment category	
Description	
Impact	
Recommendation for further assessment/evaluation	
Recommendation for mitigatory measures	

The following categories have been used to define the assessment category of the archaeological asset:

Category A - Sites of National Importance.

Scheduled Monuments, Listed Buildings of grade II* and above, as well as those that would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both. Sites that are scheduled or listed have legal protection, and it is recommended that all Category A sites remain preserved and protected *in situ*.

Category B - Sites of regional or county importance.

Grade II listed buildings and sites which would not fulfil the criteria for scheduling or listing, but which are nevertheless of particular importance within the region. Preservation *in situ* is the preferred option for Category B sites, but if damage or destruction cannot be avoided, appropriate detailed recording might be an acceptable alternative.

Category C - Sites of district or local importance.

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened. Category C sites nevertheless merit adequate recording in advance of damage or destruction.

Category D - Minor and damaged sites.

Sites that are of minor importance or are so badly damaged that too little remains to justify their inclusion in a higher category. For Category D sites, rapid recording, either in advance of or during destruction, should be sufficient.

Category E - Sites needing further investigation.

Sites, the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A - D are temporarily placed in this category, with specific recommendations for further evaluation.

The impact of the proposed works on any asset has been identified using the following impact criteria:

None:

There is no construction impact on this asset.

Slight:

This has generally been used where the impact is marginal and would not by the nature of the site cause irreversible damage to the remainder of the asset, *e.g.* part of a trackway or field bank.

Unlikely:

This category indicates sites that fall within the band of interest but are unlikely to be directly affected. This includes sites such as standing and occupied buildings at the margins of the band of interest.

Likely:

Sites towards the edges of the study area, which may not be directly affected, but are likely to be damaged in some way by the construction activity.

Significant:

The partial removal of an asset affecting its overall integrity. Assets falling into this category may be linear features such as roads or tramways where the removal of part of the feature could make overall interpretation problematic.

Considerable:

The total removal of an asset or its partial removal which would effectively destroy the remainder of the site.

Unknown:

This is used when the location of the asset is unknown, but thought to be in the vicinity of the proposed works.

2.5 Archive and Dissemination

A full archive including plans, photographs, written material and any other material resulting from the project has been prepared and the following dissemination has been applied:

- A digital report has been prepared for *Ymgynghoriaeth Gwynedd Consultancy* and Gwynedd Archaeological Planning Service;

- A paper report plus a digital report has been prepared for the regional Historic Environment Record, Gwynedd Archaeological Trust along with relevant digital datasets, including a bilingual event summary, in accordance with *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1); and

- A digital report and archive data has been prepared for submission to the *Royal Commission on the Ancient and Historical Monuments of Wales*, in accordance with the *RCAHMW Guidelines for Digital Archives Version 1*. Digital information will include the photographic archive and associated metadata.

3 RESULTS

3.1 Desk Based Assessment

3.1.1 Location and Geological Summary

The survey area is a single field on the southwestern side of the town of Bala; 20th Century housing surrounds the field to the northeast and southwest whilst 20th century buildings that front onto the A494 road bound it to its southeast.

The study area is located on the northwestern edge of the floodplain of Llyn Tegid. Its highest point is at its northwestern end which sits at 179m AOD. The field slopes to the southeast to a height of 165m AOD at its southeastern end. A narrow manmade watercourse runs downslope along the southwestern boundary. The field is generally alternating between pasture and arable.

Llyn Tegid is Wales' largest natural lake and the town of Bala is within its immediate catchment. It lies at the northeast end of the Bala cleft, a major geological fault cutting northeast to southwest across North Wales. The infant Dee is swelled by the rivers Lliw and Twrch at Llanwchllyn in the southwest and then flows into the 5.5km long lake, before becoming a sizeable river at Bala. The 1km wide, flat valley floor is at 160m above OD, while the surrounding sides rise fairly steeply to between 250m and 500m above OD, where there is a series of rounded hills, ridges and upland plateaux forming the foothills of the Arenig and Berwyn Mountains on either side. The valley provides a natural route corridor across North Wales and its strategic importance in the past explains the succession and concentration of defensive sites and settlements located in the area.

Many of the upland areas are the result of volcanic action of the Aran Volcanic Group and the Rhobell Volcanic Complex in the Ordovician period. The Aran Volcanic Group comprises several mountains which are the highest, most rugged and impressive of the area, these include the Aran Ridge and Arenig Fawr (Smith and George 1961, 35-40).

It is though that Bala Lake previously flowed west into Cardigan Bay, whereas, now the River Dee flows northeast eventually into the Irish Sea. The lake was much larger than it is now and was previously probably constrained by glacial moraine until erosion allowed the lake to reduce in water level and size. The northern end of the lake extended significantly further than now - including the area now occupied by Bala town and to Bodweni (northeast of Bala). The south end of the lake also extended much further, probably to Llanuwchllyn.

Soils consist of free draining brown earths, together with soils of impeded drainage in the lower ground. The higher ground to the north has acidic soils, predominantly with organic surfaces and include peaty podsols and gleys (Hughes 1993, 356; Hughes *et al.* 1979). These are classified as typical Brown Alluvial Soils of the Teme Association (Soil Survey of England and Wales 1980). Freely draining acid loamy soils are present over rock to the northwest, freely draining floodplain soils to the centre and southeast (Soilscapes, 2020).

3.1.2 Statutory and Non-Statutory Designations

There are no known archaeological assets within the proposed development area; within the immediate area, the following assets have been identified.

- Primary Reference Number (PRN) 3210: a post-medieval well is located 70m to the southwest at NGR SH92153583; the well is located in a sunken rectangular stone enclosure, with six steps in one corner.

- The nearest Scheduled Monument is Tomen y Bala (Me016, PRN 3202; SH92803609), located 560m to the northeast of the study area; there are no Scheduled Monuments within the development area.

- There are 50 listed buildings within the town of Bala, of these 9 are listed Grade II* and the remaining 41 Grade II; these are listed in Appendix II and shown of Figure 01. There are no listed buildings within the development area.

- There are 62 features and buildings within 500m of the study area recorded on the Gwynedd HER. These are listed in Appendix II and shown of Figure 01.

The proposed development site is within the *Bala and Bala Lakesides Registered Landscape of Special Historic Interest*, which is described as being '*centred on Bala Lake and its immediate catchment, where there is a succession and concentration of defensive sites and settlements from the Roman and medieval periods. The area includes: a large crop-mark complex of hidden prehistoric funerary and ritual sites, Roman military enclosures and medieval settlement and fields; a Roman auxiliary fort; evidence of Early Christian activity; medieval defensive structures and settlements, including a planned borough at Bala which became one of the foremost centres of Nonconformist religion in Wales during the 19th century; several important historic cultural, religious and political associations'* (Cadw/ICOMOS 2001, 68-73).

3.1.3 Environmental Remains and Soil Morphology

The likelihood of the presence of environmental remains of archaeological significance is currently unknown. However, a watercourse runs through the southwestern edge of the study area, and it is possible that this is related to improving drainage, so waterlogged deposits may be present, but the potential for this is thought likely to be low. The soil morphology is also currently unknown, but it is likely that the topsoil is quite deep on the flatter, southeastern half of the field, as a result of likely colluvial slippage from the higher ground to the northwest, and shallower on the higher ground, where shallow exposed bedrock may also be encountered. The agricultural improvements that have taken place are also likely to have resulted in a build-up of soils on the lower ground, so buried soils of potential archaeological significance may be encountered, along with earlier archaeological remains.

3.1.4 Historical and Archaeological Background

3.1.4.1 Introduction

The HER PRN entry for Bala township (PRN 9885) describes Bala as astride the main road to Dolgellau, on the floodplain close to the confluence of the Dee and Tryweryn at the north end of Llyn Tegid, Wales' largest natural lake. There is little known prehistoric archaeology, but Roman archaeology is noted in the vicinity of the town. Bala is considered to be the 'best example of a planned English borough in Meirionnydd' (Cadw/ICOMOS 2001, 70), founded by Edward II and given its formal grant of privileges in 1324. After suffering a decline in the later medieval period, the town expanded in the 18th century due to development of a hosiery industry, and the rise of Bala as an important centre for Nonconformist religion in the 19th century was very significant.

The study area is situated at the southwest corner of the former medieval town, just beyond the known extent of medieval settlement, but likely to be closely related to it, with Ffynnon Beuno, a well with possible origins in the medieval period, located to the southwest.

3.1.4.2 Prehistoric and Roman Settlement

There is little in the way of evidence for prehistoric archaeology close to the study area. However a significant complex of Roman enclosures have been identified in the immediate vicinity of Bala, at Llanfor, by aerial reconnaissance, whilst the Roman road from Chester to Caer Gai and Brithdir likely passed through the area (PRN 17760-8). At Llanfor (PRN 3211; SM Me092; SH937361) appeared to be a fort, containing a granary and barrack blocks, a stores compound with a second granary or storehouse, and a third enclosure, possibly the earliest. Subsequent geophysical survey revealed further details of the complex, along with a number of earlier Bronze Age burial and ritual sites, suggesting that the lack of knowledge of prehistoric sites in the area may be due to a lack of evidence rather than any real absence.

The Roman road from Chester must have passed through the area of modern Bala, close to the Roman complex at Llanfor, before running along the northwest side of the lake to the Roman garrison at Caer Gai. These Roman works form part of the consolidation of the area by the Romans.

3.1.4.3 Medieval and later Settlement

Llanfor continued to be of importance in the years following the Roman occupation, indicated by the early foundation of the church, indicated by its 6th century inscribed stone (PRN3204; SH93833670), and an unusual earthwork north of the church (PRN 3201; SH93823684), that may possibly represent the centre of an early lordship in the area (Cadw/ICOMOS 2001, 70; Davidson and Gwyn 2008, 5). In the medieval period the local power base was at Castell Carndochan (PRN4977; SM Me049; SH84703065) to the southwest, which has been dated to the mid-13th century, and described as ‘an important citadel of the lords of Penllyn’ (*ibid.*). It occupies a strong, commanding position on a high spur overlooking the entrance to the Lliw valley, but was increasingly eclipsed by the borough of Y Bala through the medieval period.

During the medieval period, Bala (PRN 70116) is thought to have been the maerdref of the commote of Uwch Tryweryn in the cantref of Penllyn; two, presumably Norman, mottes stand close by: Tomen y Bala at the north end of the later borough of Bala (PRN 3202; Me016, SH92803609), and Castell Gronw on the River Dee (PRN3203; SM Me067; SH9303503) at the point where it leaves the lake, this latter being destroyed in 1202 by Llywelyn ab Iorwerth. In the Extent of Merioneth of 1285 a charge of 5 shillings was made upon the commote for the ‘sustention of the houses of Bala’, houses which are again referred to in 1289 when

Robert de Slaundon was paid 'the sum of £20 which he expended in rebuilding the houses of Aber and Bala which had been unfortunately destroyed by fire (Johnstone and Reilly 1995, 22). The town remained in the medieval parish of Llanycil until the 19th century (Haslam *et al.* 2009, 545). The medieval church at Llanycil is located on the old road to Dollgellau on the banks of Llyn Tregid to the west of the town, and its large graveyard served the townsfolk of Bala from the times of the Maerdref until the 19th century.

In about 1310 a small town was founded by Roger Mortimer in an attempt to bring stability to the area and so that the town could serve as an administrative centre for the district; the borough was laid out with 53 burgage plots (Soulsby 1983, 74). The plots were laid out along one principal street, with two back lanes running parallel to it, now represented by Arenig and Plasey/Mount Streets. In 1315 the men of Penllyn petitioned that they were being forced to work on the maintenance of the houses and pay five shillings which they previously paid in lieu of their obligation to maintain the buildings of the commote (Johnstone and Reilly 1995, 22). The markets and fairs previously held at Llanfor were transferred to Bala in 1324, when it received its formal grants and priviliges (Soulsby 1983, 74).The town was never walled, however an earthen bank may have been thrown up at this time. Subsequent development, however, has destroyed most of the original plots and any enclosing bank present. By the time of Henry V the town had a barracks, a mill and a courthouse (Davidson and Gwyn 20089, 6).

A feature of the medieval town was the small chapel which stood near the town cross in High Street; there was no church at Bala until the building of Christ Church in 1811, but the chapel may have been contemporary with the foundation of the borough and continued to serve the community until the early 18th century when it was demolished and he site and associated graveyard developed.

The absence of any maintained castle means that the town does not figure in the Glyndwr revolt, although a small garrison place consisting of six timber houses was temporarily established. Limited archaeological work has been carried out at the location of the motte or the town of Bala itself. In the early 1990's, archaeologists conducting a watching brief at the site of the old gas works, immediately to the southwest of Tomen-y-Bala, identified what they believed to be part of the ditch around the base of the motte (Johnstone and Riley 1995, 23). Gwynedd Archaeological Trust also undertook a watching brief during the repair and maintenance of a partially collapsed stone retaining wall at the base of the motte (Smith & Ryan Young, 2016). The ground immediately behind the retaining wall revealed no evidence

of being part of the original motte construction and was most likely re-deposited material dating to the wall building phase.

By the 16th century, the town was described by Leyland as a ‘poor little market’, but the Hearth Tax returns of 1662, and patrician sponsorship evidenced through the families of the Lloyds of Rhiwaedog, Williams-Wynn of Wynnstay and the Annwyls indicate that some prosperity was retained. Following the decline of the town from the later Middle Ages, the town retained some administrative status into post-medieval times, and also some renewed commercial activity from the 18th century onwards, including a hosiery industry the development of which led to the rebuilding of much of the town. This declined however during the 19th century due to competition from the English midlands. However during the 19th century Bala developed into an important and flourishing centre of Nonconformist religious movements in Wales, particularly during the ministry of Thomas Charles, the famous Welsh Methodist leader. In 1837 the Methodists established a college in the town, followed by a Congregationalist college in 1842. Influential men from the town connected with these colleges were influential worldwide, such as the liberal politician T.E. Ellis and Michael D. Jones, a protagonist for the Welsh colony in Patagonia. They are commemorated, amongst others, with several monuments in the town.

3.1.4.4 Cartographic Evidence and History of Land Ownership

By the time of the tithe map of 1842 the centre of the town can be seen to have become built up again and it had become the market centre of Penllyn again, although there is still only one street of any size (Figure 03). The Red Lion Inn is present and is shown as an 'L' shaped structure within a yard on the southwestern edge of the town. The study area is located in field 65 to the north of the Red Lion, known as *Cae Twdor Ucha* and is part of the same wider property holding. The details from the tithe apportionment of the study area and adjacent areas are shown below:

Landowners	**Occupiers**	**Number Referring to the Plan**	**Name and Description of Land and Premises**	**State of Cultivation**	**Quantities in Statute Measure** **A R P**
Rice, Anwyl Esq.	Thomas Jones	63a	Red Lion House and Yard	Buildings &c	0 3 19
		64	Cae Twdor Isa	Arable	5 2 12
		65	Cae Twdor Ucha	Arable	8 2 25

This table shows that the landowner of the Red Lion and the study area was the Rice family of Rhiwlas, a major family with a substantial estate in the area. The archives for this estate are held at the Bangor University archives and these will be examined when this becomes possible, as they may contain further map and plan evidence, although the cartographic evidence in this collection is not thought to be extensive.

An examination of later historic mapping, including the Ordnance Survey 6-inch and 25-inch to 1-mile County Series Map Sheet of the areas dating from 1888 to 1920 (Figures 04-05), shows the proposed development area as an open field, similar to present day, with boundaries in the same locations, except that the High Street frontage has not been built up by this time. The differences with the present time therefore include further modern development along the Pensarn Road/High Street to the south, as well as development to the west, east and northeast. A footpath is shown on the 1901 edition map running along the eastern boundary of the field, which is still present.

3.1.4.5 Previous Historical and Archaeological work

No previous archaeological work is known to have been carried out on the study area itself. However a significant amount of general work has been carried out on the town of Bala itself that is relevant to the study area as it lies on the edge of the former medieval planned town, although no comprehensive history has been written. The pre-conquest history in relation to the Welsh Princes' Llys and Maerdref at Bala is discussed by Johnstone and Reilly (1995). An urban characterisation was carried out by Gwynedd Archaeological Trust (Davidson and Longley 2008), which discusses the character and development of the town. The medieval town is discussed by Soulsby (1983) and Smith (2001). The wider landscape is also discussed in Cadw/ICOMOS' *Landscapes of Historic Interest in Wales Part 2.2: landscapes of Special Historic Interest*, 69-73 (2001).

An archaeological watching brief has been carried out on the medieval motte at Bala, which identified evidence of post-medieval activity (Smith S. & Ryan Young C., 2016). Close to the motte, an archaeological watching brief was carried out on the former gas works site on Mount Street (Reynish, 2015), although this only identified evidence relating to the gas works itself. A small watching brief at Gwynle close to the motte failed to identify any archaeological remains (Evans, R., & Roberts, J., 2018).

3.1.5 Artefact potential

The study area has undergone significant agricultural improvement so the likelihood of the presence of post-medieval and modern artefacts brought in the manuring and soil improvement is considered to be moderate to high. As the field is located immediately to the southwest of the medieval town, there is also a moderate potential for the presence of medieval artefacts, as the field is likely to have been associated with the town even if there was no medieval development upon it. The likelihood of the presence of prehistoric and Roman artefacts is unknown, but is considered to be low to moderate. Given the presence of Roman roads and activity in the wider area, it is more likely that Roman artefacts will be encountered than prehistoric.

3.1.6 Aerial Photographs and LiDAR

3.1.6.1 Aerial Photographs

Three historic aerial photographs of the land to the rear of Red Lion Farm, Bala were examined dating from the 1940s through to the 1990s. These are listed below:

- RAF M3044 S.731 H17 140 taken 6th January 1941 (Figure 06)
- RAF 106GUK_1468 Frame 2472 taken on 14th August 1945
- ADAS 452 frame 157 taken 2nd May 1990

The 1940s aerial images show the study area much as it is now, but the surrounding area consists still of pastoral fields, generally small paddocked enclosures, with none of the development either to southwest, northeast, northwest or much of the development along the High Street having taken place. Red Lion Farm can be seen in its format as a farm, and the area along the street frontage that now contains both the Police and Ambulance stations formed part of the field under study. An intriguing curved boundary to the north, and slight indications to the east (shown on Figure 06 in green), may indicate the boundary of the former extent of the burgage plots of the medieval town. This remains however a highly speculative suggestion, and may be discounted as a result of the evidence from the geophysical survey. The 1990 aerial photograph shows this boundary, and a possible parch mark on the northeast side of the road, despite the fact that a good proportion of the surrounding development had taken place by this time.

3.1.6.2 LiDAR

Lidar Composite 1m DTM data taken from the Welsh Government *LIe Portal* was obtained (Figure 07). This showed little additional information within the study area that had not been recorded by other sources, the possible presence of a boundary bank on the line of the possible extent of the town was noted, but this is extremely ephemeral and may not be a correct interpretation.

3.1.7 Walkover Survey

The walkover survey was carried out on 29th July 2020 in dry conditions, which were good for carrying out the survey work.

The study area consists of a field of improved grassland, with a narrow grassland frontage on to the street, 14m wide and bounded by a dry stone wall to the southeast against the High Street (Plate 01). Immediately northeast of this is the former Red Lion Inn and farm, now converted into holiday accommodation but still retaining some original features of probable 18th century date (Plate 02). This access grassland opens out at the point of the rear property boundaries of the adjacent propertied into an 'arrow-shaped' field, orientated northwest-southeast from the High Street (Plate 03).

Approximately the southeast half of the field is low-lying and fairly level, suggesting that this forms part of the base of the valley in which Bala is situated. The northwest half of the field slopes moderately from northwest to southeast, with the highest point at the top northwest corner of the field. A public foot path, with a narrow macadamised surface and post and wire fence bounds the field on the north and northeast sides, with the mixed hedges at the rear of the properties beyond the path (Plate 04). This footpath is of some antiquity, as it is shown on the Ordnance Survey 6 inch County Series 2nd edition map of 1901.

A watercourse, cut into a channel 1.3m below the field ground surface, runs along part of the southwest side of the field, before following a line on the housing side of the field boundary wall (Plate 05). This is clearly a managed watercourse in a cut channel, presumably dug as part of a water management scheme to reduce flood risk. The field boundary on the southwest side of the field is a mixture of walling and fencing for about the northern half of its length, reflecting the rear boundaries of the properties on the adjacent housing estate. South of this a fence and rough hedgerow predominates (Plate 06), which includes some mature trees such as oak. This suggests that elements of this section of boundary, which is shown on the 19th century Ordnance Survey maps (Figures 04-05), may survive from at least that date. However the hedgerow has been modified in places as it forms rear property boundaries along much of its length. The boundaries along the southeast side of the field are a mixture of hedgerows and fencing, to both public and private buildings. Mature beech trees survive to the rear of the Police Station.

An electricity sub-station (Feature 02) is located in the southeast corner of the field, of brick construction with entrance doors on the southeastern side (Plate 07). Close to this, and

running on an east-southeast west-northwest alignment was an 11kV overhead cable route (Plate 08).

The field is surrounded by housing on all sides; to the northeast this appears to be generally mid-20th century public housing and fairly densely packed, and to the southwest later 20th and 21st century housing.

No evidence of archaeology was noted on the flat part of the field; however a linear depression running southwest-northeast across the lower part of the field is possible evidence for a modern service pipe or cable trench running across the field (Plate 09; Feature 01). A manhole cover was also noted in the field at the rear of the former Red Lion, suggesting that services relating to the adjacent housing may be present in the field (Plate 10). On the higher part of the field it is not possible to identify any archaeological features; however the ground is undulating and probably less improved so there is a higher chance of the survival of archaeological remains. No evidence of any ridge and furrow cultivation was identified, which might be expected if the area formed part of any strip-field agriculture associated with the medieval burgesses of the town, however this may have been obscured by later agricultural improvements.

3.1.8 Geophysical Survey

3.1.8.1 Introduction

The geophysical survey has been conducted across the development area as shown on Figure 08. The results are presented as a minimally processed greyscale plot (raw data clipped to + / - 15nT; Figure 09), a processed greyscale plot (raw data de-striped and clipped to +/- 15nT; Figure 10), a second processed greyscale plot (raw data de-striped and clipped to +/- 4nT; Figure 11) and an interpretative plan (Figure 12). Specific anomalies have been given numerical labels in the text below, as well as on the interpretative plan (Figure 12).

3.1.8.2 Probable Archaeology

No definitive archaeological responses have been identified in the results.

3.1.8.3 Possible Archaeology

Four lengths of broadly north-south aligned moderate (3-9nT) positive linear ditch type anomalies have been identified in the southeastern part of the area [1]. They may be the remains of former enclosure ditches that predate the available historic mapping for the area.

3.1.8.4 Uncertain

A number of anomalies of uncertain origin have been identified in the survey area. The straight linear examples in the southeastern end of the field are possibly the remains of land drains, they are however lower magnitude and less well-defined anomalies than the land drains recorded elsewhere and may have a recent agricultural origin.

A small number of discrete moderate positive (up to 15nT) responses across the area may be the remains of pits of archaeological origin, they do not, however, form any clear pattern with surrounding anomalies and may be recent features, or possibly tree bowls or other naturally occurring depressions in the ground. The largest of this type of anomaly [2] may also be as a result of magnetic interference from the service which cuts through it, however, it lacks the high magnitude of response that would be expected if this was the case.

Two short lengths of parallel low magnitude (2-4 nT) positive linear trend [3] may be the remains of the corner of an enclosure, their poor definition suggests that they may have a more recent agricultural origin.

A broadly ‘L’ shaped negative (-2 - -5 nT) low magnitude linear area of increased response [4] in the southeastern end of the field may form the corner of a banked enclosure that runs broadly east-west before turning to the southeast. The eastern-most part also has an accompanying moderate magnitude positive trend (6 – 9 nT) that may be suggestive of an accompanying ditch. It is however very poorly defined and may be geological or pedological in origin and is therefore classified as uncertain.

Two areas of enhanced magnetic response on the higher ground at the northwest of the survey area may be of interest as the remains of a possible banked / ditched enclosure [5]. An archaeological origin cannot be completely discounted, they are not however as clearly defined as the possible archaeological anomalies in the southeast of the field [1] and may also be as a result of natural magnetic variations in the glacial till drift geology here.

A poorly defined but more or less straight linear low magnitude positive (2 – 4 nT) trend [6] appears to run parallel with the northeastern boundary of the site in the southeastern part of the field. It may represent a former field boundary ditch that marked the edge of the field, or may possibly be a hollow worn by stock in the field in more recent times.

3.1.8.5 Land drains

Several narrow low-moderate magnitude positive and negative straight linear trends have been identified, predominately on the lower-lying central and southeastern parts of the area. They are relatively regularly spaced and run parallel with each other, and are most likely modern land drains put in as part of an agricultural improvement regime on the lower-lying ground.

3.1.8.6 Services

A very high magnitude straight linear dipolar anomaly has been identified running from southwest-northeast in the northwestern half of the field. The anomaly represents a buried service of some description, either a ferrous metal pipe or cable

3.1.8.7 Ferrous / Magnetic Disturbance

High magnitude ferrous responses close to the field’s boundaries are due to adjacent metal fences, gates and buildings. An electricity substation is also located in the southeastern corner of the field.

Smaller-scale ferrous anomalies consisting of a single high magnitude positive anomaly with an associated negative response ("iron spikes") are present throughout the data and are characteristic of small pieces of ferrous debris (or brick/tile) in the topsoil; they are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretative plot.

The extreme southeastern corner of the area contains an area of high magnetic disturbance. This most likely results from a concentration of ferrous and / or thermoremanent material being dumped into the field from the buildings immediately adjacent to the southeast.

3.1.8.8 Natural

Areas of amorphous magnetic variation have been detected in the northwestern part of the site. These are typical of natural responses detected across superficial geological deposits of diamicton which are located in the northwestern part of the survey area.

3.1.8.9 Data Appraisal and Confidence Assessment

English Heritage guidelines (English Heritage, 2008, Table 4) state that magnetometer survey can be effective over metamorphic solid geology, but that magnetic response is generally poor on glacial till drift geologies and average to poor on alluvial drift deposits depending on the depth of burial of features below. Despite this, this magnetometer survey has yielded evidence of possible archaeological features, anomalies of uncertain origin and land drains. Consequently, the technique is likely to have detected any substantial archaeological features if present. It is still however possible that archaeological features remain undetected due to the nature of the local geology.

3.2 Gazetteer of features

All the features included in the gazetteer are shown on Figure 01. All recommendations are based on the current understanding of the scheme proposals and their impact on the features, and may have to be revised if information about the scheme impacts changes. In the event of alterations to the scheme, the recommendations might have to be revisited. A 'C' after the grid reference indicates the central point of a larger feature, and 'A' after the reference indicates the central point of a wider group of features.

Feature Number	1
Site name	Linear Depression across the field
PRN number	n/a
Grid reference	SH92253593 C
Period	Modern
Site type	Industrial
Assessment category	D
Description	A linear depression in the ground, running southwest-northeast across the field, approximately 1.1m wide. It appears to reflect a modern service trench. It has been identified on the geophysical survey as very high magnitude straight linear dipolar anomaly (Figures 09-12)
Impact	Considerable
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	None

Feature Number	2
Site name	Electricity Sub-Station
PRN number	n/a
Grid reference	SH92393588
Period	Modern
Site type	Industrial
Assessment category	D
Description	A brick-built electricity sub-station, with wooden doors that take up most of the southeast frontage. An associated 11kV overhead line runs WNW-ESE southwest of this substation.
Impact	Unknown
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	None

Feature Number	3
Site name	Linear ditch type geophysical anomalies
PRN number	n/a
Grid reference	SH92293589C
Period	Unknown
Site type	Linear
Assessment category	E
Description	Linear ditch type geophysical anomalies in the southeastern part of the development site (Geophysical Anomaly [1]). They may be the remains of former enclosure ditches that predate the available historic mapping for the area.
Impact	Likely
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Further to the results of the trenching

Feature Number	4
Site name	Sub-circular geophysical anomaly.
PRN number	n/a
Grid reference	SH92233592
Period	Unknown
Site type	Sub-circular
Assessment category	E
Description	Geophysical anomaly [2] that may either be the remains of pits of archaeological origin or more recent features, tree bowls or other naturally occurring depressions in the ground. The anomaly may also be may also be as a result of magnetic interference from a service trench.
Impact	Likely
Recommendation for further assessment/evaluation	None: too close to the service trench for trenching to be viable
Recommendation for mitigatory measures	Watching brief during construction groundworks

Feature Number	5
Site name	Geophysical linear anomalies
PRN number	n/a
Grid reference	SH92263587C
Period	Unknown
Site type	Linear
Assessment category	E
Description	Two short lengths of parallel geophysical linear anomalies [3] that may be the remains of the corner of an enclosure; their poor definition suggests that they may also have a more recent agricultural origin.
Impact	Likely
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Further to the results of the trenching

Feature Number	6
Site name	L-shaped geophysical anomaly
PRN number	n/a
Grid reference	SH92363585C
Period	Unknown
Site type	Linear
Assessment category	E
Description	A broadly 'L' shaped negative low magnitude linear anomaly [4] in the southeastern end of the field may form the corner of a banked enclosure that runs broadly east-west before turning to the southeast. The easter-most part also has an accompanying moderate magnitude positive trend (that may be suggestive of an accompanying ditch. It is however very poorly defined and may be geological or pedological in origin.
Impact	Unlikely (located within protected open space)
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Further to the results of the trenching

Feature Number	7
Site name	Possible banked / ditched enclosure (geophysical anomaly).
PRN number	n/a
Grid reference	SH92173594C
Period	Unknown
Site type	Linear
Assessment category	E
Description	Two areas of enhanced magnetic response on the higher ground at the northwest of the development area may be the remains of a possible banked / ditched enclosure [5]. An archaeological origin cannot be completely discounted, they are not however as clearly defined as the possible archaeological anomalies in the southeast of the field [1] and may also be as a result of natural magnetic variations in the glacial till drift geology here.
Impact	Likely
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Further to the results of the trenching

Feature Number	8
Site name	Linear geophysical anomaly
PRN number	n/a
Grid reference	SH92343590C
Period	Unknown
Site type	Linear
Assessment category	E
Description	A poorly defined but more or less straight linear geophysical anomlay [6] that appears to run parallel with the northeastern boundary of the development area in the southeastern part of the field. It may represent a former field boundary ditch that marked the edge of the field, or may possibly be a hollow worn by stock in the field in more recent times.
Impact	Likely (note: anomaly continues into protected open space)
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Further to the results of the trenching

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusion

An archaeological assessment was carried out on land to the rear of Red Lion Farm, High Street, Bala. The study area was bounded on all sides by 20th century housing development and on the High Street side by former and current public buildings such as the Police and Ambulance Stations. No prehistoric or Roman period sites were noted within the vicinity of the study area, but it was noted to lie on the southwest edge of the medieval planned town of Bala, with the post-medieval Ffynnon Beuno, which may have medieval origins (PRN 3210; SH92153583) located 70m to the southwest. In post-medieval times the Red Lion and its associated land was noted to have formed part of the local estate of the Price family of Rhiwlas. In the 20th century public buildings have been constructed along the High Street frontage adjacent to the site, and housing development surrounded the field.

No above ground archaeological features, other than modern activity associated with water courses and electricity infrastructure, both built and in the form of 11kV overhead lines, were identified. The presence of a manhole cover and a possible service trench suggests that there may in addition be buried services present in the field. No prehistoric, Roman or medieval archaeology was identified during the walkover survey. However, given the historically significant location of the site, it is thought that there is moderate potential for at least medieval archaeology to be present and obscured under the improved pastureland, making the results of the geophysical survey significant. No evidence of any arable ridge and furrow cultivation was identified, which might be expected if the study area formed part of any medieval strip-field agriculture associated with the town. This may however have been obscured by later agricultural improvements, and the subsequent use of the field for pastoral agriculture. If however the field lay within the boundaries of the medieval town, as hinted at by the curved boundary to the south shown on the aerial photographs, it is still possible that no houses were ever built in this area in medieval times, although they may have been. It is even conceivable that evidence of a former bank and ditch surrounding the medieval town could be encountered, but it is by no means certain that one existed in this location. The improved nature of the field means that any archaeological features are likely to be buried leaving no visible surface indications.

The magnetometer survey has not revealed any definite archaeological anomalies. However, anomalies of possible archaeological provenance, represented by possible enclosure ditches [1] have been identified. A number of linear trends, small discrete positive features and areas of increased magnetic response have been assigned to the category of uncertain. The straight linear trends may be as a result of modern agricultural activity or possibly land drains; the discrete anomalies may be pits or modern or naturally occurring features. Three uncertain responses [3], [4] and [5] may be the remains of enclosure banks and ditches, they may equally be geological responses or, in the case of [3], modern agricultural features. A linear trend [6] of uncertain origin maybe a former field boundary or a hollow worn by stock in the field in more recent times. A modern service pipe or cable has also been identified as have numerous examples of modern land drains. Amorphous areas magnetic variations are thought to represent localised geological variations.

4.2 Recommendations

Based on the results of the archaeological assessment and geophysical survey, it is recommended that a further programme of archaeological evaluation (trial trenching) is implemented to target specific geophysical anomalies to verify their existence and determine their character, function and date. This should include anomalies [1], [3], [4], [5] and [6]. Trial trenching in apparently archaeologically sterile areas might also be considered given the possibility of undetected archaeological features. Any further archaeological evaluation should take place prior to the commencement of any proposed construction related groundwork.

5 BIBLIOGRAPHY

5.1 Primary Sources

5.1.1 Aerial Photographs and Lidar

1. ADAS 452 frame 157 taken 2nd May 1990
2. RAF M3044 S.731 H17 140 taken 6th January 1941
3. RAF 106GUK_1468 Frame 2472 taken on 14th August 1945
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5.2 Secondary Sources

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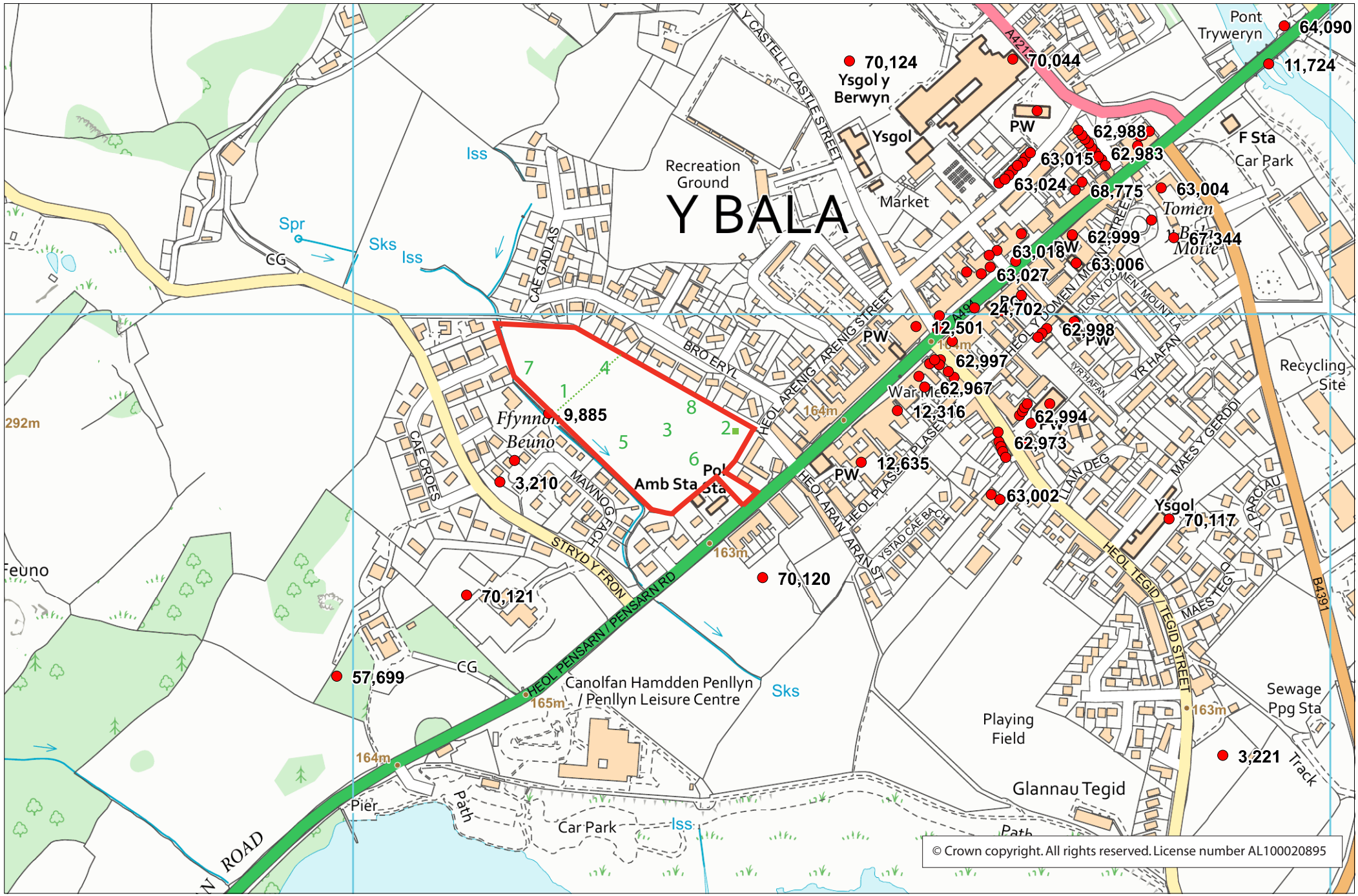


Figure 01: Site Location, outlined in red. Red dots are the sites located on the Gwynedd HER (Appendix II). Features listed in the gazetteer are shown in green and numbered. Base map taken from Ordnance Survey 1:10 000 Series sheet SH9235 Scale 1:5000@A4

Figure 02: Reproduction of the Proposed *Cadnant Planning*Development Plan for the Land to the Rear of Red Lion Farm , Bala. Not to Scale

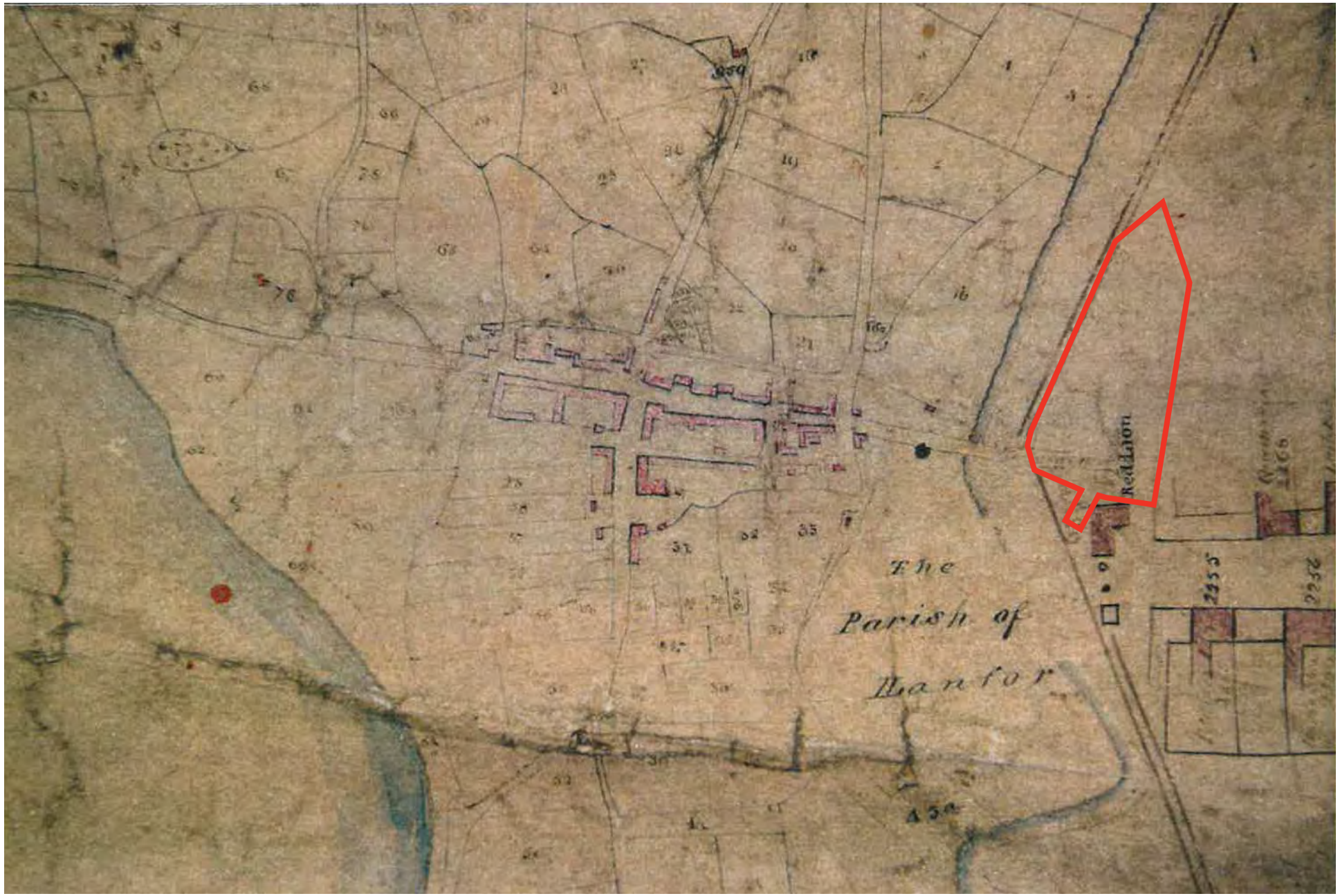


Figure 03: Tithe Map of the Parish of Bala in the Parish of Llanycil of 1838 with the approximate study area outlined in red (National Archives). Not to Scale

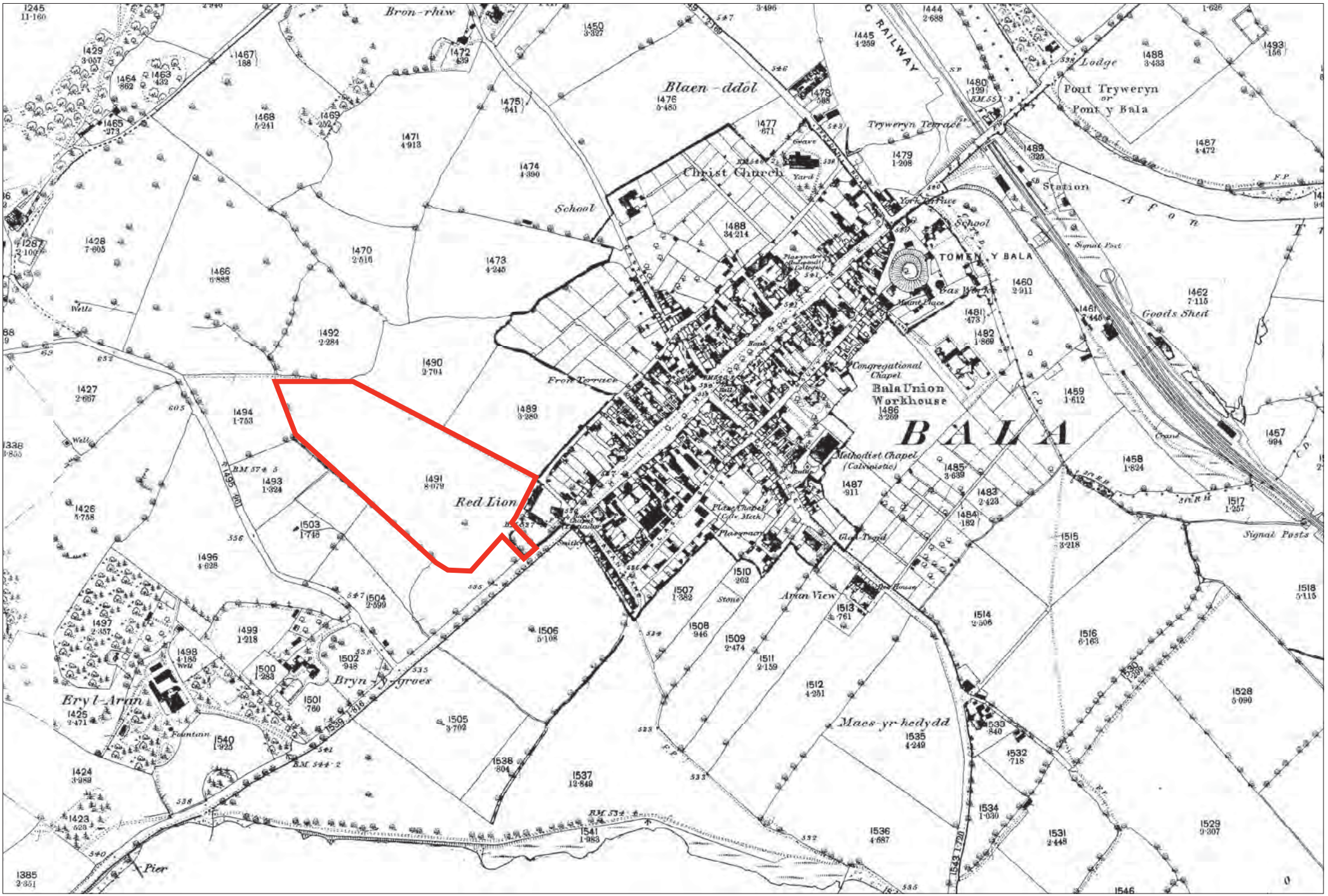


Figure 04: Ordnance Survey First Edition Merioneth County Series Map of 1888, sheet XXII.3 showing the study area outlined in red. Scale 1:5000@A4

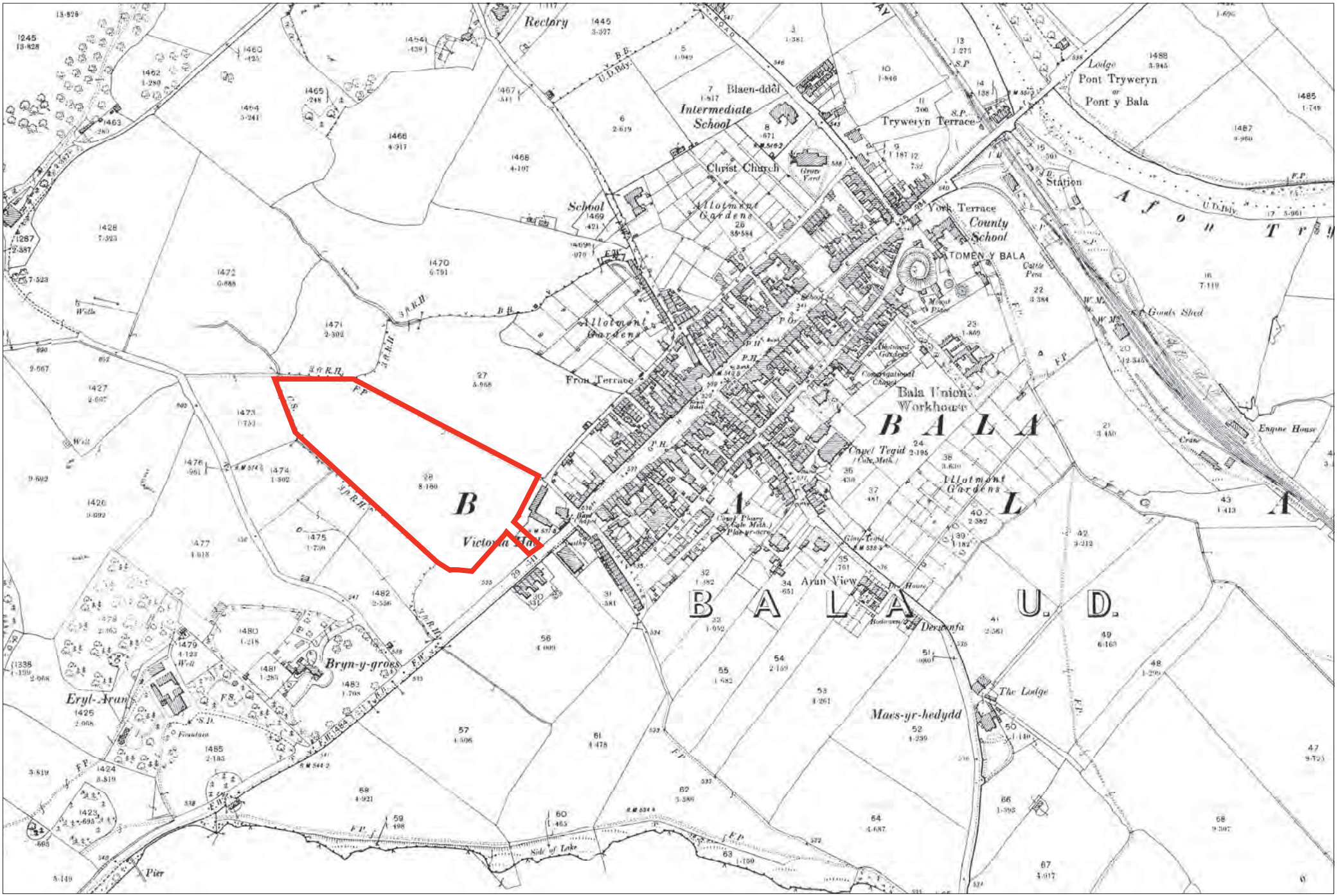


Figure 05: Ordnance Survey Third Edition Merioneth County Series Map of 1918, sheet XXII.3 showing the study area outlined in red. Scale 1:5000@A4

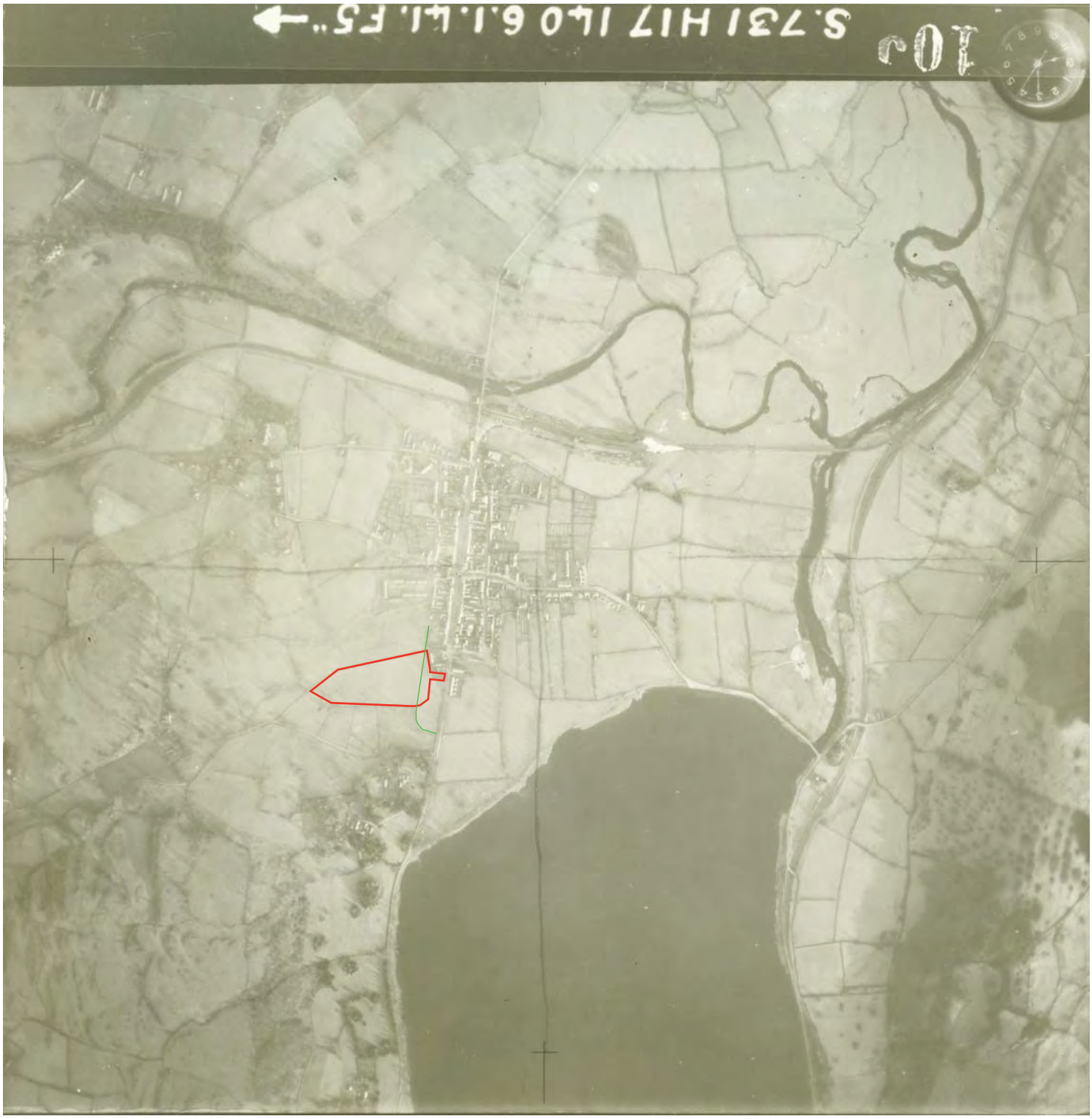


Figure 06: RAF aerial photograph M3044 S.731 H17 140 taken on 6th January 1941. The study area is outlined in red, and the possible town bounday outlined in green. Not to Scale

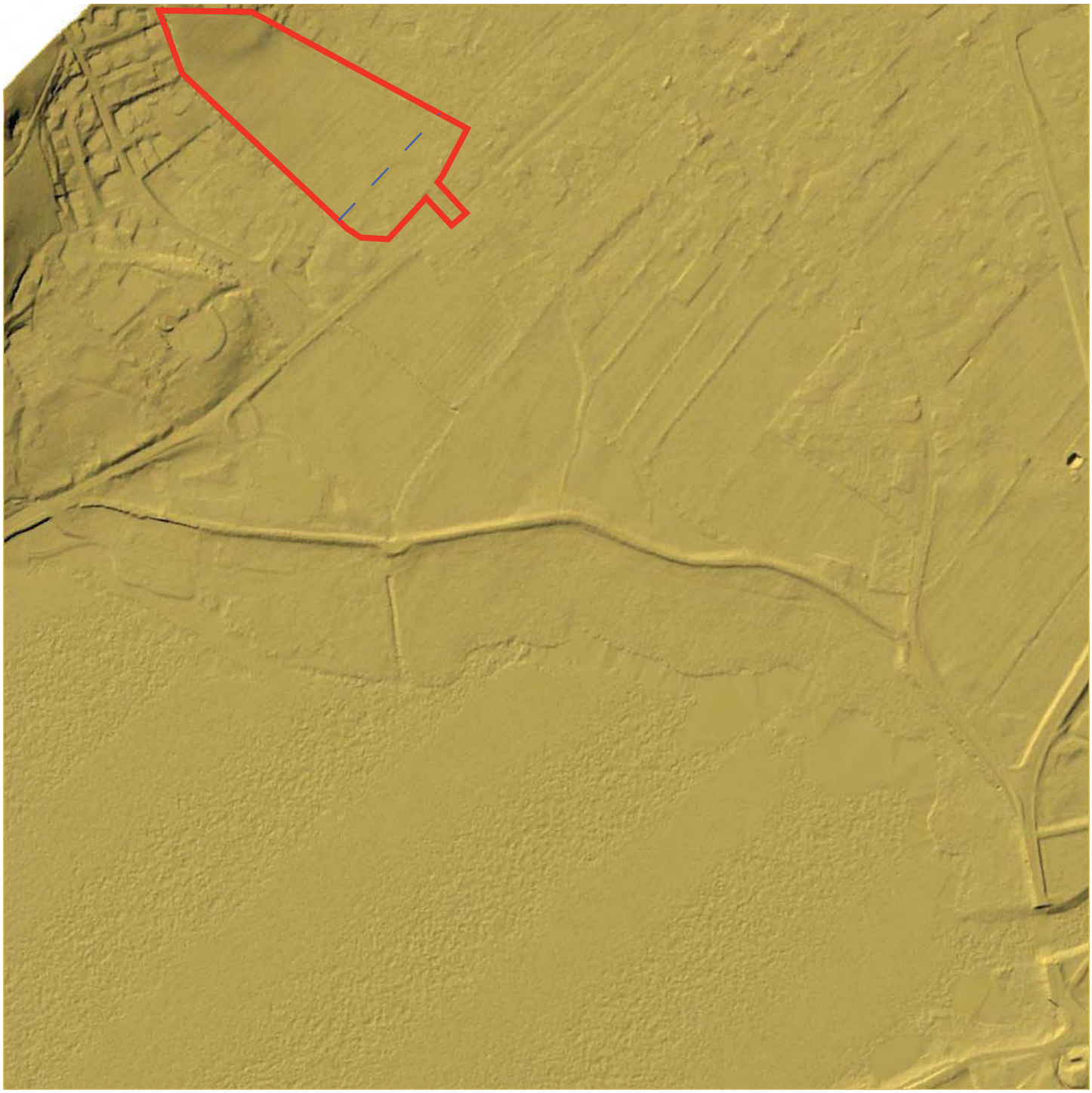
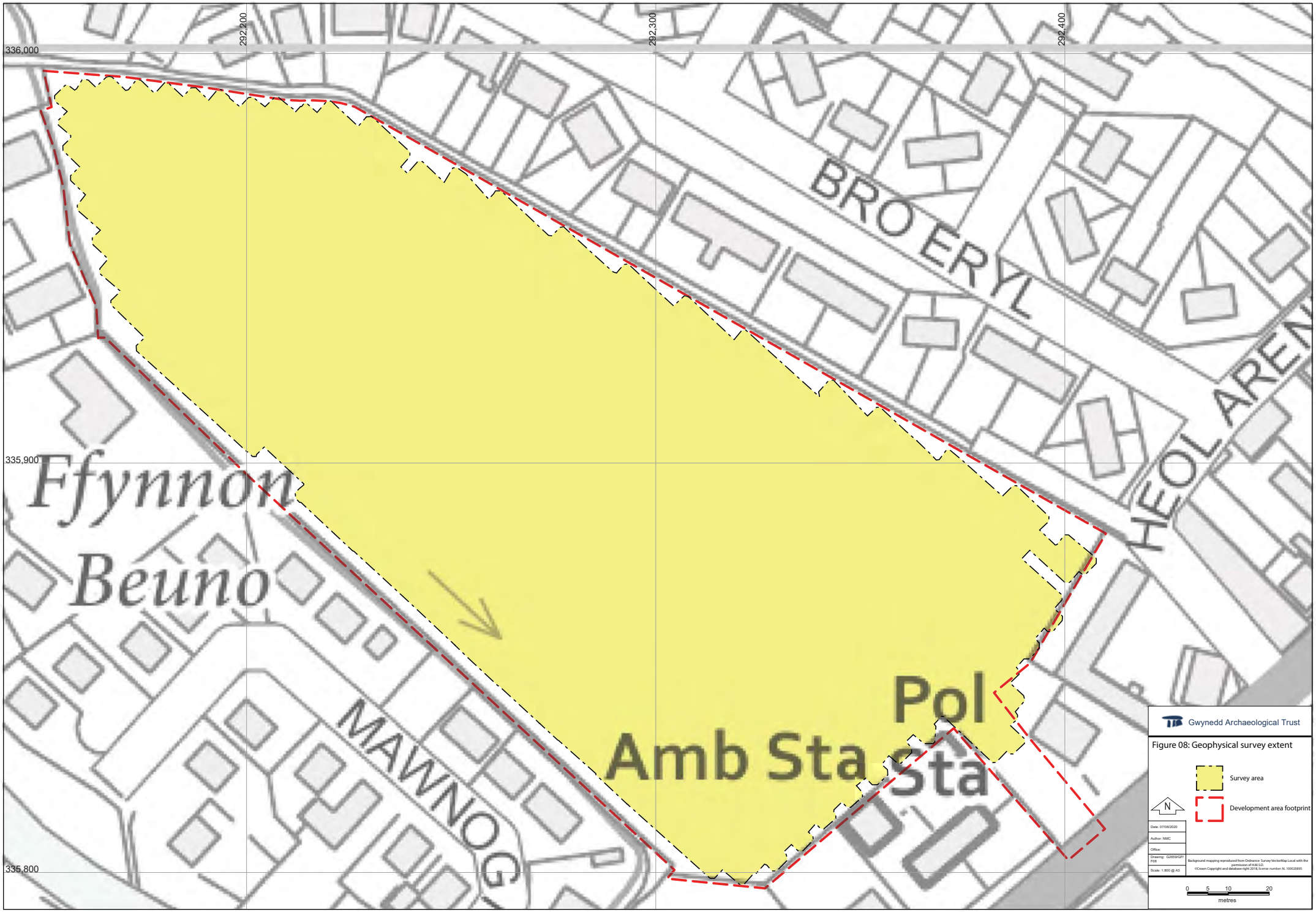


Figure 07: LiDAR 1m DTM data from the Welsh Government's Lle Portal for grid square SH9235 showing the study area outlined in red. The possible line of the former medieval town boundary is shown with a purple dashed line. Scale 1:5000@A4


336,000
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335,800
BRO ERYL
HEOL ARE
Ffynnon
Beuno
MAWNOG
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Amb Sta
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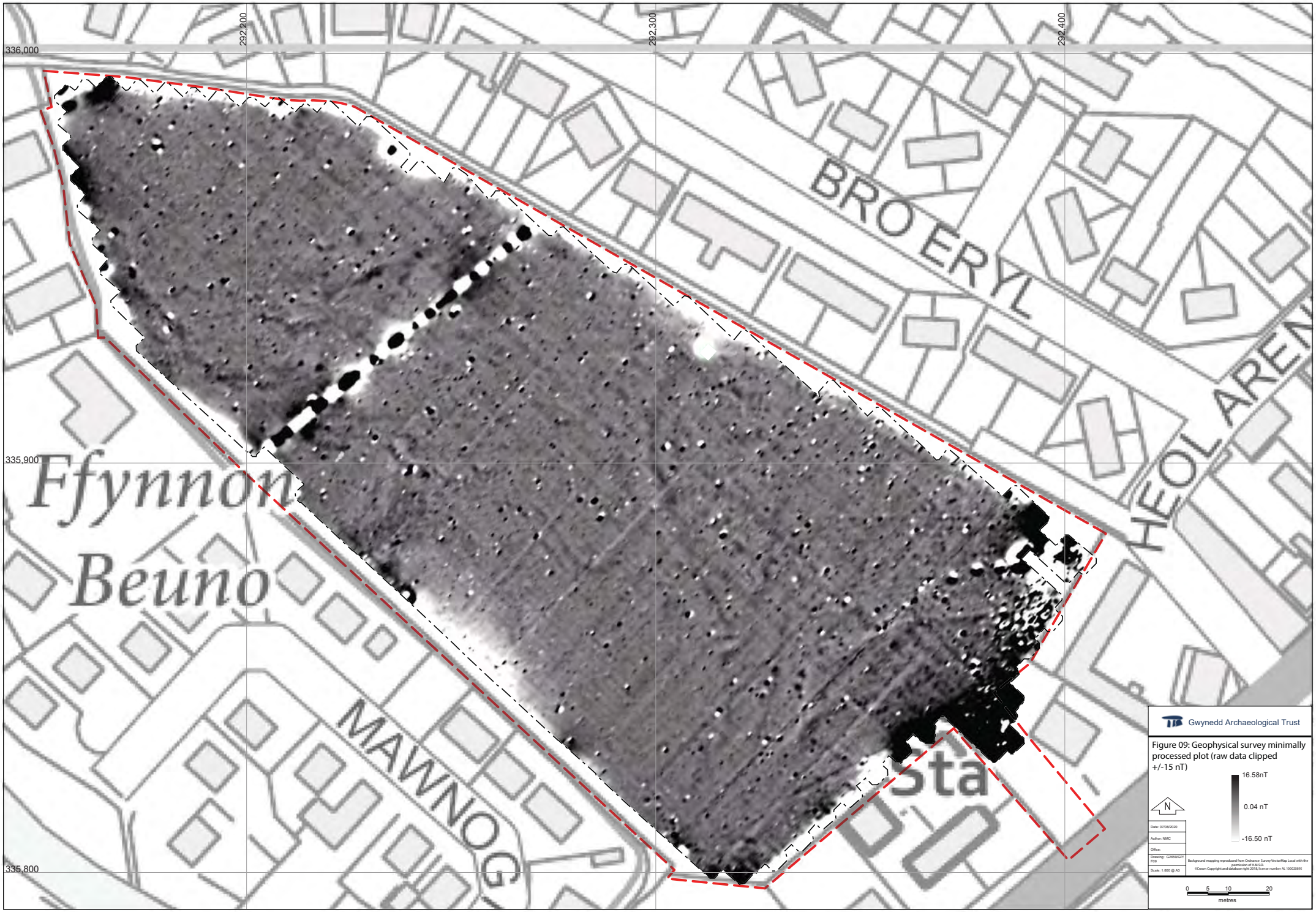
Gwynedd Archaeological Trust
Figure 08: Geophysical survey extent
Survey area
Development area footprint
N
Date: 07/08/2020
Author: NMC
Office:
Drawing: G2053/GPI
FCB
Scale: 1:800 @ A3
Background mapping reproduced from Ordnance Survey VectorMap Local with the permission of H.M.S.O.
©Crown Copyright and database right 2018, license number AL 100032895
0 5 10 20
metres



Gwynedd Archaeological Trust

Figure 09: Geophysical survey minimally processed plot (raw data clipped +/-15 nT)

16.58nT

0.04 nT

-16.50 nT

N

Date: 07/08/2020

Author: NMC

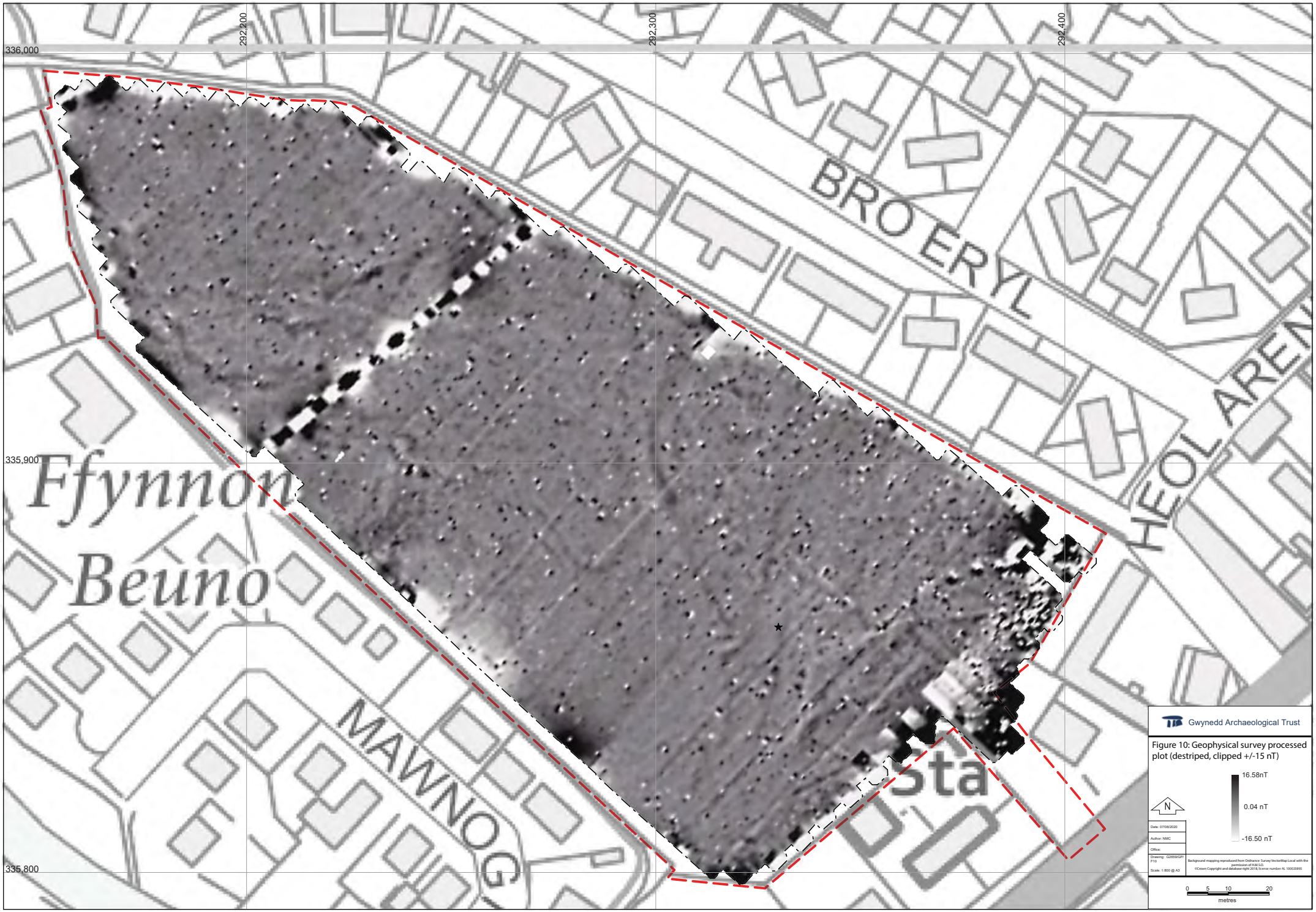
Office:

Drawing: G2053/GPI/FIG9

Scale: 1:800 @ A3

0 5 10 20

metres


336,000
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335,900
335,800
BRO ERYL
HEOL AREN
Ffynnon
Beuno
MAWNOG
Sta
Gwynedd Archaeological Trust
Figure 10: Geophysical survey processed plot (destriped, clipped +/-15 nT)
16.58nT
0.04 nT
-16.50 nT
N
Date: 07/08/2020
Author: NMC
Office:
Drawing: G2053/GPI P10
Scale: 1:800 @ A3
Background mapping reproduced from Ordnance Survey VectorMap Local with the permission of H.M.S.O.
©Crown Copyright and database right 2018, license number AL 100032695
0 5 10 20
metres


336,000
292,200
292,300
292,400
335,900
335,800
BRO ERYL
HEOL ARE
Ffynnon
Beuno
MAWNOG
Sta
Gwynedd Archaeological Trust
Figure 11: Geophysical survey processed plot (destriped, clipped +/-4 nT)
4.42nT
0.01 nT
-4.40 nT
N
Date: 07/08/2020
Author: NMC
Office:
Drawing: G2053/GPI
P11
Scale: 1:800 @ A3
Background mapping reproduced from Ordnance Survey VectorMap Local with the permission of H.M.S.O.
©Crown Copyright and database right 2018, license number AL 100032695
0 5 10 20
metres

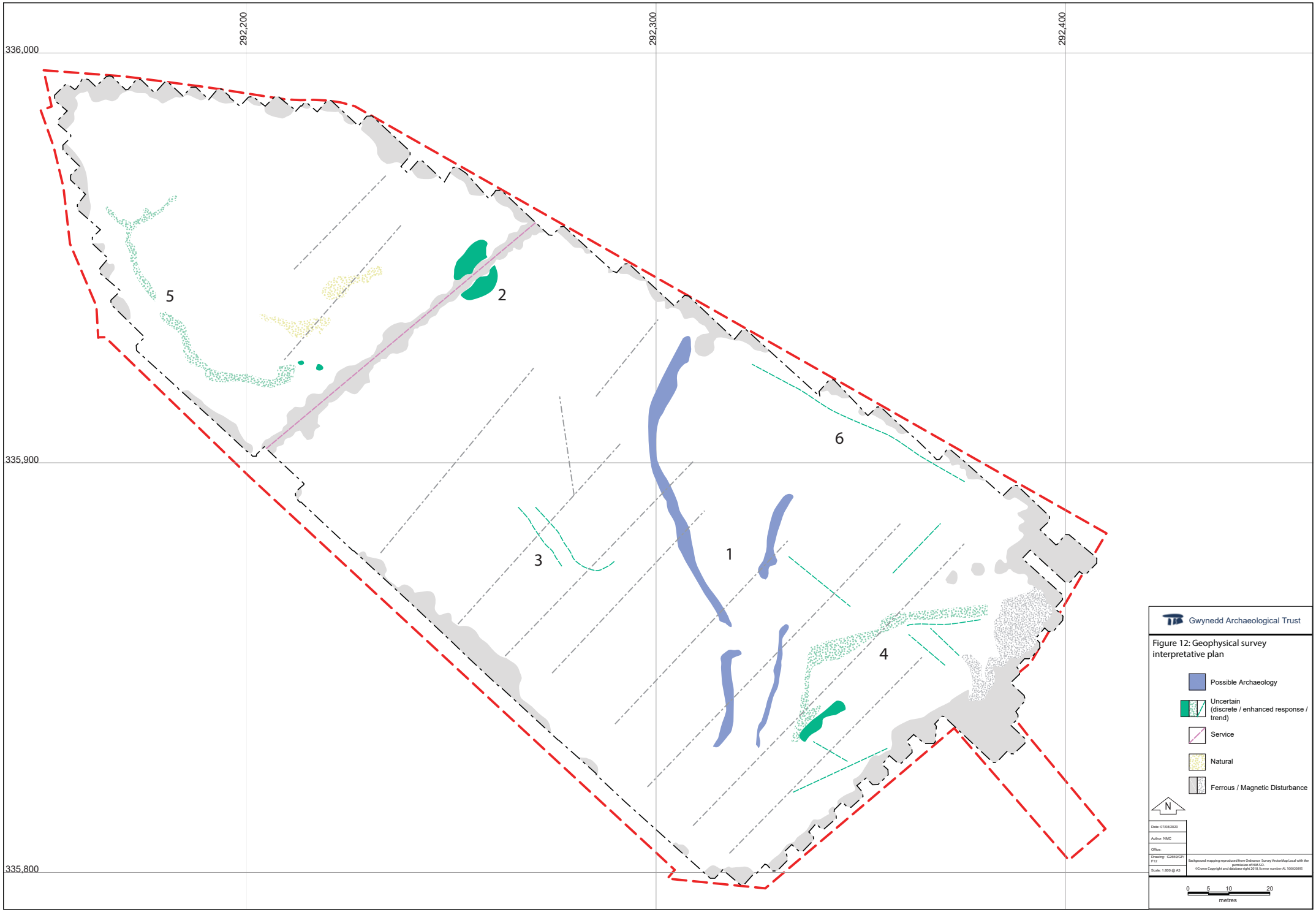
292,200
292,300
292,400
336,000
335,900
335,800
1
2
3
4
5
6
Gwynedd Archaeological Trust
Figure 12: Geophysical survey interpretative plan
Possible Archaeology
Uncertain (discrete / enhanced response / trend)
Service
Natural
Ferrous / Magnetic Disturbance
N
Date: 07/08/2020
Author: NMC
Office:
Drawing: G2053/GPI F12
Scale: 1:800 @ A3
Background mapping reproduced from Ordnance Survey VectorMap Local with the permission of H.M.S.O.
©Crown Copyright and database right 2018, license number AL 100032695
0 5 10 20
metres

Plate 1: General view of the field from the road; scale 1x1m; view from SSE (archive reference: G2659_019).

Plate 2: General view of former Red Lion buildings; scale 1x1m; view from SW (archive reference: G2659_021).

Plate 3: General view of entire field; scale not used; view from SSE (archive reference: G2659_017).

Plate 4: View of the post and wire fence boundary on the northern side of the field with adjacent footpath and mixed hedge beyond; scale 1x1m; view from W (archive reference: G2659_005).

Plate 5: View along the southwest boundary of the field showing the watercourse; scale 1x1m; view from NNW (archive reference: G2659_006).

Plate 6: View of fence and hedgeline along the southwestern boundary; scale 1x1m; view from NW (archive reference: G2659_007).

Plate 7: View of electrical substation in southeast corner of the field with the footpath beyond; scale 1x1m; view from SE (archive reference: G2659_010).

Plate 8: View along line of 11kv overhead line along the northeast side of the field; scale 1x1m; view from SE (archive reference: G2659_011).

Plate 9: View of possible linear depression that may represent a service trench; scale 1x1m; view from NNE (archive reference: G2659_012).

Plate 10: View of manhole cover in entrance area to the field; scale 1x1m; view from WSW (archive reference: G2659_018).

APPENDIX I

Gwynedd Archaeological Trust Written Scheme of Investigation

LAND TO THE REAR OF RED LION FARM, BALA (G2659)

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL ASSESSMENT & EVALUATION (GEOPHYSICAL SURVEY)

Prepared for Cadnant Planning Ltd.

July 2020

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

All GAT staff should sign their copy to confirm the project specification is read and understood and retain a copy of the specification for the duration of their involvement with the project. On completion, the specification should be retained with the project archive:

Name Signature Date

LAND TO THE REAR OF RED LION FARM, BALA (G2659)

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL ASSESSMENT & EVALUATION (GEOPHYSICAL SURVEY)

Prepared for *Cadnant Planning Ltd.*, July 2020

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Location of assessment / evaluation area (outlined red). Not to scale. 26

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been asked by Cadnant Planning Ltd. to prepare a written scheme of investigation for an archaeological assessment and evaluation (geophysical survey) in advance of a proposed residential development on land to the rear of Red Lion Farm, Bala, Gwynedd (NGR SH92333586; postcode: LL23 7AS; Figure 01). The development area measures 2.58ha and is located northwest of the High Street, within a field of improved open pasture.

The assessment will be undertaken from July 2020 and will conform to the following guidelines:

- *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* Version 1.1 (The Welsh Archaeological Trusts, 2018);
- *Guidelines for digital archives* (Royal Commission on Ancient and Historic Monuments of Wales, 2015);
- *Management of Archaeological Projects* (English Heritage, 1991);
- *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England, 2015);
- *Standard and Guidance for Archaeological Geophysical Survey* (Chartered Institute for Archaeologists, 2014); and
- *Standard and Guidance for Historic Environment Desk-Based Assessment* (Chartered Institute for Archaeologists, 2017).

GAT is certified to ISO 9001:2015 and ISO 14001:2015 (Cert. No. 74180/B/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists and a member of the Federation of Archaeological Managers and Employers (FAME).

1.1 Monitoring Arrangements

The archaeological assessment and evaluation will be monitored by the Gwynedd archaeological Planning Service (GAPS); the content of this WSI and all subsequent reporting by GAT must be approved by GAPS prior to final issue.

1.2 Historic Environment Record

In line with the Gwynedd Historic Environment Record (HER) requirements, the HER will be contacted at the onset of the project to ensure that any data arising is formatted in a manner suitable for accession to the HER and follows the guidance set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (The Welsh Archaeological Trusts, 2018). The HER will be informed of the project start date, location including grid reference, estimated timescale for the work, and further relevant information associated with the project.

The GAT HER Enquiry Number for this project is GATHER1291 and the Event PRN is 45941. The GAT HER will also be responsible for supplying Primary Reference Numbers (PRN) for new assets identified and recorded.

Prior to submission of data to the HER on completion of the project, a bilingual event summary document will be prepared in *Microsoft Word* based on the format defined in section 4.2 of *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1.1).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

A brief examination of the regional Historic Environment Record demonstrates that there are no known archaeological assets within the proposed development area; within the immediate area, the following assets have been identified:

- Primary Reference Number (PRN) 3210: a post-medieval well is located 70m to the southwest at NGR SH92153583; the well is located in a sunken rectangular stone enclosure, with six steps in one corner;

The HER PRN entry for Bala township (PRN 9885) describes Bala as astride the main road to Dolgellau, on the floodplain close to the confluence of the Dee and Tryweryn at the north end of Llyn Tegid Wales' largest natural lake. A complex of Roman enclosures have been identified in the immediate vicinity of Bala, at Llanfor, by aerial reconnaissance, whilst the Roman road from Chester to Caer Gai and Brithdir likely passed through the area. During the medieval period, Bala is thought to have been the maerdref of the commote of Uwch Tryweryn in the cantref of Penllyn; two, presumably Norman, mottes stand close by: Tomen y Bala at the north end of the later borough of Bala, and Castell Gronw on the River Dee at the point where it leaves the lake. In the early 14th century, a small town was founded in an attempt to bring stability to the area and so that the town could serve as an administrative centre for the district; the borough was laid out with 53 burgage plots. The plots were laid out along one principal street, with two back lanes running parallel to it, now represented by Arenig and Plasey/Mount Streets. Subsequent development, however, has destroyed most of the original plots. A feature of the medieval town was the small chapel which stood near the town cross in High Street; there was no church at Bala until the building of Christ Church in 1811, but the chapel may have been contemporary with the foundation of the borough and continued to serve the community until the early 18th century when it was demolished and he site and associated graveyard developed. The later history of Bala is described in the HER entry as uneventful and in the absence of any maintained castle the town does not figure in the Glyndwr revolt, although a small garrison place consisting of six timber houses was temporarily established. Limited archaeological work has been carried out at the location of the motte or the town of Bala itself. In the early 1990's, archaeologists conducting a watching brief at the site of the old gas works, immediately to the southwest of Tomen-y-Bala, identified what they believed to be part of the ditch around the base of the motte (Johnstone and Riley 1995, 23). Gwynedd Archaeological Trust also undertook a watching brief during the repair and maintenance of a partially collapsed stone retaining wall at the base of the

motte (Smith & Ryan Young, 2016). The ground immediately behind the retaining wall revealed no evidence of being part of the original motte construction and was most likely redeposited material dating to the wall building phase.

A brief examination of historic mapping, including the Ordnance Survey 6-inch to 1-mile County Series Map Sheet of the area (Sheet XXII.NE; 1901), shows the proposed development area as an open field, similar to present day. The differences include further modern development along the Pensarn Road/High Street to the south, as well as development to the west, east and northeast. A footpath is shown on the 1901 edition map running along the eastern boundary of the field.

The proposed development site is within the Bala and Bala Lakesides Registered Landscape of Special Historic Interest. The Historic Landscape Characterisation study of Bala, specifically the *Bala and Llyn Tegid - Area 2 Bala (historic core)* (PRN 24702), will be consulted as part of the assessment/evaluation.

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3 METHODOLOGY

3.1 Assessment (Desktop Study)

A desk-based assessment is defined as “a programme of study of the historic environment within a specified area or site on land, the inter-tidal zone or underwater that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage….Significance is to be judged in a local, regional, national or international context as appropriate” (CIfA 2014, 4).

The desk-based assessment will involve a study of the following resources:

1. The regional Historic Environment Register ((HER) Gwynedd Archaeological Trust, Craig Beuno, Ffordd y Garth, Bangor, Gwynedd LL57 2RT) will be examined for information concerning the study area, defined as the highlighted plot in Figure 01 and the immediate environs. This will include an examination of the core HER, the 1:2500 County Series Ordnance Survey maps and any secondary information held within the HER. All identified features will be mapped, described and added to a gazetteer of sites and the relative importance of any sites defined;
2. The National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, Plas Crug, Aberystwyth SY23 1NJ) will be checked for sites additional to the HER;
3. Aerial photographs from the National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, National Monuments Record of Wales, Plas Crug, Aberystwyth SY23 1NJ) will be examined for potential features. This will include 1946 RAF vertical aerial photographs (including sortie 106G/UK 1468 2472);
4. On-line catalogue search of the National Library of Wales (Penglais Rd, Aberystwyth SY23 3BU);
5. Archive data, including primary and secondary sources, historic maps and estate maps will be examined at the regional archives (Archifau Ynys Môn / Anglesey Archives, Diwydiannol Bryncefni / Industrial Estate Rd, Llangefni LL77 7JA and Library).. The examination of the archive data will include historic mapping including the local tithe map and schedule;

6. Light Detection and Ranging (LiDAR) data will be examined from the Lle Geo-Portal at http://lle.gov.wales/home for information on potential surface features using digital terrain modelling and digital surface modelling;

3.2 Walkover Survey

A walkover survey will be undertaken that will incorporate the assessment area study area, defined as the highlighted plot in Figure 01 and the immediate environs. All known and new archaeological features on the ground will be located and described them on GAT pro-formas. The sites will then be added to the overall gazetteer and their relative importance defined. The potential for sub-surface archaeology will be estimated and defined.

A photographic record will be maintained in RAW format using a digital SLR set to maximum resolution (Nikon D3000; resolution: 3,872 × 2,592 [10.2 effective megapixels]) and photographic metadata table will be completed and included in the report. Photographic images will be archived in TIFF format; the archive numbering system will start from G2659_001. A handheld GPS unit will also be used during the walkover survey

3.3 Geophysical Survey

3.3.1 Summary

The geophysical survey will be undertaken by GAT staff and will incorporate the area defined as the red highlighted plot in Figure 01 and will be carried out in a series of 20m grids, which will be tied into the Ordnance Survey grid using a Trimble R8 high precision GPS system. The survey will be conducted using a Bartington Grad 601-2 dual fluxgate gradiometer with a 1.0m traverse interval and a 0.25m sample interval.

3.3.2 Instrumentation

The Bartington Grad 601-2 dual fluxgate gradiometer uses a pair of Grad-01-100 sensors. These are high stability fluxgate gradient sensors with a 1.0m separation between the sensing elements, giving a strong response to deeper anomalies. The instrument detects variations in the earth's magnetic field caused by the presence of iron in the soil. This is usually in the form of weakly magnetized iron oxides which tend to be concentrated in the topsoil. Features cut into the subsoil and backfilled or silted with topsoil, therefore contain greater amounts of iron and can therefore be detected with the gradiometer. This is a simplified description as there are other processes and materials which can produce detectable anomalies. The most obvious is the presence of pieces of iron in the soil or immediate environs which usually produce very high readings and can mask the relatively weak readings produced by variations in the soil. Strong readings are also produced by archaeological features such as hearths or kilns as fired clay acquires a permanent thermo-remnant magnetic field upon cooling. This material can also get spread into the soil leading to a more generalized magnetic enhancement around settlement sites. Not all surveys can produce good results as results can be masked by large magnetic variations in the bedrock or soil or high levels of natural background "noise" (interference consisting of random signals produced by material with in the soil). In some cases, there may be little variation between the topsoil and subsoil resulting in undetectable features. The Bartington Grad 601 is a hand held instrument and readings can be taken automatically as the operator walks at a constant speed along a series of fixed length traverses. The sensor consists of two vertically aligned fluxgates set 500mm apart. Their cores are driven in and out of magnetic saturation by a 1,000Hz alternating current passing through two opposing driver coils. As the cores come out of saturation, the external magnetic field can enter them producing an electrical pulse proportional to the field strength in a sensor coil. The high frequency of the detection cycle produces what is in effect a continuous output. The gradiometer can detect anomalies down

to a depth of approximately one meter. The magnetic variations are measured in nanoTeslas (nT). The earth's magnetic field strength is about 48,000 nT; typical archaeological features produce readings of below 15nT although burnt features and iron objects can result in changes of several hundred nT. The machine is capable of detecting changes as low as 0.1nT.

3.3.3 Data Collection

The gradiometer includes an on-board data-logger. Readings are taken along parallel traverses of one axis of a 20m x 20m grid. The traverse interval is 1.0m and readings are logged at intervals of 0.25m along each traverse. Marked guide ropes are used to ensure high positional accuracy during the high resolution survey. The data is transferred from the data-logger to a computer where it is compiled and processed using ArchaeoSurveyor2 software. The data is presented as a grey scale plot where data values are represented by modulation of the intensity of a grey scale within a rectangular area corresponding to the data collection point within the grid. This produces a plan view of the survey and allows subtle changes in the data to be displayed. This is supplemented by an interpretation diagram showing the main feature of the survey with reference numbers linking the anomalies to descriptions in the written report. It should be noted that the interpretation is based on the examination of the shape, scale and intensity of the anomaly and comparison to features found in previous surveys and excavations etc. In some cases the shape of an anomaly is sufficient to allow a definite interpretation e.g. a Roman fort. In other cases all that can be provided is the most likely interpretation. The survey will often detect several overlying phases of archaeological remains and it is not usually possible to distinguish between them. Weak and poorly defined anomalies are most 4 susceptible to misinterpretation due to the propensity of the human brain to define shapes and patterns in random background "noise". An assessment of the confidence of the interpretation is given in the text.

3.3.4 Data Processing

The data is presented with a minimum of processing although corrections are made to compensate for instrument drift and other data collection inconsistencies. High readings caused by stray pieces of iron, fences, etc. are usually modified on the grey scale plot as they have a tendency to compress the rest of the data. The data is however carefully examined before this procedure is carried out as kilns and other burnt features can produce similar readings. The data on some 'noisy' or very complex sites can benefit from 'smoothing'. Grey-scale plots are always somewhat pixellated due to the resolution of the

survey. This at times makes it difficult to see less obvious anomalies. The readings in the plots can therefore be interpolated thus producing more but smaller pixels and a small amount of smoothing based on a low pass filter can be applied. This reduces the perceived effects of background noise thus making anomalies easier to see. Any further processing is noted in relation to the individual plot.

3.3.5 Aims

The report will include a discussion of the grey scale plot and an interpretation of the any anomalies identified; these anomalies will be presented as either positive or negative, suggesting whether they could be cut features (ditches, pits etc.), or built sub-surface features (e.g., banks). Figures will be included for the grey scale plot and for the anomaly interpretation. The results of the geophysical survey will be used to inform further recommendations for archaeological evaluation and/or mitigation (if relevant)

3.4 Fieldwork Archiving

Following the completion of the respective assessment/evaluation stages, fieldwork archiving will be completed based on following task list:

1. Pro-formas: all cross referenced and complete;
2. Photographic Metadata: completed in *Microsoft Access* and cross-referenced with all pro-formas;
3. Geophysical survey data: downloaded using a Computer Aided Design package;

All data will be processed and a report will be produced which will detail and synthesise the results.

A gazetteer will be compiled for any existing and newly identified sites within the local area, based on information sourced from the desk based assessment and geophysical surve ; the gazetteer will be prepared in the following format and will include:

Feature Number	
Site name	
PRN number	
Grid reference	
Period	
Site type	
Assessment category	
Description	
Impact	
Recommendation for further assessment/evaluation	
Recommendation for mitigatory measures	

The following categories will be used to define the assessment category of the archaeological asset:

Category A - Sites of National Importance.
Scheduled Monuments, Listed Buildings of grade II* and above, as well as those that would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both. Sites that are scheduled or listed have legal protection, and it is recommended that all Category A sites remain preserved and protected *in situ*.

Category B - Sites of regional or county importance.
Grade II listed buildings and sites which would not fulfil the criteria for scheduling or listing, but which are nevertheless of particular importance within the region. Preservation *in situ* is the preferred option for Category B sites, but if damage or destruction cannot be avoided, appropriate detailed recording might be an acceptable alternative.

Category C - Sites of district or local importance.

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened. Category C sites nevertheless merit adequate recording in advance of damage or destruction.

Category D - Minor and damaged sites.

Sites that are of minor importance or are so badly damaged that too little remains to justify their inclusion in a higher category. For Category D sites, rapid recording, either in advance of or during destruction, should be sufficient.

Category E - Sites needing further investigation.

Sites, the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A - D are temporarily placed in this category, with specific recommendations for further evaluation.

The impact of the proposed works on any asset will be identified using the following impact criteria, defined either as *none, slight, unlikely, likely, significant, considerable or unknown* as follows:

None:

There is no construction impact on this asset.

Slight:

This has generally been used where the impact is marginal and would not by the nature of the site cause irreversible damage to the remainder of the asset, *e.g.* part of a trackway or field bank.

Unlikely:

This category indicates sites that fall within the band of interest but are unlikely to be directly affected. This includes sites such as standing and occupied buildings at the margins of the band of interest.

Likely:

Sites towards the edges of the study area, which may not be directly affected, but are likely to be damaged in some way by the construction activity.

Significant:

The partial removal of an asset affecting its overall integrity. Assets falling into this category may be linear features such as roads or tramways where the removal of part of the feature could make overall interpretation problematic.

Considerable:

The total removal of an asset or its partial removal which would effectively destroy the remainder of the site.

Unknown:

This is used when the location of the asset is unknown, but thought to be in the vicinity of the proposed works.

3.5 Data processing and report compilation

Following completion of the stages outlined above, a report will be produced incorporating the following:

1. Front cover;
2. Inner cover;
3. Figures and Plates List;
4. Non-technical summary (Welsh/English);
5. Introduction;
6. Methodology;
    i. Desk-based assessment;
    ii. Walkover survey;
    iii. Geophysical survey;
7. Results;
    a. Desk based assessment;
        i. Location and geological summary;
        ii. Statutory and non-statutory designations;
        iii. Environmental remains and soil morphology;
        iv. Historical and archaeological background;
        v. Cartographic evidence;
        vi. Artefact potential;
        vii. Aerial photographs and LiDAR;
    b. Walkover survey;
    c. Geophysical survey
    d. Gazetteer of features;
8. Conclusions and recommendations;
    a. Conclusion;
    b. Table of sites and recommendations;
9. Acknowledgements;
10. Bibliography;
    a. Primary sources;
    b. Secondary sources;
11. Figures; inc.:
    - location plan;
    - historic mapping;
    - location plan with identified features;
    - grey scale plot;
    - anomaly identification and interpretation;
12. Appendix I (approved written scheme of investigation);
13. Appendix II (Sites listed on GAT Historic Environment Record);
14. Appendix III (Definition of mitigation terms);
15. Appendix IV (Photographic metadata - walkover survey);
    Back cover.

Illustrations will include plans of the location of the study area and archaeological sites. Historical maps, when appropriate and if copyright permissions allow, will be included.

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. The archaeological assessment outlined in this written scheme of investigation will be submitted in draft format in August 2020; a final report will be submitted to the Historic Environment within six months of submitting the draft report (February 2021).

The following dissemination will apply:

- A digital report(s) will be provided to the client/consultant and GAPS (draft report then final report);
- A paper report plus a digital report will be provided to the regional Historic Environment Record, Gwynedd Archaeological Trust; this will be submitted within six months of project completion (final report only), along with any relevant, digital information such as the project database and photographs. All digital datasets submitted will conform to the required standards set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1.1); and
- A digital report and archive (including photographic and drawn) data will be provided to Royal Commission on Ancient and Historic Monuments, Wales (final report only), in accordance with the *RCAHMW Guidelines for Digital Archives Version 1*. Digital information will include the photographic archive and associated metadata.

4 PERSONNEL

The project will be managed by John Roberts, Principal Archaeologist GAT Contracts Section. The desk based assessment will be completed by a Project Archaeologist who will have responsibility for completing compiling the gazetteer, preparing the site archive, liaising with GAPS and *Cadnant Planning Ltd.* and preparing the draft report and final report. The geophysical survey will be undertaken by GAT staff, led by a Senior Archaeologist. The survey results will be incorporated into the assessment report and included in the gazetteer. The project manager will be responsible for reviewing and approving the report prior to submission.

5 INSURANCE

5.1 Public/Products Liability

Limit of Indemnity- £5,000,000 any one event in respect of Public Liability
INSURER Aviva Insurance Limited
POLICY TYPE Public Liability
POLICY NUMBER 24765101CHC/UN/000375
EXPIRY DATE 21/06/2020

5.2 Employers Liability

Limit of Indemnity- £10,000,000 any one occurrence.
The cover has been issued on the insurers standard policy form and is subject to their usual terms and conditions. A copy of the policy wording is available on request.
INSURER Aviva Insurance Limited
POLICY TYPE Employers Liability
POLICY NUMBER 24765101 CHC / UN/000375
EXPIRY DATE 21/06/2020

5.3 Professional Indemnity

Limit of Indemnity- £5,000,000 in respect of each and every claim
INSURER Hiscox Insurance Company Limited
POLICY TYPE Professional Indemnity
POLICY NUMBER 9446015
EXPIRY DATE 22/07/2019

6 SOURCES CONSULTED

1. Berks T, Davidson A, Gwyn D & Longley D 2008 *Urban Characterisation: Bala.* Gwynedd Archaeological Trust report 727
2. Dane C 2000 Merionethshire Townships.
3. English Heritage, 1991, Management of Archaeological Projects
4. English Heritage, 2015, Management of Research Projects in the Historic Environment (MoRPHE).
5. *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1.1)
6. Haslam, R., Orbach, J. and Voelcker, A. 2009. *The Buildings of Wales: Gwynedd* (Pevsner Architectural Series)
7. Johnstone N 2000 Llys and Maerdref: The Royal Courts of the Princes of Gwynedd. A study of their Location and Selective Trial Excavation, Studia Celtica: Vol. 34: p.167-210
8. Johnstone N & Riley H F 1995 Llys and Maerdref: an Investigation into the Location of the Royal Courts of the Princes of Gwynedd. Gwynedd Archaeological Trust report 167
9. Ordnance Survey First Edition Ordnance Survey 1-inch to 25-mile County Series Map Sheets VIII.13, VIII.14, XIV.01 and XIV.02; 1889.
10. Ordnance Survey Second Edition Ordnance Survey 1-inch to 25-mile County Series Map Sheets VIII.13, VIII.14, XIV.01 and XIV.02; 1900.
11. Ordnance Survey Third Edition Ordnance Survey 1-inch to 25-mile County Series Map Sheets VIII.13, VIII.14, XIV.01 and XIV.02; 1920.
12. Royal Commission on Ancient and Historic Monuments of Wales 2015 *Guidelines for digital archives*
13. Smith S & Ryan Young C, 2016. *Tomen Y Bala Motte, Bala, Gwynedd: Archaeological Watching Brief.* Gwynedd Archaeological Trust Report 1331.
14. Standard and Guidance for Archaeological Geophysical Survey (Chartered Institute for Archaeologists, 2014).
15. *Standard and Guidance for Historic Environment Desk-Based Assessment* (Chartered Institute for Archaeologists, 2017).

APPENDIX II

Sites listed on Gwynedd Archaeological Trust Historic Environment Record

Sites on the Gwynedd HER within 500m of the Study Area					
PRN	**SITE NAME**	**SUMMARY**	**PERIOD**	**LISTED BUILDING GRADE**	**NGR**
62999	26, High Street, Bala	Early 19th century town house, one of a pair. An external modern slate plaque records the stationing of American soldiers in Bala during World War II.	Post Medieval	II	SH9273636082
62994	34 Tegid Street, Bala	A post medieval house.	Post Medieval	II	SH9268235898
62995	36 Tegid Street, Bala	A Victorian house.	Post Medieval	II	SH9268535902
62973	37 Tegid Street, Including Forecourt Walls & Railings	A Victorian house.	Post Medieval	II	SH9266135871
62996	38 Tegid Street, Bala	A Victorian house.	Post Medieval	II	SH9268735906
62974	39 Tegid Street, Bala	A Victorian house.	Post Medieval	II	SH9266335866
62989	40 Tegid Street, Bala	A post medieval house.	Post Medieval	II	SH9269035910
62972	41 Tegid Street, Bala	A post medieval house.	Post Medieval	II	SH9266535861
62966	43 Tegid Street, Bala	No. 43; listed as part of a fine early 19th century terrace of 4 houses retaining good original character. Group value with other listed items in Tegid Street.	Post Medieval	II	SH9266835855
62998	48, Mount Street	A post medieval house.	Post Medieval	II	SH9271035987
62968	50, Mount Street, Bala	A post medieval house.	Post Medieval	II	SH9270535982
62969	52, Mount Street, Bala	A post medieval house.	Post Medieval	II	SH9270135978
62967	72 High Street, Bala	Late Georgian house and shop premises, originally forming a terrace with the Barclays Bank building adjoining to the left. The windows were replaced in the mid 19th century	Post Medieval	II	SH9258535927

Sites on the Gwynedd HER within 500m of the Study Area					
PRN	**SITE NAME**	**SUMMARY**	**PERIOD**	**LISTED BUILDING GRADE**	**NGR**
		and the shop front was modernised in the later 20th century.			
63024	Awelfryn	An Edwardian house.	Post Medieval	II*	SH9266136136
24702	Bala (Historic Core), Landscape		MULTIPERIOD		SH9263636008
4281	Bala Medieval Town, Bala	Bala is situated at the northern end of Bala Lake (Llyn Tegid) at the confluence of Dee and Tryweryn. It has been described as the finest example of a planned English borough in Meirionnydd. It was founded c. 1310 by Roger Mortimer in an attempt to bring	MEDIEVAL		SH926360
9885	Bala Township, Site of, Bala		MEDIEVAL		SH922359
12296	Barclays Bank, High Street, Bala		POST MEDIEVAL;MODERN	II	SH9257935938
57699	Building, SW of Eryl-Aran		POST MEDIEVAL		SH9198335631
12316	Bulls Head Hotel, Bala		POST MEDIEVAL	II	SH9255735903
62991	Caffi'r Cyfnod	Late Georgian shop and house building with later 19th century shopfront.	Post Medieval	II	SH9266436005
36234	Capel Tegid, Bala		POST MEDIEVAL	II	SH9271335910
62997	China Treasure Takeaway	First-third 19th century house and shop with later 19th century shop front.	Post Medieval	II	SH9260135955
63017	Congregational Chapel, Including Forecourt Walls, Piers and Railings	Congregational chapel, built in 1867 and replacing an earlier chapel and independent college, formerly located opposite.	Post Medieval	II	SH9273835994

Sites on the Gwynedd HER within 500m of the Study Area					
PRN	**SITE NAME**	**SUMMARY**	**PERIOD**	**LISTED BUILDING GRADE**	**NGR**
63019	Cwpwrdd Cornel Cafe	Early 19th century house and shop, formerly 2 units, modern ground floor shop front.	Post Medieval	II	SH9259035951
63015	Derlwyn	A post medieval house.	Post Medieval	II*	SH9268836162
62981	Dolydd	An Edwardian terraced house.	Post Medieval	II*	SH9267536149
63022	E.J. Theodore, Ironmonger	An early 19th century house and shop.	Post Medieval	II	SH9260035950
63026	Fedw Arian	A post medieval house.	Post Medieval	II*	SH9267136144
3210	Ffynnon Beuno, Well, Bala		POST MEDIEVAL		SH92153583
63011	H Rowlands	Originally two early 19th century house and shop buildings, now combined.	Post Medieval	II	SH9261535937
63018	Heulfryn, Including Forecourt Walls and Railings	Late Regency former town house.	Post Medieval	II	SH9265936067
70119	Housing Estate, Bala, Character Area	Housing Estates, a Character Area in Bala. A modern housing estate on the periphery of the Medieval town.	MULTIPERIOD		SH9216535852
63010	Isfryn	An Edwardian house.	Post Medieval	II*	SH9266736140
63009	Islwyn	An Edwardian terrace house.	Post Medieval	II*	SH9268536157
63008	Ken Davies Newsagent	Late Georgian shop building with later 19th century shopfront and alterations to upper windows.	Post Medieval	II	SH9268436021
70120	Leisure Centre and Open Fields, Bala, Character Area	Leisure development and open fields, a Character Area in Bala. A modern development on previously undeveloped land.	MULTIPERIOD		SH9241935732
70116	Medieval Core,	The Medieval Core is a	MULTIPERIOD		SH92600359

Sites on the Gwynedd HER within 500m of the Study Area					
PRN	**SITE NAME**	**SUMMARY**	**PERIOD**	**LISTED BUILDING GRADE**	**NGR**
	Bala, Character Area	Character Area in Bala. The area preserves the original street plan overlain with strong 19th century character.			88
12394	Nos. 24 and 26 High Street, Bala		POST MEDIEVAL	II	SH9273636083
12635	Nos. 88 to 96 High Street, Bala		POST MEDIEVAL;MODERN	II*	SH9252035850
62982	Plas Deon	An early 19th century town house.	Post Medieval	II	SH9266035881
63002	Plas Teg	A Georgian townhouse.	Post Medieval	II	SH9265335817
63003	Plas-yn-Acre	A Georgian townhouse.	Post Medieval	II	SH9266235812
63005	Plas-yn-Dre, Including Railings to Forecourt	Plas-yn-Dre, Bala; the seat of a branch of the Lloyds of Rhiwaedog, one of Meirionethshire's principal gentry families. Its present external appearance is largely the result of Edwardian alterations.	Post Medieval	II	SH9268436084
63006	Presbyterian Chapel, Including Forecourt Walls and Railings	Built in 1810 as a Chapel of Ease and licensed for divine service in 1813. From then until the construction of Christ Church in 1855, the chapel served as the town's only Anglican church. From 1855 until 1873 the chapel was converted for use as a nationa	Post Medieval	II	SH9274036054
68775	R.H. Roberts , 7 High Street, Bala	An early 19th century house.	POST MEDIEVAL	II	SH9273936129
63007	Ronville	A post medieval house.	Post Medieval	II*	SH9268036154
63014	Rosedale, Including Forecourt Walls & Railings	A post medieval house.	Post Medieval	II*	SH9269336167

Sites on the Gwynedd HER within 500m of the Study Area					
PRN	**SITE NAME**	**SUMMARY**	**PERIOD**	**LISTED BUILDING GRADE**	**NGR**
62992	Siop Bapur Newydd	Early 19th century house with 20th century alterations to the ground floor.	Post Medieval	II	SH9259535955
62993	Siop DE	A 19th century house.	Post Medieval	II	SH9265136062
63020	Spar	Georgian pair of former townhouses.	Post Medieval	II	SH9262836045
63021	Statue of Rev Thomas Charles (including its railings), in front of Capel Tegid	Statue erected in 1875 of Rev Thomas Charles (1755-1814), promoter of education and particularly of Sunday Schools in Wales.	Post Medieval	II	SH9269435890
63023	Statue Of T.E. Ellis	Statue erected in 1903 to commemorate Thomas Edward Ellis (1859-1899), MP and Liberal Chief Whip; by W. Goscombe John, sculptor. It was unveiled on 10th October 1903 by the Right Hon. D. Lloyd George, PM.	Post Medieval	II	SH9267836056
63027	Tenovus	A Georgian townhouse.	Post Medieval	II	SH9264336043
12633	Town Hall, High Street, Llandderfel	The town hall occupies the probable site of the original early 14th century burgesses court of Bala. The Court of Great Sessions was held here until 1830 and from 1830 until 1872. The present building appears to be a rebuilding of c.1800; a clock (and pe	Post Medieval	II	SH9261335974
70121	Villa Housing, Bala, Character Area	Villa Housing, a Character Area in Bala. A modern late 19th and 20th century development of housing, preserving character.	MULTIPERIOD		SH9211635714

Sites on the Gwynedd HER within 500m of the Study Area					
PRN	**SITE NAME**	**SUMMARY**	**PERIOD**	**LISTED BUILDING GRADE**	**NGR**
12501	White Lion Hotel, No. 61 High Street, Bala		POST MEDIEVAL	II	SH9257635989
62466	Y Bala, Conservation Area	Y Bala - Snowdonia National Park Conservation Area	MULTIPERIOD		SH9259835986
62990	Y Gelli	Late Georgian town house with later 19th century or early 20th century alterations.	Post Medieval	II	SH9268835871
63025	Y Siop Fach	An early 19th century house and shop.	Post Medieval	II	SH9260935943
63001	Yr Eryr	A post medieval house.	Post Medieval	II	SH9265236050
70124	Ysgol y Berwyn and Playing Fields, Bala, Character Area	Ysgol y Berwyn and Playing Fields, a Character Area in Bala. The school incorporates Victorian and 20th century architecture.	MULTIPERIOD		SH9250836261

APPENDIX III

Definition of Mitigation Terms

Definition of field evaluation techniques

Field evaluation is necessary to fully understand and assess most class E sites and to allow the evaluation of areas of land where there are no visible features but for which there is potential for sites to exist. Two principal techniques can be used for carrying out the evaluation: geophysical survey and trial trenching. Topographic survey may also be employed where sites are thought to survive as earthworks.

Geophysical survey most often involves the use of a magnetometer, which allows detection of some underground features, depending on their composition and the nature of the subsoil. Other forms of geophysical survey, including resistivity survey and ground penetrating radar might also be of use.

Trial trenching allows a representative sample of the development area to be investigated at depth. Trenches of appropriate size can also be excavated to evaluate category E sites. Trenching is typically carried out with trenches of between 20 to 30m length and 2m width. The topsoil is removed by machine and the resulting surface is cleaned by hand, recording features. Depending on the stratigraphy encountered the machine may be used to remove stratigraphy to deeper levels.

Definition of Mitigatory Recommendations

Below are the measures that may be recommended to mitigate the impact of the development on the archaeology.

None:
No impact so no requirement for mitigatory measures.

Detailed recording:

This requires a full photographic record and measured survey prior to commencement of works.

Archaeological excavation may also be required depending on the particular feature and the extent and effect of the impact.

Basic recording:
Requiring a photographic record and full description prior to commencement of works.

Strip, Map and Sample:
The technique of Strip, Map and Sample involves the examination of machine-stripped surfaces to identify archaeological remains. The stripping is undertaken under the supervision of an archaeologist. Stripping and removal of the overburden is undertaken in such as manner as to ensure damage does not take place to surfaces that have already been stripped, nor to archaeological surfaces that have not yet been revealed.

Stripping is undertaken in as careful a manner as possible, to allow for good identification of archaeological features. A small team of archaeologists will be responsible for subsequently further cleaning defined areas where necessary. Complex sites which cannot be avoided will need to be fully excavated.

Watching brief:
This is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.

Avoidance:
Features, which may be affected directly by the scheme, or during the construction, should be avoided. Occasionally a minor change to the proposed plan is recommended, but more usually it refers to the need for care to be taken during construction to avoid accidental damage to a feature. This is often best achieved by clearly marking features prior to the start of work.

Reinstatement:
The feature should be re-instated with archaeological advice and supervision.

APPENDIX IV

Photographic Metadata - Walkover Survey

PHOTO RECORD NUMBER	DESCRIPTION	CONTEXT NUMBER (S)	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE OF CREATION OF DIGITAL PHOTO	ORIGINATING ORGANISATION	PLATES
G2659_001	General view of narrow entrance green area	n/a	NW	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_002	General view of improved pasture field	n/a	SE	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_003	View of northwest corner of study area, showing triangular tip of field and public footpath	n/a	SE	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_004	General view across the field from the northwest	n/a	NW	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_005	View of the post and wire fence boundary on the northern side of the field with adjacent footpath and mixed hedge beyond	n/a	W	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	04
G2659_006	View along the southwest boundary of the field showing the watercourse	n/a	NNW	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	05
G2659_007	View of fence an hedgeline along the southwestern boundary	n/a	NW	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	06
G2659_008	General view of the southeast edge of the field	n/a	SW	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_009	View of electrical substation in southeast corner of the field with the footpath beyond	n/a	SW	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	

PHOTO RECORD NUMBER	DESCRIPTION	CONTEXT NUMBER (S)	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE OF CREATION OF DIGITAL PHOTO	ORIGINATING ORGANISATION	PLATES
G2659_010	View of electrical substation in southeast corner of the field with the footpath beyond	n/a	SE	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	07
G2659_011	View along line of 11kv overhead line along the northeast side of the field	n/a	SE	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	08
G2659_012	View of possible linear depression that may represent a service trench	n/a	NNE	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	09
G2659_013	General view of the rear of the former Red Lion, now a holiday complex	n/a	WNW	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_014	General view showing the interface between the slope and level area within the field	n/a	W	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_015	General view of the entire study area from the highest point to the northwest	n/a	NW	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_016	Detail view showing northwest point of field	n/a	SE	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_017	General view of entire field	n/a	SSE	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	03
G2659_018	View of manhole cover in entrance area to the field	n/a	WSW	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	10

PHOTO RECORD NUMBER	DESCRIPTION	CONTEXT NUMBER (S)	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE OF CREATION OF DIGITAL PHOTO	ORIGINATING ORGANISATION	PLATES
G2659_019	General view of the field from the road	n/a	SSE	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	01
G2659_020	General view of the entrance area/roadside plot	n/a	SE	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_021	General view of former Red Lion buildings	n/a	SW	1x1m	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	02
G2659_023	View of interface between the flat ground and slope with the field from the path	n/a	NE	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_024	View of the upper northwest slope of the field from the path	n/a	ESE	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_025	View from the footpath of the entire field from the north	n/a	N	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	
G2659_026	View from Maes Treflyn of study area and Bala beyond	n/a	W	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	Cover
G2659_027	View from Maes Treflyn of study area and Bala beyond	n/a	NW	not used	Robert Evans	29/07/2020	Gwynedd Archaeological Trust	

Gwynedd Archaeological Trust
Ymddiriedolaeth Archaeolegol Gwynedd

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